



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

May 2008

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SUMMARY OF CHANGES

This document is substantially revised and must be completely reviewed. The entire document has been revised and updated with respect to releasability - Approved for Public Release.

(A, B, C, D, G) It corrects grammatical errors. (B, 1.7) It clarifies the project management and tracking function. (B, B-9) It changes the orientation of the problem solving worksheet to facilitate printing. (C, C-16) It changes the orientation of the Competency matrix to facilitate printing. (G, 2.1..1) It changes the definition of Process Manager to align with Volume N. (L, 1.2) It clarifies use of Emergency and Special Program codes for AFSO21 funding. (N) It adds several definitions previously omitted and updates the definition of Process Manager. (O, 1.7) It corrects the embedded SA&D excel spreadsheet.(O, 1.17) It adds templates for 8 wastes, Takt Time Bar Chart, and Takt Time Calculation.



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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
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VOLUME A: CONCEPT OF OPERATIONS

May 2008



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SECTION ONE: EXECUTIVE SUMMARY

Air Force Smart Operations for the 21st Century (AFSO21) encapsulates our intent to develop and institutionalize a comprehensive, Service-wide, strategic-level Continuous Process Improvement (CPI) approach. "We will capitalize on using knowledge from other organizations and disciplines to improve every business process within the Air Force. With AFSO21, we are challenging all Airmen to examine processes and eliminate steps in business processes that add little to no value." (AF StratPlan 3.6) In other words, the aim is to take our high performing organization to the next level, by reviewing how we maximize value¹ and eliminate waste² in all of our environments – operational, support, and otherwise; and fully integrate Continuous Process Improvement across the Total Air Force.

There is a call to action reaching a critical “crescendo:” Our people and aircraft have been in combat environs consecutively since 1990, asymmetric threat advantages challenge the cyber-integrity of our national defensive systems and fiscal challenges combine with demographic changes in our nation make the adversary of 2015 a real and present danger. This call to action is our burning platform.

AFSO21 is an improvement model customized to the unique environment of the United States Air Force which leverages improvement methods from various sources such as; Lean, Six Sigma, Theory of Constraints and Business Process Reengineering. AFSO21 is a transformational initiative empowering all Airmen to eliminate waste from every end-to-end process. It is about delivery of war-fighting capabilities today and tomorrow. It is about our war-fighters successfully engaging and defeating the adversaries of 2015 and beyond. AFSO21 aligns our innovative Air Force with a world-class Continuous Process Improvement culture to create a standardized, disciplined approach. AFSO21 is applicable across organizational, functional and capability boundaries with the ultimate objective of improving combat capability.

This Concept of Operations (CONOPS) articulates Air Force requirements to continue to assure asymmetric air, space and cyberspace capability by focusing on our core, governing and enabling processes. Fundamentally, AFSO21 is a mindset to attack problems and identify opportunities for improvement. It emphasizes the use of our greatest resource – our innovative, dedicated Airmen; guided by world-class leadership and unique core values by addressing the Air Force’s physical system, its management infrastructure, and cultural mindsets and capabilities.

The AFSO21 Playbook is a living document. All Airmen should expect this document to adapt to the Air Force’s implementation and institutionalization of a Continuous Process Improvement culture. Updates will be made continuously and controlled by individual volume as the Airmen of the Air Force conceive the next generation of development in the United States Air Force.

¹ Value is a need the customer is willing to pay for, expressed in terms of a specific required product or service (DoD Continuous Process Improvement Transformation Guidebook (May 2006))

² Waste is anything that adds cost or time without adding value. Generally, waste includes: Defects, Over production, Waiting time, Non-Standard over processing, Transportation, Intellect, Motion, and Excess Inventory. D-O-W-N-T-I-M-E.

SECTION TWO: PHILOSOPHY

2.1 AFSO21 VISION

The vision for AFSO21 is to establish a continuous process improvement (CPI) environment whereby all Airmen³ are actively eliminating waste and continuously improving processes. These improvements must be centered around the core missions we, as Airmen, are responsible for conducting – specifically to maintain the asymmetric advantages and capabilities the Air Force delivers in air, space and cyberspace. We need to ensure we are also driving efficiencies and improvements across-the-board. Therefore, we must use the right tools and techniques to see and attack problems and leverage opportunities for improvement; and employ our greatest resource – innovative, dedicated Airmen.

The vision directly supports the Air Force’s mission statement. The desired effect is an increase in AF combat capability *directly linked to the core AF mission*.

Operational View. The overarching intent of AFSO21 is to effectively and efficiently deliver war-winning, expeditionary capabilities (deployed and in-place) to the joint commanders. Toward that end, we must have the methods and means to continually improve and eliminate waste across all Air Force processes. AFSO21 provides the methods and the means. By achieving a CPI operating style, the Air Force will be better positioned to:



- Prepare for and participate in the joint fight, anywhere, anytime
- Develop, maintain and sustain the war-fighter edge
- Provide motivated and accountable Air Force warriors
- Continually improve our ability to meet the ever-changing demands of the world, our enemies and inevitable fiscal constraints

2.2 CRITICAL SUCCESS FACTORS

AFSO21 program success is based on three factors: being results-oriented, involving the total Air Force and a sustained and deliberate application of AFSO21 principles.

- *Results oriented.* The results and outcomes of AFSO21 efforts will be measured. Measures are tied to AFSO21 and Air Force objectives to maintain alignment and provide focus.
- *Total Air Force involvement.* The focus on war-fighter effectiveness, efficiency and the elimination of waste applies to all Airmen. Many of our processes have evolved over time, often incrementally and in reaction to limited objectives or one-time problems. The Total Air Force must change its mindset from “that is the way we have always done things” to continually seeking the best way accomplish daily work.
- *Sustained and deliberate application.* CPI ideas and methodologies have gained momentum as various organizations achieve and verify results. However, to realize the gains required to meet

³ Airmen refers to any US Air Force Member (officer or enlisted, active, reserve or guard, along with Department of Air Force Civilians) who supports and defends the US Constitution and serves our country (AFDD 1-2, Air Force Glossary (8 June 2006))

our program goals, AFSO21 efforts must be focused, deliberate, sustained over the long term and, ultimately, embedded in our culture.

2.3 CPI IS PROBLEM SOLVING

At the core of process improvement is solving problems that create waste in the day-to-day work of our Airmen. Waste and inefficiencies come in many forms and a significant amount of waste is a product of the processes and methods used. Many of these methods were never engineered in the first place. Instead they evolved over time around organizational boundaries and business rules. The different methods of process improvement are each problem solving methodologies. These methodologies will help us organize work and outputs in synchrony with requirements, more reliably satisfy customer requirements, resolve constraints in our processes and assure that the heart of AFSO21 is the identification and resolution of problems, from the tactical to the strategic level in the Air Force. We can only fail in our improvement efforts if we hide problems instead of acknowledging them and tackling them head on. We must also insist that we take a non-blaming approach in identifying and resolving problems. Our people are not to blame for inefficiencies in our processes, and they are in the best position to help identify barriers and inefficiencies in their day-to-day jobs.

We must fundamentally change the culture of our Air Force so that all Airmen understand their individual role in improving their daily processes and eliminating things that don't add value to the mission. For such a comprehensive effort to be successful, it has to be led by commanders at all levels—from the front.

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General T. Michael Moseley
Chief of Staff

Five Desired Effects

There are five desired effects associated with Smart Operations. They are as follows:

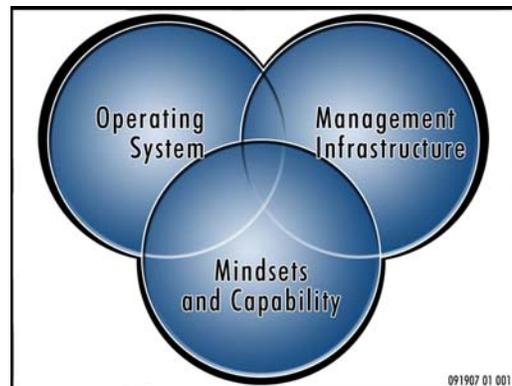
- Increase *productivity* of our most valued asset – Our Airmen
- Significantly increase critical *asset availability*
- Improve response time and decision making *agility*
- Sustain *safe and reliable* operations
- Improve energy efficiency

Continuous Improvement Organizational Components

The three major components of any enterprise include its operating system, management infrastructure and mindsets and capabilities. The greatest gain will come from improvements across the three components vice limiting improvement activities to one. The three components are as follows:

- *Operating System*: The physical tools and techniques to create value and minimize loss
- *Management Infrastructure*: The formal structures, processes and systems through which the operating system is managed to deliver warfighting capability
- *Mindsets and Capability*: The way people think, feel and conduct themselves in the workplace, both individually and collectively

Figure A1 - Components of an Enterprise



SECTION THREE: IMPLEMENTATION

3.1 PHASED APPROACH

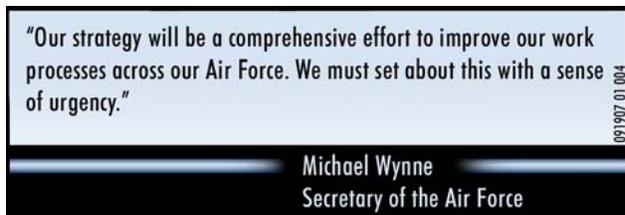
The Air Force will implement AFSO21 in a three-phased approach. Implementation phases are illustrated below.

Figure A2 - AFSO21 Phased Implementation

Phase 1 Initiation	Phase 2 Full Implementation	Phase 3 Mature and Sustain
<ul style="list-style-type: none"> ▪ Leadership commitment ▪ Vision ▪ Establish governance ▪ Mission priorities / goals set ▪ Initial training and benchmarking ▪ Quick visible wins – demonstration area established 	<ul style="list-style-type: none"> ▪ Internal capacity to sustain process improvement ▪ All key areas “touched” ▪ Strategic alignment of goals / metrics ▪ Redeployment of resources is routine ▪ Substantial and growing performance improvements 	<ul style="list-style-type: none"> ▪ Commanders spending more time on strategy & improvements ▪ Self-managed work teams ▪ Cultural changes effected ▪ Improvements extended to strategic partners ▪ Use more advanced CPI tools
Years 1 – 3	Years 2 – 5	Years 4 – 7

Phase I: Initiation (Years 1-3)

- Senior Leader’s exposure, training, and commitment to AFSO21.
 - Understanding is best achieved through seeing and participating in improvement events
- AF Key Process Owners/Champions conduct value stream mapping (VSM) for their process
 - The VSM helps one understand how work is actually accomplished today in terms of participants, dependencies between sub-processes and MAJCOM or functional boundaries and key issues and opportunities for improvement
 - Develop a VSM and “future state” to chart priorities for the AF Key Process Owner/Champion
- Senior Leaders and Commanders set the vision, goals and strategy and articulate the case for change within their organization, aligning these with Air Force process goals
- Senior Leaders and Commanders are responsible for governing AFSO21 efforts using established lines of Command authority (for example, wing, group and squadron commanders at base level) and support from process professionals
- Achieve quick, visible wins by selecting high-payback areas that can demonstrate clear AFSO21 results
- Measure results and communicate them—internally and externally.
- Senior Leaders and Commanders direct redeployment of resources, dollars and personnel, as results are achieved.



- Build training programs so that by Phase II, everyone in the Air Force receives the appropriate level of AFSO21 training as they need it—beginning with awareness training for those in accession programs
- Movement to Phase II will occur when the Air Force Key Process Owner/Champion substantiates sufficient process definition to sustain process improvement efforts
 - This will be supported by analysis of the current situation including goal attainment, metrics and organizational behavior

Phase II: Full Implementation (Years 2-5)

- Structure is in place to sustain process improvement
 - Sufficient experience to grow and sustain AFSO21 improvement methods and operating style
 - Institutionalized local processes for training and conducting improvement events
- All key areas and people have been involved and understand AFSO21 improvements
 - Includes greater cross-organizational/cross-functional process improvements and the elimination of waste
 - Work teams are able to self-generate improvements that contribute to warfighter capabilities and waste elimination
- Full alignment of goals and metrics, from headquarters level to the individual Airman so all understand their role(s) and their contributions to the capabilities they enable
- Redeployment of resources has expanded from the first phase, with some resources redeployed towards emerging mission requirements and critical shortfalls in Major Commands or the Air Force
- Higher levels of performance and efficiency are evident across the organization
 - The organization is achieving substantial performance improvements and is demonstrating a measurable, consistent path of improvement
- Movement to Phase III will occur when the Air Force Key Process Owner/Champion can substantiate that Air Force level process standards have been set, attained and are being adjusted for improvement across the Air Force

Phase III: Mature and Sustain (Years 4-7)

- Senior Leaders and Commanders are achieving world-class results and setting strategy, leading and motivating the organization toward Continuous Process Improvement (versus daily firefighting)
- Self-improvement teams affect day-to-day business
- Cultural changes associated with AFSO21 are visible and pervasive across the organization—AFSO21 is recognized as our way of doing our job every day
- Matured supporting structure is in place to sustain Continuous Improvement with sufficient experience and proven results to extend our methods and elimination of waste to Air Force strategic partners (inside and outside the DoD)
- Use of more advanced tools (e.g., automatic error detection and error elimination, improved predictability and management of problems and advanced variability analysis and reduction techniques) are applied to AFSO21 efforts

CPI Methods. CPI methods, and principles must become part of our culture. AFSO21 problem solving incorporates the techniques listed below.

- *Lean.* A systematic approach to identify waste, focus activities on eliminating it, and maximize (or make available) resources to satisfy other requirements. Lean is simply about removing waste. The goal is to stop performing those activities and processes that do not add to a product or service's value. Value is solely defined by the customer. Many experts estimate that before lean is applied, processes are 90% – 99 % waste. The correct application of Lean tools and techniques will show how to peel away layer after layer of waste. Lean tools such as Failure Modes and Effects Analysis can further eliminate wasteful variance in processes. When first taught beginning Lean tools, students may complain that it just seems like common sense. As understanding is deepened, conventional wisdom is questioned and students never look at the world the same way again. Lean is a journey of continuous improvement rather than a destination. There is no “end point”... only a never ending journey of relentlessly eliminating waste.
- *Six Sigma.* A strategy that increases efficiency by statistical process control. A Six Sigma organization can be understood as having only 3.4 defects per million opportunities - most “good” organizations are only Four Sigma at best (6,210 defects per million). Six Sigma relies on a repeatable 5 step approach to project management and problem solving.
- *Theory of Constraints.* A philosophy and methodology for addressing logical thinking, scheduling and controlling resources and measuring performance. The philosophy emphasizes that a single constraint or bottleneck exists in any process and controls the output of the entire process.
- *Business Process Reengineering.* A management approach that examines aspects of a business and its interactions and attempts to improve the efficiency of underlying processes. Major and sometimes radical change are sometimes associated with business process reengineering.

Eight-Step Problem Solving Model. The CPI methods above will be used dependent upon the type improvement and problem being addressed with Smart Operations tools. Regardless the method, the Air Force is adopting a standard Eight-Step Problem Solving model to progress from assessment of current operations to measuring results after improvements are made. It will be useable from rapid improvement events to larger reengineering efforts. The Eight-Step Problem Solving Process is discussed in more detail in Volume B of this Playbook.

Organizing for Process Improvement. AFSO21 must be integrated into normal command and control chain responsibilities. In addition, the Air Force is organizing broader, strategic improvement efforts under Air Force Key Process Owner areas of responsibility. These are two dimensions of AFSO21 improvement efforts the Air Force is organizing.

AFSO21 organizes work under a governance structure with clear process ownership. Senior Air Force leaders will set the context for all improvement efforts and their relevance to Air Force mission areas and processes. We will use the governance structure to outline plans and priorities for implementation along end-to-end value chains. A Process Council has been established comprised of designated Air Force Key Process Owners as well as Major Command Commanders as our governance structure. The charter and composition of the Process Council is explained in Volume G of this Playbook. Air Force Key Process Owners are further supported by Master Process Officers, Core Teams (responsible for organizing and managing AFSO21 efforts for Air Force Key Process Owners), and a Team Lead for the Core Team (may be the Master Process Officer performing both roles). These roles and responsibilities are further explained in Volume G.

Commanders are expected to organize and lead process improvement efforts within their command authority. Most effective AFSO21 efforts will be aligned with strategies and goals outlined by Commanders (explained further in Strategic Alignment and Deployment in Volume F). The Air Force has established the “CCO” or “CVO” office designation for AFSO21 teams at Major Command and Wing

level. The importance of this work is highlighted by being directly attached to Commanders or Vice Commanders. This is to ensure AFSO21 efforts are integrated and aligned with Commander priorities and objectives.

The Air Force level office organizing and leading AFSO21 efforts (SAF/SO) reports directly to the Secretary of the Air Force. SAF/SO is responsible for development and maintenance of AFSO21 methods and tools outlined in this Playbook. Additional duties and responsibilities are further detailed in Volume G.

AFSO21 will be the Air Force's foundation for CPI by standardizing and stabilizing best practices that maximize value and minimize waste. AFSO21 will be institutionalized across the Air Force by integrating it into workforce development programs with appropriate training and education from the newest Airmen to the most senior leaders.

Sharing and Communicating Results. AFSO21 requires an integrated and synchronized communication strategy for all levels of Air Force leadership to effectively communicate awareness and understanding of AFSO21; as well as educate and inform Airmen at all levels of their crucial role in relation to AFSO21. The strategic communications plan, Volume D of the AFSO21 Playbook, will be executed over a period of several years. The primary target audiences are Airmen at all levels – Senior Air Force leaders, mid-level Airmen, and junior-level Airmen.

Multiple methods will be needed to effectively communicate new ideas and best practices to promote replication of success across Process areas and organizations. A knowledge management system will be employed to share standard reference material and results from improvement activities. Volume E describes AFSO21 information technology and knowledge management methods. Process Owners and Major Commands should also leverage existing communities of practice and process cross-talk to share and discuss best practices for broader Air Force implementation. These communities of practice may be internal and external to the Air Force.

The DoD Continuous Process Improvement/Lean Six Sigma (CPI/LSS) Senior Steering Committee (SSC) acts as a primary coordinating forum for the Air Force to share Department-wide CPI effort results. Representatives from OSD Staff, defense agencies and services are members of the SSC. The SSC reports DoD CPI progress to the DepSecDef. SAF/SO represents the Air Force on the CPI/LSS SSC.

Training and Education. A standard training and education approach will establish and sustain AFSO21 core concepts throughout Air Force organizations and among our Airmen. Below are general training tenets:

- Training for AFSO21 event participants will be delivered just-in-time
- All training will use AFSO21 standard material and approved trainers
- The general workforce does not require certification training. The communications strategy will be used to reach the general workforce as well as just-in-time training.

In addition, AFSO21 concepts are being weaved through multiple education courses for officers, enlisted and civilians. See the AFSO21 Training and Education Plan (Volume C) for more information.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

**VOLUME B: INTRODUCTION TO THE
EIGHT-STEP OODA LOOP AFSO
PROBLEM-SOLVING PROCESS**

May 2008



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SECTION ONE: EIGHT-STEP OODA LOOP PROBLEM-SOLVING CYCLE

The OODA Loop (Observe, Orient, Decide, Act) was originated in the 1950's by Col. John R. Boyd, USAF. The OODA loop is an objective description of the decision making process. Due to Col. Boyd's emphasis on the infinitely repeating nature of decision making it is an excellent match for the AFSO21 principal of Continuous Improvement. Both principals are based on the concept that the process is never done. The AFSO21 Playbook takes the four steps of the OODA loop and further breaks it down into an Eight-Step Problem-Solving road map that is flexible enough to be effective at any level; Air Force, MAJCOM, Wing, Value Stream and Individual Airmen levels.

Col. Boyd's four decision making phases are mapped to the AFSO21 Eight-Step Problem-Solving Process as follows:

- Observe:** Step 1 – Clarify & Validate the Problem
Step 2 – Break Down the Problem / Identify Performance Gaps
- Orient:** Step 3 – Set Improvement Targets
Step 4 – Determine Root Causes
- Decide:** Step 5 – Develop Countermeasures
- Act:** Step 6 – See Countermeasures Through
Step 7 – Confirm Results & Process
Step 8 – Standardize Successful Processes

Consistent application of the Eight-Step Problem-Solving Process will provide a concise and common format for presentation of data, problem solving facts and information. This will ease benchmarking and sharing of best practices when similar problems arise in other areas. The common structure provides a common language which will more easily translate into a common understanding.

The OODA Loop and the OO – OO – OO – OO Stutter

The Orient phase is the most critical to the speed of the overall decision making process. Observed data is filtered through the lens of the observer's history of experiences. In a team setting, the complexity of the filtering process grows exponentially with each additional team member required to gather and filter information and join the team in a consensus decision. Many teams therefore fail to reach a decision consensus spending all of their time gathering data and trying to understanding it in a stuttering OO – OO – OO – OO cycle.

Persons or organizations who can perform the OODA decision making loop more quickly than their rivals can gain a competitive advantage. In a competitive situation, it is possible for one team to force a competing team into the OO – OO – OO – OO stutter. Decisively reaching the Act phase and creating new facts before the competitor has completed their OODA loop forces the competitor to restart their decision making cycle and Observe the new facts. By constantly completing the OODA loop before the competitor, the competitor is prevented from ever reaching the Decide or Act phases leaving them stuttering OO – OO – OO – OO.

By consistently using the OODA loop based Eight-Step Problem-Solving Process in AFSO21 projects and across their personal and professional lives. Air Force leaders can begin to hone their understanding of how they and their organizations solve problems and make decisions. With experience, leaders can

learn to recognize the difference between time being spent constructively to solve problems at a root-cause level and organizations wasting time in an OO – OO – OO – OO stutter.

More importantly, Air Force leaders can learn to increase the combat effectiveness of the US Air Force by learning when and how to increase the agility of their organizations by a speeding up their OODA loops and potentially throwing an opponent into the OO – OO – OO – OO stutter. In an era where the amount of data available to the combat commander is exponentially greater than at any other time in history it can be extremely tempting to avoid the ambiguity of war and await “perfect” information to make “perfect” decisions. Having an intimate understanding of the Eight-Steps of the OODA Loop and their practical application puts Air Force leader in the best possible position to know when and how to make the most effective time vs. information ambiguity trade offs required to increase agility and combat effectiveness.

This process can be observed at the individual level in a boxing match when one boxer is able to land a series of punches so quickly that his opponent is left reeling unable to regain his balance after the first punch and is never able to throw a single counter punch. It can also be observed at the theater level when one Air Force plans and executes cycles of combat sorties faster than the opposing Air Force can react to the damage created by the previous cycle of sorties, thus preventing any effective defense or counter attack.

1.1 CLARIFY THE PROBLEM

OODA - OBSERVE

The critical first step to effective Problem-Solving is clearly understanding the problem. Any problem solving effort that begins with “We all know what the problem is, so what are we going to do about it?” is doomed to failure before it begins. It is counter-intuitive to the action minded, solution-oriented Airmen that often, the most effective way to solve a problem is to ignore the obvious solution, spend a little time not taking any action, and being problem oriented. Identifying and clearly defining a problem is not defeatist or whining, it is taking the time to know the enemy. Only after a problem is completely understood is the team in the best possible position to solve the problem.

Which problems first?

There are leans tools that can assist the Air Force leader in deciding which problems should be tackled. These tools are defined in detail elsewhere in the ASFO21 playbook:

1. Strategic Alignment and Deployment (SA&D) – Provides a framework for ensuring resources and activities are linked to the key strategies, directives and goals of the enterprise. Any individual problem solving effort can have greater impact if it is coordinated with the rest of the organization.
2. Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis – Provides an objective means to identify areas of need for problem solving efforts
3. Voice of the Customer (VOC) – Only one entity can define value - the customer. Understanding who the customers are and what their needs are is a prerequisite to understanding whether or not those needs are being met.
4. Value Stream Mapping (VSM)/Voice of the Process (VOP) – Overview of the process at any level to determine areas of needed focus.
5. Go and See – Determine problems with data. Actually walking the process or problem area provides first hand data rather than second hand opinions.

When deciding where to deploy limited problem solving assets the Air Force leader should be guided by four questions:

1. Would solving this problem directly contribute to my organizations strategic goals? (SA&D above)
2. Would solving this problem directly address an organizational level weakness? (SWOT above)
3. Has this problem been identified as a barrier to transforming my organization from its current state to the needed future state? (VOC and VSM/VOP above)
4. What opportunities were identified or observed by the process or problem “walk” and do these opportunities align with the first three questions? (Go and See above)

How to craft a problem statement

A good problem statement is the first step to an effective solution. A good problem statement is:

- Written Down – Usually one paragraph and always less than one page. More than one paragraph may be a sign of combining more than one problem in a single problem statement.
- Factual – All the descriptive terms should be precise, without emotion and without names.
- Agreed to by all parties – Lack of consensus at this stage indicates the problem is still unclear.

A good problem statement should include:

- What – is the problem? Often two or three words (a noun and a verb) are enough. e.g. Target missed, Aircraft broken, Repair slow, Computer crashed, Airmen discriminated against.
- Where – did the problem happen?
- When – did the problem happen?
- What – is the significance of the problem? Many problems exist, some are more critical than others. When tackling any problem, Air Force leaders should ask themselves: “Will solving this problem further the strategic goals of my organization?”

1.2 BREAK DOWN PROBLEM & IDENTIFY PERFORMANCE GAPS OODA - OBSERVE

Once the proper target is identified and problem is clearly defined data should be gathered about the problem area. This is again a sometimes frustrating step for Airmen who want to move to taking action and implementing solutions but the better a problem is understood the better the solution will be. Often, the more thorough the evaluation of a problem in this step, the better a leader can judge the impacts of potential solutions offered later and evaluate solutions during implementation.

Current Assessment

The first step in assessing a problem area is gathering and reviewing Key Process Indicators and Metrics. Understanding what objective data is needed and what the data, once it has been gathered, means is critical to “root cause” problem solving and process improvement.

There are two tools that can assist in understanding what data is needed and the story it is trying to tell. These tools are defined in detail elsewhere in the ASFO21 playbook.

1. Performance Gap Analysis – What is the difference between the level of performance seen today and the level of performance identified as needed tomorrow?

2. Bottleneck Analysis (or Constraint Analysis) – Which step(s) in the process are inhibiting the flow of the entire process. Sometimes referred to as the weakest link, or the slowest step, this analysis is defined by the Theory of Constraints.

When gathering and analyzing problem data, Airmen should be guided by five questions:

1. Does the problem require more analysis or does leadership have enough information to execute a solution?
2. If more information is needed:
 - What measures are available today?
 - Do these measures align with customer driven Key Performance Indicators (KPI)?
 - Is there a gap between the data available and the data required? (ie. Does the data needed not exist today thus requiring a new measurement system?)
3. What is the gap between current performance and the customer's requirements
4. Does the data point to any specific areas of root cause?
5. Does the data indicate a bottleneck / constraint?

1.3 SET IMPROVEMENT TARGETS

OODA - ORIENT

Improvement targets must be set on two levels simultaneously, the strategic and the tactical.

Strategic Vision

At a high level, the Air Force leader must create a vision of what the organization will strive to become. Value Stream Mapping (VSM) is the primary tool for defining the current state, the ideal state, and the practically achievable future state. VSM is defined in detail elsewhere in the AFSO21 Playbook. A vision is a view into the future that succinctly describes how the organization will conduct business. It implies a gap between the current state and a better future state. A future state can be defined as “better” only when it supports effective fulfillment of the organization's mission.

1. Common vision(s) and goals foster teamwork, inter-departmental cooperation, and alignment between goals, metrics, and actions.
2. Focus on reducing constraints to achieve better utilization of resources and capabilities.
3. Continued acceleration of improvement efforts.
4. Better foundation for fact-based analysis and decision-making.
5. Expanding perspective on the entire (end-to-end) value stream.

Tactical Targets

Tactical targets define the performance levels required to make the vision a reality. Targets should be challenging but achievable and have B-SMART characteristics.

- **Balanced** – Ensure goals are balanced across the multiple fronts of organizational output and multiple targets
- **Specific** – Have desirable outputs that are based on subject matter expert knowledge and experience and are applicable to the process improvement activity
- **Measurable** – Includes time frames and have data that is obtainable from specific sources
- **Attainable** – Resources are available; may have some risk, but success is possible

- **Results Focused** – Link to the mission, vision, and goals and are meaningful to the user
- **Timely** – Provide step-by-step views versus giant leaps and are measurable at interim milestones

1.4 DETERMINE ROOT CAUSES

OODA - ORIENT

All too often Air Force leaders find themselves addressing problems that have been “solved” many times before. This is usually due to problem solving efforts directed at the symptom(s) a problem presents rather than at the root cause of the problem. If an aircraft is constantly breaking down and becoming non mission capable, should the goal be to: reduce aircraft usage, improve repair cycle time, improve the quality of replacement parts, improve the aircraft design, or improve the aircraft design process. Clearly each step becomes increasingly difficult but each step also has a greater impact in preventing the recurrence of the problem. Root Cause Analysis is a trade off between digging as deeply as possible and finding the deepest point that is still within the team’s sphere of influence.

There are six tools that can assist the Airman in determining the “true” Root Cause. These tools are defined in detail elsewhere in the ASFO21 playbook.

1. **5 Whys?** - When you think you understand the cause of the problem, ask what caused the cause. i.e. Ask “why” five times
2. **Brain Storming** – Almost always a cross functional team that actually works in the area of a problem knows the root cause of the problem though they do not realize it at the time. An open environment to throw out as many ideas as possible can be a useful means of pulling information out of the team member that they, perhaps, did not realize was important.
3. **Pareto Analysis** – a good rule of thumb is 80% of the problem will be caused by 20% of the inputs. Usually, the only inputs anyone can remember are the ones someone else is responsible for. Objectively graphing the data can point to the critical 20%.
4. **Affinity Diagrams** – With thousands of inputs, outputs and measures finding a way to group like items can simplify a problem enough that it can be more easily understood.
5. **Fish Bone Diagrams** – (a.k.a. Cause and Effect Diagrams) - A simple way to visually depict the relationship between specific categories of process inputs and the undesirable output.
6. **Control Charts** – Objectively graphing the output of a process over time. Usually includes pre-defined upper and lower performance level limits.

Root Cause Analysis can be as much an art as a science. Airmen should keep four questions in mind to help guide them through the process.

1. Which of the Root Cause Analysis tools should I use?
 - Why these tools?
 - Who do I need to involve in the Root Cause Analysis? Ten heads are better than one. Account for cultural issues related to the problem.
2. What is (are) the root cause(s) according to the tools?
3. Will addressing these root causes address the performance gap?
4. Can the problem be turned on or off by addressing this root cause?

1.5 DEVELOP COUNTERMEASURES

OODA - DECIDE

The decision making and solution development step is over half way through the Eight-Step process. If the first four steps have been done correctly this should be the easiest step of all. As simple as this step

should be there are some very important guidelines the Air Force Leader should follow in order to ensure the greatest possible likelihood of success.

The key principal to remember is that the impact of a solution is a combination of the quality of the solution and the acceptance of the solution by the people who must implement it. The relationship is similar to a mathematical formula;

$$(\text{Quality of solution}) \times (\text{Acceptance}) = \text{Impact}$$

An excellent solution that receives no support has zero impact. On the other hand, an average solution that receives some support will have some impact. With the entire first half of the Eight-Step Problem-Solving Process focused on the left half of the equation it is now up to the Air Force leader to present the solution in such a way as to gain its acceptance by those that must implement it.

Guiding Principals when Developing the Countermeasures:

1. Whenever possible use the AFSO21 Standard Action Plan, Time Line and Report Out templates available elsewhere in the AFSO21 Playbook. The reports provide a common structure to ease information sharing and provide a concise format.
2. Select the most practical and effective countermeasures – use the “Keep it Simple” principle
3. Create a clear and detailed action plan
 - Use the same B-SMART principles defined in Step 2 Set Improvement Targets.
 - Reference facilitation techniques as appropriate
4. MOST importantly build consensus with others by involving all stakeholders appropriately. By judiciously involving stakeholders in the solution creation step, the stake holders will develop a sense of ownership in the solution and therefore, in the solutions success. This also prevents the complaint that the stake holders are victims of the solution process.
 - Communicate
 - Communicate
 - Communicate

1.6 SEE COUNTERMEASURES THROUGH

OODA - ACT

Action comes at the end of the OODA Loop for a reason. Air Force leaders acting before they are ready for this step are likely to be as successful as the marksman with the motto “ready, fire, aim.” There are three key questions the Air Force leader must answer before taking action

1. Which improvement philosophy best fits my situation?
2. What is the best setting for implementing my solution?
3. What process improvement tools are most appropriate?

Philosophy

The AFSO21 Playbook incorporates aspects of four major Process Improvement Philosophies. Each has its own areas of specialization. Solutions may simultaneously draw from more than one area.

1. Lean – Focus on reducing waste
2. Theory of Constraints – Focus on improving throughput by eliminating bottlenecks
3. 6 Sigma – Focus on reducing variation and errors
4. Business Process Reengineering – Focus on overhauling how work is done

Setting

The largest factor in determining the most appropriate setting is the scope of effort required.

1. Just Do It (a.k.a. Point Improvement) – One person (or a small team) in less than a day.
 - Use torque wrenches instead of adjustable wrenches
 - Route paperwork via email instead of US Postal Service or USAF distribution channels
2. Rapid Improvement Event (RIE) – A small team in less than one week. A Charter must be developed, a team selected and communication begun as early as possible.
 - Improve aircraft servicing cycle time
 - Improve 1st pass yield of brake shoe repairs
3. Improvement project - A large team over a long period.
 - Shorten aircraft annual overhaul cycle time
 - Write software to track annual overhauls

Tools

There are dozens of tools from which an experienced practitioner can choose. Here are eight of the most universally applicable tools. Tools should be selected based on how well they address the root cause(s) identified in Step Four, “Determine Root Cause(s).”

1. 6-S & Visual Management - A place for everything and making it obvious when everything is not in its place
2. Standard Work – The bedrock foundation of Continuous Improvement. Without standard work it is impossible to tell if improvements are due to chance or due to our efforts.
3. Cell Design – Designing how workers are arranged relative to the work and to each other.
4. Variation reduction – The core of 6 Sigma.
5. Error Proofing – it is good to do something right the first time. It is better to make it impossible to do wrong.
6. Quick Changeover – Time spent adjusting the machine is time not spent adding value to the product.
7. Total Productive Maintenance (TPM) – In order to get the most productivity out of a machine down time for maintenance must be planned for. A machine run 90% of the time with maintenance during the other 10% will be more productive in the long run than a machine run 100% of the time.
8. Rapid Improvement Events (RIE) – See Setting above

In addition to these three areas there is almost always some form of training required to make the solution work. The training can often be linked to the communications plan developed in Step Five “Develop Countermeasures.” The training is usually needed at several levels simultaneously. Implementers and front line supervisors need the most intensive training with less detailed but no less important training at echelons above. Customers and Suppliers of the targeted process may also need training.

1.7 CONFIRM RESULTS AND PROCESS

OODA - ACT

Step Seven closely mirrors the data collection portion of Step Two “Breakdown the Problem and Identify Performance gaps.” Ideally the Key Process Indicators and Metrics identified in Step Two will be all that is needed here. The project(s) should be monitored for:

1. Performance relative to the Baseline developed in Steps One and Two.
2. Performance relative to B-SMART targets established in Step Three.
3. Performance relative to where we thought we would be at this stage of the solution implementation?
4. If we are not meeting targets by deadlines, do we need to return to Step Four Determine Root Cause(s)? Incorrect Root Cause(s) determination is the most common mistake made by Process Improvement efforts.

In addition to the conventional measures mentioned above, the Team Leader may have to act as a project manager and evaluate other dimensions of the solution implementation as well. In large scale Process Improvement, where there may be multiple improvements happening across a wide sphere of influence, this is separate function for project management and tracking. Coordination of numerous projects to maximize their cumulative impact and minimize any wastefully duplicative effort is the critical role of the MAJCOM /Wing Master Process Officers, as the advisor to the Commander. Each project in the portfolio must be evaluated as to their overall fit in the command's Strategic Alignment and Deployment. Each project must be tracked to determine if their actual impact is different than originally projected; to evaluate compliance with standard work (affects repeatability of any successes); and to determine the sustainability of results. (*Are teams achieving their objectives by executing the plan as written or are they improving results merely by working twice as many resources or working twice as hard?*)

1.8 STANDARDIZE SUCCESSFUL PROCESSES

OODA - ACT

Step Eight is the most commonly skipped and under completed of the entire Problem-Solving Process. It is very tempting to take new found knowledge and skills and immediately move on to the next improvement initiative skipping the effort of ensuring the results stick.

Step Eight can be defined by the answers to three Questions:

1. What is needed to standardize the improvements?
 - Tech order changes, Air Force Instruction changes, Official Instruction changes
 - Equipment materiel changes, Vendor or Supplier changes
 - Changes at training commands, Changes by mobile Training Units
2. How should improvements and lessons learned be communicated
 - CPI Management Tool (PowerSteering®)
 - Key Meetings
 - Air Force Publications, Message Traffic, Chain of Command
 - Communities of Practice (Air Force Knowledge Now)
3. Were other opportunities or problems identified by the Problem-Solving Process?
 - Restart the OODA Loop – This should be the Air Force Leader's first instinct as the OODA loop is infinite.

1.9 SUMMARY

The never ending cycle of the OODA Loop and the Continuous Improvement Process closely parallel one another. Effective problem solving must follow the Observe, Orient, Decide, and Act process. Attempting to skip, reorder or short cut steps invariably leads to, at best sub-optimal solutions and at worst outright failure. Following the Eight-Steps will ensure actions lead to the desired results with an absolute



minimum of wasted effort. Following the Steps will also ensure the results are aligned with the needs of the organization. All of this leads to a virtuous nesting of organizational purpose and activities and increased Air Force combat effectiveness.

VOLUME B: INTRODUCTION TO THE EIGHT-STEP OODA LOOP AFSO21 PROBLEM-SOLVING PROCESS

May 2008

<p>Approval Information/Signatures</p>	<p>6. See Countermeasures Through ○○○A</p> <p>a. Which philosophy best prescribes tools that address root causes(s)? b. Which tools best address root causes(s)? c. Which method for implementation fits the tool and improvement need? - Rapid Improvement Event? - Improvement Project? - Point Improvement or "Just Do It"? d. If RIE or Project, create "Charter" and communicate e. What training or education is needed? By Whom?</p> <p>TOOLS: 6S & Visual Mgt, Standard Work, Cell Design, Variation Reduction, Error Proofing, Quick Changeover, TPM, RIE</p>
<p>AFSO21 Problem Solving Process OODA – Observe, Orient, Decide, & Act 8-Step Problem Solving Process</p>	<p>4. Determine Root Cause ○○DA</p> <p>a. What root cause analysis tools are necessary? - Why are these tools necessary? - What benefit will be gained by using them? - Who will need to be involved in the root cause analysis? -- 10 heads are better than one -- Remember "cultural" issues related to problem b. What is (are) the root cause(s) according to the tools? c. How will the root cause be addressed? d. Will addressing these address the performance gap? e. Can the problem be turned on or off by addressing the root cause? f. Does the root cause make sense if the 5 Whys are worked in reverse? - Working in reverse, say "herefore" between each of the "whys"</p> <p>TOOLS: 5 Whys, Brainstorming, Pareto, Affinity, Fishbone, Control Charts</p>
<p>Team Members:</p> <p>1. Clarify & Validate the Problem ○○DA</p> <p>a. Does this problem, when solved, help meet needs identified by the organization? - Is it linked to the SA&D of organization? - Does it help satisfy customer needs (VOC)? b. Does this problem, when solved, address key issues identified during SWOT analysis? c. Has this problem been identified and directed by a Value Stream Map at the appropriate level? - What does the "Future State" need? - What resources have been identified to address this issue? d. What opportunities were identified or observed by the process or problem area "walk"? - Will addressing or improving these issues deliver results that relate to #a or #b? - Will addressing or improving this problem deliver the desired future state from #c?</p> <p>TOOLS: SA&D, Voice of Customer, VSM, Go & See</p>	<p>7. Confirm Results & Process ○○○A</p> <p>a. How are we performing relative to the Observe phase (Steps 1 & 2)? b. How are we performing relative to Step 3? c. How are we performing relative to Financial Reporting Template projections? d. If we are not meeting targets, do we need to return to Step 4? - Most problem solving "breakdowns" occur relative to improper root cause identification</p> <p>TOOLS: KPIs/Metrics, Performance Mgt, SA&D, Standard Work, Audit</p>
<p>5. Develop Countermeasures ○○DA</p> <p>a. Develop potential countermeasures - Tools and philosophies from Lean, TOC, 6 Sigma and BPR as appropriate b. Select the most practical and effective countermeasures c. Build consensus with others by involving all stakeholders appropriately - Communicate, communicate, communicate d. Create clear and detailed action plan - B-SMART actions - Reference Facilitation Techniques as appropriate</p> <p>TOOLS: A3, Action Plans, Timelines, Financial Reporting Template</p>	<p>7. Confirm Results & Process ○○○A</p> <p>a. How are we performing relative to the Observe phase (Steps 1 & 2)? b. How are we performing relative to Step 3? c. How are we performing relative to Financial Reporting Template projections? d. If we are not meeting targets, do we need to return to Step 4? - Most problem solving "breakdowns" occur relative to improper root cause identification</p> <p>TOOLS: KPIs/Metrics, Performance Mgt, SA&D, Standard Work, Audit</p>
<p>2. Break Down the Problem/Identify Performance Gaps ○○DA</p> <p>a. Does the problem require more analysis or does leadership have enough information to execute a solution? - Is this simply a leadership directive? b. If more data is needed, how do we measure performance now? - What are the KPIs? What is the performance gap? c. Does other "non-existent" data need to be gathered? d. What does the data indicate are the potential root causes? e. Does the data review indicate a bottleneck or constraint?</p> <p>TOOLS: KPI/Metrics, Performance Gap Analysis, Bottleneck Analysis</p>	<p>8. Standardize Successful Processes ○○DA</p> <p>a. What is needed to Standardize Improvements? - Tech Order changes? - Air Force Instruction changes? - Official Instruction changes? b. How should improvements and lessons learned be communicated? - CPI Mgt Tool - Key meetings? c. Were other opportunities or problems identified by the Problem Solving Process? - Restart OODA Loop</p> <p>TOOLS: Checkpoints/Standardization Table, Report Out Theme Story, Broad Implementation, CPI Mgt Tool</p>
<p>3. Set Improvement Target ○○DA</p> <p>a. Is the improvement target measurable? Is it concrete? Is it challenging? b. Is the target "Output Oriented"? - What is the desired output? - Should be "things to achieve"; should avoid "things to do" -- Will be addressed by Action Plans (Step 5) c. The desired target should: - Do what? By how much? By when? - If it is a Process Problem, what is the future state? - How will it be realized?</p> <p>TOOLS: Ideal State, Future State Mapping, B-SMART</p>	<p>5. Develop Countermeasures ○○DA</p> <p>a. Develop potential countermeasures - Tools and philosophies from Lean, TOC, 6 Sigma and BPR as appropriate b. Select the most practical and effective countermeasures c. Build consensus with others by involving all stakeholders appropriately - Communicate, communicate, communicate d. Create clear and detailed action plan - B-SMART actions - Reference Facilitation Techniques as appropriate</p> <p>TOOLS: A3, Action Plans, Timelines, Financial Reporting Template</p>
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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME C: EDUCATION AND TRAINING PLAN

May 2008

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SECTION ONE: EDUCATION AND TRAINING PLAN SUMMARY

1.1 PURPOSE

The Air Force Smart Operations for the 21st Century (AFSO21) Education and Training Plan (E&TP) documents the responsibilities and actions necessary to ensure the successful execution of standardized AFSO21 education and training. The Air Force goal is to be self-sustaining (military and government civilian only) in Continuous Process Improvement (CPI) activities by 2010.

1.2 REFERENCES

- OSD Continuous Process Improvement Transformation Guidebook, May 2006.
- DoD Directive 5010.42 dated May 15, 2008.
- AFSO21 Playbook Volumes A and L.

1.3 PLAN DESCRIPTION

The AFSO21 Education and Training Plan consists of defining requirements, standards, methods of deployment and tracking accomplishments.

The AFSO21 education plan is the process by which an Airman is encouraged and enabled to develop his or her potential in a Continuous Process Improvement environment. AFSO21 educational material will be designed into existing professional military education courses. It is vital all Airmen receive AFSO21 education.

The AFSO21 training plan refers to the acquisition of competencies as a result of learning the practical knowledge that relates to specific, useful skills. Through teaching and learning, the individual acquires and develops knowledge and skills. Unique AFSO21 competencies require courses designed for specific skill sets for certain roles found in the Continuous Process Improvement environment. Only a small percentage of the Air Force is required to gain facilitator and/or instructor skills through AFSO21 training.

1.4 RESPONSIBILITIES

1.4.1 SAF/SO

- 1.4.1.1 Determines requirements and defines standards of AFSO21 education and training course material and instruction. This includes identifying supplemental courses provided outside of Air Force channels.
- 1.4.1.2 Assists in the development and approval of education and training course material.
- 1.4.1.3 Establishes a training tracking and certification process.
- 1.4.1.4 Defines equivalency process for prior Continuous Process Improvement training.
- 1.4.1.5 Selects individuals for instructor training.

1.4.2 AETC/AU

- 1.4.2.1 Assists in the development of and maintains standardized AFSO21 course material.

- 1.4.2.2 Executes AFSO21 education program through the professional military education architecture.
- 1.4.2.3 Provides the standard training material to designated trainers/instructors, contract or organic.

1.4.3 MAJCOM and Functional Areas

- 1.4.3.1 Coordinates and schedules training activities for the selected individuals identified for Level 2, Level 3, and process champion training.
- 1.4.3.2 Reviews and recommends wing/unit nominees for Level 2 training.
- 1.4.3.3 Provides Level 1 and awareness training.
- 1.4.3.4 Provides feedback on effectiveness of training courses.

1.4.4 Wings/Units

- 1.4.4.1 Selects Airmen for Level 1 and Level 2 training based on individual leadership abilities.
- 1.4.4.2 Ensures Level 2 trainees have a chartered AFSO21 problem and mentor prior to attending training.
- 1.4.4.3 Provides Level 1 and awareness training.
- 1.4.4.4 Provides feedback on effectiveness of training courses.

SECTION TWO: IMPLEMENTATION PLAN

2.1 COURSE MATERIAL

2.1.1 Training Material Development. Training material is developed and maintained by AU and SAF/SO. Training material is developed consistent with the Core Competencies Matrix (see appendix 2).

2.1.2 Material Updates.

2.1.2.1 Material is developed in coordination with SAF/SO following the Core Competencies Matrix.

2.1.2.2 Course material will be updated periodically.

Trainers/Instructors are responsible to check the AFSO21 CoP prior to class start to ensure the material taught is the most current.

2.2 TRAINING

2.2.1 Just-in-Time Training. Team members should receive training prior to undertaking an event. Any training is Just-in-Time training. Facilitators can determine what kinds of training may be needed by the team. (Most training material is on the SAF/SO CoP).

2.2.2 Level 1 Training

2.2.2.1 Delivered as a standard stand-alone, in-residence, course; provided by SAF/SO or local AFSO21 office.

2.2.2.2 Training focuses on basic AFSO21 tools and problem-solving skills.

2.2.3 Level 2 Training

2.2.3.1 Training for Level 2 covers the advanced application of Lean tools, Six Sigma and Theory of Constraints.

2.2.3.2 Training will specifically focus on the 8-step problem solving model (see Volume B) and the tools and techniques used.

2.2.4 Level 3 Training

2.2.4.1 Training includes specialized training in the use of Enterprise Value Stream Mapping, Business Process Re-engineering, Strategic Alignment and Deployment, and Performance Management.

2.2.5 Champion Training

2.2.5.1 Training is focused on leading and guiding AFSO21 activity.

2.2.5.2 Champion training includes a 1 hour of Senior Leader Awareness class

2.2.6 Executive Training

- 2.2.6.1 Training is focused on leading and guiding AFSO21 activity.
- 2.2.6.2 Executive “Leading for Success” workshop focuses on strategic alignment and deployment and performance management.

2.3 CERTIFICATION PROCESS

2.3.1 Level 1

- 2.3.1.1 Completion of the AFSO21 in-residence course or completion of appropriate level of PME that incorporates Level 1 training.
- 2.3.1.2 At a minimum, lead three or more AFSO21 problem-solving teams
 - 2.3.1.2.1 One (or more) problem-solving activity must be of a team of six or more.
 - 2.3.1.2.2 One (or more) problem-solving activity must be outside the trainee’s functional area. Functional area is defined as outside the AFSC or duty position.
- 2.3.1.3 At a minimum, teach one awareness training class under the oversight of a certified Level 2 or higher. Suggest teaching the awareness training class after completing the problem-solving requirements of para. 2.3.1.2.

2.3.2 Level 2

- 2.3.2.1 Completion of AFSO21 Level 1 training requirements defined in para. 2.3.1 (prerequisite).
- 2.3.2.2 Lead ten additional problem-solving activities in addition to the Level 1 training requirements defined in para. 2.3.1 (prerequisite).
- 2.3.2.3 Completion of AFSO21 Level 2 academic training in principles of Lean, Six Sigma, facilitation, or other CPI methods.
- 2.3.2.4 At a minimum, lead five or more AFSO21 problem-solving teams.
 - 2.3.2.4.1 One (or more) problem-solving activity must be outside the trainee’s functional area. Functional area is defined as outside the AFSC or duty position.
 - 2.3.2.4.2 One (or more) problem-solving activity must be of a transactional or administrative process.
 - 2.3.2.4.3 One (or more) problem-solving activity must be a Rapid Improvement Event.
- 2.3.2.5 At a minimum, teach one Level 1 training class under the oversight of a certified Level 2. Suggest teaching the Level 1 training class after completing the problem-solving requirements of para. 2.3.2.4.
- 2.3.2.5 Mentor at least two Level 1 individuals (trained or certified).

2.3.3 Level 3

2.3.3.1 Completion of AFSO21 Level 2 training requirements defined in para. 2.3.2.

2.3.3.2 Lead 20 additional problem solving team beyond the problem-solving Level 2 requirements in para. 2.3.2.4.

2.3.3.3 Mentor at least two Level 2 individuals (trained or certified).

2.3.3.4 Complete instruction in the principles of Enterprise Value Stream Mapping Activity (EVSMA), Business Process Re-engineering (BPR), Strategic Alignment and Deployment (SA&D), and Performance Management.

2.4 TRACKING PROCESS

2.4.1 Certification. Upon notification of completion of certification or upgrade by facilitators, Master Process Owners will update the CPI Management Tool (PowerSteering[®]) to reflect the correct skill level of AFSO21 certified personnel.

2.4.1 Special Experience Identifier. Upon certification, Master Process Officers will ensure Special Experience Identifier (SEI) paperwork is submitted for approval.

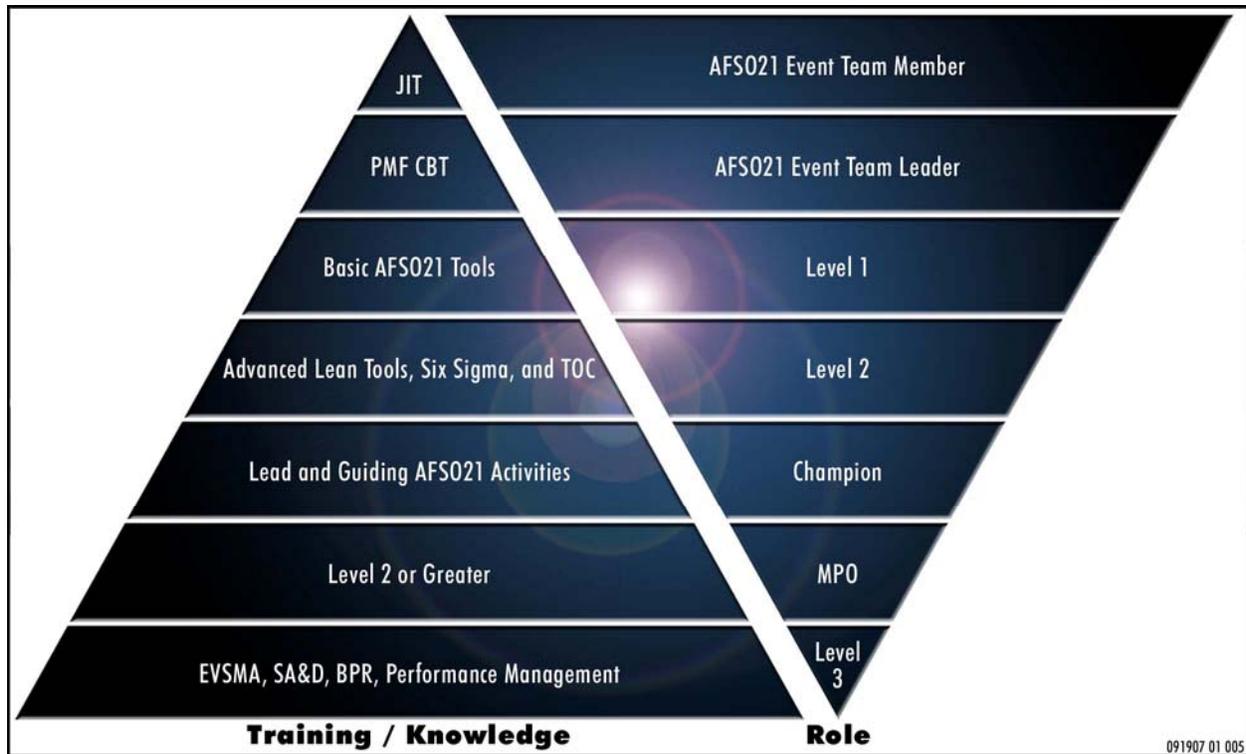
APPENDIX 1: AFSO21 CERTIFICATION LEVELS AND REQUIREMENTS

Figure C1 – AFSO21 Certification Matrix

REVISED	Level 1 Trainee	Level 1 Certified	Level 2 Trainee	Level 2 Certified	Level 3 Trainee	Level 3 Certified
Problem-Solving Prerequisite (minimum)	N/A		Lead 10 (13 total cumulative)		Lead 20 (38 total cumulative)	
Problem-Solving Certification Requirement (minimum)	Lead 3		Lead 5 (18 total cumulative)		TBD	
Teaching Requirement (minimum)	1 x Awareness Class		1 x Level 1 Class		No requirement	
Training Time-Frame (suggested)	6-12 months		12-24 months		36-48 months	
Full-Time Support (desired)		One per Squadron		One per Wing		One per MAJCOM

NOTE: Refer to specific requirements in para. 2.3.

Figure C2 – Knowledge vs. Role



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APPENDIX 2: CORE COMPETENCY LISTING

LEGEND

Training / Certification Competency Levels

- 0 – Not Applicable
- 1 – Awareness
- 2 – Appreciation
- 3 – Application
- 4 – Authority

Education Competency Levels

- 0 – Not Applicable
- 1 – Knowledge
- 2 – Comprehension
- 3 – Application
- 4 – Analysis
- 5 – Synthesis
- 6 – Evaluation Team

	Training / Certification			Education				
	Level 1	Level 2	Level 3	Workforce	Supervisor	Mid-Level Mgr	Sr Leaders	G.O.
Enlisted Targeted Rank	E6-E7	E7-E8		All	ALS	NCO Academy	SNCOA	
Officer Targeted Rank	O3-O4	O4-O5		All	SOS	ACSC	AWC	
Civilian Targeted Pay Grade				All	Sup Class		GS-15 Seminar	

Core Competency Topics

Technical Skills	Charter/Conduct Events	3	4	4	0	2	3	5	5
	Project or event chartering		3	4	4	0	2	3	5
Standard process for planning, preparing, conducting and outbriefing an event and action plan		3	4	4	0	2	3	5	5
Standard process for event follow-u		3	4	4	0	2	3	5	5
Value Analysis		3	3	4	2	3	4	5	5
Value vs non-value added activity analysis		3	3	4	2	3	4	5	5
Waste Analysis--tour		3	3	4	3	4	5	6	6
Understand and identify 8 common forms of waste		3	3	4	3	4	5	6	6
Understand and apply "Go and See" to see waste		3	3	4	3	4	5	6	6
Understand use of tools associated with waste analysis (spaghetti diagram, time and motion studies)		3	3	4	1	3	4	5	5
Risk Analysis		1	3	4	1	3	4	6	6
Understand what risk is		1	3	4	1	3	4	6	6
Measuring risk		1	3	4	0	3	4	6	6

	Training / Certification			Education				
	Level 1	Level 2	Level 3	Workforce	Supervisor	Mid-Level Mgr	Sr Leaders	G.O.
Managing risk	1	3	4	0	3	4	6	6
Contingency planning	1	3	4	0	2	3	6	6
Flow Analysis and Work Design	3	3	4	1	3	4	5	5
Principle of Flow	3	3	4	2	3	4	5	5
Principles and methods of Pull vice Push	3	3	4	2	3	4	5	5
SIPOC	3	3	4	1	3	4	5	5
Standard work	3	3	4	2	4	5	5	5
Value Stream Mapping	3	3	4	1	2	3	5	5
Labor Content and Planning	2	3	4	0	3	4	6	6
Cellular work design	2	3	4	2	3	4	5	5
6S (Sort, Straighten, Shine, Standardize, Sustain, Safety)	3	3	4	3	3	4	6	6
Point of Use Material	3	3	4	2	3	4	6	6
Visual management methods	2	3	4	2	3	4	6	6
Establishing Pull Signals (Kanbans and Just-in-Time)	2	3	4	1	2	3	5	5
Enterprise or end-to-end value stream analysis	1	2	4	0	1	3	6	6
Workload leveling	2	3	4	1	3	4	5	5
Quick Changeover	2	3	4	2	3	4	5	5
Cycle time vs takt time vs lead time	3	3	4	1	3	4	5	5
Error proofing	2	3	4	1	3	4	5	5
Constraint Analysis	2	3	4	0	1	2	4	4
Critical chain management	2	3	4	0	1	2	4	4
Queuing theory	1	3	4	0	1	2	4	4
Metrics and Goals	2	3	4	1	2	3	5	5
Fundamentals of metrics and measures of effectiveness and efficiency	2	3	4	1	2	3	5	5
Data collection and storage	2	3	4	1	2	3	4	4
Balanced scorecard and metrics alignment	2	3	4	1	2	3	5	5
Strategy and goal alignment (Hoshin Kanri)	2	3	4	0	1	2	5	5
Probability/Statistics	1	3	4	0	1	2	4	4
Discrete vs continuous	0	TBD	TBD	0	1	2	4	4
Descriptive statistics	0	TBD	TBD	0	1	2	4	4
Inferential statistics	0	TBD	TBD	0	1	2	4	4
Probability theory	1	TBD	TBD	0	1	2	4	4
Probability of combined events	0	TBD	TBD	0	1	2	4	4
Conditional probability	0	TBD	TBD	0	1	2	4	4
Counting rules	0	TBD	TBD	0	1	2	4	4

Technical Skills (continued)

		Training / Certification			Education				
		Level 1	Level 2	Level 3	Workforce	Supervisor	Mid-Level Mgr	Sr Leaders	G.O.
	Probability distributions	0	TBD	TBD	0	1	2	4	4
	CPI Philosophy	2	3	4	2	3	4	6	6
	AFSO21 Overview	2	3	4	2	3	4	6	6
	Lean Principles	3	Level 3 for 2 CPI Methods	4	2	3	4	6	6
	Theory of Constraints	2		3	1	2	3	6	6
	Business Process Reengineering	2		3	0	1	2	5	5
	Six Sigma	2		3	1	1	2	5	5
	Cultural Assessment	2	3	4	0	1	2	5	5
	Project Management	3	3	4	0	1	3	5	5
	Planning and tracking	3	3	3	0	1	3	5	5
	Resource management	3	3	3	0	1	3	5	5
	"Lean" reporting	3	3	3	1	1	3	5	5
	Process Management	2	3	4	1	1	2	5	5
	Core, Governing and Enabling Processes	2	2	4	1	1	2	5	5
	AF Process Governance/Ownership	2	2	4	1	1	2	5	5
	Process Standardization	2	3	4	2	2	2	5	5
	DoD and AF Process Management and Architectures	2	2	3	1	1	2	5	5
	System Thinking	2	3	4	1	1	3	5	5
	Types of systems	2	3	4	1	1	3	5	5
	Systematic systems approach	2	3	4	1	1	3	5	5
	Defining system components	2	3	4	0	1	3	5	5
	Determine system boundaries	2	3	4	0	1	3	5	5
	Determining interactions	2	3	4	0	1	3	5	5
	Preventing the law of unintended consequences	2	3	4	0	1	3	5	5
	Problem Solving	3	4	4	1	3	4	6	6
	Identifying and defining the problem	3	4	4	1	3	4	6	6
	Discovery tools	3	4	4	1	3	4	6	6
	Root cause analysis	3	4	4	1	3	4	6	6
	Verifying root cause	3	4	4	1	3	4	6	6
	Decision Analysis	3	4	4	1	2	4	6	6
	Fact-based decision making vs opinionated decision making	3	4	4	1	2	4	6	6
	Generating alternatives (brainstorming, SMEs, etc.)	3	4	4	1	2	4	6	6
	Organizing alternatives (management and planning tools)	3	4	4	1	1	3	6	6
	Evaluating alternatives (dominated vs feasible ideas)	3	4	4	0	1	3	6	6
	Determining optimal solutions	3	4	4	0	1	3	6	6

		Training / Certification			Education				
		Level 1	Level 2	Level 3	Workforce	Supervisor	Mid-Level Mgr	Sr Leaders	G.O.
	Implementing solution	3	4	4	1	1	3	6	6
	Conflict Resolution	2	3	4	1	2	3	5	5
	Types of Conflict	2	3	4	1	2	3	5	5
	Sources of Conflict	2	3	4	1	3	3	5	5
	Strategies for managing conflicts	2	3	4	0	3	3	5	5
	Dealing with difficult people	2	3	4	0	3	3	5	5
	Leadership	1	3	4	1	3	4	6	6
	Role of leaders	1	3	4	1	3	4	6	6
	Leader behaviors (do's and don'ts)	1	3	4	1	3	4	6	6
	Situational leadership	1	3	4	1	3	4	6	6
	Change Management	2	3	4	1	3	4	6	6
	Why change is difficult	2	3	4	1	3	4	6	6
	Effective change management methods	2	3	4	1	3	4	6	6
	Team Dynamics	2	3	4	1	3	4	6	6
	Types of teams	2	3	4	1	3	4	6	6
	Team interactions and relationships	2	3	4	1	3	4	6	6
	Team meetings	3	3	4	0	3	4	6	6
	Coaching and mentoring	1	3	4	0	3	4	6	6
	Communications	3	3	4	0	2	3	5	5
	Strategic communications	2	3	4	0	2	3	5	5
	Sharing event results and successes (A3 Report)	3	3	4	0	2	3	5	5

APPENDIX 3: COURSE LISTING

A3.1 AFSO21 EDUCATION AND TRAINING COURSE SUMMARY AND STATUS

Education Courses: Developing knowledge	Training Courses: Developing a skill set
Awareness – Basic	Level 1 Problem Solving
Awareness – Air University (AU) Courses	AFSO21 Modules – 6S, Standard Work, SA&D
Awareness – Senior Leader Course	AFSO21 Modules on deck for development
Awareness – Executive Leader Course	Level 2 Problem Solving
AWC/ACSC	Level 3 Problem Solving
SOC/EPME	

A3.2 DETAILS

Education Courses: Developing knowledge

Awareness - Basic

- Purpose: Provide general knowledge of AFSO21
- Intended Audience: AF members prior to being involved in CPI activity. Material tailored to audience (as required).
- Duration: 2 hours
- Status: Refreshed Sep 07

Awareness – Air University (AU) Courses: GP/CC, WG/CC, GS-15, and CMSgt

- Purpose: Provide introductory framework for leading in an AFSO21 environment
- Intended Audience: New wing and group commanders, and GS-15s
- Duration: 1 Hour
- Status: Deployed

Awareness – Senior Leader Course

- Purpose: Provide introductory knowledge of how to lead a lean enterprise
- Intended Audience: O-6 and GS-15
- Duration: 1.5 day academics + 1/2 day plant tour
- Status: Deployed Nov 07. Subsequent MAJCOM hosted courses approximately 2 per month.

Awareness – Executive Leader Course

- Purpose: Provide introductory knowledge of how to lead a lean enterprise
- Intended Audience: General Officers, SESs, and CCMs/CFMs
- Duration: 1 day academics + 1/2 day plant tour
- Status: Deployed in Aug 07. Subsequent courses approximately 2 per month.

AWC/ACSC

- Purpose: Provide introductory AFSO21 knowledge of mid-level management
- Intended Audience: PME students
- Duration: 1 day and plant tour
- Status: Refreshing material ECD FY08

SOC/EPME

- Purpose: Provide introductory AFSO21 knowledge of tactical level management
- Intended Audience: PME students
- Duration: 1 day
- Status: Concept in development ECD Mid-FY08

Training Courses: Developing a skill set

Level 1 Problem Solver

- Purpose: Develop AFSO21 facilitator skills set for tactical level CPI activity
- Intended Audience: TSgt-SMSGt, Lt-Maj, GS-11 to GS-13
- Duration: 1 week in classroom followed by 3 monitored events
- Status: Refresh Complete

AFSO21 Modules – 6S, Standard Work, SA&D

- Purpose: Develop AFSO21 skills beyond the Level 1 on the journey to Level 2 and being used as JIT by facilitators
- Intended Audience: Level 1 Problem Solvers and event teams
- Duration: approximately 4 hours
- Status: Complete

AFSO21 Modules on deck for development

- Go & See Waste
- Performance Management and A3 Reports
- Visual Management
- TOC
- TPM
- (more to follow)

Level 2 Problem Solver

- Purpose: Develop certified Level 1 problem solvers to include more lean tool development, Six Sigma, and TOC. Seed AF organizations with Level 2 problem solving capability
- Intended Audience: Seasoned Level 1

- Duration: 2 weeks academics and completion of problems outlined in para. 2.3.2.4
- Status: Wave 2 complete, Wave 3 complete, Wave 4 - June 08

Level 3 Problem Solver

- Purpose: Develop certified level 2 facilitator to level 3 capacity to include EVSMA, BPR, SA&D, and Performance Management
- Intended Audience: Seasoned Level 2
- Duration: TBD
- Status: Under Development (ECD is TBD)

APPENDIX 4: EQUIVALENCY PROCESS

- Contact Wing/organization AFSO21 POC to request application for equivalency. Equivalency is used to certify individuals, in AFSO21, who have previous experience in Lean or Six Sigma.
- Submit completed application back to the wing/organization POC who will forward it to MAJCOM/Directorate. The MAJCOM/Directorate POC will forward the application, and supporting documentation to SAF/SO.
- The SAF/SO office will review and evaluate the submitted package. The package will be evaluated as to the:
 - Type of training received by the individual to include source, level, and amount,
 - Scope of the events/problems/projects, and
 - Results of the events/problems/projects that they have been involved in. Applicants for Level 1 should be able to demonstrate, for example, ones to tens of positions saved or thousands of dollars saved in a process. Candidates for Level 2 equivalency should be able to demonstrate results in terms of tens to hundreds of positions saved or hundreds of thousand dollars saved.
- Equivalency certification:
 - Packages that meet minimum criteria will be granted equivalency by the SAF/SO office and returned to their respective MAJCOM/Directorate AFSO21 Office.
 - For packages that are questionable, the SAF/SO office will coordinate with the submitting MAJCOM/Directorate for more information or clarification as required.
 - The submitting MAJCOM/Directorate may withdraw the submitted package or
 - A formal board will only be convened for packages that are disputed between the submitting MAJCOM/Directorate and the SAF/SO office.
 - Packages that meet board criteria will be granted equivalency and returned to their respective MAJCOM/Directorate AFSO21 Office.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME D: STRATEGIC COMMUNICATIONS PLAN

May 2008



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SECTION ONE: STRATEGIC COMMUNICATIONS PLAN SUMMARY

1.1 PURPOSE

The Air Force Smart Operations for the 21st Century (AFSO21) Strategic Communications Plan documents the responsibilities and actions necessary to help institutionalize a comprehensive, service-wide, strategic-level Continuous Process Improvement culture.

1.2 PLAN DESCRIPTION

AFSO21 Strategic Communications Plan consists of guideposts and messages for use by all in the Air Force to uniformly understand the foundations of our Continuous Process Improvement journey. We will capitalize our effort by using knowledge from other organizations and discipline to improve every process within the Air Force. With AFSO21, we are challenging all Airmen to examine every work process and eliminate steps that add little to no value to the end-state deliverable (product or service).

Even the world's premier air-war fighter, the U.S. Air Force, must constantly refresh, refit, revise and improve to maintain its competitive edge. In order to retain a global strike capability that minimizes collateral damage, uses the minimum of force necessary to achieve the mission and puts the fewest of our people and material resources at risk, we must innovate together as a service to meet the needs of this century. Since 2000, our Air Force has tested and experimented with and improved industry lean concepts at the Air Logistics Centers and more recently across the spectrum of mission areas. We have reached maturity in the experiment and are ready to expand across the total Air Force as codified by our Strategic Plan.

SECTION TWO: IMPLEMENTATION PLAN

Purpose	To inform key audiences about Air Force Smart Operations for the 21 st Century (AFSO21) to increase interest, participation and sustain support.
POCs	SAF/CMX: William Murray (703-697-5789) (DSN 227-XXXX) SAF/PAO: Ms. Vicki Stein (703-697-5147) (DSN 227-XXXX) SAF/PAI: SMSgt Mitch Gettle (703-588-2072) (DSN 425-XXXX) HAF/IMMT: Darlene Brown (703-695-7317) (DSN 225-XXXX) SAF/SO: Lt Col Brou Gautier (703-696-1080) (DSN 426-XXXX)
Background	Air Force faces many challenges in terms of resource constraints in a high operations tempo environment due to its range of missions including the GWOT. The world's best Air Force has three priorities: 1) Win the war on terror, 2) Develop and take care of our Airmen and 3) Recapitalize and modernize the Air Force. However, we cannot use 20 th Century thoughts, tactics, techniques and even some procedures and still expect to remain the nation's champions in air, space and cyberspace. These priorities must be accomplished in order to continue controlling air, space and cyberspace – the first and most fundamental step to successful execution of Joint/Coalition operations. One major strategy to support our innovation is the development of a comprehensive and standardized approach to improve work processes across the AF. Air Force Smart Operations for the 21st Century (AFSO21) is the initiative to transform the Air Force toward a culture of Continuous Process Improvement. (CPI).
Mission Impact	Even the world's finest Air Force can improve and it is critical to the protection of our Nation that we continually do so. We strengthen our combat capability when we drive continuous improvement and innovation into day-to-day processes. It is essential to eliminate unnecessary work and barriers so Airmen can accomplish their most critical work. At the same time, we will generate savings needed to recapitalize the Air Force and provide stronger war fighting capabilities for the joint team.
Strategic Intent	To integrate and synchronize consistent communication actions and messages about AFSO21 and achieve specific fundamentally important results.
Objectives	<ul style="list-style-type: none"> • Effectively communicate key themes and messages to key stakeholders about AFSO21 through various channels. • Prepare senior spokespeople and key influencers to communicate AFSO21 priorities and goals during key communication activities. • Synchronize AF-wide communication efforts, embed CPI by highlighting successes and de-conflict potential communication disconnects.
Engagement Strategy	<ul style="list-style-type: none"> • Primary spokespersons: Director, Smart Operations for the 21st Century (SAF/SO); Deputy Director, SAF/SO; AF Senior Leaders, Air Staff, MAJCOM and Wing AFSO21 Subject Matter Experts (SME). • Integrate AFSO21 messages with AF messages. • Target communication actions toward key audiences. • Collaboration between MAJCOM AFSO21 SMEs and PAs to execute communication actions.
Key Audiences	Internal: Senior Leaders, Mid level Leaders and all Airmen. External: The Administration and Congress, Secretary of Defense and other Services, Industry CPI Leaders and AF Suppliers.
Desired Results	Internal: <ul style="list-style-type: none"> • Airmen have a mindset that continuous process improvement promotes excellence and is a part of daily operations. • Airmen understand the goals and principles of AFSO21 and their role in it. • Airmen effectively communicate, implement and sustain AFSO21 improvements. • Airmen view execution of core processes as best-in-class.

	<p>External:</p> <ul style="list-style-type: none"> • Air Force is viewed as a credible, high-performing steward of its resources. • Air Force is viewed as a benchmark innovator in CPI.
<p>Effects Assessment</p>	<p>SAF/CMA will</p> <ul style="list-style-type: none"> • Measure Airmen's awareness and opinion of the program via Internal Communication Assessment Group (ICAG) survey. • Analyze media coverage of AFSO21 initiatives.
<p>Key Messages</p>	<ul style="list-style-type: none"> • AFSO21 (Air Force Smart Operations for the 21st Century) is building a culture of continuous improvement to enhance combat effectiveness. • Even the world's finest Air Force can improve. AFSO21 provides the tools and training to achieve greater results in every mission area. • Airmen's time is valuable. AFSO21 processes allow Airmen to spend more of their time on the mission and reduce extra duty hours caused by nonvalue-added tasks. AFSO21 is about achieving "Excellence" in everything we do. • AFSO21 Five Desired Effects guides improvement initiatives at every AF level toward results that increase combat capability. <p>AFSO21 FIVE DESIRED EFFECTS:</p> <p>Productivity</p> <ul style="list-style-type: none"> • AFSO21 encourages Airmen to continuously examine and improve the way they work. • AFSO21 is producing greater results and effects with current or fewer resources (doing more of the right things with the same or less effort). <p>Asset Availability</p> <ul style="list-style-type: none"> • AFSO21 creates a stronger AF – equipment and people are mission-ready and available more efficiently and effectively. • AFSO21 seeks to improve all asset availability from aircraft to information technology to range space, etc. <p>Agility</p> <ul style="list-style-type: none"> • AFSO21 improves response time to the warfighter at all levels of the Air Force. • Reduced process cycle times with general goal of 50% improvements. <p>Safety</p> <ul style="list-style-type: none"> • In everything we do, we must consider safety. AFSO21 initiatives are designed to sustain and enhance the safety of our people and the safe use of our material assets. • AF seeks to achieve SecDef mandate to reduce injury rates by 75% by the end of FY08. <p>Energy Efficiency</p> <ul style="list-style-type: none"> • AFSO21 promotes finding better ways to save energy, finding alternative forms of energy and encouraging a culture where Airmen make energy conservation a consideration in everything they do. • Achieve the President's goal of 3% annual savings (FY07-16) & an internal "blue line" of 5% per annum. • 3 Pronged AF Strategy – Demand side reduction, Supply side alternatives, and cultural change.
<p>Responsibilities</p>	<ul style="list-style-type: none"> • SAF/SO and SAF/CM will update this strategic communication plan as needed. • SAF/CM will ensure 2-digit, then SECAF and CSAF approval of this plan. • SAF/CM will ensure widest distribution of this plan. • SAF/SO will communicate initiatives through a variety of channels and direct communication action will be taken by MAJCOM SMEs. • SAF/SO will: <ul style="list-style-type: none"> ▪ Join the Strategic Communication (SC) Community of Practice (CoP) on the AF Portal ▪ Load AFSO21 upcoming events into the Communication Tasking Order (SC CoP)



	<p>master calendar) located on the SC CoP.</p> <ul style="list-style-type: none"> ▪ Create an AFSO21 Communication IPT and participate in the Strategic Communication Working Group (SCWG). ▪ Ensure AFSO21 SMEs have a copy of the strategic communication plan. ▪ Be the central “Hub” for all AFSO21 content development and integration in terms of themes and messages, Best Practices and Success Stories. ▪ Update the AFSO21 Community of Practice (CoP). ▪ Develop an AFSO21 Communication Toolkit to include a standard brief, fact sheet, and video. <ul style="list-style-type: none"> • SAF/PA will develop supporting plans to encompass public and media outreach and product development. • SAF/PA will: Publicize via AFNEWS, AFLINK, and other products as appropriate; proactively engage with external media; develop products that amplify AFSO21 messages. • MAJCOMs PAs will: Use MAJCOM AFSO21 SMEs for content reviews and to assist in developing supporting PA plans.
End State	<p>The end state goal is an Airmen culture that uses continuous process improvement at every level for a more combat effective and resource efficient Air Force</p>

SECTION THREE: FREQUENTLY ASKED QUESTIONS

Q: What is Air Force Smart Operations for the 21st Century (AFSO21)?

A: AFSO21 is an Air Force-unique model to implement Continuous Process Improvement practices into our day-to-day operations. It uses portions of various process improvement approaches and blends them into a standard model that fits Air Force needs. As this approach was developed, we were mindful of the processes we share with businesses that are successfully implementing these improvements, as well as inherent differences between us. Most importantly, this architecture is based on the idea that process improvement will never be complete. Even good processes can be made better.

Q: What is the focus of AFSO21?

A: AFSO21 is focused on ensuring the war fighter has the resources and skills for the joint fight. Some of our internal processes have been in place since the 1970's, before computers, cell phones and fax existed. 21st Century warfighters are ready for and require more innovative and streamlined processes. AFSO21 will give the war fighter exactly what is needed to achieve those results. We will not waste time, effort or money that does not meet the specific requirements of the warfighter.

AF seeks to achieve results guided by the **AFSO21 Five Desired Effects**:

- **Productivity** - Encouraging all Airmen to continuously examine and improve the way they work.
 - Doing more of the right things with the same or less effort.
- **Asset Availability** – Creating a stronger AF – equipment and people are mission-ready and available more efficiently and effectively; AFSO21 seeks to improve all asset availability from aircraft to information technology to range space, etc.
- **Agility** - AFSO21 improves response time to the warfighter at all levels of the Air Force.
 - 50% reductions in process cycle time is the general goal.
- **Safety** - In everything we do, we must consider safety. AFSO21 initiatives are designed to sustain and enhance the safety of our people and the safe use of our material assets. AF seeks to achieve SecDef mandate to reduce injury rates by 75% by the end of FY08.
- **Energy Efficiency** - AFSO21 promotes finding better ways to save energy, finding alternative forms of energy and encouraging a culture where Airmen make energy conservation a consideration in everything they do.
 - Achievement of the Administration's goal of 3% annual savings (FY07-16) & internal "blue line" of 5% per annum.
 - A Three-Pronged AF Strategy – Demand side reduction, Supply side alternatives and cultural change.

Q: What are the key tenets behind AFSO21?

- Leadership involvement
- Define value from the customer's perspective
- Expose and solve problems
- Measure to achieve results
- Airmen participation
- Increasing combat capability

Q: Isn't most of the Air Force already performing AFSO21 under a different name? Why create something completely different?

A: The Air Force has been on the road to process improvement for several years, but with some key omissions—organizations operating separately may have used one program or another to continuously improve, but now with AFSO21, we have the commitment to use Continuous Process Improvement from the highest levels of leadership in the Air Force. To avoid only making incremental changes, AFSO21 combines the best industry tools that will allow Air Force-wide transformational change. We are following one method, with one mission, acting as one team.

Q: Why is the Air Force attempting this transformation?

A: Transformation and process improvement are not foreign concepts to the Air Force. Some people may not comprehend the urgent need to transform what is widely acknowledged as the world's best air and space force. History has often demonstrated that trying to merely hang on to existing advantages is shortsighted and often met with disastrous consequences. Demand for air and space capabilities is increasing while the resources depended upon to produce those capabilities are decreasing. Meanwhile, the Air Force systems and structures providing these capabilities need to be recapitalized. The Air Force must take their high-performing enterprise to the next level to meet challenges posed by the adversary of 2015 and beyond. This is best achieved by a service-wide move to innovate and improve.

Q: How will the Air Force conduct AFSO21?

A: Air Force leaders are implementing AFSO21 with a three-phased approach tailored to meet the priorities and opportunities in their areas of responsibility, to improve performance and eliminate waste, to remove barriers for their Airmen, and enable ever-higher levels of performance. Phase one of AFSO21 focuses on training Air Force leadership on the various process improvement components of AFSO21 (tools & engagement methods) to improve work processes. Phase two is the full implementation of AFSO21 throughout the Air Force. This involves training Airmen to understand AFSO21's effects on their operational activities and how they can improve their work place. The third phase reinforces the concept of continuous improvement of internal Air Force work processes and extends the same improvement processes to the Air Force's strategic partners.

Q: What can an Airman in the field expect to see at his or her level as AFSO21 integrates into Air Force operations?

A: Airmen will participate in their work places and units to improve how their units do business. By analyzing how their mission is accomplished, they have the ability to redesign and integrate their processes, which will result in reduced waste, reduced costs, reduced risk and, most importantly, increased combat capability.

Q: How do we define "productivity" in the Five Desired Effects?

A: Productivity is defined as the Airmen's valued output and the time required to produce the output. Productivity involves Airmen continuously examining and improving the way they work by eliminating wasteful steps then, doing more of the right things with the same or fewer resources and effort. Different metrics will be designed, as required, to measure productivity.

Q: Where does one go for help to learn more about implementing AFSO21?

A.: Each installation, major command and Headquarters organization has personnel assigned who can help you learn more about AFSO21. AFSO21 offices are aligned under the respective organization's Commander or Vice Commander.

Look for senior leader views, articles and general information on the AFSO21 public website: www.af.mil/library/smartops.asp.

AF-wide AFSO21 policies, initiatives, points of contacts (POCs), discussion forums, etc., can be found on the AFSO21 Portal Page: <http://afso21.af.mil>.

Q: How can an Airman submit an AFSO21 process improvement idea?

A: Your idea may be something that benefits your particular location or it could have AF-wide benefits. Contact your local AFSO21 POC. AFSO21 offices are aligned under your Commander or Vice Commander.

You can also submit ideas through the AF's Innovative Development through Employee Awareness (IDEA) Program. Contact your installation, major command or Headquarters AFSO21 POC for more information.

Q: How is AFSO21 different from Total Quality Management (TQM)?

A: AFSO21 shares some of the same tools and techniques, but is implemented with some key differences. 1) It is an end-to-end analysis of processes, not a review of a series of stand alone processes. The entire A to Z process review allows Airmen to determine what parts of the system have value and what parts are waste (value stream); 2) AFSO21 has the ongoing support of AF senior leadership; 3) The focus is on achieving results (along AFSO21 Five Desired Effects – Energy Efficiency, Productivity, Asset Availability, Sustained Safety and Increased Agility). These targeted improvements meet the ultimate goal of increased capability for the warfighter.

Q: What happens to AFSO21 when this Administration changes?

A: The need for AF innovation and resources constraints will not end when the President changes. The AF adopted AFSO21 (Continuous Process Improvement) as a set of tools and principles that allows it to increase combat capability, while generating savings for modernization requirements for the long term. We are integrating necessary knowledge, skills, and abilities into Air Force (active, Guard, Reserve and civilian) education and training requirements.

Q: Is AFSO21 going to be a career field AFSC for officers and NCOs?

A: No. The AF opted not to create an AFSC for AFSO21 in order to involve personnel from all AFSCs who bring their diverse expertise to AFSO21 positions. They will gain AFSO21 tools and skills to apply when they return to their organizations and specialties. This approach embeds AFSO21 into the AF culture without creating new AFSCs. However, AFSO21 experience will result in a Special Experience Identifier (SEI) for the various certification levels allowing leaders to identify personnel with this critical skill set within their organizations.

SECTION FOUR: SENIOR LEADER QUOTES

4.1 SECAF

“Even the world's finest Air Force can improve, and it's critical to the protection of our nation that we continue to do so.” Sep 07

“We value the service of our Airmen, whether active, Reserve, Guard or civilian, and we believe that in every case, they are intending to bring value to our Air Force.”. “Today, our Airmen are going to have to carry a slightly heavier load, but we're trying to do it smartly and efficiently using AFSO21. If we can do that, we can be proud to know that our efforts have resulted in a better Air Force in 2015 and 2020 than ever before, and this is our bottom-line duty.” May 07

“Air Force Smart Operations for the 21st century now has an effect not just in maintenance, logistics or depot operations, but it can affect computer operations, flight operations, and program office operations. AFSO 21 is a much broader umbrella of what the Air Force does well.” Jun 07

“Excellence” does not stop with singular achievements, which is why our Core Value has the qualifier of “in All We Do.” A culture of excellence must inform and permeate all of our actions. AFSO21 assists us in achieving this excellence by empowering our Airmen to ask how we can do things better. Excellence must be our prevailing attitude.” – Letter to Airmen, 11 Jan 07

4.2 CSAF

“Whether there is budget pressure or not, AFSO21 is the right thing to do. We must look for system wide hidden cost saving efficiencies and eliminate unnecessary work and barriers so Airmen can accomplish their most critical work.” “Process improvement will never be complete. Even good processes can be made better, and that innovation in day-to-day processes will strengthen Air force combat capability.” Sep 07

“AFSO21 (Air Force Smart Operations) and other initiatives are paying big benefits in time and energy and money. Ultimately, our goal is to ensure the Air Force maintains the right size and mix of forces to meet this global challenge of today and tomorrow, and for that reason, educating and training our Airmen remains the top priority.” Feb 07

“Our job as America's Airmen is to *fly and fight in the air, space and cyberspace*, and we're the best in the world at what we do. But we can always improve combat effectiveness, and I believe AFSO21 can help us get there. As you have seen and heard, Airmen everywhere are already implementing the principles of AFSO21 and we are beginning to see some impressive results.” Feb 07

“We also expect our Air Force Smart Operations for the 21st Century (AFSO 21) programs to further optimize our daily business practices and processes to get at eliminating unnecessary or non-value added work. The objective here is to allow us to work smarter, not harder, and to cut contract and operating cost and translate these savings directly into increased combat capability while freeing more resources for recapitalization and modernization.” Aug 06

4.3 CMSAF

“AFSO 21 is about being more efficient, spending our money wisely, reducing waste and becoming a more efficient and capable Air Force.” Apr 07



“We are committed to creating a culture within our Air Force that gives each Airman the power to improve processes they are involved with. From the newest Airman through our most senior officers, we all have a responsibility to elevate ideas that will make the quality of our work and those we supervise better and more relevant to today's fight.” 20 Sep 06



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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME E: KNOWLEDGE MANAGEMENT

May 2008

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SECTION ONE: KNOWLEDGE MANAGEMENT PLAN SUMMARY

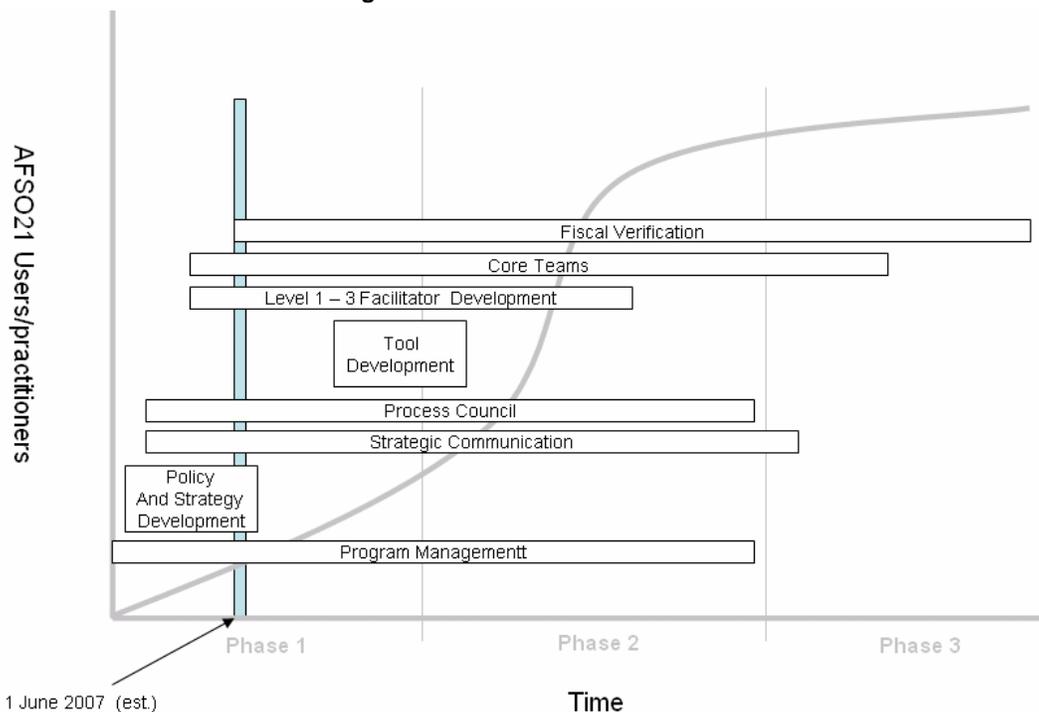
1.1 BACKGROUND

The Air Force definition of knowledge management is “the strategies and processes of identifying, capturing and leveraging knowledge and expertise within an organization.” To be efficient, knowledge management must allow a user to take advantage of information technology solutions while creating a supportive, collaborative and sharing culture.

AFSO21 Knowledge Management (KM) is a component strategy to the overall Air Force and realizes a fully transformed, network centric, knowledge-based force. The Air Force enabling concept associated with this strategy is called Knowledge-Centric Operations (KCO). Continuous innovation is required to enable warfighters, who must draw real time from all five domains as they close and engage the enemy. Warfighters need clean data, accessible information, relevant expertise/knowledge, and keen foresight to not only strike from the Air, Space, Land, Sea, and Cyberspace, but to also sustain superiority. The Knowledge-Centric Operations Enabling Concept is designed to spur the continuous adaptation and reorientation of a truly integrated force that is innovative, more agile, more rapidly deployable and more capable of engaging a wider range of threats. With KCO, organizations and communities focus on learning by managing their warfighter know-how, adapting to the always-changing needs of the extended kill-chain and excelling in both routine and non-routine activities so the joint team can dominate the 21st Century battle space.

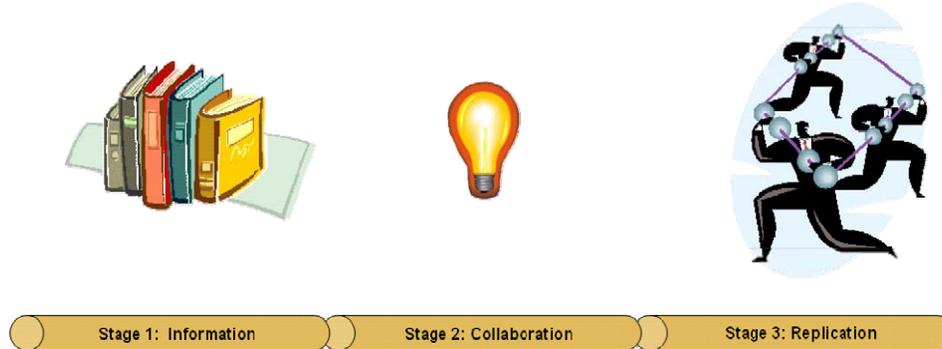
The AFSO21 KM strategy consists of a three stage implementation: 1) Information & reference, 2) Collaboration & sharing, and 3) Replication. The KM Tool Development effort will be performed in Phase 1 and Phase 2 of the AFSO21 Implementation Campaign or “Continuous Improvement Journey.”

Figure E1 – Innovation “S” Curve



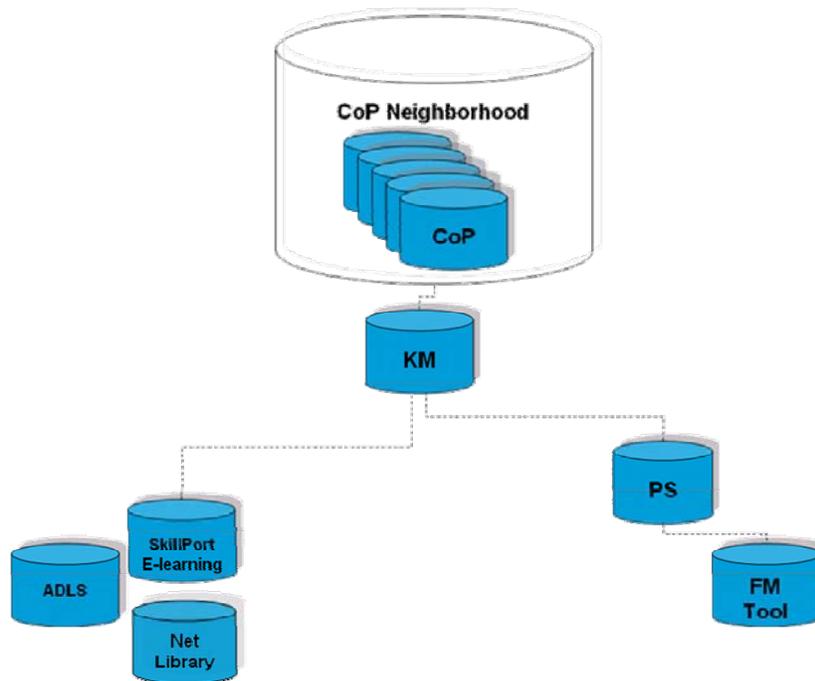
The innovative spread of Continuous Process Improvement throughout the Air Force (AF), or use of AFSO21 thought processes will follow a standard innovation “S” curve. It is in Phase 2, when the KM Tool Development effort reaches “Stage 3: Replication” that rapid succession of innovation and waste elimination will occur along each of the 10 AF Key Process Owner enterprise value streams. The number of practitioners/users will explode to 90% making major thought process adjustments that improve combat capability, enhance warfighter employment and use of Airpower and rapidly enhance modernization and recapitalization efforts which will return greater operational employment.

Figure E2 – Three Stage Implementation of AFSO21 Knowledge Management



As boundary-less knowledge sharing becomes synonymous with Air Force culture, the Air Force will transform into a learning organization. The learning organization supports the strategy of a functionally-driven culture of thinkers ... One Team ... always learning and always evolving with One Mind to accomplish One Mission. The KM effort is seen as a subcomponent of several knowledge sharing efforts as shown in the diagram below:

Figure E3 – Relationship to existing and new Support



SECTION TWO: INFORMATION TECHNOLOGY (IT) SUPPORT

2.1 OVERVIEW

AFSO21's IT solution provides a secure, web-based, searchable and collaborative IT environment that is accessible by anyone, anywhere, to manage our CPI efforts across the Air Force. This IT environment is an information management and knowledge management collaborative capability aligned with Air Force policies and guidance. It leverages standard IT capabilities currently available to provide services for Process Improvement Project; Definition, Capture and Management.

2.2 PROCESS CAPTURE SERVICE (IGRAF^x)

Provides Air Force Core Team members:

- Capture: Create and Submit VSM and Process Maps into AFSO21 process repository
- Repository: Query, Analyze and Retrieve baseline and derived Value Stream Maps (VSM) and Process Maps

It is intended that processes will be documented after the event is concluded to limit team distractions. iGrafx is one IT tool available to assist with this, however use of iGrafx[®] is not mandatory.

For details on the Process Capture Service software, visit our website at <http://afso21.af.mil>, and click on the "Process Capture Service" link under "Technology Tools".

2.3 CPI-MANAGEMENT TOOL (CPI-MT)

Provides Air Force Key Process Owners, MAJCOM, AF Key Process Owner Core Team, Wing AFSO21 Office, Problem Solving Team Leaders and Problem Solving Team Members with the following:

- Project Management: Create, manage, analyze, process, control, and report Process Improvement Project information
- Strategic Alignment: Align Process Improvement Projects to AF Key Processes
- Executive Visibility: Provide management dashboards for enterprise awareness
- Reporting: Provide automated report delivery system
- Auditing: Provide information for analysis and audit

CPI-MT is based upon commercial off-the-shelf (COTS) software (PowerSteering[®]). It is intended that all ideas and chartered projects will be documented, entered into and tracked via CPI-MT.

- Access to CPI-MT at the local level is controlled by the base AFSO21 office, typically the Wing CCO or CVO office.
 - In order to view or edit ideas and projects in CPI-MT, a new user must be "invited" to join the system by a current user. New Team Leads should be invited by the CCO/CVO office and Team Members can be invited by the Team Lead.
 - Each MAJCOM CCO/CVO office has a CPI-MT Administrator whom can manage the system for units within the MAJCOM.
- CPI-MT is designed to track ideas and projects via the 10 AF Key Processes (see Volume G), or organizationally, via MAJCOM/base/unit level.

- Any CPI-MT user can enter a new idea into the system. By default, the idea will be placed within the organizational structure under your operating location (e.g. base).
- Only users with Team Leads or higher permissions can create new projects. By default new projects will be placed within the organizational structure under your operating location (e.g. base).
- A MAJCOM/Wing CCO/CVO office can move ideas/projects from the organizational structure to the AF Key Processes structure as needed.
- Business Rules for movement of projects within CPI-MT:
 - Forward to/up AF Key Process Owner approval chain when:
 - Attacking an Air Force process
 - Process spans beyond scope of one MAJCOM
 - Requesting AF Key Process Owner resource support
 - AF Policy change is required
 - Forward to/up MAJCOM approval chain when:
 - Forwarding a wing-level idea for an Air Force process improvement
 - Attacking a MAJCOM process
 - Process spans beyond the scope of one wing/base
 - MAJCOM policy change is required

CPI-MT is accessed via the AF Portal.

User-level training is available for CPI-MT both within the CPI-MT system under “Important Links”, and on our website at <http://afso21.af.mil>, using the “CPI-MT” link under “Technology Tools”.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME F: STRATEGIC ALIGNMENT AND DEPLOYMENT

May 2008

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SECTION ONE: STRATEGIC ALIGNMENT AND DEPLOYMENT PLAN

1.1 PURPOSE

Strategic Alignment & Deployment (SA&D) is the method used to ensure everyone in the organization is working effectively towards the same goals identified by senior leadership. Deploying this method to the appropriate level requires clear communication of the SA&D process to all who are involved in its execution. The goals and objectives are to be measured and therefore must be written in clear, understandable language. A point of contact will be identified at the appropriate level of responsibility to monitor the process and flow of information up the chain to the MAJCOM/Headquarters CC.

Successful SA&D requires effective communication throughout the organization. Validation can only occur when the SA&D process is deployed to the lowest level and tracking and reporting of metrics begin. Senior leadership's responsibility is to clearly state goals and objectives, deploy the process to the next level and review monthly tracking.

SA&D is designed to:

- Align the enterprise to achieve the goals and objectives impacting the entire organization.
- Provide a common/standard methodology to deploy metrics and action plans throughout the enterprise.
- Communicate commander's intent relative to goals, objectives, metrics and action plans.
- Assign accountability and responsibility at all levels.
- Ensure alignment throughout the organization.
- Concentrate the organization on high-leverage outputs.
- Form a disparate group of individuals into a team with a common goal.

Critical components of SA&D:

- Matrix. This sheet identifies MAJCOM/Headquarters-wide goals; objectives which support the implementation of the goal; key metrics and action themes to support objectives; and shows linkage from goal to action themes.
- Tracker. This sheet is used to show monthly status of progress toward objectives.
- Action Plans. One action plan is developed per objective. This is the detailed plan of action for meeting the objective. The plan will outline the strategies, milestones, measures and exit criteria.
- SA&D Review Notes. This sheet is used to capture monthly notes relating to actions.

1.2 PROCESS – CATCHBALL (REFER TO FIGURES F1 AND F2)

Catchball is the continuous give-and-take between levels around chosen targets and organizational capabilities.

Using the goals and objectives developed at the higher organizational level (e.g. MAJCOM/Headquarters CC level) the process is deployed to sub-organizations (e.g. Wing/Staff Commanders). Commanders then start the process at their level and further deploy to their (e.g. Groups/Division) who will further deploy down to the next level, if necessary going to the lowest level possible.

The AFSO21 Certified Level 1 or Level 2 will:

- Meet with the appropriate leader and provide them a review on:

- The SA&D process and how it needs to occur.
- The SA&D flow and format.
- Conduct a team meeting with the Commander and his staff (Group Commanders /Division Chiefs) to complete the Wing/Staff level SA&D action plan and develop the next level actions. The process will then be deployed to the next level, as required. The Level 2 or Master Process Officer (MPO) will explain the process, as required, to various teams during organizational planning stages. At the team meeting the Commander will:
 - Set the stage and expectations for the meeting by reviewing the outcome of the MAJCOM/Headquarters' off site to include the MAJCOM/Headquarters-wide Goal set by the Commander.
 - *Review the MAJCOM/Headquarters level Objectives.* Discuss how the Wing/ Staff intend to meet the Commander's MAJCOM/Headquarters-wide Objectives. The commanders, at the next level, then meet and discuss how they intend to meet the objectives.
 - *Review the MAJCOM/Headquarters Level Action Themes* that were developed for each Top Level Objective and the Team Actions which are to be deployed to the next level. As the process is deployed, specific actions will be identified to support these themes.
 - *Review the Key Metrics and Targets*, these are the tools used to measure objectives and Action Themes and identify anticipated results.

At each Team meeting, the entire team will determine if there are any additional actions that need to be added. As the process is deployed, the next level will develop their specific Actions and related Metrics and Targets for how they intend to meet each of the previous level's Action Themes.

Catchball ensures that targets set at a higher level are passed down to the next level to ascertain their feasibility. The leaders will review, with the entire team, their specific Actions, Metrics, Targets and OPRs. The team will either concur or discuss to insure these are correct and aligned with the Action Themes. This give-and-take activity is performed between different levels of the organization to make sure that critical information on goals and objectives as well as feedback is passed back and forth. Catchball is vital to the process as it helps to show linkage among different squadrons/groups/wings/divisions.

Figure F1 - Deploy the Process (Wing example)

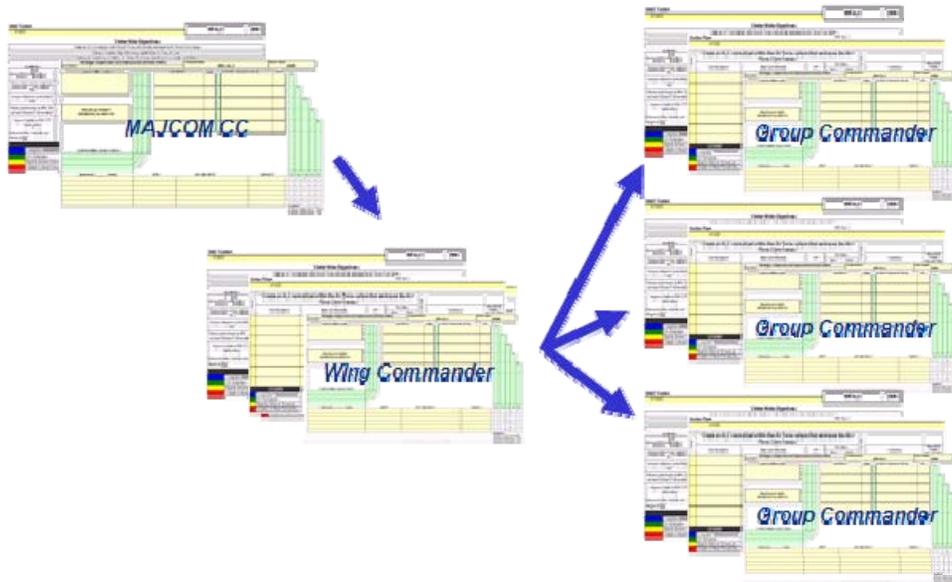
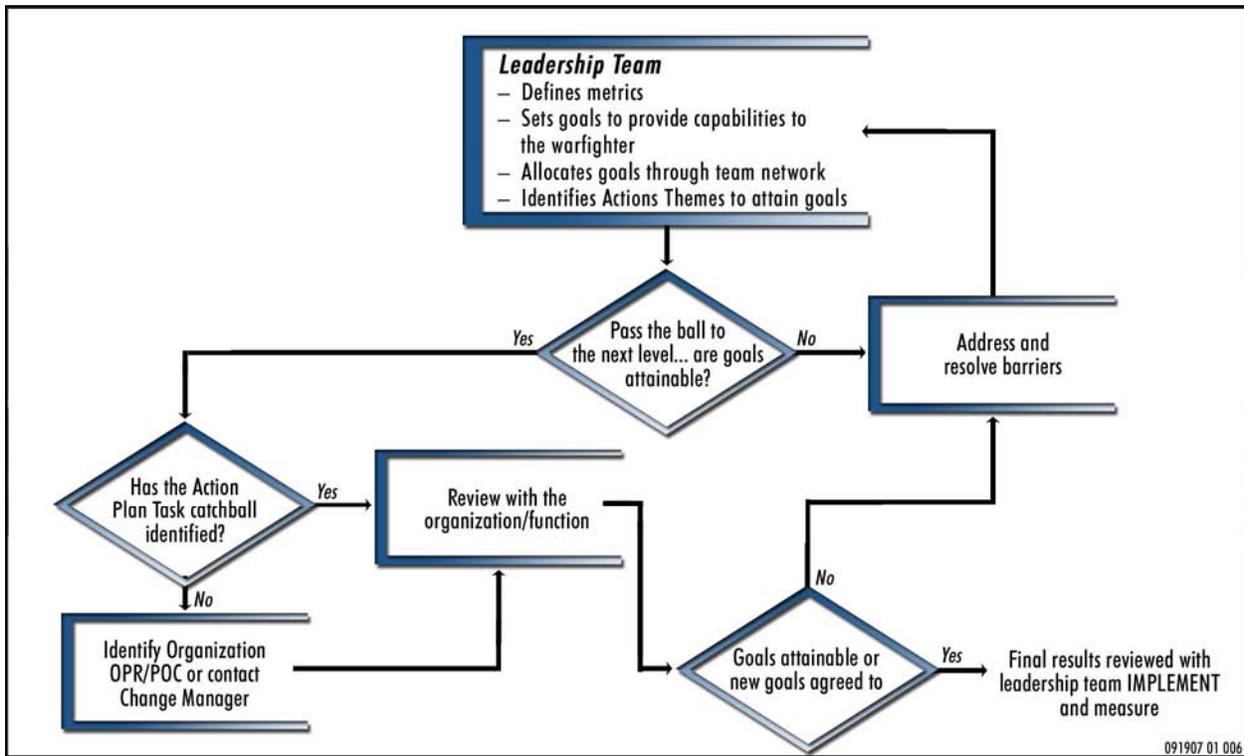


Figure F2 - Catchball Process



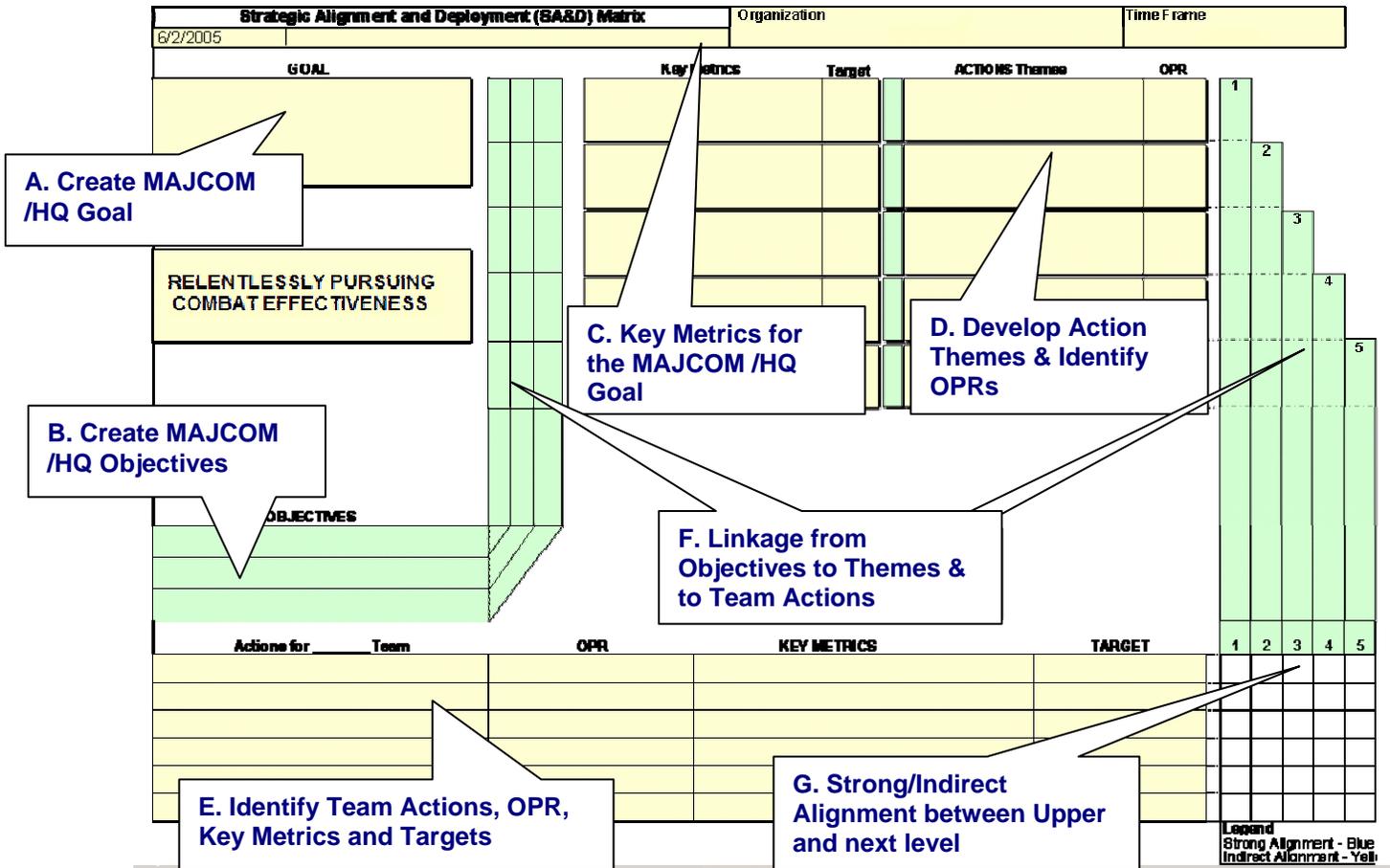
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1.3 MATRIX

The SA&D matrix (refer to Figure F3) is composed of linked areas of information which show the flow from MAJCOM/Headquarters Goal to Team Actions and provides a measuring tool which can be used at each level. The matrix areas below are in the logical order they should be completed.

- *Area A.* The MAJCOM/Headquarters Goal as stated by the Commander. This area does not change as the process is deployed.
- *Area B.* Three MAJCOM/Headquarters Objectives are developed to support the Goal. This area does not change as the process is deployed.
- *Area C.* Key Metrics, identified by the MAJCOM/Headquarters, are the main areas the MAJCOM/Headquarters CC is interested in tracking. These Metrics are directly linked to the Objectives. As the process is deployed, each level will place their metrics in this area.
- *Area D.* Action Themes/OPR states how the Goal and Objectives are to be accomplished and identifies the OPR for each theme. The MAJCOM/Headquarters Level matrix shows the MAJCOM/Headquarters Level Themes. As this is deployed, each level will place their specific Themes in this area.
- *Area E.* This area has several parts:
 - “Actions for ___Team” reflect the Actions to be taken by the next level in order to meet the Action Themes in Area D. When deployed to the next level down, these Team Actions become the Action Themes (Area D) at the next level.
 - “OPR” is the person responsible or the go-to person that has the authority to make it happen and follow thru with the action required.
 - “Key Metrics” are how the action will be measured.
 - “Target” reflects the anticipated result reached upon completion of the metric.
 - The team actions will move to Area D and C, respectively, as the process is deployed to the next level.
- *Area F.* This area provides linkage to ensure focus and alignment from Goal to Team Actions in order to support warfighter capabilities.
- *Area G.* These blocks are to be color coded to show strong alignment (blue), indirect alignment (yellow), or no alignment (white) between upper level Action Theme and next level Action Themes. When filled in this will provide a visual of where resources may need to be realigned to meet objectives.

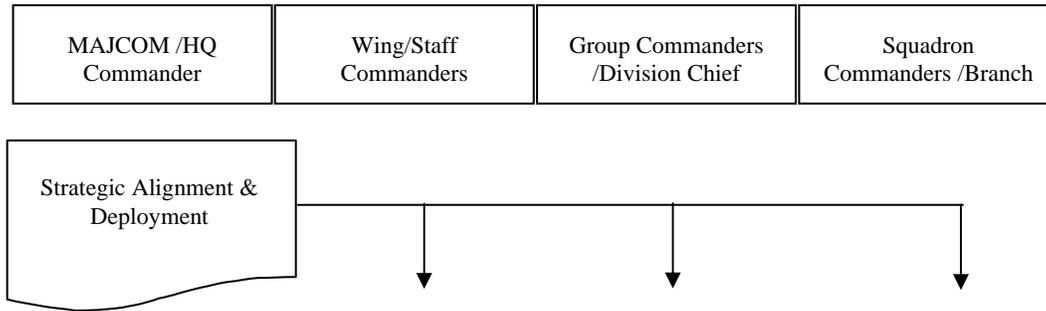
Figure F3 - Strategic Alignment and Deployment Matrix



1.4 PROCESSES USED TO INFORM PEOPLE

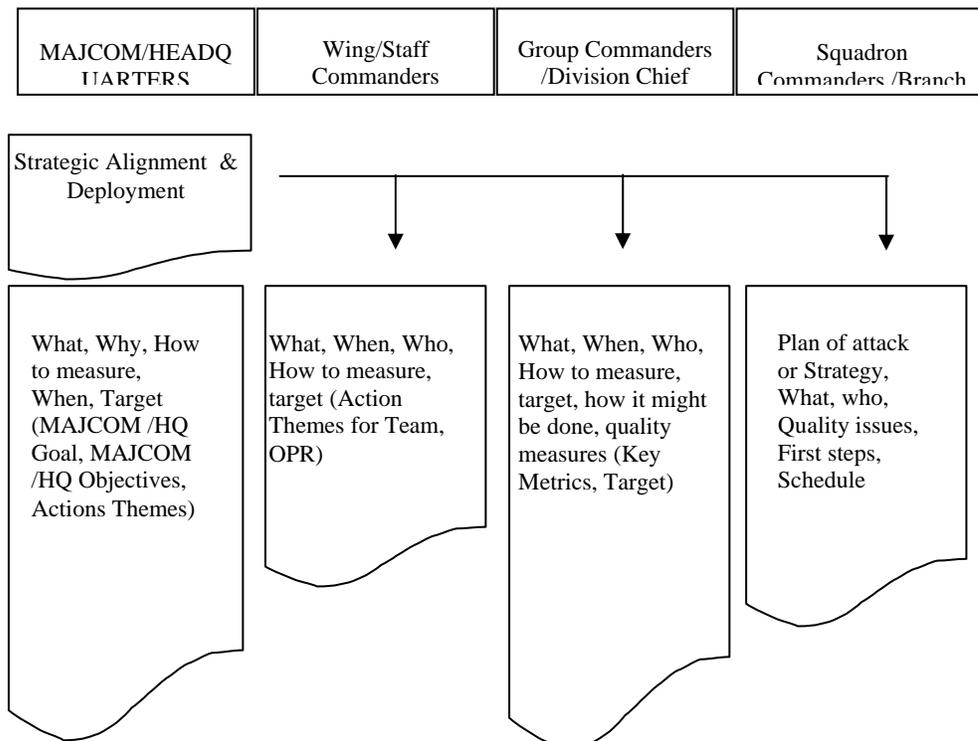
Figure F4, below, depicts the normal approach to SA&D. It is the “broadcast” approach. The MAJCOM/Headquarters Commander develops a policy statement and broadcasts it to the organization.

Figure F4 - The “Broadcasting” of policy



The evolution of a policy statement as it moves down the chain of command is depicted in the following Figure F5.

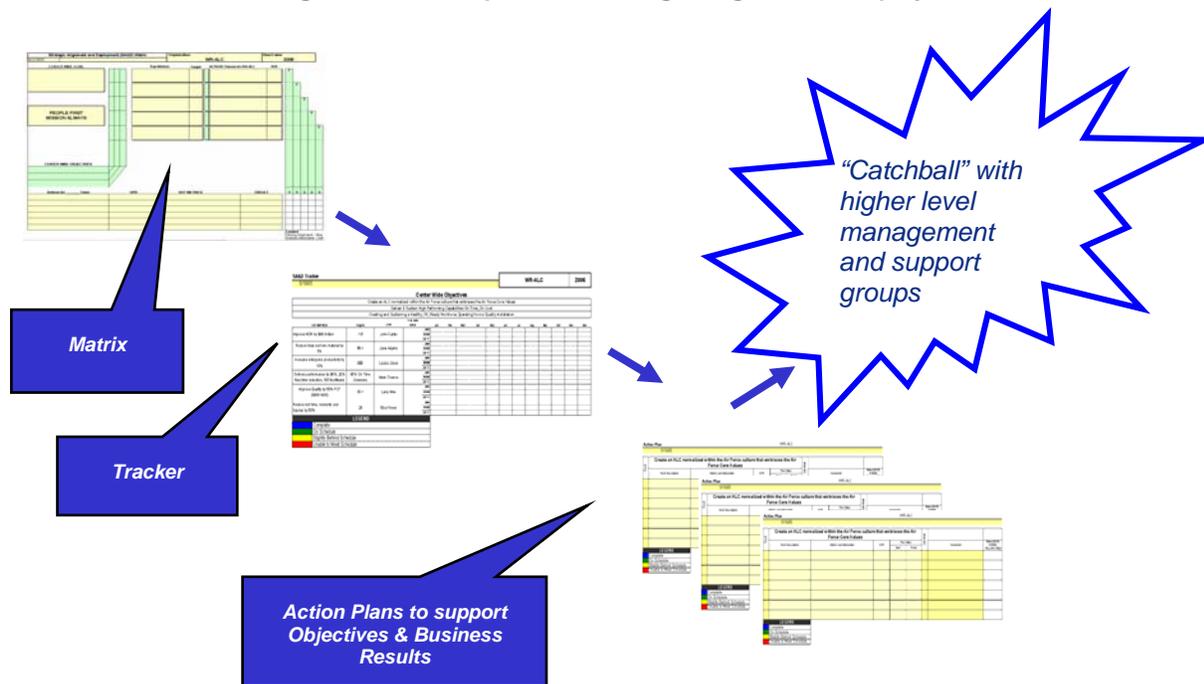
Figure F5 - The evolution of a policy statement into a specific plan or strategy for accomplishment



1.5 DEVELOPMENT (REFER TO FIGURES F3 AND F6)

- SA & D Tracking – Refer to paragraph 1.6.
 - The Objective, Key Metric, Target, and OPR from the Matrix will automatically be filled in on the tracker sheet. The sheet will be used to show a monthly status of the progress of objectives.
- Action Plans – Refer to paragraph 1.7.
- Catchball with higher level management and support functions. Catchball provides an opportunity for others to contribute to another unit’s metric with possible linkage and support which would otherwise go unnoticed.

Figure F6 - Development of Strategic Alignment & Deployment



1.6 SA&D TRACKING (REFER TO FIGURE F7)

Performance measures to be tracked are automatically filled to this sheet when entered into the Matrix. Areas from the Matrix which are automatically linked are the MAJCOM/Headquarters Objectives, Key Metrics, Target, and OPR.

- Manual monthly tracking is divided into three color coded parts:
- “Plan” block identifies the monthly goal to reach in order to meet the target.
- “Actual” block will reflect the number/percentage that was actually met by the end of the month.
- “ytd+/-“ indicates if the metric is ahead or behind schedule for the year.

Color Codes. The monthly tracking is color coded (see Legend) using the following:

- Completing target should be indicated by shading blue.
- On schedule of target should be indicated by shading green.
- Slightly behind target should be indicated by shading yellow.
- Not meeting target should be indicated by shading red.

Figure F7 - Example Tracking Progresses of Objectives

SA&D Tracker				2006												
Objectives																
KEY METRIC	Target	OPR	Yr to Date Actual	plan	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
				actual												
				ytd +/-												
				plan												
				actual												
				ytd +/-												
				plan												
				actual												
				ytd +/-												
				plan												
				actual												
				ytd +/-												
				plan												
				actual												
				ytd +/-												

LEGEND	
	Complete
	On Schedule
	Slightly Behind Schedule
	Unable to Meet Schedule

1.7 ACTION PLAN (REFER TO FIGURE F8)

The recipe for accomplishment of our objectives is summarized in individual action plans--one for each objective. Action plans by nature are just as their name implies--plans of action. Within the structure of this strategic plan is one action plan for each of our strategic objectives. Each MAJCOM/Headquarters action plan identifies accountability for objective accomplishment and outlines the achievement strategies, milestones, performance measures, and exit criteria for objective fulfillment. The specific format for each action plan is as follows:

- *Objective.* This is the MAJCOM/Headquarters Objective identified by the MAJCOM/Headquarters Commander and is automatically filled in and linked to the Matrix.
- *Events Column.* Will be checked if there is an event scheduled/ongoing to accomplish the specific action.
- *Short Description.* Briefly describe the action to be taken.
- *Details and Deliverable.* List specific steps to accomplish the objective and action theme.
- *OPR.* Identifies the person/unit responsible for this specific action.
- *Plan Dates.* The start and finish dates identified for accomplishing achievement strategies.
- *Catchball.* This column will be checked to identify that there is a link to another unit for support or action.
- *Comments.* Use this area to expand on the Catchball or other significant information related to this action.
- *Status.* This block is color coded, in accordance with the Legend, to identify the progress of the action to completion.

Figure F8 - Actions Plan Sheets

Action Plan

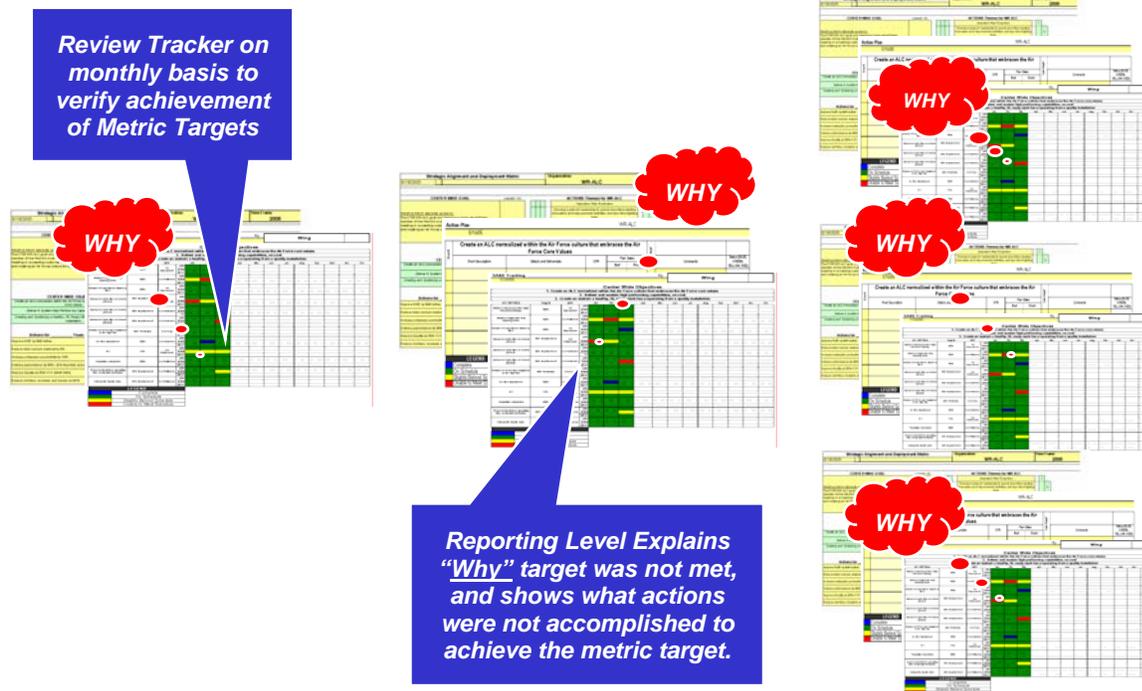
Event	Short Description	Details and Deliverable	OPR	Plan Dates		Catchball	Comments	Milestone, Critical, YELLOW, RED
				Start	Finish			

Complete
On Schedule
Slightly Behind Schedule
Unable to Meet Schedule

1.9 REVIEW AND REPORTING PROCESS

Once the SA&D process has been deployed down to the action level, the lowest level will begin reporting up the chain. Only the target areas which were not met are to be reported monthly. Reporting should include why the target was not met and what is the plan to meet the metric target.

Figure F10 - Metrics Review



1.10 MONTHLY TRACKING INFO WILL BE FOUR WEEKS OLD ONCE IT REACHES THE MAJCOM/HEADQUARTERS

Each Level reviews the Tracker for their Level and then reports up to next level the following week. This reporting continues up the chain to the MAJCOM/Headquarters Level. The Tracker will indicate which Metric Target has been met and which has not been obtained. After reviewing each Metric Targets, the Metric Targets that have not been met are discussed in more detail.

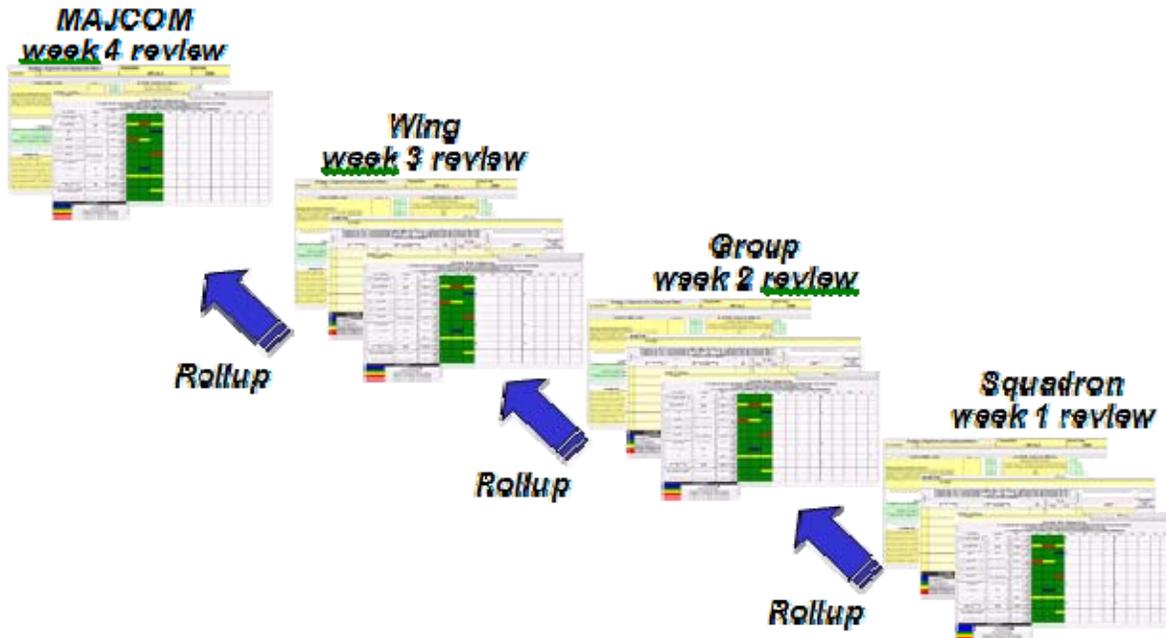
The discussion for the Metric Targets that have not been met will begin with the question of “why”. The lower level will explain Root Cause, and then provide the counter actions of how and when they intend to achieve the Metric Target for the next period of review. This process of asking “why”, explaining the Root Cause, and providing counter actions of how and when to get back on track to meet the Metric target will repeat for each Metric Target not met.

The Action plans will only be reviewed as part of the Root Cause and Counter Action for the specific Metric Target that was not obtained.

1.11 DEPLOYMENT, ROLL UP AND REPORTING (WING EXAMPLE)

- *Week One* – Report to Squadrons
- *Week Two* – Squadrons report to Group
- *Week Three* – Groups report to Wing
- *Week Four* – Wings report to MAJCOM/Headquarters

Figure F11 - Reporting up the chain



1.12 DEFINITIONS

Action Plans: Specific method or process to achieve the results called for by one or more objectives.

Action Themes: Groupings of objectives with a common underlying purpose.

Actions: Communicate the Team's intent of meeting the Action Themes.

Catchball: Continuous give-and-take between levels around chosen targets and organizational capabilities.

Goal: A broad statement describing a desired future condition or achievement without being specific about how much and when.

Objectives: Articulate the actionable components of our strategy.

Corrective Actions: Action taken to eliminate the cause of a nonconformance that has occurred, and prevent recurrence of the nonconformance.

Initiatives: Close the gap between our current and desired performance.

Metrics: A measurement, taken over a period of time that communicates vital information about a process or activity. A metric should drive appropriate leadership or management action.

SA&D Matrix: This is a one page diagram that begins with the over arching Strategic Goal and cascades the goal into focused Team Actions, Metrics and goals for each metric. (Productivity, Cost, Inventory, Quality & Safety)

RALFI: Results, Accomplishments, Lessons Learned, Future Plans, Issues. Summary of the Months activities for the area in review.

Root Cause: Original reason for nonconformance within a process. When the root cause is removed or corrected, the nonconformance will be eliminated.

Tracker: One Page Chart that documents the Business Result Metrics.

Vision Statement: A powerful, short phrase to point the organization in a direction for the future.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME G: GOVERNANCE AND PROCESS COUNCIL CHARTER

May 2008

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SECTION ONE: AIR FORCE KEY PROCESSES AND GOVERNANCE

All organizations are made up of core activities and support activities that enable and provide vision and structure for enabling and core activities. A process is a designed group of related tasks that work together to create value. To fully develop an end-to-end view of our strategic processes, enterprise level processes have been designated to define the critically essential lines within the Air Force. Hereafter designated the Air Force Key Processes, the following cross-functional/cross major command processes represent the essence of Air Force Title 10 responsibilities: 1) Plan/Execute Strategic Initiatives; 2) Manage Programs and Processes; 3) Develop Warfighters; 4) Develop & Sustain Warfighting Systems; 5) Deployment and Distribution Chain; 6) Conduct Air, Space, Cyber Operations; 7) Caring for People; 8) Provide IT Support; 9) Provide Infrastructure; 10) Managing Financial Resources. To that end, the SECAF/CSAF have grouped the AF Key Processes into defined governing, core, and enabling processes:

- **Governing.** Essential and directive processes required to facilitate execution of core processes by providing corporate direction and strategy, allocate resources, and align the Air Force to achieve all warfighting competencies and long-term goals. Organizational processes and programs that direct and focus other subordinate processes
- **Core.** Processes that combine to define the core mission of the Air Force
- **Enabling.** Support processes that provide core processes with needed resources and capabilities

Each process is described briefly below:

Group	Process	Description and Scope
Governing	Plan and Execute Strategic Initiatives	Examine ways to refine process flow into a logical, efficient business practice from receipt of input to development of the AF CONOPS. This process must be responsive to the needs of the AF and its customers.
	Manage Programs and Processes	Manage Programs & Processes' (MPP) designs and improves the processes that translate Air Force strategy into policy and resources. In it's governing relationship to other processes, MPP sub-processes receive performance input from core and enabling AF processes to provide resources, program and policy direction as outputs for the execution of the AF mission.
Core	Develop Warfighters	This process will involve a comprehensive review of current capabilities/processes in an effort to transform all processes related to Developing Warfighters using AFSO21 methodologies/assessments at all levels of the Air Force. Sub-processes will provide specific target areas and measurable objectives.
	Develop and Sustain Warfighting Systems	D&SWS begins with capability planning/requirements and ends with ultimate disposal of the system. The process addresses the entire enterprise lifecycle for Air and Space Warfighting systems. Also included are appropriate business systems and services.
	Deployment and Distribution Chain	This process will streamline the deploy, distribute and redeploy processes on the force projection continuum and provide seamless flow with adjacent processes
	Conduct Air, Space and Cyber Operations	This process will establish the foundation for Air, Space and Cyber Ops processes across the Air Force.

Group	Process	Description and Scope
Enabling	Caring for People	Caring for People is a “cradle-to-grave” enabling process for Airmen of all components of the Total Force to include family members and retirees. Caring for people touches every aspect of an AF member’s career from accession to separation, and in the case of many Airmen, continues after termination of active service. This project’s scope will assess/transform processes related to caring for people through AFSO21 end-to-end process reviews including areas of personnel, services, compensation, medical, legal, chaplain, safety, protection, housing, and the ways commanders/ supervisors assist in the long-term sustainment of members.
	Provide IT Support	This process provides IT Support to Governing, Core, and Enabling processes. It will propose processes to align IT support to mission outcomes, and implement changes to ensure that support. “Provide IT Support” encompasses all of the work which facilitates flow, capture, processing, storage and display of information in a technical man-made environment (cyberspace). The associated sub-processes can be broken into those central to “Provide IT Support” and those which directly interface with other AF primary processes: Centralized IT Support sub-processes and Interfacing IT Support sub-processes.
	Provide Infrastructure	This process will identify ways to reduce the time and effort of providing effective infrastructure to our AF; increase efficiency of organizations involved in the process. Make better use of funds by divesting unneeded infrastructure. Standardize processes where possible.
	Managing Financial Resources	This process will assess the entire life-cycle of <i>Managing Financial Resources</i> enterprise processes including cost analysis, budgeting, and financial accounting & operations. They will prioritize Rapid Improvement and BPR Events. The Core Team will conduct a Value Stream Analysis of sub-processes and establish open communications with the other Key Process Owner Core Teams. The Core Team will leverage BPR, Lean, and Six Sigma methods to reduce waste and improve processing for the entire life-cycle of these processes including points of integration with other key process owners.

1.1 AFSO21 GOVERNANCE.

Air Force senior leaders will govern implementation. *We will not invent new high level governance bodies;* we will primarily use our existing Air Force corporate bodies and governance structure.

1.2 ROLES AND RESPONSIBILITIES

Below are roles and responsibilities for key AFSO21 stakeholders and participants.

1.2.1 SECAF/CSAF/Corona

SECAF / CSAF, direct implementation of AFSO21 using CORONA, as our corporate body, for oversight and reporting of AFSO21 results and other transformation activities. The Air Force Corporate Structure will be used to set Air Force plans and priorities and to review resource allocation in biennial programming and budgeting.

1.2.2 Process Council

The Process Council governs the AFSO21 initiative and is accountable to the Secretary of the Air Force, the Air Force Chief of Staff, and Corona, which serves as the board of directors guiding Air Force transformation. The Council guides and integrates the transformation of governing, core and enabling processes to improve combat capability. In addition, the Council ensures the culture, organizational

structures, investments, and other resources are aligned to institutionalize continuous process improvement. Additional roles and responsibilities of the AFSO21 Process Council are available in the Process Council Charter.

1.2.3 Air Force Key Process Owners

The AF Key Process Owners are responsible for continuously improving their designated processes. Process Owners are the principle designers. Process Owners:

- Lead cross-process, cross-MAJCOM, cross-functional processes improvement
- Leverage the process-based portfolio management capability of the USAF
- Clearly link improvements to investments with a definitive set of metrics and measurements
- Appoint the sub-process owners; ensure sub-process owners deliver AF-wide process improvements consistent with the SECAF and CSAF vision and direction
- Maintain an Air Force wide perspective
- Develop organic continuous process improvement capabilities
- Ensure alignment with strategic goals, objectives and processes

1.2.4 Process Core Teams

AF Key Process Owners will create from within their commands, a team to assist them with management of the Enterprise Level Value Stream. This team will be called an “AF Key Process Owner Core Team” and should be comprised of senior level, cross-functional and cross-MAJCOM and includes collaboration with the Total Air Force (Active Duty, Air National Guard, Reserve, Civilian, and Contractor), OSD, Services and other Agencies. They maintain an Air Force-wide perspective. It is recommended that the core teams be staffed with a few full-time personnel to manage CPI operations on a day-to-day basis. Senior level leaders (O-6/GS-15) will be assigned to oversee the efforts of each of the 10 process core teams and be designated as AF Key Process Owner Core Team Leaders or “Process Leads.” They may or may not be assisted by “Process Co-leads.” As determined by the AF Key Process Owner, the Process Lead and Co-lead will provide periodic updates on the status of AFSO21 events that have cross-cutting implications, particularly those that may need to be elevated to the SECAF/CSAF due to multi-million dollar effect or significant impact to force employment, rotations, or deployments. Personnel assigned to the AF Key Process Owner Core Teams should be Master Process Officers (as defined below).

1.2.5 Process Lead Team

On a periodic basis, the Director SAF/SO will call together the Process Leads/Co-leads/Master Process Officers (MPOs) of the ten AF Key Processes to meet and discuss issues affecting the Enterprise Level Value Streams. When the assembled group of Process Leads meet, it will be known as the “Process Lead Team.” It will meet regularly via Teleconference and will occasionally have face-to-face conferences.

1.2.6 MAJCOMS / HQ AF

MAJCOM Commanders, DRUs, FOAs, and HQ AF organizations are the principal implementers of AFSO21. They may establish a companion governance structure to the Air Force level, using existing command responsibilities and lines of authority. Each MAJCOM, as well as HAF and SAF organizations, should appoint a lead for AFSO21 implementation. The AFSO21 team should remain small and flexible. Commanders also develop organic continuous process improvement capabilities and provide Level 1 training opportunities using the standard curriculum. Oversee Level II organic training.

1.2.7 Master Process Officers (MPOs)

MPOs manage the AFSO21 program for Process Owners and Commanders or Directorates at the HAF, SAF, and MAJCOM level. MPOs:

- Advise their leadership on AFSO21
- Promulgate results across the Air Force
- Ensure alignment among all related strategic goals, objectives and processes
- Set priorities
- Communicate with leadership and the workforce
- Select and oversee projects which align to the key processes
- Lead complex projects which align to the key processes
- Maintain overall alignment with other AF Key Processes and MAJCOMs
- Mentor and coach Level 1 and Level 2 Facilitators
- Maintain an Air Force-wide perspective
- Serve, as required, as member of the either the Process Lead Team or Virtual Team based upon current assignment

1.2.8 Virtual Team

On a periodic basis, the Director SAF/SO will call together a meeting of all the MAJCOM/HAF/SAF Master Process Officers who lead respective AFSO21 teams. This “virtual team” eliminates the need for a large centralized project office and is comprised of members from MAJCOM, HAF, SAF, and voluntarily includes some DRUs and FOAs. This group will be the primary forum for information and data flow regarding AFSO21 implementation. It will meet regularly via teleconference and occasionally have face-to-face conferences. Members will typically be the prime AFSO21 Action Officers for their organizations. There may be occasions when the “Virtual Team” and the “Process Lead Team” will meet together to provide coordination across the Total Air Force.

1.2.9 Commanders/Directors/Functional Chiefs

At the Wing (or equivalent) level, leadership:

- Champions AFSO21 efforts by creating and communicating their organization’s strategic view
- Provides financial and other required resources for AFSO21 efforts
- Manages local value stream which support the AF level processes

1.2.10 Facilitators (Level 1, Level 2, Level 3)

AFSO21 facilitators are primarily responsible for conducting training events and facilitating improvement events. Facilitators coordinate among the MPO and Project Leads to ensure improvement events are properly scoped, planned, and executed. Facilitators:

- Advise organizations on appropriate projects
- Work with project leads on project pre-work
- Facilitate projects
- Follow up on Action Plans

1.2.11 Event Team Leaders

Event Team Leaders are responsible for leading the team and, ultimately, the success of a given event (Value Stream Mapping Event, Rapid Improvement Event, or larger Improvement Initiative). Event Team Leaders coordinate team activities with the Facilitator before and during AFSO21 improvement events, are responsible for pre-event preparation and coordination among team participants prior to the project, advising appropriate leaders if there are any barriers to being prepared for the event, assuring adequate support through the event, and managing post-event follow-up activities. Many events can fail from lack of preparation or support from team members. Event Team Leaders should keep leadership apprised of upcoming events and the people and resources needed to accomplish the events.

1.2.12 Air University (AU/CC)

AU/CC will oversee the delivery of appropriate training curriculum.

1.2.13 Warfighting Integration and Chief Information Officer (SAF/XC)

SAF/XC will manage the AFSO21 related IT systems.

1.2.14 AFSO21 Office (SAF/SO)

The AFSO21 Office is responsible for implementation of Priority 3.6 of the AF Strategic Plan which is to “develop and institutionalize a comprehensive, Service-wide, strategic-level continuous process improvement approach.” The AFSO21 Office reports directly to the Secretary of the Air Force and Chief of Staff of the Air Force while supporting all Command’s and headquarters’ leaders.

SECTION TWO: WING GOVERNANCE AND SUPPORT

2.1 WING LEVEL AFSO21 GOVERNANCE AND SUPPORT

2.1.1 Wing Level AFSO21 Structure

Commanders need to have a supporting structure to initiate and institutionalize continuous process improvement to (1) ensure consistency in training and application of improvement efforts, (2) provide the requisite supporting structure to supervisors, process owners, and the workforce, and (3) provide required leadership governance over process improvements. The structure described below is for a typical Air Force Wing—local needs determine precise structure. Much of the effort and many of the roles identified below are within existing Senior Leader, Commander, and supervisor responsibilities. The preponderance of support is part-time; however, a small, full-time group of Process Managers is needed to facilitate aggressive, organized, and results-oriented AFSO21 implementation.

Executive Council

An **Executive Council** should be established with the Wing or Deputy Wing Commander as chair and the Group Commanders or their deputies on the Council as members. The purpose of the Council is to provide governance and leadership to AFSO21 efforts within the organization. Responsibilities of the Council include the following:

- Align organizational goals and objectives with Command and Air Force goals, objectives and key performance measures.
- Validate enterprise-wide processes and prioritize efforts.
- Align efforts through approval of teams and initiatives.
- Make decisions dealing with resource allocations such as manpower, facilities, and funding.
- Communicate policy: i.e. model, reporting, accountability, how to deal with barriers, repercussions.
- Ensure standardized deployment of AFSO21 efforts.
- Make decisions on redeployment of personnel, facilities, and equipment resulting from efforts.
- Ensure resources are available.
- Monitor and support teams by providing resources and barrier removal.
- Establish incentives to promote and reward continuous improvement.

Process Managers (PM)

Manager of AFSO21 reporting directly to the Commander at Wing, Group, and Squadron level.

- Operates as full time position.
- Directs and advises AFSO21 teams below their level.
- Ensures standard deployment. (i.e. Tools, certification, resources, reporting, etc.)
- Assist teams and work areas to eliminate waste, implement AFSO21 practices, and solve long buried problems at their root cause.
- Wing Level Only: Ensures strategic alignment of efforts; supports Commander in the development of organizational goals, sequencing process improvement efforts, creating reports, tracking improvements/savings and follow-up.

- **Wing Level Only:** Primary responsibility for assigning AFSO21 certified facilitators to improvement efforts. Monitors status of trained personnel in the unit and provides recommendations to the Commander for new candidates. to attend Level 1 and Level 2 training. Ensures workforce awareness training is periodically performed. Mentors Level 1 and Level 2 trainees to ensure maturation in CPI techniques, tactics and procedures.

Team Lead

Coordinates team activities with event Facilitator before and during AFSO21 improvement events, and has primary responsibility for pre-event preparation, coordination among team participants prior to the project, advising Commanders if there are any barriers to being prepared for the event, assuring adequate support through the event, and managing post-event follow-up activities. Many events can fail from lack of preparation or support from team members. Team leads should keep commanders apprised of upcoming events and the people and resources needed to accomplish the events.

Process Owner (Below AF Key Process Level)

An individual with the authority and responsibility for leading an organization or group. Often responsible for developing the organizational strategic plan, however, in smaller organizations, they may execute plans prepared at a higher level. Process Owner’s have the ability to directly affect all that happens within their sphere of influence, relative to the specific process, and will have varying amounts of influence with other process owners that provide them inputs or that receive their outputs. Distinctly different from Champions who have organizational authority over multiple process owners.

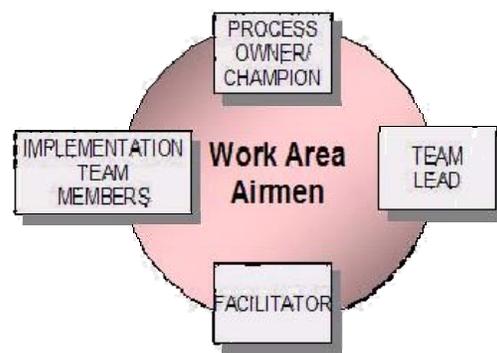
Responsibilities in the problem solving process:

- Eliminate barriers
- Ensure progress
- Reward team members
- Help sustain changes

Figure G1. Wing Roles



Figure G2. Event Roles



SECTION THREE: AFSO21 CONTACTS

3.1 AFSO21 CONTACTS

Internet

- ✓ Air Force Portal:
<https://www.my.af.mil/gcss-af/afp40/USAF/ep/globalTab.do?channelPageId=-946951&pageId=681743>
- ✓ AFSO21 Community of Practice:
<https://wwwd.my.af.mil/afknprod/ASPs/CoP/OpenCoP.asp?Filter=OO-TR-AF-43>

NOTE: Accessible with an Air Force Portal account only.

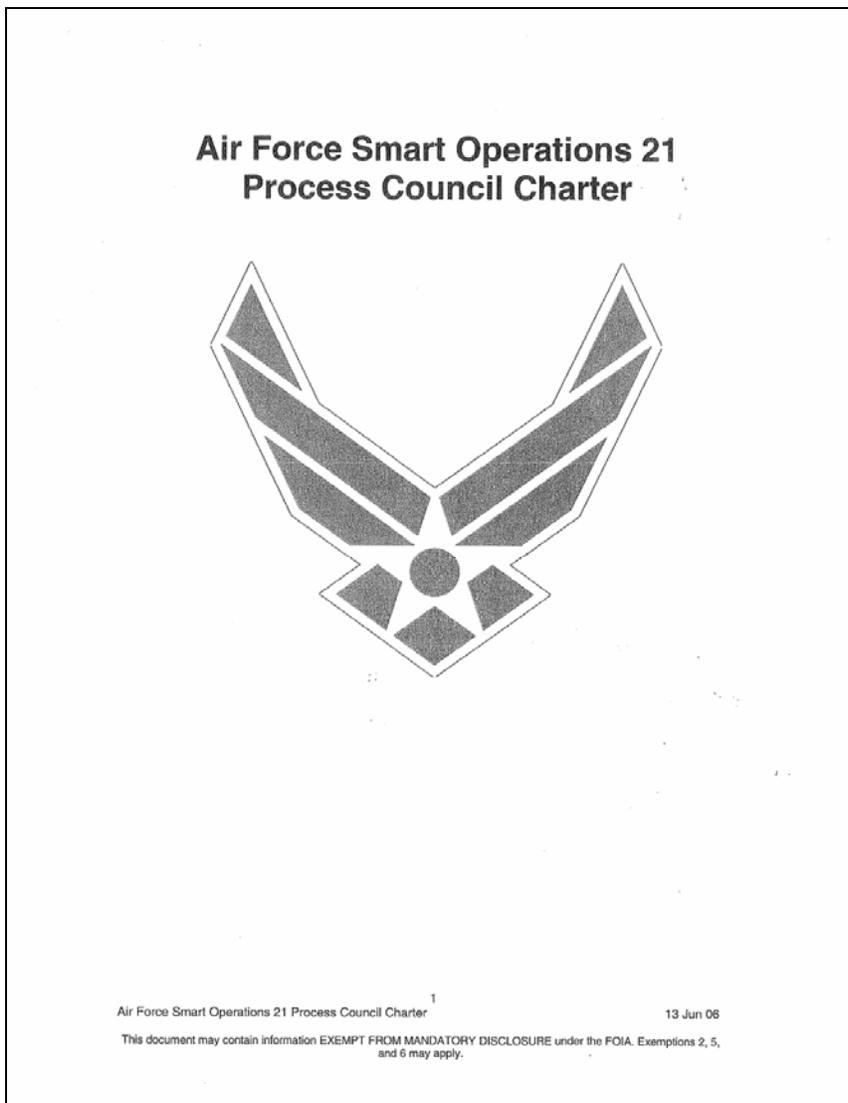
Organization / Email	Commercial	DSN
Air Force Smart Operations for the 21st Century (SAF/SO) safso21.workflow@pentagon.af.mil	703-588-2033	425-2033
Air Combat Command (ACC) acc.afso@langley.af.mil	757-225-7618	575-7618
Air Education and Training Command (AETC) afso21.workflow@randolph.af.mil	210-652-6063	487-6063
Air Force Materiel Command (AFMC) afmc.cvo.workflow@wpafb.af.mil	937-904-3121	674-3121
Air Force Reserve Command (AFRC) afrc.a9cvo@afrc.af.mil	478-327-2401	497-2401
Air Force Special Operations Command (AFSOC) afsoc.cvo@hurlburt.af.mil	850-884-1285	579-1285
Air Force Space Command (AFSPC) afspc.cvo.workflow@peterson.af.mil	719-359-1934	692-5809
Air Mobility Command (AMC) amc.cvo@scott.af.mil	618-229-2233	779-2233
Air National Guard (ANG) ang.afso21@ang.af.mil	301-836-7338	278-7338
Pacific Air Forces (PACAF) pacaf.cco@hickam.af.mil	808-449-0936	315-449-0936
United States Air Force Europe (USAFE) usafe.afso21@ramstein.af.mil	011-49-6371-471045	314-480-1045

SECTION FOUR: PROCESS COUNCIL CHARTER

4.1 AFSO21 PROCESS COUNCIL CHARTER – 13 JUN 2006



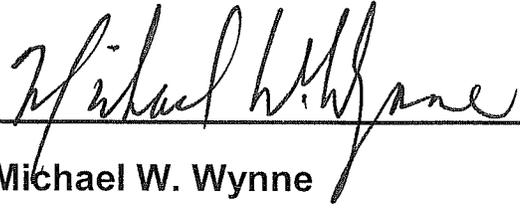
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Air Force Smart Operations 21 Process Council Charter



Approved:



Michael W. Wynne

Secretary of the Air Force

13 June 2006

Date

Air Force Smart Operations 21 Process Council Charter

Vision

The AFSO21 vision is to fundamentally change the culture of the Air Force so that *all Airmen* understand their individual role in improving their daily processes and eliminating things that don't add value to the mission.

The AFSO21 Process Council provides Air Force enterprise-wide leadership to accomplish the AFSO21 vision. For such a comprehensive effort to be successful, it has to be led by commanders at all levels -- from the front.

AFSO21 Process Council Purpose

The AFSO21 Process Council is the governance body of the AFSO21 initiative. The Secretary of the Air Force, Undersecretary of the Air Force, the Air Force Chief of Staff, and Vice Chief of Staff will provide oversight, and in conjunction with Corona, will serve as the board of directors guiding Air Force transformation.

The AFSO21 Process Council guides and integrates the transformation of governing, core and enabling processes to improve combat and combat support operations, to provide Joint commanders and Airmen the asymmetric advantages and capabilities the US Air Force delivers in air, space and cyberspace. In addition, the AFSO21 Process Council will ensure the culture, organizational structures, investments, and other resources are aligned to institutionalize continuous process improvement.

Background

When establishing AFSO21 in Nov 05, SECAF and CSAF described the primary objectives as:

- Providing a standard AF approach to continuously improve all processes that, when combined with our AF capabilities, deliver required effects
- Instilling a culture promoting eliminating waste, sharing best practices, reducing cycle times in delivery of effective combat capability across all products and services, and involving all Airmen in the relentless pursuit of excellence
- Ensuring that all Airmen understand their role, develop the ability to effect change, and continuously learn new ways to improve processes in order to save resources and eliminate waste

In accordance with best practices established in government and industry, the AFSO21 Process Council will take an enterprise view and will establish governing, core and enabling Air Force Process Owners.

- Governing – Processes that direct and focus other processes. Essential executive-level governance processes that are required to set corporate direction and strategy, allocate resources, and align the organization to achieve its long term goals.
- Core – A set of inter-related, cross-functional processes that combine to realize the mission of the enterprise.
- Enabling – Support processes that provide core processes with needed resources and capabilities.

AFSO21 Process Council Membership

The AFSO21 Process Council is chaired by the Air Force Vice Chief of Staff (AF/CV). In his absence, the A3/5 will chair the Process Council and provide day-to-day oversight and guidance.

The AFSO21 Process Council Chair will determine the governing, core, and enabling processes and will assign Air Force Process Owners. By virtue of process ownership, Air Force Process Owners will be members of the AFSO21 Process Council.

Members include:

- Assistant Secretary of the Air Force for Acquisition (SAF/AQ)
- Assistant Secretary of the Air Force for Financial Management and Comptroller (SAF/FM)
- Assistant Secretary of the Air Force for Manpower and Reserve Affairs (SAF/MR)
- Assistant Secretary of the Air Force for Installations and Environments (SAF/IE)
- Administrative Assistant to the Secretary of the Air Force (SAF/AA)
- Air Force Surgeon General (AF/SG)
- Office of the Secretary of the Air Force, Chief of Warfighting Integration and Chief Information Officer (SAF/XC)
- Deputy Chief of Staff for Personnel (AF/A1)
- Deputy Chief of Staff Air, Space and Information Operations, Plans and Requirements (AF/A3/5)
- Deputy Chief of Staff for Installations and Logistics (AF/A4/7)
- Deputy Chief of Staff for Strategic Plans and Programs (AF/A8)
- Vice Commander Air Combat Command (ACC)
- Vice Commander Air Education and Training Command (AETC)
- Vice Commander Air Force Materiel Command (AFMC)
- Vice Commander Air Force Space Command (AFSPC)

- Vice Commander Air Mobility Command (AMC)
- Vice Commander Pacific Air Forces (PACAF)
- Vice Commander Air Force Special Operations Command (AFSOC)
- Vice Commander United States Air Forces, Europe (USAFE)
- Deputy Director Air National Guard (ANG)
- Vice Commander Air Force Reserve Command (AFRC)

Air Force Process Owner Responsibilities

- Lead cross-MAJCOM, cross-functional processes improvement
- Develop process-based architecture
- Appoint the sub-process owners; ensure sub-process owners deliver AF-wide process improvements consistent with the SECAF and CSAF vision and direction
- Leverage the process-based portfolio management capability of the USAF; clearly link improvements to investments with a definitive set of metrics and measurements

AFSO21 Process Council Responsibilities

- Define an AF-wide continuous process improvement force development, performance metrics, and effectiveness capture strategy
- Establish priorities for AFSO21 projects and events and subordinate team charters
- Establish a process-based portfolio management capability that identifies waste, facilitates solutions, and recommends adjustments within the AF Corporate Structure
- Establish a process for registering, administering, and assessing process improvements to eliminate duplication
- Assist AF Process Owners to define a common set of standards and procedures for governing the process improvement environment, documenting and communicating process improvements, eliminating duplication
- Recommend savings to be redistributed to assist AF Process Owners to continuously improve AF governing, core and enabling processes
- Resolve issues between competing processes
Lead realignment of organizational structures, investments, and other resources within their commands to support the governing, core and enabling AF process improvement
- Establish subordinate teams as required to facilitate executing Council responsibilities. Activities may include strategic transformation assessment and planning, investment strategies, issue assessment and resolution recommendation.

AFSO21 Process Council Teams

Office of the A3SO:

- Responsible for AFSO21 Process Council Support
- Responsible for AF-wide training on process engineering
- Responsible for ensuring AF improvement targets are tracked, measured, and reported to SECAF, CSAF, and AFSO21 Process Council
- Continuously communicates AFSO21 messages, goals, and progress to the Air Force
- Provides guidance, toolsets, and standard methodologies to Air Force for achieving continuous process improvement (such as the AFSO21 Starter Kit)
- Provides Secretariat support for AFSO21 Process Council
- Manpower support for the AFSO21 office will be in accordance with SAF/AA guidance.

Funding

The Air Force Corporate Structure will provide funding for the Process Council and AFSO21 office through HAF funding channels. MAJCOMS will provide funding for their improvement programs and events.

Reporting

The AFSO21 Process Council Chair will provide the Secretary of the Air Force and AFSO21 Process Council members a semiannual report on AF-level process improvement and waste reduction. The Chair will also brief CORONA on progress and major decisions.

Effective Date

The charter is effective immediately upon approval of the Secretary of the Air Force. Annual charter reviews will be conducted on the anniversary date to ensure currency.

Reference Documents

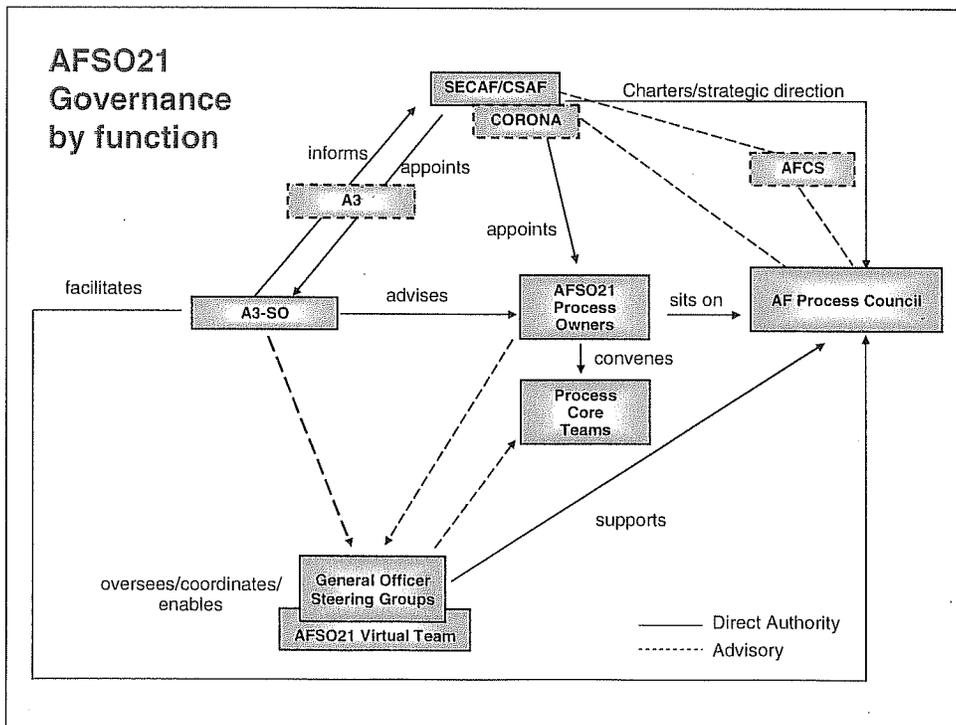
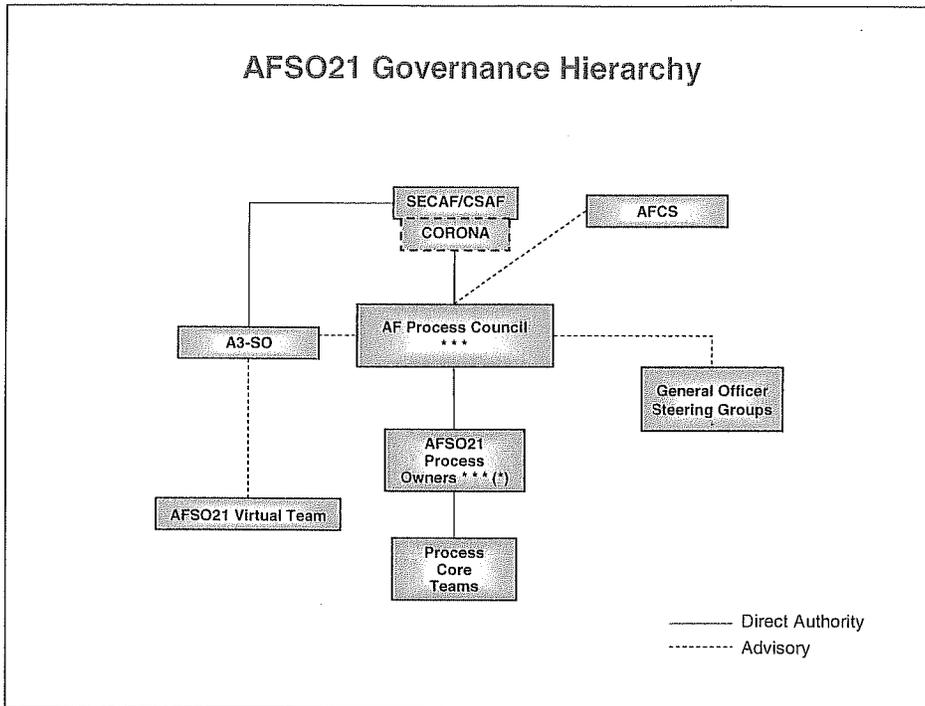
1. Secretary of the Air Force memorandum dated November 7, 2005, establishing the Lean Across the Air Force.

2. DoD Continuous Process Improvement Transformation Guidebook v1.0, March 2006

Attachments

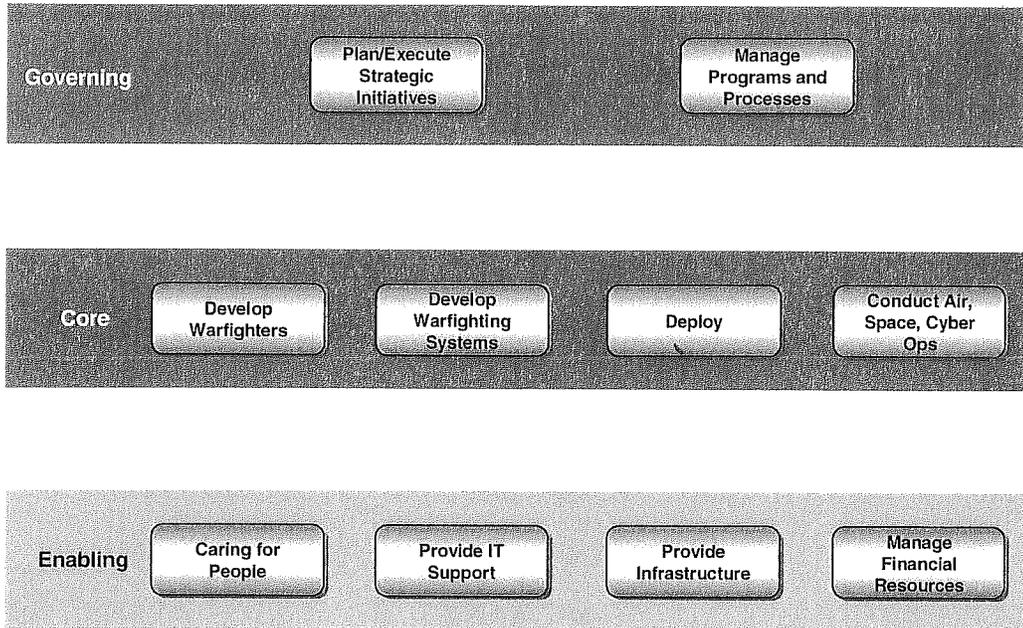
1. AFSO21 Governance
2. AF Key Processes

Attachment 1



Attachment 2

Air Force Key Processes



Integrity - Service - Excellence

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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME H: CPI METHODOLOGIES

May 2008



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SECTION ONE: LEAN

Lean is really a mindset — a way of viewing the world. Lean is about focus, smooth process flows, doing only those activities that add value (as the customer defines value) and removing waste (eliminating all other activities that don't add value). Lean can be simplified as: removing wastes (those activities and processes that don't add to a product's value). Value is defined by the customer.

Lean principles:

1. Specify what creates value from the customer's perspective
2. Identify all the steps along the process chain
3. Make all the processes “flow”
4. Produce only what is “pulled” by the customer
5. Strive for perfection by continually removing wastes

Many steps have been added over time to a process: internal accounting, supervisory controls, compensation for a poor worker, specific for an individual worker's personality, communication and record keeping. All of these added steps have been deemed significant and important over time by management or workers but in reality have nothing to do with the actual requirements of value identified by the customer. In many cases, if the customer actually knew about the added steps they would not agree to pay for those added steps, therefore they are really wastes in the process. In many cases, these “hidden steps” are hidden “costs” that organization's leadership has been unable or unwilling to recognize (cost of delay time, cost of rework, cost of additional labor, cost of storage).

Every aspect of an organization has the potential for huge amounts of waste. The correct application of Lean tools and techniques allow leaders to peel away layer after layer of waste. Like peeling an onion, even after taking away the biggest outer layers, there are always layers of waste underneath. Unfortunately, in many cases, there is strong resistance, organizational culture and beliefs that certain procedures and protocols are necessary, required for good order and discipline, for promotion and competitiveness, or quality of life. Lean is a mental approach, a journey of continuous improvement rather than a destination. There is no “end point”...only the endless journey of continuously eliminating waste.

In application, there are several standard “tools” used to apply Lean:

- Value Stream Mapping
- Six “S”
- Visual Workplace
- Do it
- Cellular design
- One piece Flow
- Tact Time
- Setup Reduction
- Lean Accounting

SECTION TWO: SIX SIGMA

Six Sigma is one of the strategies and tools which leading organizations have started used to reduce variation and defects thus reducing cost and increasing customer satisfaction. The intent of Six Sigma is to deliver high performance, reliability, and value to the end customer. The use of Six Sigma as a process improvement method means use of a disciplined approach to measuring the defects produced by a business process and then systematically determining how to remove them. The disciplined approach is a five step methodology: Define, Measure, Analyze, Improve, Control (DMAIC).



Sigma (σ) is a statistical term that means deviation from the mean. Six standard deviations or six sigma from the mean equates to 99.9997% of all data points in a normal distribution. This can be expressed as defects per million opportunities or DPMO. For example, a process that is 99.0% effective = $3.8\sigma = 10,000\text{DPMO}$. In more understandable terms this would equate to 20,000 lost pieces of mail per hour or 15 minutes of unsafe drinking water per day. Those same processes at 99.9997% = 6σ would mean seven lost pieces of mail per hour or one minute of unsafe drinking water every seven months.

The DMAIC methodology is explained below:

- *Define:* First define the improvement opportunity, develop an improvement project plan, define the process and evaluate the process. This can include conducting a Failure Modes and Effects Analysis (FMEA), and identifying critical parameters.
- *Measure:* Measure the existing process and identify the process capability requirement.
- *Analyze:* Process is analyzed to determine its capability. Data is analyzed to identify opportunities for improvement and to develop plans for improving the process. The steps in this phase include Root Cause Analysis, updating the FMEA, developing an improvement plan and determining the path forward.
- *Improve:* The plan that was developed in the Analyze phase is implemented. The results of the change are evaluated and conclusions are drawn as to its effectiveness. This can lead to documenting changes and updating new instructions and procedures.
- *Control:* Control plans are developed to ensure the process is institutionalized and are developed to ensure the new process continues to be measured and evaluated. This can include implementing process audit plans, data collection plans and plans of action for out of control conditions, if they occur.

The DMAIC methodology should be used when a product or process is in existence that is not meeting customer specification or is not performing adequately. DMAIC includes milestone reviews, certain deliverables, checkpoints, questions and concerns that require expert practitioners called Black Belts. The importance of the tollgate/milestone reviews ensures consistency of approach between various improvement engagements and strategic alignment.

The Six Sigma technique continually requires review to aim for development and delivery of near perfect products and services.

SECTION THREE: BUSINESS PROCESS REENGINEERING

Business Process Reengineering (BPR) is a comprehensive process requiring a change in the fundamental way business processes are performed. BPR identifies unnecessary activities and eliminates them and wherever possible it takes manual procedures and automates them. It requires a thorough understanding of the existing processes and with this knowledge allows for an analysis of each component of the process can be performed more effectively with a constant focus on customer satisfaction.

In general, there are seven principles of reengineering to streamline work processes and thereby achieve significant levels of improvement in quality, time and cost:

1. Organize around outcomes, not tasks
2. Identify all the processes in an organization and prioritize them in order of redesign urgency
3. Integrate information processing work into the real work that produces the information
4. Treat geographically dispersed resources as though they were centralized
5. Link parallel activities in the workflow instead of just integrating their results
6. Put the decision point where the work is performed, and build control into the process
7. Capture information once and at the source

BPR provides a clean slate perspective enabling the designers of business processes to disassociate themselves from today's process, and focus on a new process. In a manner of speaking, BPR practitioner projects himself into the future and asks: what should the process look like? What do my customers want it to look like? What do other employees want it to look like? How do best-in-class organizations do it? What might we be able to do with new technology?

BPR begins with defining the scope and objectives of the reengineering project, then going through a teaming process (with customers, employees, competitors and non-competitors, and with new technology). Given this knowledge base, a vision for the future is created and a new business processes designed. Given the definition of the "to be" state, a plan of action is created based on the gap between the current processes, technologies and structures, and the desired future state. It is then a matter of implementing the solution.

SECTION FOUR: THEORY OF CONSTRAINTS

The Theory of Constraints (TOC) is a process improvement technique focused on maximizing throughput by use of a “constraint-based” approach. TOC seeks first to identify the constraint preventing greater throughput, like a hose with a crimp. Every system will have one process step that is the *most* limiting and therefore degrading the system’s ability to achieve the organizational goal. This limiting process step is the constraint. The constraint must be identified and the system managed in relation to that constraint. Trying to improve any process step other than the constraint by definition will not result in any greater throughput from the process and will in all likelihood make things worse.

Constraints can be broadly classified into one of three categories: internal resource constraints, market constraints or policy constraints. In order to manage performance, constraints must be identified and treated specially.

TOC Implementation steps:

1. Identify the constraint
2. Decide how to exploit the constraint
3. Subordinate all other processes to above decision
4. Elevate the constraint
5. If, a new constraint emerges, return to Step 1. Don't let inertia become the constraint.
6. Change the system if required

According to TOC, there are four primary types of “systems.” They specify the general flow of materials through a system, and they provide some hints about where to look for typical problems. The four types can be combined in many ways in larger facilities. (Materials flow from bottom to top):

- **I:** Material in “I” systems flow in a sequence, such as in an assembly line. The primary work is done in a straight sequence of events. The constraint is the slowest operation.
- **A:** The general flow of material is many to one, such as in a plant where many sub-assemblies converge for a final assembly. The primary problem in “A” systems are in synchronizing the converging processes so that each supplies the final process point at the right time.
- **V:** The general flow of material is one to many, such as a plant that takes one raw material and can make many final products. Classic examples are meat rendering plants or steel plants. The primary problem in “V” systems is "stealing" where one operation (X) at a diverging point "steals" materials from the other (Y). Once it has processed through X, it cannot come back and run through Y without significant rework.
- **T:** The general flow is that of an “I” (or multiple lines), which then split into many assemblies. Most manufactured parts are used in multiple assemblies and nearly all assemblies use multiple parts. Customized devices, such as computers, are good examples. “T” systems suffer from both synchronization problems of “A” systems (parts aren't all available for an assembly) and the stealing problems of “V” systems (one assembly steals parts that could have been used in another).



SECTION FIVE: BUSINESS CASE ANALYSIS

Business Case Analysis (BCA) is a systematic examination of alternatives resulting in a recommendation based on the “corporate” good. BCA is a tool used to manage process improvement activities from inception through implementation while documenting functional, economic and technical alternatives. Essential ingredients include functional process descriptions, technical architecture descriptions, cost projections, action plans, measures of performance and risk assessments for each alternative under consideration. The main goal is to help management decide in a rational way, the true business value of a potential process improvement and reengineering and whether or not to proceed. It both quantifies the improvements and guides the subsequent work. Recommendations are 1) tailored to individual circumstances, 2) consider process resources, risks and benefits and 3) emphasize financial aspects.

Each process improvement initiative uses as its reference for measurement, the status quo as a baseline. Baseline cost and performance provide threshold values for the cost and performance of alternatives. AS-IS costs and performance measurements revised to reflect any approved changes not yet implemented would provide this baseline. The business case should include at least three alternatives, including the status quo. Each alternative must give functional management a complete view of financial and operational impacts of proposed changes.

A typical BCA deliverable is outlined below:

Business Case Section		Content description
1	Executive Summary	Summarizes the opportunity, recommendation and business impact
2	Introduction and background	Sets the scene by tracing the key events leading up to the business case and builds credibility by summarizing due diligence performed
3	Opportunity or problem definition	Describes the opportunity to be seized or problem to be solved in business terms, either linked to business objectives or pain points
4	Recommended solution & alternatives	Recommends a specific solution and gives rationale for its selection from the alternatives considered
5	Benefit estimates and assumptions	Presents assumptions, quantifies sources and types of expected benefits, how they will be measured & who is responsible for them
6	Cost estimates and assumptions	Quantifies expected costs and the assumptions upon which they are based, usually with scenarios for the range of costs
7	Risk factors and mitigation	Quantifies the major risks that could impact project success and provides mitigation strategies for each
8	Financial analysis	Presents the organizations standard financial measures, e.g., ROI, NPV, IRR, used to evaluate other capital investments
9	Implementation approach/ timeline	Provides estimated timing of tasks/phases so financial analyses based on the timing of expenditures and benefits can be completed
10	Appendices	Presents detailed supporting data, such as financial models

SECTION SIX: CHANGE MANAGEMENT

Change management is a structured approach to change in individuals, teams, organizations and societies that enables the transition from a current state to a desired future state. Organizational change management includes processes and tools for managing the people side of change.

Change management involves aligning an agency's organizational culture with new ways of doing business. An organization's culture can be a difficult thing to get a handle on. Defined as "the underlying assumptions, beliefs, values, attitudes and expectations shared by the members of an organization," organizational culture is comprised of the current human and political dynamics, as well as the organization's history. Getting people to see past their own fears—real or perceived—is a challenge of particular relevance to managers and requires a unique kind of leader—sometimes called a change manager or change "agent."

A change agent is a person who has the *clout*, the *conviction*, and the *charisma* to make things happen and to keep people engaged. Change agents employ a number of skills—they must:

- Understand, but not participate in, an organization's politics
- Be able to "deconstruct" an organization or process and put it back together in original, innovative ways
- Be keen analyzers who can clearly and persuasively defend their analyses to the organization
- Speak many organizational languages—marketing, finance, systems management
- Understand the financial impacts of change, whether brought on by radical overhaul or incremental continuous improvements

In essence, they must bring order out of chaos.

Change Agents face several common barriers:

- *Cultural resistance.* Parochialism and cultural resistance to change can play a critical role in hindering financial management reform efforts. Many current operating practices have a long, entrenched bureaucratic history that has developed piecemeal over time in order to accommodate the needs of different organizations and special interests. The more deeply rooted these systems and attitudes are, the more difficult comprehensive change will be.
- *Unclear goals and performance measures.* Many agency managers lack clear, hierarchically linked roadmaps that offer straightforward illustrations of how their work contributes to attaining strategic goals. This situation can be complicated by poorly integrated accounting, information, and reporting systems.
- *Lack of incentives for change.* For many agencies, performance is measured by the amount of money spent, people employed, or tasks completed. Increased attention should be given to rewarding behaviors that meet strategic, results-based goals.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME I: FINANCIAL REPORTING TEMPLATE

May 2008

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SECTION ONE: OVERVIEW

The Air Force Smart Operations for the 21st Century (AFSO21) vision is to establish an environment where various tools and techniques are employed to successfully change our day-to-day operating style, and to fully integrate continuous improvement into the full spectrum of Air Force operations. The focus of process improvement must be results-oriented versus activity-oriented, and the effects delivered defined in measurable operational results. Measures of success include resources saved, cycle time efficiencies and effectiveness improvements.

The most thorough method of assessing all the impacts of a proposed change is to examine the initiative using the format of a Business Case Analysis (BCA). Although a full-scale BCA is not required for every AFSO21 event, the BCA approach will stimulate thinking, foster creative solutions, evaluate the solutions and help prepare a more convincing argument for change. This approach does not replace the judgment of a decision maker, but rather provides information to aid that judgment. It considers all the expected effects of an action, not just the financial ones, across the entire organization and also assesses the likelihood that those effects will occur as anticipated (i.e., risk issues).

The final AFSO21 Validation Package will consist of two documents – the Financial Reporting Template and the Decision Summary Report. This user's guide provides instructions for completing the Financial Reporting Template. Instructions for completing the Decision Summary Report are available in the AFSO21 Decision Summary Report guidance.

Comprehensive BCA tools, guides and templates (including the AFSO21 Decision Summary Report guidance, the Financial Reporting Template, and this user's guide) are available on the FM Center of Expertise (CoE) website at <https://www.saffm.hq.af.mil/coe>.

1.1 PURPOSE

A key part of a process redesign and evaluation is documenting costs and projecting potential benefits, whether in terms of mission effectiveness (e.g., readiness measures), performance efficiencies (e.g. cycle time reductions), financial improvements (e.g., Total Ownership Cost (TOC) reductions), manpower savings, or other relevant and important outcomes. The Financial Reporting Template is the standard Air Force tool for tracking and reporting AFSO21 financial metrics in a uniform manner. This user's guide and accompanying Microsoft® Excel© Financial Reporting Template will help process improvement initiators define the financial costs of the current baseline (Current State) and evaluate the costs of the alternative future state (Future State) solutions.

If the process improvement produces results or benefits that can't be quantified in dollar impacts, such as improved customer service or satisfaction, improved internal and external communications, improved accuracy, or improved morale, the appropriate place to describe them is in the AFSO21 Decision Summary Report as part of the Benefits Analysis.

1.2 ROLES AND RESPONSIBILITIES

The following list describes the roles and responsibilities of individuals and organizations:

1.2.1 *Project Point of Contact (POC)*

- Researches and collects financial data for the Current State and Future State costs
- Completes the Financial Reporting Template, with assistance from the appropriate AFSO Office, and local Financial Management Office

- If more than one Future State alternative is considered, uses the Financial Reporting Template's metrics to recommend the best alternative
- Prepares the AFSO21 Decision Summary Report documenting results of the analysis and justification for selecting the Future State alternative

1.2.2 Installation or MAJCOM Financial Management Office

- Assists the POC in identifying types of data and sources needed for Current State and Future State costs
- Assists the POC in completing the Financial Reporting Template
- Assists with the compilation of the Decision Summary Report to support the selection of an alternative course of action

1.2.3 Secretary of the Air Force Financial Management Center of Expertise (FM CoE)

- For initiatives at the installation and MAJCOM level, the FM CoE has been chartered to support local FMs with these and similar studies
- Assists the FM POC in completing the Financial Reporting Template
- Reviews the completed AFSO21 Validation Package

1.2.4 Secretary of the Air Force Financial Management Cost (SAF/FMCE)

- Provides policy and guidance for the Financial Reporting Template and Decision Summary Report
- For initiatives conducted at the Air Staff level, SAF/FMCE will provide additional analytical assistance as needed
- Validates costs and benefits reported in the AFSO21 Validation Package according to thresholds (\$5M in any one year and/or \$15M across the FYDP)
- Maintains AFSO21 database from all initiatives for reporting purposes

1.2.5 Secretary of the Air Force's Smart Operations Office (SAF/SO)

- Responsible for ensuring Air Force improvement targets are tracked, measured, and reported to SECAF, CSAF, and AFSO21 Process Council
- Provides guidance, toolsets, and standard methodologies to Air Force for achieving continuous process improvement
- Responsible for day-to-day management and monitoring of AFSO21 activities

1.3 METHODOLOGY

The Financial Reporting Template is an Excel© workbook with a series of inter-related worksheets, also referred to as tabs throughout this guide. The template is designed to be a user-friendly, simplistic tool for analyzing costs of AFSO21 initiatives. Volume I, acts to guide the user through a series of questions in a business case approach to support the selection of an alternative course of action. It is structured to help think about as many costs and benefits of a change initiative as possible. However, due to the variance in types of AFSO21 initiatives, unique local conditions, and variance in type and nature of savings, the Financial Reporting Template does not explicitly cover all potential benefits and costs.

Benefits may fall into one or more categories (i.e. manpower, equipment, supplies, etc.). They may be monetary or non-monetary, tangible or intangible, or a combination of all four. If investment costs exceed

monetary benefits, then other benefits (safe and reliable operations, improved quality, or customer satisfaction for example) must be clearly defined to describe why the initiative is worth the additional cost to the Air Force.

The Air Force appreciates all AFSO21 initiatives that provide valuable improvements and produce significant returns against key Air Force problems, and/or produce results in one or more of the “5 Desired Effects.”

The “5 Desired Effects” are to:

1. Increase productivity of our most valued asset – Airmen
2. Enhance operational availability of high value assets
3. Accelerate response times and agility
4. Sustain flight and workspace safety
5. Increase energy efficiency *

* There is a Template tab to capture cost data associated with energy efficiency, as it is fairly easy to quantify units and price per unit. All the desired effects are rated with a category of improvement on the Project Information tab (see section 3.0). All process improvements producing results in one or more of the five Desired Effects should be described in the results of the AFSO21 Decision Summary Report.

The Financial Reporting Template will be the tool for documenting the monetary results. It is a series of interconnected worksheets designed to collect Current State and Future State data by cost category, appropriation, and fiscal year as a minimum. The summary tabs recap the information in a format suitable for presentation to installation, MAJCOM or Air Staff leadership.

The remainder of this document provides instructions for completing the Template. Direct any questions or requests for assistance in completing the Financial Reporting Template to the Air Force Financial Management Center of Expertise (FM CoE) at DSN 926-7162 or commercial (303) 676-7162.

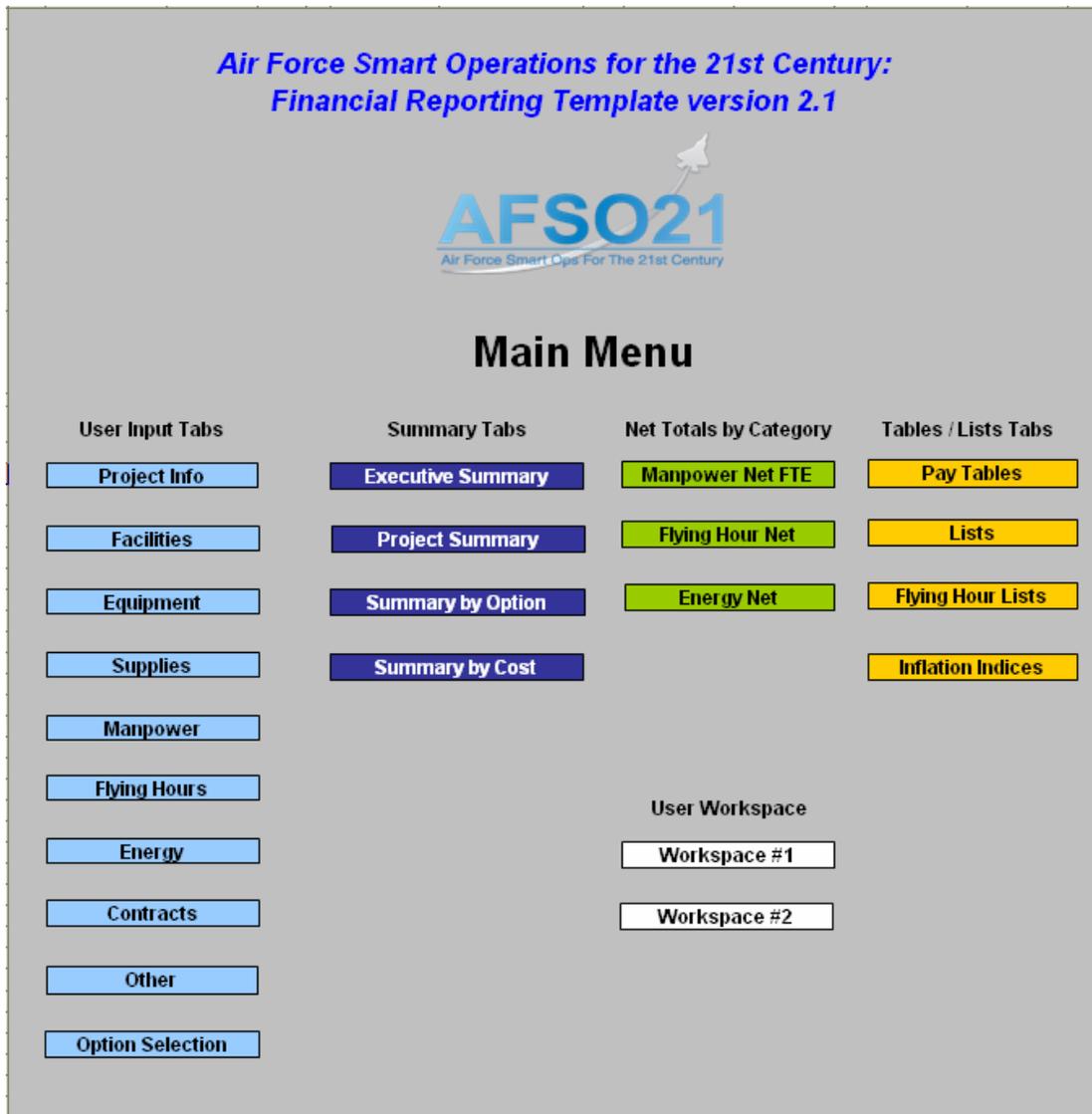
SECTION TWO: GENERAL DESCRIPTION OF THE WORKSHEET TABS

There are several types of worksheet tabs contained in the Template. The tab title buttons are color coded to group similar tabs together:

- *Light Blue*: Require user input
- *Dark Blue*: Summarize costs and inputs in the workbook
- *Green*: Contain non-dollar related information
- *Yellow*: Contain data tables the Template uses for calculations
- *White*: Blank worksheets available for user calculations

The figure below depicts the grouped tabs and their associated colors.

Figure I1. Main Menu Screen



Within the worksheet tabs, individual cells are color coded in the same manner. Cells requiring the user to type an entry appear in blue. Some blue cells contain formulas to make the data input process easier. When values are directly input into a cell with a formula, the formula is overwritten. Other cells within the tabs are shaded grey. Grey cells are shaded either because they are not used, or they have formulas to auto-calculate values based on input cells. Grey cells are locked to protect the formulas within them.¹ Additionally, as many of the sheets are linked to other sheets and interdependent, deleting any cell or row could affect formulas and summaries on other tabs. Some cells are encoded to be grey initially; however, they turn blue if user input becomes necessary as the Template is completed.

The figure below shows part of the Project Info screen with examples of the blue (user input) and grey (locked) cells identified.

Figure I2. Example of Blue and Grey Cells

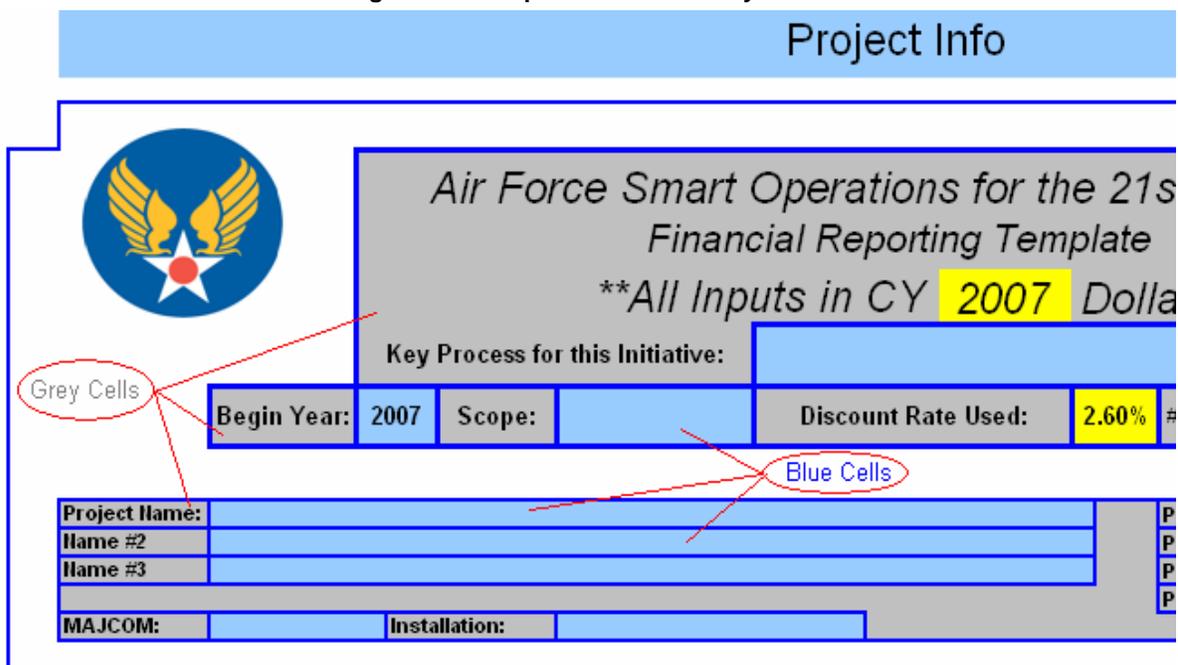


Figure I3. Floating Toolbar

There is a floating toolbar on each worksheet that shortcuts to the Main Menu tab. It remains visible anytime the Template is open and is the primary means to navigate the Template. The floating toolbar is depicted in the following picture.



If the floating toolbar is accidentally closed, it can be retrieved by: View > Toolbars > AFSO21

The following sections provide instructions for completing each cost category data input tab. The sections, identified by the name of the tab, are divided into three parts.

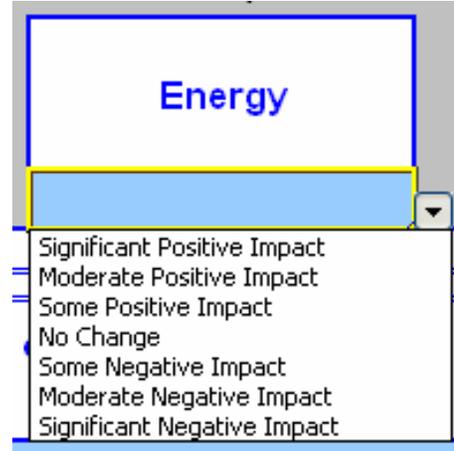
- *Introduction* - a brief purpose statement for the tab
- *Design* - describes how to enter information in the tab

¹ If there is a need to overwrite a formula in a grey, locked cell, please contact the CoE.

- *Considerations* - poses questions and thoughts to help the user complete a more thorough analysis, and guides the user to the appropriate location in the tab to enter the answers.

The cost category data input tabs contain a mix of blank cells for hard keying values, and drop-down menus to select from a list of possible choices. The drop-down menu will appear any time the user selects a cell that has an underlying menu. The picture below shows an example of a drop-down menu when the cell is selected.

Figure I4. Example Drop Down Menu



To remove data that was input incorrectly, highlight the blue text cells, right click and select “clear contents” or use the delete function.

Additional rows cannot be added to the worksheet. If more than 20 line items are need...select rows X and Y, right click, unhide to access an additional 40 lines. If more rows are still needs contact the COE.

All input tabs require users to enter information specific to the type of cost in addition to two standard inputs: appropriation and cost/benefit category.

2.1 APPROPRIATION

For each line in the Template, select the correct appropriation from a drop-down menu of Air Force appropriations. If the initiative impacts an appropriation not listed, select “Other” and explain in the Comments column. The Comments column and Appropriation drop-down option are displayed in the following figure.

Figure I5. Example of Comment and Appn Input Cells

Comments (optional)	N/A	Appn.
		0350 - NGREA
		3010 - Aircraft Procurement
		3020 - Missile Procurement
		3080 - Other Procurement
		3300 - MILCON
		3400 - O&M
		3500 - MILPERS AD
		3600 - RDT&E

2.2 COST/BENEFIT CATEGORIES

For each line of entry in each of the Future State sections that creates a net savings or a net cost, the cell in the Cost/Benefit Category column will turn blue signaling that a user input is necessary. Select one of the following cost categories from the drop-down menu: Cost Avoidance, Cost Savings, Sustainment/Recurring, Investment, Indirect Costs, or Residual/Salvage Value. Note that only the categories appropriate for that tab will appear (i.e. Residual/Salvage Value will not appear on the Manpower tab.) When the line of entry reflects no change from the Current State section, this cell will

remain grey and no user entry is required. A brief description of each category is provided to help make a selection. The drop-down option is shown in the picture below.

Cost Avoidance is a benefit from actions that remove the need for an increase in manpower or costs which would be necessary if present management practices continued. These include such things as price increases, replacement of aging or obsolete equipment, overtime pay due to increased workload resulting from poorly functioning processes or equipment, etc. Cost avoidance savings must meet at least one of the following conditions:

- Measurable, quantifiable savings from actions that remove a previously documented funding need for increase in manpower or O&M costs
- Elimination of necessary costs if present management practice continues
- Attains a required higher level of readiness or increased value (quality or timeliness) of output without increasing staffing or cost
- Absorbs a growing workload without increasing staffing or cost

Cost Savings relates directly to a budget line or an historical expenditure rate that will change because of the new process or activity. Cost savings must meet at least one of the following conditions:

- Measurable, quantifiable savings that can be precisely identified and placed under management control at the time the savings occur
- Costs for manpower authorizations or funded work year reductions
- Reduced or removed operating cost (such as utilities, travel, and repair) and reduced or removed parts and contracts
- Reflected in specific reductions in the approved program or budget after obtaining them

For example, the initiative proposes to stop issuing DoD installation vehicle stickers. The cost savings is the Air Force no longer has to produce or purchase the stickers. In addition, this initiative would result in a non-monetary benefit as vehicles would no longer be readily identifiable, thus making them a less likely target for terrorist activity.

Sustainment/Recurring costs are those associated with providing required resources to maintain and prolong operations until successful mission accomplishment or over the subject’s extended service life.

Investment is those program costs required to introduce into operational use a new capability; to procure initial or additional equipment, or to provide for major modifications of an existing capability. For example, if the initiative is to automate transactional personnel processes and provide kiosks in common areas (i.e. BX, commissary, clinic, or flight line) for individuals to complete transactions themselves, an investment cost would be the funding required to purchase and install the kiosks as well as any one-time costs for a contractor to train personnel on their use.

Indirect Costs are an investment in resources that have already been purchased but which could be utilized for other purposes. While the consumption of these resources is needed to provide a complete picture of the initiative under consideration, they do not result in the actual expenditure of additional funds nor do they directly result in an increase to actual Air Force (or other government) expenditures. An example of such an investment is the diversion of existing manpower to implement the suggested program. This could be in the form of a one-time expenditure of manpower to design, modify or construct

Figure I6. Cost/Benefit Category Drop-down Input



existing assets or facilities (i.e. self help labor to re-model a facility) or the cost of training existing personnel on new procedures (taking time away from other tasks). This type of indirect manpower investment cost could come from internal assets such as training employees on new procedures or from external assets such as requiring customers to learn new procedures. However, such indirect costs are not strictly limited to manpower. For example, the diversion of an existing piece of equipment from its normal use to work on implementing an initiative would be an indirect use of supplies (gas, parts, or other items consumed while the equipment is used). If the use of this piece of equipment represents a significant percentage of its operating life, then a proportion of its procurement value should also be charged as an indirect investment in the initiative, even if the asset was already purchased for another use.

Residual/Salvage - If the Future State scenario(s) involve investments in assets (buildings, vehicles etc.), those assets may have economic value at the end of the analysis. This value should be considered in the analysis, and is done so by selecting the Residual/Salvage Value cost/benefit category. Residual value is the expected value of an asset at any point in time before the end of its economic life for assets whose economic life extends beyond the scope of analysis. Salvage value is the expected value of an asset at the end of its useful life. **The residual or salvage value is the opposite of a cost but, like all user inputs in this template, it should be entered as a positive value. The Template will automatically make all necessary sign adjustments.** The economic life of assets can frequently be found in functional area directives for planning, programming and budgeting for resources. For example, Air Force A-76 guidance provides estimates of economic lives for selected assets. **Please note that in this template, residual/salvage can only be claimed on assets that have corresponding investment costs (in the Template).**

2.3 GENERAL DATA INPUT

Each input tab has a summary section at the top of the tab. As the user completes the Current State and Future State sections, the dollar results by fiscal year will automatically be pulled into the summary section. A red note to the right of the Total column in the summary section indicates the net cost of the Future State alternative exceeds the net cost of the Current State alternative. The following picture shows the summary section with red notes.

Figure 17. Summary Section with Red Notes

Scenario Options in CY07*	2007	2008	2009	2010	2011	2012	2013	TOTAL
Current State	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Future State #1	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Future State #2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Future State #3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

*These totals, from the row below this tab, are linked to the "Roll-Up" tab and are used in the financial metrics calculations for each "To-Be" option.

**** NOTE: The "To-Be" total for this option is not less than the "As-Is" total ****

**** NOTE: The "To-Be" total for this option is not less than the "As-Is" total ****

**** NOTE: The "To-Be" total for this option is not less than the "As-Is" total ****

When populating the Template, complete the Current State sections first. The descriptive information entered in the Current State section will be automatically copied into the Future State section. This is to ease some of the data input requirements.

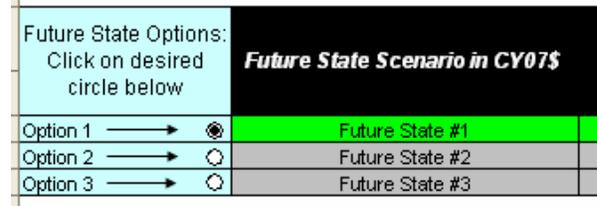
For each tab, at the minimum, the user must enter data into the Current State section (available space for up to 20 items) and Future State #1 (columns D-G will be pre-filled based on Current State data for all common cost elements in most tabs). Up to an additional two (2) alternatives can be entered for a total of three (3) Future State alternatives. This total is adjusted on the Project Information tab. If the improvement presents more than three Future State alternatives, contact the CoE for assistance in adding space for more alternatives.

After all the Future State alternatives are completed and thoroughly analyzed, the user must click on the Option Selection tab and select one alternative by clicking on the button to the left of the Future State scenarios. The selected alternative will be used to calculate the key financial metrics (i.e. Return on

Investment, Net Present Value, and Payback Year) displayed on the Executive Summary tab. The following figure shows the radio buttons to select from the Future State scenarios.

As the Template is populated with cost data, it is important to remember that the initiative under consideration may impact another organization, and those impacts must also be captured in the analysis. For example, if an initiative proposes the base fitness facility remain open 24 hours a day, 7 days a week to improve unit fitness and morale, any impact on the fitness facility to include the cost associated with longer operating hours must be considered.

Figure I8. Screenshot of Option Toggle



All Current State and Future State costs should be entered as base-year dollars, using the current fiscal year as the base year. The Template will automatically convert the base-year dollars to then-year dollars using USAF weighted inflation indices. The inflation indices account for the rise in general levels of prices from year to year. The Template will apply the inflation factors, so no user input is required. However, the SAF/FMCE annual inflation indices can be found on the SAF/FMC page of the Air Force Portal for informational purposes. The inflation indices can also be found in the “Inflation Indices” tab and will be updated by SAF/FMC each year.

SECTION THREE: PROJECT INFORMATION TAB

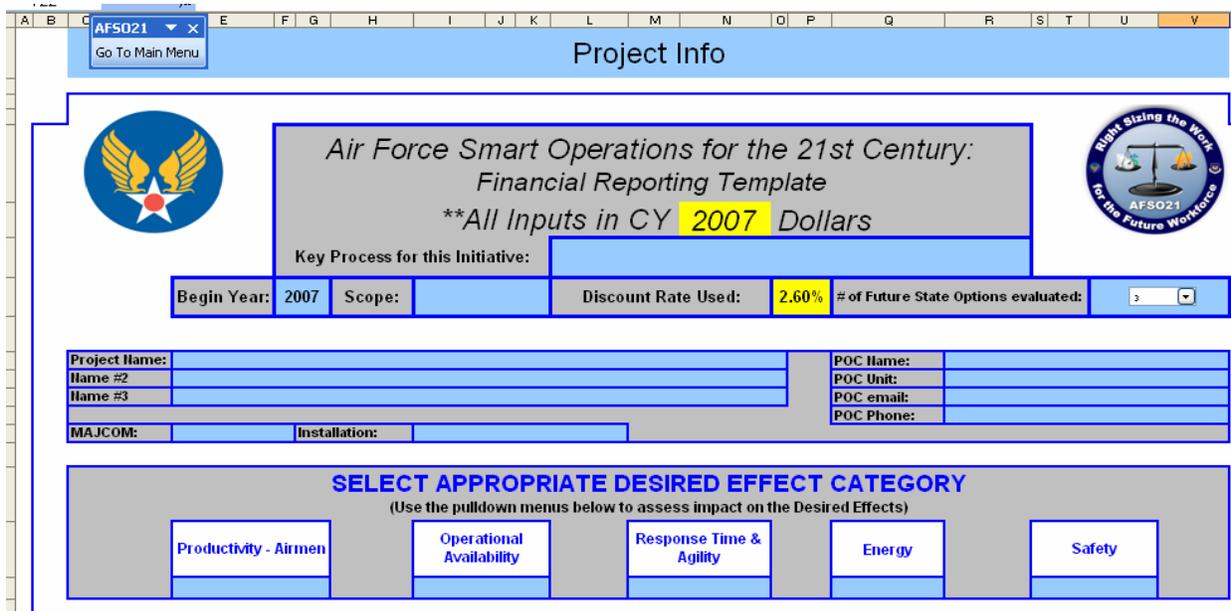
3.1 INTRODUCTION

The Project Information tab collects general information about the process improvement and provides definitions for the cost categories used to document financial metrics.

3.2 DESIGN

The first section of the Project Information tab identifies the project and point of contact (POC) information (shown in the figure below). The bullets that follow describe how this section is to be completed.

Figure I9. Project Info Tab, Top



Project Info

*Air Force Smart Operations for the 21st Century:
Financial Reporting Template*
**All Inputs in CY 2007 Dollars

Key Process for this Initiative: _____

Begin Year: 2007 Scope: _____ Discount Rate Used: 2.60% # of Future State Options evaluated: 3

Project Name:	_____	POC Name:	_____
Name #2:	_____	POC Unit:	_____
Name #3:	_____	POC email:	_____
MAJCOM:	_____	POC Phone:	_____
Installation:	_____		

SELECT APPROPRIATE DESIRED EFFECT CATEGORY
(Use the pulldown menus below to assess impact on the Desired Effects)

Productivity - Airmen

Operational Availability

Response Time & Agility

Energy

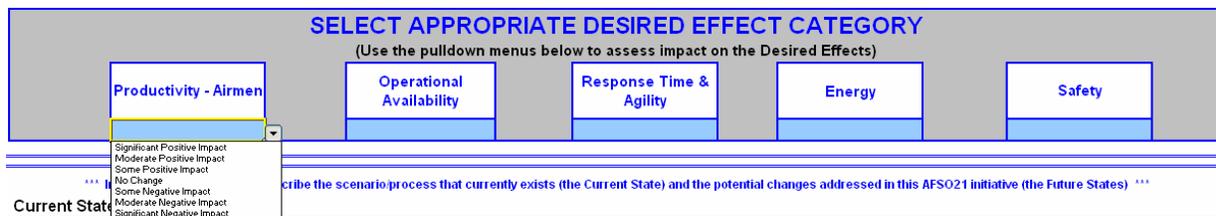
Safety

- *Key Process* - Select the Key Process being studied from the drop-down menu. Air Force processes may be characterized into three types:
 - *Governing* – Processes that direct and focus other processes. Essential processes required to set corporate direction and strategy, allocate resources, and align the Air Force to achieve its long-term goals
 - 1) Plan/Execute Strategic Initiatives; 2) Manage Programs and Processes;
 - *Core* – Inter-related, cross-functional processes that combine to realize the mission of the Air Force
 - 3) Develop Warfighters; 4) Develop & Sustain Warfighting Systems; 5) Deployment and Distribution Chain; 6) Conduct Air, Space, Cyber Operations;
 - *Enabling* – Support processes that provide core processes with needed resources and capabilities
 - 7) Caring for People; 8) Provide IT Support; 9) Provide Infrastructure; 10) Managing Financial Resources.

- *Begin Year* - Select the beginning fiscal year of the initiative from the drop-down menu. This **MUST BE DONE** to get accurate results. The fiscal years displayed in the remaining tabs will be automatically populated and will start with the year entered in this cell.
- *Scope* - select the option from the drop-down list that best describes the applicability of the initiative: Air Force, MAJCOM, Installation, or Unit.
- *Discount Rate* - The real discount rate is provided.
- Select the number of *Future State* options considered from the drop-down menu. The Template will automatically adjust the number of Future State options displayed in the remaining tabs based on the selection.
- *Project Title* - Enter the title of the project. This feature will enable future use by key word search.
- Complete the *POC Installation, Name, Phone Number, Email and Unit*. Select MAJCOM from the drop-down menu.
- If the installation or MAJCOM assigns AFSO21 project identifiers, enter the information in the Project ID block, otherwise enter N/A.

The second section (shown below) indicates how the Air Force Desired Effects are affected by the initiative. For each of the Desired Effects select from the drop-down menu the term that best describes the expected results the initiative will produce: Significant Positive Impact, Moderate Positive Impact, Some Positive Impact, No Change, Some Negative Impact, Moderate Negative Impact, Significant Negative Impact. If there are multiple Future State options, delay completing this section until the analysis is complete and the selected option is chosen. **This section should apply to the selected option only.**

Figure I10. Air Force Desired Effect on Project Info Tab



The final section of the Project Information tab (shown below) provides space for a short description of the alternatives considered. The bullets following the screenshot below describe how this section is to be completed.

Figure I11. Project Info Tab, Bottom

*** In the space below, please describe the scenario/process that currently exists (the Current State) and the potential changes addressed in this AFSO21 initiative (the Future States) ***

Current State

Future State #1

Future State #2

- Briefly describe the current process in the Current State block, and the process improvement alternative(s) in the Future State block(s).
 - The text entered in these blocks will be automatically copied into the Current State and Future State blocks in the other tabs as appropriate.
 - The description of the Current State of operations establishes the foundation against which the proposed alternatives can be evaluated. The Current State can also be described as the status quo.
 - Provide a brief root cause of the problem that the alternative will focus on (i.e., training, equipment, personnel, etc.)
 - The alternative solutions should briefly describe how the new process will work and the expected benefits (i.e., increase production from 4 to 6 widgets a day).

If the descriptions require more space than provided, increase row height to make the text box larger. If the improvement presents more than three Future State alternatives, contact the CoE for assistance in adding space for more alternatives.

SECTION FOUR: FACILITIES TAB

4.1 INTRODUCTION

The Facilities tab is structured to calculate costs associated with a change to a facility's use based on user inputs. The user is required to enter data only into the light blue cells.

4.2 DESIGN

The Current State section should contain all facilities that are affected by the statement resident at the top of the Current State input section. This statement is carried over from the Project Information tab. Each affected facility or item should receive its own row to calculate costs (one and only one facility or item per row).

Moving from left to right within the Facilities tab, the first few columns accumulate information about the specific types of facilities affected. This information aids in determining the appropriate cost per square foot to enter in Column I and provides the detail necessary for the projected savings to be validated. The figure below shows the input cells for the Current State section which are described in the bullets that follow. The Future State section inputs are similar except for the Required Action and Cost/Benefit Category inputs found only in the Future State input section.

Figure I12. Current State Input Section for Facilities Tab

Current State															0	
Ref. #	Unit/Installation	Facility Name	Facility Type	Gov't Lease	N/A	Cost per Sq Ft	2007	2008	2009	2010	2011	2012	2013	Comments (optional)	N/A	Appn.
F1																
F2																
F3																
F4																
F5																
F6																
F7																
F8																
F9																
F10																
F11																
F12																
F13																
F14																
F15																
F16																
F17																
F18																
F19																
F20																

- *Unit/Installation* - Enter the unit and installation names (ex. 50 MSS/Schriever AFB)
- *Facility Name* - Enter the facility name (ex. Building 1470)
- *Facility Type* - Enter the type of facility (admin, medical, operations, maintenance, multi-use, housing, etc)
 - *Gov't/Lease* - From the drop-down menu, select Gov't or Lease to indicate whether the government owns the facility or leases it.
- *\$ per Sq Ft* - Enter the cost per square foot of the facility in CY dollars for the current fiscal year. The Template will convert to Then-Year dollars as necessary. **If this is a leased facility, please note that the lease costs per square foot may be in then-year dollars and should be converted back to CY if this is the case.**
- *20XX Sq Ft* - In each FY column enter the total square footage of the facility or portion of the facility affected in the alternative
- *Comments* - Enter additional information to help explain the nature of this line item.
- *Appn.* - From the drop-down menu select the appropriation that covers the facility: MILCON (3300), O&M (3400), etc.

The inputs described up to this point are the basis of the calculations in the Annual Totals section on the right side of the sheet. No further input is necessary for the Current State.

Once the Current State data has been entered, move on to Future State #1. In this section, the user is to enter all corresponding data for the first change alternative. The descriptor data is automatically carried over from the Current State. If a carried over facility or item will have the same usage, ensure that the same price and quantity is entered as in the Current State. If a carried over facility will no longer be used the 20XX Sq Ft values should be zero (0). If the initiative adds a facility or item, record the data on a new row.

Figure I13. Future State Input Section for Facilities Tab

Future State #1																
Ref. #	Unit/Installation	Facility Name	Facility Type	Govt / Lease	Required Action	CY07\$ per Sq Ft	2007 Sq Ft	2008 Sq Ft	2009 Sq Ft	2010 Sq Ft	2011 Sq Ft	2012 Sq Ft	2013 Sq Ft	Comments (optional)	Cost/Benefit Category	App.
F1																
F2																
F3																
F4																
F5																
F6																
F7																
F8																
F9																
F10																
F11																
F12																
F13																
F14																
F15																
F16																
F17																
F18																
F19																
F20																

For Required Action use the drop-down menu to select the action required by the initiative (shown in the figure below). The bullets that follow describe each Required Action option.

Figure I14. Required Action Drop-down List in Future State Section of Facilities Tab

Future State #1							
Ref. #	Unit/Installation	Facility Name	Facility Type	Govt / Lease	Required Action	CY07\$ per Sq Ft	2007 Sq Ft
F1							
F2							
F3							
F4							
F5							
F6							
F7							
F8							

- *Construction* - Project costs to include architecture and engineering services, construction design, real property acquisition costs, and land acquisition costs necessary to complete the construction project.
- *Demolition* - Disposal of excess and/or obsolete facilities.
- *Modernization* - Alteration of facilities solely to implement new or higher standards (including regulatory changes), to accommodate new functions, or to renew building components that typically last more than 50 years (such as foundations and structural members).
- *Restoration* - Repair and replacement work to restore facilities damaged by inadequate sustainment, excessive age, disaster, accident, or other causes.
- *Sustainment* - Maintenance and repair activities necessary to keep a typical inventory of facilities in good working order over an extended service life (ex. > 50-years). It includes regularly scheduled adjustments and inspections including maintenance inspections (fire sprinkler heads, HVAC systems) and regulatory inspections (elevators, bridges), preventive maintenance tasks, emergency response and service calls for minor repairs, and major repairs for replacement of

facility components that are expected to occur periodically throughout the facility service life. This also is the category to choose for an existing leased facility.

- *Free Up Space* - Vacate some or all of a facility and make it available for some other use.
- *Other* - Action not covered in the other sections. Provide additional context in the Comments column.

For any facility that records a change from the Current State or is an added facility in the Future State, the associated cell in Column R, Cost/Benefit Category, will turn blue to signal that an input is required.

- *Cost/Benefit Category* - From the drop-down menu (shown below) select the cost classification. These categories describe the nature of the change in cost from the Current State to the Future State, and allow the Template to collect and summarize costs by category. These categories include: Cost Avoidance, Cost Savings, Sustainment/Recurring, Investment, Indirect Costs, and Residual/Salvage.

Figure I15. Cost/Benefit Category Drop-down

2013 Sq Ft	Comments (optional)	Cost Benefit Category
		<div style="border: 1px solid black; padding: 2px;"> Cost Avoidance Cost Savings Sustainment/Recurring Investment Indirect Costs Residual / Salvage </div>

If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.



If the preferred alternative saves facilities and/or dollars for one unit or organization, but causes an increase in another unit or organization, be sure to capture the impacts to both units in each Future State section. For example, if the initiative proposes converting an aircraft maintenance hangar into a fitness facility, how does that impact the maintenance unit currently using the hangar? Is the construction of a new facility needed?

Repeat these steps for any additional Future State alternatives to be analyzed.

4.3 CONSIDERATIONS

A considerable amount of facilities information can be acquired from the Automated Civil Engineering System (ACES) found on the SAF-MIL (A) 7115, Air Force Real Property Detail Report. An additional excellent source of information is the DoD Facilities Pricing Guide, UFC 3-701-06. This document can be found at http://www.acq.osd.mil/ie/irm/irm_library/UFC%203-701-06%20signed.pdf.

Consider the potential cost or benefit areas listed below when completing the tab. **Use a separate row for each type of cost and use the Comments column to further explain the entry.**

- If the alternative proposes building a new facility, enter the type of facility, square footage, and cost per square foot. Possible entries in the Comments column could be “Design Costs” or “Environmental Clean Up”.
- If the entire facility is eliminated, are there demolition, environmental clean-up, lease termination, or furniture/equipment disposition costs?
- If the new building, portion of a building, or renovation will be government owned, factor in design costs.
- Will the alternative require construction of a new facility?

- Have all costs associated with construction in the local area been considered?
- If the new building, portion of a building, or renovation will be leased, include any costs associated with lease (ex. grounds maintenance, repairs, etc.)
- Will the Facility change result in an impact on:
 - *Equipment?* - i.e. disposal of equipment from a building slated for renovation or demolition (*If yes, complete the Equipment tab*)
 - *Supplies?* - disposal of supplies from a building slated for renovation or demolition OR decrease storage space for inventory (*If yes, complete Supplies tab*)
 - *Flying Hours?* - i.e. does the facility affect the availability of flying hours? (*If yes, complete the Flying Hours tab*)
 - *Energy?* - i.e. reduce/eliminate electrical costs (*If yes, complete the Energy tab*)
 - *Existing/New contracts?* - i.e. new facility allows movement of contractors to government site vice contractor site (*If yes, complete the Contracts tab*)

SECTION FIVE: EQUIPMENT TAB

5.1 INTRODUCTION

The Equipment tab is designed to collect information on all nonexpendable items and assets impacting the alternative solution. Although there may not be any direct impact on the specific piece of equipment, there may be impacts on the operation of the equipment. It is therefore recommended to review this tab to ensure all potential equipment cost areas have been addressed.

5.2 DESIGN

The Equipment tab is designed to take into account the impacts in terms of investment in new equipment, the disposition of old equipment, and the cost impacts of maintaining and operating both.

The Current State section should contain all equipment items that are affected by the Current State statement resident at the top of the Current State data input section. This statement is carried over from the Project Information tab. The Current State scenario allows the user to input the dollar amounts directly tied to the current use of the equipment. This involves both the normal operating cost of the equipment and the eventual replacement cost of the equipment as it ages. It is the user's responsibility to determine these costs. Each affected equipment item should receive its own row to calculate costs (one and only one equipment item per row). As information is entered across the sheet, provide descriptor data, cost data, projection data, and appropriation data concerning the Current State (how things are now prior to any changes). This user input is the basis of the calculations in the Annual Totals section on the right side of the sheet.

Moving from left to right, the first few columns accumulate information about the specific types of equipment affected. The average unit cost and quantity consumed by FY are then entered in the corresponding columns. The Current State input section is pictured in two parts below followed by bullets describing the inputs.

Figure I16. Equipment Tab Current State Inputs, Left

Current State		0								
Ref. #	Type of Cost	Description	N/A	N/A	N/A	CY07\$ Unit Price	2007 Qty	2008 Qty	2009 Qty	2010 Qty
E1										
E2										
E3										
E4										
E5										
E6										
E7										
E8										
E9										
E10										
E11										
E12										
E13										
E14										
E15										
E16										
E17										
E18										
E19										
E20										

- *Cost/Benefit Category* - From the drop-down menu (shown below) select the cost classification: Cost Avoidance, Cost Savings, Sustainment/Recurring, Investment, Indirect Costs, or Residual/Salvage.

Figure I18. Cost/Benefit Category Drop-down

Cost/Benefit Category	Appropriation
Cost Avoidance	
Cost Savings	
Sustainment/Recurring	
Investment	
Indirect Costs	
Residual / Salvage	



If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.

The worksheet allows input quantities to change on a year-by-year basis. This will create a profile of the total costs and the cash flow needed to maintain the equipment in its current state. **Use a separate row for each type of cost and use the Comments column to further explain the entry.**

Repeat these steps for any additional Future State alternatives to be analyzed.

The Template allows separate maintenance inputs for both the Current State and Future State sections. Ideally, the investment cost in the new equipment will be partially offset by savings in the operating costs. This does not preclude equipment from being more expensive to operate if the cost savings of the overall project justify the additional expense in the equipment area.

5.3 CONSIDERATIONS

As the Equipment tab is completed, consider several areas as cost data is being collected. The following questions cover most areas, but the particular project may raise other questions/costs to be included as well.

Reduced or eliminated equipment:

- What equipment will be reduced or eliminated?
- How much of the equipment will be reduced?
- Where is the equipment being reduced located?
- Will this reduction result in a consolidation of assets? How will the remaining equipment be allocated among organizations? Will this result in a decrease in facility space required (*If yes, complete the Facilities tab*)
- If equipment is consolidated and shared by more than one organization, where will it be housed, who will be responsible for the equipment, and how will other users access it? What are the costs involved in sharing the asset?
- Will there be a change in transportation costs associated with using the equipment (*If yes, adjust the unit cost or record transportation costs in the Other tab*)?
- Will there be changes in the utilization of each particular piece of equipment?
 - What will be the additional cost of maintaining the equipment or using it more?
 - How will the change impact the life of the equipment?
 - How will the additional costs of using and maintaining the remaining equipment be spread out over the course of its life-cycle?

- If equipment is being eliminated altogether, what are the disposal costs involved? Will there be an effect to supply inventory levels (for example the removal of several printers may mean less paper is required) (*If yes, complete the Supplies tab*)
- Is the function of the equipment going away completely, or is it being accomplished with another piece of equipment, or accomplished in another manner? What are the additional costs to continue the function without this equipment?
- What is the phase-out plan and schedule for the old equipment? What are the costs on a year-by-year basis?
- Is there any hazardous material or environmental concerns in disposing of the old equipment? What is the cost and schedule for doing this?
- Will there be a change in energy costs (i.e. electric or fuel usage)? (*If yes, complete the Energy tab*)
- What other costs are involved?

New equipment:

- What is the recurring and non-recurring cost of the new equipment? Is the equipment a new build, or is it COTS? Does the new equipment require development and production costs to procure it? What is the required delivery date of the equipment?
- What is the function of the equipment? Is there software required? Will the equipment require or take advantage of software updates?
- What is the maintenance concept of the new equipment?
- What are the operating costs of the new equipment? These can be looked at in terms of man-hours (*enter this information in the Manpower tab*), energy consumption (*enter this information in the Energy tab*), supplies (*Supplies tab*), etc.?
- What is the phase-in schedule of the new equipment?
- What training costs will be tied to the new equipment (*enter this information in the Other tab*)?
- What is the cost of support equipment needed to support the new equipment?
- What is the service life of the new equipment? How often will it need to be replaced? What are the disposable costs of the new equipment at the end of its service life?
- What is the storage and space allocation requirement of the equipment? What are the costs involved?
- Will there be a warranty tied to the new equipment? If so, what is its cost? Are maintenance costs after the warranty expires included in the analysis?
- Will the equipment be leased or purchased?
- What is the requirement and cost for spares (both individual parts and total system)?
- Does the new equipment automate a previously manual task, or does it allow a person to work more efficiently? (*If yes, complete the Manpower tab*)
- What other costs are involved?

SECTION SIX: SUPPLIES TAB

6.1 INTRODUCTION

The Supplies tab is designed to collect information on the expendable material and items used in the equipment, maintenance and support of military operations.

6.2 DESIGN

The Supplies tab is designed to account for impacts in terms of a reduction, increase, or replacement of supply requirements or inventory.

The Current State section should contain all supply items that are affected by the statement resident at the top of the Current State data input section. This statement is carried over from the Project Information tab. Each affected supply item should receive its own row to calculate costs (one and only one supply item per row). As information is entered across the sheet provide descriptor data, cost data, projection data, and appropriation data concerning the Current State (how things are now prior to any changes).

Moving from left to right, the first few columns accumulate information about the specific supply item affected, and the FY columns use the previous columns' inputs to calculate the costs. The Current State input section is pictured in two parts below. The inputs are described in the following bullets.

Figure I19. Supplies Tab Current State Input Section, Left

Current State ⁰							
Ref. #	Item Description	Part #	N/A	CY07\$ Unit Price	2007 Qty	2008 Qty	2009 Qty
S1							
S2							
S3							
S4							
S5							
S6							
S7							
S8							
S9							
S10							
S11							
S12							
S13							
S14							
S15							
S16							
S17							
S18							
S19							
S20							



If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.

Repeat these steps for any additional Future State alternatives to be analyzed.

6.3 CONSIDERATIONS

While the user inputs for the Supplies tab are straightforward, consider the following questions when completing the Future State alternatives. **Use a separate row for each type of cost and use the Comments column to further explain the entry:**

- If the Future State alternative changes the supply requirement in more than one organization, capture the impact to all affected organizations.
- If the supply requirement increases, is it a one-time or recurring requirement?
- Do alternative supply sources exist which provide better price or quality items?
- Is there a cost to store the supplies? Is there a transportation cost to receive the supplies? *If so, enter these impacts in the Other tab.*
- Are there manpower costs or savings associated with the alternative? Examples are awarding and monitoring contracts, placing and receiving delivery orders. *Enter these impacts in the Manpower tab.*
- Will the increase or decrease in supplies in inventory affect facility space requirements? *If yes, complete the Facilities tab.*

SECTION SEVEN: MANPOWER TAB

7.1 INTRODUCTION

The Manpower tab is designed to capture baseline labor costs and labor impacts (decreases or increases) associated with the alternatives. All impacts should be included, regardless of the unit affected or magnitude of the impact (full or partial positions).

7.2 DESIGN

The Manpower tab is structured to calculate costs based on user inputs. Document the manpower currently required to perform the process in the Current State section. Estimate the total manpower required for each alternative in the Future State section. The Template will compare the Current State and Future State to calculate the cost or savings. If the initiative saves manpower authorizations, include a copy of the Unit Manpower Document highlighting these positions as an attachment to the Decision Summary Report.

The Current State section should contain all manpower positions that are affected by the statement resident at the top of the Current State input section. This statement is carried over from the Project Information tab. Each position should receive its own row to calculate costs (one and only one position per row). As information is entered across the sheet provide descriptor data, cost data, work-year data, and appropriation data concerning the Current State (how things are now prior to any changes). The screenshots below show the manpower input section that is described in the following bullets.

Figure I22. Manpower Tab Current State Input Section, Left

Current State		0								
Ref. #	Unit	Position	Annual Rate CY07\$	Hours or FTEs?	2007	2008	2009	2010	2011	
					Hrs or FTEs					
M1										
M2										
M3										
M4										
M5										
M6										
M7										
M8										
M9										
M10										
M11										
M12										
M13										
M14										
M15										
M16										
M17										
M18										
M19										
M20										

- *Appn.* - Select the appropriation from the drop-down menu: O&M (3400), etc.

The user input up to this point is the basis of the calculations in the Annual Totals section on the right side of the sheet. No further input is necessary for the Current State.

Once the Current State data has been entered, move on to Future State #1. In this section, the user is to enter all corresponding data for the first change alternative. The descriptor data is automatically carried over from the Current State. For carried over positions, ensure that the same mode, FTE or Hours, is selected. If a carried over position will no longer be used the 20XX FTE values should be zero (0). In the hours mode, if the number of hours used by the new process is different from the Current State, record the new hours used. When adding a position, record the data on a new row.

For any position that records a change from the Current State or is a new position in the Future State, the associated cell in column T, Cost/Benefit Category, will turn blue to signal that an input is required.

- *Cost/Benefit Category* - From the drop-down menu (Future State only) select the cost classification from the drop-down menu: Cost Avoidance, Cost Savings, Sustainment/Recurring, Investment, and Indirect Costs. This drop-down option is pictured below.

Figure I24. Cost/Benefit Category Drop-down

Comments (optional)	Cost/Benefit Category	Appropriation
	▼	
	Cost Avoidance	
	Cost Savings	
	Sustainment/Recurring	
	Investment	
	Indirect Costs	



If a particular line item is not changed from the Current State, the associated cell in Column T will remain gray and no input in that cell is required.

If the preferred alternative eliminates positions and/or dollars for one unit or organization, but causes an increase in another unit or organization, be sure to capture the impacts to both units in each Future State section. For example, if the initiative proposes moving a billet from one organization to another organization, capture the loss and gain of the billet in each organization.

Repeat these steps for any additional Future State alternatives to be analyzed.

7.3 CONSIDERATIONS

- Does the alternative cause a workload increase in another unit? If so, capture the manpower impacts to each affected unit in the Future State section. For example, if proposing to eliminate all contract custodial support and have individual units perform facilities housekeeping, estimate the amount of time that will take.
- Does the alternative eliminate documented overtime or backlog? Overtime costs and overtime savings should be recorded in the Other tab. Overtime rates are not programmed in the Template, so overtime must be grouped into sets of like positions and rates (i.e. equal pay grades or equal rates per FTE or hour). Each equivalent overtime set should have its own row and should be adequately described in the Item Description column. Enter the rate per unit in the Unit Price column, and then phase the units of overtime needed for each year in the annual quantity columns.
- Does the alternative eliminate the requirement for a manpower increase in the future?
- Does the alternative save manpower by consolidating work from two or more different work centers? If so, capture the manpower impact to each work center in the Current State and Future



State sections. For example, if proposing to create an installation typing pool and eliminate all administrative positions, capture the manpower savings to each unit losing administrative workload.

SECTION EIGHT: FLYING HOURS TAB

8.1 INTRODUCTION

The Flying Hours tab is designed to collect baseline data and alternative approaches to the number of flying hours and/or cost per flying hour for specific Mission Design Series (MDS) by MAJCOM.

8.2 DESIGN

The Current State section should contain all MDSs that are affected by the Current State description carried over from the Project Information tab. Each affected MAJCOM/MDS should receive its own row to calculate costs (one and only one MAJCOM/MDS per row). If a single MDS comes from more than one MAJCOM, individual lines will be required for each as the cost per flying hour (CPFH) factors vary between MAJCOMs. The user inputs in the blue cells are the basis of the calculations in the Annual Totals section on the right side of the sheet.

Moving from left to right, the first few columns accumulate information about the specific MAJCOM and types of aircraft affected, and the FY columns use the previous columns' inputs to calculate the costs. The inputs section is split into the two pictures below followed by bullets describing the inputs.

Figure I25. Flying Hours Tab Current State Input Section, Left

Current State		0							
Ref. #	MAJCOM	MDS	Commodity	CPFH CY07\$	2007 Hours	2008 Hours	2009 Hours	2010 Hours	2011 Hours
F1			Reparables						
			Consumables						
			Av Fuel						
F2			Reparables						
			Consumables						
			Av Fuel						
F3			Reparables						
			Consumables						
			Av Fuel						
F4			Reparables						
			Consumables						
			Av Fuel						
F5			Reparables						
			Consumables						
			Av Fuel						
F6			Reparables						
			Consumables						
			Av Fuel						
F7			Reparables						
			Consumables						
			Av Fuel						
F8			Reparables						
			Consumables						
			Av Fuel						
F9			Reparables						
			Consumables						
			Av Fuel						
F10			Reparables						
			Consumables						
			Av Fuel						
Totals:					0.00	0.00	0.00	0.00	0.00

dollars for one unit or organization, but causes an increase in another unit or organization, be sure to capture the impacts to both units in each Future State section.

Filling in the Future State scenarios is very similar to filling in the Current State scenario, with the following exceptions.

- If an initiative changes a CPFH factor (through efficiencies etc.) rather than the number of hours flown, use the table to the right of the Future State tables to enter an adjusted CPFH. If an adjusted factor is entered, it will be automatically used instead of the established CPFH factor to calculate annual costs. To revert back to the established CPFH, simply delete the adjusted factor from the corresponding cell. The figure below shows the input screen for adjusting the CPFH factors.

Figure I27. Cost Per Flying Hour Factor Adjustment Tool

Use this table if initiative is going to change the cost per flying hour of any of the three commodities. Enter a factor for each year. If a cell is left blank, the default CPFH factor (from table to left) will automatically be used.

Future State #2			Adjusted CPFH Factors						
MAJCOM	MDS	Commodity	2007	2008	2009	2010	2011	2012	2013
		Reparables							
		Consumables							
		Av Fuel							
		Reparables							
		Consumables							
		Av Fuel							
		Reparables							
		Consumables							
		Av Fuel							
		Reparables							
		Consumables							
		Av Fuel							
		Reparables							
		Consumables							
		Av Fuel							
		Reparables							
		Consumables							
		Av Fuel							

- In situations where the costs of the Current State differs from the Future State, the Cost/Benefit category cell turns blue. A Cost/Benefit category must be selected when this happens. This does not categorize the line itself, rather the difference between the Current State and Future State for that line. For instance, if the difference was as a result of reduced flying hours, it might be categorized as Cost Savings. The input cells for this data are displayed below.

- Do not change flying hours and the CPFH factor on a single line item. It will take two different types of actions to accomplish this phenomenon, and would need to be addressed as two different Future State options, or two different AFSO initiatives.

Figure I28. Cost/Benefit Category Drop-down

Comments (optional)	Cost/Benefit Category	Appropriation
	<input type="text" value="Cost/Benefit Category"/> <ul style="list-style-type: none"> Cost Avoidance Cost Savings Sustainment/Recurring Investment Indirect Costs 	

Repeat these steps for any additional Future State alternatives to be analyzed.

8.3 CONSIDERATIONS

In most cases, changes to a flying hour program are the result, or the product of, another action. As changes to flying hours are computed, keep in mind that these changes may be a result of a new process being implemented. If this is the case, make sure the new process is fully documented in the appropriate tab(s). For example, changing a training syllabus that requires students to spend more time in a simulator than actually flying could mean extra simulators are required (*Equipment tab*), extra simulator instructors are needed (*Manpower tab*), etc.. The resulting flying hour savings would then be documented here.

- If the Future State alternative changes the flying hour requirement in more than one organization, capture the impact to all affected organizations.
- If the initiative requires additional flying hours, is it a one-time or recurring requirement?
- Consider using the Fuel Initiatives Saving Calculator (FISC) as a resource. It is a tool used to estimate fuel savings in gallons from energy initiatives. It has programmed flying hours and sorties plus burn rates.

SECTION NINE: ENERGY TAB

9.1 INTRODUCTION

The Energy tab is designed to collect baseline information on energy consumption required by the Current State of operations, and changes in type, quantity, or price proposed in the alternatives.

9.2 DESIGN

The Current State section should contain all energy items that are affected by the statement resident at the top of the Current State input section. This statement is carried over from the Project Information tab. Each affected energy item should receive its own row to calculate costs (one and only one energy item per row). As the tab is populated provide descriptor data, cost data, consumption data, and appropriation data concerning the Current State (how things are now prior to any changes). This user input is the basis of the calculations in the Annual Totals section on the right side of the sheet. The following two figures show the Current State input section.

Figure I29. Energy Tab Current State Input Section, Left

Current State								
Ref. #	Item Description	Type	Unit of Measure	N/A	Unit Price CY07\$	2007 Qty	2008 Qty	2009 Qty
E1								
E2								
E3								
E4								
E5								
E6								
E7								
E8								
E9								
E10								
E11								
E12								
E13								
E14								
E15								
E16								
E17								
E18								
E19								
E20								

Figure I31. Cost/Benefit Category Drop-down

Comments (optional)	Cost/Benefit Category	Appropriation
	<input type="text" value=""/> <ul style="list-style-type: none"> Cost Avoidance Cost Savings Sustainment/Recurring Investment Indirect Costs 	



If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.

Repeat these steps for any additional Future State alternatives to be analyzed.

9.3 CONSIDERATIONS

In many cases, changes in energy are the result, or the product, of another action. Keep in mind that these changes may be a result of the process being implemented. If this is the case, make sure the revised process is fully documented in the appropriate tab(s). For example, changing vehicle purchases to include more fuel efficient vehicles should be documented in the Equipment tab. Reducing the frequency in bus routes or delivery times may mean fewer drivers are needed (Manpower tab). The resulting energy savings would then be documented here in the Energy tab.

- If the Future State alternative changes the energy requirement in more than one organization, capture the impact to all affected organizations
- Does the initiative propose converting from one energy source to another (for example, converting from coal to electricity)? If so, enter the current energy source (coal) in the Current State section. This information will be automatically copied into the Future State section. Enter zeroes in the quantities columns. Add the proposed energy source (electricity) to the Future State section and fill in the required data.
- If the initiative proposes a way to use less energy, but the type of energy does not change, simply adjust the quantities in the Future State section.

SECTION TEN: CONTRACTS TAB

10.1 INTRODUCTION

The Contracts tab is designed to collect data associated with contract costs that are not included in the previous input tabs. Examples include janitorial service, waste disposal, or contract termination fees. Contract labor should be accounted for in the Manpower tab.

10.2 DESIGN

The Contracts tab is a relatively simple tab to complete, with just three required inputs. The Current State section should contain all contract items that are affected by the statement resident at the top of the Current State input section. This statement is carried over from the Project Information tab. Each affected contract item should receive its own row to calculate costs (one and only one contract item per row). As information is entered across the sheet, provide descriptor data, cost data, quantity data, and appropriation data concerning the Current State (how things are now prior to any changes). This user input is the basis of the calculations in the Annual Totals section on the right side of the sheet. The following two figures show the input cells for the Current State data.

Figure I32. Contracts Tab Current State Input Section, Left

Current State		0							
Ref. #	Item Description	N/A	N/A	N/A	Qty.	Annual Contract Cost in I			
						2007	2008	2009	2010
C1									
C2									
C3									
C4									
C5									
C6									
C7									
C8									
C9									
C10									
C11									
C12									
C13									
C14									
C15									
C16									
C17									
C18									
C19									
C20									

Figure I34. Cost/Benefit Category Drop-down

Comments (optional)	Cost / Benefit Category	Appropriation
	<div style="border: 1px solid black; padding: 2px;"> Cost Avoidance Cost Savings Sustainment/Recurring Investment Indirect Costs Residual / Salvage </div>	



If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.

Repeat these steps for any additional Future State alternatives to be analyzed.

10.3 CONSIDERATIONS

- Try to be as specific as possible in the space provided. This will help properly document the initiative and also aid in the validation process.
- Are there other indirect costs or benefits associated with the contract? If there are, ensure these are documented in the appropriate tab(s). For instance, is there an indirect manpower cost or savings associated with the alternative? Examples are replacing personnel with a contract service (i.e. contracting lawn care service currently done by CE personnel). Enter these impacts in the Manpower tab.
- If the Future State alternative changes the contract requirements in more than one organization, capture the impact to all affected organizations.

SECTION ELEVEN: OTHER TAB

11.1 INTRODUCTION

The Other tab is designed to collect costs associated with the initiative not fitting in any of the previous input tabs. Examples of costs recorded in this tab are travel, tuition, mail/postage, overtime, lost discounts, and interest penalties.

11.2 DESIGN

The Other tab is a relatively simple tab to complete, with just three required inputs. The Current State section should contain all other items that do not fit into one of the defined tabs that are affected by the statement resident at the top of the Current State input section. This statement is carried over from the Project Information tab. Each affected “Other” item should receive its own row to calculate costs (one and only one “Other” item per row). To complete this tab, enter descriptor data, cost data, quantity data, and appropriation data concerning the Current State (how things are now prior to any changes). This user input is the basis of the calculations in the Annual Totals section on the right side of the sheet. The input cells for the Current State section are displayed in the two figures below.

Figure I35. Other Tab Current State Input Section, Left

Current State								
Ref. #	Item Description	N/A	N/A	N/A	CY07\$ Unit Price	2007 Qty	2008 Qty	2009 Qty
C1								
C2								
C3								
C4								
C5								
C6								
C7								
C8								
C9								
C10								
C11								
C12								
C13								
C14								
C15								
C16								
C17								
C18								
C19								
C20								

Figure I37. Cost/Benefit Category Drop-down

Comments (optional)	Cost/Benefit Category	Appropriation
	<div style="border: 1px solid black; padding: 2px;"> <ul style="list-style-type: none"> Cost Avoidance <li style="background-color: #e0e0e0;">Cost Savings Sustainment/Recurring Investment Indirect Costs Residual / Salvage </div>	



If a particular line item is not changed from the Current State, the associated cell in Column R will remain gray and no input in that cell is required.

Repeat these steps for any additional Future State alternatives to be analyzed.

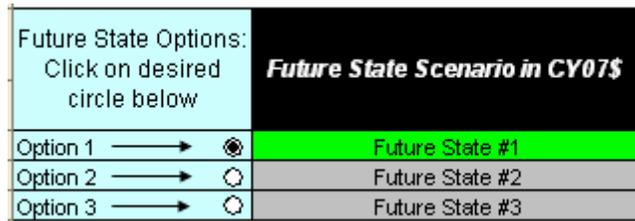
11.3 CONSIDERATIONS

- Try to be as specific as possible in the space provided. This will help properly document the initiative and also aid in the validation process.
- Are there other indirect costs or benefits associated with the initiative? If there are, please ensure they are fully documented in the appropriate tab. For instance, is there an indirect manpower cost or savings associated with the alternative? An example is proposing to provide training virtually by web meeting versus individuals traveling to a training course taught by active duty instructors. The travel costs saved by the initiative would be entered in the Other tab and the active duty instructor effort saved would be entered in the Manpower tab.
- If overtime costs or overtime savings are expected with the initiative, they should also be recorded in the Other tab. See Section 7.3 for guidance on how to make overtime entries.
- If the Future State alternative changes the requirements in more than one organization, capture the impact to all affected organizations.

SECTION TWELVE: OPTION SELECTION

This tab displays Current State costs by category in CY\$, the total costs of the Future State options, ROI, NPV, breakeven year of the Future States and the annual and cumulative net from Current State differentials of the Future States. Using the information on this tab, the preferred Future State option is then selected using the radio buttons on the left side of the worksheet. **This is an important step!** Once a particular option is selected, it will auto populate several other tabs with the appropriate data for that option. The option selection radio buttons are displayed in the screen capture below.

Figure I38. Option Selection Toggle



SECTION THIRTEEN: SUMMARY TABS

Unlike the cost category data input tabs in this template, the summary tabs, tables and lists do not require any data entry. These tabs auto populate the other tabs or consolidate data from them. Each one is explained below.

13.1 EXECUTIVE SUMMARY

The Executive Summary is a one-page synopsis of the final Future State option selected after completing the initiative analysis. It is a convenient, printable page that summarizes all the inputs. It will automatically display the Current State description and the Future State description of the option selected. It also displays other pertinent data such as expected impacts in the Desired Effects, payback year, total cost, ROI, and NPV. Finally, it displays a table at the bottom with various financial data displayed by FY. All figures are in TY\$.

13.2 PROJECT SUMMARY

The Project Summary tab compares the Current State and Future State by cost/benefit category (CY\$ to the left and TY\$ to the right) in the first set of rows. The second set of rows shows the total cost of the Current State by cost category (CY\$ to the left and TY\$ to the right). The third set of rows shows the total cost of the Future State by cost category (CY\$ to the left and TY\$ to the right). Finally, the fourth set of rows displays the net differences between the Current State and Future State (CY\$ on the left and TY\$ on the right).

13.3 SUMMARY BY OPTION

This tab pulls data from all the input tabs. It displays total costs, broken down by appropriation of each Future State option as well as the net differentials of each Future State option from the Current State broken down by cost/benefit category. All dollar figures are available in CY\$ (to the left) and TY\$ (to the

right). The side-by-side format makes for easy comparisons and can be used to verify that data common to all Future State options if entered consistently.

13.4 SUMMARY BY COST

This tab displays, by cost category, totals of each Future State and net differentials from the Current State (left two columns). This is done in both CY\$ (left) and TY\$ (right). It also displays cost/benefit categories (right two columns) from the Current State in both CY\$ (left) and TY\$ (right). Green cells highlight the option selected in the Option Selection tab.

SECTION FOURTEEN: NET TOTALS BY CATEGORY TABS

14.1 MANPOWER NET

This tab draws data from the Manpower tab and displays the difference in manpower levels between the Current State and Future State options, sorted by Personnel Category (Officer, Enlisted, GS/WG Civ, etc.). The first and second columns address FTEs while the third and fourth columns address hours. The differences are expressed in number of hours or FTEs, depending on what data was entered, and in a percentage change. On the main menu of the Template this tab is labeled 'Manpower Net FTE'

14.2 FLYING HOUR NET

This tab draws data from the Flying Hours tab and displays for each option the difference in the Current State and Future State in two sets: number of flying hours (left two columns) and gallons of fuel consumed (right two columns). It displays the results by MAJCOM and MDS. The second column in each set displays the differences as a percent change.

14.3 ENERGY NET

This tab draws data from the Energy tab and displays the difference in the Current State and Future State number of units of energy consumed for each option. It displays the results by type of commodity. The second column displays the differences as a percent change. The third normalizes the data (except water) by converting the measures to British Thermal Units and displays them in millions (i.e. MMBTU = 1 million BTUs or a thousand thousand BTUs).

SECTION FIFTEEN: USER WORKSPACE TABS

The workbook contains two tabs that users can use to document backup calculations or for anything else that they may require space. For example, if the user made adjustments to the CPFH factors on the flying hour tab, they might want to use this space to document the methodology behind their adjustments.

SECTION SIXTEEN: TABLES / LISTS TABS

16.1 PAY TABLES

This tab contains pay tables by category used in the drop-down menus on the Manpower tab.

16.2 LISTS

The Lists tab is simply a source of information for the drop-down menus on the input tabs.

16.3 FLYING HOUR LISTS

This tab contains tables of information on MAJCOM, MDS, Cost per Flying Hour, etc., used in the drop-down menus on the Flying Hour Tab.

16.4 INFLATION INDICES

This tab contains inflation factor tables by appropriation and FY used in all inflation calculations.

ATTACHMENT 1: REFERENCES

AFI 32-1089 – *Air Force Military Construction and Family Housing Economic Analysis Guide*

AFI 33-103 – *Requirements Development and Processing*

AFI 38—301 – *Productivity Enhancing Capital Investment Program*

AFI 63-107 – *Integrated Product Support Planning and Assessment*

AFI 65-501 – *Economic Analysis*

AFI 65-502 – *Inflation*

AFI 65-509 – *Business Case Analysis*

AFMAN 65-506 – *Economic Analysis*

AFMAN 65-510 – *Business Case Analysis Procedures*

DOD Directive 5000.1 – *The Defense Acquisition Team*

DOD Instruction 5000.2 – *Operation of the Defense Acquisition System*

DOD Directive 5000.4M – *Cost Analysis Guidance and Procedures*

DOD Instruction 7041.3 – *Economic Analysis for Decision Making*

DOD Facilities Pricing Guide, UFC 3-701-06

Office of Aerospace Studies AoA Handbook – *A Guide for Performing Analysis Studies: For Analysis of Alternatives or Functional Solution Analyses*

DoD Financial Management Regulation

OMB Circular A-11 Section 300 – *Planning, Budgeting, Acquisition, and Management of Capital Assets*

OMB Circular A-76 – *Performance of Commercial Activities*

OMB Circular A-94 – *Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs*

The President's Management Agenda

SAF-MIL (A) 7115, *Air Force Real Property Detail Report*

USD (AT&L) Policy Memo: *Performance Based Logistics Business Case Analysis*



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME J: AFSO21 TOOLS AND METHODOLOGY

May 2008

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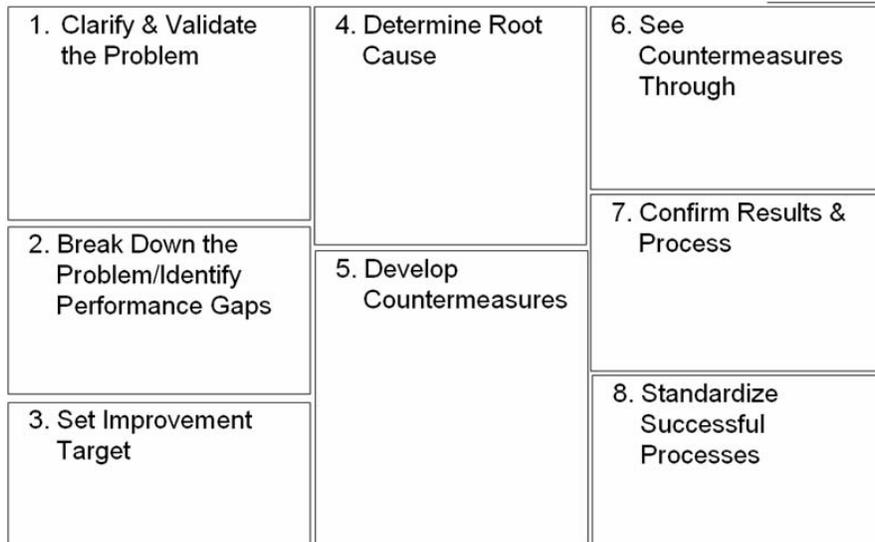
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OVERVIEW

This volume is arranged to mirror the eight step problem solving process. It contains eight sections and the tools and techniques which are generally appropriate to each step in the problem solving process. The eight steps in the problem solving process are:

1. Clarify & Validate the Problem
2. Break Down the Problem/Identify Performance Gaps
3. Set Improvement Target
4. Determine Root Cause
5. Develop Countermeasures
6. See Countermeasures Through
7. Confirm Results & Process
8. Standardize Successful Processes



SECTION ONE: CLARIFY AND VALIDATE THE PROBLEM

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Process Sequence Chart
- B. Spaghetti Map
- C. Value Stream Mapping
- D. Go & See
- E. Stakeholder Analysis
- F. SIPOC
- G. Enterprise Analysis and Action Planning
- H. Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis
- I. Voice of the Customer
- J. Strategic Alignment and Deployment (SA&D)

1.1 PROCESS SEQUENCE CHART (PSC)

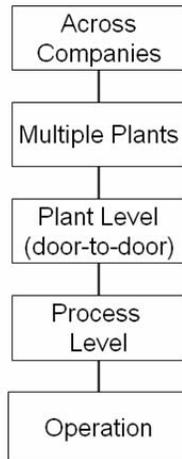
1.1.1 *Description of the Situation*

PSC is a simple diagram that provides a level of process granularity needed to capture the small levels of material and information operations needed to complete a process or activity.

1.1.2 *Description of the Tool*

The PSC is a schematic representation of the current or proposed flow. The use of symbols to detail different separate activities helps to clarify the understanding of the steps in a process and to show relationships between the flow of materials and information.

Figure J1 – Activity Levels

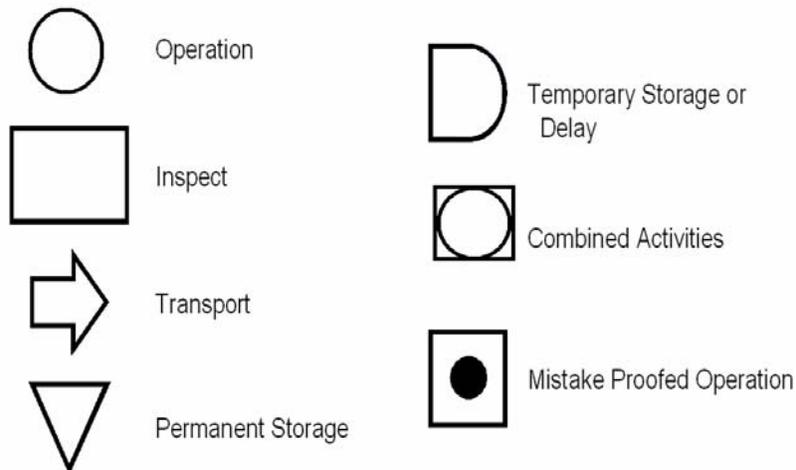


1.1.3 Mapping Tips

The chart uses seven symbols to represent each operation and step in the process. The goal of the process sequence chart is to discretely identify each steps in the process. Mapping tips are:

- Draw the map while walking the process.
- Account for times required at each step in the process.
- Gather new information. Do not rely on old data standards—gather current relevant data that will yield pertinent information.
- Draw all maps by hand with pencil and paper.

Figure J2 - Symbols for Process Sequence Chart



1.1.4 Analysis of the Data

Proper use of the process sequence chart can help with identification of process waste. A well documented PSC will facilitate other steps in the problem solving process, allowing for a thorough review of each step in determining how it adds value as defined by the customer. The PSC is a finer level of granularity than a Value Stream Map, although the purposes are similar. A process improvement team within an office or shop would use this level of granularity for more localized improvement initiatives.

Figure J3 - Example of Process Sequence Chart (Before)

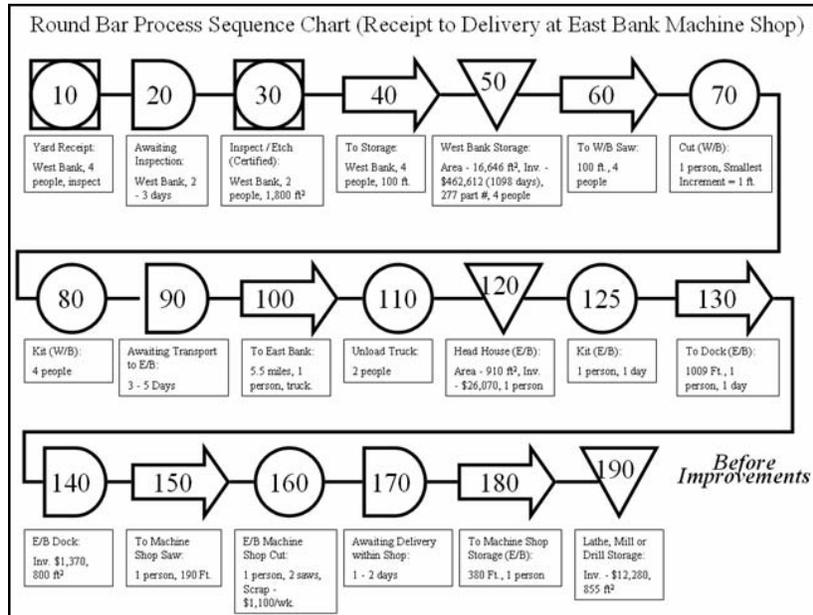
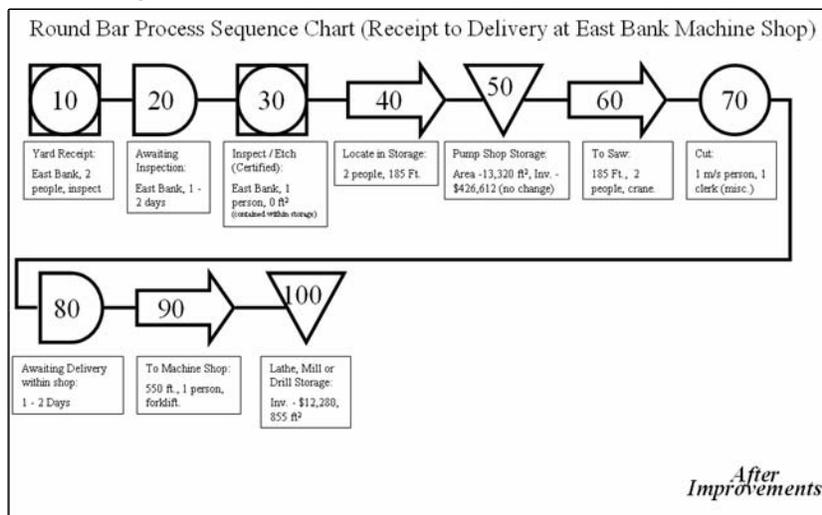


Figure J4 - Example of Process Sequence Chart (After)



1.1.5 Expected Outcomes

- Reduction of Waste.

- Reduction of Idle Time.
- Reduction of Inventory.
- Continuous flow of information, materials, and product.

1.2 SPAGHETTI MAP

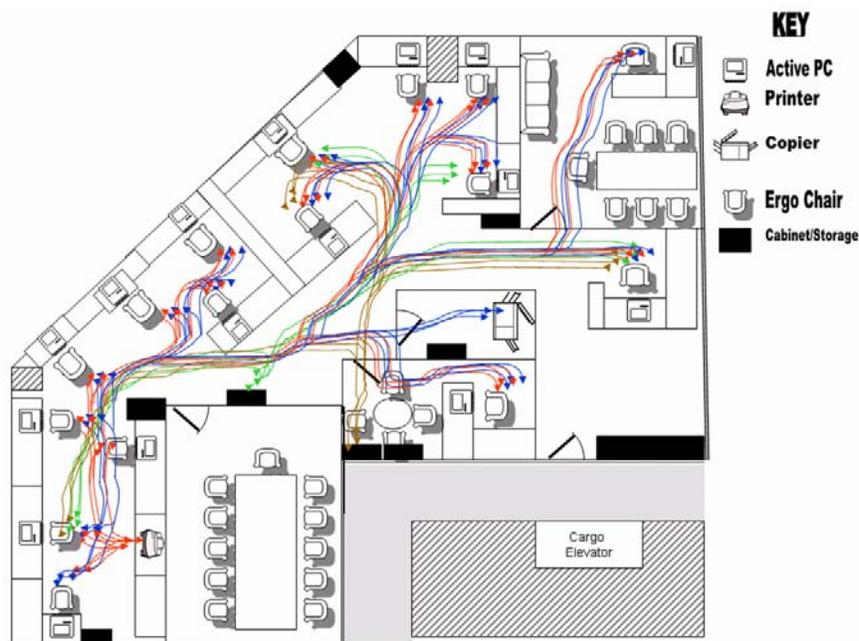
1.2.1 Description of the Situation

The spaghetti map is a simple diagram of an office/workshop that graphically depicts movements and transportation complete a process or activity.

1.2.2 Description of the Tool

The rough diagram of an office or workspace is drawn with labels at each area that an operation or step is performed. Colored lines are drawn showing the typical movement of each person involved in in one cycle (day, repair job, task, etc.) of the process. The distances also need to be recorded.

Figure J5 – Spaghetti Diagram (Before)



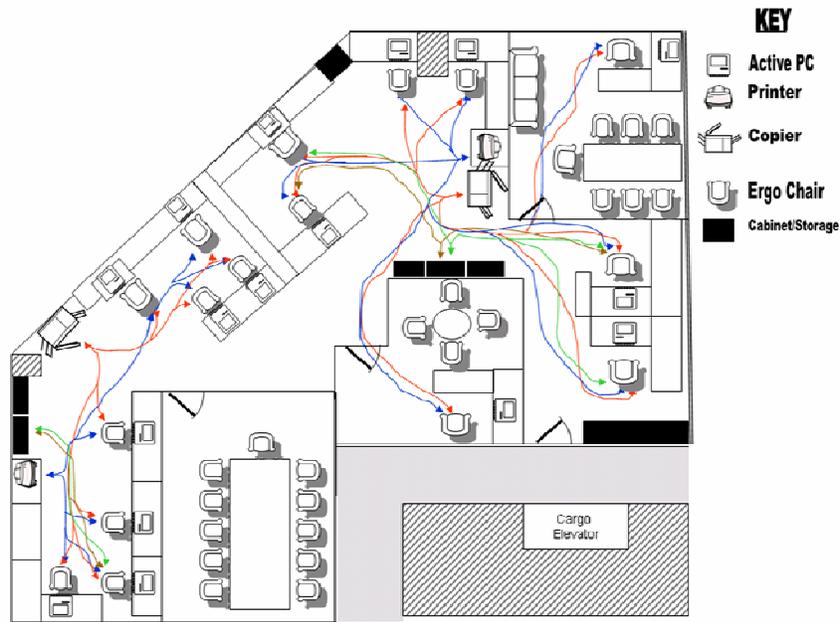
1.2.3 Mapping Tips

- Draw the map while walking the process.
- Account for distance and time required to at each step in the process.
- Gather new information. Do not rely on old data standards—gather current relevant data that will yield pertinent information.
- Draw all maps by hand with pencil and paper.

1.2.4 Analysis of the Data

Proper use of the spaghetti map will assist the problem solving team in determining how office/workshop layout causes wasteful motion and transportation between operations. The spaghetti map also shows route conflicts that prevent effective parallel processing.

Figure J6 – Spaghetti Diagram (After)



1.1.5 Expected Outcomes

- Reduction of Waste.
- Reduction of Idle Time.
- Reduction of Motion and Transportation.

1.3 VALUE STREAM MAPPING (VSM)

1.3.1 Description of the Situation

VSM is a simple diagram of every step involved in the material and information flows needed to bring a product from order to delivery. The maps can be drawn from different points in time as a way to raise consciousness of opportunities for improvement. It also helps to create understanding of the flow of materials and information, and the value that is created.

1.3.2 Description of the Tool

A current state map follows a product’s path from order to delivery to determine the current conditions. A future state map deploys the opportunities for improvement identified in the current state map to achieve a higher level of performance at some future point.

1.3.3 Current-State Mapping

The goal is to identify all areas in which the flow is not smooth from process to process without interruption. The three elements mapped are:

- The flow of Materials.
- The flow of Information.
- The flow of the product through the processes.

1.3.4 Mapping Tips

- Draw the map while walking the flow.
- Walk the entire door-to-door process.
- Gather new information. Do not rely on old data standards—gather current relevant data that will yield pertinent information.
- Map the flow as a team, but each person should do their own map for experience.
- Draw all maps by hand with pencil and paper.

Figure J7 - Symbols for Value Stream Mapping (iGrafx)

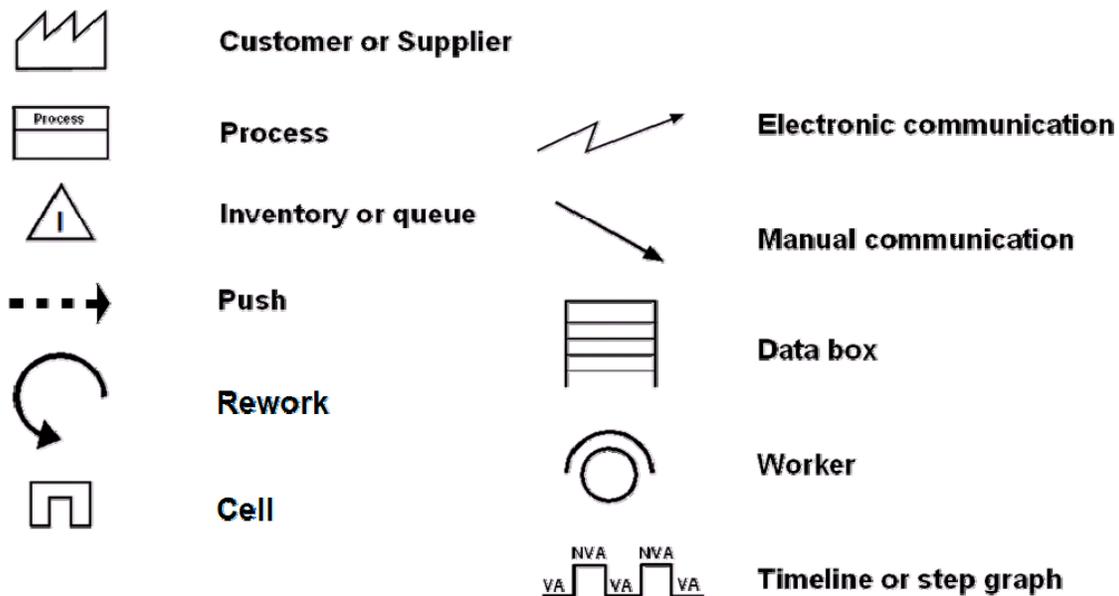
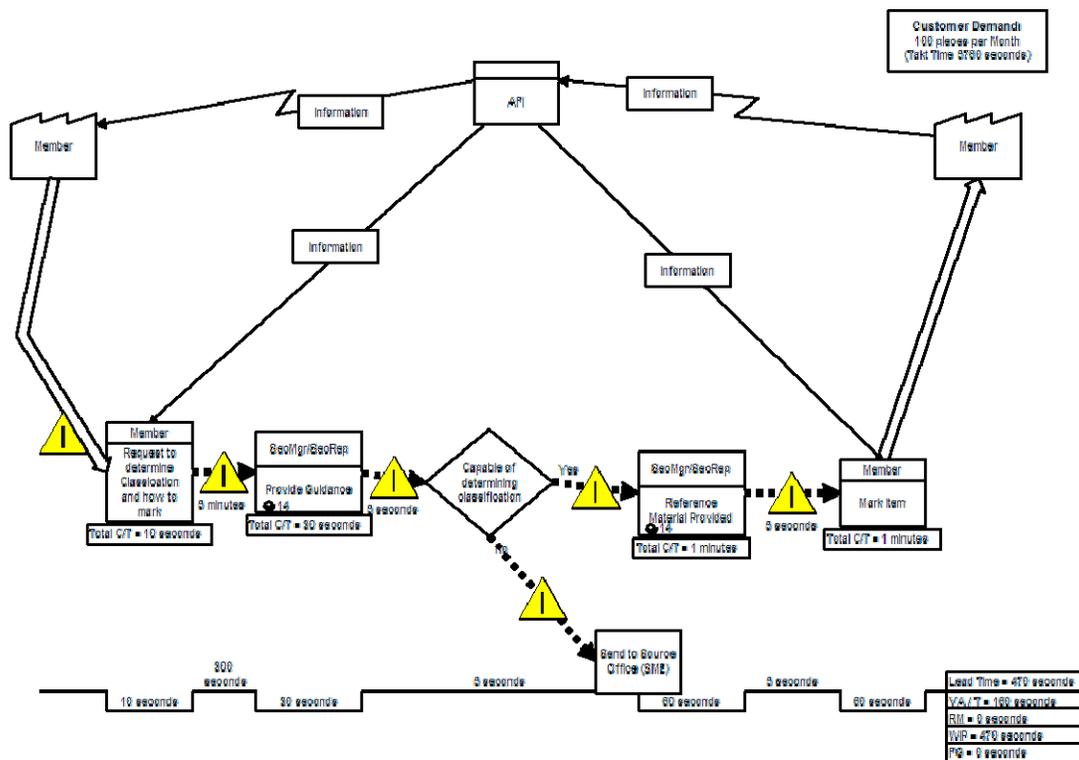


Figure J8 - Example of a Value Stream Map (iGrafx)



1.3.5 Future-State Mapping

- The Future State Map will create a vision for the implementation of a Lean/CPI System.
- The map will represent how things will change so that everyone can be aware of what will happen.
- The Future State Map will show opportunities for improvement.
- The Future State Map may have several iterations.
- First develop an “Ideal State” without consideration as to how it will be achieved – no restraints or constraints should be considered.
- Then develop a map showing the first steps necessary to reach the ideal state.
- There is no “final state” because methods continually improve.

1.3.6 Analysis of the Data

The purpose of the value stream map is to identify waste in current processes. The Process Owner or Team Lead then uses his/her findings and his/her knowledge of lean to develop a Future-State Map. The implementation of the Future State should begin as quickly as possible.

1.3.7 Expected Outcomes

- Reduction of Waste.
- Reduction of Idle Time.
- Reduction of Inventory.
- Continuous flow of information, materials, and product.

1.4 GO AND SEE

1.4.1 *Description of the Situation*

When actively engaged in problem solving, the Process Owner or Team Lead should physically go to the actual place/source of the problem and observe first-hand what is taking place. If there is a team of individuals working to resolve a particular problem, then it is recommended that the entire team travels to the actual place to see the problem the same way at the same time, thus everyone on the team will be able to agree to what they are seeing and have the same fundamental understanding about the problem at-hand. This recommendation is made because of the simple fact that problems, when articulated or explained by others, are reflected through their personal perspective/biases/filters. Without actually laying eyes of the problem at-hand, you can only accept the points of view of others and make the best determination you can with the available information. Ultimately, this can lead to identifying the wrong problem and instituting ineffective countermeasures.

During the problem solving process, it is recommended that one delays any attempt to immediately solve the problem until all the issues have been identified; clearly and precisely. When we think of problems, we should be like a scientist and be as objective as possible. Problem solving is a logical, common sense, fact-based, step-by-step approach based upon a “go and see” philosophy. It is a practiced skill, requiring the practitioner to apprehend what is actually happening versus what “should” be happening and requires a dissection of the problem into smaller problems or steps. Large, vague, and complicated problems must be clarified and fully understood before the real problem(s) can be identified and properly addressed.

In order to master this type of problem solving, it is necessary to first understand the problem at-hand. When you first begin using this problem solving approach, you must not lean too heavily on your personal experiences or perspectives. The reason for this is simple: we typically rely too much on our personal experiences/insights to solve problems. We must first develop the mind in performing good problem solving. Then when problem solving is mastered and used with experience, the problems are solved very quickly.

1.4.2 *Description of the Tool*

- Set aside pre-conceived ideas.
- See the abnormal occurrence(s) and point of cause(s) first hand.
- Delay cause analysis until you have a thorough grasp of what is actually happening.
- Prioritize causes in order to discover the High Value Targets (HVT).
- Establish a cause and effect relationship based on fact and not assumption.
- Continue asking “Why?” until you can prevent the recurrence of the problem by addressing the root cause(s).

1.4.3 *Analysis of the Data*

To determine what is causing the problem by going to the actual site to see first hand what is actually happening versus what should be happening. By going to the actual site of the abnormality the Process Owner or Team Lead will be able to operate on facts and not on assumptions.

1.4.4 *Expected Outcomes*

- Accurate identification of the real problem(s).
- Meeting and talking first hand to the airmen experiencing the problem.
- Seeing the abnormality.

- Witnessing the impact of the problem(s).
- Trying to see what is causing the problem.

1.5 STAKEHOLDER ANALYSIS

1.5.1 Description of the Current Situation

During Phase II, as you bring stability to the organization, you find a need to enhance the value to your customers and integrate this throughout the enterprise value stream. To accomplish this, you need to do a thorough analysis of your stakeholders to ensure that you have alignment throughout the value stream.

Engaging in this process is an integral part of the Enterprise Value Stream Mapping and Analysis (EVSMA). This process looks at all aspects of the enterprise value stream to ensure that value is added to as many levels as possible.

1.5.2 Description of the Tool and Usage

One of the analysis tools from EVSMA is the stakeholder analysis. It plays an important part in determining if all constituents are adding value and aligning to the common purpose of satisfying the customer. Therefore, the stakeholder analysis is a method for determining how each plays a part in delivering value to the customer and assessing current performance and satisfaction. The analysis is divided into five steps:

- Identify all the stakeholders (suppliers, customers, airmen, etc.) in the value stream.
- Conduct an assessment into the stakeholders' expected value and the contribution they make to delivering value.
- Analyze the current performance of all stakeholders and how that performance affects value delivery.
- The final step is to view stakeholders' requirements for performance, expectations, and measures of success and to plan accordingly pressing forward, increasing or optimizing value wherever possible.

1.5.3 Expected Outcomes

- Recognition of all stakeholders' contribution to delivering value to the customer.
- Matching of that contribution to the required performance characteristics.
- Distillation of issues into a significant few.
- Action items to enhance value added.

1.6 SIPOC – SUPPLIERS, INPUTS, PROCESS, OUTPUTS AND CUSTOMERS

1.6.1 Description of the Current Situation

When accomplishing a RIE, one of the main factors for success is the set of boundaries that are established for the outcomes. The boundaries are established by the Process Owner, but are reconfirmed during the event using a SIPOC. SIPOC is an acronym for Suppliers, Inputs, Processes, Outputs, and Customers. Each term is defined as follows:

- *Supplier(s)* – Those organizations and sometimes individuals who supply work in process or entire subsystems to the creation of value for the customer. Suppliers can supply materials, information or expertise. For AFSO21, the customer supplier relations are vital to understand. Every one except the customer in the value stream is a supplier for either the customer or the following process. Delivering value to the customer requires the suppliers deliver value at each step.

- *Inputs* – A description of where all the inputs to the process come from. It is the physical or information inputs defined. It is a clear description of exactly what the suppliers supply.
- *Processes* – The steps the delivery of value takes at a high level. May be broken down into subprocess if they are important to the discussion of where value comes from.
- *Outputs* – Both intended and unintended. It is the products that are delivered from the value stream even if they do not go directly to the customer. These outputs help define the delivery of value.
- *Customer(s)* – The person or organization that receives value from the processes and outputs. They define value and determine if it has been delivered. Defining this is a critical element of delivery value. Usually is defined by the person or organization that puts the outputs to use.

1.6.2 Description of the Tool and Usage

The tool is used during the mapping process to ensure everyone is in consensus concerning key elements involved. Divergence from this description can lead to defining value in an incorrect way by and thus cause the value stream to not deliver true value. To use the tool to its best advantage the following process should be utilized:

- First define the nature of a SIPOC and its intended use.
- Explain the elements individually and how they combine to give clear boundaries to the effort.
- Define each element in the following order: Process (what we do), Outputs (what we deliver), Customers (who gets it), Inputs (what does it take to make it), Suppliers (who provides the inputs). Show the connection to delivering value.
- Make sure that each element then delivers value to the customer.
- Summarize by asking how this will impact the current situation and it is transformed into the future state.
- Ask for majority agreement and use this information as often as necessary to keep the group on task.

1.6.3 Expected Outcomes:

- Clarity for definition of the customer.
- Understanding of the elements that should deliver value to the customer.
- Definition of the processes.
- Understanding of the suppliers.
- Understanding of the physical inputs to the process.
- Validation of the processes mapped in the current state.
- Consensus on all the elements for more detailed value mapping and analysis.

1.7 ENTERPRISE ANALYSIS AND ACTION PLANNING (ENTERPRISE VSM)

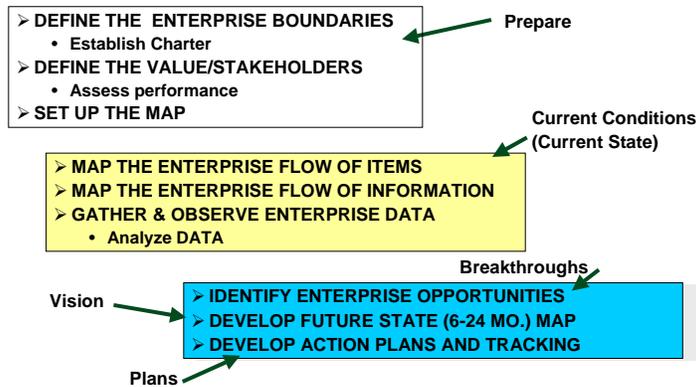
1.7.1 Description of the Current Situation

It is an enterprise look at the entire business thru the lenses of all stakeholders. The model looks at the Enterprise from different facets to allow for waste identification and to create a Future State vision for the Enterprise. A gap analysis and action planning is accomplished based on the waste identification and Future State visioning.

1.7.2 Description of the Tool and Usage

Figure J9 - EVSM Tool and Usage Description

Model Used:



1.7.3 Expected Outcomes

- Identification and assessment of Enterprise Value Streams that provide capabilities to Warfighters.
- Identification and assessment of key enabling processes.
- Desired future state.
- Implementation plans that include metrics.
- Leadership roles and responsibilities to achieve transformation.

1.8 STRENGTHS, WEAKNESSES, OPPORTUNITIES, AND THREATS (SWOT) ANALYSIS

1.8.1 Purpose

The SWOT Analysis provides strategic planners with a list of political, environmental, technical, managerial, or programmatic issues in an orderly format during strategic planning sessions.

1.8.2 Description

The SWOT Analysis produces an input to strategic planning documents and forces discussion and assessment of internal (Strengths, Weaknesses) and external (Opportunities, Threats) issues that are affecting the organization. It also forces the team to decide what issues are more important than another within a category and forces consensus on them.

1.8.3 Actions

The Level 1 or Level 2 should follow the steps below to perform a SWOT Analysis:

Resources Required: Flip Charts, markers

- Label four flip charts: Strengths (Build), Weaknesses (Overcome), Opportunities (Exploit), and Threats (Mitigate)
- Remind the team that Strengths and Weaknesses are related to internal aspects of the organization and that Opportunities and Threats relate to external aspects of the organization.
- It does not matter what flip chart category the Level 1 or Level 2 begins with.

- Using a brainstorming technique capture inputs from the team members
- Using a prioritization technique (e.g., Nominal Group Technique) with the team to determine the top 4 to 5 inputs for each area (Strength, Weakness, Opportunity, Threat).

1.8.4 Expected Outcomes

- An understanding of internal and external factors that are barriers or enablers to achieving strategic objectives

1.9 VOICE OF THE CUSTOMER - VOC

1.9.1 Purpose

Voice of the Customer gives the Air Force leader a road map as to what is important and what is not. There is a sole arbiter as to what is value added and what is waste – the customer.

1.9.2 Description

The first step in improving a process is to understand the customer's needs. Gathering the VOC has two parts, 1) Identifying the customer and, 2) Documenting the VOC. Identifying your customer may be more difficult than it seems on the surface;

- Immediate vs. ultimate customers.
- Internal vs. External customers.
- Current happy and unhappy customers.
- Heavy vs. Light customers – the Pareto principal predicts that 20% of your customers consume 80% of your product.
- Lost customers.
- Potential future customers who would be your customer if only.

There are many ways to gather VOC

- Surveys - On-Line, Mail, etc.
- Interviews.
- Focus Groups.
- Complaint departments or systems.
- Market research.
- Customer databases.
- Observation.
- Customer contracts or specifications.

In gathering the VOC caution must be exercised to ensure an unbiased sample of the most appropriate customer groups.

1.9.3 Actions

To better serve your customer, you must determine your customer's needs. What are your customers Critical to Quality (CTQ) issues? CTQs are those items that *must* be met in order to satisfy the customer. Your customer may also have unstated or implied needs that they take for granted and do not feel they need to specify.

Once the VOC is established there are three major areas where it can guide the Continuous Improvement Process.

- *Self Evaluation* – How does your service or product measure up against the VOC? This can provide a road map for prioritizing future improvement efforts. This concept is further defined in Gap Analysis and Value Stream Mapping. Only your customer can determine whether a process step is value added.
- *Measures* – A measurement system should be designed around a system of Key Process Indicators (KPI) that reflects your ability to effectively meet your customer’s CTQs.
- *Plan for the future* – What will your customer need in the future and how will you adapt to provide that future need?

1.10 STRATEGIC ALIGNMENT AND DEPLOYMENT (SA&D)

1.10.1 Purpose

Strategic Alignment & Deployment (SA&D) is the method used to ensure everyone in the organization is working effectively towards the same goals identified by senior leadership.

1.10.2 Description

Deploying this method throughout the organization communicates to every person the senior leader’s process improvement focus points for a specified period. SA&D shows the activities necessary to achieve organizational goals and objectives. In addition, it provides a common/standard methodology to deploy the metrics and action plans throughout the enterprise. Further, there are assignments for accountability and responsibility, and an organizational focus on high- leverage outputs.

1.10.3 Actions

The Level 1 or Level 2 should follow the steps below to complete a SA&D planning session:

Resources Required: SA&D Matrix Template, SA&D Tracker Template (To Be Developed), Action Plan Template, SA&D Notes Template (To Be Developed) flip charts, markers

- Conduct a Strategic Planning Session to identify the organizations high value initiatives, key metrics, goals and objectives, and action themes.
- Complete the SA&D Matrix to include target dates for completion and responsible personnel (by name).
- Prepare the SA&D Tracker to show the progress of objectives.
- Prepare an Action Plan for each objective. This is the detailed plan of action for meeting the objective. The plan will outline the strategies, milestones, measures, and exit criteria.

1.10.4 Expected Outcomes

- The result of SA&D is a set of agreed to goals and initiatives/actions to achieve them. Leadership should use the SA&D to communicate and monitor progress in accomplishing tasks and initiatives critical to goals and objectives. The SA&D should be a product of annual strategic and performance planning.

SECTION TWO: BREAKDOWN THE PROBLEM / IDENTIFY PERFORMANCE GAPS

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Key Performance Indicators (KPI) / Metrics
- B. Value and Waste Analysis
- C. Constraint Analysis
- D. Implementation Risk Analysis
- E. Demand Analysis
- F. Performance Gap Analysis
- G. Bottleneck Analysis

2.1 KPI/METRICS

Metrics are the means to measure results, and ultimately, determine whether the desired goal(s)/objective(s) have been achieved. It is extremely important to note that whatever set of metrics are employed to objectively measure an organization's results they must complement the organization's operations. For example, let's say the goal is to optimize cost savings in all functions within a specific supply function. The results derived from these metrics must be translated in such a way that the logistics community can recognize the value gained through such efficiencies and the total costs of such a process. (Reducing cost in one area might inadvertently drive a cost increase elsewhere within the organization).

If the goal is cycle time reduction and an organization reduces its own cycle time and simultaneously unknowingly reduces the effectiveness and reliability (an undesirable affect) of another part of the system, the burden is then passed to another activity with possibly a longer overall cycle time. All Air Force organizations should have a set of metrics and CPI projects, all of which are actively tracked, evaluated, and reviewed, that together achieve improvements without adding unintended offsetting and additional expense in other organizational processes.

2.1.1 *Leading Metrics Versus Lagging Metrics*

Quality, delivery (e.g., throughput and cycle time), and cost metrics are typically measured on a reoccurring basis and are often referred to as "lagging" metrics because they are collected and reported after after-the-fact. These metrics are results-oriented and track overall performance trends, but by the time a time-delayed metric identifies a potential problem, it may have become more of a problem than previously reported.

Outcome-based or "leading" metrics help make future predictions about what is likely to happen, thus allowing possible problems to be anticipated and either neutralized or avoided. A leading metric might be a comparison of current operations with the organization's pre-defined goals or expectations (i.e. are we doing what we are supposed to do in the correct/proper manner?). One example of a leading metric is a "first pass" measurement at each workstation within a given office. These observations/measurements will give operations personnel a needed "first look," from which they can begin to address, minimize, and ultimately, correct discrepancies or problems.

2.1.2 Customer-Oriented, Outcome-Based Metrics

The outcomes to measure are those that are perceived to have value in supporting the customer’s mission. Several DoD organizations are currently employing customer-oriented, outcome-based metrics. The Navy, for example, uses a “Ready For Tasking” (RFT) metric to calibrate key processes and measures in its enterprise value chain to measure the availability of aircraft available to Fleet Commanders. Management of this kind of metric requires focusing on preventive and predictive actions.

2.1.3 Criteria for Evaluating Metrics

CPI metrics should have six key characteristics:

- Balanced – Ensure goals are balanced across the multiple fronts of organizational output and multiple targets
- Specific – Have desirable outputs that are based on subject matter expert knowledge and experience and are applicable to the process improvement activity
- Measurable – Includes time frames and have data that is obtainable from specific sources
- Attainable – Resources are available; may have some risk, but success is possible
- Results Focused – Link to the mission, vision, and goals and are meaningful to the user
- Timely – Provide step-by-step views versus giant leaps and are measurable at interim milestones

2.1.4 Other Considerations Related to Metrics

- *Face validity*—e.g., It may not be obvious that a given metric actually relates to a given goal even though a causal analysis shows that it does.
- *Level of aggregation*—certain metrics are only valid or reliable at certain levels of aggregation. For example, when costs at a depot are determined based on depot-wide overhead rates applied to labor, the cost information is only valid when the depot is taken as a whole. The actual cost for any given piece of the organization is likely different from the calculated value. In other cases, aggregated metrics can be misleading or incorrect even though the individual metrics are correct (this is generally known in the statistics community as “Simpson’s Paradox”).
- *Data ownership*—even if the data exists, we might not be able to get access if it is under the control of an individual or organization that chooses not to make it available. This might require elevation to a higher level to achieve cooperation and overcome resistance to cultural change.

2.2 VALUE AND WASTE ANALYSIS

2.2.1 Description of the Situation

Waste is anything that uses resources, but does not add real value to the product or service; anything that takes time, resources, or space, but does not add to the value of the product or service delivered to the customer. In order to streamline the Value Stream and improve productivity, quality, and customer service it is essential to learn to recognize the eight types of waste (D-O-W-N-T-I-M-E).

Figure J10 - Description of the 8 Wastes

The 8 Wastes	Definition	Information	Air-Base Applications
Defects	Work that contains errors, rework, mistakes or lacks something necessary	<ul style="list-style-type: none"> ▪ Data entry error ▪ Pricing error ▪ Missing information ▪ Missed specifications ▪ Lost records 	<ul style="list-style-type: none"> ▪ Scrap ▪ Rework ▪ Defects ▪ Correction ▪ Field failure

The 8 Wastes	Definition	Information	Air-Base Applications
			<ul style="list-style-type: none"> ▪ Variation ▪ Missing parts
Over-production	Generating more than is needed right now	<ul style="list-style-type: none"> ▪ More information than the customer needs ▪ More information than the next process needs ▪ Creating reports no one reads ▪ Making extra copies 	<ul style="list-style-type: none"> ▪ Producing more to avoid set-ups ▪ Batch process resulting in extra output
Waiting	Idle time created when material, information, people or equipment is not ready	<ul style="list-style-type: none"> ▪ Waiting for... ▪ Faxes ▪ The system to come back up ▪ Copy machine ▪ Customer response ▪ A handed-off file to come back 	<ul style="list-style-type: none"> ▪ Waiting for parts ▪ Waiting for prints ▪ Waiting for inspection ▪ Waiting for information ▪ Waiting for machine repair
Non-standard overprocessing	Efforts that create no value from the customers' viewpoint	<ul style="list-style-type: none"> ▪ Creating reports ▪ Repeated manual entry of data ▪ Use of outdated standard forms ▪ Use of inappropriate software 	<ul style="list-style-type: none"> ▪ Multiple cleaning of parts ▪ Paperwork ▪ Over-tight tolerances ▪ Awkward tool or part design
Transportation	Movement of information that does not add value	<ul style="list-style-type: none"> ▪ Retrieving or storing files ▪ Carrying documents to and from shared equipment ▪ Taking files to another person ▪ Going to get signatures 	<ul style="list-style-type: none"> ▪ Moving parts in and out of storage ▪ Moving material from one workstation to another ▪ Moving materials on trucks, forklifts, etc.
Intellect	Any failure to fully utilize the time and talents of people	<ul style="list-style-type: none"> ▪ Overlooking expertise within the organization ▪ Not soliciting ideas ▪ Undefined requirements that result in rework ▪ Lack of coordination and communication 	<ul style="list-style-type: none"> ▪ Rework ▪ Scheduling conflicts ▪ Duplication of efforts
Motion	Movement of people that does not add value	<ul style="list-style-type: none"> ▪ Searching for files ▪ Extra clicks or key strokes ▪ Clearing away files on the desk ▪ Gathering information ▪ Looking through manuals and catalogs ▪ Handling paperwork 	<ul style="list-style-type: none"> ▪ Searching for parts, tools, prints, etc. ▪ Sorting through materials ▪ Reaching for tools ▪ Lifting boxes of parts
Excess Inventory	More information, project, material on hand than is needed right now	<ul style="list-style-type: none"> ▪ Files waiting to be worked on ▪ Open projects ▪ Office supplies ▪ E-mails waiting to be read ▪ Unused records in the database 	<ul style="list-style-type: none"> ▪ Raw materials ▪ Work in process ▪ Finished goods ▪ Consumable supplies

2.2.2 Analysis of the Data

To determine if waste is present, the Process Owner or Team Lead needs only to observe the workplace and watch for the eight types of waste. Unless the area has been diligent in keeping the eight wastes to a minimum, the Process Owner or Team Lead can insist the area check their eight waste condition using an audit sheet. The 6S program is recommended approach toward this endeavor.

2.2.3 Expected Outcomes

- Discipline in how the workplace is ordered.
- Reduced inventory.
- Decreased idle time.
- Prevention/Reduction of work containing errors.
- Less waste.

2.3 CONSTRAINT ANALYSIS

2.3.1 Description of the Situation

- It must be a known factor throughout the organization that if we don't manage our constraints, then our constraints will manage us.
- We have to look at the entire chain of processes and how they are linked together in order to truly understand how they are connected. Constraint Analysis is how we manage constraints.
- There are two assumptions to work from:
 - Every organization has a set of processes working together to achieve a common goal.
 - Every process has a constraint that limits it from higher performance.
- Typical Constraints: Time, Capacity, Materials, Equipment, Human.

“Just as the strength of a chain is governed by the weakest link, so is the strength of an organization of interdependent resources.”

- - - Eli Goldratt

Figure J11 - Chain of homogenous processes



Figure J12 - Chain of non-homogenous processes



2.3.2 Description of the Tool

There are five steps for Constraint Analysis and Management

- Identify the process/system constraint or bottleneck (the weakest link).
- In order to manage a constraint you have to identify it first.
- Exploit the constraint.
- Focus on how to get more within the existing constraint's capacity.
- Subordinate everything to the constraint.
- Get everything to the constraint that is needed, when it is needed.
- Elevate the constraint.
- After the constraint is identified, exploited and non-constraint resources subordinated, the next step is to determine if the output of the constraint can meet the demand from the customer.
- Go back to Step 1 and start over.
- Once a constraint is broken, a new one will emerge because there is always one in the system. So repeat the above steps on the new constraint in the system.

2.3.3 Analysis of the Data

- Another thought on constraints would be to force the constraint to stay in one place (once a new constraint emerges, focus using the five steps to eliminate).
- Actions to support the organization goals through Constraint Analysis and Management:
 - Increase THROUGHPUT.
 - Decrease INVENTORY.
 - Decrease OPERATING EXPENSE.

2.3.4 Expected Outcomes

- Balanced flow through the value chain.
- Increased output from the system.
- Increased efficiency.
- Improved problem solving ability.
- Increased knowledge of identifying and reducing/eliminating constraints.

2.4 IMPLEMENTATION RISK ASSESSMENT

Implementation Risk is an evaluation of the likelihood (or probability) of not achieving a specific objective within a specified amount of time with the resources provided. DoD 5000.2-R defines *risk* as “a measure of the inability to achieve program objectives within defined cost and schedule constraints.” Risk has two components,

- The probability/likelihood of failing to achieve particular performance, schedule, or cost objectives.
- The consequence of failing to achieve those objectives.

Failing to account for the severity of the consequences means that risks may be misstated. For example, if a particular event has a high probability of failure, but only a small impact, then it is unrealistic to call it a “high” implementation risk. On the other hand, a number of risks can have a low probability of occurrence, but have consequences so serious that they are treated as significant risks. A classic case is safety of flight issues, which typically have been handled as “moderate” or “high” risks, despite their relatively low probability of occurrence.

2.4.1 Implementation Risk Management Process

Implementation risk management is the act or practice of controlling risk. DoD 5000.2-R defines risk management as, “All actions taken to identify, assess and eliminate or reduce risk to an acceptable level in selected areas (e.g., cost, schedule, technical, product reliability, organizational culture and resistance, etc.) and the total program.” The implementation risk management process includes identifying and tracking risk areas, defining risk mitigation plans as part of risk handling, monitoring risks, and performing periodic risk assessments to determine how risks have changed and how to plan adequate schedule and resources. Implementation risk management process activities fall into four broad elements and are performed with many iterative feedback loops:

- Risk planning is the process of developing and documenting an organized, comprehensive, and interactive approach to identifying and tracking risk areas, defining risk mitigation strategies, performing periodic risk assessments to determine how risks have changed, and planning for adequate resources.
- Risk assessment is the process of evaluating a program and its risks and includes risk identification and risk analysis. In this context, risk identification is the process of examining each program to

identify risk areas. Risk analysis is the process of examining each identified program risk, isolating the cause, and determining the impact of the program risk in terms of its probability of occurrences, its consequences, and its relationship to other risk areas or processes.

- Risk handling is the process that identifies, evaluates, selects, and implements risk handling options to set risk at acceptable levels given program constraints. The most appropriate strategy is selected from these handling options and documented in a risk handling plan.
- Risk monitoring is the process that systematically tracks and evaluates the performance of risk handling actions against established metrics throughout the acquisition process and develops further risk handling options or executes risk mitigation plans, as appropriate.

Keep implementation risk management focused. Too often, implementation risk management discussions become lost in the details of methodology. Methodology is important only to the extent that it is technically sound and provides value added structure, analyses, and insights to decision makers. In the end, effective implementation risk management is driven by human judgment. This is at best aided by, rather than directed by, methodology.

2.4.2 Top-Level Guidelines for Effective Implementation Risk Management

- Assess program risks and develop strategies to manage those risks at each milestone.
 - Identify early and intensively manage those design parameters which critically affect capability, readiness, design cost, or life cycle cost.
 - Use technology demonstrations and aggressive prototyping to reduce risks.
 - Include test and evaluation as part of the risk management process.
- Include industry participation in implementation risk management. Contractors must identify risks and develop plans to manage those risks as part of their proposals.
- Use an early, structured implementation risk assessment and analysis process to identify and analyze risks.
 - Identify, assess and track technical, schedule, and cost risk areas.
 - Establish risk mitigation plans.
 - Provide for periodic integrated risk assessment throughout each program phase.
- Establish a series of “implementation risk assessment events,” where the effectiveness of risk reduction conducted to date are reviewed. These events are to be tied to the integrated master plan at each level and have clearly defined entry and exit criteria. Use DoD 4245.7-M as a guide.
- Include processes as part of implementation risk assessment; the government supplier’s or contractor's managerial, development, and manufacturing capabilities/ processes.
- Clearly define a set of evaluation criteria for assigning risk ratings (low, moderate, high) for identified risk areas.

2.5 DEMAND ANALYSIS

Demand Management is the planning process for converting customer requirements for a product or service (the demand) into a production or service plan. The goals of Lean Manufacturing are to provide high quality (zero defects) on time (100%) at the lowest total cost by removing waste in the process.

Demand from customers is seen in many different customer supplier relationships from medical treatment (from routine to emergency), food service, home building, manufacturing airplanes and components, meeting service levels of # of airplanes available, #of tanks and other equipment available, providing

refueling service for aircraft (in the air and on the ground), delivering bombs on target, hiring and transferring personnel, delivering paychecks on time.

Demand lead time varies from emergencies with no forecast lead time to ship building with 36 month production lead time. Although emergencies arrive with little or no warning, emergency demand volume can be estimated if sufficient experience data is gathered.

2.5.1 Steps in Demand Management

- Sales forecasting based on history or market research. This ranges from past history to seasonal analysis to sophisticated models.
- Converting forecasts to sales plans. One forecasts are completed a sales plan is developed and project budgets are established.
- Converting Sales Plans to Operations Plans. Sales plans are then communicated to operations groups to put facilities, equipment, and resources into place.
- Converting Operations Plans to Production Plans. Based on actual orders and short term forecasts the Operations/Service department will issue a production plan that details what, how much and when needs to be produced or provided.
 - Production Planning is the process of converting customer orders into a production plan. Cycle time and Takt Time comparisons are made here.
 - Production Control is the process of ensuring the production plan is met every shift.
 - Both require intimate knowledge of production operations along with customer knowledge and supplier processes.

Production Planning is accomplished in traditional (push) or Lean (pull) depending upon the company. Push scheduling gives all steps in the process the same schedule and any updates or revisions are communicated weekly. This means that if the final shipments change during the week the supporting processes do not react. Pull scheduling requires the system to replenish only what is consumed. When changes take place at the delivery point the entire supply chain makes an adjustment.

Lean Scheduling provides a uniform predictable output for planning materials and resources. It uses Takt time (time for a unit based on customer demand and time available. This is used for operations and administration products/services.

Final note: Demand always changes and production rarely goes completely to plan. Contingency plans are always required to ensure customer satisfaction.

2.6 PERFORMANCE GAP ANALYSIS

2.6.1 Purpose

Performance Gap Analysis provides an objective quantitative documentation of the difference between a process' current performance and customer requirements.

2.6.2 Description

Performance Gap Analysis produces a roadmap for identifying and prioritizing process improvement initiatives based on the Voice of the Customer (VOC). When customers are unhappy or a process is not performing well, one must determine how and where the process is deficient. Performance Gap Analysis provides a team with an objective means to identify and quantify process deficiencies.

2.6.3 Actions

The Team Leader will need two sets of information in the same units of measure. The process current performance levels and the customer's Critical to Quality (CTQ) measures from the VOC. Gathering the data in the same units of measure is the most difficult aspect of the process. The first step is identifying the customer CTQs. See the VOC Module for more detail on gathering CTQs. Very often process measures that are based on the VOC do not exist requiring either manual data collection or the creation of new process measures.

Once data is gathered in the correct units of measure, the next step is simple math. Interpretation and ranking of the gaps identified can be more complex. Comparisons between failures to meet two or more different CTQs can be tricky, much like comparing apples and oranges. Which CTQ is the most important to the customer? Often as the gap between performance and requirements widens the pain to the customer widens exponentially. In some cases exceeding customer expectations in one area can mask customer concerns in another. Hence gathering data on all CTQs is important, not just those CTQs that the process is failing to meet.

Some examples: Being ten cents too expensive and one pound too heavy can have very different meanings. For a rivet ten cents and a pound per rivet can be massive where as for an aircraft engine these are trivial. For a steak ten cents can be meaningless to the customer who is getting an extra pound of meat. For pickle ten cents may also be meaningless to a customer who has no interest in eating a one pound pickle spear at any price.

2.6.4 Expected Outcomes

- Documented and quantified improvements necessary to meet customer and strategic objectives.

2.7 BOTTLENECK ANALYSIS

2.7.1 Purpose

Bottleneck Analysis helps to identify the specific step(s) in a process that are holding down the throughput of the entire process.

2.7.2 Description

Bottleneck Analysis is the key tool in the Theory of Constraints (TOC). Every process has one step that is slower than the rest. Much like a kink in a hose, that one step controls the throughput potential of every other step in the process. Furthermore, trying to improve the throughput of a process by improving any step other than the bottleneck step by definition can not improve the throughput, and will most likely actually make things worse. If a Gap Analysis indicates that processing speed or volume goals are not being met, then a Bottleneck Analysis is indicated. Although almost all processes have volume and speed requirements, a Bottleneck analysis may not be needed unless these requirements are not being met.

2.7.3 Actions

Each step in the process must be identified and its throughput capacity measured.

- Value Stream Mapping (VSM) is the ideal tool for mapping out all the steps in a process.
- Each step must be measured for its throughput capacity under normal conditions.
- Units of measure must be normalized across the VSM. For example, on a car assembly line the wheel station may be able to mount 12 wheels per hour and the trunk lid station may be able to mount 5 lids

per hour. This would be 3 cars per hour for the wheel station and 5 cars per hour for the trunk lid station, identifying the wheel station as the bottleneck.

- The steps must be compared. A bar graph is an excellent tool for this by placing common units of measure on the vertical axis and a separate bar for each step in the process. A horizontal line representing the throughput speed required to meet customer expectations is also useful. The bar graph makes it visually obvious which step is the bottleneck (the shortest bar). The bar graph also easily shows if there are any other steps that can not meet the required processing rates.

Suggested further reading “*The Goal*” by Eliyahu M. Goldrat. *The Goal* is an extremely easy reading primer on the Theory of Constraints (TOC). Set in a novel format, the reader not only learns about all aspects of TOC through the eyes of the main character, but also how the TOC can save your carrier and your marriage.

2.7.4 Expected Outcomes

- Identification of areas where improvements can deliver greater results.

SECTION THREE: SET IMPROVEMENT TARGET

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Ideal State
- B. Future State Mapping
- C. B-SMARTER Goals

3.1 IDEAL STATE MAPPING

3.1.1 Purpose

Ideal State Mapping forces the team to envision what their process would look like if there were no constraints and no waste. Ideal State Maps thus provide the team with a process goal to strive for.

3.1.2 Description

Ideal State Mapping is the second step in Value Stream Mapping (VSM). Teams first map the Current State, followed by the Ideal State, and lastly the Future State. Ideal State maps always have far fewer steps than the current state. Ideal State maps are almost always not 100% achievable. Some types of waste are required by business or legal needs, even if they play no part in fulfilling a customer need. Ideal State maps are also not drawn with resource constraints, but the real world is almost always resource constrained.

3.1.3 Actions

Value Stream Mapping is most effectively completed by a cross functional team of process and customer experts, ideally from six to 12 members. Materials needed are several colors of sticky notes, felt tip markers, and a wall size expanse of butcher block paper.

- VSM the Current State.
- Identify and label all the forms of waste in the Current State.
- Redraw the current state without the waste.
- Make adjustments given infinite resources without regard for constraints.
- Evaluate the process for its ability to meet Voice of the Customer (VOC) Critical to Quality (CTQ) requirements.
- Make adjustments as required to enable the process to meet CTQs.
- Reevaluate to ensure no waste has been added and all CTQs are met.

3.1.4 Expected Outcomes

- Stretch thinking of problem solving team members – to get outside the box.
- Vision of ideal state and processes prior to developing a nearer term future state map and improvement action plan.

3.2 FUTURE STATE MAPPING

3.2.1 Purpose

Future State Mapping allows the team to envision what they believe their process can practically be improved to look like. Future State Maps thus provide the team with a practical road map of what improvement needs to be made to the Current State.

3.2.2 Description

Future State Mapping is the third step in Value Stream Mapping (VSM). Teams first map the Current State, followed by the Ideal State, and lastly the Future State. The goal of the Future State Map is to get as close to the Ideal State Map as practically possible. Future State Maps should be practically achievable in a reasonable time frame. At a minimum, Future State Maps should achieve customer Critical to Quality requirements (CTQs). Future State Maps almost always have fewer steps and fewer rework loops than the Current State. At the point of drawing, teams do not need to have a full understanding of how they will achieve the changes required. Teams should concentrate on where in their process they believe they can get the biggest bang for the buck in their Process Improvement efforts.

3.2.3 Actions

Value Stream Mapping is most effectively completed by a cross functional team of process and customer experts, ideally from six to 12 members. Materials needed are several colors of sticky notes, felt tip markers, and a wall size expanse of butcher block paper.

- VSM the Current State.
- VSM the Ideal state.
- Identify and label all the forms of waste in the Current State.
- Identify how the process is failing to meet customer CTQs.
- Redraw the Current State to meet the minimum goal of achieving customer CTQs.
- Evaluate differences between the Future State and the Ideal State. What differences can be practically overcome in a reasonable time frame?
- Make adjustments as required if more waste can be eliminated from the process.

3.2.4 Expected Outcomes

- Process map for re-engineered work flow.
- Action plan to implement new process and controls.

3.3 BALANCED, SPECIFIC, MEASURABLE, ATTAINABLE, RESULTS FOCUSED, TIMELY (B-SMART) METRICS

3.3.1 Purpose

B-SMART is a guide for creating metrics that are aligned with a value stream and are used as improvement targets. Most importantly the metric should encourage lean behaviors and not short term cost control.

3.3.2 Description

B-SMART metrics are important during the problem definition phase of process improvement activities. Using the B-SMART acrostic as a guide for developing measures of Quality, Cost, Delivery, Safety, or Morale should produce a metric that is:

- Balanced – Ensure goals are balanced across the multiple fronts of organizational output and multiple targets
- Specific – Have desirable outputs that are based on subject matter expert knowledge and experience and are applicable to the process improvement activity
- Measurable – Includes time frames and have data that is obtainable from specific sources
- Attainable – Resources are available; may have some risk, but success is possible
- Results Focused – Link to the mission, vision, and goals and are meaningful to the user
- Timely – Provide step-by-step views versus giant leaps and are measurable at interim milestones

3.3.3 Actions

The Level 1 or Level 2 should follow the steps below to assist a team with developing B-SMART Metrics:

Resources Required: Flip Charts, markers

- Identify what type of metrics (financial, behavioral, core-process) are appropriate to the process improvement activity
- Define the purpose for collecting data, what the team needs to know from the data being collected, and can the team take action on the data collected.
- Create a standard definition for the metric to include the type of metric, reason for its selection, data source and method of collection, formula, periodicity
- Create a data collection process that includes who will be collecting data, how the data will be used. The data collection process should be as simple as possible and be automatic. The least amount of effort exerted by personnel to collect data minimizes the errors associated with the data.

3.3.4 Expected Outcomes

- Establishment and use of balanced measures that ensure overarching goals are achieved and timely leadership/management action is taken.
- Means in place to ensure attainment of one metric and goal is achieved without harm to other areas of importance (eg., driving mission improvement by demanding longer duty days)

SECTION FOUR: DETERMINE ROOT CAUSE

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Root Cause Problem Solving
- B. 5 Whys
- C. Brainstorming
- D. Pareto Diagram
- E. Affinity Diagram
- F. Fishbone Diagram
- G. Control Charts
- H. Interrelationship Digraph [To be produced]

4.1 ROOT CAUSE PROBLEM SOLVING

Description of the Situation

Much of what Air Force officers do is solve problems and make decisions. New officers, in particular, often make decisions and solve problems by reacting to them. They are "under the gun," stressed and very short for time. Consequently, when they encounter a new problem or decision they must make, they react with a decision that seemed to work before. With this approach, it is easy to get stuck in a circle of solving the same problem over and over again. In problem solving you must use a systematic approach.

4.1.1 *Description of the Tool*

Initial Problem Perception

- Do you know enough to know what to do?
- If the problem is large, vague, and complicated, then break down the problem into smaller problems.
- If there are clusters of problems then identify which of them is the most important (use prioritization matrices).
- Which one you address first may be based on the most pressing issues, such as quality, cost, productivity, manpower, etc.

Clarify the Situation

- Clarify the Real Problem.
 - Ask "What should be happening?" This is based on standards.
- Check the standard or standardized work.
- Is everything in the general standard condition? If not, return to the standard condition and the problem will probably disappear.
- If no standards exist then "What should be happening?" is based on your "expectations" and the supervisor's idea of what a standard would look like if there were one.

- Ask “What Is Actually Happening?”
- This is based on confirmed facts (data) – not opinions or guesswork. Remember, the plural of anecdote is not data.
- Try to look at existing data first.
 - If data doesn’t exist, set up a baseline measurement of the problem as it exists now. Capture quantifiable data.
- Interview everyone that deals with the problem. **Use Caution:** Be sure to distinguish between fact and fiction as you may be dealing with assumptions (opinions).
- You should personally “go see” the actual situation where it exists to get a clear picture of the problem.
- Make sure everyone “sees” and understands the same problem in the same way.
- Identifying the “real problem” is the purpose of “clarifying the situation.”

Locate the Point of Cause of the Problem (area or geographic location of the abnormality)

- Breaking down the data may indicate where the point of cause is located. If so, “narrow down” at that area. When “narrowing down” the occurrence is in front of you.
- May have to “track back” through the processes or procedures to find a single occurrence causing the problem.
- The point of cause is the point of attack to start the cause and effect investigation.
- Keeping an open mind is critical to good observation at the point of cause.
- Point of cause is where you identify possible causes based on what you see first hand.

Cause and Effect Investigation

- Direct Cause (an action causing the problem).
- Look for the “direct cause” of the abnormality. You need to know why something is happening before you decide how to stop it. Abnormalities are the result of something.
- Establish the relationship of the cause and effect. Record what you investigated, how you investigated, and the results of the investigation.
- Build the “5 Whys” (or more) Chain from the direct cause until you can reach the root cause.
- Establish each “why” on verified cause/effect relationship.
- Do the “therefore check” to see if the logic makes sense.

4.1.2 Root Cause

- Can you prevent the recurrence of the problem by addressing this cause?
- Is this cause the beginning of a chain of events that leads to the problem?
- Is this cause linked to the problem by a chain of cause and effect relationships?
- Does it pass the “therefore test?”
- If you continue to ask “why” will you get into another problem?

4.1.3 Countermeasure

- The purpose of the countermeasure is to eliminate the root cause and prevent recurrence of the problem.

- Can you take temporary action to improve or control the problem? These measures may or may not address the root cause of an identified problem.
- Put in a countermeasure (permanent) to directly address the root cause of the identified problem.
- Install “checkpoints” to ensure the countermeasure stays in place.

Follow-Up / Standardization

- Was the countermeasure trial effective in improving the problem?
- Did you have to revise any of the countermeasures or checkpoints?
- Have a tracking method for the countermeasures.
- Were the goals met?
- Communicate and standardize the countermeasure(s) across the organization.

Analysis of the Data

To determine the root cause of the problem so the Process Owner or Team Lead can implement a long term countermeasure. The Process Owner or Team Lead can use the systematic problem solving method to effectively address problems as they occur.

4.1.4 Expected Outcomes

- Identifying the real problem.
- Locating the cause.
- Installing a countermeasure for the cause.
- Following-up and standardizing the countermeasures.

4.2 FIVE WHYS

4.2.1 Purpose

The Five Whys is a simple method to help problem solving teams drill down to the “true” root causes. The Five Whys is one of many Root Cause Analysis (RCA) methods.

4.2.2 Description

To prevent a problem from ever occurring again, teams must address the root causes of the problems rather than just the symptoms. The Five Whys helps teams to drill down to the chain of events that lead to a problem. Teams should not take “five” as an absolute, as they may need to go deeper than five and rarely ever reach root causes in fewer than five steps. Teams should be cautious as the Five Whys implies that every event has only one cause. Often there are several factors that come together to cause an event. At times, teams may drill down to items that are out of their sphere of influence. Although the teams may not be able to control the ultimate root cause, they can at least inform those who do and implement countermeasures as far down the root cause chain as they are able.

4.2.3 Actions

A strength of the Five Whys is its simplicity. Teams start with a simple problem statement and ask, “Why did the problem occur?” When an explanation is reached the team asks why again...five times.

1. Why did the aircraft launch late?
 - Because the fueling team was slow.

2. Why was the refueling team slow?
 - *Because one Airman from the fueling team was in the infirmary with a broken leg.*
3. Why did the Airman break his leg?
 - *Because the Airman slipped on an oil spill in the hangar.*
4. Why was there an oil spill in the hangar?
 - *Because a machine in the hangar had old washers that were leaking oil.*
5. Why didn't the maintenance department change the washers?
 - *Because the maintenance department's budget was cut, and they chose to slide all the preventive maintenance events by six months.*

A good test of the logic in the drill down is to see if the chain works in reverse. Start at the fifth why and work back to the first, but instead of asking why say “therefore...”

4.2.4 Expected Outcomes

- Identification of true root problem causes vice symptoms to focus corrective measures.
- Narrowing a broader list of contributing causes to those whose resolution provides the greatest benefit.

4.3 BRAIN STORMING

4.3.1 Purpose

Brain Storming is a simple way for a team to generate a large number of ideas in a short amount of time.

4.3.2 Description

Brain Storming is a technique which allows the creative subconscious of team members to throw out ideas in a nonjudgmental setting. By establishing that ideas do not have ranks and there are no bad ideas, the team is freed of the fear of judgment and the creative juices get flowing. Doing Brain Storming in a team setting lets team members build on, and be inspired by, each others ideas. The technique is especially useful in finding creative new approaches to difficult problems. By itself, Brain Storming will not generate solution plans; however, in conjunction with other tools, such as Affinity Diagrams and Impact vs. Effort Ranking, Brain Storming can help kick start a problem solving team.

4.3.3 Actions

Brain Storming is most effectively completed in a group or team setting, ideally from four to 12 members. Necessary materials include a large stack of sticky notes, felt tip markers, and a wall size expanse of butcher block paper. Using sticky notes will facilitate sorting of the ideas and the likely next step, Affinity Diagramming.

One or two team members with good handwriting should be made scribes to ensure every idea is written to an individual sticky note. The team should be instructed to throw out any idea they can think of without consideration as to how feasible or outlandish the idea may seem. Team members should build on each others ideas.

The Level 1 or Level 2 should concentrate on the team ensuring every member is contributing and an open nonjudgmental environment is maintained. Team members who are especially loud or who have strong personalities may shut down less outgoing team members and should be effectively managed.

Allowing team members to take turns has the positive of ensuring all participate, but also has the downside of inhibiting the stream of consciousness and free flow of ideas.

4.3.4 Expected Outcomes

- Many ideas generated, categorized, and prioritized.
- Consensus agreements.

4.4 PARETO DIAGRAM

4.4.1 Purpose

The Pareto Diagram is a graphical technique to sort the critical few from the trivial many.

4.4.2 Description

The Italian economist Vilfredo Pareto (1848-1923) discovered that 80% of the wealth in Italy was held by 20% of the population. This 80/20 rule has later been shown to apply to almost every aspect of human endeavor. For example, 20% of customers will account for 80% of sales, 80% of sales will be generated by 20% of the sales force, and 20% of Airmen will account for 80% of a supervisors time.

Pareto Diagrams make it visually obvious which one or two causal factors drive the vast majority of the impact. Pareto Diagrams also provide a ranked order in which the factors should be addressed. Possibly the largest but least appreciated advantage of Pareto Diagrams is that they remove emotion from the debate. The failure modes that are most likely to be remembered are the ones with the greatest emotional linkage, or possibly those modes that point to “someone else” being responsible. Even though these emotional failure modes may be very rare and actually account for very little of the total impact, they are likely to be a source of heated debate and misdirection for a Problem Solving team. Pareto Diagrams dispassionately reflect only the cold hard data.

4.4.3 Actions

A Pareto Diagram could be used to depict aircraft mission abort reason codes. A column chart would be generated with a separate column for each mission abort code. The height of each column would represent the number of times of each of the abort codes had been reported. The most severe or frequent mode is graphed on the extreme left of the graph with the second most frequent to the 1st column's immediate right, and so on across the page to the right. The least often reported abort code would be on the extreme right. True to Pareto's Principal, data depicted this way almost always has a few columns on the left that are an order of magnitude larger than the rest of the columns on the page.

Microsoft Excel is an excellent tool for creating Pareto Diagrams. Merely enter the data in two columns; one column for factor titles and one for the quantitative measures. Sort the data in descending order. Highlight the data and choose column graph (the default 1st graph option) in the graphing tool.

4.4.4 Expected Outcomes

- Ability to see top results “20%” factors influencing “80%.”

4.5 AFFINITY DIAGRAM

4.5.1 Purpose

Affinity Diagrams provide an extremely simple and flexible method of organizing ideas and information.

4.5.2 Description

If a team is unfamiliar with a problem area or feels overwhelmed by a large volume of data or ideas, Affinity Diagrams can bring an initial level of order to the chaos. Affinity Diagrams simply lump together ideas or data points that have something in common. By grouping and regrouping ideas and data points, teams can begin to develop organized patterns of thought from disparate and incoherent information.

Affinity Diagrams are often used with the Brain Storming technique. The often-generated large volume of loosely related ideas is an ideal target for an Affinity Diagram. Fishbone Diagrams are a very specific form of Affinity Diagrams.

Affinity Diagrams may also be referred to as KJ Diagrams after Dr. Kawakita Jiro an early proponent of the method.

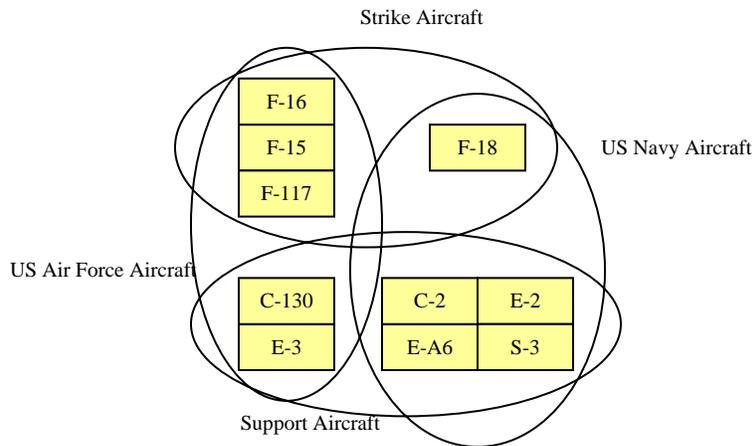
4.5.3 Actions

Affinity Diagrams can be built by team or individuals but as always “ten heads are better than one.” Resources Required: a wall sized expanse of butcher block paper or Flip Charts, Sticky notes, Markers:

- Create a separate sticky note for each idea, or data point.
- Arrange all the sticky notes on the left edge of wall where the entire team can see all the notes.
- Look for two of the notes that have something in common
- Move those two notes to their own area of the wall.
- Look for other notes that “fit” with the first two and move them over with the first two.
- Repeat steps three through five until all notes have been moved from the left edge into a specific affinity grouping(s).
- Some sticky notes may belong to more than one group. This is OK. The two groups will need to be moved next to each other on the wall so that the sticky notes belonging to both groups can also be near their original groups.
- Draw a circle around each affinity group of sticky notes and label the circles as to what factor all the occupants have in common. Some sticky notes may be simultaneously within more than one circle.
- Review the groupings.
 - Do all the affinity groupings make sense relative to each other?
 - Do one or more groups need to be dissolved and those sticky notes returned to the left hand edge?
 - Do any of the affinity group titles need to be “tweaked?” and one or more sticky notes removed from the new clearer affinity grouping title?
- Congratulations, you have just drawn an affinity diagram!

An example of an Affinity Diagram using yellow sticky notes on a butcher block paper with markers used to circle and label the affinity groups.

Figure J13 - Affinity Diagram



4.5.4 Expected Outcomes

- Organization of information into themes or categories.
- Use of information to discuss results.

4.6 FISHBONE DIAGRAM

4.6.1 Purpose

A Fishbone Diagram is a regimented method of organizing all the factors that may contribute to a problem.

4.6.2 Description

A Fishbone Diagram is a predefined form of Affinity Diagrams. Fishbone Diagrams literally look like a fish skeleton, with six ribs branching off a central spine. A problem statement serves as the fish head, with the six ribs representing the six broad categories of causal factors: Manpower, Machine, Method, Material, Measurement and Environment.

A fishbone diagram is an excellent way to organize data around an unfamiliar problem. In other problem solving methodologies, the fishbone diagram is referenced by alternate names: “5M&E” Diagrams, “4M” Diagrams (Measurement and Environment are left out), “Cause and Effect” Diagrams, and “Ishikawa” Diagrams.

4.6.3 Actions

A fishbone diagram is most effectively completed by a cross functional team of process and customer experts, ideally from six to 12 members. Materials needed include a stack of sticky notes, felt tip markers, and a wall size expanse of butcher block paper or flip chart paper:

- Draw the skeleton of the Fish to be filled in. Draw an Empty Rectangle for the Head on the right and a spine extending to the left. Draw three Parallel ribs branching off of the spine above the spine and three more ribs below the spine. Upper ribs point from the spine towards the upper left corner and lower ribs point to the lower left.

- Label the Fish Skeleton. The Head contains the problem statement, and the ribs are labeled Machine, Material, Measurement, Method, Manpower, and Environment.
- Have the team brainstorm ideas that could be contributing to the problem.
- Write each idea on a separate sticky note.
- Place each sticky note on the rib that most closely describes the category the idea relates to.
- After free flowing stream of consciousness dries up, have the team concentrate on each rib, one at a time, to try and squeeze a last few ideas out of the team.

4.6.4 Expected Outcomes

- Visual structure of cause and effects.
- Aids in cause identification for a defined problem.
- Balanced look at problem causes.

4.7 CONTROL CHARTS

4.7.1 Purpose

Control Charts visually organize time series data collected on the results of a process. The visual display of quantitative data makes it easier to observe how a process is behaving, and differentiate between variation due to “noise” (also called Common Cause Variation) and variation that signals a significant change in the process (also called Special Cause Variation).

4.7.2 Description

Control Charts are run or line charts with a time series running along the horizontal axis. The vertical axis usually represents some quantitative measure of the process output as sampled at a fixed interval. The chart typically has three equally spaced horizontal lines running across the chart. The center line is the expected average of the measurements, the upper line is the Upper Control Limit (UCL), and the lower line is the Lower Control Limit (LCL). Data points that fall above or below the control limits indicate a change has occurred in the process and an adjustment should be made to the process. As long as the data points fall between the UCL and LCL the process is behaving normally and no action should be taken.

For example, for a drill press that machines 200 bolts per hour, five bolts might be weighed at the beginning of each hour. The average weight of the five bolts is then plotted on the chart each hour. The average expected weight might be 1.0 ounce and the UCL and LCL are 1.1 ounces and 0.9 ounces. Over time a series of data points will appear and let the machine operator know if the process is working within control limits, with no adjustments needed, or if the process is out of limits, requiring adjustments. Anytime a process change is initiated by the operator the change should be annotated on the Control Chart.

Control Charts can also reveal patterns in the process output. Day shift personnel might produce heavy bolts, or night shift personnel might make more process changes than required. Control Charts are also referred to as Shewhart Charts after their creator, Walter Shewhart (1891-1967).

4.7.3 Actions

Once the Control chart is set up, the person closest to the work should be placed in charge of taking the samples and entering the data in the chart. UCL and LCL values can be determined mathematically based on sample size and Standard Deviation of the data points already collected. UCL and LCL values are also sometimes taken from customer specifications.

4.7.4 *Expected Outcomes*

- Means to measure performance and identify normal versus abnormal variation to take corrective action.

SECTION FIVE: DEVELOP COUNTERMEASURES

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Analysis of Alternatives
- B. Cost-Benefit Analysis (CBA) / Return on Investment (ROI)
- C. Event Management
- D. Facilitate Effective Meetings
- E. A3
- F. Action Plans
- G. Timelines [To be produced]
- H. Financial Reporting Template [To be produced]

5.1 ANALYSIS OF ALTERNATIVES

5.1.1 *Description of the Situation*

When the Process Owner or Team Lead has identified countermeasures to address the root cause(s), it is necessary to evaluate the countermeasures prior to implementation. The object is to narrow a list of countermeasures to a manageable number. Screening is done by a surface evaluation to determine if any of the possible countermeasures are unworkable on the basis of established criteria.

5.1.2 *Description of the Tool*

The following questions are used to test possible countermeasures to see if they are workable.

- *Effectiveness*: Can this countermeasure help me achieve my target/goal? How well will this countermeasure work? Will this countermeasure prevent recurrence of the problem?
- *Feasibility*: Is this countermeasure possible in this situation in light of cost, safety, resources, management approval, and time?
- *Impact*: Will this countermeasure create more problems than it helps solve? What effects will this countermeasure have on my job, team, other operations, and the Air Force?

Countermeasures that do not pass this surface check are dropped from immediate consideration to arrive at a narrowed list of possible countermeasures. Note that countermeasures are set aside from immediate consideration rather than discarded because they may be needed if the narrowed list does not survive thorough evaluation. The object is to identify strengths and weaknesses of all countermeasures on the narrowed list so they can be compared for selection.

Thorough evaluation is done by projecting the outcome of each countermeasure if it were implemented in the problem situation. Outcome is projected in terms of the three effectiveness evaluation criteria. An Alternative Analysis Rating Matrix is used to evaluate and rate possible countermeasures on the basis of the three criteria and organize the information for comparison. Various questions are asked for each

criterion to project and evaluate the outcome of a possible countermeasure. The specific questions used vary depending on the problem situation.

Figure J14 - Alternative Analysis Rating Matrix

Countermeasure Ratings: 1 = Low, 2 = Medium, 3 = High

Possible Countermeasures	High Effectiveness	High Feasibility	High Impact	Low Cost	Total

5.1.3 Analysis of the Data

To determine which countermeasure is appropriate, the Process Owner or Team Lead should use the above matrix. The rating table will explain to the Process Owner or Team Lead’s superior officers the rationale for selecting a particular countermeasure against all of the alternatives.

5.1.4 Expected Outcomes

- Select the best countermeasure, judged in the context of:
 - Cost effectiveness.
 - Ease in implementation.
 - Degree of impact.
 - Ability to address the root cause.

5.2 COST BENEFIT ANALYSIS (RETURN ON INVESTMENT)

5.2.1 Description of the Situation

Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment or to compare the efficiency of a number of different investments. Return on investment is a very popular metric because of its versatility and simplicity. That is, if an investment does not have a positive ROI, or if there are other opportunities with a higher ROI, then the investment not be undertaken. A negative ROI indicates that the costs far outweigh the benefits and therefore, the project should not be initiated.

5.2.2 Description of the Tool

To calculate ROI, the benefit (return) of an investment is divided by the cost of the investment; the result is expressed as a percentage or a ratio.

Figure J15 - ROI Calculation

$$ROI = \frac{\text{Gain from Investment} - \text{Cost of Investment}}{\text{Cost of Investment}}$$

$$\text{Dock-to-Dock Time} = \frac{\text{Total Units}}{\text{End of Line Rate}}$$

5.2.3 Total Cost per Unit

Figure J16 - Total Cost Per Unit Calculation

$$\text{Total Cost} = \frac{[\text{labor cost} + \text{overhead cost} + \text{material cost} + \text{warranty cost} + \text{freight cost}]}{\text{\# of good units produced}}$$

5.2.4 Analysis of the Data

Calculations must be made to determine whether the investment should be undertaken. If a negative return on investment indicates that the costs outweigh the benefits, then the project should not be initiated. A chart like the one below is useful to see the relationship between actions taken and expected outcomes. From the information contained you can see the impact on total cost.

Figure J17 - Expected Outcomes

Category	Current Cost	Projected Improvement	Projected Savings
Finished Goods Inventory	\$5,392,659	60%	\$3,234,000
Work in Process Inventory	\$1,225,000	50%	\$612,000
Raw (Static) Inventory	\$265,000	30%	\$79,500
Labor Cost (Straight Time)	\$4,775,000	20%	\$955,000
Labor Cost (Over Time)	\$211,000	20%	\$42,200
Scrap Reduction Per Year	\$1,736,000	20%	\$347,200
Administration	\$100,000	30%	\$30,000
Returns	\$50,000	10%	\$5,000
TOTAL COST	\$13,752,000		\$5,305,400

5.2.5 Expected Outcomes:

- Reduce inventory.
- Improve equipment and processes.
- Work with purchasing and suppliers to reduce cost of components and raw materials.
- Improve racks and packaging.
- Build it right the first time.
- Build to a production schedule.
- Achieve best in the world levels of efficiency.

*Note – You must use your actual categories and data for this analysis

5.3 EVENT MANAGEMENT

The earliest phase within the AF three-phase implementation model is annotated in parentheses after each tool or method.

5.3.1 Description of the Situation

Once the situation is understood and the problems to be solved are known, it is time to create a plan to move forward. The plan is called a Project Plan.

- That plan has several important characteristics and each important to the final outcome. Skipping steps or not carefully monitoring the accomplishment of the plan will result in more waste in the system.
- The plan is a systematic process that helps to define the current situation, create a clear definition of the plan, careful planning at the task level including resources, potential failure modes, and potential opportunities.
- The overall feasibility of the plan is tested against both the goals of the organization and cost to accomplish the plan.

5.3.2 Description of the Tool

- The initiation phase requires the plan to be discussed at several levels to determine priorities and steps to move forward.
- Only then is implementation to begin. Careful planning can substantially reduce implementation issues and costs.
- During the implementation phase, the most important post planning activities take place. A series of reviews are conducted on a regular basis that allows everyone to see how well the plan is being enacted and to work problems as they occur. Occasionally modifications are required, but in an AFSO21 organization, these are minimal and problems encountered will necessitate aggressive problem solving to achieve the agreed upon plan. Any change to the plan must be documented and part of the review in the future.

5.3.3 Analysis of the Data

- A project plan used as a standard is a rich source of data. It will help the project manager quickly gain understanding to the issues and consequences.
- Once a deviation from the plan is understood, the problem solving process begins and issues are looked at in a much greater depth. Deviations to almost all plans are common in most cases.

5.3.4 Expected Outcomes

- Alignment of action to expected outcomes.
- Systematic process for managing projects to reduce waste.
- A unified view of the problems.
- An enacting force for problem solving.
- A plan as a standard.
- Attention to detail in cost, performance, and time parameters.
- An opportunity to bring a team together for a common outcome.

Use the critical path (PERT Chart) as an opportunity to see the impact of missed deadlines on the total time for the project.

5.4 FACILITATING EFFECTIVE MEETINGS

5.4.1 Description of the Situation

When two or more people come together to meet, the communication that takes place is often ineffective. The ineffective communication might take place for several reasons including lack of understanding and agreement about the purpose of the meeting, the agenda, the decision-making process, start and end times,

who should attend, roles and responsibilities, as well as ineffective personal communication skills. What is needed is a way to address those issues. That way is meeting facilitation.

5.4.2 Description of Tool

Facilitation for effective meetings involves three steps, each with specific processes and tools.

- **Step One:** Planning for an effective meeting. During the planning step, the person responsible for managing the meeting (ideally, with the help of the meeting Level 1 or Level 2) must complete the following:
 - Determine the purpose of the meeting.
 - Consider the organizational context for the meeting.
 - Identify key stakeholders/meeting participants.
 - Develop an outcome statement(s).
 - Determine the topics to be covered.
 - Determine his/her expectations for participants.
 - Determine processes/tools to be used including decision-making processes.
 - Determine time requirements/boundaries.
 - Consider potential “bumps” in the meeting and how they might be addressed.
 - Consider necessary roles and who will fill them.
 - Determine the location of the meeting.
 - Determine the room arrangement for the meeting.
 - Build a detailed agenda for the meeting.
 - Build a plan for communicating to, educating, and preparing the participation to be successful in the meeting.
 - Determine what he/she personally need to be ready – to be fully capable and committed to making sure the meeting is successful.
 - Initiate contact with meeting participants according to the communication/ education/ preparation plan.
- **Step Two:** Conducting an effective meeting. During this phase, the person responsible for the managing the meeting (ideally, with the help of the meeting Level 1 or Level 2) must make sure the following are completed:
 - Educate participants on processes and tools to be used.
 - Work to assure that meeting participants are focused on the same step of the meeting process.
 - Work to assure that meeting participants are focused on the same tool.
 - Constantly check for understanding and agreement/consensus.
 - Be transparent with the conversations that she/he is having in his/her head.
 - Encourage appropriate participation.
 - Start and end processes/tools clearly.
 - Use an appropriate room arrangement.
 - Record ideas as given in the participants’ own words.
 - Use appropriate interventions to keep the meeting “on track”:
 - Maintain/regain focus.
 - Say what is going on.
 - Call “time-out” to talk about what is going on.

- Enforce agreements.
 - Ask questions for understanding.
 - Call “time-out” to talk about what is going on.
 - Manage process battles.
 - Demonstrate compassion.
 - Recommend an alternative tool when needed.
 - Ask participants for help when needed.
 - Use a “parking lot” for deferred issues.
 - Summarize the situation.
 - Encourage participation.
- **Step Three:** Following an effective meeting. During this phase, the person responsible for managing the meeting must make sure the following are completed:
- Send participants:
 - A full summary of the meeting.
 - The action plan if any was developed.
 - A “thank you” and a restatement of the purpose and importance of the work done in the meeting.
 - The initial information on the next meeting if any.
 - Information/education material as needed.
 - Phone/meet with participants as needed.

5.4.3 Analysis of the Data

There is data that must be analyzed in each of the three steps for effective meetings. In the first step, *Planning for an Effective Meeting*, it is important to determine what knowledge and skills participants will need to fully participate in the meeting. In the second step, *Conducting an Effective Meeting*, it is important to constantly assess how effectively the participants are following the agenda and determine what process/tool to use to improve their ability. In the third step, *Following an Effective Meeting*, it is important to review the agenda to assess what was accomplished and what remains to be accomplished.

5.4.4 Appropriate Tool to be Used

The most effective tools to be used in making sure a meeting is effective are first, a detailed agenda and second, a set of meeting processes and facilitation tools that can be used to guide participants through the agenda.

5.4.5 Expected Outcomes

Expected outcomes include: 1) a completed agenda, 2) a detailed description of who will do what, when as part of the meeting follow-up, and 3) participants who are satisfied with their work done in the meeting.

5.5 A3

5.5.1 Purpose

The A3 is an approach to communicating specific information about a process improvement event at a high level. The important take away from this A3 module is that there is a flow or approach to providing specific information that is helpful when deciding what information should be documented for distribution.

5.5.2 Description

The content of the A3 developed by the team should tell a story: Problem Definition and Description, Problem Analysis, Implementation Plan, Results, and Future Steps. AFSO21 uses three types of A3 formats for communicating process improvement information: A3 Status Report, A3 Summary Report, and A3 Problem Solving.

5.5.3 Actions

The Level 1 or Level 2 should follow the steps below to perform complete an A3:

Resources Required: A3 Status Report Template, A3 Summary Report Template, and A3 Problem Solving Template.

1. Complete each template, filling in the blanks with the requested information (See Vol O).

5.5.4 Expected Outcomes

- Summary, Status or Result of 8-step OODA problem solving process documented on one page.
- Clear display of key information needed by organizational leadership.
- Highlighting of critical action for leadership involvement.

5.6 ACTION PLAN

5.6.1 Purpose

The Action Plan is used to capture and plan process improvement initiatives that are identified by process owners, champions, and team members during many types of planning sessions and events.

5.6.2 Description

The Action Plan provides the Level 1 or Level 2 with a method to capture high value initiatives that can provide a measurable impact to an organization's process. Identified in the Action Plan are the Key Air Force processes that will be impacted, and the level of importance that should be placed upon the initiative.

5.6.3 Actions

Resource Required: Action Plan template. Below are the steps to completing the Action Plan.

1. Identify session being performed where initiative was discovered (i.e., Strategic Working Group, etc.) or when initiative is to be accomplished (i.e., RIE, Project, Do-It).
2. Start and End Date: Format ddmmyy

3. Difficulty/Impact – Identify the difficulty vs. impact of the initiative. The best combination is in quadrant 1 (Low Difficulty/High Impact).
4. Readiness – Identify for each area of the current state how prepared you are for change.
5. Scope – Indicate the scope of the initiative (i.e., MAJCOM, Wing, Staff, etc.)
6. Champion – Identify, by Name, who the Champion is for the initiative.
7. Process Owner – Identify, by Name, who the Process Owner is for the initiative.
8. Lead – Identify, by Name, who will the Lead the initiative.
9. List under Lead who will be a team member on the initiative. Identify by PRIM or SUPT who will be a voting member of the team.
10. Event Title – Succinct, Definitive, Descriptive Statement
11. Issue to be Addressed – Problem Statement (e.g., 4Ws – What, When, Where, Why) – Do Not Mention Solution Here
12. Mission Description – Solution – What and How
13. Areas to Consider – Detailed Guidance Points to Clarify Mission Vector – List Potential Opportunities and Obstacles
14. Objective(s)/Deliverable(s) – Measurable Results – This has to answer the “so what?” with a specific yield by a specific date. How will success be measured? What metrics will be applied to compare the end result with the start point? If the metric is not “pure” (i.e., reduce time required from 1 hour to 30 min), define the calculation required. Balanced – Specific – Measurable – Attainable – Results Focused – Timely – Evaluated – Reviewed (B-S.M.A.R.T.E.R.)
15. Progress/Status Reporting – From Who/To Who/What/When (NLT/Frequency)
16. Who/What is OUT – Areas and people that are not in play
17. Critical Path – Determined by using a PERT Chart
18. AFSO21 Desired Effects – Select 1st and 2nd Order Effects of the Initiative
19. Targets (Waste to be Eliminated) – Select all that Apply
20. Data – Identify the current state of data.
21. Demand – What type/degree of support will be required? How urgent is the effort?
22. AF KP Touch Points – Select what Governing, Core, or Enabling process is going to be affected by the initiative.

5.6.4 Expected Outcomes

- Projects, events, and do-its.
- Responsibilities and completion dates assigned.
- Follow-up dates established to ensure counter-measures in place and performance gains achieved.
- Leadership endorsement of the team’s plan.

5.7 ACTION PLAN – STRATEGIC LEVEL

5.7.1 Purpose

The Strategic Action Plan is used to capture and plan process improvement initiatives that are identified by process owners, champions, and team members during strategic planning sessions and events.

5.7.2 Description

The Strategic Action Plan communicates the high level process improvement objectives of senior leaders to all levels of the command. Identified in the plan are the Air Force Key Process Owners that will be impacted, and the level of importance that should be placed upon the objectives.

5.7.3 Actions

Resource Required: Action Plan Strategic - Template. Below are the steps to completing the Strategic Action Plan.

1. Objective. This is the objective identified by senior leadership and is to be linked to the Communication Plan – Strategic.
2. Events column will be checked if there is an event scheduled/ongoing to accomplish the specific action.
3. Short Description. Briefly describe the action to be taken.
4. Details and Deliverable. List specific steps to accomplish the objective and action theme.
5. OPR. Identifies the person/unit responsible for this specific action.
6. Plan Dates. The start and finish dates identified for accomplishing achievement strategies.
7. Catchball. This column will be checked to identify that there is a link to another unit for support or action.
8. Comments. Use this area to expand on the Catchball or other significant information related to this action.
9. Status. This block is color coded, in accordance with the legend, to identify the progress of the action to completion.

5.7.4 Expected Outcomes

- Projects, events, and do-its.
- Responsibilities and completion dates assigned.
- Follow-up dates established to ensure counter-measures in place and performance gains achieved.
- Leadership endorsement of the team's plan.

SECTION SIX: SEE COUNTERMEASURES THROUGH

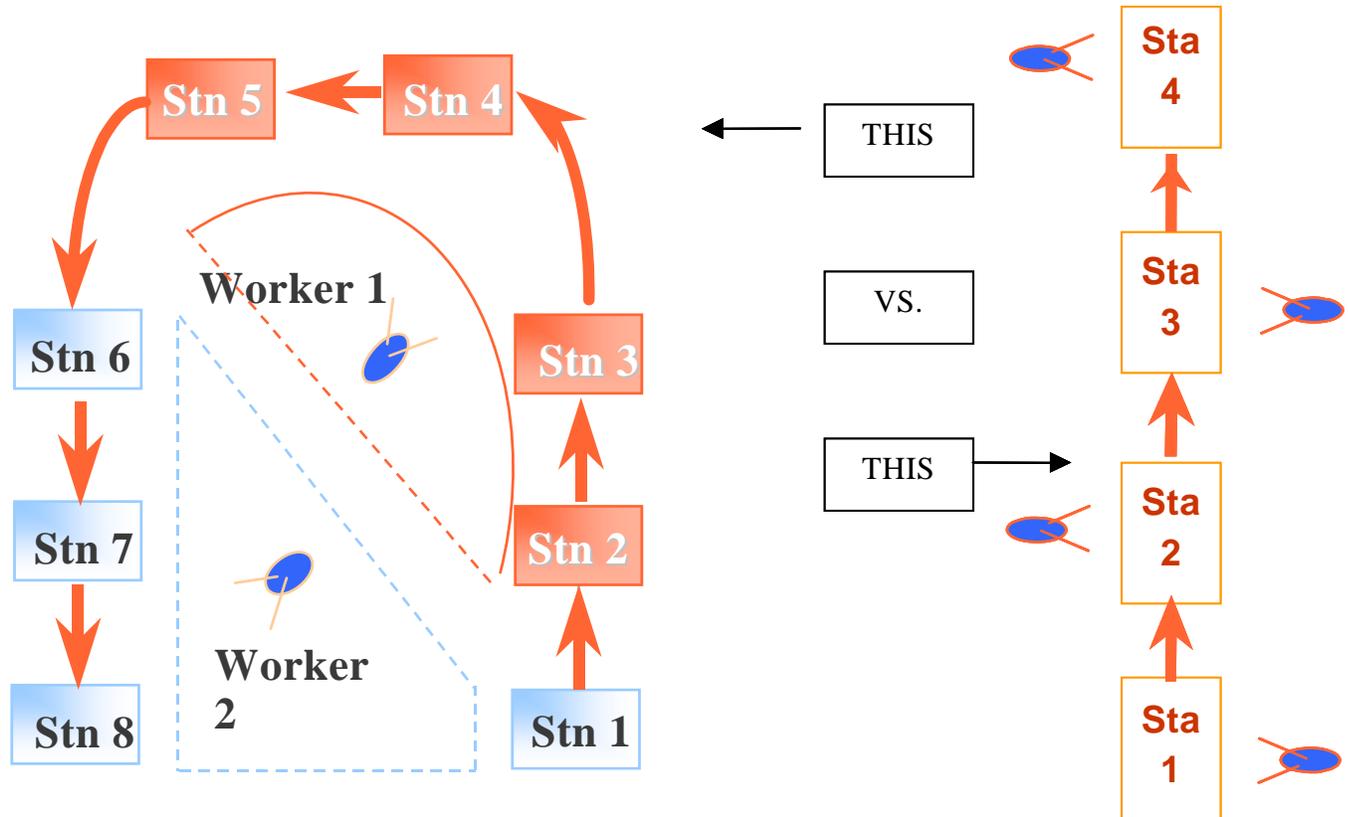
This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Cell Design
- B. Visual Management
- C. 6S
- D. Line of Sight
- E. Material / Information Flow Design
- F. Quick Changeover
- G. Error Proofing
- H. Process Design
- I. Level Production
- J. Team Problem Solving
- K. Change Management
- L. Communications
- M. Work Design / Ergonomics
- N. Applying Visual Management – Process Control
- O. AFSO21 Event Guidelines
- P. Standard Work [To be produced]
- Q. Variation Reduction [To be produced]
- R. Total Productive Maintenance (TPM) [To be produced]
- S. Rapid Improvement Event (RIE) [To be produced]

6.1 CELL DESIGN

6.1.1 Description of the Situation

Figure J18 - Cell Design



When processes control what people do instead of people controlling what processes do, it is an unarguable sign that there is a need for implementing cell design into an existing value stream or process flow.

6.1.2 Description of the Tool

- Cell Design is characterized by the following:
 - Flexible worker loops.
 - Workers separated from machines or single processes.
 - Productivity improvement possibilities.
 - Improved communication.

6.1.3 Analysis of the Data

To help the Process Owner or Team Lead to determine if the process value stream needs to be in a cell design instead of separate individual operations.

6.1.4 Expected Outcomes

- Optimizing the dollars spent on value added activities.
- Increasing capacity at minimum investment.

- Minimizing travel distances of both man and material.
- Balancing workloads.

6.2 VISUAL MANAGEMENT

6.2.1 *Visual Management – use visual controls so no problem is hidden*

- Use simple visual indicators to help people determine immediately whether they are in a standard condition or deviating from it.
- Design simple visual systems at the place where the work is done.

6.2.2 *Description of the Situation*

Line of sight is a term for having a visual work environment that is set up with signs, labels, color-coded markings, etc., such that anyone unfamiliar with the process can, in a matter of minutes, know what is going on, understands the process, and knows what is being done correctly and what is out of place. There are two types of applications in visual factory: displays and controls.

- A visual display relates information and data to employees in the area. For example, charts showing the monthly revenues or a graphic depicting a certain type of quality issue critical to air force personnel.
- A visual control is intended to actually control or guide the action of personnel. Examples of controls are readily apparent in society: stop signs, handicap parking signs, no smoking signs, etc.
- Visual controls describe workplace safety, production throughput, material flow, quality metrics, or other information.
- The most important benefit of a visual factory is that it shows when something is out of place or missing.
- Visual displays and controls help keep things running as efficiently as they were designed to run.
- Visual information can also help prevent mistakes. Color coding is a form of visual display often used to prevent errors. Shaded "pie slices" on a dial gauge tell the viewer instantly when the needle is out of the safe range. Matching color marks is another approach that can help people use the right tool or assemble the right part.

6.2.3 *Description of the Tool*

Visual displays can take many forms. The essence of the concept is that there should be a clear visual indication of any situation where a non-standard is present. It should be easy for someone who knows nothing about a process to quickly assess the current situation. This aids in the process of problem solving. A problem is defined as a deviation from a standard or known expectation. Listed below are some examples:

- | | |
|---|--|
| <ul style="list-style-type: none"> ▪ Color-coded pipes and wires. ▪ Painted floor areas for good stock, scrap, trash, etc. ▪ Shadow boards for parts and tools. ▪ Indicator lights. | <ul style="list-style-type: none"> ▪ Work group display boards with charts, metrics, procedures, etc. ▪ Production status boards. ▪ Direction of flow indicators. |
|---|--|

Visual factory is the systems model of how visual display can be enhanced to accomplish the visual workplace. At the bottom of the systems view is the important concept of having a stable work

environment anchored by having the workplace organized so that its current condition is known, organized, marked, and maintained.

As you go further up the pyramid, you aggregate the organized workplace to give the value adder a clear view of what is present or not present in the management of the system. This is accomplished by creating the standards and sharing information visually so the person adding value can quickly assess the current situation.

This leads to the concept of Visual Control. Visual control is using information given by the process to assess condition or status that drives improvement or maintenance of the standard.

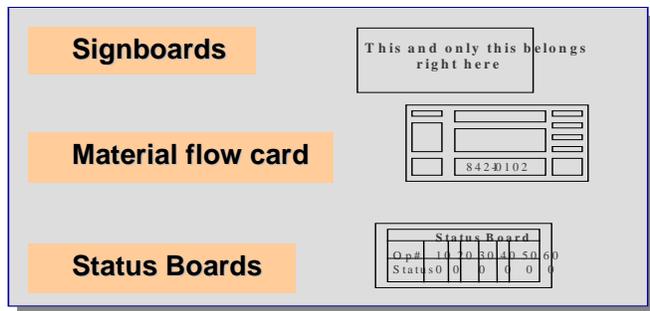
6.2.4 Analysis of the Data

To determine, in the least amount of time, the status of the workplace through the use of line of sight visuals. The Process Owner or Team Lead can distinguish promptly between a normal and an abnormal condition.

6.2.5 Expected Outcomes

- These visuals will make abnormalities and waste obvious enough to be recognized.
- Constantly exposing the need for improvement.
- Preventing defects and errors.
- Sharing information.
- Organizing and standardizing the workplace.

Figure J19 - Visual Displays and Controls
Visual Displays and Controls



6.3 SIX "S"

6.3.1 Description of the Situations

Early in the implementation the need for a stable foundation arises. The appropriate response is to establish the fundamental disciplines that will drive the implementation of AFSO21 forward. Six S is one of the most important disciplines. The ordering of a work area into a clearly visual managed area where there is a place for everything, everything is in its place, and the standard established is sustained, requires the use of Six S. The need for Six S is visually determined by asking the most basic questions.

- Is the workplace non-standard or standard?
- Is the placement of materials, equipment, and work instructions aimed at reducing waste?
- Can you determine what is important by the visual status of work?

6.3.2 Description of the Tool

Six S - is a structured process for bringing affirmative answers to the above questions and provides the foundation for visually managing the workplace. Six S is a basic, fundamental, systematic approach for productivity, quality, and safety improvement in all types of business. Each "S" stands for a step in achieving workplace order. It focuses on achieving visual order, organization, cleanliness, and standardization. The expected results are improved profitability, efficiency, and service.

- Sort -- the first step in cleaning and organizing things.
 - Sort through everything in the work area and keep only what is necessary by discarding items that are used.
 - Everything that isn't used frequently should be moved to a separate, common storage area.
- Straighten -- organize, identify, and arrange everything in a work area.
 - There should be a place for everything and everything in its place, with everything properly identified and labeled.
- Shine -- regular, usually daily, cleaning and maintenance.
 - Inspect everything while cleaning, including machines, tools, equipment, and supplies.
- Standardize -- make it easy to maintain - simplify and standardize.
 - Standardize when the fastest, safest, best quality, repeatable steps have been identified.
 - Allows individual creativity to improve upon the standards.
- *Sustain*-- continue to train and maintain the standards.
 - Establish a formal system for monitoring the results of Six S.
 - Make needed changes in the standards and provide training that addresses those changes.
- *Safety* -- Make sure that no improvement to the workplace is operating in a way that decreases the level of safe operation in the area.

6.3.3 Analysis of the Data

To determine if Six S is appropriate, the Process Owner or Team Lead need only observe the workplace and ask the above questions. Unless personnel in the area have been diligent in their Six S over a long period of time, the Process Owner or Team Lead should insist those in the area check their Six S condition using an audit sheet.

6.3.4 Expected Outcomes

- Discipline in how the workplace is ordered.
- Equating misplacement of materials, information, equipment, etc. as waste.
- Less waste in movement, waiting, and excess inventory.
- Self-maintaining workplace.

6.4 LINE OF SIGHT

6.4.1 Description of the Situation

Line of Site visual control is a term used to describe means, devices, or mechanisms to manage or control operations (processes) so as to meet the following purposes:

- Make the problems, abnormalities, or deviation from standards visible to everyone and thus corrective action can be taken immediately.
- Display operating or progress status in an easy to see format.
- Provide instruction.
- Convey information.
- Provide immediate feedback.

The main purpose of Line of Site visual control is to organize the working area in a way that people (even outsiders) can tell whether things are going well or are amiss without the help of an expert.

One of the biggest visual control innovations is the “big room.” This is a very large room in which many visual management tools are displayed and maintained. Most often the tools are displayed on signboards, or on large walls in the workplace. The tools display the status of each area of quality, cost, productivity, maintenance, safety, etc. These tools include the status of each item compared. These tools can be reviewed by any of the airmen. Any deviation from the schedule or performance targets is immediately visible. This system enables fast and accurate decision making. A well developed visual control system increases productivity, reduces defects and mistakes, helps meet deadlines, facilitates communication, improves safety, lowers costs, and generally gives workers more control over their environment.

6.4.2 Description of the Tool

- Use line of site visuals so no problems are hidden.
- Use line of site visuals to help airmen to determine immediately whether they are in a standard condition or deviating from it.
- Try to communicate on one piece of paper so the reader sees at a glance the most important points for decision making.
- Avoid using a computer screen when it moves the worker’s focus away from the workplace.
- Reduce your reports to one piece of paper whenever possible, even for your most important financial decisions.
- It is important to use visual management charts and graph everywhere. The charts allow for communication and sharing.

6.4.3 Analysis of the Data

To enable the Process Owner or Team Lead, upon entering a work area, to immediately assess the status of the workplace as to whether it is in a standard condition. The Process Owner or Team Lead should be able to scan charts and graphs very quickly to ascertain the work status.

6.4.4 Expected Outcomes

- Correct problems.
- Reduce costs.
- Reduce waste.
- Shorten lead time and keep the delivery due date.
- Reduce inventory.
- Ensure a safe and comfortable working environment.
- Increase productivity.

Figure J20 - Signboard Example



6.5 MATERIAL / INFORMATION FLOW DESIGN

6.5.1 Description of the Situation

- Product flow is typically the only focus considered and there is a need to consider the other two flows:
 - Material.
 - Information.
- The flow of material and information tells people what needs to be done next and with what materials (inputs).

6.5.2 Description of the Tool

- Information Flow:
 - Starts with the customer requirements and follows the path of what happens with the customer requirement information.
 - Through scheduling, actual processing and through the entire value chain.

6.5.3 Material Flow

- Based on a PULL SYSTEM in return is again based on customer demand.
- What is needed, the right quantity, the right quality and when it is needed.

- Tools of a PULL SYSTEM:

- Sequencing.
- Broadcasting.
- Kitting.
- Kanban.
- Market Places.

6.5.4 Analysis of the Data

- Determine the right Material Flow and Information Flow systems required for each situation requiring implementation.
- The three flows are connected:
 - Product.
 - Material.
 - Information.
- Specify and simplify the three flows based on the current condition compared to the desired condition.

6.5.5 Expected Outcomes

- Implement and continuously improve Material and Information Flow.
- Understand Pull Systems.
- Determine the need for Kanban.
 - Rules of Kanban.
 - Simple is better.
- Establish Market Places.
- Establish Min/Max Inventory Levels.

6.6 QUICK CHANGEOVER

6.6.1 Description of the Situation

- When the Project Manager perceives a process or system demonstrates a need for improving throughput or consistency of quality output. Quick Changeover is the tool that will allow the following to prevail.
 - Improve consistency of operations.
 - Improve confidence in quality.
 - Support the principle of Continuous Improvement.
- There is downtime when a changeover takes place. Quick Changeover is used to reduce that time down in a value stream, system, or process.

6.6.2 Description of the Tool and Usage

- Quick Changeover is a designed tool for reducing the amount of changeover time in a system. Changeover time from one process to another, one machine to another, one aircraft to another.
 - There are five phases in a changeover event:
 1. Set up.

2. First system or process outgoing.
 3. Next system or process incoming.
 4. Adjustments.
 5. Cleaning, storing or placement of outgoing system or process.
- Steps to reduce changeover:
 - Gather the current changeover situation by collecting data.
 - Brainstorm how to streamline the changeover method.
 - Prioritize the improvement ideas.
 - Implement new ideas and create new “Current Best Method of Changeover”.

6.6.3 Analysis of the Data

- When the current changeover procedure is captured and we understand all the steps necessary for the changeover, we determine if they are INTERNAL or EXTERNAL steps.
 - Internal steps are steps that take place while the process is down.
 - External steps are steps that take place while the process is running.
- Decide if we can change some Internal Steps to External Steps.
- Streamline the remaining Internal Steps.
- Streamline the External Steps.
- Prioritize the Improvement Ideas.
- Create the new standard of changeover.

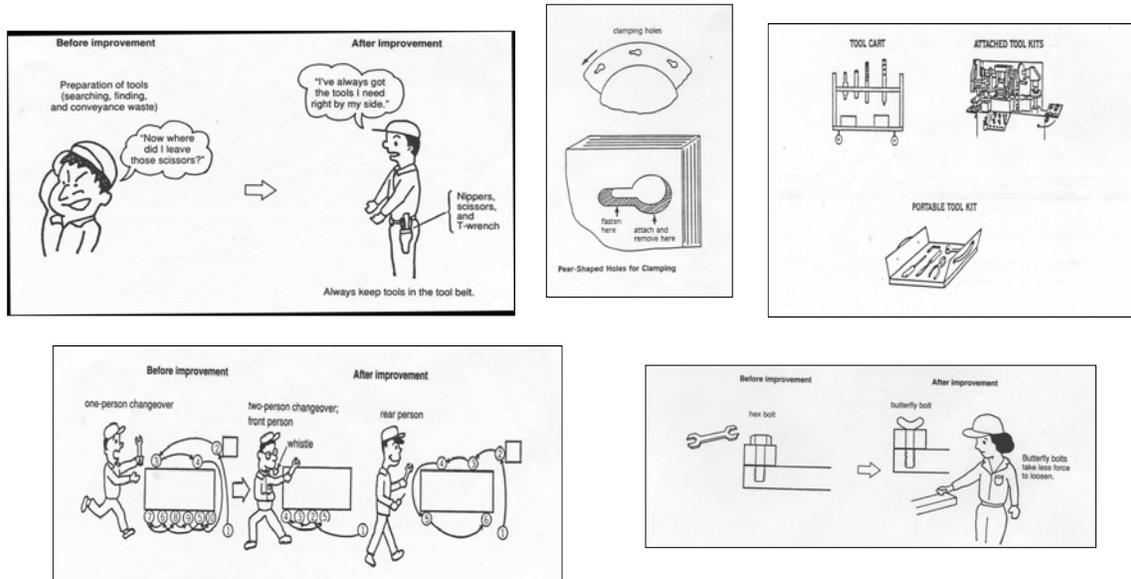
Figure J21 - Benefit Analysis Matrix

		BENEFIT	
		SMALL	LARGE
EASE OF IMPLEMENTATION	EASY	2 Medium Priority	1 High Priority
	HARD	4 Low Priority	3 Medium Priority

6.6.4 Expected Outcomes

- Increasing available time.
- Increasing ability to adjust to customer demand.
- Reducing rework / repair.
- Reducing amount of handling steps.
- Reducing obsolescence.
- Reducing lead time.

Figure J22 - Examples of Quick Changeover



6.7 ERROR PROOFING

6.7.1 Description of the Situation

People are human and cannot be expected to do everything like a machine, exactly the same each time. A simple distraction can lead to a part of their work being done wrong. It is also not necessarily their fault, as poorly designed processes that require a great deal of attention can contribute severely to problems. The basic principle of error proofing, is to design or develop tools, techniques and processes such that it is impossible or very difficult for people to make mistakes.

Error proofing is more of a concept than a procedure. Thus, its implementation is governed by what people think they can do to prevent errors in their workplace, and not by a set of step-by-step instructions on how they should do their job.

Error proofing is implemented by using simple objects like fixtures, jigs, gadgets, warning devices, paper systems, and the like to prevent people from committing mistakes, even if they try to. These objects, known as fool proof devices, are usually used to stop the machine and alert the operator if something is about to go wrong.

For example, a plate that must be screwed down in one orientation only could have the screw holes in non-symmetrical positions so that it can only be screwed in the right orientation. The principle can be easily used in non-manual situations (where mistakes can have huge costs associated). For example, in a project management process, checklists may be used at various times in the project to check that particular tasks have not been forgotten.

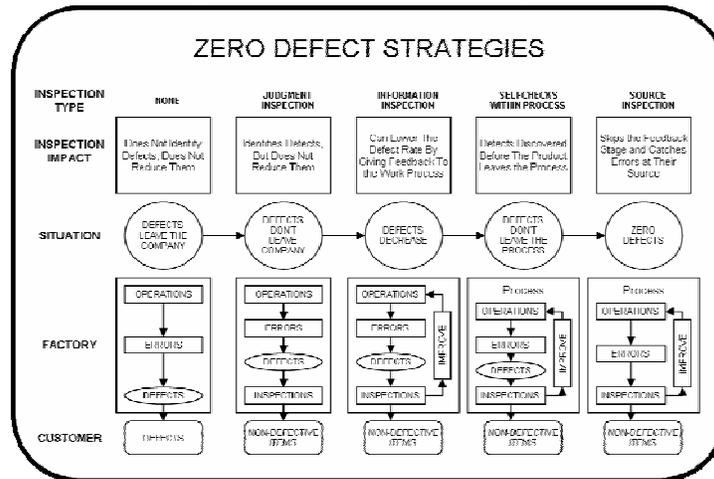
Ideally, error proofing ensures proper conditions exist before actually executing a process step, preventing defects from occurring in the first place. The basic function of error proofing is:

- A defect exists in one of two states: It is either about to occur, or it has already occurred. Error proofing has three basic functions to use against defects – shutdown, control, and warning.
- Recognizing a defect is about to occur is called “prediction,” and recognizing a defect has already occurred is called “detection”.

6.7.2 Description of the Tool

The objective is to prevent, or at least detect and weed out defects, as early as possible in the process. The use of simple error proofing mechanisms and other safeguards can also prevent mistakes from becoming catastrophic events.

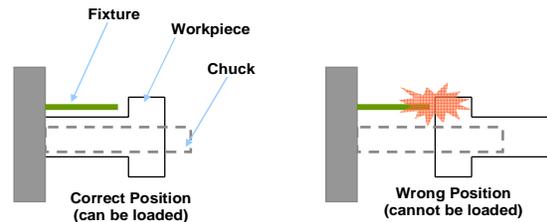
Figure J23 - Zero Defect Strategies



- Identify a mistake that occurs frequently and design something fool-proof to prevent or detect that particular mistake.
- Identify when problems happen.
- Identify the operation or process.
- Analyze and define the root causes to understand why the problem happened.
- Take proper corrective actions.
- Modify processes so it is impossible to make them in the first place.
- Decide the right error proofing approach, such as:
 - Using a shut out type (preventing an error being made), or an attention type (highlighting that an error has been made).
 - Take a more comprehensive approach instead of merely thinking of error proofing as limit switches, or automatic shutoffs. Error proofing can be electrical, mechanical, procedural, visual, human, or any other form that prevents incorrect execution of a process step.
 - Try the method and see if it works

Figure J24 - Error Proofing Illustration

Error Proofing Illustrated



Goal = Prevention, not Detection

Train the operator, review performance, and measure success.

Good error proofing devices, regardless of their implementation, should share the following characteristics:

- Useable by all employees.
- Simple to install.

- Low cost. If they are too complicated or expensive, their use will not be cost-effective.
- Part of the process, implementing inspection.
- Placed close to where the mistakes occur, providing quick feedback to the workers so that the mistakes can be corrected.
- Does not require continuous attention from the operator (ideally, it should work even if the operator is not aware of it).
- Provides instantaneous feedback, prevention, or correction.

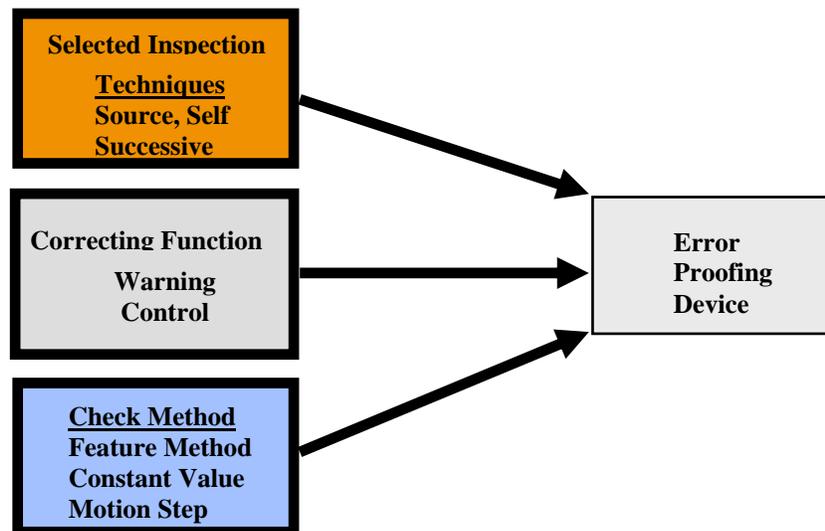
6.7.3 Analysis of the Data

To determine if a fool-proof device is appropriate, the Process Owner or Team Lead need only observe the workplace and talk to the people at each process. The Process Owner or Team Lead can consult data of down time or processes producing errors.

6.7.4 Expected Outcomes

- Less downtime.
- Less errors.
- Improved quality.

Figure J25 - Expected Outcomes



6.8 PROCESS DESIGN

6.8.1 Description of the Situation

- Knowing there should be clear and visual indicators where everything is needed for any process requiring inputs and outputs, and then one knows he/she is ready to design a process. This is indicative for the need of process planning and preparation.
- Requires developing a process in the shortest time to satisfy quality requirements, processing requirements, and cost requirements.

6.8.2 Description of the Tool

- Process Planning:
 - A plan is a standard that should not be deviated from unless agreement is achieved.
 - A project management process provides the systematic approach to planning.
- Process Preparation Responsibility:
 - The responsibility of this process preparation is a shared responsibility and is best accomplished when full knowledge is present for everyone.
 - The process should be prepared to accomplish two important elements.

- Capability to satisfy the customer over a range of requirements usually defined by the product life cycle.
- A clear understanding of how all elements of the process support the intended outcomes of lowest total cost, highest quality, and shortest cycle time necessary to satisfy the customer.
- **Equipment Planning:**
 - Equipment is only one element of a process. Its role is to support those who are adding value in the process. It should be specified to accomplish all the AFSO21 objectives.
 - Equipment should be specified to accomplish the process over the range of demands by the customer.
 - Equipment should be specified based on life cycle cost.
 - Reliability of the equipment should be built into equipment through a detailed reliability study of the system degraders and non robust features being strengthened.
 - Maintenance of the equipment should be able to be accomplished with minimal disruption to the process of creating value.
 - Equipment should be tied to an alarm system that aids in identifying problems as the equipment is being run.
 - Equipment check-out should be accomplished both as it is built and installed.
 - Preventative maintenance procedures should accompany the equipment.
 - The operator should be trained to both operate and maintain the equipment.
 - Equipment should be flexible to being moved easily to achieve cells configured to the customer requirement that will change.
 - Tooling and fixture should be easily monitored to allow life cycle costs to be determined.
- **Process Planning/Preparation Review Meetings:**
 - The major lesson of AFSO21 is that we are much more powerful when we all contribute.
 - Production preparation should be reviewed with parties involved and singular in focus. The person adding value must be supported in the accomplishment of value adding.
 - The initial meetings should focus on developing the plan to accomplish the value to the customer.
 - Follow on meeting should be focused on monitoring the accomplishment of the plan.
- **Quality Control:**
 - Begins with clear customer requirements.
 - Requirements are translated into individual processes and cells with critical characteristics are controlled.
 - Failure modes to quality reductions are identified.
 - Control plans are establish to provide standards for maintaining customer specifics.
 - Inspection plans are created to monitor the actual situation.
 - Source inspection is created at the entry stage of the process to make sure inputs to a process are consistent with overall customer satisfaction.
 - Operators are trained in maintaining quality through problem solving, self inspections, and mistake proofing devices.
 - Quality metrics are posted and monitored.
 - Customer feedback is sought.

6.8.3 Analysis of the Data

- First and foremost ensures that quality is built into the design of the process:
 - Built in Go/No Go (Error Proofing).
 - Guarantee process is capable of constant waste identification and elimination and meeting customer demand.
- When to apply Process Planning:
 - New product:
 - At all stages of the development in initial deployment.
 - At every step of the implementation process.
 - To learn from the process for future process implementation.
 - New design:
 - At all stages of the design process.
 - During concept design.
 - During initial prototypes.
 - During performance evaluation.
 - During initial installation.
 - New Output:
 - From time of introduction to de-commission.
 - Change in demand.

6.8.4 Expected Outcomes

- Ability to create a Process Planning Master Plan.
- Ability to Design Process with the 7 Ms in mind.
 - Man.
 - Machine.
 - Method.
 - Material.
 - Mother Nature (environment).
 - Measurement.
 - Management.
- Management of cost during the life cycle of the process.
- Lower total life cycle costs.
- Involvement of all those involved especially the person who adds value.

6.9 LEVEL PRODUCTION

6.9.1 Description of the Situation

Level Production refers to a three- phased approach that aligns production goals with customer demand over a function of time. It is guided by the principal of setting the production pace and delivery to match actual customer demand. It results in a schedule that is driven by the customer demand and leveled to support balanced workload and smooth material flow. The three phases are:

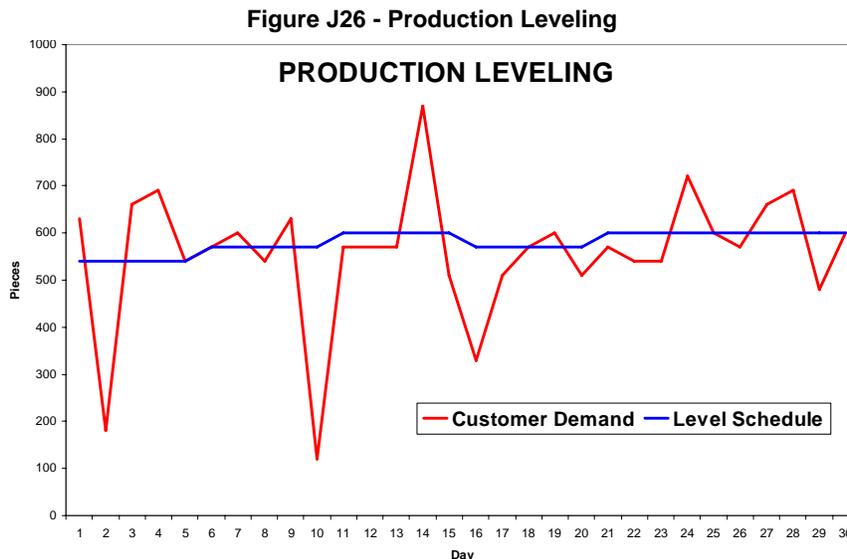
- Production Planning Phase.
- Production Scheduling Phase.
- Production Execution Phase.

6.9.2 Description of the Tools

Production Planning Phase

Production Planning begins with the process of determining the specific volume and mix to be produced over a given period of time. It compares the best possible projection of orders against available supply and production resources and plans for production accordingly. It is the initial phase of determining where, in what quantities and in what order things will be produced. Typically it begins by taking customer demand over a several month timeframe, and actually scheduling production over a shorter time period.

In the example below, the customer volume varies anywhere between 100 units per day to as much as 900 units per day.



Production Scheduling Phase

Production Scheduling takes input from the Production Planning phase and creates actual daily schedule of volume and mix to be produced on a daily basis. Every day the schedule is adjusted based upon actual customer orders by model type or color requested, but will be based on the parameters of the Production Plan established above.

In the following example you can see how the monthly demand for 10,000 units of each model type, A, B, C, D, and E are divided by 20 production days into daily increments of each model type with a daily demand of 500 units per day.

Figure J27 - Monthly Demand

Product Types	Quantity	Daily Production
A	5000 units / 20	250
B	2000 units / 20	100

Product Types	Quantity	Daily Production
C	2000 units / 20	100
D	500 units / 20	25
E	500 units / 20	25
TOTAL	10,000 units / 20	500 total / day

The leveled amounts would be 50% “A”s , 20% “B”s and “C”s and 12.5% “D”s, and “E”s. The leveled sequence would be A-B, A-C, A-B, A-C, A-D, A-B, A-C, A-B, A-E repeat 15 times per day. This sequence allows you to not only manage volume and mix, but to manage sequence. It is the ultimate extension of batch of one and thus leveled creation.

Production Execution Phase

The third phase of the Level Production process is executing the planned schedule. It is during this phase that many of the other Lean tools are incorporated to ensure as much as possible that the schedules are met. Standardized Work with a customer derived Takt time is used to pace production. Progress against the schedule is visually managed by production tracking, problem identification, and problem solving. Shortages to the planned schedule are communicated and overtime is adjusted as needed to level the schedule over the remaining time period.

6.9.3 Analysis of the Data

The data analysis will lead to a production schedule that is driven by the customer demand, but takes into account the actual capability of the facilities capacity to meet the scheduled production. It also will result in a smoother schedule to the production facility and supply chain to smooth the material flow needed to support production.

6.9.4 Expected Outcomes

- Firmed leveled longer term Production Plan matched to facility capabilities balanced to the customer forecast.
- Smoothed executable nearer term schedule based on customer orders.
- Leveled flexible Production Plan with daily adjustments based on actual customer orders.
- Immediate reaction to production plan misses to adjust and correct the schedule as needed.

6.10 TEAM PROBLEM SOLVING

6.10.1 Description of the Situation

Operating as a team to solve problems can ensure better ideas, buy-in to the countermeasures, and better problem solving. Statistics have shown that when systematic problem solving is conducted in teams, the countermeasures are usually better due to the diversity of the individuals. Each airman sees the problem and the countermeasures differently. By utilizing synergy of the team, the Process Owner or Team Lead will be able to employ these strengths in solving the problem.

Figure J28 - Problem Situation

PROBLEM SITUATION	
Standard	Produce at full capacity - 16 hours (8am-12am)
Current Situation	Producing 15 hours
Discrepancy	1 hour
Extent	Since 11/16/92. The problem occurs in the early part of the shift
Rationale	Must be addressed to meet current production demands without overtime and be able to fill new order by end of this year.

6.10.2 Description of the Tool

- Problem Identification.
- Select Problem.
- Gather Information.
- Go see problem first hand.
- Cause Analysis.
- Identify potential causes.
- Analyze the data.
- Conduct 5 Why/Therefore check.
- Identify Root Cause.

Figure J29 - Cause Analysis

Potential Causes	Check Method	Evaluate
Thick paint	Test viscosity	Thick
Improper cleaning of robots	Inspect Pre-Shift	OK
Contaminated Paint	Analyze paint	OK
Most Likely Cause(s)	Thick Paint	
Paint nozzle opening too small	Compare to 1, 2, 3	OK
Investigation showed thick paint build up in the nozzles		

- Countermeasure(s).
- Identify potential countermeasure(s).
- Select countermeasure(s)

Figure J30 - Countermeasures

Evaluate Possible Countermeasures				
Possible Countermeasures	Effectiveness	Feasibility	Impact	
Insulate paint lines	LOW		MED	PLUS
Insulate paint robots	MED		MED	PLUS
Insulate outside walls	HIGH		HIGH	PLUS
Most Appropriate Countermeasure(s) Insulate outside walls				

- Implementation.
- Identify stakeholders.
- Develop implementation plan.
- Communicate the plan.
- Gain approval.
- Execute the plan.

Figure J31 - Implementation Plan

What Action Is To Be Taken	Who Is Responsible	Schedule Timing		
		11/24 – 11/25	11/26 – 11/27	11/28 – 11/29
Analyze and measure area to be insulated	Maintenance G/L	11/24 ●		
Purchase Insulation	Engineer Specialist		11/26 ●	
Schedule time for insulation	Production Manager	11/25 ●		
Install Insulation				11/28 ●

- Follow-up.
- Monitor the plan.
- Make changes as needed.
- Report the results.

Figure J32 - Follow-Up / Verification / Standardization

Ensure proper insulation in any critical areas of paint (especially booths/equipment) that have outside wall						
60 min						
45 min						
30 min						
15 min						Std. Is 0
0 min						
	11/30	11/31	12/01	12/02	12/03	

- Standardize/Sustain.
- Standardize the countermeasure(s).
- Identify Checkpoint(s).
- Communicate across the organization.
 - Presentation.
- Present team results to superiors.

6.10.3 Analysis of the Data

To determine the root cause of the problem so the Process Lead with the problem solving team can implement a long term countermeasure. The Process Owner or Team Lead can use the systematic problem solving method to effectively address problems as they occur.

6.10.4 Expected Outcomes

- To identify the real problem.
- To locate the cause.
- To put in a countermeasure for the cause.
- To follow-up and standardize the countermeasures.

6.11 CHANGE MANAGEMENT

6.11.1 Description of the Situation

Sometimes, random change can be quite effective. It's just that a random change usually isn't the change that is wanted or needed and additionally; the change that occurs usually doesn't happen at the right time. For our purposes, change must be more predictable and focused. Change must be planned, implemented, and evaluated in alignment with the wants/needs of the organization's leadership. In other words, it must be managed.

6.11.2 Description of the Tools

Change management incorporates several steps, each having specific tools and actions:

- *Step One:* Preparing the organization's managers to lead and manage the change process. In this stage the organization's managers must assess their own readiness (commitment and capability) to lead and manage the change process. They must determine how they feel about change and understand their own resistance to change. They must clarify what they need to be fully committed to the change as well as what knowledge, skills, and support they need to be fully capable. The organization's managers must identify key stakeholders, what their expectations are regarding the change, and develop a plan to manage non-alignment with the change that is to be made. Most certainly, managers need clarity about the organization's reason for change, the plan for change including a communication plan, defined roles and responsibilities, and measurables.
- *Step Two:* Preparing the organization to make the change. Managers must assess the organization's readiness (commitment and capability) and develop plans to address those situations where readiness is not sufficient. They must engage others through vision, purpose, and a compelling rationale for the change. Also, they must communicate with the organization in a structured and meaningful way about the plan for change, the desired outcomes, the measures, as well as roles and responsibilities. They will need to publicly acknowledge the challenges faced in making the change, and demonstrate their own readiness to lead and manage the change process. They must accept resistance as legitimate and address it appropriately as it arises. Managers must empower others by inspiring and encouraging others and modeling/leading by example the desired behavior they want others to emulate.
- *Step Three:* Implementing the change. It may seem obvious but, the first step necessary at some point is to "start" and that start should be identified as such in the plan. Managers will need to deploy policy throughout the organization. Managers must make sure that the plan is being implemented appropriately. Managers and the rest of the organization must be checking the implementation constantly, identifying and addressing the problems that arise and capturing learning along the way. The emotional aspect of making a change is always present and managers should provide the needed communication and socio-emotional support to carry the organization through those difficult moments. Managers should be finding successes, catching people doing things right and recognizing efforts and achievements. Organizational communications must move from just "need to know" to "need to trust". Managers must follow the plan and any deviation from plan must come as a result of monitoring, assessing, evaluating, and deliberate problem solving/decision-making.
- *Step Four:* Monitoring the change. The change process must be constantly monitored. That monitoring should include assessing and evaluating how the change is going with regard to outcomes, adherence to the plan, processes, tools, and the human elements. It is important to identify issues, concerns, questions, challenges, obstacles, problems as well as successes and key learning.

- *Step Five:* Making necessary adjustments. As a result of monitoring the change, it may become necessary to make adjustments in the implementation plan, processes, or tools. Whatever the needed adjustments may be, they should be made in a timely and effective manner.

6.11.3 Analysis of the Data

First, it is necessary to determine the readiness (commitment and capability) of the organization's management-leadership and the organization as a whole to move forward with the change processes. This can be done with a standardized audit. Second, there must be a determination of actions that are required to address areas of need and when they should be addressed.

6.11.4 Appropriate Tools to be Used

Appropriate tools include 1) an assessment instrument to determine readiness, 2) a strategic and operational plan to follow, 3) measures to determine effectiveness, 4) defined roles and responsibilities, 5) a communication plan to assure effective and timely communication, 6) a plan for education, training, coaching and mentoring, 7) a clear statement of the vision, mission, values, strategies, compelling rationale for the change, 8) appropriate guidance, coaching, and mentoring.

6.11.5 Expected Outcomes

- Committed and capable management and leadership.
- Committed and capable organization.
- Planned change process with relevant measures.
- Effective change.
- Challenges and obstacles that are managed in an appropriate and timely way.

6.12 COMMUNICATIONS

6.12.1 Description of the Current Situation

At every stage of AFSO21 implementation it is critical to communicate effectively the plan, the progress, and the way forward. Early in the implementation you are building the trust in the system by doing what you say and being open to help personnel understand what may not be clear. This serves you well because personnel are learning and not sure if the activities indicated are in their best interest. It is possible to implement without communicating extensively but you will find great reluctance to try new behavior and the implementation will ultimately fail. Effective communications in itself is not sufficient for success, but it is certainly necessary to succeed.

6.12.2 Description of the Tool and Usage

There are many ways to communicate effectively. You can use educational processes, postings, prepared small briefings, meetings, newsletters and project status boards. The methods chosen are a function of the resources available and the maturity of the group to the process of AFSO21 implementation. The principle is to have the communications pulled and not pushed. Good communications comes from supplying the personnel with what they need when they need it. Good communications also comes from conveying the right messages that supports the goals of the organization. The concept of waste says that support must be purposeful and consistent with achieving the goals with everything else being waste.

Another avenue of communications comes with the need to share information through reporting. The process for reporting must also stand the AFSO21 test for the least amount of waste. Most formal

reporting becomes an end and the exercise of reporting becomes an opportunity to create a favorable impression. This leads to excess, PowerPoint presentations, and a lack of consistent format. Our aim in AFSO21 is to both be efficient and effective, to have a standard format, and make problem solving a way of life. To that end a standard reporting format is recommended. The recommended format is to utilize a one-page report with a standard layout. This restricts the amount of space available and causes the reporter to minimize the waste of excess verbiage.

The logic of the reporting format follows the logic of problem solving. The intent is to lift up problems and provide a mechanism for communications of plans to solve the problems identified. The logic of the report is to define the problem as a deviation from a standard or an expectation, define the root cause of the problem, define the plan for resolving the problem and the follow up plan to maintain the new condition created in solving the problem. For the reader the logic is easy to follow and the process of managing the outcomes is explicit and easily monitored.

6.12.3 *Expected Outcomes*

- Aligned activity to goals.
- Creation of a dialog that allows the organization to understand what the communications needs of the personnel are.
- Clarity about the path forward.
- Expectations are set.

6.13 COMMUNICATIONS PLAN - EVENT LEVEL

6.13.1 *Purpose*

The Event Level Communications Plan provides the Event Team Leader with an event task and stake holder matrix to act as a road map ensuring all appropriate personnel are communicated to at the appropriate level and time.

6.13.2 *Description*

Lack of communication among an Event Team and the event stake holders can be a huge barrier to team success. Alternatively good communications will accelerate results by building acceptance and buy in on the part of those affected by the event. The Event Level Communications plan should be built around the event stake holders and the degree of involvement each stakeholder has in the tasks leading up to, during and after an event. There are four levels of involvement: Responsible, Accountable, Consulted, Informed (RACI - pronounced “ray-see”, as in “Have you completed your RACI matrix?”).

1. *Responsible* – Those persons that will actually personally perform individual event tasks. Responsibility is determined by the person who will be held accountable for the task’s completion. Responsibility can be shared.
2. *Accountable* – The person who will be held ultimately accountable for the outcome of the task.
3. *Consulted* – An individual who should be consulted *before* a task or decision is made. Two-way communication is required. The more stake holders that can be made to *feel* they were consulted the more likely the Event Leader will build the critical mass of buy in required for success.
4. *Informed* – Individuals to be notified *after* a decision or action is taken. One-way communication. Although much easier than Consulted communication, personnel does not engender the same level of buy in and does not guarantee that the person informed actually read or understood the communication.

The act of constructing the RACI matrix forces the Team Leader to think through the relations between event tasks and personnel. This exercise will provide a new level of insight into the key drivers of the event’s future success. Therefore, Team Leaders should never delegate the task of developing the RACI matrix, although they may create it jointly with other team members.

Team Leaders should consult with their Event Champions and come to consensus on what level and method of communication the champion prefers.

Once the RACI Matrix is completed, Team leaders should refer back to it often to ensure all communications are happening as planned.

6.13.3 Actions

Building an Event Level Communications Plan can be completed by simply filling a two-axis Matrix.

1. In an excel spreadsheet list the event’s stake holders across the top horizontal axis. Include: Champion, Team Leader, each team member, and all personnel who provide event inputs or support, and those who will implement solutions derived from the Event.
2. Down the left edge of the matrix on the vertical axis, list all the event tasks.
3. Systematically work through each row of the matrix considering each stake holder’s involvement in each task and what form of communication will be required in the event.

A significantly chopped down example of a RACI Matrix

Figure J33 - RACI Matrix

	Champion Col. Smith	Team Leader	Team – Mr. Able	Team – Ms. Yun	Data Supt Ms. Speer	Admin – Mr. Han
Draft SIPOC	A	R	R	C	C	I
Set up team logistics	C	A		R		
Deliver Training	C	A,R				I
Identify data collectors	A,R	I				C
Schedule data collectors	A	R			R	
R = Responsible A = Accountable C = Consult I = Inform						

6.13.4 Expected Outcomes

- Timely, effective communication of goals, AFSO21 activities and results.

6.14 WORK DESIGN/ERGONOMICS

6.14.1 Description of the Current Situation

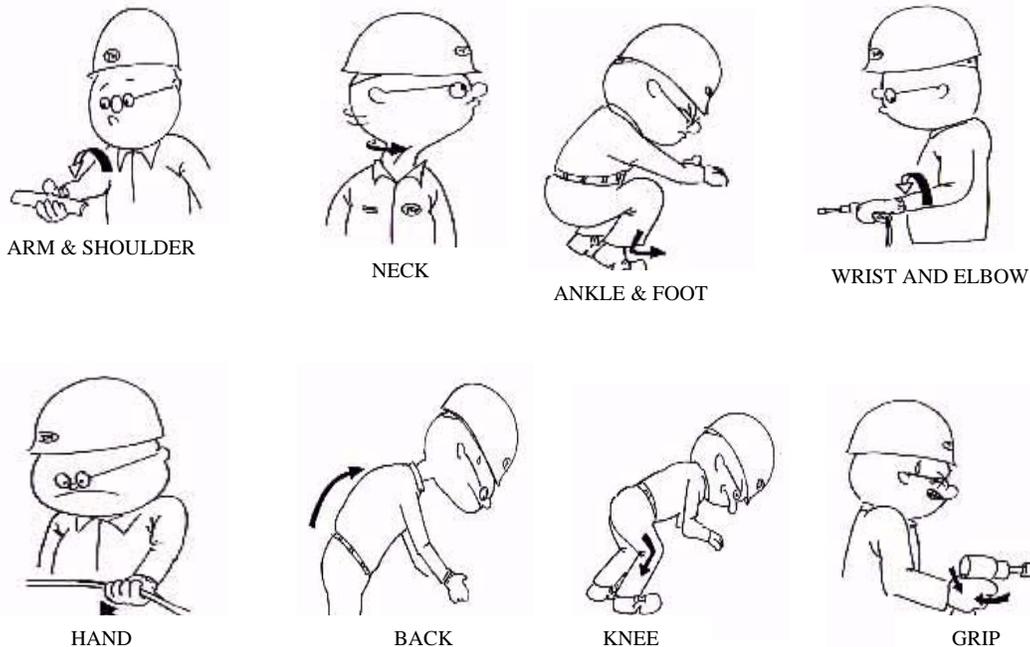
As any project manager or process leader recognizes there is potential for an operation or process to cause undue injury to the person performing the job, one must consider the ergonomics of the task being conducted is safe and easy or easier to complete.

- Definition of Ergonomics – Erg is Greek for WORK and Nomoi is Greek for NATURAL LAW.
 - Must consider the physical and mental capabilities and limits of the worker as they interact with tools, equipment, work methods, tasks, and environment.

6.14.2 Description of the Tool and Usage

- It is possible to significantly reduce risk of injury by following ergonomic principles:
 - All work activities should allow the worker to adopt several different, but equally healthy and safe positions.
 - Where muscular force has to be exerted it should be done by the largest muscle group.
 - Work activities should be performed with joints at about mid-point of their range of movement.

Figure J34 - Work Movement



- Goals of Job Design:
 - Reduce work related musculoskeletal disorders.
 - Reduce safety hazards.
 - Improve efficient work methods.
 - Improve employee relations.
- Establish an Ergonomic Teams:
 - Multi-functional group to address strains and sprains.
 - Give the team training in Ergonomics, how to resolve risk factors.
- Making Ergonomics work:
 - Don't fail to plan.
 - Awareness campaigns.
 - Get and maintain support from
 - Team member rotation.
 - Ergonomics expertise.
 - Team approach.

superiors.

- Risk Factors during Work Site Analysis:
 - Forcefulness, awkward positions, repetition, etc.
 - Identifying causes of risk factors.
- Risk Factors Prevention and Control:
 - Engineering Controls.
 - Work Practice Controls.
 - Personal protective equipment.

6.14.3 Expected Outcomes

- Individual job satisfaction.
- Safe job positions.
- Reduced burden on muscle groups.
- Ergonomically correct jobs and tasks.
- Ergonomically correct posture.

6.15 APPLYING VISUAL MANAGEMENT – PROCESS CONTROL

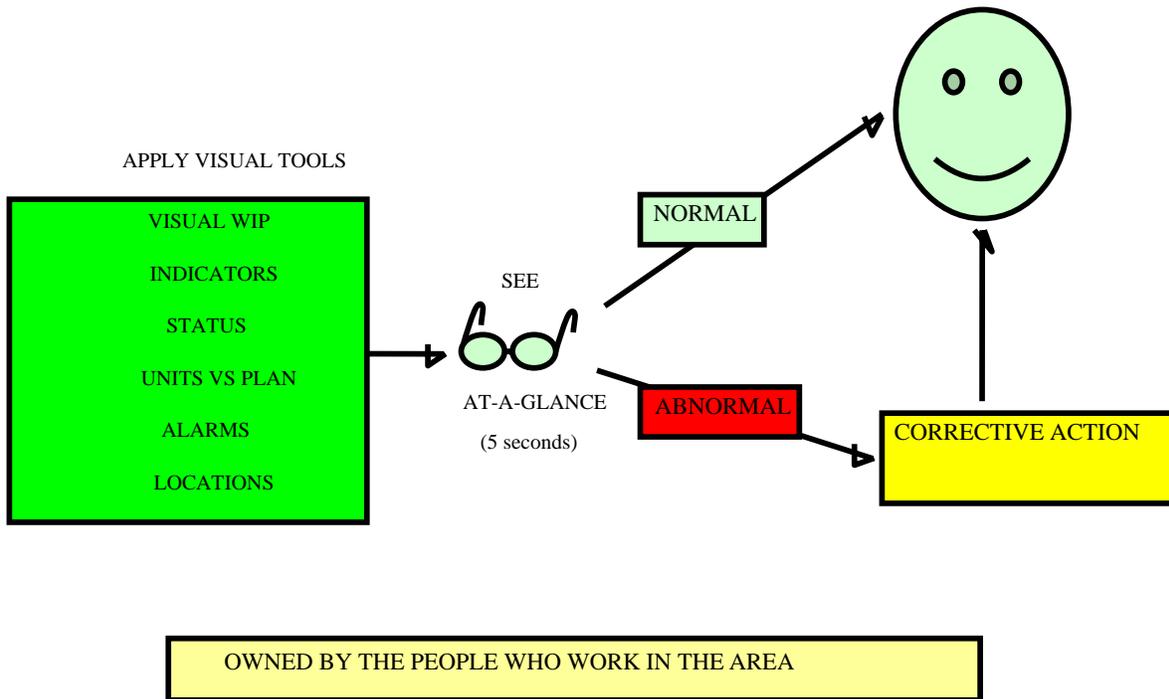
6.15.1 Description of the Situation

- When processes are out of control, it means a failure to meet agreed upon customer satisfaction requirements is eminent.
- There are INTERNAL, EXTERNAL, and HIDDEN customers to be satisfied.
 - Customer(s)- the person or organization that receives value from the processes and outputs. They define value and determine if it has been delivered. Defining this is a critical element of delivery value. Usually is defined by the person or organization that puts the outputs to use.
 - Internal – those departments or processes inside the enterprise who receive process outputs in order to perform their own duties.
 - External – those outside the enterprise who purchase or use final product or service.
 - Hidden – Those customers outside of the organization whose needs might not be immediately considered (small customers, customers who don't complain, potential customers, and customers who have left).
- Quality Control System not robust or well-defined enough to satisfy the customer.

6.15.2 Description of the Tool

- Tools required for a robust Quality System.
 - A robust quality system helps people understand when a condition, while still in standard, might be approaching a non-standard condition.
- How Quality System relates to other CPI Playbook Tools.
 - Many of the tools in the playbook are intertwined.

Figure J35 - Applying Visual Management



- How to specify Quality Requirements.
 - Visual management and education.

6.15.3 Analysis of the Data

- Quality Systems allow us to run the business while incorporating the following elements:
 - Defining the customer.
 - Establishing Inspection Standards.
 - Building in quality.
 - Conducting periodic checks.
 - Problem Solving.
- Inspections must be made at the appropriate places in the process.

6.15.4 Expected Outcomes

- Ability to visually recognize abnormal states to allow quick corrective action.
- Agreed upon quality priorities.
- Identify major issues for the processes.
- Methods of controlling the process.
- Monitor for sustainability.

6.16 AFSO21 EVENT GUIDELINES

6.16.1 Description of the Situation

During the implementation of a CPI culture, the “Rapid Improvement Event” (RIE) has three uses. The first use is to conduct pilot projects which demonstrate the benefits of CPI activities and increase buy-in from leadership and the organization, until the organization is ready to fully implement CPI. This flow is illustrated in Figure 41 below. The second use is a byproduct of training allowing organization Green Belt Level 1 or Level 2s to take ownership of the culture change. The RIEs give new Level 1 or Level 2s experience in using the RIE checklists and dealing with team activities. The third use is to make actual improvements to processes that leadership has identified to improve the capability of the entire enterprise.

6.16.2 Description of the Tool

The RIE is a structured process used to improve processes. The RIE has three main groups of actions: The actions required before the team meets, the actions for the team members during the week-long event, and the actions required to sustain the changes identified during the RIE. An RIE is often thought to take 7 weeks, with three weeks being spent on pre-team meeting actions, a one-week team event, and then three weeks sustaining the changes. The actions required during these groupings are listed in Attachment 1.

6.16.3 Analysis of the Data

RIEs can be used to conduct pilot projects to build commitment to a CPI effort or they could be the result of an Enterprise Value Stream Assessment that prioritizes the processes that should be improved in an organization. These processes should be identified using a Pareto Chart to clarify the 20% of processes that cause 80% of the problems.

6.16.4 Appropriate Tools Used – Description and Usage

There is a normal flow of activities that typically lead to an RIE. Events and checklists are included in Atch 3 of the Playbook.

The purpose of the Pre-Team Meeting Guide is to set up the RIE by having the organization’s leadership identify the general process to be improved, the goal and the scope of the improvement effort. The Steering Team Meeting Guide walks team members through their responsibilities and then has them complete the draft Charter. The Team Kick-Off meeting is conducted on the first day of the RIE. The two objectives are for the steering team to brief the team on the Charter and train the work group team and steering team on what will take place during the rest of the event.

The Value Stream Mapping Guide is typically the type of event conducted when first starting in a new organization. It allows the organization to map out one process and identify a prioritized list of actions to improve it.

6.16.5 Expected Outcomes

The primary outcome of an RIE is the “Implementation Plan,” a prioritized list of actions to improve a process. However, there are also a few other outcomes that are beneficial and are listed below.

- Primary: Prioritizing the Implementation Plan.
- Creating a Future State Map of the process.
- Creating a Current State Map of the process.
- Metrics to ensure gains are sustained.

6.17 STANDARD WORK

6.17.1 Purpose

Standard work represents the best known way to complete a task. Standard work ensures that the same work will take the same amount of resources to achieve the same results every time.

6.17.2 Description

Standard work is the foundation of continuous improvement. All team members should be searching for improvement opportunities. Once discovered and implemented, the team should standardize across all team members so everyone will benefit from the best practice.

If work processes are not standardized across the organization, it is impossible to effectively experiment and test new ideas for improving the work process. If the current process is not standard, then it will be impossible to determine the impact of improvements upon process outputs.

6.17.3 Actions

The standard work of every process step will be unique. Although each standard work event is a custom process, there are a few things that Level 1 or Level 2s should keep in mind across all such efforts.

1. Involve staff from all shifts: In many 24/7 operations there will be at least three methods of working the process: First shift's method, second shift's method, and the third shift's method. Members from all shifts working the same tasks together in the same place and at the same time will help establish best practices for standard work.
2. Let the process workers define the work and gain consensus: They know the work better than anyone else so telling them how to do it is a recipe for disaster. They also need to understand the benefits and develop ownership of standard work. One of the best ways to develop ownership and buy-in is to involve them in the change process.
3. Keep it simple: Unnecessary complexity adds unnecessary opportunities for failure.
4. Document the standard work and train from the documentation. Once the "best possible method" is agreed on it must be documented so that everyone can learn about the new standard and everyone can now measure themselves against the standard.

Standard work is unique to each process, but they all share certain characteristics:

1. It should be the best, safest, easiest, most cost effective and productive way to complete the task.
2. It preserves the corporate knowledge of everyone who has done the process in the past for the benefit of everyone who will work the process in the future.
3. It provides the basis for measurement against a standard.
4. It provides the basis for training future team members on how to perform a task
5. It ensures meeting the customer Critical to Quality (CTQ) requirements.
6. It minimizes operator driven variability.

6.17.4 Expected Outcomes

- Document and train workforce on standard process.
- Provide platform to stabilize work and performance prior to next level of process improvement and waste elimination.

6.18 VARIATION REDUCTION

6.18.1 Purpose

To reduce the fluctuation of the process output, or measure the amount of spread around the average process output. Variation reduction provides a more precise range of process outputs. A variation is the largest single cause of scrap output reduction. Variation reduction leads to reduced waste.

6.18.2 Description

Variation reduction is not unlike marksmanship. When a marksman is training to improve his aim he first concentrates on firing very tight groupings of rounds by aiming at a blank white target. After tight grouping is established, attention can then be turned to centering the tight grouping over the center of a target with a bull's eye printed on it. Had the Marksmen skipped the variation reduction step and jumped directly to centering on the bull's eye he may have been centered on the bull's eye but with a wide grouping he may not have had any rounds in the ten ring. With a wide random grouping the marksman may not have been able to be sure he was centered on the bull's eye. Variation reduction is the first step to process capability improvement.

6.18.3 Actions

Variation reduction is inherently unique to each process so a detailed standard approach is not practical. At a high level variation reduction involves performing a detailed study of the sources of the variation and the relative magnitudes. After the variation is well understood error proofing countermeasures must be planned and implemented for each source of variation. There are three sources of variation inherent in every process;

1. *Human variation* – humans are flawed and will never be able to be 100% consistent from moment to moment. A good counter strategy is to attempt to remove the human element as much as possible where ever possible.
2. *Equipment variation* – no matter how perfectly machined and maintained every machine is slightly flawed in some way and wears over time.
3. *Measurement error* – Perfect measurement is not consistently possible so each measurement will introduce some variation into the observed values.

All processes contain these three sources of variation and there are several process-specific sources of variation.

6.18.4 Expected Outcomes

- Defined, measured and documented variations.
- Desirable outputs defined.
- Countermeasures to variation documented
- Control limits established to flag future output outside desirable range.

6.19 TOTAL PRODUCTIVE MAINTENANCE - TPM

6.19.1 Purpose

Total Productive Maintenance (TPM) manages the equipment involved in a process to ensure that every piece of equipment will always be ready and able to perform as required.

6.19.2 Description

TPM is a comprehensive lifecycle plan of preventative maintenance*, predictive** maintenance, inspection, cleaning, and repair. This plan involves equipment operators and maintenance/repair staffs.

Overall Equipment Effectiveness (OEE) is a measure of equipment availability, performance efficiency and quality of output for every machine. There are Six Major Losses that reduce OEE.

1. Equipment malfunctions
2. Set up and adjustment times
3. Idling and minor stoppages
4. Reduced operating speed
5. Time lost creating scrap product
6. Time lost waiting for a machine to “warm up” or “cool down” at start up or cool down.”

A TPM plan should aim for 85% or better operational availability. Although 100% is the ideal goal time must be set aside for planned preventative maintenance.

6.19.3 Actions

Each TPM plan will unique to each equipment item, but there are a few standard principles the Team Leader can use in all situations.

1. Operators should be entrusted with cleaning and minor repairs
2. Operators should receive formal operating, cleaning and minor maintenance training
3. The Six Major Losses should be targeted for elimination
4. Zero percent (0 %) scrap should be targeted
5. A lifecycle plan should be made for phasing in new machines and phasing out old machines. Any major life cycle events such as mid-life overhaul should also be considered.

* Preventive maintenance is periodic checking adjusting and replacing of parts to prevent failures.

** Predictive maintenance is forecasting potential problems by measuring machine variables and machine condition.

6.19.4 Expected Outcomes

- Ensure machine availability and up time.
- Maximize equipment and work flow effectiveness.

6.20 RAPID IMPROVEMENT EVENT - RIE

6.20.1 Purpose

Rapid Improvement Events (RIE) provide immediate process improvement results within limited boundaries using a small team (usually six to twelve people) in one week or less.

6.20.2 Description

Rapid Improvement Events bring together cross functional teams of the people who actually do the work to improve a specific aspect of the Process. The events are a combination of classroom training and learning through doing for the participants. Usually a trained Level 1 or Level 2 will instruct and guide a team of novice change agents through the process. The RIE veterans then return to their regular duties and if they had a good RIE experience will become evangelists for Continuous Process Improvement.

Because of the tangible rapid improvements, and the empowerment of front line workers to be involved in the change process, RIEs are often a great way to build culture change momentum and energize a team around Continuous Process Improvement.

6.20.3 Actions

See Volume K One Week Event Guide

6.20.4 Expected Outcomes

- Design and implement improvement for immediate result.

SECTION SEVEN: CONFIRM RESULTS AND PROCESS

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Conducting a Review
- B. Rewards and Recognition

7.1 CONDUCTING A REVIEW

7.1.1 *Description of the Situation*

From the beginning of the implementation of AFSO21, it will be necessary to conduct a variety of reviews. Reviews will be required for problem solving, goal setting, monitoring performance, project management and quick hitting “Do-Its.” As a Process Manager, in order to reduce variability, a consistent, standardized process is necessary. This is a break from the norm because the focus is to work problems. The expectation is that people are doing what they have committed to in their plans.

By solely focusing on problems, the leader must set a positive tone or the reviews will become punishment. A balance must be struck between providing learning and creating the environment where it is unacceptable to hide problems.

Reviews should not be ad hoc but rather planned to accomplish specific objectives:

- Understand the current situation as it compares to the commitment in a plan.
- Coach a larger group to higher levels of performance.
- Create a sense of team from common purposes.
- Instill a sense of pride in accomplishment.
- Establish accountability.
- Work problems that are common to the entire group.
- Provide recognition.

7.1.2 *Description and use of the Tool*

Reviews need not be complicated. The real value of the review is to make sure that one attends to the most important aspects of performance. In operational terms, they should focus on lifting up problems.

7.1.3 *Analysis of the Data*

The review is conducted in the following manner:

- Prior to the review, notify the participants and ask them to update their plans.
- The original planning document should have adequate space allocated for the review of progress.
- No document other than the planning document and a problem solving format should be brought to the review.

“The only way of failing in the implementation of AFSO21 is to hide problems.”

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- The planning document should reference the level of achievement against the goal and the problem solving document should be used when there is a deviation from the expectation or standard.
- The review should consist of discussing the problems only.
- In discussing the problems, the format of the problem solving sheet should be followed.
- Great emphasis should be placed on correctly defining the problem based on facts.
- Once the facts are agreed to, the problem statement can be written as a deviation from a standard or expectation.
- The remainder of the problem solving form should be discussed searching for the root cause and resolving it through countermeasures.
- A final check should be made of the allocation of resources and commitment from supporting organizations.
- The most significant accomplishments from the reviews are alignment of actions to priorities and commitment of the organization to accomplish the plans, including countermeasure plans.

7.1.4 *Expected Outcomes*

- Establishing the ritual of planning and reviews.
- Aligning and prioritizing activities.
- Committing to the value of problem solving.
- Clarifying purpose.
- Using facts verses opinions.

7.2 REWARDS AND RECOGNITION

7.2.1 *Description of the Situation*

Recognition is a powerful tool that can make workplaces, on average 15-25 percent more productive. If done right, recognition makes employees more engaged in their work and more committed to their organization. Done wrong, employees become disillusioned and apathetic. There are a variety of benefits of recognizing employees for a job well done:

- Improved Morale.
- Enhanced productivity.
- Increased competitiveness.

Employee recognition should be consistently fair, but great care should be taken to make sure employee recognition efforts do not become expectations or entitlements. There are six steps that should be followed when giving recognition:

- Timely.
- Proportional.
- Sincere.
- Specific.
- Individual.
- Personal.

7.2.2 *Description of the Tool*

The following ideas can be used to approach the provision of employee recognition. The combination of ideas and the six steps proves to be extremely effective.

7.2.2.1 Money

- Bonuses.
- Cash awards.
- Gift Certificates.

7.2.2.2 Written Words

- Handwritten thank you notes.
- A letter of appreciation in the employee file.
- Recognition posted on the bulletin board.

7.2.2.3 Positive Attention from Supervisory Staff

- Provide public praise at a meeting.
- Provide frequent positive performance feedback – at least weekly.

7.2.2.4 Encourage Employee Development

- Send airmen to professional conferences and seminars
- Work out a written employee development plan.

7.2.2.5 The Work Itself

- Provide cross training opportunities.
- Provide opportunities for empowerment and self-management.

7.2.2.6 Types of Recognition

- *Timely* – Recognition should be given to an individual as soon as possible after the performance takes place. Immediate recognition is best. Passage of time reduces the effectiveness of recognition.
- *Proportional* – Do not overdue the recognition for “small stuff.” This will make people question your motives. All good performance should be recognized, but in varying degrees.
- *Sincere* – Insincere recognition is meaningless and can do great harm. Be honest and open and let employees know you really appreciate their efforts.
- *Specific* – Employees should be recognized for (a) specific behavior(s). Specific appreciation such as, “The level of detail you added to the report was extremely useful in making key decisions.” Avoid vague phrases such as, “Good job.”
- *Individual* – Individuals should be recognized more so than groups. Within a group, individuals make different contributions. To recognize all when perhaps only a few did most of the work is unfair, and may lead to resentment.
- *Personal* – Have your recognition fit the style of the individual being honored whenever possible. All people are different, i.e., some individuals may like public praise, while others would prefer a private discussion.

Figure J36 - Recognition Terminology

Recognition	Recognition is the acknowledgement of an individual's or team's desired behavior, effort, or business result that supports the organization's goals and values.
Award	An item given to an individual or team to commemorate a specified achievement.
Celebration	A planned or spontaneous event in recognition of individual or team achievement.
Reward	An item (usually with monetary value) that is given to an individual for meeting goals.
Intangible Recognition Tools	Verbal and/or written praise in acknowledgement of an individual's or team's achievement.

7.2.3 Analysis of the Data

To enable the Process Owner or Team Lead, upon entering a work area, to immediately recognize an airman in a demeanor fitting the workplace environment and the individual being recognized.

7.2.4 Expected Outcomes

- Improved Morale.
- Decreased Stress.
- Decreased Turnover.
- Higher Revenue and Profit.
- Decreased Absenteeism.

SECTION EIGHT: STANDARDIZE SUCCESSFUL PROCESSES

This section of the document will capture various AFSO21 tools and methods. They are organized around the following areas:

- A. Why is Transactional Lean so Important
- B. Steps to Successful Management of a Transactional Value Stream
- C. Transactional Tools
- D. Checkpoints / Standardization Table
- E. Report Out Theme and Story [To be produced]
- F. Board Implementation [To be produced]
- G. CPI Management Tool (PowerSteering[®]) [To be produced]
- H. Restart the OODA [To be produced]

8.1 WHY TRANSACTIONAL LEAN IS SO IMPORTANT

AFSO21 is an integrated philosophy that focuses on the removal of waste in a process or series of processes. When analyzing a typical process at least 95% of the activities in process are non value added. It has been estimated that 90% of waste elimination in the Air Force can be found in transactional or administrative process. Not only is this waste pervasive but it is difficult to see due to the distributive nature of most transactional work.

Clearly a large opportunity exists for improvement to be made by eliminating waste in transactional processes. This untapped potential exists in the most likely places. In exists in the paper we process, the information we process and share, in the behind the scenes manipulation of paper, and in the inboxes and in baskets in the Air Force. It is limited only by the number of hours we work and the amount of people the budgets will tolerate. Everyone in the Air Force participates and will continue to do so until a logical and efficient process for the elimination of waste prevails. It seems as if the principles must be different for the elimination of waste. However, when you probe beneath the language that is decidedly non production you find that the principles are exactly the same. All the good work that has preceded AFSO21 has failed to make a substantial dent in the amount and pervasiveness of transactional processes. Our challenge is to be creative enough to develop smooth and efficient process improvement techniques that will lead the way to transactional waste reduction.

As we progress through this chapter we will all find that the most difficult process is he beginning. Once we find the appropriate process to go forward the answers to waste elimination will be self evident. We must supply the energy and creativity to make transactional waste visible and provide the methods to end its reign over the largest part of Air Force life.

8.2 STEPS FOR SUCCESSFUL MANAGEMENT OF A TRANSACTIONAL VALUE STREAM

1. Identification of a high level strategic need and a willingness to change.
2. Agree on the application of AFSO21 principles to better accomplish the satisfaction of the need.
3. Creation of a support structure to sustain the elimination of waste.

4. Creation of a process for eliminating waste and determine the way to measure success.
5. Identification of the current state of the process using techniques of Value stream Mapping and the value add, non- value added content of the process.
6. Creation of a future state that sustains the elimination of waste.
7. Gaining leadership commitment to the new process and the elimination of waste defined.
8. Implementation of the future state attainment plan.

8.3 TRANSACTIONAL PROCESS TOOLS

8.3.1 Value Stream Mapping for Transactional Processes

- VSM for Transactional Process enable the organizational to visualize the process, point to problems, and focus the effort to transform the transactional processes.
- Information flow replaces material flow as the process indicators.
- Information flow is usually not tied to a schedule and difficult to see.
- Transactional departments typically support several value streams which make it more difficult to see the flow.

When mapping, begin with the tasks, information flow, and the performance of the tasks to determine the flow of the process.

The steps to achieving a valuable mapping effort are:

- Select a service family that indicates the potential to achieve improvement.
- Determine a manageable boundary to the scope of the map. Not too small to have meaningful results and not too large to encourage failure.
- Select a team that has current knowledge about each step of the process and how it effects other organizations.
- Determine the metrics and the data to be collected.
- Walk the value stream if appropriate.
- Determine how each process prioritizes work.
- Summarize the metrics.
- Create the current state map.
- Determine the undesirable effects from the current process.
- Create an ideal state to encourage creative thought.
- Create a future state map that is 3 to 6 months into the future.
- Determine the gap between the current and future state.
- Create a work plan that is based on continuous improvement projects.
- Brief the process leadership to gain acceptance for the work plan.

Selecting a Service Family that has share similar processing steps. A service or product matrix is useful in making this determination.

Figure J37 - Service or Product Matrix

Products or Services	Processing Steps			
	Step 1	Step 2	Step 3	Step 4
A	X		X	
B		X	X	X
C		X	X	X

In this example the last two processing steps are a service family. Services B and C are standard service families. These families can be looked at as common process and mapped identically. These service families also give the greatest leverage to your mapping effort.

The determination of the boundaries come from an examination of the processes to determine if the across the company, across several departments or across a single department. The determination of this helps the mapping team determine the complexity of the effort and the likelihood of success. The major determination of the boundaries is to decide if the problems are visible or hidden by location or distance.

The mapping team should be a cross representation of all the functions necessary to understand the problems. Teams do not have to be continuous as certain key functions can come into the mapping when their services are being described. The team leader is the person who knows the value stream from end to end and must be present during the entire mapping process.

The current state map is drawn using the same process as a production process. Remember that the process of mapping is not only for gaining a pictorial description of the process but also to create agreement on how the process works.

The future state map is to be created to visually depict how the process will flow after the improvements are made. It is typically 3 to 6 months into the future. The time frame is an important decision because the team should only pick a duration that can be understood by all those needed for implementation. A poor decision at this point will leave the team frustrated and unable to support implementation.

The questions that the future state must answer:

- What are the customer’s real requirements?
- How will you check performance and how often?
- Which steps create value and which are waste?
- How can the flow be optimized with no interruptions?
- How is the work controlled between process steps?
- How can the workload be balanced?
- What process improvements are required to achieve the future state?

The most important aspect of the future state is a work plan that clearly explains the tasks necessary to reach the future state. The quality of the mapping effort can only be measured in the quality of the implementation. Many times the work plan will describe continuous improvement projects that will lead to the future state. These continuous improvement projects must be described in enough detail for the responsible person to take appropriate action, track the progress, and measure the results.

8.3.2 Waste Identification

As a transformation process progresses must have a specific outcome for a specific customer. That customer determines value add. The value add to the customer may not add value to the final product but is necessary to support the various needs of the organization. For mapping of a transactional process this necessary but non value added service is considered to be value add for the analysis. Some transactional process such as design of a product or required audits or inspections may be value add if the customer requires them. Processes such as payroll or order entry do not add value to the final customer but are necessary to complete the transactions to the organization. Waste is pervasive in the transactional process and fall into the common categories of waste used in production or maintenance mapping.

Figure J38 - Examples of Transactional Wastes

Waste Category	Transactional Examples
1. Overproduction- producing more or sooner than the customer requires	Preparing paperwork before it can be processed by the following process
2. Inventory - outcome of batch processing	Have too much on hand of supplies, Paper, batch process reports, etc
3. Waiting Awaiting approvals, in basket	Downtime from system failures, waiting
4. Over processing Unnecessary reports,	Re-entering data, additions reports
5. Correction	Order entry errors, errors in design Engineering change orders
6. Excess Motion- people movement	Going to the copier, central data getting supplies
7. Conveyance- move of materials	Excessive email attachments, multiple approvals
8. Overburden- of people and equipment	Excessive use of people and Equipment
9. Underutilization of people	Low expectations, poor training, Inadequate tools available

8.3.3 Metrics

The selection of metrics for transactional process can determine how the change is perceived. Most transactional processes have no metrics to determine success of the process. Process metrics from production processes make sense but may have to be renamed to insure complete understanding.

8.3.4 Process Metrics that can be used in Transactional Processes

- *Lead time* – time taken from order to completion of process.
- *Changeover time* – time taken from the end of the last product to the first good product on a new type.
- *Inventory counts* – files, forms that are waiting process.
- *Demand rate* – volume of transactions experienced at the process.
- *Percent completed* – with perfect quality the first time processed.
- *Uptime of equipment* – percent of time equipment is working when needed.
- *Number of people* – could also be full time equivalents.
- *Available time* – hours of work to be utilized to process transactions.

When selecting metrics make sure that they can be collected during the mapping process. The team has a great deal of flexibility in selecting metrics but the ones selected must give an accurate representation of the process. Estimated date is acceptable only if the team generally accepts that it is a fair representation. If value is seen in a set of metrics then a simple and easy way need to be devised to collect them. In most cases the person doing the process should collect the data only if observation is not feasible.

8.3.5 Process for Applying Transactional AFSO21:

The process for improving transactional process will follow predictable steps. It should be noted that making sure you have agreement at each step is critical to long term success. It is recommended that you check often with the sponsor and the process owner to ensure they are full in agreement. If agreement is not found then the previous steps must be questioned to achieve the answers. The following process is recommended to achieve agreement throughout the improvement cycle:

- Determine the target for improvement.
- Get agreement on deliverable and outcomes from the process owner.
- Assemble the best team possible that understands the process.
- Gather data on the current process and map the current state.
- Determine the undesirable consequences of the current process.
- Create a future state that improves the value added content of the work.
- Determine the gap between the current state and the future state.
- Write a work plan to improve the process.
- Assign responsibilities.
- Monitor plan implementation.
- Have regular reviews.
- At the end of the improvement implementation conduct a review to determine if the goals have been met and what to do about those that haven't.
- Consider the results in the new period planning for goals.
- Forms and Examples:

8.4 CHECKPOINTS AND STANDARDIZATION

8.4.1 Purpose

Checkpoints and standardization are fundamental to assessing the effectiveness of a countermeasure that is put into place to control or sustain the gains made during a process improvement event.

8.4.2 Description

Without checkpoints and standard methods in place the effectiveness of countermeasures is difficult to guarantee, meaning early gains could be lost. The purpose of the countermeasure is to eliminate root cause effects and prevent recurrence of the problem.

8.4.3 Actions

The Level 1 or Level 2 should follow the steps below to assist a team with developing checkpoints and standard methods:

- Identify the root cause of the problem being worked and determine the type of checkpoint or standard method that best counters or eliminates the undesirable effect.
- Select countermeasures (error-proofing, standard work, control charts, control boards) and analyze for each error and choose for implementation.
- Prepare new procedures and train all operators.



**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME K: ONE WEEK EVENT GUIDE

May 2008

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SECTION ONE: LEVEL 1 GUIDE

The purpose of this guide is to provide Level 1s with a reference tool to use when conducting events aimed at targeting waste, saving cost, and reducing man-hours. This section provides an overview and step-by-step description of what activities should occur before, during and after an event. The next section will provide checklists and templates for use by Level 1s.

1.1 WHAT IS AN EVENT?

An Event is organized methodology to evaluate, improve, implement and communicate a process improvement.

1.2 WHAT IS AN EVENT SUMMARY?

An Event Summary is the document provided to management of what was accomplished during an Event. This includes the resulting Action Plan and is the document that requires approval from management to proceed with the action plan as briefed. It is created during, not after, an event occurs.

1.3 TYPES OF EVENTS

1.3.1 *Value Stream Mapping (VSM) (Establishes a plan)*

- Big picture view of processes that span multiple organizations.
- Focuses leadership on areas of potential improvement and generates need for rapid improvement events, just-do-it and/or projects.
- This includes Strategic Working Groups, and Strategic and Operational Planning Sessions.
- Example: Developing Warfighters.

1.3.2 *Just-Do-Its (Provides immediate results)*

- Derived from VSM or RIE.
- Short duration event to improve processes with limited boundaries.
- Example: changes to current operating procedures or standards of work in a maintenance area.

1.3.3 *Rapid Improvement Event (RIE) (Provides immediate results)*

- Derived from VSM to focus on a specific sub-process.
- Short duration event to improve processes with limited boundaries.
- Example: QF-4 Engineering Proposal to make modifications to F-4s from the bone yard to bring them up to standard for employment as QF-4 drones.

1.3.4 *Projects (Long term results)*

- Derived from VSM to focus on a specific project or as determined by leadership.
- Long duration event to improve processes that are large in scope or complexity.
- Example: reengineering or development of an organizational structure. Major acquisition for a new weapon system.

1.4 PRE-EVENT ACTIVITIES

1.4.1 *Initiate contact with organization requesting assistance*

- Meet with leadership to identify need and area for improvement – capture and analyze VOC.
- Establish Team Composition & Conduct Pre-Team meeting
- Establish event timeline

1.4.2 *Develop Charter with Steering Committee*

- The charter is an agreement between Management and Team members on the task to be accomplished. Champion/Process Owner and Implementation Team members should sign the completed copy.
- Parts of a Charter:
 - Team Title
 - Purpose/Scope
 - Objectives
 - Time Utilization
 - Membership
 - Milestones/Deadlines
 - Exit Criteria

1.4.3 *Conduct climate survey*

- When to Use?
 - Give to Leadership at Pre-Team Mtg.
 - Use Before Starting each New Team or Organization
- What is the Purpose? To Determine:
 - Senior Leadership Commitment
 - Mid-Level Management Support with Resources
 - Worker Buy-In to Need
- How do you Use?
 - Participants identities are Anonymous
 - Balanced Mix of Managers/Employees
- What are Actions if Unfavorable Results?
 - More Manager/Awareness Training
 - Publicize Successes

1.5 EVENT ACTIVITIES

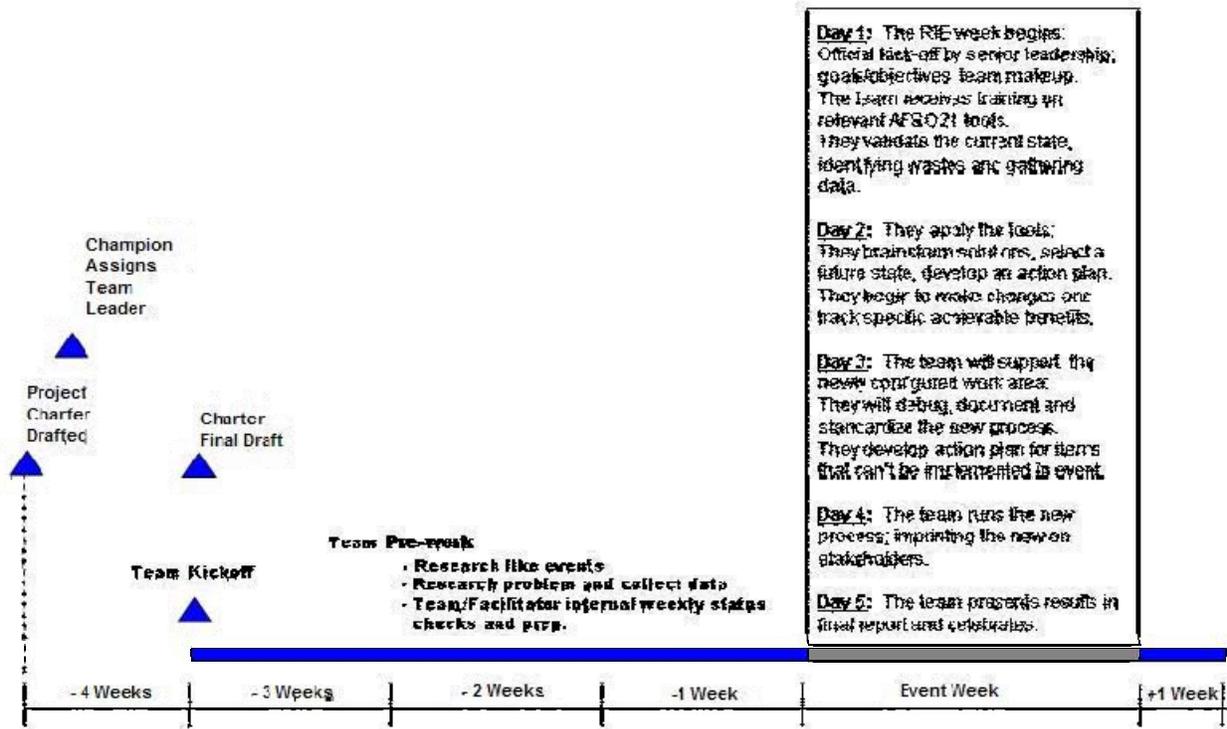
1.5.1 *Provide Awareness training to Team Members:*

- Training provided will be the two-hour AFSO21 Basic Awareness Course.

1.5.2 *Rapid Improvement Event (RIE)*

- Three Phases of Rapid Improvement Events
 - Preparation

- Execution
- Follow-up
- The following is an example of a RIE (front to back):
 - 1. Preparation (Avg. 3 Weeks)**
 - (a) Leaders select topic/scope based on VOC analysis
 - (b) Identify Team Lead/Alternate
 - (c) Identify Steering Team/Train
 - (d) Identify Work Group Team
 - (e) Conduct Climate Survey
 - (f) Identify /Collect Data:
 - Demand Participation
 - Requirement Details
 - Resources Allocated
 - Historical Data
 - (g) Take Pictures/Video
 - (h) Communicate Intent/Expectations.
 - (i) Build Charter
 - (j) Schedule Team Participation
 - (k) Finalize Logistics: Location, Dates, Times
 - 2. Execution (Avg. 5 Days)**
 - (a) Identify Current State
 - (b) Identify Changes
 - (c) Prioritize/Detail
 - (d) Out brief Steering Team
 - (e) Implement Changes to Control Plan
 - 3. Follow-up (Avg. 3 Weeks)**
 - (a) Process Owner Manages
 - (b) Identify Problems/Solve
 - (c) Sustain Team- Celebrate
 - (d) Establish Standard Work
 - (e) Follow up on Solutions
 - (f) Stabilize Process
 - (g) Update Documents
 - (h) Track Metrics
 - (i) Take Pictures/Video



1.5.3 Value Stream Mapping (VSM)

- Map Current State
- Map Ideal State
- Map Future State

1.5.4 Just Do-It

- Simple action to implement improvement effort (1-2 days)
- Within the span and control of the Team

1.5.5 Project

- Long time to complete action (3-6 Months)
- Larger cross organization team effort
- Usually several organizations are involved

1.6 POST-EVENT ACTIVITIES

1.6.1 Conduct Out-brief

- Recognize Team Members
- Review Charter and Goals
- Brief the Wall (Summarize Current, Ideal, & Future States)
- Brief Results/Comparison of the States
- Provide Metrics

- Brief Implementation Plan
- Gain Approval

1.6.2 Follow-up

- Team should perform 30, 60 & 90 day checks to ensure compliance with approved changes (Continue for 6 to 12 months, based on plan).

SECTION TWO: ATTACHMENTS

1. Generic Event Flow
2. Level 1 Checklist (Pre-Event)
3. Climate Survey (Pre-Event)
4. Charter Preparation Checklist (Pre-Event)
5. Team Meeting Checklist (Pre-Event)
6. AFSO21 Event Charter Template
7. Team Kick-Off Meeting Guide
8. Value-Stream Assessment Guide
9. Value Stream Mapping Guide
10. Supplier, Inputs, Process, Outputs, and Customers (SIPOC)
11. A3 Report (Status) Template
12. A3 Report (Completion Summary) Template
13. Lean “Basic Steps” Guide
14. Lean “Rapid Improvement Event (RIE) Steps” Guide
15. Six Sigma “Basic Steps” Guide
16. 8 Step Problem Solving Process “PSP” Guide

ATTACHMENT 1: GENERIC EVENT FLOW

(Planning/Approving/Running an Event (Front to Back))

1. Chartering and Approval
2. Team Formation/Prep Work
3. Timeline/Typical Event Week
4. Out brief/Follow-up
5. Recording Results/Auditing
6. Redeployment of Resource

ATTACHMENT 2: LEVEL 1 CHECKLIST (PRE-EVENT)

PURPOSE: To assist the Level 1 in identifying and accomplishing all of the steps necessary for a successful event. Specifically, it provides the Project Description and establishes the goal and scope of the event. In addition, it provides for the identification of the Project Champion and Owner, Stake Holders, Team Leader, Level 1, and Team Members

1. Complete this checklist in the planning phases prior to the start of an event.
2. Upon completion, the checklist should be provided to Team Members



Date:

1. Confirm Team Title

A. Project Description (Background, Problem, Business Case)

B. Goal

C. Scope Process Start: Stop:

D. Event Dates: Start: ECD:

D. Plan Climate survey: Start: ECD:

2. ID Players:

A. Champion

B. Team Leader

D. Process Owner (process under review)

E. Level 1/ Level 2

F. Mentor (if appropriate)

	Name	Contact phone / E-mail
G. Team (function)		

3. Coordinate Stakeholder Survey and Analysis:

4. ID Event / Tools to Use: SIPOC, VSM, RIE

5. Plan Charter Completion (if not previously accomplished) (60 Minutes)

A. Date / Time:

6. Plant Team Kick-Off Meeting

A. Agenda

B. Attendees (1st half, 2nd half)

C. Deliverables Charter, Training

7. Finalize Team Logistics

A. Meeting Location

B. Dates/Times

C. Frequency / Duration

D. Equipment Needed

8. Other Issues / Concerns

ATTACHMENT 3: CLIMATE SURVEY (PRE-EVENT)

SURVEY GOAL: To determine three things: Organization’s Support of Continuous Process Improvement (CPI), Organization’s willingness to Resource CPI Efforts, and Individual’s willingness to Initiate/Participate in CPI Efforts.

1. Give to any organization before they start their first major Process Improvement (PI) effort
2. At least 24 Surveys must be completed and averaged to have valid data.
3. Representation from each category should be: 100% of Senior Leaders (Dir, Dep, Div, Div Dep); 50% of Middle Managers (Supervisors/Leads); at least 60% of total Surveys should be from the Process Owner/Worker category. NOTE: This survey should be kept anonymous and voluntary for Union Employees.
4. Decision Points on Average scores:

8.0 or higher: Support PI. Ready to start an initiative. Management should continue what they are doing. TR will Facilitate LEAN efforts in this organization.

4.0 – 7.9: Neutral to PI. Management must strongly articulate support as the Initiative begins. TR will Facilitate LEAN efforts, but must see Leadership involvement.

– 3.9: Opposed to PI. Delay any PI initiatives for 1-2 months until management can change Culture and Attitudes toward PI. Retake Survey before starting Initiative.

5. Expected Averages by Categories and Attitude toward PI:

	<u>Opposed to PI</u>	<u>Neutral to PI</u>	<u>Support PI</u>
Senior Leaders	6-7	7-9	9-10
Middle Managers	1-3	3-5	6-8
Process Owners/Workers	2-4	5-7	9-10

6. Suggest DIR/DEP hand Survey out at a Staff meeting with a pitch by Senior Leader. Return in 2 days.
7. Analysis of the Survey data will be returned two days after turned into TR for analysis.
8. Refer any questions on the Survey or analysis to your organization’s CPI Core Team.

Survey

Your participation in the following survey is necessary to help assess the current climate in your organization relative to process improvement. Answers to the following questions are anonymous.

Please CIRCLE your answer to the following question

- In which of the three categories below would you place yourself?

Senior Leader (Dir, Dep, Div, Div Dep)

Middle Manager (Sup./Leader)

Process Owner/Worker

Please mark “X” in the square for the appropriate number for each question. The following questions will use the following 1-10 rating scale: 1 = Strongly Disagree 5=Neutral 10 =Strongly Agree

Questions	1	2	3	4	5	6	7	8	9	10
I feel my organization’s Senior Leaders Support Process Improvement Efforts.										
I feel my Immediate Supervisor Supports Process Improvement Efforts.										
I feel I would Support Process Improvement Efforts in my work area.										
I feel my Organization’s Senior Leadership would Resource Process Improvement Efforts.										
I feel my Immediate Supervisor would Resource Process Improvement Efforts.										
I feel I would Resource Process Improvement Efforts in my work area.										
I feel that there are plenty of Processes in my organization that could be improved.										
I feel I have an Open Mind to new ways of doing business in my work area.										
I feel I would initiate or participate in a Process Improvement Effort in my work area if I saw the opportunity.										

ATTACHMENT 4: CHARTER PREPARATION CHECKLIST (PRE-EVENT)

Date:	
Charter "basics":	
1.	Process Owner / Champion
2.	Problem/Opportunity Statement
3.	Impact Statement
4.	Project Scope
5.	Brief description of Current Process
6.	Current Performance
7.	Project Scope
8.	Level 1/ Level 2 / Mentor
Team Leader Assignment:	
Name	
Anticipated duration of assignment to oversee team event, implementation, and follow-ups (30, 60, 90 day checks)	
Team Members Assigned	

Impact to Five Desired Effects	
PRODUCTIVITY	
ASSET AVAILABILITY	
AGILITY	
SAFETY & RELIABILITY	
ENERGY EFFICIENCY	

ATTACHMENT 5: TEAM MEETING CHECKLIST (PRE-EVENT)

Date:		
1. Purpose of Meeting		
2. Team Roles and assignments:		
A.	Team Leader	
B.	Time keeper	
C.	Scribe	
D.	Recorder	
E.	Process Guide	
F.	SME	
3. Supporting advisors:		
	Level 1/ Level 2	
	Mentor (if appropriate)	
	FM advisor	
	SME (dissimilar AFSC) <i>(if appropriate)</i>	
4. Agenda: (Set roles, purpose, agenda items and times)		
A		min
B		min
C		min
D		min
E		min
F		min
G	Wrap up	5 min
5. Wrap-up Specifics:		
A.	Next Meeting / Location	
	Who	What
		When
	Tasking	
6. Post-Meeting Review (Pluses / Minuses)		
	Pluses	Minuses

ATTACHMENT 6: AFSO21 EVENT CHARTER TEMPLATE

Charter: <Event Title>

Process Owner/Champion					
Problem/Opportunity Statement					
Impact Statement:					
Project Scope:					
Brief Description of Current Process:					
Current Performance:					
Team Members:	Team Lead: Facilitator: Other:				
Potentially Affected Users:					
Impact to Desired Effects	PRODUCTIVITY	ASSET AVAILABILITY	AGILITY	SAFETY & RELIABILITY	ENERGY EFFICIENCY

ATTACHMENT 7: TEAM KICKOFF MEETING GUIDE

DATE _____

*****USE of MEETING DYNAMICS REQUIRED*****

1. Introductions/Icebreaker
2. Identify special team members
 - a. Process Owner
 - b. Steering Committee
 - c. Team Leader
 - d. Level 1/ Level 2/ Mentor
3. Review/Modify Charter
4. Work Group/Team Code of Conduct
 - a. Start and End on Time (including breaks & lunch)
 - b. Use Meeting Dynamics
 - c. Maintain Focus
 - d. Break Plan (50/10)
 - e. Cell Phones/Pagers (VIBRATE ONLY)
 - f. Everyone Participates
 - g. One Conversation at a Time
 - h. No Side Discussions
 - i. No Retribution
 - j. Decisions By Consensus
 - k. Use a "Parking Lot"
5. Work Group/Team Logistics
 - a. Location
 - b. Dates/Times
 - c. Frequency
 - d. Duration
 - e. Equipment
 - f. Reporting Process
6. ID Events
7. Event Training (SIPOC, VSM, RIE)

ATTACHMENT 8: VALUE STREAM ASSESSMENT GUIDE

Current State

1. Identify Vision, Scope, Goal (Wing, Group, Squadron, Directorate, Division, Branch, Process)
2. Ensure you have Senior Leader Buy-In
3. Identify the right participants (SME, Management, and Level 1/ Level 2)
4. Identify Data Requirements
5. First Team MTG:
 - a. Team Introduction
 - b. Team Building: Code of Conduct, Logistics
 - c. Roles: Leader, Level 1/ Level 2, Scribe, Recorder, Timer
 - d. Team Training: VSM, LEAN Basics
6. Confirm Data and Sources
7. Identify/Group Major Processes in Organization (brainstorm) (Major Groups are the Value Streams)
8. Identify Stakeholders in the 9 Groupings on TT Chart
9. List Stakeholder Group Expectations/Contributions on TT Chart
10. Identify Top 3-5 Expectations for each Stakeholder Group
11. Prioritize Each Stakeholder Group top 3-5 Expectations on separate PICK Charts
12. Identify Common Thread Expectations
13. Prioritize Value Streams on a PICK Chart
14. Build a Prioritized Focus List of Value Streams from PICK Chart
15. Identify VSM Implementation Plan details

ATTACHMENT 9: VALUE STREAM MAPPING GUIDE

1. Validate Data/Sources
2. Review VSM Steps (show visual)
3. Expand Current State (SIPOC Process Steps) (Product and Information Flows)
 - a. Touch Time (Active Work Time)
 - b. Cycle Time (Receipt to Release)
 - c. Number of People in Step
 - d. Cost of Step
4. Identify Perfect State Map
5. Identify Undesirable Effects (UDEs) on T-Chart
6. Identify Why UDE is a Problem (T-Chart, Left side)
7. List Possible Solutions to UDEs (T-Chart, Right side)
8. Prioritize UDEs (Pick Chart) – maintain awareness of timing limitations as well
9. Identify Future State (optional before or after UDEs)
10. Generate an Implementation Plan (Prioritize UDEs, Categories of:
 - a. Just Do It (JDI)
 - b. Rapid Improvement Event (RIE)
 - c. Project (PROJ)
11. Outbrief Steering Team, Senior Leaders
12. Task Teams with JDIs, RIEs, and Projects

VSM Data Collection Template

OVERALL DATA RECOMMENDED (process-dependent)

1. Customer Demand
2. TAKT Time
3. Cycle Time
4. Budget Breakdown
5. # of Personnel involved

STEP DATA: (recommended - collect for each step of a VSM)

1. Title/Name of Process Step
2. Touch Time: Active Work Time
3. Cycle Time: Time from receipt to release
4. # of People involved
5. Cost of Step Activity

ATTACHMENT 10: SIPOC GUIDE

1. Describe SIPOC Template/Blocks
 - a. Suppliers: Provide Inputs to Process
 - b. Input: Identify All Process Inputs Relative to Project Scope
 - c. Process: High-Level Map, 5-6 Steps
 - d. Outputs: Process Outputs Delivered to Customer
 - e. Customer: Internal, External (End User)
2. Identify Process (30K view)
3. Identify Outputs to Meet Customer Requirements/Expectations
4. Identify Customers (internal, external, and hidden)
5. Identify Inputs to Process
6. Identify Suppliers
 - Identify Suppliers Who are also Customers
7. Request Process Feedback from Workers (post sheets, e-mails)
 - Requires Management Approval
8. Walk/Document High-Level Process
 - a. Product Spaghetti Chart
 - b. Manpower Spaghetti Chart
 - c. Collect Step Data (see template)
 - d. Identify Existing Metric Data (Production Number, Time)
 - e. Identify /Collect Other Process Data

<Event Title> SIPOC					<Event Title> Sub-Processes					
Supplier(s)	Inputs/Req'ts	Process	Output(s)/Req'ts	Customer(s)						

ATTACHMENT 11: A3 REPORT (STATUS) TEMPLATE

A3 Status: <Event Title>



TEAM MEMBERS:

Ms Deb Doyle (AFDWA7KH), Ms Charlotte Rose (AFDWA7KH), Mr Paul Dunbar (SAF/SO), Maj Joe Heilhecker(SAF/So), Mr Michael Puckett (AF/A4)

PROBLEM/OPPORTUNITY STATEMENT:

- MAJCOMs and organizations are having to individually contract for similar AFSO21 contract support services, creating duplication of effort and waste.
 - Winning Team: BearingPoint w/ Simpler Consulting, TSD, NewVectors, MainStream, VSE Corp, GDIT, Anser, and IBM.

PROJECT SCOPE:

- Establish a Blanket Purchase Agreement with tailorable support services that can be used across the Air Force.
 - This BPA does not replace existing contract support organizations may be using

EXPECTED IMPROVEMENT

- \$99M BPA w/ tailored prices for full or part time support
 - Highly qualified array of expertise—Lean focused
 - Management support services
 - POC to access and use this contract: Ms Charlotte Rose, AFDWA7KH, DSN 297-7938.

IMPLEMENTATION:

Task/Steps	Act/Est Start date	Act/Est Cmpl date	Compl %
RFP Release	10-Jul-06	5-Sep-06	100%
Source Selection	6-Oct-06	4-Apr-07	100%
Award	16-Apr-07	4-May-07	90%
Debriefs	18-Apr-07	3-May-07	90%
Customers Initiate Call Orders	As Req'd	As Req'd	

ISSUES/CONCERS:

- Assisting first users in exercising contract
 - Publicizing the BPA

ATTACHMENT 12: A3 REPORT (COMPLETION SUMMARY) TEMPLATE

A3 Summary Report: <Event Title>

PROCESS OWNER/CHAMPION:

TEAM MEMBERS:

PROBLEM/OPPORTUNITY STATEMENT:

Background: Information necessary for reader to understand the complete situation

Standard: Identify what should be happening

Current Situation: Explain what is actually happening now

Discrepancy: Diff. Between standard & current situation

Extent: Location of discrepancy & how long it has been occurring

Rationale: Justify why problem is being addressed now

IMPACT STATEMENT:

Do what: increase, reduce, eliminate, stop...

To what: Describe the area affected by the project

How much: Quantifiable measures that must agree with the standard

By when: A specific date

CAUSE ANALYSIS:

Using one or all of:

- Show fishbone or simplified version
- Show pareto analysis
- Do 5 WHYs of most significant likely cause
- Identify and restate root cause at the bottom

PROCESS IMPROVEMENT:

- Consider & identify short/long term Improvements against the AF five desired effects
- Explain why Improvements were selected
- Improvements should address root cause
- If Improvements do not address root cause, either: explain why, explain plan for addressing root cause, or explain that Improvements selected are intermediate

IMPLEMENTATION:

- What steps will be taken
- Where will they be implemented
- Who will be responsible for implementation
- When (what date) will steps be taken

FOLLOW-UP:

- Explain how you evaluated the success or failure of the plan
- If successful; standardize
- If not successful; begin improvement cycle again

FUTURE IMPROVEMENTS:

- List ideas for future improvements to this plan
- List ideas for future projects that were discovered during this project

DATE: _____

ATTACHMENT 13: LEAN “BASIC STEPS” GUIDE

1. Management selects Focus for the Process Improvement event
2. Identify Team Members and Baseline Data
3. Conduct a Climate Survey
4. Finalize Team Logistics
5. Conduct 1st Team Meeting
6. Train Team on Basic LEAN
7. Identify “Current State” and “Future State”
8. Map Out existing Process
9. Identify Value Added and Non-Value Added Steps
10. Map out Optimum Process
11. Identify and Prioritize Changes
12. Implement Changes with Detailed Plan(s)
13. Follow up and Recycle
14. Identify Additional Changes

ATTACHMENT 14: LEAN “RAPID IMPROVEMENT EVENT (RIE) STEPS” GUIDE

Three Main Parts:

1. Pre Event Activities
 - Management selects Focus, Scope
 - Identify Team Lead and Alternate
 - Identify Steering Team and Team Members
 - Identify Baseline Data to collect
 - Conduct Organizational Climate Survey
 - Collect Data
 - Customer Demand
 - Customer requirements
 - Historical Production data
 - Communicate team intent/expectations
 - Schedule Team participation
 - Finalize Logistics: Location, dates, times
2. 3-5 Day Event
 - Day 1: Identify Current State
 - Day 2: Identify Changes
 - Day 3: Prioritize Changes and Detail Actions
 - Day 4: Implement Changes and Control Plan
 - Day 5: Out brief Steering Team
3. POST Event Activities
 - Process Owners must manage new Process to Control Plan
 - Identify Problems on Control Boards
 - Identify Solutions to Problems
 - Implement Solutions to New Process
 - Sustain Team commitment and new Process
 - Ensure Solutions Working
 - Sustain Standard Work
 - Stabilize new Process
 - Update Work Documents on all Changes
 - Compare/Analyze Metrics

ATTACHMENT 15: SIX SIGMA “BASIC STEPS” GUIDE

The phases of Six Sigma are intended to improve the quality and efficacy of a process by identifying process variation in satisfying customer requirements and expectations, and then reducing or eliminating the variation. Once the process is stabilized, and achieving the desired level of effectiveness it is then Leaned to optimize the efficiency.

The DMAIC (Define, Measure, Analyze, Improve, Control) Process

Define

The first phase in the DMAIC process is to define the project, develop an improvement project plan, define the process and evaluate progress. The steps include:

- Establish purpose and scope for the improvement project
- Develop improvement project plan, including schedule and resources
- Develop process map, including key elements and boundaries
- Conduct a Failure Modes and Effects Analysis (FMEA)
- Identify critical parameters

Measure

In the Measure phase existing process data is collected, measurement systems are evaluated and the process capability requirements are identified. The steps in this phase include:

- Determine process capability requirements or specifications
- Establish measurement method and tools
- Determine sampling plan to meet goals
- Collect data
- Present status report

Analyze

In this phase the process is evaluated to determine its capability. Process data is analyzed to identify opportunities for improvement and to develop plans for improving the process. The steps in this phase include:

- Convert data into information
- Determine process capability
- Develop priority list of parameters
- Perform root cause analysis
- Develop improvement plan
- Present status report
- Determine path forward

Improve

In the Improve phase the improvement plan, developed in the Analyze phase, is implemented. The results are evaluated, conclusions are drawn, improvements are finalized and tested. After the desired

improvements are implemented the changes to the process are documented and new instructions and procedures are developed. The steps in this phase include;

- Implement improvement plan
- Perform designed experiment if applicable (DOE)
- Measure improvements
- Develop conclusions, recommendations and next steps
- Update documentation
- Present status report

Control

The Control Phase is where the improvements become institutionalized. The process changes were documented in the Improve phase. In this phase, control plans are developed to ensure the process continues to be measured and evaluated. This includes implementing process audit plans, data collection plans and plans of action for out-of-control conditions, if they occur. The steps in the Control Phase of the DMAIC process include:

- Establish control system for each critical parameter
- Establish data collection plan
- Establish out-of-control plan
- Establish internal audit plan
- Develop and present final report

ATTACHMENT 16: 8 STEP – PROBLEM SOLVING PROCESS “PSP” GUIDE

1. Clarify & Validate the Problem

⓪ O D A

- a. Does this problem, when solved, help meet needs identified by the organization?
 - Is it linked to the SA&D of organization?
 - Does it help satisfy customer needs (VOC)?
- b. Does this problem, when solved, address key issues identified during SWOT analysis?
- c. Has this problem been identified and directed by a Value Stream Map at the appropriate level?
 - What does the “Future State” need?
 - What resources have been identified to address this issue?
- d. What opportunities were identified or observed by the process or problem area “walk”?
 - Will addressing or improving these issues deliver results that relate to #a or #b?
 - Will addressing or improving this problem deliver the desired future state from #c?

TOOLS: SA&D, Voice of Customer, SWOT Analysis, VSM, Go & See

2. Break Down the Problem/Identify Performance Gaps

⓪ O D A

- a. Does the problem require more analysis or does leadership have enough information to execute a solution?
 - Is this simply a leadership directive?
- b. If more data is needed, how do we measure performance now?
 - What are the KPIs? What is the performance gap?
- c. Does other “non-existent” data need to be gathered?
- d. What does the data indicate are the potential root causes?
- e. Does the data review indicate a bottleneck or constraint?

TOOLS: KPI/Metrics, Performance Gap Analysis, Bottleneck Analysis

3. Set Improvement Target

O ⓪ D A

- a. Is the improvement target measurable? Is it concrete? Is it challenging?
- b. Is the target “Output Oriented”?
 - What is the desired output?
 - Should be “things to achieve”; should avoid “things to do”
 - Will be addressed by Action Plans (Step 5)
- c. The desired target should:
 - Do what? By how much? By when?
- d. If it is a Process Problem, what is the future state?
 - How will it be realized?

TOOLS: *Ideal State, Future State Mapping, B-SMART*



4. Determine Root Cause

- a. What root cause analysis tools are necessary?
 - Why are these tools necessary?
 - What benefit will be gained by using them?
 - Who will need to be involved in the root cause analysis?
 - 10 heads are better than one
 - Remember “cultural” issues related to problem
- b. What is (are) the root cause(s) according to the tools?
- c. How will the root cause be addressed?
- d. Will addressing these address the performance gap?
- e. Can the problem be turned on or off by addressing the root cause?
- f. Does the root cause make sense if the 5 Whys are worked in reverse?
 - Working in reverse, say “therefore” between each of the “whys”

TOOLS: *5 Whys, Brainstorming, Pareto, Affinity, Fishbone, Control Charts*

35 Idea Killers to be watchful for!!!!

- | | |
|---------------------------------------|---|
| 1. We tried that before | 19. We’re not ready for that |
| 2. Our place is different | 20. It isn’t in the budget |
| 3. It costs too much | 21. Can’t teach an old dog new tricks. |
| 4. That’s not my job | 22. Good thought, but impractical |
| 5. They’re too busy to do that | 23. Let’s give it more thought |
| 6. We don’t have the time | 24. We’ll be the laughing stock |
| 7. Not enough help | 25. Not that again |
| 8. It’s too radical a change | 26. Where’d you dig that one up? |
| 9. The staff will never buy it | 27. We did all right without it |
| 10. It’s against company policy | 28. It’s never been tried before |
| 11. The union will scream | 29. Let’s put that one on the back burner |
| 12. Runs up our overhead | 30. Let’s form a committee |
| 13. We don’t have the authority | 31. I don’t see the connection |
| 14. Let’s get back to reality | 32. It won’t work in our plant office |
| 15. That’s not our problem | 33. The committee would never go for it |
| 16. I don’t like the idea | 34. Let’s sleep on it |
| 17. You’re right but... | 35. It can’t be done |
| 18. You’re 2 years ahead of your time | |

5. Develop Countermeasures

O O **D** A

- a. Develop potential countermeasures
 - Tools and philosophies from Lean, TOC, 6 Sigma and BPR as appropriate
- b. Select the most practical and effective countermeasures
- c. Build consensus with others by involving all stakeholders appropriately
 - Communicate, communicate, communicate
- d. Create clear and detailed action plan
 - B-SMART actions
 - Reference Facilitation Techniques as appropriate

TOOLS: A3, Action Plans, Timelines, Financial Reporting Template

6. See Countermeasures Through

O O D **A**

- a. Which philosophy best prescribes tools that address root cause(s)?
- b. Which tools best address root cause(s)?
- c. Which method for implementation fits the tool and improvement need?
 - Rapid Improvement Event?
 - Improvement Project?
 - Point Improvement or “Just Do It”?
- d. If RIE or Project, create “Charter” and communicate
- e. What training or education is needed? By Whom?

TOOLS: 6S & Visual Mgt, Standard Work, Cell Design, Variation Reduction, Error Proofing, Quick Changeover, TPM, RIE

7. Confirm Results & Process

O O D **A**

- a. How are we performing relative to the Observe phase (Steps 1 & 2)?
- b. How are we performing relative to Step 3?
- c. How are we performing relative to Financial Reporting Template projections?
- d. If we are not meeting targets, do we need to return to Step 4?
 - Most problem solving “breakdowns” occur relative to improper root cause identification

TOOLS: KPIs/Metrics, Performance Mgt, SA&D, Standard Work, Audit

8. Standardize Successful Processes

O O D **A**

- a. What is needed to Standardize Improvements?
 - Tech Order changes?
 - Air Force Instruction changes?
 - Official Instruction changes?

- b. How should improvements and lessons learned be communicated?
 - CPI Management Tool (PowerSteering[®])
 - Key meetings?
- c. Were other opportunities or problems identified by the Problem Solving Process?
 - Restart OODA Loop

TOOLS: Checkpoints/Standardization Table, Report Out Theme Story, Broad Implementation, CPI Mgt Tool

Problem Description
A general description of a few words that describes the problem.

I. Problem Situation		IV. Countermeasure(s)	
<p>Typical Information</p> <ol style="list-style-type: none"> 1. How many 2. How often 3. How found 4. Who affected 5. Who found 6. Where originated 7. Current trend 8. Effect on following processes 9. What is the standard 10. Illustrations (sketch, photograph). 11. Graphs & charts 	<p>PPS Questions/Information</p> <ol style="list-style-type: none"> 1. Briefly state the problem in general terms. 2. Why this is a problem for you. 3. Describe how you first became aware that a problem exists. 4. Describe your first impression of the problem (initial problem perception). 5. Why was this problem selected over other problems that may exist? 6. What baseline measurements were taken to establish that a problem exists? 7. Did you go and see the problem first hand? If not why didn't you? 8. What is actually happening? 9. What should be happening? 	<p>Typical Information</p> <ol style="list-style-type: none"> 1. Confirmation 2. Effectiveness 3. Short-term 4. Long-term 5. Perfect 6. Preferred 7. Potential countermeasure s 8. Why recommended 9. Illustrations (sketch, photograph, matrix) 	<p>PPS Questions/Information</p> <ol style="list-style-type: none"> 1. What is the countermeasure(s)? 2. Why was this countermeasure selected? 3. Prepare to implement a countermeasure trial. 4. When will you meet with all of the
II. Target/Goal		V. Implementation	
<p>Typical Information</p> <ol style="list-style-type: none"> 1. Comparison of current versus standard 2. Do what, to what, how much, by when 	<p>PPS Questions/Information</p> <ol style="list-style-type: none"> 1. What do you hope to accomplish? 2. What are your goals? 	<p>Typical Information</p> <ol style="list-style-type: none"> 1. Who 2. What 3. How Where Timing 4. Checkpoint(s) 5. Illustrations (sketch, photograph, matrix) 	<p>PPS Questions/Information</p> <ol style="list-style-type: none"> 1. Explain how you received approval to implement the countermeasure(s). 2. List the stakeholders involved.
III. Cause Analysis		VI. Follow-Up / Standardization	
<p>Typical Information</p> <ol style="list-style-type: none"> 1. Track back 2. Why made 3. Why missed 4. Possible causes 5. Five whys 6. Five therefores 7. Graphs& charts (fishbone, pareto, flowchart) 	<p>Typical Information</p> <ol style="list-style-type: none"> 1. Trend after the countermeasure is implemented 2. How successful was the countermeasure(s) 3. Illustrations (sketch, photograph, 	<p>PPS Questions/Information</p> <ol style="list-style-type: none"> 1. Was the countermeasure(s) effective in improving or solving the problem? 2. After the implementation explain how the countermeasure(s) was tracked. 	





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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME L: AFSO21 BUSINESS RULES

May 2008



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SECTION ONE: BUSINESS RULES

1.1 GENERAL BUSINESS RULES

- AF Key Process and any designated Key Sub-Process Teams will meet, as required, via teleconference or video conference whenever possible. Process Lead Team and Virtual Team meetings or conferences will be held via teleconference or video conference whenever possible – TDYs will be unit funded
- AF Key Process Owners, MAJCOMs and Functionals will use the standard AFSO21 training and toolsets (e.g., AFSO21 Playbook)
- AF Key Process Owners, MAJCOMs, and Functionals will use a common set of project metrics and reporting templates consistent with process council reports
- AF Key Process Owners, MAJCOMs, DRUs, FOAs, and SAF/HAF organizations will use standard metric calculations (e.g., return on investment)
- AF Key Process Owners, Process Leads/Co-leads and MAJCOM/HAF/SAF/DRU/FOA MPOs will document and leverage best practices and existing process work, whenever appropriate, to facilitate and accelerate continuous process improvement
- AF Key Process MPOs/Process Leads/Co-leads will use MAJCOM MPOs as the conduit into MAJCOMs and vice versa
- Commanders/Directors/Functional Chiefs are organizational AFSO21 champions
- All chartered AFSO21 projects will be entered into and tracked via the CPI Management Tool (PowerSteering[®])
- All processes should be documented using standard symbols (per AFSO21 training material)
- Chain of command will be respected when requesting information or support

1.2 FINANCIAL BUSINESS RULES

The AF has a compelling need to recapitalize. AFSO is a powerful tool to drive performance gains and must contribute to that objective. Like PBD720 and energy goals, current financial targets did not originate with AFSO.

- The Emergency and Special Program (ESP) code "GX" will be used to capture all incremental costs and funding associated with AFSO21 initiatives.
- The objective is actual, tangible gains in efficiency through improved process – not risk taking cuts.
- Financial resources generated from savings will be allocated to AF-level priorities.
- MAJCOMs do not retain AFSO related savings until they reach their target. Savings will go toward AF-level priorities.
- Savings is defined as a sustained reduction in programmed cost that results in a subsequent reduction in TOA.

- Cost Avoidance is defined as a reduction in cost that is not yet programmed. It relates to money that would likely have been spent, or needed. It is therefore important, but unavailable for re-investment.
- While financial benefit is important to re-capitalization, benefits need to be balanced across the full “Five Desired Effects”- many important cases may not have direct savings. The Five Desired Effects are 1. Productivity 2. Equipment availability 3. Agility and response/cycle time 4. Safety 5. Energy savings
- FY08 generated efficiencies will remain in the MAJCOMs going forward.
- In all years, any savings beyond targets can be retained by the MAJCOM. This can be used for discretionary re-investment and/or allocated against subsequent years
- Annual savings targets continue through FYDP.
- Percentage savings targets were applied to all appropriations except R&D, procurement and MILPERS. This was done to limit the savings goal to the most addressable areas of the cost structure.
- Savings generated outside targeted cost structure elements (e.g. DHP, R&D) will be available to apply towards a MAJCOM target
- While typically under-funded, efficiency gains in utilities will be allowed as savings due to the “must pay” nature of the bill.
- Savings and other benefits outside of AF accounts (e.g. DHP, TWCF) are important, need to be documented, and may be put to use in OSD/Inter-Service discussions
- One-time gains like inventory reduction may count as savings, provided a plan is developed to monetize the changes – e.g. reduced spare parts buy
- Projects requiring investment capital will be given serious consideration and funded based on a) meeting a pre-set ROI hurdle rate, and b) linkage to actual savings allocated against MAJCOM financial targets. The level of capital and working mechanisms are under development
- Future Process Council meetings will be held quarterly and in person. The format will be largely devoted to a AF Key Process and MAJCOM roundtable review of initiative progress, results, and support requirements. The dialogue started on 22 August 07 will be ongoing
- AF Key Process Owners have full authority to coordinate and recommend changes to procedure through a fact-based case for improved performance. Where disagreement develops, the Council as a whole should review the case and decide the best course of resolution. The SECAF and CSAF have final authority and will engage as required
- AF Key Process Owners currently have no savings contribution target, but are expected to make every possible effort to deliver tangible benefits to MAJCOMs

1.3 PROJECT MANAGEMENT BUSINESS RULES

- Idea Generation and Approval to Charter a Project
 - Individuals will screen for related planned, on-going and completed projects and improvement efforts before initiating a new project to capitalize on work completed and avoid unnecessary duplication
 - Document findings for benefit of event Champion
 - Submit to unit AFSO21 point of contact with Individuals’ Contact Information

- CPI-Management Tool will allow the idea submitter to select initial routing for review and approval.
- AFSO21 leads for AF Key Process Owners, MAJCOMs, Wings and Groups must ensure proper contact information and primary (and secondary) e-mail addresses for routing and action.
 - › If a commander or supervisor has reviewed and approved role and they do not directly use CPI-Management Tool (CPI-MT), ensure their agent for monitoring and responding to forwarded actions is recorded in the CPI-MT.
- Confirm correct idea routing by receiving evaluator...forward if necessary to appropriate evaluator if misdirected
- If ownership unknown, coordinate with SAF/SO and appropriate AF Key Process Owner Core Teams to assign to right evaluation and approval team
- Avoid letting ideas languish—ensure they are directed to proper ownership within 1 day (90% of time) and 1 week (100% of time)
- MAJCOMs and AF Key Process Owners determine delegated authorities for Event/Project/ Initiative approval
- Approval authority (or their reviewer for a project) will do the following:
 - Ensure completeness of inputs for good, potential projects in prep for approval
 - › Work with submitter or complete information if known by reviewer
 - Ensure project does not unduly duplicate other work (accomplished or planned)
 - › Return to sender and communicate rationale if necessary
 - Review Expected Improvements
 - › Ensure alignment with desired effects
 - Forward for up-channel Command and/or AF Key Process Owner approval
 - Monitor reply to initiate or redirect the project recommendation
- Rules for forwarding project initiation recommendations for approval to proceed¹:
 - Forward to/up AF Key Process Owner approval chain when:
 - › Attacking an Air Force level process
 - › Process spans beyond scope of one MAJCOM
 - › Requesting AF Key Process Owner resource support
 - › AF Policy change is required
 - Forward to/up MAJCOM approval chain when:
 - › Forwarding a wing-level idea for an Air Force process improvement

¹ The bias is to approve versus disapprove project initiation if replies are not received in a timely manner to proceed.

- › Attacking a MAJCOM level process
- › Process spans beyond the scope of one wing/base
- › MAJCOM policy change is required
- Providing status to idea submitter
 - Provide means to ensure idea submitter knows status of project—advise when action can be expected from approval authority (e.g., when a Process Board may review and act on the recommendation)
 - Ideas that do not require MAJCOM or AF Key Process Owner approval, but are under their general ownership, will be visible to them. MAJCOM and Process Owner should engage in prompt fashion (1-2 week) in planning a project if it is one that should be redirected or leveraged for AF process—something that should be an exception vice a norm.
- Chartering a Project
 - Standard charters will be used and entered into the CPI-Management Tool
 - Approval authority either completes the draft charter for the project or assigns a Champion to draft the charter and oversee the project
 - Team lead, facilitator and team members are assigned to the project
 - If there are policy changes expected in conducting an event, it is a best practice to have the policy manager on the team or as a close advisory to ensure changes are expeditiously made
 - Teams should have financial manager and manpower advisors to the team for accounting and audit-ability of any hard financial or manpower savings
 - All projects, events and initiatives that are chartered will be entered into CPI-MT
 - Team meets to confirm chartered responsibilities and objectives
 - Changes presented and approved by Champion
 - Supervisors confirm team members and their availability to support the project
 - Note: Team members and supervisors should expect 25% of their team members' time to be required to prepare for an event—and 100% during an event
- Project Planning and Execution
 - Team norms established
 - Team project plan developed
 - Team roles and responsibilities assigned/confirmed
 - All critical stakeholders included as team members or advisors in planning and conducting the event and follow-on implementation
 - Teams will use standardized methods and templates from the AFSO21 Playbook
 - Follow 8-Step OODA Problem Solving Model in conducting and documenting results of a project

- Ensure Champion/AF Key Process Owner for a project receives updates as steps of the process are completed for needed decisions and concurrence with team findings and proposed solutions
- Presenting Project Findings and Recommendations
 - All projects should minimally record the following in presenting and sharing results
 - Charter
 - A3 summary report
 - Financial Reporting Template to record cost and benefits of improvement recommendations
 - Process maps
 - Action plans with the following categories of actions
 - › Do Its can be accomplished immediately or very short order
 - › Events are planned and accomplished within 45 days
 - › Projects are efforts that involve more than one event and take up to 6 months
 - › Initiatives are broader change activities that are longer than 6 months and involve more than one project
 - Recommendations should include plans for follow-up measures and checks to ensure new processes and benefits have been sustained, e.g., 30-60-90 day, 6 mo, and 1 year.
 - › Specific follow-up dependent on the nature of the AFSO21 E/P/I
- Implementation of Improvements and Validating Results
 - Capture and share key documents from the event for others to review/re-use. Key documents include the charter, process map(s), action plan and an A3 summary report.
 - Involve financial managers and manpower managers in auditing actual results and to ensure we do not double count from earlier efforts hard financial or manpower savings
 - iGrafx is highly recommended for process capture but is not mandatory



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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME M: SUGGESTED READING LIST

May 2008

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SECTION ONE: TOP TEN READING LIST

1.1 LEAN THINKING: BANISH WASTE & CREATE WEALTH IN YOUR CORPORATION

by James Womack and D. T. Jones, ISBN: 0684810352

Overview on lean thinking and three in-depth write-ups of how a small, medium and large firm accomplished it. If you are interested in Lean Thinking, this is a must read.

1.2 THE TOYOTA WAY: 14 MANAGEMENT PRINCIPLES FROM THE WORLD'S GREATEST MANUFACTURER

by Jeffrey K. Liker, ISBN: 0-07-139231-9

The book reveals the 14 foundational management principles behind the automaker's world-famous system of "Lean production." Principles are discussed in four categories: philosophy, process, people, and problem-solving.

1.3 LEAN SIX SIGMA FOR SERVICE: HOW TO USE LEAN SPEED AND SIX SIGMA QUALITY TO IMPROVE SERVICES AND TRANSACTIONS

by Michael L. George, ISBN: 0071418210

A "how to" for applying the Lean Six Sigma methodology in non-manufacturing environments.

1.4 THE MACHINE THAT CHANGED THE WORLD: THE STORY OF LEAN PRODUCTION-- TOYOTA'S SECRET WEAPON IN THE GLOBAL CAR WARS THAT IS NOW REVOLUTIONIZING WORLD INDUSTRY

by James P. Womack, Daniel T. Jones and, Daniel Roos, ISBN: 0743299795

First published in 1990, the book provides insights for leaders in any industry who seek to transform traditional models to examples of lean success. A management classic, this book reveals Toyota's lean production system, the basis of enduring success of the Toyota corporation, now the largest auto manufacturer in the world.

1.5 LEARNING TO SEE: VALUE STREAM MAPPING TO ADD VALUE & ELIMINATE MUDA

by Mike Rother and John Shook, ISBN: 0966784308

This book was published by the Lean Enterprise Institute as a "tool kit" for value stream mapping. It is divided into the following sections: getting started, current state mapping, lean value stream concepts and thinking, future state mapping, and achieving the future desired state. Numerous graphics and hands-on examples are included to facilitate the learning process.

1.6 THE GOAL: A PROCESS OF ON-GOING IMPROVEMENT

by E.M. Goldratt and Jeff Cox ISBN: 0884270610

Introduces the Theory of Constraints and applies it in manufacturing (first in a series of books on understanding and applying TOC: *It's Not Luck* is about TOC applied to marketing; *Critical Chain* is about TOC as applied to project management).

1.7 CREATING CONTINUOUS FLOW: AN ACTION GUIDE FOR MANAGERS, ENGINEERS AND PRODUCTION ASSOCIATES

by Mike Rother and Rick Harris, ISBN: 0966784332

A practical, detailed, direct approach to understand and apply LEAN.

1.8 POKA-YOKE: IMPROVING PRODUCT QUALITY BY PREVENTING DEFECTS

by Nikkan Kogyo Shimbun ISBN: 0915299313

This book provides, real world, simple solutions to process problems. An illustrated guide, the book provides problem statements and before/after sketches of conditions requiring 100 percent zero defects. Many poka-yoke devices come from line workers and are implemented with the help of engineering staff. The result is better product quality - and greater participation by workers in efforts to improve your processes, your products, and your company as a whole.

1.9 TOYOTA PRODUCTION SYSTEM: BEYOND LARGE-SCALE PRODUCTION

by Ohno, Taiichi, ISBN: 0898061806

The basic description of the Toyota Production System.

1.10 5S FOR OPERATORS: 5 PILLARS OF THE VISUAL WORKPLACE

by Hiroyuki Hirano ISBN: 1563271230

This book presents the concepts and tools and outlines the 5 pillars of a visual workplace. Intended to provide an understanding of how to make your workplace cleaner and safer, and your job simpler and more satisfying. Hirano discusses how the 5S theory fosters efficiency, maintenance, and continuous improvement in all areas of the company, from the plant floor to the sales office.

SECTION TWO: SUGGESTED READING LIST

2.1 CHANGE MANAGEMENT

Built to Last: Successful Habits of Visionary Companies

by Jim Collins and Jerry I. Porras, HarperCollins Publishers, New York, NY: 1994. ISBN 0-88730-671-3
After six years of studying 18 companies determined to be visionary companies, Collins and Porras provide a thought provoking analysis and fundamental concepts that are common in great organizations that have endured with a average lifespan of 90 years. Filled with specific examples and concepts that can be used today as a blueprint to follow.

Decision Making for Leaders

by T.L. Saaty ISBN 0-9620317-0-4

The key book for understanding the Analytic Hierarchy Process, what it is and how to use it for making decisions in a complex world.

Defense Acquisition Review Journal (ARJ)

Aug-Nov 04 Edition, Special edition devoted entirely to Lean

<http://www.dau.mil/pubs/arq/2004arq/arq2004.asp>

Good to Great: Why some companies make the leap...and others don't

by Jim Collins;Harper Business, NY: 2001. ISBN 0-06-662099-6

Results of a study of 28 companies that made the leap from good to great. The findings serve as a guide for change management and leadership.

The Leader: Developing The Skills And Personal Qualities You Need To Lead Effectively

by Normand L. Frigon Sr. and Harry K. Jackson Jr.; MAF Publishing, San Diego, CA: 2003.

ISBN 0-9747135-0-3

Basic guide on leadership. Includes process, tools and techniques needed to develop or refine leadership ability.

Leading Change

by John P. Kotter, Harvard Business School Press, Boston, MA: 1996. ISBN 0-87584-747-1

A personal, clear-headed and inspiring book that provides practical advice on instituting change. It provides eight examples of mistakes made by change and then provides an eight stage change program.

Leading Six Sigma

by Snee, Ronald D. and Hoerl, Roger W. ISBN: 0130084573

A Step-by-Step Guide Based on Experience with GE and Other Six Sigma Companies. An excellent resource from leaders in the Six Sigma movement who have lead Six Sigma efforts at leading companies.

Making Change Work: Practical tools for overcoming human resistance to change

by Brien Palmer; ASQ Quality Press, Milwaukee, WI: 2003. ISBN 0-87389-611-4

Provides tools for evaluating an organization's readiness for change, and for successful change management.

The Heart of Change Field Guide: Tools and Tactics for Leading Change in Your Organization

by Dan S. Cohen, Harvard Business School Press, Boston, MA: 2005. ISBN 1-59139-775-8
This book is a follow-up guide to John Kotter and Dan Cohen's book, *The Heart of Change*. This guidebook provides tools and advice for application in the work rooms and shop floors of any organization.

Why Change Doesn't Work: Why initiatives go wrong and how to try again and succeed
by Harvey Robbins and Michael Finley; Peterson's, Princeton, NJ: 1996. ISBN 1-56079-944-7
Examines the challenges faced when embarking on a course of organizational change. The authors provide suggestions and guidance for dealing with the challenges.

Who Moved My Cheese?
by Spencer Johnson, G.P. Putnam's Sons Publishing, New York, NY: 1998. ISBN 0-399-14446-3
A straight forward parable about change and resistance to change.

2.2 CPI

The 5S Pocket Guide
by J Peterson, and R. Smith ISBN: 0527763381
A good pocket guide about the 5S's and how to apply them.

Activity Based Costing: Making It Work for Small and Mid-Sized Companies (2nd Edition)
by Douglas Hicks ISBN: 0471249599
An outstanding book that shows how to apply ABC in an effective manner without a massive investment in resources, although titled for "small and mid-sized", larger companies would do well to read and understand. If you are interested in ABC, this is a must read.

The Balanced Scorecard: Translating Strategy into Action
by Robert Kaplan and David Norton ISBN: 0875846513
How do we measure ourselves for the past, present and future ? Read The Balanced Scorecard. The traditional financial measures alone do not tell us the whole story, we need more. This book tells us what and how to measure ourselves better.

Basic Statistics: Tools for Continuous Improvement 4th Edition
by Mark J. Kiemele, Stephen R. Schmidt and Ronald J. Berdine; Air Academy Press, Colorado Springs, CO: 2000. ISBN 1-88-156-06-7
Basic statistical reference for all CPI practitioners.

Critical Chain
by Eliyahu M. Goldratt, The North River Press, Great Barrington, MA: 1997. ISBN 0-88427-153-6
The third book in a series of fictional novels that teach lessons in thinking. This thought provoking work will exhort readers to examine and rethink their business practices in the field of project management.

Developing Lean Supply Chains—A Guidebook,
by Phelps, Thomas A, Hoenes, Teri, and Smith, Michael, Altarum Institute, 2003
A guide to applying value stream mapping and other Lean concepts to supply chains as systems. Based on work with a Boeing supply chain.

A Field Guide to Focused Planning: Hoshin Kanri-American Style

by Joseph F. Colletti ISBN: 0965071812

Shows how to generate and link the high level metrics of the enterprise down to the processes in the enterprise that are generating the actual product or service.

Getting the Right Things Done: A Leaders Guide to Planning and Execution

by Pascal Dennis, The Lean Enterprise Institute, Cambridge, MA: 2006. ISBN 0-976315-6-2

The book is a provides readers with an understanding of key components of strategy deployment, “catchball” and continuous improvement using A3 thinking. It provides a step-by-step approach to strategic alignment and deployment in a workbook form that is easy to read and understand.

The Kaizen Blitz: Accelerating Breakthroughs in Production and Performance

by Anthony Laraia, Robert Hall and Patricia Moody, February 1999.

Dr. Robert Hall and Pat Moody are pioneers in the development and application of the Kaizen Blitz and this book presents their lessons learned since the inception of this key process improvement activity. A systematic approach to planning, executing, and achieving results with a kaizen blitz are provided and case studies are used to emphasize the potential.

Lean Enterprise Value: Insights

by Earl Murman, et al, MIT’s Lean Aerospace Initiative, , 2002

Based on the eight-year Lean Aerospace Initiative study at MIT, this book develops a value creation framework for the aerospace industry, presenting five principles for creating lean enterprise value. After an overview of the recent history of the industry, the book delves into the origins of lean thinking in TQM and Six Sigma, and highlights applications of lean thinking in commercial and military aircraft, software, missiles, and space launch systems. It shows how to implement lean principles, and examines the interrelatedness of corporate and government enterprises in aerospace. Contributors include members of the American Institute of Aeronautics and Astronauts, as well as a former secretary of the US Air Force and a former head of MIT’s Department of Aeronautics and Astronautics. Copyright © 2004 Book News, Inc., Portland, OR.

Lean Extended Enterprise: Moving beyond the Four Walls to Value Stream Excellence,

by Steven Boeder and Terence Burton. Format: Hardcover, ISBN: 1-932159-12-6.

This book looks at lean from a big picture enterprise level across a broad spectrum of CPI concepts and tools. It contains helpful checklists, guides and progress measurement tools.

Lean Logistics: The Nuts and Bolts of Delivering Materials and Goods,

by Michael Baudin, Format: Hardcover, ISBN 1-56327-296-2.

Lean in the logistics world.

Lean Manufacturing: A Plant Floor Guide,

by John Allen, Charles Robinson, and David Stewart. 2001

This guide to implementing lean manufacturing methods outlines the necessary elements, articulates the rationale behind the initiative, and provides an overview of the process. The book offers advice on identifying the causes of waste, profiling the business’ needs, mapping the value stream, crafting policies, problem solving, and applying lean tools. A five-phase framework for implementation is explained one step at a time. Copyright © 2004 Book News, Inc., Portland, OR.

Lean Manufacturing for the Small Shop,

by Gary Conner, Format: Hardcover, ISBN: 0872635201.

The Lean Manufacturing Pocket Handbook,
by Kenneth Dailey, Format: Paperback, ISBN: 0-9747221-0-3.

Lean Six Sigma
by Michael George ISBN: 0071385215
Very complete treatment of the integration of Lean and Six Sigma and the strong reasons for combining them.

Lean Six Sigma: Combining Six Sigma Quality with Lean Production Speed,
by Michael George, April 2002
This book explains how to integrate Lean Production and Six Sigma. The difference between these two concepts is that Lean focuses on eliminating waste and reducing cycle time while Six Sigma focuses on improving quality and minimizing process variation. The author shows how Lean and Six Sigma complement each other and provides a detailed roadmap for integrated implementation.

The Lean Six Sigma Pocket Toolbook: A Quick Reference Guide to 70 Tools for Improving Quality and Speed,
by Michael L. George, John Maxey, David T. Rowlands, Mark Price ISBN: 0071441190
Outstanding Quick Reference Guide for 70+ Lean Six Sigma Tools.

Lean Solutions: How Companies and Customers Can Create Value and Wealth Together,
by James Womack and Daniel Jones, September 2005.
This book moves beyond lean from a supplier's perspective to place the customer in charge of the value mapping and leaning process. This offers a win-win approach to customer supplier efforts with representative case study examples. The authors coin the term 'lean provisioning' as a new perspective that goes beyond the original lean focus and approach.

Lean Transformation: How to Change Your Business into a Lean Enterprise,
by Bruce A. Henderson and Jorge L. Larco, Format: Hardback, ISBN: 0-9646601-2-1.
A guide to leaning an enterprise from a business perspective.

Office Kaizen: Transforming Office Operations into a Strategic Competitive Advantage
by William Lareau, Format: Paperback, ISBN: 0873895568.

Quality Essentials: A Reference Guide from A to Z
by Jack B. ReVelle; ASQ Quality Press, Milwaukee, WI: 2004. ISBN 0-87389-618-1
Compendium of CPI topics alphabetized and illustrated for easy reference. An essential reference for all CPI practitioners.

Quality Improvement Tools & Techniques
by Peter Mears ISBN: 0070412197
Outstanding book for concise explanations of all the tools and each explanation ends with a problem for the reader to solve "Now it's your turn" (with many of the solutions in the Appendix). Covers basic tools (Pareto to control charts) to advanced techniques (Quality Function Deployment, Hoshin Planning, Gap Analysis, Taguchi Methods).

Revolution in Manufacturing: The SMED System,
by Shingo, Shige, Productivity Press, 1985

Initial text by father of single minute exchange of dies concept.

Reengineering the Corporation: A Manifesto for Business Revolution,
by Michael Hammer and James Champy, Format: Paperback, ISBN: 0060559535.
The original guide to reengineering.

The Agenda: What Every Business Must Do to Dominate the Decade
by Michael Hammer, Three Rivers Press, New York, NY: 2001. ISBN 1-4000-4773-0
A practical business book that addresses both business teamwork and customer focus. Written in a clear and easy to understand format, the book is full of ideas and teaches techniques that both small and large companies use to succeed in creating a customer centric perspective.

The Six Sigma Handbook
by Thomas Pyzdek ISBN: 0071410155
Deals with problem solving, team building issues. Tom has a long history of writing clearly on performance improvement topics.

The GE Way Fieldbook: Jack Welch's Battle Plan for Corporate Revolution
by Robert Slater, McGraw-Hill, New York, NY: 2000. ISBN 0-07-135481-6
Written in a conversational format, the book applies GE concepts from the ground level up. Emphasizes building harmony in an organization by eliminating boundaries. Quotes from Jack Welch fill the guide and help the reader understand his emphasis on leadership.

The Six Sigma Black Belt Handbook
by Thomas McCarty, Lorraine Daniels, Michael Bremer, and Praveen Gupta, McGraw-Hill, New York, NY: 2005. ISBN 0-07-144329-0
A "how to" book for practitioners, the book provides practical approaches and techniques that can readily be applied to any process improvement opportunity. The book is well designed, clear and concise content, this handbook is a must have type resource.

Today and Tomorrow: Commemorative Edition of Ford's 1926 Classic
by Henry Ford, Productivity Press, Cambridge, MA: ISBN: 0-91-529936-4
First published in 1926, this autobiography of Henry Ford presents ideas that have never stopped having an impact. Close reading of this book by Taiichi Ohno, of Toyota, inspired his "just in time" concepts. Remarkable and inspiring at the time: doubling wages, cutting the price of a car in half, and producing over two million units a year. Resilient, despite the lapse of time...this business philosophy remains profound to world-wide organizations.

Six Sigma for Green Belts and Champions
by Howard S. Gitlow and David M. Levine, FT Press/Pearson Education, Upper Saddle River, NJ: 2005. ISBN 0-13-117262-X
A Six Sigma implementation guide for green belts and champions. Helps them to discover six sigma tools and techniques to prepare for certification programs.

Six Sigma for Managers,
by Greg Brue, Format: Paperback, ISBN: 0-07-138755-2.
Managerial guide to using Six Sigma in any organization.

Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top

Corporations,

by Mikel Harry (Ph.D.) and Richard Schroeder, Format: Hardcover, ISBN: 0385494378.

The Six Sigma Way

by Peter Pande, et al ISBN: 0071358064

Excellent book (business best seller) on Six Sigma with special importance for transactional processes. Pande is a consultant who works with GE Capital, American Express and Sears & Roebuck. For a manager wanting quick insight into Six Sigma, read the first five chapters.

Statistical Methods for Quality Improvement 2nd Edition

by Thomas Ryan; John Wiley & Sons, NY: 2000. ISBN 0-471-19775-0

A text on variability reduction for Black Belt and Master Black Belt level practitioners.

Statistical Quality Control: Strategies and Tools for Continual Improvement

by Johannes Ledolter and C. W. Burrill, ISBN: 0471193784

A very well thought-out book covering both the team problem-solving aspects (excellent explanation of Nominal Group and Delphi Techniques) and the statistics (analysis of data, hypothesis testing, control charts, DOE (both classical and Taguchi methods) and Response Surface Methodology).

Theory of Constraints

by Eliyahu Goldratt, December 1999

This book discusses the key concepts involved in Goldratt's theory of constraints: the five focusing steps; the process of change; how to prove effect-cause-effect; and how to create simple solutions to complex problems. In addition, the author discusses the adverse impact that organizational and cultural issues can have on process improvement efforts.

TPM for the Lean Factory: Innovative Methods and Worksheets for Equipment Management,

by Sekine, Keniche; Arai, Keisuke, Productivity Press, 1999

A description of the Total Productive Maintenance process. Includes description of how to implement TPM.

The Complete Lean Enterprise: Value Stream Mapping For Administrative And Office Processes,

by Beau Keyte and Drew Locher, Format: Paperback, ISBN: 1563273012.

The Toyota way field book: a practical guide for implementing Toyota's 4P's,

by Jeffrey Liker and David Meier

An excellent reference aid for anyone implementing the Lean principles modeled from Toyota's production and management methods.

Understanding Industrial Designed Experiments (4th Edition)

by Stephen R. Schmidt & Robt. Launsby, ISBN: 1880156032.

A very practical text that "Blends the best of the best designed experiment techniques." Deals with Taguchi, Shainin and classical DOE, tells you which is best for a given situation and why. Has a great "Rule of Thumb" appendix and includes a floppy with data and simulation packages to assist understanding of setting up and running a DOE.

Understanding Variation

by Donald Wheeler ISBN: 0945320353

A great book for starting the process of understanding process variation and how to make rational decisions about it—a short and very concise read.

The Visual Factory: Building Participation Through Shared Information

by Michel Greif ISBN: 0915299674

What's the best way to make process performance known throughout the organization? Read this book and put it into action.

Value Stream Management: Eight Steps to Planning, Mapping & Sustaining Lean Improvements,

by Don Tapping, Tom Shuker and Tom Luyster, January 2002.

This is a how-to manual for implementing and sustaining lean improvements. It is very well organized, simple to follow and provides ready to use reference material in the form of hard copies and a compact disc (CD). The authors use a manufacturing case study to illustrate each learning point. This is a valuable reference for those wanting a down to earth approach to implementing lean improvements.

Value Stream Management for the Lean Office: Eight Steps in Planning, Mapping and Sustaining Lean Improvements in Administrative Areas,

by Don Tapping and Tom Shuker, Paperback, ISBN: 1563272466.

2.3 DESIGN FOR LEAN SIX SIGMA

Better Designs in Half the Time: Implementing QFD Quality Function Deployment

by Bob King; GOAL/QPC: ISBN 1-879364-018

Basic reference on QFD. The book that introduced QFD to the US.

Design and Management of Service Processes

by Rohit Ramaswamy ISBN: 0201633833

An excellent book on characterizing and improving service (transactional) processes (one of the AT&T series).

Design for Six Sigma: A Roadmap for Product Development

by Kai Yang and Basem El-Haik; McGraw Hill, NY: 2003. ISBN 0-07-141208-5

Fundamental handbook for all designers.

Fast Innovation

by Michael L. George, James Works, Kimberly Watson-Hemphill ISBN: 0071457895

Achieving Superior Differentiation, Speed to Market, and Increased Profitability by understanding the art of innovation.

Function Deployment: How to Make QFD Work for You,

by Cohen, Lou, ISBN: 0201633302

The book to buy if you are trying to learn QFD (after you have Terninko's book, see below)

The Innovation Algorithm: TRIZ, Systematic Innovation and Technical Creativity

by Genrich Altshuller, translated by Lev Shulyak and Steven Rodman; Technical Innovation Center, Inc., Worcester, MA: 2000. ISBN 096407404-4

Description of ARIZ, TRIZ's problem solving algorithm.

Patterns of Problem Solving 2nd Edition

by Moshe Rubenstein and Iris R. Firstenberg; Prentice-Hall, Inc., Englewood Cliffs, NJ: 1998. ISBN 0131227068

An engineering approach to fact based decision making.

The QFD Handbook

by Jack ReVelle, J.W. Moran and C. A. Cox ISBN 0471173819

Covers a wide variety of techniques and applications for assisting the translation of customer needs into the design of products and services and the related processes necessary to produce/deliver them.

Quality Engineering Using Robust Design

by Madhav S. Phadke ISBN: 0137451679

Background and application of Taguchi experimentation methods (one of the AT&T series). Good book on Taguchi and Robust Design methods.

Step-By-Step QFD: Customer Driven Product Design (2nd Edition)

by John Terninko ISBN: 1574441108

Great introduction to QFD as well as TRIZ and Taguchi.

Today and Tomorrow

by Ford, Henry Productivity Press: 1926, 1988 (reprint)

Ford's early text on mass production. One of the source documents for the thinking that drove the Toyota Production System.

Tools for Thinking and Problem Solving

by Moshe Rubenstein; Prentice-Hall, Inc., Englewood Cliffs, NJ: 1986 ISBN 0-13-925140-5

A compendium of tools for problem solving and decision making.

2.4 RELIABILITY ENGINEERING

Reliability Engineering Handbook,

by Dodson and Nolan, Basic reliability engineering text.

Practical Reliability Engineering 4th Edition

by Patrick D. T. O'Connor; John Wiley and Sons, NY: 2003. ISBN 0-470-84463-9.

Text on reliability engineering and management. Provides preparation for ASQ Certified Reliability Engineer examination.

Reliability-Centered Maintenance 2nd Edition

by John Moubray; Industrial Press Inc., NY: 1997. ISBN 0-8311-3146-2.

Basic reference on RCM.

Repairable systems reliability,

by Ascher and Feingold, 1984, Marcel Dekker.

Specifics of applying reliability to repairable systems.



Systems Engineering and Analysis,
by Blanchard and Fabrycky, 1990, Prentice Hall.
Basic introductory text on systems engineering.



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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME N: GLOSSARY OF TERMS AND ACRONYMS

May 2008



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SECTION ONE: GLOSSARY OF TERMS

The terminology provided in this volume has been largely derived from a variety of continuous improvement-related publications and programs. (Terms highlighted in **bold letters** indicated those not specifically used by AFSO21, but still recognized as important to the continuous process improvement body of knowledge)

<u>3P</u>	A three dimensional look at the health of an organization: 1. People: Satisfaction of both Internal and External customer. 2. Product: Conforming to the requirements specified. 3. Process: Continuous Improvement of all the operations and activities.
<u>5S</u>	See 6S. A traditional Lean manufacturing tool. Originally five Japanese words starting with the letter "S" translated into several combinations of English words.
6S	A process improvement tool. An approach to cleaning up, organizing, and standardizing work: <ul style="list-style-type: none"> • sort (clear out rarely used items) • straighten (organize and label a place for everything) • shine (clean) • standardize (make standard the best known way to do something) • sustain (consciously continue to work the previous four items) • safety (ensure all hazards are removed)
A3	Popularized by Toyota Corporation, a single page report. Forces the person preparing the report to eliminate non-essential information and stick to essential facts only. <i>A3 is a standard paper size used frequently in Japan and Europe.</i>
Action Item	Formally assigned requirement to accomplish something within an assigned time frame. Very often action-item tracking numbers are used to assure accountability.
Action Plan	A time-phased schedule for executing Events, Projects and Do-Its that transitions a process from the current state to the desired future state, as determined by members of the Lean Event.
Activity Based Costing	A management accounting system that assigns cost to products based on the amount of resources used (including floor space, raw materials, machine hours, and human effort) in order to design, order, or make a product.
Air Force Eight Step Problem Solving Process	The eight step problem solving process is an iterative approach which reflects continuous improvement and revisiting how work is performed and how it can be further improved. The eight step problem solving process is based on the OODA Loop (Observe, Orient, Decide, Act) as originated in the 1950's by Col. John R. Boyd, USAF. He defined how successful fighter pilots engaged in combat by repeating the decision making process (OODA loop) faster than their enemy, and he was able to help teach new pilots to do the same, improving their chances for success. Air Force Leaders today increase the combat capability of the their organizations, by using the same infinitely repeating nature of decision making emphasized by Col. Boyd, using AFSO21 and Continuous Process Improvement. Observe: Step 1 – Clarify & Validate the Problem Step 2 – Break Down the Problem / Identify Performance Gaps Orient: Step 3 – Set Improvement Targets Step 4 – Determine Root Causes Decide: Step 5 – Develop Countermeasures Act: Step 6 – See Countermeasures Through Step 7 – Confirm Results & Process Step 8 – Standardize Successful Processes
Air Force Smart Operations for	The Air Force dedicated effort to develop and institutionalize a comprehensive, Service-wide, strategic-level continuous process improvement approach. (AF StratPlan 3.6) "We will capitalize on using knowledge from other organizations and disciplines to improve every

the 21 st Century	business process within the Air Force. With AFSO21, we are challenging all Airmen to examine processes and eliminate steps in business processes that add little to no value."
AFSO21	Air Force Smart Operations for the 21 st Century.
Alignment	The disciplined agreement within an organization between top level strategic plans, goals and objectives with all subordinate levels' plans, goals and actions.
<i>Alternative</i>	An approach or program that is another possible way of fulfilling an objective, mission, or requirement. The status quo, or an upgrade to the status quo, is usually an alternative to a proposed course of action. (AFMAN 65-506, <i>Economic Analysis</i>)
Analysis of Alternatives	Process that follows the defining of alternatives, where different courses of action are reviewed, weighed, and either chosen or eliminated as the optimum choice.
Andon Board	See Visual Management
Advanced Planning System (APS)	Computer program that seeks to analyze and plan a logistics, manufacturing, or maintenance schedule to optimize resource use to achieve desired results.
<i>Appropriation</i>	An authorization by an act of Congress that permits Federal agencies to incur obligations and make payments from the Treasury. An appropriation usually follows enactment of authorizing legislation. An appropriation act is the most common means of providing Budget Authority (BA). Appropriations do not represent cash actually set aside in the Treasury; they represent limitations of amount that agencies may obligate during a specified time period. (Defense Acquisition University, <i>Glossary of Defense Acquisition Acronyms & Terms</i>)
Autonomation	Transferring human intelligence to automated machinery so machines are able to detect the production of a single defective part and immediately stop themselves while asking for help. Permits one operator to oversee many machines with no risk of producing vast amounts of defective product.
AVCOM	Avionics Components Obsolescence Management, a software tool that helps provide forecast and other information on electronic parts obsolescence.
Awareness Training	Typically a two hour block of instruction given to all Airmen and civilian employees on CPI principles and methodology.
AWP	Awaiting Parts—A special status for an item held up in a repair process while it waits for parts needed to complete the repair. This time is generally not considered in determining the time a repair organization spends repairing something.
B-SMART	Acronym for Balanced-Specific-Measurable-Attainable-Results Focused-Timely. It is used in relation to objective setting in CPI initiatives. A sound objective will meet each of the letters of the acronym.
Backflow	A flow that returns towards its source. In a production or maintenance environment, it is any step in the process that must be corrected or redone.
Balanced Scorecard	A strategic management system used to drive performance and accountability throughout the organization. The scorecard balances traditional performance measures with more forward-looking indicators in four key dimensions: <ul style="list-style-type: none"> ▪ Financial ▪ Integration/Operational Excellence ▪ Employees ▪ Customer
Baseline Measure	A statistic or numerical value for the current performance level of a process or function. A baseline needs to be taken before improvement activities are begun to accurately reflect the rate of improvement or new level of attainment of the performance being measured.
<i>Base Year (BY)</i>	A reference period that determines a fixed price level for comparison in economic escalation calculations and cost estimates. The price level index for the BY is 1.000. (www.dau.mil/pubs/glossary)
Batch & Queue	The mass production practice of making large lots of a part or product then sending the batch to wait in queue before the next operation in the production process.

Benchmark	A qualitative and/or quantitative performance measure of an activity or activities enacted at one or more enterprises that are considered best in class. A benchmark helps an Air Force organization set goals in the strategic or tactical phase of an implementation. The comparison is usually made between companies competing for the same market shares, but can also be done based on a single similar function even if the enterprises are from different industries and participate in different markets.
<u>Best Practise</u>	
<u>Black Belt</u>	See Level 2
Brainstorming	A method of unlocking creativity and generating ideas that is very effective for teams. In the first step, ideas are offered without the constraints of critical evaluation or judgment. The idea is to “let go”. After all ideas have been listened to, no matter how “far-fetched,” the ideas are then critically evaluated to select the best ones.
Breakdown Maintenance	A Total Productive Maintenance technique: Time it takes to accomplish a fix after breakdown occurs.
Buffer Stock	Maintaining some small portion of finished products/goods to temporarily satisfy variations in demand.
Burning Platform	The case for action – the reason to initiate an event. Defined by Leadership.
Business Case	A written document describing why an organization is planning to implement a process improvement initiative, to include a goal and objectives that are specific and measurable based on cost, performance, or schedule.
<i>Business Case Analysis (BCA)</i>	A business decision document that identifies alternatives and presents convincing economic and technical arguments for implementing alternatives to achieve stated organizational objective/imperative(s). (AFMAN 65-510, <i>Business Case Analysis Procedures</i>)
Business Value	Not identified by the customer, but required to satisfy some other need (e.g., policy, law or regulation, operational security).
Capability Maturity Matrix.	A framework for assessing organizational capability in terms of various characteristics (e.g., lean practices). Level 1 normally represents rudimentary capability and level 5 represents world-class industry leader capability.
Capacity Constraint	Anything that hinders production or process flow (the weak link in the chain).
CASCO	Conduct Air Space and Cyber Operations
Catchball	A participative approach to decision-making. Used in policy deployment to communicate across management levels when setting annual business objectives. The analogy to tossing a ball back and forth emphasizes the interactive nature of policy deployment.”
CDOV	Concept-Design-Optimize-Verify. An acronym for a systems approach to requirements development and effective problem solving. The steps suggest a process from development of an improvement idea to a feedback loop that monitors performance in relation to process goals.
Cell	A logical, efficient, and usually physically self-contained arrangement of personnel and equipment to complete a sequence of work. The cell enables one-piece flow and multi-process handling. Typically, each cell has a leader who manages the workflow and is responsible for maintaining performance and productivity.
Cell Design	The technique of creating and improving cells to optimize their one-piece flow. A quality cell design results in improved space use, higher value-adding ratios, shorter lead times, lower work in process, and optimal use of employees.
Champion	The individual within an organization with the authority to commit and dedicate resources, assets, and people, and to charter new initiatives. Charged with primary responsibility for creating the vision and leading an organization based on their strategic view of his/her organization. Champions guide CPI initiatives through critical understanding of how the organization fits into the enterprise at large.
Change Management	Change which is planned, predictable, focused and aligned with the wants/needs or the organization’s leadership.

Change Agent	See Level 1
Change Manager	See Level 2
Communication Plan	The strategy a Change Agent uses to convey his or her CPI beliefs and commitment to every level of the organization. This is spelled out in each organization's "CPI Implementation Plan."
Control Chart	A chart with upper and lower control limits on which values of some statistical measures for a series of samples or subgroups are plotted. The chart frequently shows a central line to help detect a trend or plotted lines toward either control limit.
CONOPS	Concept of operations—description of how an organization will implement a certain program or effort.
Constraint	A constraint is any resource whose capacity is less than the demand placed upon it. TOC attacks constraints and barriers (restrictions or other blocks to increases in output). If no demand is placed on the resource, but it is still the limiting step in a process it is called a "time trap."
Continuous Flow	The mechanism to transform a product, service or information by which the request for the item is triggered by a customer demand. The production process creates the needed item without delay or inventory in just the right quantity and delivered at the right time to satisfy the triggered demand.
Core Team	The full-time personnel within an organization dedicated to CPI operations on a day-today basis. The Core Team is lead by the organization's Master Process Officer. The Core Team will typically be comprised of one-to-three percent of the organization's population.
Corrective Action	The action an identified group takes to reverse a downward trend in process metrics.
Corrective Maintenance	A Total Productive Maintenance technique: Improving or modifying equipment to prevent breakdowns or to make maintenance activities easier.
Cost Avoidance	Benefits from actions that remove the need for an increase in manpower or costs that would be necessary if present management practices continued. Cost-avoidance savings enables a higher level of readiness or increased value (quantity, quality, or timeliness) of output to be reached without increasing staffing or cost, or absorb a growing workload without increasing staffing or cost. (AFI 38-301, Productivity Enhancing Capital Investment Program)
Cost Savings or Hard Savings	Benefits which can be precisely measured, quantified, and placed under management control at the time the benefits occur. Hard savings can be reflected as specific reductions in the approved program or budget. Examples include: manpower authorization costs or funded work-year reductions, reduced or removed operating costs (such as utilities, travel, and repair), and reduced or removed parts and contracts. (AFI 38-301, Productivity Enhancing Capital Investment Program)
CPI	Continuous Process Improvement—a comprehensive philosophy of operations that is built around the concept that there are always ways in which a process can be improved to better meet the needs of the customer and that an organization should constantly strive to make those improvements
CPI Deployment Cycle	A multi-step cycle that shows how the Air Force views CPI progression and management. The cycle begins with strategic planning and culminates in CPI project implementation. It is an iterative cycle that builds upon achieved results.
CPI Maturity	The degree of process improvement across a defined set of process areas where management goals have been set and metrics for measuring attainment of the goals are in place. The reliability of repeatability of CPI application.
CPI Mentor	A CPI Mentor is defined as "a trusted counselor or guide" for CPI practitioners and leaders working to accelerate process improvement in their organizations. Mentoring, therefore is a relationship in which a person with greater CPI training, experience and wisdom guides another person to develop both personally and professionally. Adapted from AFI 36-3401
Cost Management	Managing various resources properly, and eliminating all sorts of Waste in such a way that the overall cost goes down.
Critical Customer Requirements	Measurable, "must-have" or "must-be" attributes which are important to the customer. Often, a major challenge for process improvement teams is translating the Voice of the Customer into Critical Customer Requirements.

(CCR)	
Culture Change	A major shift in attitudes, norms, sentiments, beliefs, values, operating procedures, and behavior of a group or organization.
Current State	Part of the Value Stream Analysis, this depicts the “current state” or “as is” process - how it actually works in terms of operations, materiel, and information flow.
Current Year \$ or Then-Year \$	See <i>Then-Year \$</i>
Customer	Someone for whom a product is made or a service is performed. There are internal and external customers. The external customer is the end user of an organization’s product or service. Internal customers are those who take the results of some internal process step (i.e., a report, an electronic file, or a component) as an input for their work. When applied to a supply chain, entire companies become customers of one another.
Customer Pull	<p>Pull systems are similar to other systems like “just in time” (jit), material as needed (man), and kanban.</p> <p>Pull got its start in America in the grocery business: The grocer replaced on their shelves, products demanded or “consumed” by the customer. The grocer needed deliveries on time, the proper brand, and the right price and size to satisfy the customer. To do this, the grocer used JIT, communication with both supplier and customer, and rotation of stock F.I.F.O.</p>
Customer Relationship Management (CRM)	A philosophy that puts the customer at the design point, it is being customer-centric. It should be viewed as a strategy rather than a process. It is designed to understand and anticipate the needs of current and potential customers.
Cycle Time	The time duration of a process, e.g., from request of a part to fulfillment of the order. The beginning and end of a specific cycle time are defined as part of a CPI project and used to set the baseline for related value stream analysis and improvement goals.
Discount Rate	The parameter used to translate future costs into present worth (see “Present Value” below). It is a measure of the time value of money. (AFMAN 65-506, Economic Analysis)
<u>DMAIC</u>	Acronym for Define-Measure-Analyze-Improve-Control. DMAIC is an ordered problem solving methodology applied widely in private and public sector organizations. The DMAIC phases direct a process improvement team logically from problem definition to implementing solutions that are linked to root causes, towards establishing best practices to help ensure the solutions stay in place. <i>A Six Sigma tool.</i>
<u>DMADV</u>	Acronym for Define-Measure-Analyze-Design-Verify. Design for Six Sigma (DFSS) or new product/service introduction. DMADV is a data-driven quality strategy for designing products and processes, and it is an integral part of a Six Sigma Quality Initiative.
<u>DMALC</u>	A derivative of DMAIC. Acronym stands for Define-Measure-Analyze-Lean-Control. DMALC is an application of the DMAIC problem solving methodology in the Lean environment.
<u>DMSMS</u>	Diminished manufacturing sources and material shortages—an inclusive term for the general problem of parts becoming unavailable by becoming obsolete or through suppliers going out of business or leaving a particular market.
DoD	U.S. Department of Defense
Do-It	A desired change to the current state that can be done quickly and easily—usually within days.
Delivery	Meeting both the delivery as well as the volume required of the customer.
Driver	An action that forces an expected reaction.
Efficiency	The amount of output per unit of input. Alternatively, it is the quality whereby one alternative uses less input per unit of output than the other alternatives. (AFMAN 65-506, Economic Analysis)
Equipment	In logistics, all nonexpendable items needed to outfit or equip an individual or organization (http://www.dtic.mil)
Enterprise Resource	A type of software package that attempts to consolidate all the information flowing through the enterprise from finance to human resources. ERP is used to standardize data,

Planning (ERP)	streamline the analysis process, and manage long-term planning with greater ease.
End-to-End Value Stream Mapping or Enterprise VSM & Analysis (EVSMA)	A powerful tool for analyzing material and information flow throughout and between organizations in order to identify and plan improvements. EVSMA and EA&AP use simple diagrams to depict a current process and provide clarity to support improvements in lead time and inventory reductions. Organizations use these tools to identify and plan kaizen/related events for improved effectiveness. Use also encourages participants from all parts of the organization to gain an understanding of the current material and information flow.
Error Proofing	The design or development of tools, techniques and processes that make it impossible or very difficult for people to make mistakes.
Event	A short-term, high intensity effort to address a specific problem. The focus is typically a week, though the preparation normally begins several weeks in front and follow-up continues after. Also called by other names, including Rapid Improvement Event, Rapid Improvement Workshop, Kaizen Event, Kaizen Blitz, Accelerated Improvement Workshop.
Event Summary	The summary provided to management of what was accomplished during an Event. This includes the resulting Action Plan and seeks approval from management to proceed with the action plan as briefed.
Executive Council	An Executive Council should be established with the Wing or Deputy Wing Commander as chair and the Group Commanders or their deputies on the Council as members. The purpose of the Council is to provide governance and leadership to AFSO21 efforts within the organization.
Facilitator	Consultant, advisor, or subject matter expert that leads or drives the pace and direction of a group participation event.
Facility	A real property entity consisting of one or more of the following: a building, a structure, a utility system, pavement, and underlying land. (http://www.dtic.mil)
Firefighting	Using emergency fixes for problems without eliminating the root cause; managing by crisis instead of proactive planning.
Five Whys	The problem solving technique of asking “why” five times to identify the root cause of a problem. Solutions to other than the root cause address symptoms and may provide temporary relief, but will not ensure that another symptom does not return in its place. The most effective countermeasures developed and implemented should address the root cause. Practice was made a standard practice made popular by Taiichi Ohno and Shigeo Shingo.
Flow	The sequential, coordinated movement of information, product, or service through a process.
Flow Thinking	Production or other work areas are grouped according to various classifications (product, material used, service provided, etc.) and located close to each other to allow unimpeded coordination.
Flow Time	The amount of time it actually takes a product, information or service to move through a process, including wait time.
Footprint space	The amount of physical space it takes to execute a step in a process.
Future State	A vision of the optimum operating environment with new/improved processes in place.
Gap Analysis	An analysis that compares current performance to desired performance so that solutions can be found to reduce the difference (close the gap).
Green Belt	<i>See Level 1</i>
Hoshin Kanri	<i>See Strategy Alignment and Deployment</i>
HQ	Headquarters
Ideal State	A vision of the “future state” that depicts what the system should look like if there were no constraints. Based on the “King or Queen for a Day” mentality.
Inflation	Inflation is a rise in the general level of prices. (AFMAN 65-506, Economic Analysis)
Indirect Costs	An investment in resources that have already been purchased but which could be utilized for other purposes. While the consumption of these resources is needed to complete the initiative under consideration, they do not result in the actual expenditure of additional funds nor do they directly result in an increase to actual Air Force (or other government) expenditures. (Lt Col Bickel, SAF/CoE)

Integration	Merging a continuous process improvement approach with the current organizational culture by seeking economies of scale, synergies and the best way of enhancing organizational change
Investment	Those program costs required beyond the development phase to introduce into operational use a new capability; to procure initial, additional, or replacement equipment for operational forces; or to provide for major modifications of an existing capability. They exclude research, development, test and evaluation, military personnel, and operation and maintenance appropriation costs. (AFMAN 65-506, Economic Analysis)
Just-in-time (JIT)	A strategy for inventory management in which raw materials and components are delivered from the vendor or supplier immediately before they are needed in the transformation Process
<u>Kaikaku</u>	A Japanese term for a rapid and radical change process, sometimes used as a precursor to kaizen activities.
<u>Kaizen</u>	A Japanese term that means continuous improvement, taken from words 'Kai' meaning continuous and 'Zen' which means improvement.
<u>Kaizen Story</u>	A Japanese term meaning a standardized problem solving procedure to be used at each level of an organization on a continuous process improvement journey. <i>See Air Force Eight Step Problem Solving Process.</i>
<u>Kanban</u>	A term that means "signal". It is one of the primary tools of a Just-in-Time system. The kanban signals a cycle of replenishment for production and materials in order to maintain an orderly and efficient flow of materials. It is usually a printed card that contains specific information such as part name, description, quantity, etc.
Lead or Co-Lead	Full-time positions under AF Key Process Owners. They lead AF Key Process Teams. Their responsibilities include: <ul style="list-style-type: none"> • Ensure strategic alignment of AFSO21 efforts for AF Key Process Owners. • Ensure strategic charters are created for enterprise level initiatives. • Report to the Process Council updated status on High Value Initiatives and any areas requiring intervention at the General Officer or CSAF/SECAF levels. • Provide strategic direction and support to MAJCOM Teams and work areas to eliminate waste, implement AFSO21 practices. Monitors proposed as well as on-going AFSO21 projects and events under their Process Owner authority to 1: ensure alignment with strategic objectives and 2: leverage AFSO21 efforts for broader AF benefit. Helps develop AFSO21 implementation strategy for their leader's command.
Lead Time	Interval of time between the established need for something and its successful delivery.
Lean	A systematic approach to identify waste, focus activities on eliminating it, and maximize (or make available) resources to satisfy other requirements.
Lean Enterprise	A business organization that delivers value to its stakeholders, with little or no superfluous consumption of resources (materials, human, capital, time, physical plant, equipment, information or energy).
<u>Lessons Learned</u>	The Air Force Lessons Learned (L2) Program exists to enhance readiness and improve combat capability by capitalizing on the experiences of Airmen. A "lesson learned" is an insight gained that improves military operations or activities at the strategic, operational, or tactical level, and results in long-term, internalized change to an individual or an organization. Past experiences also assist senior leaders in programming, budgeting, and allocating resources to make changes to doctrine, organization, training, materiel, leadership & education, personnel, and facilities (DOTMLPF). A lesson learned is not a compliance "report card" nor is it automatically accepted and implemented without the scrutiny of war-fighters and functional experts. A lesson learned is not "owned" by any one organization (i.e., the Combat Air Forces (CAF), Mobility Air Forces (MAF), the respective A9Ls, etc.). The AF L2 program is defined in AFI 90-1601 (draft).
Level 1	An individual assigned at the squadron/branch level responsible for providing CPI awareness training and conducting RIEs of lesser complexity at the squadron and group level. (See Vol C, Figure C1) Completion of the 40 hour in AFSO21 in-residence course or completion of appropriate level of PME that incorporates Level 1 training. Taught at least one class of AFSO21 Awareness. At a minimum, lead problem solving in three events <i>Level 1 is referred to as a Green Belt in Six Sigma or Lean-Six Sigma.</i>

Level 2	An individual assigned at the wing/division level, and who has completed Level 1 training and certification. Lead 10 events subsequent to Level 1 certification to fulfill prerequisite experience necessary to attend Level 2 training (prerequisite cumulative total of 13 events). Able to participate in end-to-end events of greater complexity, and work with a Level 3 at the enterprise level. (See Vol C, Figure C1) Completion of additional training in principles of Lean, Six Sigma, Theory of Constraints, and facilitation. At a minimum, leads five additional AFSO21 events as a Level 2 candidate (cumulative total 18 events). Taught at least one Level 1 course. Defends problem solving work before a board to become certified. <i>Level 2 is referred to as a Black Belt in Six Sigma or Lean-Six Sigma.</i>
Level 3	An individual assigned to a Major Command, who has completed significant training in CPI and completed Level 2 training and Level 2 certification. Responsible for designing Major Command CPI initiatives, managing Wing and Group CPI efforts, and coordinating all CPI related activities within the Major Command. Joins efforts with other Major Commands and Air Force Key Process Owner Core Teams on Enterprise level CPI efforts. (See Vol C, Figure C1) Lead 20 events subsequently as a certified Level 2 to fulfill prerequisite experience necessary to attend Level 3 training (prerequisite cumulative total of 38 events lead). Complete additional instruction in the principles of Enterprise Value Stream Mapping Activity (EVSMA), Business Process Re-engineering (BPR), Strategic Alignment and Deployment (SA&D), and Performance Management – specifics TBD. <i>Level 3 is referred to as a Master Black Belt in Six Sigma or Lean-Six Sigma.</i>
Level Scheduling	Planning an output so that the fabrication of different items is evenly distributed over time.
Leverage Point	The point at which attention and/or application of resources would result in tangible improvements/ benefits to the entire end-to-end value stream.
Life-cycle Costs	Life-cycle costs of an asset are all direct and indirect initial costs, including planning and other costs for procurement; all periodic or continuing costs of operations and maintenance; and costs of decommissioning and disposal. (OMB Circular No. A-11 (2006))
Maintenance Prevention	A Total Productive Maintenance technique: Designing and installing equipment that needs little or no maintenance.
MAJCOM	Major Command—the highest level distinct commands within the Services, normally led by four-star flag officers.
Management Review	A report to management on progress made during an Event. A heading check to ensure that management agrees with the approach taken by the Team, normally done in the middle of an Event.
Manual Cycle Time	The amount of hands-on time it takes to move a product or information through a process.
Master Black Belt	<i>See Level 3</i>
Master Process Officer (MPO)	MPOs manage the AFSO21 program for Process Owners and Commanders or Directorates at the HAF, SAF, and MAJCOM level. MPOs: <ul style="list-style-type: none"> ▪ Advise their leadership on AFSO21 ▪ Promulgate results across the Air Force ▪ Ensure alignment among all related strategic goals, objectives and processes ▪ Set priorities ▪ Communicate with leadership and the workforce ▪ Select and oversee projects which align to the key processes ▪ Lead complex projects which align to the key processes ▪ Maintain overall alignment with other AF Key Processes and MAJCOMs ▪ Mentor and coach Level 1 and Level 2 Facilitators ▪ Maintain an Air Force-wide perspective ▪ Serve, as required, as member of the either the Process Lead Team or Virtual Team based upon current assignment <p>Monitors proposed as well as on-going AFSO21 projects and events under their leader's command or Process Owner authority to 1: ensure alignment with strategic objectives and</p>

	2: leverage AFSO21 efforts for broader Command or AF benefit. Monitors training and AFSO21 efforts to institutionalize continuous process improvement under their leader's command Helps develop AFSO21 implementation strategy for their leader's command.
MC rate	Mission capable rate—a calculated rate that describes the portion of aircraft or vehicles that make up a weapon system that are, at least nominally, in a mission-ready condition. It excludes from consideration any aircraft or vehicles that have been shipped to a depot for repair. When the MC rate falls below some Service-defined target, then expediting becomes necessary to get that weapon system back up to full speed.
Mentor	See <i>CPI Mentor</i>
Metrics	Measurements taken over a period of time that communicate vital information about a process or activity.
Milk Run	A routing of a supply or delivery vehicle to make multiple pick-ups or drop-offs at different locations. Normally performed on a routine or semi-routine basis.
Mission	The Mission is a concise, unambiguous, and measurable description of the organization's role in the overall objectives of the Department of Defense with a clear and explicit connection to the Strategic Planning Guidance (SPG)/Contingency Planning Guidance (CPG). The declaration should also have specific reference to the effective achievement of that mission.
Monument	Part of a process that cannot easily be altered whether because of physical constraints or legal or regulatory requirements.
Muda	A Japanese term for waste. Lean thinking references use this term as a synonym for waste. See <i>Waste</i> .
Multi-Machine Working	Training of employees to operate and maintain different types of production equipment. Multi-Machine working is essential to creating production cells where each worker utilizes many machines.
NCO	Non-commissioned officer.
Net Present Value (or Present Value)	See <i>Present Value</i>
Non-Value-Added	Any activity that takes time, materiel or space, but does not add value to the product or service from the customer's perspective. For example, inspections or reviews normally are non-value-added because they are checking to see whether the work was done right in the first place. A non-value added process step violates at least one of the following criteria: <ul style="list-style-type: none"> • The customer is willing to pay for this activity. • It must be done right the first time. • The action must somehow change the product or service in some manner.
One Piece Flow	The concept of moving one work piece at a time between operations within a work cell. Sometimes referred to as a lot size of one.
Operational Plan	The plans that guides CPI. Usually done at the organization level, the operational plan identifies the actions that support achieving stated organizational transformation. The operational plan recognizes and builds on current good practices and integrates them, providing consistent CPI deployment within the organization.
OSD	Office of the Secretary of Defense
Outcome	The resulting effect of outputs as they relate to an organization's mission and objectives. They are the critical performance measures to capture.
Overburden	Requirements beyond equipment or staff's capability. Translation means strain and difficulty.
Pareto Principle	In 1906, Italian economist Vilfredo Pareto observed that twenty percent of the people owned eighty percent of the wealth. In the late 1940s, Dr. Joseph M. Juran inaccurately attributed the 80/20 Rule to Pareto, calling it Pareto's Principle. In general, the concept is that for any given distribution of results, the majority of the distribution (80%) is determined by a small part of the (20%) potential contributors or causes. For example: one would expect that in a typical manufacturing operation, 80% or more of manufacturing costs will be driven by 20% or less of the cost drivers.
Payback Period	The number of months or years required for the cumulative savings to have the same value

	as the investment cost. (AFI 38-301, Productivity Enhancing Capital Investment Program)
Peer Groups	A group that shares common functional responsibilities and carries out similar activities. Peer groups provide an opportunity for cross feeding information about CPI goals, challenges, approaches, activities, and accomplishments. Examples of potential peer groups include turbine engines, fighter aircraft, and communications-electronics.
Perfection	The complete elimination of waste so that all activities along a value stream create value.
Performance measure	A measurable characteristic of a product, service, process, or operation the organization uses to track and improve performance. The measure or indicator should be selected to best represent the factors that lead to improved customer, operational, and financial performance.
PDCA	Plan-Do-Check-Act—A process based on the scientific method for addressing problems and opportunities.
PM	Program Manager, the PM is in charge logistics support for one or more specific weapon systems. Program managers, in collaboration with other key stakeholders establish logistics support program goals for cost, customer support, and performance parameters over the program life cycle.
POA&M	Acronym for Plan of Action and Milestones. A common management and reporting tool for CPI projects.
POC	Point of contact—key person representing a given organization.
Point of Use (POU)	The condition in which all supplies are within arms reach and positioned in the sequence, in which they are used to prevent hunting, reaching, lifting, straining, turning or twisting.
Policy Deployment	The process of cascading or communicating a policy from top to middle management, and throughout the rest of the organization using a give-and-take process called “catchball”.
PR	Purchase Request—how an Item Manager initiates a purchasing process.
Present Value (or Net Present Value)	The net value of a flow of funds, expressed as a single sum of dollars; effectively, the sum of money equivalent to all current and future flows. Calculated by multiplying the net cost figure for each year by the corresponding discount factor, and summing the results. (AFMAN 65-506, Economic Analysis)
Preventive Maintenance	A Total Productive Maintenance technique: Actions taken performing a specific task to prevent breakdowns from occurring.
Problem Solving Teams	Self-improvement teams composed of a small number of employees. Teamwork of this type ensure better ideas, buy-in and better problem solving. The diversity of Airmen on the team creates synergy and improved problem solving.
Process	A series of individual operations required to create a design, completed order, product or service.
Process Agent	An individual at the squadron level, with primary duties to provide awareness training and facilitate squadron and/or group level end-to-end Rapid Improvement Events, commensurate to their level of training. These individuals will typically be a Level 1, working with mentors.
Process Council	The Process Council focuses on process improvement and engineering efforts. Operational processes are part of their purview to collaborate and de-conflict Air Force level and MAJCOM improvement activities.
Process Cycle Efficiency (PCE)	A lean metric derived by assessing total value added time (to customer) against total lead time (duration of process from beginning to end).
Process Manager	<p>Manager of AFSO21 initiatives, reporting directly to the Commander at Wing, Group, and Squadron level.</p> <ul style="list-style-type: none"> ▪ Operates as full time position. ▪ Directs and advises AFSO21 teams below their level. ▪ Ensures standard deployment. (i.e. Tools, certification, resources, reporting, etc.) ▪ Assist teams and work areas to eliminate waste, implement AFSO21 practices, and solve long buried problems at their root cause. ▪ <u>Wing Level Only</u>: Ensures strategic alignment of efforts; supports Commander in the development of organizational goals, sequencing process improvement efforts,

	<p>creating reports, tracking improvements/savings and follow-up.</p> <ul style="list-style-type: none"> ▪ <u>Wing Level Only</u>: Primary responsibility for assigning AFSO21 certified facilitators to improvement efforts. Monitors status of trained personnel in the unit and provides recommendations to the Commander for new candidates. to attend Level 1 and Level 2 training. Ensures workforce awareness training is periodically performed. Mentors Level 1 and Level 2 trainees to ensure maturation in CPI techniques, tactics and procedures.
Process Operator	The role of the Process Operator is to provide methods for implementing visual control or reacting to non- stable conditions. The Process Operator recognizes the need for the development of supervisory skills and for a logical and systematic approach to problem solving.
Process Owner (below AF Key Process Level)	<p>An individual with the authority and responsibility for leading an organization or group. Often responsible for developing the organizational strategic plan, however, in smaller organizations, they may execute plans prepared at a higher level. Process Owner's have the ability to directly affect all that happens within their sphere of influence relative to the specific process and will have varying amounts of influence with process owners that provide inputs or that receive their outputs. Distinctly different from Champions who have organizational authority over multiple process owners.</p> <p>Responsibilities in the problem solving process:</p> <ul style="list-style-type: none"> ▪ Eliminate barriers ▪ Ensure progress ▪ Reward team members ▪ Help sustain changes
Product Families	Items of like kind or units linked to specific material or a common end product; all equipment, workers, and support personnel arranged in a logical sequence to support a common product or product line.
Product Life Cycle Management (PLCM)	A technology for managing the entire life cycle of a product from initial development through end of life management (EOL). PLCM focuses on collaboration across the enterprise as well with external customers and suppliers.
Production leveling	Configuring the workload and output of a workstation so that the workstation produces items at a rate close to "takt" time and in an even distributed mix over a time period with minimal slack or nonproductive time through balancing and rebalancing.
Productivity	The efficiency with which resources are used to provide a government service or product at specified levels of quality and timeliness. (AFI 38-301, Productivity Enhancing Capital Investment Program)
Pull	A system by which nothing is produced by the upstream supplier until the downstream customer signals a need. <i>See Customer Pull</i>
Pull scheduling	The flow of resources in a production process by replacing only what has been consumed.
Pull Signal	A communication tool used in the Just-In-Time system whenever batch production or product need exists. A Pull Signal (card, signboard, etc) is used to order product for delivery when needed. <i>See Kanban.</i>
Pure Value	Task demanded by the customer to satisfy a requirement to add form, fit or function.
Push	A system by which suppliers produce arbitrary amounts of an item and advance it to the next stage without regard for overall demand.
Quad Chart	The Quad Chart is used to display the status of implementing a process, especially the Enterprise Processes. These charts quickly show the steps required to develop the new process; the schedule and success in deploying the new process; the internal benefits, measured in terms of personnel, dollars or space saved; and the impact on the War fighter, based on improved availability, affordability, performance, deployability, or survivability.
Quality	Refers to the quality of products or services delivered to the customer. In this instance,

	quality refers to conformance to specifications and customer requirements. In a broader sense, quality refers to the quality of work in designing, producing, delivering, and after-servicing the products or services.
Quality Circles	See <i>Problem Solving Team</i> .
Queue Time	The time a product spends in a line awaiting the next design, order processing or fabrication step.
Quick Changeover	Quick Changeover is a designed tool for reducing the amount of changeover time in a system. Changeover time from one process to another, one machine to another, one aircraft to another. There are five phases in a changeover event: <ul style="list-style-type: none"> • Set up. • First system or process outgoing. • Next system or process incoming. • Adjustments. • Cleaning, storing or placement of outgoing system or process.
Radar Diagram	See "Spider Diagram"
Rapid Improvement Event (RIE)	A short-term, high intensity effort to address a specific problem. The focus is typically a week, though the preparation normally begins several weeks in front and follow-up continues after. Also called by other names, including Rapid Improvement Workshop, Kaizen Event, Kaizen Blitz, Accelerated Improvement Workshop.
Red-Tag Campaign	Part of a 6S Event, the red-tag campaign places red tags on furniture or items that are not used, need repair, or should be turned in to Defense Reutilization and Marketing Office (DRMO). Red tags remain on the items until the appropriate action is taken.
Reliability	Refers to the degree of certainty that a product or service will perform as intended over a set period of time.
Residual Value	The expected value of an asset at any point in time before the end of its economic life. (AFMAN 65-506, Economic Analysis)
Return on Investment (ROI)	The ratio between the predicted or computed savings or cost avoidance (the return) that will result from some action and the cost of completing the action (the investment). Should take the time value of money into account.
Return-On-Investment (ROI)	A calculation used to determine whether a proposed investment is wise and how well it will repay the investor. The benefit (return) of an investment is divided by the cost of the investment: the result is expressed as a percentage or a ratio. (AFI 38-301, Productivity Enhancing Capital Investment Program)
RFT	Ready for tasking—measure of the number of an operational military unit's equipment is ready and capable of supporting the unit's current tasks. Expressed as a percentage only of the current requirement, not as a percentage of total. For example, if unit has 10 aircraft and 8 are needed on a given day but only 6 are capable of performing the task, then the ready-for-tasking rate is 75%.
Root Cause Problem Solving	Systematic problem solving to determine the point of cause (root cause) of a problem so long-term counter measures can be implemented to correct the problem.
Salvage Value	The salvage value... is the amount that would be expected to be obtained from selling the asset at the end of its useful life, but only when such proceeds (from recycle, resale, salvage, etc.) are permitted to be retained and used by the DoD component. Typically, personal property (e.g., vehicles, ADP and equipment) will not have a salvage value. If the asset is to be traded in on a new asset, the salvage value is the expected trade-in value. For purposes of computing depreciation, military equipment and real property assets (e.g., buildings, facilities and structures) do not have salvage values. (DoD Financial Management Regulation, Volume 4, Chapter 6)
Senior Change Agent	Champion or head change agent who supports the transformation to CPI.
Senior Leader	The person at the top of an organization's chain of command.
Setup Time	Also called changeover time. The time it takes to change a system or subsystem from making one product to making the next. Typically divided into external setup time, which covers preparations that can be done while the previous operation is still in process, and internal setup time, which cover preparations that are done while the process is idle.

Shingo Prize	A prize established in 1988 in honor of Shigeo Shingo, as an annual award presented to organizations that achieve superior customer satisfaction and business results related to Lean “excellence”.
Single Minute Exchange of Die (SMED)	A detailed approach to reducing any machine setup time to less than 10 minutes.
Single Piece Flow	The movement of a product or information, upon completion, one at a time through operations without interruptions, backflow or scrap.
SIPOC	A SIPOC diagram is a tool used by a team to identify all relevant elements of a process improvement project before work begins. It helps define a complex project that may not be well scoped, and is typically employed at the Measure phase of the Six Sigma DMAIC methodology. It is similar and related to Process Mapping and 'In/Out Of Scope' tools, but provides additional detail. The tool name prompts the team to consider the <u>Suppliers</u> (the 'S' in SIPOC) of your process, the <u>Inputs</u> (the 'I') to the process, the <u>Process</u> (the 'P') your team is improving, the <u>Outputs</u> (the 'O') of the process, and the <u>Customers</u> (the 'C') that receive the process outputs. In some cases.
Six Sigma (6σ)	A strategy that espouses increasing profits by eliminating variability, defects and waste that undermine customer loyalty. Six Sigma can be understood/perceived at three levels: <ul style="list-style-type: none"> • Metric—3.4 defects per million opportunities. • Methodology—a structured problem solving roadmap. • Philosophy—reduce variation in your business and take customer-focused, data driven decisions.
SME	Subject matter expert—A recognized expert in a given area of knowledge (subject).
Spaghetti Chart	A map of the path taken by a specific product as it travels down the value stream in an organization, so called because the product’s route typically looks like a plate of spaghetti.
Spider Diagram or Assessment	An assessment tool used to gauge CPI commitment and maturity within an organization. Also called a Radar Chart. A common variant has the spokes of the diagram measure (Levels zero through four) commitment and maturity by assessing the following: Leader’s Commitment, the Organization, Value Stream Analysis, Rapid Improvement, Process Control, Strategy Alignment & Deployment/Policy Deployment, 3P Breakthroughs, On-Demand, Defect-Free, Achieving Lot Size of One, Lowest Cost, and Visual Management.
SPO	System Program Office—Home of the Air Force Program Director, the person in charge of managing a weapon system, including acquisition.
Steering Committee	The steering committee comprises senior-level stakeholders who carry out CPI-related planning, identify key metrics, establish CPI infrastructure, monitor performance, and facilitate process improvement when necessary.
Stakeholder	Person internal or external to an organization who has a stake in the outcomes of a process.
Standard Work	An agreed upon set of work procedures that: effectively combine people, materiel, and machines to maintain quality, efficiency, safety, and predictability. Work is described precisely in terms of cycle time, work in process, sequence, takt time, layout, and the inventory needed to conduct the activity.
Strategic Buffer	A predetermined quantity kept on hand to combat variability and lead time impacts.
Strategic Communication	Effective organizational communication with stakeholders, organizational personnel, and customers both internal and external. Synergy is gained by communicating with external audiences while simultaneously communicating strategic plans to internal audiences.
Strategic Plan	The process an organization uses to achieve and document long-term goals and objectives. One of two key plans that guides CPI activity.
Strategy Alignment and Deployment	The method used to ensure everyone in the organization is working effectively towards the same goals identified by senior leadership.
Supplier Management Development	An transformational organization’s overall performance and efficiency becomes more dependent on the capabilities of its suppliers. An organization benefits greatly when key suppliers increase their throughput to deliver timely products and services, dramatically reduce costs, introduce new services designed to address the organization’s needs, expand their footprint to provide seamless coverage in multiple regions, and work with the

	organization to streamline joint processes.
Supplies	In logistics, all materiel and items used in the equipment, support, and maintenance of military forces. (http://www.dtic.mil)
Supply Chain Management (SCM)	Proactively directing the movement of goods from raw materials to the finished product delivered to customers. SCM aims to reduce operating costs, lead times, and inventory and increase the speed of delivery, product availability, and customer satisfaction.
Support Team	The support team comprises dedicated and ad hoc resources that facilitate and implement CPI planning. The support team may be organizational based or may have experts brought in as needed from other activities (e.g., HQ) or the commercial sector.
Surge	Rapid increase in demand.
Takt Time	Takt is German for beat (as in the beat of music). In CPI thinking, takt time is the available production time divided by the rate of customer demand. Takt time sets the pace of production to match the rate of customer demand and becomes the heartbeat of the system.
TDY	Temporary Duty/On duty (military or civilian) at other than home station.
Then-Year \$ or Current Year \$	Value, cost, or benefit measures which include estimates of all expected future price changes. A current (or then-year) dollar contains implicit adjustments for variation in the purchasing power of a dollar over time. Current dollars represent amounts that will be paid for resources in the actual years in which payments will be made. (AFMAN 65-506, Economic Analysis)
Theory of Constraints (TOC)	A philosophy and a methodology for addressing logical thinking, scheduling and controlling resources, and measuring performance. The philosophy emphasizes that a systems constraint exists in any process and controls the output from the entire process.
Throughput Time	The time required for a product to proceed from concept to launch, order to delivery, or raw materials into the hands of the customer. This includes both processing and queue time.
Total Lead Time	Duration of a process from beginning to end.
Total Productive Maintenance (TPM)	A set of techniques to ensure every machine in a process is always able to perform its required tasks. Focused on avoiding and eliminating breakdowns or maintenance delays, and increasing capacity. Includes: Preventative Maintenance, Corrective Maintenance, Maintenance Prevention and Breakdown Maintenance.
Total Quality Management (TQM)	A concept which requires management and resource commitment to adopt a perpetual improvement philosophy, through succinct management of all processes, practices and systems throughout the organization to fulfill or exceed the customer expectations.
Total Value-Added Time	The total time in a process during which the value of the product going through the process to the customer is increased.
Types of Processes	<p>Core - Interrelated, cross-functional processes that combine to realize the mission of the Air Force.</p> <p>Enabling - Support processes that provide core processes with needed resources and capabilities.</p> <p>Governing - Processes that direct and focus other activities throughout the organization. Essential processes that set corporate direction and strategy, allocate resources, and align the Air Force to achieve its long-term goals.</p>
Value	A need the customer is willing to "pay extra" to receive. Easily expressed in terms of a specific required product or service. In the commercial sector can be easily related to the bottom line in terms of corporate profits. In the federal sector, it is related to requirements identified by the customer.
Value-Added	The parts of the process that add worth to the customer's product or service. To be considered value added, the action must meet all three of the following criteria: <ul style="list-style-type: none"> • The customer is willing to pay for this activity. • It must be done right the first time. • The action must somehow change the product or service in some manner.
Value Categories	Pure Value, Business Value, Non-value added.

Value Stream	The specific activities required to design, order, and provide a specific product or piece of information, from concept to launch, order to delivery into the hands of the customer. A term used to encompass all the planning, execution, products, and services that go into an organization-wide process to create value for the customer.
Value Stream Map	Identification of all the specific activities occurring along a value stream for a product or product family.
Variability	An aspect of an item or process that is likely to be unstable or has an inherent/inborn chance of unpredictability.
Vision	The Vision is a clear depiction of the future that describes clearly yet succinctly how the organization will conduct business on a day-to-day basis.
Visual Management	Tools which allows management to quickly visually determine whether a process is proceeding as expected or is in trouble.
Warfighter	The ultimate customer. The warfighter is the ultimate focus of CPI activity and should drive the key metrics that serve as the focal for alignment of subordinate metrics and for the synchronization of CPI activity.
Waste	Anything that adds cost or time without adding value. Generally, waste includes: injuries, defects, inventory, overproduction, waiting time, motion, transportation, and over processing waste. Waste is often placed into the following categories (D-O-W-N-T-I-M-E): <ul style="list-style-type: none"> • Defects - having a direct impact to the bottom line, quality defects resulting in rework or scrap are a tremendous cost to organizations. • Overproduction - to produce an item before it is actually required. • Waiting - whenever goods are not moving or being processed, the waste of waiting occurs. • Nonstandard Over Processing - Often termed as “using a bazooka to swat flies,” many organizations use expensive high precision equipment where simpler tools would be sufficient. • Transportation - moving product between processes is a cost that adds no value to the product. • Intellect – human brainpower squandered in processes that do not require intelligent thought: expediting, chasing paper, etc. Any failure to fully utilize the time and talents of people • Motion - this waste is related to ergonomics and is seen in all instances of bending, stretching, walking, lifting, and reaching. • Excess Inventory - stockpiles of both in-process and finished goods inventories are a direct result of overproduction and waiting.
Work in Process (WIP)	At any given time, items currently somewhere between the start of a process and the end of the process. In a CPI system, standardized work-in-process is the minimum number of parts (including units in machines) needed to keep a cell or process flowing smoothly.
Work Group	The work group is the key implementation activity for CPI projects that improve operations. Work groups are comprised of members who have functional expertise in operations in the value stream being assessed and improved. Work group members also have expertise in CPI tools or the team is augmented with such capabilities.
Work Tree Administrator	The person with responsibility and permissions to administer all command actions within the web-based project portfolio management solution (CPI-MT). Maintains cognizance over all data inputs and assignments in the CPI-MT for their command.

SECTION TWO: ACRONYMS AND ABBREVIATIONS

3P	People, Product and Process
A3	(not an acronym) – refers to a size of paper larger than legal size (See glossary)
ACES	Automated Civil Engineering System
AFI	Air Force Instruction
AFMAN	Air Force Manual
AF	Air Force
AF StratPlan	Air Force Strategic Plan 2006-2008
AFSO21	Air Force Smart Operations for the 21st Century
AFSO	Air Force Smart Operations
ANG	Air National Guard
APPN	Appropriation
APS	Advanced Planning System
AWP	Awaiting parts
AVCOM	Avionics Components Obsolescence Management
B-SMART	Balanced-Specific-Measurable-Attainable-Results Focused-Timely
BCA	Business Case Analysis
BX	Base Exchange
BY	Base Year
CASCO	Conduct Air Space and Cyber Operations
CBA	Cost/Benefit Analysis
CC	Commander
CCO	Officer of the Commander
CCR	Critical Customer Requirements
CDOV	Concept-Design-Optimize-Verify
CONOPS	Concept of Operations
CoE	Center of Expertise
COTS	Commercial-Off-the-Shelf
CPFH	Cost Per Flying Hour
CPG	Contingency Planning Guidance
CPI	Continuous Process Improvement
CPI-MT	Continuous Process Improvement – Management Tool
CRM	Customer Relationship Management
CSAF	Chief of Staff of the Air Force
CV	Vice-Commander
CVO	Office of the Vice Commander
CY\$	Constant-Year Dollars
DFSS	Design for Six Sigma
DMAIC	Define-Measure-Analyze-Improve-Control
DMADV	Define-Measure-Analyze-Design-Verify

DMALC	Define-Measure-Analyze-Lean-Control
DMSMS	Diminished manufacturing sources and material shortages
DoD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EA&AP	Enterprise Analysis and Action Planning
ECD	Estimated completion date
EOL	End-of-life
ERP	Enterprise Resource Planning
EVSMA	End-to-End Value Stream Mapping or Enterprise VSM & Analysis
F.I.F.O.	First in first out
FISC	Fuel Initiatives Savings Calculator
FM	Financial Management or Financial Managers
FTE	Full Time Equivalent
FY	Fiscal Year
GS	General Schedule
HQ	Headquarters
JIT	Just-in-time
MAJCOM	Major Command (a three or four star general in command–10 MAJCOMs exist)
MBTU	British Thermal Units in Millions
MC	Mission Capable
MCF	Thousand Cubic Feet
MDS	Mission Design Series
MILCON	Military Construction
MILPERS	Military Personnel
MOGAS	Motor Gasoline
MPO	Master Process Officer
NCO	Non-commissioned Officer
NPV	Net Present Value
NSPS	National Security Personnel System
O&M	Operations & Maintenance
OPR	Office of Primary Responsibility
OSD	Office of the Secretary of Defense
PCE	Process Cycle Efficiency
PDCA	Plan-Do-Check-Act
PLCM	Product Life Cycle Management
PM	Program Manager
POA&M	Plan of Action & Milestones
POC	Point of contact
POM	Program Objective Memorandum
POU	Point of use
PR	Purchase Request

RDT&E	Research, Development, Test & Evaluation
RIE	Rapid Improvement Event
RFT	Ready for tasking
ROI	Return on Investment
SAF/FMC	Secretary of the Air Force Financial Management Cost
SAF/FMCE	Secretary of the Air Force Financial Management Cost and Economics
SAF/SO	Secretary of the Air Force Smart Operations
SCM	Supply Chain Management
SECAF	Secretary of the Air Force
SIPOC	Suppliers-Inputs-Process-Outputs-Customers
SME	Subject Matter Expert
SMED	Single Minute Exchange of Die
SPG	Strategic Planning Guidance
SPO	System Program Office
SQ FT	Square Feet
TAKT	(not an acronym) – means “beat, pulse, or rhythm.” It is the German word for the baton used by a conductor. (See glossary)
TDY	Temporary duty
TOC	Theory of Constraints
TOC	Total Ownership Cost
TPM	Total Productive Maintenance
TQM	Total Quality Management
TWCF	Transportation Working Capital Fund
TY\$	Then-Year Dollars
USAF	United States Air Force
VSM	Value Stream Map
WIP	Work in Progress
WG	Wage Grade



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**AIR FORCE SMART OPERATIONS FOR
THE 21ST CENTURY**
PLAYBOOK

VOLUME O: AFSO21 TEMPLATES

May 2008



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1.2 SIX “S” CHECKLIST



6S_Checklist.xls

6-S CHECKLIST	
Org:	Date:
	POC:
Work Space or Area:	
Sort: Distinguishing between the needed and the not needed	
	Develop needed criteria. This is a listing of all resources (information, machinery, tools, personnel) that are absolutely necessary to perform the task in the specified work space or area.
	Conduct a walk through of the work space or area and identify task resources that meet the criteria developed in Step 1 that will remain in the work space or area. Remove everything else.
	Create a separate holding area for all items removed from the work space or area and red tag each item. Reevaluate criteria developed in Step 1.
	Dispose of all unnecessary items after determining that they are no longer required or do not belong in the work space or area.
	Post needed criteria on 6S Control Board.
Straighten: A place for everything and everything in its place	
	Develop set-in place criteria for all resources. Includes, point of use locations for information and tools. Identify resources required to implement set-in place initiatives (e.g., shadowboards, foam cutouts).
	Implement set-in place criteria for work space or area.
	Walk through work space or area and verify that there is a place for everything.
	Confirm that resources are easily verified to be in-use.
	Post set-in place criteria on 6S Control Board.
Shine: Material and equipment clean and inspection ready	
	Develop clean and inspect criteria for work space or area.
	Train all personnel on clean and inspect criteria for work space or area.
	Create clean and inspect schedule.
	Implement clean inspect schedule.
	Post clean and inspect schedule on 6S Control Board
Standardize: Implementing standard procedures for the first 3-S's and visual controls	
	Evaluate effectiveness of standard procedures and visual controls.
	Make adjustments as required to standard procedures and visual controls to achieve desired results.
Sustain: Establishing the necessary discipline to consistently sustain 6-S standards.	
	Establish periodicity for evaluating effectiveness and compliance with 6S standards.
	Conduct audits of 6S standards in accordance with periodicity identified in Step 1 using 6S Audit Sheet.
	Provide appropriate recognition for meeting 6S standards and post on 6S Control Board.
Safety: There is an emphasis on identifying and eliminating safety hazards.	
	Identify safety hazards.
	Ensure appropriate measures are implemented to eliminate or reduce the effect of safety hazards.

1.3 SIX "S" AUDIT



6S_Audit_Sheet.xls

6-S AUDIT				
Org:	Date:	Auditor:	SCORE	
			1st Day	Last Day
Sort: Distinguishing between the needed and the not needed			Choose One Only	
0	No activity has occurred.			
1	The criteria to determine needed vs. unneeded items has been determined. Needed items for the work area have been identified. There are no more than 8 violations of unneeded items present in work area.			
2	Initial identification exercise has been conducted and unneeded items have been removed. There are no more than 6 violations of unneeded items present in work area.			
3	A separate holding area exists for unneeded items and an items log is posted in the plant. There are no more than 4 violations of unneeded items in work area.			
4	Identification of unneeded items is performed at set time intervals, and the holding area is evaluated at set time intervals. All items are reviewed regularly for need. There are no more than 2 violations of unneeded items in the work area.			
5	Only needed items ever enter the work area. There are no violations of unneeded items in the work area.			
Strakhten: A place for everything and everything in its place			Choose One Only	
0	No activity has occurred.			
1	All needed items are present, it's not difficult to determine items in use. There are no more than 8 set-in-order violations.			
2	It is obvious where needed items (including tooling, tools, procedures, etc.) belong (using lines, labels, signs). There are no more than 6 set-in-order violations.			
3	The entire work area is visually indicated (including aisleways, workstations, equipment, storage locations, etc.) There are no more than 4 set-in-order violations.			
4	Items are put away immediately after use. It is easy to determine what items are in use. There are no more than 2 set-in-order violations.			
5	Height and quantity limits are visually obvious. There are no set-in-order violations.			
Shine: Material and equipment clean and inspection ready			Choose One Only	
0	No activity has occurred.			
1	Area cleaning is done randomly. There are no more than 8 cleanliness violations.			
2	Initial cleaning has occurred (floors, walls, stairs, surfaces). Machines and equipment have been cleaned. There are no more than 6 cleanliness violations.			
3	Cleaning/housekeeping responsibilities are documented and followed daily. Cleaning materials are easily accessible. There are no more than 4 cleanliness violations.			
4	Cleaning is used as an inspection tool for preventive maintenance. Cleanliness problems are identified and preventive action is taken. Machines have been painted. There are no more than 2 cleanliness violations.			
5	The entire work area is spotless. Surgery could be performed in the area. There are no cleanliness violations.			
Standardize: Implementing standard procedures for the first 3-S's and visual controls			Choose One Only	
0	No activity has occurred.			
1	6-S standards for conditions of Sort, Set in Order and Shine have been set. Each of the first three S's is rated 1 or higher. There are no more than 8 standardize violations.			
2	6-S standards are documented and posted in work area using a workplace scan display or other visual method. Each of the first three S's is rated 2 or higher. There are no more than 6 standardize violations.			
3	Needed items, Standard Work for 6-S, and Visual Controls are in the work area. Each of the first three S's is rated 3 or higher. There are no more than 4 standardize violations.			
4	6-S is measured and posted in work area. Each of the first three S's is rated 4 or higher. There are no more than 2 standardize violations.			
5	6-S documentation is routinely reevaluated and updated (including the workplace scan). Each of the first three S's is rated 5. There are no standardize violations.			
Sustain: Establishing the necessary discipline to consistently sustain 6-S standards.			Choose One Only	
0	No activity has occurred.			
1	25% of employees in work area (on all shifts) have been trained in 6-S. Each of the first 4 S's is rated 1 or higher. There are no more than 8 sustain violations. There are safety hazards.			
2	50% of employees in work area (on all shifts) have been trained in 6-S. Each of the first 4 S's is rated 2 or higher. There are no more than 6 sustain violations. There are safety hazards.			
3	All employees in work area (on all shifts) have been trained in 6-S. Each of the first 4 S's is rated 3 or higher. There are no more than 4 sustain violations. There are safety hazards.			
4	All employees in work area perform daily and weekly 6-S activities as part of their standard work. Each of the first four S's is rated 4 or higher. There are no more than 2 sustain violations. There are safety hazards.			
5	Area employees help create a planning worksheet to sustain 6-S standards and guidelines. 6-S activities are documented in each employee's standard work instructions. Each of the first four S's is rated 5. There are no sustain violations and no safety hazards.			
Safety: There is an emphasis on identifying and eliminating safety hazards.			Choose One Only	
0	There are safety hazards.			
6-S Total:			0	0
<p>0-5, Area is cluttered with no sustainment or training plan. 6-15, Some clutter has been removed and stored appropriately, a sustainment and training plan somewhat exists. 16-30, Clutter has been removed and stored appropriately a functional sustainment and training plan exists.</p>				

1.4 A3 STATUS REPORT



A3_Status_Report.ppt

A3 Status Report: <Event Title>

IMPLEMENTATION:

Task Steps	Act/Est Start date	Act/Est Compl date	Compl %

FUTURE ACTIONS:

BACKGROUND:

PROBLEM/OPPORTUNITY STATEMENT:

OBJECTIVES:

EXPECTED IMPROVEMENTS:



1.5 A3 SUMMARY REPORT



A3_Summary_Report
.ppt

A3 Summary Report: <Event Title>		PROCESS OWNER/CHAMPION:	PROCESS IMPROVEMENT:	IMPLEMENTATION:	FOLLOW-UP:	FUTURE IMPROVEMENTS:	DATE: _____
		TEAM MEMBERS:					
PROBLEM/OPPORTUNITY STATEMENT:		IMPACT STATEMENT:	CAUSE ANALYSIS:				

1.6 A3 PROBLEM SOLVING



A3_Problem_Solving.ppt



A3_Problem_Solving.doc

<p style="font-size: 2em; margin: 0;">A3 Problem Solving: <Event Title></p>	<p style="font-size: 0.8em; margin: 0;">Approval Information/Signatures</p> <hr/> <hr/> <hr/>	
	<p style="text-align: center;">1. Clarify & Validate the Problem</p>	<p style="text-align: center;">6. See Countermeasures Through</p>
	<p style="text-align: center;">2. Break Down the Problem/Identify Performance Gaps</p>	<p style="text-align: center;">7. Confirm Results & Process</p>
	<p style="text-align: center;">3. Set Improvement Target</p>	<p style="text-align: center;">8. Standardize Successful Processes</p>
	<p style="text-align: center;">4. Determine Root Cause</p>	
	<p style="text-align: center;">5. Develop Countermeasures</p>	

1.9 OPPORTUNITY AND ACTION PLAN



Opportunity_and_Ac
tion_Plan_Event_Lev

<p>Champion: _____</p> <p>Process Owner: _____</p> <p>Lead: _____</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:50%;">Org</td> <td style="width:50%;">Name</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>	Org	Name	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<p>EVENT</p> <p><input checked="" type="radio"/> PRIM <input type="radio"/> SUPT</p>																										
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<p>Readiness: H M L</p> <p>Process <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Resources <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Organization <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Methodology <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Policy <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Technology <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Other <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>Personnel <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	<p>Start: _____</p> <p>End: _____</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:25%; text-align: center;">4</td> <td style="width:25%; text-align: center;">2</td> <td style="width:25%; text-align: center;">1</td> <td style="width:25%; text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">H</td> <td style="text-align: center;">L</td> <td style="text-align: center;">H</td> <td style="text-align: center;">L</td> </tr> </table> <p style="text-align: center;">Impact</p>	4	2	1	3	H	L	H	L																																		
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H	L	H	L																																								
<p><input type="radio"/> Strategic Working Group</p> <p><input type="radio"/> Strategic Planning</p> <p><input type="radio"/> Operational Planning</p> <p><input type="radio"/> Value Stream Analysis (VSA)</p> <p><input type="radio"/> Project</p> <p><input type="radio"/> Rapid Improvement Event (RIE)</p> <p><input type="radio"/> Do-it </p>	<p>Scope: <input type="radio"/> WING <input type="radio"/> MAJCOM <input type="radio"/> STAFF <input type="radio"/> USAF <input type="radio"/> JOINT <input type="radio"/> COALITION</p>																																										
<p>Event Title: _____</p> <p>Issue to be Addressed: _____</p>	<p>Who/What is OUT: _____</p> <p>Critical Path: YES <input type="checkbox"/> NO <input type="checkbox"/></p>																																										
<p>Mission Description: _____</p> <p>Areas to Consider: _____</p>	<p>AFSO21 Desired Effects (1st and 2nd Order):</p> <p><input type="checkbox"/> People Productivity</p> <p><input type="checkbox"/> Critical Asset Availability/Combat Capability</p> <p><input type="checkbox"/> Cycle Time Response Time</p> <p><input type="checkbox"/> Energy Savings/Efficiency</p> <p><input type="checkbox"/> Safe and Reliable Operations</p>																																										
<p>Objective(s)/Deliverable(s) (Productivity (How Many?), Quality (How Well?), Financial (How Much?), Time (How Long/Fast?)) - % or #s - within a specified time limit:</p> <p>_____</p>	<p>Targets (Waste to be Eliminated):</p> <p><input type="checkbox"/> Defects <input type="checkbox"/> Transportation</p> <p><input type="checkbox"/> Overproduction <input type="checkbox"/> Injury</p> <p><input type="checkbox"/> Waiting <input type="checkbox"/> Motion</p> <p><input type="checkbox"/> Nonstandard/Over-processing <input type="checkbox"/> Excess Inventory</p>																																										
<p>Progress/Status Reporting: _____</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:10%;">Data:</td> <td style="width:10%;">Y</td> <td style="width:10%;">N</td> <td style="width:10%;">H</td> <td style="width:10%;">M</td> <td style="width:10%;">L</td> <td style="width:10%;">AF KP Touch Points:</td> </tr> <tr> <td>Collected</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> PESI <input type="checkbox"/> MFR</td> </tr> <tr> <td>Relevant</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> MPP <input type="checkbox"/> CASCO</td> </tr> <tr> <td>Accurate</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> DW <input type="checkbox"/> CP</td> </tr> <tr> <td>Analyzed</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> D&S <input type="checkbox"/> PIS</td> </tr> <tr> <td>Available</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> DDC <input type="checkbox"/> PI</td> </tr> </table>	Data:	Y	N	H	M	L	AF KP Touch Points:	Collected	<input type="checkbox"/> PESI <input type="checkbox"/> MFR	Relevant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> MPP <input type="checkbox"/> CASCO	Accurate	<input type="checkbox"/> DW <input type="checkbox"/> CP	Analyzed	<input type="checkbox"/> D&S <input type="checkbox"/> PIS	Available	<input type="checkbox"/> DDC <input type="checkbox"/> PI																				
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1.11 STANDARD WORK1



Standard_Work_Combination_Sheet.xls



Standard Work Combination Sheet

Process / Area:

Date:

Before / After (Circle One)

Observer:

Quality Check	Safety Precaution	Standard WIP	Number of Process WIP	TAKT Time	Cycle Time
◆	■	●			



Center for Executive Education

1.14 CHARTER



Charter.ppt

Charter: <Event Title>						
Process Owner/Champion						
Problem/Opportunity Statement						
Impact Statement						
Project Scope:						
Brief Description of Current Process:						
Current Performance:						
Team Members:						
	Team Lead:					
	Facilitator:					
	Other:					
Potentially Affected Users:						
Impact to Desired Effects	PRODUCTIVITY	ASSET AVAILABILITY	AGILITY	SAFETY & RELIABILITY	ENERGY EFFICIENCY	

1.15 8 WASTES



8_Wastes.xls

Identify 8 Types of Waste		
Org:	Date:	POC:
Work Space or Area:		
Walk through your workspace looking for any of the "8 Wastes"		
<p><u>D - Defects</u> Not meeting specified requirements</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		<p><u>T - Transportation</u> The unnecessary movement of material or a product addint time and consuming space</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><u>Q - Overproduction</u> Ties up more resources than necessary</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		<p><u>I - Intellect</u> Failure to fully utilize the time, physical ability, creative ideas, problem solving abilities and talents of people.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><u>W - Waiting</u> Increases wait time, work-in-process, and delays response time to the customer</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		<p><u>M - Motion</u> Poor labor efficiency because of work layout or material not in easy reach</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p><u>N - Nonstandard overprocessing</u> Creates delays without adding any benefit and invites more defects in the process</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>		<p><u>E - Excess Inventory</u> Ties up capital and invites risk of obsolescence and damage</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

1.16 TAKT TIME / CYCLE TIME BAR CHART



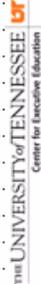
Takt_Time_Cycle_Time_Bar_Chart.xls



Takt_Time_Cycle_Time_Bar_Chart.ppt



TAKT Time / Cycle Time Bar Chart



Process / Area:	Part Number:	Date:	Observer:
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$$\frac{\sum \text{Cycle Time}}{\text{TAKT Time}} = \frac{\text{Operators Needed}}{\text{Operators Needed}}$$

1.17 TAKT TIME CALCULATION FORM



Takt_Time_Calculation Form.xls

TAKT Time Calculation Form

Plant Location : _____

Project Area : _____

Date : _____

TAKT Time = $\frac{\text{Total available operating time per day(sec)}}{\text{Adjusted part requirement (qty)}}$

TOTAL AVAILABLE OPERATING TIME(seconds):

shift duration _____ minutes

- lunch / dinner _____ minutes

- start up _____ minutes

- shut down _____ minutes

- breaks _____ minutes

= net operating time per shift _____ minutes

X number of shifts/day _____ shifts

= net operating time per day _____ minutes

X seconds/ min _____ seconds

= net operating time per day _____ seconds

ADJUSTED PART REQUIREMENTS (quantity):

customer demand part no. 0 _____ pieces

+customer demand part no. 2 _____ pieces

+customer demand part no. 3 _____ pieces

+customer demand part no. 4 _____ pieces

+customer demand part no. 5 _____ pieces

= total customer demand / day _____ pieces

X scrap adjustment factor _____ (1+scrap%)

= adjusted no. of parts needed/day _____ pieces

note: average scrap % _____ %

TAKT Time = $\frac{\text{Total available operating time per day(sec)}}{\text{Adjusted part requirement (qty)}}$ = $\frac{\text{0}}{\text{0}}$ = 0



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