

## **CHAPTER 6**

# **PREPARATIONS FOR THE CHEMICAL WEAPONS CONVENTION**

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## **6.0 INTRODUCTION**

The Chemical Weapons Convention (CWC) was opened for signature on January 13, 1993. As of January 1, 1997, 164 countries have signed the CWC. On October 31, 1996, Hungary became the 65th country to ratify the treaty, thus initiating proceedings for entry into force. Entry into force (EIF) is scheduled to take effect on April 29, 1997—180 days after the 65th ratification. As of March 1, 1997, 70 countries have ratified the treaty, not including the United States. The U.S. Senate is scheduled to hold hearings on the CWC during early 1997. The Senate may hold a vote on whether to provide its advice and consent on the treaty prior to EIF, though no date for the vote has been set as of March 1, 1997.

### **6.1 DEPARTMENT OF DEFENSE PREPARATION**

The Department of Defense conducts an Implementation Working Group (IWG) to plan for implementation of the Chemical Weapons Convention (CWC) and related bilateral chemical weapons agreements. Through regularly recurring meetings, representatives of the Office of the Secretary of Defense (OSD), the Joint Staff, the Military Services, and DoD agencies and activities coordinate planning efforts to ensure successful implementation of the CWC and related CW agreements. Formal meetings of the CWCIWG are scheduled approximately monthly and *ad hoc* meetings are held as needed to address short-notice requirements. Upon implementation of the CWC a counterpart Compliance Review Group (CRG) will be established within DoD. The CWCCRG will meet as needed to address ongoing compliance concerns.

The Military Services and the On-Site Inspection Agency (OSIA) have developed individual implementation plans to provide guidance for their commands and activities under the CWC and the related agreements. As outlined in their plans, the Services and OSIA have conducted assistance visits and formal exercises to ensure that all elements are prepared to comply with the agreements.

The Military Services have individually established implementation support offices which participate actively at the DoD CWCIWG, provide Service policy direction, and conduct ongoing liaison with their major commands to ensure that all military elements are fully prepared for inspections under the CWC and related CW agreements.

In accordance with the DoD Program Plan for Research, Development, Test and Evaluation (RDT&E) for Arms Control, the Defense Special Weapons Agency (DSWA) directs the DoD RDT&E effort to ensure that arms control verification proceeds using the most effective technology available.

OSD, the Joint Staff, the Military Services, OSIA and DSWA frequently provide technical experts to support activity at the CWC Preparatory Commission (PrepCom) in The Hague, The Netherlands. The PrepCom is charged with developing procedures and implementing the international forum, the Organization for the Prohibition of CW (OPCW), which will oversee worldwide compliance with the CWC.

OSD and the Joint Staff have provided representation and OSIA has provided operational advice to US negotiating delegations in Moscow, Russia for completion of CW bilateral implementation protocols. Discussions continue concerning follow-on aspects of the historic Wyoming MOU, for which inspections were completed in December 1994. Negotiation of protocols to enable implementation of the Bilateral Destruction Agreement (BDA), which was signed in 1990, continues.

## **6.2 TRAINING FOR INSPECTORS**

DoD has been involved in several efforts to train individuals to perform duties related to various CW agreements. The OSIA has a training program for both OSIA cadre and augmentees from Defense and other governmental agencies. This three phased program includes one week of classroom instruction in the Washington area, one week of hands-on practical exercises (including operation in a toxic-agent environment) at the US Army Chemical School, Fort McClellan, Alabama, and specialized team training at various locations.

In an effort to ensure that inspectors working under the auspices of the CWC and the OPCW are adequately trained to perform their duties, DoD requested DSWA to develop a training program that might be offered to the OPCW as a method of training inspectors. DSWA contracted with the U.S. Army Chemical School to develop a suitable training program for OPCW inspectors. Using the Chemical School's preliminary draft program as a model, the Preparatory Commission of the OPCW developed a General Training Scheme for CWC inspectors. The United States has formally offered to participate in this program and will teach several courses at various U.S. facilities. (*A Module 1 Basic Course* will not be taught in the United States as originally proposed.) Several *Module 2 Specialty Training Courses* have been offered to include: (1) a three week Demilitarization of Chemical Weapons Course to be taught at the Chemical Demilitarization Training Facility, Edgewood Area, Aberdeen Proving Ground, Maryland; a two week Inactivation, Conversion, and Destruction of Chemical Weapons Production Facility Course to be taught at Pine Bluff Arsenal, Arkansas; and a two week Conventional and Chemical Munitions Course to be taught at the U.S. Army Chemical School. (On February 7, 1997 the Provisional Technical Secretariat (PTS) of the OPCW decided not to conduct any module 2 training in the United States citing the still unresolvable "technical transfer" issue. This is the same issue that resulted in the cancellation of module 1 training.) The U.S. has also offered to provide facilities for *Module 3 Inspection Team Training*. Anniston Army Depot will provide the training site for Chemical Weapons Storage Site inspection team training. Pine Bluff Arsenal will provide the site for CW Production Facility team training. The Chemical Agent Munitions Disposal System at Tooele Army Depot will provide the training site for destruction site inspection training. (As of March 1, 1997, the issue of conducting the module 3 training in the United States has not been resolved.) Additionally, the United States has offered to jointly participate with other countries to develop and present training courses. The US, United Kingdom, and Finland will jointly conduct a Sampling and Analysis Course in Helsinki, Finland and Porton Down, UK. The United States and Germany will jointly conduct a Non-destructive Evaluation Course to be taught in Münster, Germany. The Provisional Technical Secretariat of the OPCW has also formally requested U.S. assistance in teaching the Team Communication and Management Course that will be taught in The Hague,

The Netherlands. The United States will no longer assist in teaching any courses for the PTS, but has elected instead to provide sanitized versions of the programs of instructions to the PTS.

### **6.3 PREPARATION OF DEFENSE INSTALLATIONS**

OSIA has coordinated actively with the Military Services in preparing DoD installations for inspections under the CWC and related bilateral CW agreements. All Defense installations which will be subject to declaration under the requirements of the CWC, and many which will be subject to challenge even though not declared, have been visited by OSIA technical experts and Military Service representatives. A series of staff assistance visits, joint training exercises, and mock inspections have been carried out at installations identified by the Military Services as being potentially vulnerable. Furthermore, the Military Services have initiated efforts to ensure that affected commands take timely and appropriate measures to reduce vulnerability.

OSIA has expended nearly 6,300 man days conducting site visits, field training exercises, bilateral CW agreement inspections, and other on-site activities (over 158 separate events) in preparation for the CWC and related CW agreements. OSIA has visited, on a recurring basis, every DoD CW-related facility in the US that will be declared under the CWC. In addition to assistance visits and routine training exercises, a total of 64 mock inspections and five inspections under a bilateral CW agreement have been conducted at US facilities over the past three years. Activity is continuing to ensure that all US DoD facilities are in full compliance with the applicable CW mandates.

### **6.4 PREPARATION OF DoD-CONTRACT INSTALLATIONS**

In the event of CWC inspection of DoD-contract activities, the Defense Treaty Inspection Readiness Program (DTIRP), for which OSIA is the DoD Executive Agent, has a trained cadre of technical experts from the security countermeasures and counterintelligence community to assist defense contractors in preparing for a CWC challenge inspection. The DTIRP personnel have conducted CW vulnerability assessments and site assistance visits, and have participated in numerous mock inspections and table top exercises. In order to assist program and facility managers, OSIA has developed a sophisticated arms control risk assessment model designed to address risks to national security and proprietary information. The DTIRP system enables the assessment of susceptibility, as well as vulnerability, and the level of preparation needed to protect critical technologies, sensitive programs, and capabilities.

OSIA has implemented an extensive outreach program to provide information about the CWC, security countermeasures, facility preparation, and DTIRP to both government and DoD industry. OSIA provides training and awareness services through such fora as industry seminars, mobile training teams, mock inspections, tabletop exercises, industry associations, national conventions and symposia. DTIRP speakers participated in more than 50 outreach events during the last fiscal year. OSIA also publishes various educational products (printed and video) and administers electronic bulletin boards to provide information concerning the CWC to government and industry.

Through DTIRP, OSIA maintains an operational capability to deploy counterintelligence personnel and specialized equipment to support assistance teams at challenged facilities on short notice. DTIRP is an integral support element to the Military Services, Department of Energy, and others for CW challenge inspections at their undeclared, as well as their declared, facilities. This capability will be available to support DoD and government contractors during implementation of the CWC.

## **6.5 COOPERATIVE THREAT REDUCTION (CTR): RUSSIAN CHEMICAL WEAPONS (CW) DESTRUCTION SUPPORT PROGRAM**

The Cooperative Threat Reduction (CTR) Program, a bi-partisan Congressional initiative created in November 1991, is an effort to enhance the national security of the United States through cooperative engagements with Russia, Belarus, Kazakhstan, and Ukraine aimed at diminishing the threat posed by weapons of mass destruction along with their associated delivery systems. Establishment of the CTR Program was a direct response to the political and economic uncertainties associated with the disintegration of the former Soviet Union that called into question the ability of the newly independent states to provide for the safe and secure transportation, storage, and eventual reduction of complete elimination of these weapons. With respect to chemical weapons, the objective of the CTR Program is to assist the Russian Federation in the safe, secure, timely, cost-effective and environmentally sound destruction of its CW stockpile, specifically nerve agent destruction, and thus to contribute to Russia's ability to meet the destruction milestones of the Chemical Weapons Convention.

This program is currently focused on two primary projects: (1) development of a Chemical Agent Analytical Monitoring capability, and (2) establishment of a Chemical Weapons Destruction Facility (CWDF). An Implementing Arrangement between DoD and the RF Ministry of Defense to facilitate coordination of the CWDF-related project was concluded on July 10, 1996.

The Chemical Agent Analytical Monitoring project is assisting the RF in establishing a multi-laboratory system to provide chemical agent and environmental monitoring capabilities to support the Russian CW destruction program. This project currently consists of two primary components: establishment of a Central CW Destruction Analytical Laboratory (CAL) at the Moscow Research Institute of Organic Chemistry and Technology (GosNIIOKhT), and the provision of three mobile laboratories. The three mobile labs were procured under an existing U.S. Army contract and delivered to Russia in September 1996. A contract to support establishment of the CAL was awarded to ConTrack International, Inc. in October 1996.

The CWDF project is the keystone of the program and will likely be the major CTR activity in Russia in the final years of the CTR program, *i.e.*, FY 2000 and beyond. It consists of several tasks that are directed towards achieving an operational CW destruction facility at Shchuch'ye, Kurgan Oblast. These tasks include the following:

- Preparation of site-specific planning documentation to include project cost estimates and schedule, process and facility design baseline data, a site feasibility study (Justification of

Investment), and an initial environmental impact assessment. The effort is being conducted under a contract awarded to Bechtel National Incorporated (BNI) in May 1994.

- Optimization of the Russian two-step (neutralization/bituminization) chemical destruction process, previously evaluated in both U.S. and Russian laboratories and found to achieve satisfactory agent destruction levels, will entail additional laboratory scale tests necessary to design a bench scale reactor system for further testing and development of the destruction process equipment for a CWDF. This work is being done under a contract awarded to Battelle Memorial Institute in September 1996.
- Process scale-up and equipment development to include bench scale testing of the destruction processes, munitions processing machinery development and testing, and related technical and engineering studies. An Engineering Management Support (EMS) Contract was awarded to The Ralph M. Parsons Company of Delaware on December 3, 1996 to perform this work.
- Process and facility design will be conducted based on the results of the other ongoing tasks to support the decision-making process leading to approval to begin construction of the Shchuch'ye CWDF. This work will be performed under the EMS contract.
- Actual construction and start-up of the CWDF will include facility construction, equipment acquisition and installation, operator training and systemization of the CWDF, which may be executed as options to the EMS contract. It should be emphasized that implementation of this work will require annual authorization and appropriations from the U.S. Congress.

The implementation of a third CW related CTR project, Chemical Weapons Production Facility Dismantlement, is pending an Implementing Agreement to support dismantlement, conversion and/or redirection of former Soviet CW production capability at the Volgograd "KHIMPROM" Complex or other former production facility.

## **6.6 VERIFICATION TECHNOLOGY**

In January 1991, DoD modified DSWA's charter to add the conduct of Research, Development, Test, and Evaluation (RDT&E) for inspection technology related to arms control treaty verification. Today, the DSWA Chemical Biological (CB) Arms Control Technology (ACT) Office has the lead within DoD for developing the technologies for implementation of CB arms control treaties and agreements. This function is integral to the global arms control component of the U.S. National Security Strategy.

The CB ACT Office conducts RDT&E to support U.S. roles in global CB arms control initiatives by developing technologies and procedures for DoD identified implementation, verification, monitoring, and inspection needs as required by CB arms control agreements. The CB ACT program is directed towards protecting national security interests, improving the

effectiveness of verification efforts, assisting the United States to meet legal obligations imposed by treaty provisions, supporting development of U.S. policy, minimizing inspection and implementation costs, and enhancing the safety of treaty inspections. DSWA's designation as a combat support agency will add another important focus, whereby the CB ACT program will also consider the impact of CB arms control agreements on warfighting commanders and their missions.

The current DSWA CB ACT Program focuses on the following:

- support to negotiations,
- compliance support/data management,
- inspector safety monitoring,
- off-site monitoring,
- non-destructive evaluation,
- on-site analysis.

### ***Support to Negotiations***

The CB ACT Office provides technical support to the Office of the Secretary of Defense (OSD) in the form of technical experts and information related to CW compliance and implementation support. The program also provides for support to OSD and OSIA for bilateral arms control negotiations with the Russian Federation (RF).

Through the CB ACT program, DSWA provides technical support to U.S. negotiators involved with Biological Weapons Convention (BWC) Review Conferences and to OSD staff engaged in exchange visits to military biological facilities under the auspices of the US/UK/RF Trilateral Statement.

### ***Compliance Support/Data Management***

The CB ACT program supports the development of DoD data and notification management systems that satisfy U.S. treaty reporting requirements. The CWC Information Management System (CWCIMS) was developed for, and adopted by the Organization for the Prohibition of Chemical Weapons (OPCW) to assist in scheduling and managing CWC inspections. The Chemical Agent Management Information Network (CAMIN) is a joint DSWA/Army program which provides a means to address DoD data declarations required by the CWC. The CB ACT Program Office is also developing a proposed data management system to assist with the submission of annual declarations under the BWC.

### ***Inspector Safety Monitoring***

Ensuring inspector safety during arms control inspections is a priority concern. The CB ACT Program Office continues to pursue a real-time portable CW agent monitor for the detection of trace levels of volatile CWC scheduled chemical to assure that inspectors are not exposed to a hazardous area. The key challenges on this effort involve meeting time weighted

average (TWA) detection limits, satisfying intrinsic safety requirements for the instrument, and meeting false negative and false positive accuracy criteria.

### ***Off-Site Monitoring***

The CWC permits monitoring during challenge inspections at a negotiated perimeter. The CB ACT program continues to focus on evaluation of technologies that can be used to monitor the perimeter of facilities undergoing challenge inspections. (See for example *Sample Screening* below.)

### ***Non-Destructive Evaluation (NDE)***

NDE systems permit the non-invasive interrogation of munitions and containers. The current CB ACT program is exploring the following technologies:

- Acoustic Resonance Spectroscopy (ARS) - a mature technology used to classify munitions by content. It requires the development of a matching template database.
- Portable Isotopic Neutron Spectroscopy (PINS) - PINS employs neutron radiation from a small radioisotopic source. Chemical elements are identified by their characteristic gamma ray signature. PINS is now available commercially and has been used successfully by the U.S. Army to identify the contents of hundreds of munitions recovered from burial sites and firing ranges.
- Swept Frequency Acoustic Interferometry (SFAI) - SFAI can identify liquid agent inside munitions and containers by measuring several of its physical properties, such as density, and the attenuation of sound speed over a wide range of frequencies. In contrast to ARS, SFAI does not require a template signature.

The continuing challenge for NDE is to meet speed, accuracy, logistics, safety, and human engineering criteria. The focus is on developing a single, multi-function instrument which is intrinsically safe, provides fast analysis, meets a high level of identification confidence, and which can be operated in full protective clothing.

### ***On-Site Analysis***

On-site analysis represents the broadest and most intense effort in the CB ACT program. To be successfully performed, it requires state-of-the-art sample collection, screening, preparation and determinative analysis methods and equipment.

The United States has taken the lead in the development of an on-site laboratory. DSWA prototypes, such as the “fly-away lab,” which has been used to support UN Special Commission inspections in Iraq, and the “Modular Laboratory” which has been adapted for use in the U.S. CWC compliance program are examples of on-site laboratory proof-of-concept efforts. DSWA continues to guide its on-site analysis program towards a laboratory employing

field portable equipment, instrumentation and techniques, which meet specific criteria designed to maximize sampling and analysis capabilities under the time and logistics constraints of a CWC inspection.

*Sample Screening* - CWC inspectors require a screening system that will be effective for all compounds of interest, including non-volatiles. The system must also minimize and preferably eliminate false negatives, be intrinsically safe to use, and contribute minimally to an already profound logistics burden.

*Sample Preparation* - The CB ACT Office has pursued sample preparation procedures which emphasize speed and minimize the complexity of extraction, derivitization, and concentration. A proposed sample preparation method for gas chromatography/mass spectrometry (GC/MS) has been developed through a joint U.S./Finnish partnership.

*Determinative Sample Analysis* - The CB ACT Office is pursuing technology improvements to satisfy determinative analysis requirements. The goals are to reduce power consumption, increase sample throughput, and ruggedize packaging, while reducing false positives to zero. DSWA also has addressed the requirement to prevent the loss of national security and confidential business information during inspections by initiating a project to develop “masking” or “blinding” software for analytical instruments. The software is designed to prevent inspectors from accessing data not relevant for an inspection. Thus far, this project has produced software for use with GC/MS, which DSWA has made available to industry. Similar requirements are now anticipated for data generated by all analytical instruments used on an inspection site.