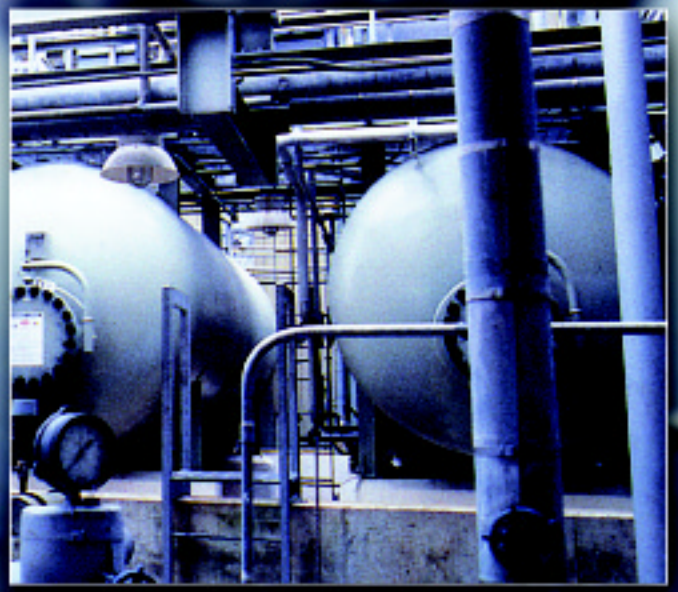
Distributed by:
Defense Threat Reduction Agency
DTIRP Outreach Program
8725 John J. Kingman Road, MSC 6201
Fort Belvoir, VA 22060-6201
1.800.419.2899
Email: dtirpoutreach@dtra.mil
Web: http://dtirp.dtra.mil

Order No. 114 P

December 2003

Features of Chemical Facilities

December 2003



Chemical Weapons Convention

Order No. 114 P

This pamphlet is part of a series about the Chemical Weapons Convention and its potential security impact on DoD facilities and chemical plants. It was prepared by the Defense Treaty Inspection Readiness Program (DTIRP) to increase ***Readiness Through Awareness*** within the U.S. Government and defense contractor community. Additional copies of this pamphlet, as well as other information about arms control treaties and the application of security countermeasures, are available through the DTIRP Outreach Program.

December 2003

Prepared for:
Defense Threat Reduction Agency
DTIRP Outreach Program
8725 John J. Kingman Road, MSC 6201
Fort Belvoir, VA 22060-6201

From the DTIRP Outreach series: Order No. 114P

TABLE OF CONTENTS

INTRODUCTION

The Chemical Weapons Convention (CWC) establishes extensive data monitoring and verification measures. These include intrusive on-site inspections at government and privately-owned facilities associated with scheduled and unscheduled discrete organic chemicals (UDOC) monitored by the Convention. A facility may be subject to declaration and inspection if it produces, consumes, imports, exports, or transfers monitored chemicals above the threshold levels set by the CWC.[1]

Even if your facility has no declarable chemical activities, it still could be susceptible to a challenge inspection. Challenge inspections are conducted by a multinational team of inspectors tasked to investigate, clarify, and resolve a non-compliance concern. Although the Convention specifies no numerical limit on challenge inspections—and it is the current assessment of the U.S. Government that the frequency of such inspections cannot be predicted—the chances of a challenge inspection occurring at any given facility are believed to be exceedingly small.

Regardless of the type of CWC inspection—"routine" or challenge—as a facility security officer, CWC point of contact, or program manager, you must grant inspectors sufficient access to your facility to fulfill their inspection mandate. At the same time, you will be responsible for protecting national security, proprietary, and other sensitive information not related to chemical weapons.

The broad scope of CWC challenge inspection provisions complicates the identification of exactly which facilities—chemical or non-chemical—could be targeted. For this reason, this pamphlet introduces various features of industrial facilities that could act as indicators of chemical activity, and thereby increase a facility's susceptibility to inspection.

[1] For more information about threshold levels, see DTIRP article *The CWC—Reporting Obligations for Defense Industry*, Order No. 110A.

BACKGROUND

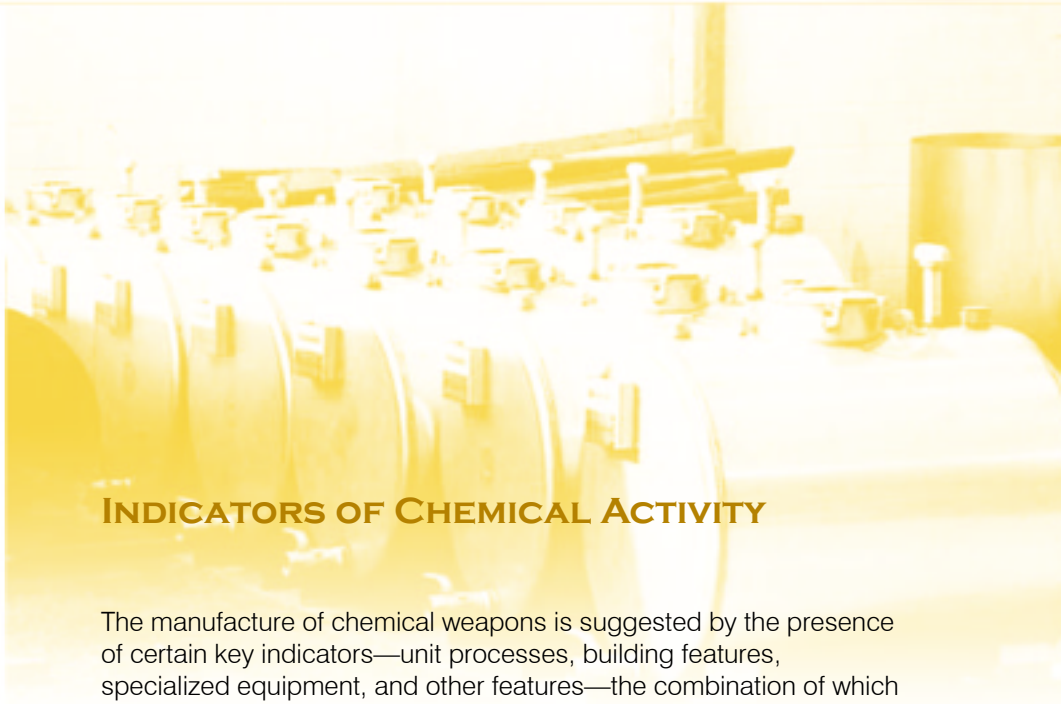
The CWC is an international arms control agreement that prohibits the development, production, acquisition, stockpiling, transfer, and use of chemical weapons. The Convention has more than 150 States Parties and its verification provisions are the most comprehensive and intrusive of any arms control agreement yet negotiated. The CWC is also the first arms control agreement to have a major impact on a large segment of private industry.

A wide variety of industrial enterprises in many fields—not just chemical producers—may be subject to "routine" and/or challenge inspections. All CWC inspections are conducted by an international team of inspectors employed by the Technical Secretariat of the Organization for the Prohibition of Chemical Weapons (OPCW), the Convention's implementing body located in The Hague, Netherlands. Industries potentially affected by the CWC include, among others, aerospace, automobiles, biotechnology, cosmetics, electronics, food processing, mining, paint, paper, pesticides, pharmaceuticals, photographic supplies, plastics, ink, semiconductors, soap, detergent, and textiles.

A challenge inspection may be requested by any State Party for the sole purpose of clarifying and resolving questions concerning possible non-compliance with the Convention. Unlike "routine" inspections, challenge inspections are not limited to declared facilities. They may occur at *any* facility—declared or undeclared, government or privately-owned—on short notice. Even a defense contractor or private company not involved with scheduled chemicals and who has no declarable activities or CWC reporting obligations, could conceivably find that one of its facilities has become the subject of a challenge inspection. The United States, and thus the facility, would be obligated to provide sufficient information and access to the facility to demonstrate that no prohibited activities are taking place.

Since declared facilities are already subject to "routine" inspections, and because the Executive Council of the OPCW can dismiss a challenge request if it is judged to be "frivolous, abusive, or beyond the scope" of the Convention, challenge inspections will most likely be directed toward only the most serious, suspected violations at undeclared facilities. Moreover, they are most likely to occur at a facility suspected of being, or simply appearing to be, a chemical facility.

The features, or "indicators," listed in the next section of this pamphlet, are found at many industrial facilities. However, these features could arouse suspicion and thus increase a facility's susceptibility to a challenge inspection.



Indicators of Chemical Activity

The manufacture of chemical weapons is suggested by the presence of certain key indicators—unit processes, building features, specialized equipment, and other features—the combination of which is distinctive and rare in industrial practice. While the presence of such indicators at a facility are merely suggestive, and are by no means proof of chemical weapons production—or even, for that matter, declarable chemical activity—they could arouse serious suspicions and increase the facility's susceptibility to a challenge inspection.

Certainly not every indicator of chemical activity is likely to prompt a request for a challenge inspection. But, when multiple indicators are found in combination, they become more meaningful. Consequently, a facility possessing several of the indicators discussed in this section of the pamphlet may face greater susceptibility to a challenge inspection.

Many indicators of chemical activity are fairly common in a variety of legitimate industries, both chemical and non-chemical. In many cases, they simply indicate a facility's desire or legal obligation to keep potentially harmful materials out of the environment and away from employees who might otherwise be harmed. Such precautions are necessary and standard in many industrial operations and may even be required to assure product quality control. However, to a State Party with a non-compliance concern, these measures could seem to indicate that undeclared activities monitored or prohibited by the CWC are occurring.

Processes

Industrial processes that share some of the physical characteristics of monitored or prohibited chemical activities include:

- Batch production with industrial mixers;
- Dry bulk and fluid handling;
- Environmental and safety processes using air handling equipment, clean rooms, exhaust stacks, high-capacity filters, scrubbers, and other controls; and
- Certain processes for loading, unloading, storing, and transporting equipment and materials.

These processes are used by a variety of legitimate industries, including coal and steel production, mining, crop protection, fertilizer production, paper production, wood preservation, chlorine manufacturing, paint and ink production, roof coatings, cosmetics, chemical manufacturing, pharmaceuticals, plastics, ceramics, textiles, food and beverage processing, and electronics, among others.

Building Features

The following physical building features are common to both chemical and non-chemical facilities and could suggest the presence of processes monitored by the CWC.

Air locks, for example, are used in many facilities to seal off a room or building in which toxic chemical processes or handling is taking place. The combination of having process control rooms with controlled access via air locks may be considered as especially indicative of activities monitored by the CWC. However, air locks are used in a variety of commercial industry operations, including battery manufacturing, spray-painting, and microelectronics processing.

Central or portable decontamination facilities are common at chemical facilities. They are also a common feature of nuclear power and other nuclear material handling plants and operations, hazardous waste disposal facilities, and other non-chemical facilities. Such facilities provide an area where employees can shower and change clothes to prevent the inadvertent contamination of areas outside the facility. They can also be used in emergency situations where contamination occurs.

Clean rooms are sterile rooms used at certain facilities producing toxic chemicals to ensure that dust and other contaminants, both chemical and non-chemical, are not brought into chemical production areas from the outside. Clean rooms are used in a variety of industrial enterprises, including microelectronics processing and equipment manufacturing.

Covered passages are used to shield the environment from chemical contamination when employees move from one area to the next. Covered passages, such as heated tunnels, are a common feature of industrial operations located in cold climates.

Other common features of chemical facilities include **instrument panels** monitoring the flow of chemicals and **interior bay separations** used to avoid accidental chemical mixing and to preclude injury to employees. However, these too have applications outside the chemical industry. For example, interior bay separation may be employed in any industry, chemical or non-chemical, that uses solvents. Other chemical indicators include **isolated process control rooms**, found in industries using automated robotics in manufacturing operations, and a **non-standard plant layout**, such as one that includes isolated changing facilities, showers, and laundry facilities. **Storage bunkers** and **underground facilities** could indicate volatile chemical activity, but may also exist in rocket or ordnance testing areas.

Special Equipment

The presence and use of certain specialized equipment could suggest a facility's participation in CWC-monitored or prohibited activities. For example, corrosive chemicals—including chlorine and fluorine, which may be ingredients in chemical warfare agents—require **special corrosion-resistant containers, piping, and handling facilities** to prevent damage to the equipment. Special items include a combination of silver- or titanium-lined **distillation columns** with special, double- or triple-walled and titanium-lined piping and **chemical reactors** constructed of special alloys.

Detection equipment used to measure air quality and to identify any traces of chemicals in the air could indicate the presence of chemical activity. Examples of such equipment include badges that change color when chemicals are present and hand-carried air quality control devices. High-capacity air handling equipment, used to maintain a continuous flow of clean air in a room containing chemicals, can also be an indicator. Such equipment includes **air treatment systems** such as cyclones and charcoal filters on ventilation systems, but could also describe equipment used for asbestos removal. In addition, **scrubbers** filter out dust particles and potentially toxic particulates from the waste products resulting from chemical processes.

Special safety equipment, such as **protective personnel suits** and **emergency response vehicles**, also indicate hazardous chemical operations. **Vapor reduction equipment**, a common feature of industrial spray-painting operations, may employ special purge or exhaust systems, sprays of water, or other vaporized chemicals to displace or reduce vapor concentrations if chemicals are accidentally released. Finally, **waste control systems** designed to handle toxic chemicals are common to CWC-monitored chemical facilities.

Other Chemical Indicators

Other indicators of chemical activity that could raise concerns about CWC compliance are found throughout legitimate facilities. Several examples follow.

Affiliates. If an undeclared facility is affiliated with a declared facility, it may be regarded with more suspicion than would otherwise be the case. Such ties might include ownership, partnership, and joint contracts. Often, shipping manifests, container labels, and other records can be used to identify a company's suppliers or other affiliates.

Historical precedence. If a facility has been associated with a chemical weapons program in the past, or if a previous owner used the facility for these purposes, it could greatly increase the facility's susceptibility to a challenge inspection.

Location. The location of a facility in a remote, isolated area, especially when combined with other characteristics of chemical activity, could be considered grounds for concern.

Environment. Corrosion or discoloration of snow, ponds, creeks, rivers, or foam around a chemical plant could indicate that toxic chemicals are processed at the facility. The presence of effluent ponds or dead animals or vegetation around a chemical plant could also suggest the presence of toxic chemical processing.

Medical. The presence of antidotes to chemical agents at a chemical facility or at nearby hospitals is a high risk indicator of the presence of certain scheduled chemicals or their precursors. Other indicators may be medical surveillance programs that monitor the health of facility employees and the logging of chemicals with which they come into contact. A high incidence rate of medical problems and ailments symptomatic of exposure to chemical warfare agents, or other toxic chemicals, among facility employees provides good cause for suspicion.

Physical Security. Heightened security has traditionally been a feature of special weapons programs, including chemical weapons programs. Indicators of special activity might include **special entry and exit controls**, such as guard posts, double or high security fences, gates, coded door locks, video monitoring, special lighting, and armed security for incoming and outgoing shipments; any **special restrictions** placed on a facility or area surrounding a facility (for example, stopping all traffic when chemicals are being moved); and **unusual or irregular plant operating schedules**, such as intermittent night operations. The presence of **heavily armed security guards** is an additional high-security feature which, when not consistent with the stated purpose of a facility, can raise suspicions.

Public Information. Substantial amounts of open source information is available that might lead another State Party to target a facility for a challenge inspection. This information includes **plant records**, which may be audited, as well as company literature and **promotional material**, government publications, newspapers, industry association newsletters, trade journals, Internet sites, and other materials, which together can provide significant background about a facility's history, operations, contractual relationships, technical capabilities, and physical characteristics.

Official government documents in the public domain can also provide valuable information. For example, Environmental Protection Agency (EPA) reports provide detailed data on chemical emissions at U.S. industry facilities. EPA's Toxic Release Inventory (TRI) is a database on toxic chemical releases and transfers by manufacturing facilities. All facilities listed in the TRI are required to report the manufacture, processing, and consumption of all toxic chemicals in excess of minimum reportable quantities. They also must identify what they are doing to reduce, recycle, and treat each reported chemical. Other sources of information include EPA and Occupational Safety and Health Administration (OSHA) reports on violations of federal regulations, court records associated with lawsuits filed against companies for accidents or safety incidents, and shipping manifests for the transport of hazardous material mandated by the Department of Transportation.

Even **facility blueprints** registered with local or county government offices can provide information about activities taking place at a facility. Information derived by CWC States Parties from legitimately acquired **overhead photographic imagery**, such as that obtained from commercial sources on the Internet, may be subject to misinterpretation and exploitation. For example, evidence of new buildings or other construction with the physical features cited previously could suggest future activities of concern to the Convention.

CONCLUSION

Understanding the features of chemical facilities can help you take measures to mitigate any indicators suggesting the presence of non-compliant activities. Challenge inspections are expected to be extremely rare, and the probability of a challenge inspection occurring at any individual facility is very low. If the United States is notified of a challenge inspection, however, it will most likely occur at a facility exhibiting a number of the indicators mentioned in this pamphlet. Taken together, these indicators could lend credence to a non-compliance concern.

To obtain additional information about the CWC, other arms control treaties potentially affecting your facility, and the application of security countermeasures, contact the DTIRP Outreach Program coordinator at 1-800-419-2899, your local Defense Security Service (DSS) Industrial Security Representative, or your government sponsor. Also see the list of related DTIRP products beginning on the next page.

RELATED MATERIALS

101B Challenge Inspections under the Chemical Weapons Convention
Bulletin

102P Chemical Weapons Convention—The Impact
Pamphlet

104V The Chemical Weapons Convention and Its Impact on U.S. Facilities
Video

105B The Chemical Weapons Convention: A Quick Reference Guide
Bulletin

106B The Organization for the Prohibition of Chemical Weapons (OPCW)—A Snapshot
Bulletin

107V Managed Access under the Chemical Weapons Convention
Video

108P Chemical Weapons Convention: Questions Facing the U.S. Defense Industry
Pamphlet

110A The CWC—Reporting Obligations for Defense Industry
Article

112P Managed Access under the Chemical Weapons Convention
Pamphlet

RELATED MATERIALS

115P Routine Inspections under the CWC
Pamphlet

117P Guide for Challenge Inspections under the Chemical Weapons Convention
Pamphlet (pocket size)

118P Guide for Initial and Routine Inspections under the Chemical Weapons Convention
Pamphlet (pocket size)

119P CWC Challenge Inspection Planning Considerations
Pamphlet

122P Guide to Managed Access under the Chemical Weapons Convention
Pamphlet (pocket size)

123A Development of a Chemical Weapons Convention Pre-Inspection Briefing
Article

124A Site Preparation for Inspections under the Chemical Weapons Convention
Article

125P CWC Inspection Preparation Guide
Pamphlet

127C Chemical Weapons Agreements Information
CD-ROM

129P Guide to Scheduled Chemicals
Pamphlet

RELATED MATERIALS

130B CWC Initial Inspection—Lessons Learned
Bulletin

131P Rights & Obligations of the Inspection Team & the Inspected State Party under the Chemical Weapons Convention
Pamphlet

132P Quick Reference Guide to Chemical Equipment
Pamphlet

133B Role of the Requesting State Party Observer in CWC Challenge Inspections
Bulletin

152P CWC Inspectors' Privileges and Immunities
Pamphlet

407C Arms Control Treaties Information
CD-ROM

408P Arms Control Agreements Synopses
Pamphlet

410P Quick Reference Guide to Arms Control Inspection Timelines
Pamphlet

413A Arms Control Developments: Weapons of Mass Destruction
Article

906B Transparency During Arms Control Inspections
Bulletin

907P DTIRP Arms Control Outreach Catalog
Pamphlet

RELATED MATERIALS

908V Facility Protection Through Shrouding
Video

930C The Arms Control OPSEC Process
Automated CD-ROM

936V Verification Provisions—Point and Counterpoint
Video

942C DTIRP Outreach Products on CD
CD-ROM

950V The Technical Equipment Inspection (TEI) Process
Video

954T Why TEI?
Trifold Brochure