The Toyota - Air Force Nuclear Enterprise Analogy

By Mark Stout & Larry Chandler

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Although Toyota is one of the world's premier manufacturers, they are now dealing with an intense threat to their credibility. At the heart of the issue are concerns about the quality and safety of Toyota products. In the U.S., at least 52 people have died in accidents thought to be related to unintended and sudden acceleration in Toyota vehicles. These problems have resulted in public apologies in both Beijing and Washington by Toyota's President, Akio Toyoda, and worldwide, over 8 million Toyotas have been recalled.

In the Air Force, there is an analogous credibility challenge which thankfully hasn't killed anybody, but is none-the-less significant. That challenge remains the USAF's nuclear enterprise.* If the efficacy of the AF's nuclear endeavors are being accurately measured by Air Force and Department of Defense inspection teams, the nuclear enterprise remains in a very unhealthy condition.

While the details and specific errors have not been announced, the Air Force Times relayed a statement that Malmstrom Air Force Base's 341st Missile Wing and the its 16th Munitions Squadron both failed their February 2010 nuclear surety inspections. The Air Force response, as reported in the Washington Post, was that "There were no critical deficiencies noted. The wing is still fully able, in the eyes of the inspector general team, to conduct its mission safely, securely and with credibility" and that the public is in no way endangered by these failures. OK, I'll accept the later, but if there were no critical deficiencies, why didn't they pass?

The not-critical-but-somehow-unqualifying errors at Malmstrom were preceded by a different unsatisfactory performance at Kirtland Air Force Base in November 2009. There, both the 377th Air Base Wing and the 498th Nuclear Systems Wing received unsatisfactory grades for problems in the personnel reliability program, nuclear weapons maintenance operations, and nuclear weapons security procedures. In late January 2010, while preparing for its obligatory 90-day recheck inspection, a HQ AFMC staff assistance team found the unit had not corrected the problems from their failed November NSI. This was so unexpected that HQ Air Force Materiel Command conducted a separate "Over-watch" of the staff assistance findings, which were validated. As a result, the Kirtland (Air Force Nuclear Weapons Center) leadership took the very unusual step of a sort of 'self-initiated nuclear decertification.' Strange days, indeed.

So how do the problems at Toyota and in the Air Force's nuclear enterprise fit together? Toyota watcher and author Robert Cole, writing in the Harvard Business Review, has detailed several of the manufacturer's problems which appear to have direct applicability to the USAF's nuclear enterprise. Broadly, these problems have to do with organizational goals and incentives and (forgive the cliché) unintended consequences.

An often unspoken but ever-present organizational goal is to be relevant--- after all, an irrelevant organization will soon cease to exist. In 1992, the Air Force faced new challenges to its relevance, shaped in large part by the dissolution of the Soviet Union in late 1991, and in no

small part by the AF's own success in Desert Storm earlier that same year. Following these events, USAF leaders attempted to make the Air Force ever more relevant by focusing additional organizational effort and resources on conventional capabilities (like stealthy aircraft, "smart munitions", and the space-enabled successes demonstrated in Desert Storm) and less on its nuclear enterprise. In many ways, 1992 can be summed up in what Robert McNamara observed following the Cuban Missile Crisis: conventional forces were the spear and nuclear forces the shield, although in the 1990s, the shield was certain to get a lot smaller.

Between Desert Storm and the fall of the Soviet Union, President George H.W. Bush unilaterally de-alerted the USAF's nuclear bomber fleet along with 450 Minuteman II ICBMs in September 1991, providing the Soviets, in the words of then Secretary of Defense Dick Cheney "the incentive they need to shift their country away from the business of cranking out nuclear weapons and toward the work of building democracy." With the Department of Defense expected to pay much of the anticipated "peace dividend," something had to give and one of the bill-payers would be the USAF's nuclear enterprise.

The flip side of the story of this rapid contraction and associated de-emphasis on the Air Force's nuclear enterprise was Toyota's rapid expansion. In 1998, Toyota set off to *enhance* its relevance in the global automotive industry with the aim of doubling their global market share. As an organizational goal, this large increase in market share would entail a number of things: more people working on a broader product line; selling more; manufacturing more (and in different places); bringing products from development to market more quickly; and, sustaining the famous Toyota reputation for quality. Additionally, the market-share goal could be easily measured, observed, and tracked, but as Cole notes, Toyota's traditional mantras like "Customer First" had a way of yielding when in conflict with the primary target of increased market share. After all, what gets rewarded is what gets done.

Instead, Toyota's rapid market expansion diluted the experience levels of its managers just as the Air Force's focus on conventional conflicts pulled human and fiscal resources away from a well-established and mature nuclear enterprise. At Toyota, Cole observed these changes drove massive increases in engineering man-hours, particularly in integration and joint software development. He adds that overworked people, engineers in this case, tend to make mistakes and that inside Toyota, it is said to take about ten years to develop a fully capable engineer.

As alluded to, the Air Force's experience was Toyota's in reverse: rapid contraction instead of rapid expansion. With the USAF ICBM force, for example, the aforementioned 450 Minuteman IIs were depostured, including removing all weapons, ICBM components, the missiles themselves, and more. Later, all 50 Peacekeeper ICBMs were also depostured and taken out of the inventory. In between, 150 Minuteman IIIs from a BRAC'd base were depostured and moved from one base to a separate base in another state and repostured. Throughout, the Minuteman III system went from a multiple warhead configuration to a single warhead configuration (including using recycled re-entry vehicles that once resided on Peacekeeper ICBMs). Along the way, a huge Minuteman III life extension program refurbished or remanufactured the missile from "nosecone to nozzle." All these actions required a massive amount of effort, including literally millions of miles of travel, and work throughout the far-flung missile fields of Missouri, North and South Dakota, Montana, Wyoming, Nebraska, and Colorado.

While all this was happening, the traditional ICBM maintenance required to inspect and repair missiles, weapons, facilities and support equipment continued unabated. And what happened to Airmen manning in the missile maintenance and missile operations officer career fields? You

got it…it decreased. If many hands make the load light, fewer hands are certain to make the load heavier, all other things being equal.

A separate but contributing move that reduced corporate nuclear knowledge was the 1991 merger of the munitions maintenance officer and aircraft maintenance officer career fields. At the time, this move drove 250 munitions officers into a larger sea of 1750 "general purpose logistics" officers and clearly reduced the opportunities to develop comprehensive and in-depth munitions expertise. Because the activities at a Weapons Storage Area comprise about three-quarters of the Nuclear Weapons Technical Inspection criteria, having experienced and capable munitions officers is essential. This was eloquently forewarned by Major General (Retired) Lew Curtis, the San Antonio Air Logistics Center Commander, who in 1987 said "We have learned through long and bitter experience that nuclear logistics operations demand experience and technical expertise far beyond that required for general maintenance of even non-nuclear munitions."

So, just as at Toyota, it seems there were too few experienced people doing too much in too short a time and both the Air Force and Toyota underestimated the challenges of these highly complex endeavors. Airmen may have become experts in depostures and repostures while perhaps losing the habits of mind and the knowledge and experience required to achieve daily and sustained excellence in aircraft, missile and nuclear weapons operations.

These complex problems are reminiscent of Steven Covey's law of the farm, that is, you reap what you sow. When Toyota placed market share as a pre-eminent goal, a cascade of unintended consequences followed. In hindsight, it seems obvious Toyota's rapid expansion might well affect the quality of its product. Similarly, when the Air Force de-emphasized nuclear weapons maintenance and operations while concurrently increasing the nuclear weapon systems' maintenance workload, a weakening of the entire enterprise was bound to occur.

Many nuclear-experienced and capable Airmen could read the writing on the wall and pursued other career opportunities. For bomber crews and staff, this became a focus on conventional capabilities. For many ICBM crews and staff, the focus often moved to positions in the space arena. For ICBM maintenance, nuclear weapons, and security personnel, it meant separating from the Air Force or training into other specialties, especially those involved with the flight line, fighter aircraft, and deployments. For the Air Force, it appears to have taken about fifteen years to reach a nuclear enterprise "Tipping Point" marked by the inadvertent movement of six nuclear weapons from Minot Air Force Base to Barksdale AFB in 2007 and a separate event involving incorrectly shipping nuclear-related ICBM components to Taiwan. Through most of the interim years from the end of the Cold War until these times, despite benign neglect, a loss of experience combined, and expanding workloads, the nuclear enterprise was still managed effectively by the experienced officers and NCOs who had resisted or avoided the career enhancing push to "career – broaden," remaining in the nuclear weapons career fields. But when these Airmen finally left the service, the safety net of experience and expertise unraveled. Still, if this is now so obvious, why did it happen? Perhaps it relates back to something attributed to Winston Churchill: no job is impossible for the man who doesn't have to do it.

After an Air Force Chief of Staff and a Secretary of the Air Force were relieved following the Minot to Barksdale and the disassociated-but-relevant Taiwan incidents, new leadership established the goal of "Reinvigorating the AF Nuclear Enterprise" as the Air Force's top priority. Recently, that goal was subtly changed and is now described as Continue To Strengthen The Air Force Nuclear Enterprise. Based on the recent inspection results at the nuclear units, it appears we can legitimately question if we are addressing the underlying root

causes of the Minot and Taiwan incidents. While Toyota is important, a compliant (that is, safe, secure, and reliable) USAF nuclear enterprise is essential.

Mark Stout is a researcher at Air University's National Space Studies Center. Mr. Stout sometimes posts at the blog Songs of Space and Nuclear War. Larry Chandler is a retired Air Force Colonel working on the effort to revitalize the USAF Nuclear Enterprise. The opinions expressed here are those of the authors' alone and may not reflect the views and policies of the US Air Force or the Department of Defense.

* Even though the term 'nuclear enterprise' lacks total precision, it is intended to represent the totality of what the Air Force does regarding *anything nuclear* to include operations, logistics, security, modernization, delivery vehicles, and weapons.