

Treaty Obligations for Industry

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The CWC empowers an international authority to collect unprecedented quantities of information from private nondefense companies and to conduct intrusive inspections of their manufacturing facilities. Those treaty obligations affecting U.S. industry are discussed in the following sections.

REPORTING OBLIGATIONS

The CWC will require producers and some processors and consumers to create a paper trail for all the treaty-controlled compounds they work with, so that inspectors can monitor their manufacture and ultimate use. To this end, the companies will have to file initial declarations and annual reports on their activities. Although the reports will allow a margin of error of a few percentage points, they will provide a general picture of each relevant plant's activities and a baseline for inspection. The U.S. National Authority will collect the required data from industry and transmit reports on a yearly basis to the OPCW's Technical Secretariat.¹

I Overlap With Other Reporting Requirements

U.S. chemical companies must already report on a regular basis to several regulatory authorities, including the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), the International Trade Commission, the Bureau of the Census, and hundreds of State and local agencies. These statutory reporting requirements cover all



¹ The data may be collected by one or more U.S. Government agencies with current regulatory responsibilities, such as the Department of Commerce, EPA, or OSHA, so as to build on existing channels with industry.

aspects of commercial chemical production, including quantities of feedstock materials, processed materials, and end-products; characteristics and toxicity of materials; statistical and chemical data on gaseous, liquid, and solid wastes; and reports on the transportation of hazardous materials and on worker health and safety.² For example, each chemical manufacturing facility must file on a yearly basis a Toxic Release Inventory covering the use of 317 toxic chemicals and their release into air, water, and solid waste.

According to the Chemical Manufacturers Association, compliance with U.S. environmental regulations cost the industry about \$4.9 billion in 1992.³ Collection and tabulation of regulatory data require a major effort on the part of large chemical companies, which may have more than 150 separate production sites. For example, at one major chemical manufacturer with some 50,000 employees, about 1,700 people spend most of their time satisfying the requirements of Federal and State regulatory agencies for environmental and statistical data.⁴ The U.S. chemical industry's long experience with such domestic regulations will be helpful in preparing the additional reports mandated by the CWC. Indeed, many firms may view the treaty as a form of "supranational regulation."

Nevertheless, the information currently envisioned as necessary for CWC verification

differs both quantitatively and qualitatively from that collected for internal management or for domestic regulatory purposes.⁶ The major discrepancies between the reporting requirements mandated by the CWC and by U.S. domestic environmental regulations are listed in table 3-1, and can be summarized as follows:

- Environmental regulations do not cover all of the chemicals relevant to the CWC.
- Of the chemicals that are covered, some of the annual production thresholds at which companies must file reports are higher than those specified by the CWC.
- Some environmental regulations apply to chemical manufacturers but not to processors or consumers, which are covered under the CWC.
- Some environmental regulations require prospective rather than retrospective reporting.
- The reporting deadlines for the CWC are shorter than those required by EPA, and estimates of future production must be updated more frequently.

There is also a difference in certain key definitions between the Toxic Substances Control Act (TSCA) and the CWC. In TSCA, the "processing" of a chemical may result in a "different

² Relevant regulations are derived from several laws that control toxic chemicals in the workplace, transportation and the environment, including the Toxic Substances Control Act (TSCA), the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Resource Conservation and Recovery Act (RCRA), the Superfund Amendments and Reauthorization Act (SARA), and the Occupational Safety and Health Act (OSHA). See Kyle B. Olson, "Domestic Regulation of the U.S. chemical Industry and Its Application to a chemical Weapons Ban," in Thomas Stock and Ronald Sutherland, eds., *National Implementation of the Future Chemical Weapons Convention*, SIPRI Chemical & Biological Warfare Studies No. 11 (New York, NY: Oxford University Press, 1990), p. 102.

³ Michael P. Walls, Senior Assistant General Counsel, CMA, letter in response to OTA questionnaire, Feb. 26, 1993.

⁴ Julian P. Perry Robinson and Ralf Trapp, "Summary Report of the Proceedings," in J. P. Robinson, ed., *The Chemical Industry and the Projected Chemical Weapons Convention: Volume II*, SIPRI Chemical and Biological Warfare Studies No. 5 (New York, NY: Oxford University Press, 1986), p. 6.

⁵ Will D. Carpenter, "Implementing Global Chemical Weapons Disarmament: Chemical Industry Perspective," in Eric H. Arnett, ed., *Implementing a Global Chemical Weapons Convention: Proceedings from a 1989 Annual Meeting Symposium* (Washington DC: AAAS Program on Science, Arms Control, and National Security, 1989), p. 23.

⁶ Mark Mullen, *Verification of a Chemical Weapons Convention: Summary of Lessons Learned from the Verification Experience of the International Atomic Energy Agency*, Briefing, vol. 2, No. 6, Dec. 20, 1991 (Los Alamos National Laboratory, Center for National Security Studies), p. 22.

form or physical state from that in which it was received. The CWC, in contrast, draws a clear line between processing (defined as “a physical process, such as formulation, extraction and purification, in which a chemical is not converted into another chemical” and consumption (“conversion into another chemical via a chemical reaction”).⁸

In addition to these discrepancies, U.S. regulatory laws do not permit releasing industry data submitted to the government to an international organization such as the OPCW. Employing EPA and OSHA data for CWC compliance would therefore require amending the various regulatory laws, which would be a long and drawn-out process. For these reasons, the U.S. Government cannot simply “piggyback” on existing reporting requirements to meet its CWC declaration obligations. Nevertheless, U.S. officials hope to minimize the added burden to industry by building as much as possible on existing reporting channels.

| Direct Costs of Reporting

The major U.S. chemical companies currently track production activities with computerized accounting systems, which integrate plant manufacturing data with inventory and import-export accounts. To satisfy CWC requirements, companies will need to modify these systems to collect additional information and to meet shorter reporting deadlines. Within 30 days after the treaty enters into force, each State Party must submit to the OPCW an initial declaration that provides data for the previous 3 calendar years on the quantities of each Schedule 2 chemical produced, processed, consumed, imported, or exported, and

less extensive information on other treaty-controlled chemicals. In subsequent years, companies will have to file annual reports updating the initial declarations 90 days after the end of the calendar year; these reports will contain data on prior-year activities and plans for the upcoming year.

If the United States is to meet its CWC obligations, U.S. chemical companies will need to generate production statistics more quickly, in greater detail, and on more compounds than in the past.⁹ These tasks may require the development of new accounting software and subroutines that improve the speed and timeliness of data collection and analysis. Since U.S. manufacturers will have to submit initial declarations—including data on the previous calendar year’s activities—within 30 days after the CWC enters into force (most likely in January 1995), companies must start preparing to collect such data by the beginning of 1994.

Although the CWC will increase the cumulative reporting burden on firms that produce, process, or consume scheduled chemicals, the largest chemical companies anticipate no significant increase in employees or compliance costs as a result of the treaty.¹⁰ For large chemical companies, the time and effort to comply with CWC reporting requirements will be small relative to total sales and other regulatory costs. According to Will Carpenter, a retired Monsanto executive and consultant to the Chemical Manufacturers Association, the costs of CWC implementation will be “incremental” and ultimately “acceptable.”¹¹ Nevertheless, the size of

⁸Section 3, Toxic Substances Control Act, P.L. 94-469.

⁹“Definitions and Criteria,” article II, paragraph 12, in Conference on Disarmament *Draft Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction*, extracted from CD/1 173, Sept. 3, 1993 (henceforth “Draft Chemical Weapons Convention”), p. 12.

⁹ Interview with Kyle B. Olson, Director, Industry and Arms Control, Chemical and Biological Arms Control Institute, Alexandria, VA, Dec. 22, 1992.

¹⁰Michael P. Walls, CMA, letter in response to OTA questionnaire, Feb. 26, 1993.

¹¹“Industry Urges Quick Implementation of U.N. Chemical Weapons Agreement,” *International Trade Reporter*, vol. 10, Jan. 20, 1993, p. 79.

Table 3-1-Comparison of Reporting Requirements for the CWC and Selected U.S. Environmental Laws

	TSCA	FIFRA	TRI	CWC
Types of chemicals	All chemical substances manufactured or imported into the United States except for R&D substances, pesticides, tobacco products, nuclear materials, firearms and ammunition, food, food additives, drugs, and cosmetic devices.	Active ingredients in pesticides (rodenticides, insecticides, herbicides, fungicides, and antimicrobial).	317toxic chemicals and 20 chemical categories.	CWC agentsand precursors large-volume toxic chemicals used as warfare agents in the past, and other discrete organic chemicals.
Companies covered	Manufacturers and importers. (Under some sections of TSCA, processors and distributors.)	Manufacturers of active ingredients, formulators, and registrants.	Manufacturers, processors, users.	Manufacturers, processors, users.
Production threshold for reporting	No threshold quantity.	No threshold quantity.	A facility must file a form if it manufactures or processes 25,000 pounds or more of a listed toxic chemical or uses 10,000 pounds of a listed toxic chemical.	Threshold ranges from 100 g to 200 metric tons per year depending on the type of chemical and its utility for production of CW agents.
Type of data reported	Before beginning production of a new chemical, firms must submit a Pre-Manufacture Notice (PMN) stating quantity of new chemical to be produced during first year and maximum quantity during anyone of the first 3 years. PMN submissions also require all available data on chemical toxicity, byproducts, use, environmental releases, disposal practices human exposure, and effects on health and the environment. Firms must submit a Significant New Use Notice (SNUN) for new uses of existing chemicals that have been designated in a Significant New Use Rule (SNUR).	Each active ingredient and formulation must be registered with the EPA, along with voluminous testing data on health and environmental effects. No quantity information required for registration. Companies must also submit annual reports on quantities of active ingredients and formulated products made at each production facility.	Releases of each listed chemical to the environment, transfers of the chemical to off-site locations, source reduction, and recycling activities.	Production, processing, or consumption of schedule 2 chemicals and production of Schedule 3 and "other relevant" chemicals.

Table 3-1-(Continued)

	TSCA	FIFRA	TRI	CWC
Aggregation of production data	Varies according to section of TSCA.	Reported for each chemical at each facility, aggregated over the reporting year.	Reported for each chemical at each facility, aggregated over the reporting year.	Reported for each chemical at each plant or plant site, aggregated over the reporting year.
Protection of proprietary data	Firms may designate proprietary data as confidential and protect them from release. Health and safety data cannot be claimed confidential under most circumstances.	Firms may protect certain limited data from release.	Reported data are made available to the general public in various formats, including a publically accessible on-line database.	Firms may designate proprietary data as confidential and protect them from release.
Timellne	Firms must file a PMN on a one-time basis at least 90 days before production begins. ASNUN must be filed 90 days before production begins. There are certain exemptions for abbreviated review periods.	Firms are required to report on production of controlled chemicals during the previous calendar year by March 1, and must also report estimated production for the coming year.	Reports must be filed on or before July 1 for the previous calendar year.	U.S. National Authority must issue an annual report on previous year's activities 90 days after end of the calendar year, so data may be required earlier from industry.
Penalties for late filing or failure to file	Civil penalties of up to \$25,000 per violation per day, and/or criminal penalties of fine plus up to 1 year in prison.	Civil penalties (up to \$5,000) and criminal penalties (up to \$25,000, 1 year in prison) may be assessed for serious violations of the Act.	Civil and administrative penalties of up to \$25,000 per chemical per day.	Civil and/or criminal penalties may be specified in the U.S. implementing legislation.
Revised declarations	Firms must keep EPA informed of new data on substantial risk of chemicals, including test data.	Registrants must keep EPA informed of new testing data on the adverse health and environmental effects of pesticides.	Not required by law.	Companies must file a revised report if new orders result in unexpected production of scheduled chemicals, in some cases 5 days before production starts.

TSCA - Toxic Substances Control Act, P.L. 94-469

FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136-136y.

TRI - Toxic Release Inventory, Sec. 313, Emergency Planning and Community Right-to-Know Act, 40 CFR 370

SOURCE: U.S. Environmental Protection Agency, Office of Technology Assessment, 1993.

the additional burden will depend to a large extent on the design of the reporting formats to be issued by the OPCW Technical Secretariat; these formats are still being negotiated by the PrepCom. To keep paperwork within reasonable bounds, it would be desirable to develop simple, standardized data declaration forms so that companies can simply check off boxes and fill in blanks. U.S. industry representatives also want to ensure that the PrepCom and the implementing legislation require industry to submit no more information than is truly essential to verify treaty compliance. Obviously, the more information that is requested, the greater the risk that trade secrets may be disclosed---either deliberately or unintentionally.

The reporting burden will be proportionately more onerous for small and medium-sized companies, which have a smaller base of management and operating personnel and less experience in providing information to regulatory agencies. Since the reporting thresholds in the CWC are relatively low, some smaller companies may be required to fill detailed production reports for the first time. In addition, the treaty requires that a chemical plant report to the National Authority any significant change in its declaration of anticipated activities for the next year; each such change must be reported 5 days before it occurs. This requirement will impose a greater burden on custom manufacturers, who make small batches of chemicals on order to meet short-term or seasonal demand. Since these firms are often unable to predict their production over the coming year, they will have to amend their annual reports fairly often.¹² Many small companies could benefit from specialized data-collection packages designed to their requirements.

INSPECTION OBLIGATIONS

To confirm that the activities of commercial plants that produce, process, or consume scheduled chemicals are consistent with their declared purpose, the CWC verification regime calls for two types of onsite inspections. Declared commercial facilities that produce, process, or consume Schedule 2 chemicals, which could be converted fairly easily to military use, will be subject to *routine* inspections. The number, intrusiveness, and duration of these inspections will vary according to the chemicals used at a given facility, its process equipment, and its production activities. Schedule 3 and "other relevant" facilities will also be subject to routine inspection on a less stringent basis. Supplementing the routine-inspection regime will be the right of a State Party to request a *challenge* inspection of any declared or undeclared facility on the territory of another State Party that is suspected of clandestine activities such as CW agent production or storage.

Unlike onsite inspections by domestic regulatory agencies, which are performed by U.S. Government officials, inspections under the CWC will be carried out by international civil servants employed by the OPCW Technical Secretariat and drawn from the countries participating in the treaty regime. Depending on the size and complexity of a site, the typical inspection team will probably consist of 6 to 10 people, including a team leader, a chemical engineer, a process engineer, an analytical chemist, and technicians and interpreters. This team may break up into subteams during the inspection.¹³ The inspectors may be equipped with portable analytical instruments, computers, and safety equipment, although the technical parameters of these devices remain to be determined by the PrepCom. Inspectors visiting U.S. facilities will be accompanied by escorts from the inspected facility who are

¹² Dan Charles, "Chemical Weapons Ban: Now for the Hard Work," *New Scientist*, vol. 137, No. 1857, Jan. 23, 1993, p. 7.

¹³ Dr. Leo Zeffel, "Plant Inspections," presentation at a Seminar on the Chemical Weapons Convention and Its Impact on the U.S. Chemical Industry, sponsored by the U.S. Arms Control and Disarmament Agency, Washington DC, Feb. 11, 1993.

well-versed in its layout and activities; in some cases, they may also be escorted by one or more U.S. Government officials who are familiar with the provisions of the treaty.

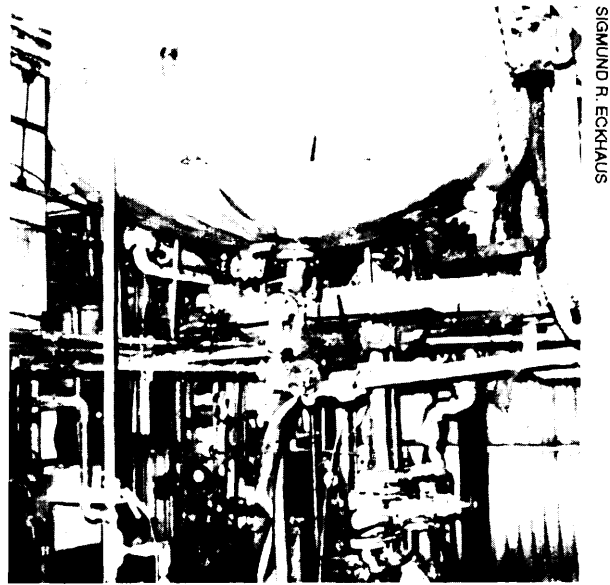
Routine Inspections

Routine inspections of commercial chemical plants are designed to detect—and thereby deter—the use of declared facilities for CW agent production. In particular, routine inspections will verify that:

- the plant is not being used to manufacture CW agents;
- the quantities of dual-use precursor chemicals produced, processed, or consumed are consistent with legitimate declared needs; and
- controlled chemicals are not diverted to a secret onsite or offsite location for illicit purposes.¹⁴

Commercial facilities subject to routine inspection are those involved in the production, processing, or consumption of Schedule 1 and 2 chemicals or the production of Schedule 3 chemicals. For example, a few U.S. defense contractors will be subject to routine inspection because they consume more than the threshold quantity of Schedule 2 chemicals (e.g., for the production of composite materials) or use Schedule 1 chemicals for the development of chemical defenses (e.g., detectors and protective gear). Inspections of Schedule 2 and 3 facilities will begin as soon as possible after the treaty enters into force, while inspections of ‘other relevant’ facilities will likely be phased in later.

Before routine inspections begin at Schedule 2 facilities, the OPCW Technical Secretariat will conduct an initial (baseline) inspection of each plant to assess the risk it poses to the goals of the treaty and hence the frequency and intensity of future inspections. These initial inspections are



Reactor used for the production of dimethyl methylphosphonate (DMMP), a chemical that has commercial applications but can also be converted into nerve agents.

likely to take up to 3 years to complete. Priority in making the initial inspections will go to the facilities of higher risk, that is, those plants that could be used most easily to produce chemical weapons.

During the initial inspection of each Schedule 2 facility, the OPCW and the U.S. National Authority will negotiate a *facility agreement* with the close participation of the plant owners. This agreement will define the verification procedures on a plant-specific basis, laying out areas of the site that will be inspected, where samples can be taken, which plant records can be audited, necessary safety measures, and ground rules for escorts. Some parts of a site maybe excluded from routine inspection, such as research and development laboratories, pilot plants, and nonrelevant production units.

The CWC requires the negotiation of facility agreements for all Schedule 2 facilities, unless

¹⁴ Yuri V. Skripkin, ‘‘Some Technical Aspects of Verification of the Non-Production of Chemical Weapons in the Chemical Industry,’’ in S. J. Lundin, ed., *Verification of Dual-use Chemicals Under the Chemical Weapons Convention: The Case of Thiodiglycol*, SIPRI Chemical & Biological Warfare Studies No. 13 (Oxford, England: Oxford University Press, 1991), pp. 118-119.

both the OPCW and the State Party specifically waive it as unnecessary. Facility agreements are not required for Schedule 3 and “other relevant” facilities, which pose less of a threat to the goals of the treaty and thus require less intrusive inspection. At the latter sites, plant officials are expected to work out an informal “inspection plan” when the inspectors arrive at the plant gate. Nevertheless, States Parties have the option of negotiating a more detailed facility agreement for Schedule 3 and “other relevant” plants if they so choose.

The OPCW Technical Secretariat will select Schedule 3 and “other relevant” plants for inspection using software that takes into account weighting factors to ensure an equitable geographic distribution. Each Schedule 2 or 3 plant may not receive more than two routine inspections per year, and there is a annual ceiling on the total number of inspections of Schedule 3 and “other relevant” facilities.

Routine inspections will involve three mutually reinforcing elements: visual inspection of production equipment, chemical sampling and analysis, and auditing of plant records. In some cases, it may be possible to determine from visual inspection alone if a chemical plant is capable of engaging in illicit activities, since production of CW agents would probably involve the use of corrosion-resistant reactors and special containment measures. Nevertheless, if a government is bent on acquiring a CW capability and is willing to cut corners on agent shelf-life, environmental protection, and worker safety, CW agents could be manufactured with standard chemical production equipment, which would simply be replaced when corroded. For this reason, chemical sample collection and analysis will be needed to provide evidence of clandestine CW agent production that cannot be detected by visual inspection alone.

Sensitive analytical instruments (e.g., combined gas chromatography and mass spectrometry) can detect telltale traces of CW agents or their degradation products in samples from the production line, the waste stream, or even the walls and floor of a plant. Onsite analysis of samples should normally be able to verify the presence or absence of scheduled compounds or their degradation products. Nevertheless, if a treaty violator has attempted to eliminate or conceal traces of CW agent production before an inspection by decontaminating the production line or by producing a closely related commercial chemical in the same reactors (e.g., the pesticide methyl-parathion instead of the nerve agent sarin), the results of onsite chemical analysis may be inconclusive. In such cases, the treaty gives the inspection team the right to send a sample to an offsite laboratory for more sophisticated testing.

The facility agreement may rule out sampling at certain points along the production line that could disrupt production or reveal sensitive proprietary information, as long as the plant officials offer acceptable alternative ways to resolve the inspectors’ compliance concerns. For example, if a plant is using a process containing a proprietary catalyst, the plant managers could give the inspectors samples of both the feedstock and the final product, but not of the intermediate mass containing the catalyst. While the facility agreement should be structured to protect proprietary information unrelated to CWC verification, it should also give the inspectors enough flexibility to make cheating difficult, thereby reinforcing the deterrent effect of the inspections. For example, the agreement might permit random sampling of undeclared vessels connected to declared reactors if such vessels could be used to divert chemicals for CW agent production.¹⁵

If suspicions of illegal activity emerge during an inspection, the inspectors may request to go beyond the explicit terms of the facility agree-

¹⁵Conference on Disarmament, “Report on the Second United States Trial Inspection document No. CD/CW/WP.301, June 27, 1990, p. 13.

ment; if plant officials refuse, they could be suspected of hiding something. In this case, plant officials must find a way to satisfy the inspectors' concerns, for example by allowing them to examine additional records or by permitting a walk-through of an additional area of the plant after taking the time to shroud sensitive equipment. Since CWC inspectors will generally seek to avoid controversy, they are unlikely to overstep their authority by making unreasonable requests.

The full impact of routine inspections on U.S. industry is not likely to be felt until about a decade after the CWC enters into force. For the first 5 to 10 years of CWC implementation, most inspection resources will go to the task of monitoring the elimination of chemical-weapons stockpiles and CW agent production facilities. Commercial sites not subject to inspection initially will be phased gradually into the system. As a result, it will take several years before the CWC reaches a steady state in which international inspectors are routinely inspecting chemical plants.¹⁶

Another factor constraining the number of inspections of U.S. chemical plants will be the limited resources of the international inspectorate in terms of time, money, and manpower. The OPCW Technical Secretariat will employ at most about 1,000 international civil servants, of whom between 250 and 400 will be inspectors. Since a team of roughly 6 to 10 inspectors will be required to inspect each site, no more than a few dozen sites can be inspected at a time, or a few thousand per year, only some of which will be in private industry. Given that more than 25,000 chemical plants worldwide will be subject to inspection, the odds that any given U.S. plant will be inspected will be fairly low. Thousands of U.S. chemical plants will be declared, but only a small fraction will actually be inspected.

I Challenge Inspections

A State Party to the CWC that seeks to violate the treaty might engage in clandestine agent production at an undeclared site. For this reason, routine inspections of declared sites will be supplemented by the right of any participating state to request a "challenge" inspection of any facility on the territory of another State Party that is suspected of containing a clandestine CW storage or production facility. In this way, challenge inspections provide a "safety net" to cover violations that cannot be detected through routine inspections; they also allow the participating countries to ventilate their compliance concerns before the court of world opinion.

Challenge inspections can take place at *any* government or privately owned facility, declared or undeclared. For challenges of undeclared facilities, the inspection team will arrive onsite within 48 hours after the host country has been notified; the two sides may then negotiate for a maximum of 72 hours over the degree of access needed to demonstrate treaty compliance.¹⁷ Officials at undeclared plants must grant some access to the site 102 hours (5 days) after the challenge is announced. (For declared plants, some access must be granted 39 hours after a challenge is announced.) The duration of a challenge inspection may not exceed 84 hours, unless extended by agreement with the inspected State Party.

Depending on the outcome of negotiations during the inspection, inspection of the site may involve visual examination of production facilities (including the taking of instant photographs), sample collection and analysis, and access to plant records pertinent to production of treaty-controlled chemicals. To reduce the potential for mischievous or intelligence-motivated challenge inspections, the OPCW's 41-country Executive Council can block a challenge request within the first 12 hours after it is presented if the request is

¹⁶ Will D. Carpenter, chemical industry consultant, personal communication, May 12, 1993.

¹⁷ Communications channels for informing a challenged site of an impending inspection remain to be worked out.

judged to be “frivolous, abusive, or beyond the scope” of the treaty. Since representation on the Executive Council gives weight to States Parties with the largest chemical industries, these countries will be in a position to oppose inspections that appear motivated primarily by intelligence-gathering.

Moreover, although the CWC imposes no numerical limit on challenge inspections, the U.S. chemical industry believes they will be relatively rare, high-profile events. Since challenge requests will be tantamount to an allegation of noncompliance, they will carry a political cost that States Parties will most likely only wish to incur for the most serious suspected violations. For this reason, governments will probably not wish to expend their political capital by challenging a declared commercial facility that is already subject to routine inspections.¹⁸ Challenges of commercial plants may still occur, however, if persistent suspicions of noncompliance cannot be resolved through routine inspections alone.

During a challenge inspection, plant officials are obligated to provide only the minimum amount of information necessary to demonstrate treaty compliance and need not disclose military or business secrets. At plants in the United States, the U.S. Government may provide escorts to make sure that the international inspectors follow the guidelines set out in the CWC. (Although government escorts are not required by the treaty, they will probably be present at least during initial routine inspections and challenge inspections, if finding permits.) Should an adversarial situation develop during an inspection, the government

escorts may intervene to help resolve the controversy without embarrassment for the United States. At the end of the visit, the inspection team must make a preliminary draft report on the inspection available to the host country for review and attempt to resolve any compliance concerns in discussions with plant officials.

COSTS OF INSPECTIONS

Estimates of the cost of preparing for and hosting CWC inspections at U.S. chemical plants vary greatly, since they depend primarily on the labor costs of personnel involved with the inspections. In order to test out procedures for both routine and challenge inspections, countries participating in the CWC have conducted more than 200 National Trial Inspections (NTIs) at their own government and industrial facilities.¹⁹ To date, the United States has performed seven NTIs, two of which were simulations and five actual mock inspections. The second U.S. NTI, for example, was a mock inspection of a production facility for a Schedule 2 chemical (thiodiglycol, the immediate precursor of mustard agent), including an initial declaration, a baseline inspection and preparation of a facility agreement, and a routine inspection.²⁰ while these exercises have served primarily as a means to develop and refine monitoring and verification measures for the treaty, they have also helped to assess the potential impact of the inspections on industry.

After the first U.S. NTI, the participating company reported a cost of \$10,000 for its time (100 man-hours) in preparing for the trial inspec-

¹⁸ Michael P. Walls, “The Private Sector and Chemical Disarmament,” in Brad Roberts, ed., *The Chemical Weapons Convention: Implementation Issues, Significant Issues Series*, vol. XIV, No. 13 (Washington DC: Center for Strategic and International Studies, 1992), p. 44. Indeed, during the CWC negotiations the chemical industry favored routine inspections as a way of minimizing challenge inspections of industry, which would have been suggestive of a treaty violation.

¹⁹ Battelle Memorial Institute and EER Systems Corp. have developed a computer database on these inspections known as the “chemical Weapons Convention National Trial Inspections Information System.”

²⁰ Sigmund R. Eckhaus, “U.S. National Trial Inspection at a Thiodiglycol Facility, in S. J. Lundin, ed., *Verification of Dual-use Chemicals Under the Chemical Weapons Convention: The Case of Thiodiglycol*, SIPRI Chemical & Biological Warfare Studies No. 13 (New York, NY: Oxford University Press, 1991), pp. 106-117.

tion, including the use of its own analytical capabilities.²¹ Industry representatives stressed,

however, that this cost estimate was of questionable accuracy because it assumed different procedures than would probably be used for real inspections involving foreign nationals. In practice, the cost of hosting routine inspections will depend on several factors, including the size of the inspection team, the amount of access granted to the facility, and the number of samples analyzed onsite.

Inspections will also be more costly if they interfere with normal production. For example, the treaty entitles the inspectors to ask plant officials or workers to take samples from the production line under the inspectors' supervision and to operate idle equipment to demonstrate its function. Interference with production is likely to be rare, however, because the CWC states explicitly that onsite inspections must be conducted so as to cause the "least possible . . . disturbance to the facility or area inspected. The inspection team shall avoid unnecessarily hampering or delaying the operation of the facility and avoid affecting its safety."²² Industry expects the inspectors to follow this guideline closely, only interfering with ongoing production if such action is absolutely necessary to resolve compliance concerns. Officials of the inspected plant also have the right to deny unreasonable requests for reasons of safety or undue disruption, provided they can find some other means of demonstrating to the inspectors' satisfaction that the facility is treaty-compliant.

The upper bound of estimates for the cost of an onsite inspection at a commercial site apply to facilities that:

- are particularly large and complex,
- have extensive areas containing activities relevant to the CWC, and
- are engaged in highly proprietary or classified defense activities, such as the manufacture of advanced composite materials for "stealth" aircraft.

In such cases, the Department of Defense has estimated that the cost per facility could be as high as \$200,000 to \$500,000 because of the need for extensive site preparation involving a large number of man-hours, including training escorts, shrouding sensitive equipment, and conducting mock inspections.²³

The higher range of inspection costs could also result if a chemical company decides to:

- shut down production temporarily in areas to be visited by inspectors for safety reasons or to protect trade secrets; or
- reconfigure or relocate production or consumption of scheduled chemicals to protect trade secrets related to other, commercially more important products manufactured in the same plant.²⁴

While such shutdowns and relocations would result in considerable costs and job losses, they are likely to be quite rare. The Pentagon's higher range of cost estimates for CWC inspections may also be exaggerated for three reasons:

- some preparation expenses will be one-time only, such as the purchase of shrouds or the reconfiguration of controls and gauges;
- the figures probably overestimate the number of personnel (and hence man-hours) required to prepare for and conduct inspections; and

21 Conference on Disarmament, "Report on a United States National Trial Inspection Exercise," document No. CD/922, June 22, 1989, p. 13.

22 6&conduct of Inspections, " appendix I, annex 2, paragraph 40, *Draft Chemical Weapons Convention*, op. cit., p. 80.

23 Susan D. Leibbrandt, Special Assistant to the Assistant to the Secretary of Defense for Atomic Energy (Chemical Matters), Office Of the Secretary of Defense, personal communication, April 1993.

24 Interview with Dr. Leo ZefTel, chemical industry consultant, Dec. 22, 1992.

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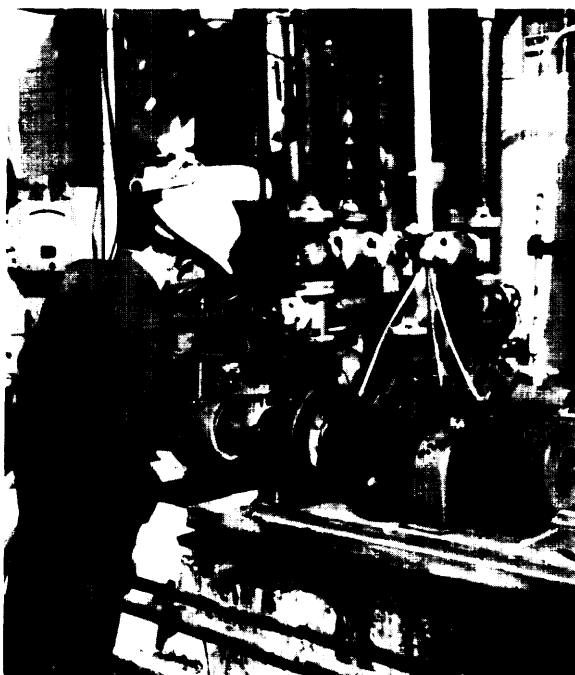
Initial plant briefing

SIGMUND R. ECKHAUS



Perimeter monitoring

SIGMUND R. ECKHAUS



Inspection of equipment

SIGMUND R. ECKHAUS



Inspection of product

SIGMUND R. ECKHAUS

*Sample collection*

SIGMUND R. ECKHAUS

*Sample analysis*

SIGMUND R. ECKHAUS

*Records audit*

The U.S. Government has conducted four National Trial Inspections (NTIs) of commercial chemical plants that produce some of the dual-use chemicals listed in the Chemical Weapons Convention. These mock inspections have served two purposes: to help negotiators develop effective onsite inspection procedures and to enable companies to prepare for future inspections of their own facilities. The photographs shown here were taken during the first three U.S. trial inspections, NTI-1 took place in February 1989 at the Akzo Chemicals plant in Gallipolis Ferry, WV which produces DMMP, a Schedule 2 chemical; NTI-2 occurred in March 1990 at the Alcolac plant in Baltimore, MD, which then produced thiodiglycol, another Schedule 2 chemical; and NTI-3 was conducted in September 1990 at the Monsanto Agricultural Co. plant in Luling, LA, which produces a phosphorus herbicide. The purpose of the first two NTIs was to test procedures for routine inspections; the third tested procedures for a challenge inspection of industry using a negotiated, managed-access approach.

. costs to industry will tend to decline over time as plant officials move down the learning curve and develop more efficient ways to prepare for and host inspections.

A number of factors may also influence the frequency and intrusiveness of onsite inspections. First, as mentioned above, the limited resources of the OPCW Technical Secretariat in terms of workforce, money, and time will constrain the total number of inspections per year. Second, the degree of experience and expertise demonstrated by the international inspectors, and the extent of industry cooperation with the verification regime, could lead to a reduction over time in the number of inspections and the relative size of inspection teams. Finally, the frequency and intrusiveness of inspections may be influenced by the prevailing international political situation. If international tensions are low, inspections of chemical facilities may tend to be pro forma and relatively nonintrusive, requiring only modest preparations that can be undertaken at low cost. If, however, the international community enters a renewed period of heightened tensions, CWC inspections might be used increasingly for harassment and

espionage, forcing companies to undertake more extensive protective measures and hence increasing implementation costs.²⁵

No specific U.S. Government fund has been established to defray the costs to industry of preparing for inspections. Instead, companies will have to absorb these expenses as an additional cost of doing business. Some of these costs may, of course, be passed on to the consumer in higher prices. Although defense contractors are generally prepared to spend money to prepare for inspections on the assumption that they will be reimbursed by the U.S. Government, this issue has not yet been decided. Indeed, companies without government contracts would object strongly if they were required to absorb the costs of inspections while competitors with defense contracts were reimbursed by the taxpayers, giving them an unfair advantage. U.S. chemical companies also want to ensure that the costs of preparing for and hosting inspections are allocated equitably among all of the States Parties so that treaty compliance does not weaken the international competitiveness of U.S. firms.

²⁵ Robert G. Gough, Sandia National Laboratories, personal communication.