

THE HENRY L. STIMSON CENTER

**Implementing the
Chemical Weapons Convention:
Counsel from Industry**

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Editor

Report No. 10 January 1994



Pragmatic steps toward ideal objectives



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Executive Summary

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Objectives of the Meeting

The Henry L. Stimson Center assembled in Washington, D.C. a group of individuals from U.S. commercial chemical plants for an in-depth roundtable discussion of key issues associated with the implementation of the Chemical Weapons Convention (CWC). The purpose of the meeting was to ask these individuals, who have extensive experience in the operation and management of commercial chemical companies, their thoughts about the procedures being considered to implement the CWC. During the roundtable discussion, the innate ability of senior plant managers to cope with the CWC's requirements and, ultimately, their support of the accord's objectives was apparent. Moreover, the plant managers had many constructive suggestions to facilitate the CWC's implementation.

The CWC prohibits the development, production, acquisition, stockpiling, and use of chemical weapons. While none of these chemical weapons activities are associated with the everyday products of the chemical industry, such as dyes, polymers, agrochemicals, ball point pen ink, and pharmaceuticals, some of the same chemicals used to produce these legitimate items can also be used to make chemical weapons. The CWC therefore requires monitoring of the utilization of many "dual-use" chemicals by the chemical industry.

Trade associations have ably represented chemical industry's interests at the Geneva negotiations and continue to do so during the deliberations of the Preparatory Commission in The Hague where procedures are being prepared to implement the CWC. Trade associations have been supportive of the CWC and have constructively contributed to the treaty's main provisions and its annexes on chemicals, verification, and confidentiality. According to one recent estimate, there are more than 20,000 chemical companies in the United States alone. Trade associations, however, have had difficulty soliciting widespread industry participation in the meetings they hold on the CWC. Moreover, the U.S. Government's efforts to spur awareness of the CWC, including thousands of mailings and a series of seminars across the country, have met with lukewarm response from industry. Efforts to reach chemical industry will undoubtedly intensify in the months ahead. Until then, few can confidently claim to know how industry at large and at the senior plant management level might react to the implementation of the treaty.

The Stimson Center convened industry representatives to address key questions associated with the CWC's entry into force and, in the process, began to lay several disconcerting questions to rest. For instance, some wondered if chemical companies might balk at the CWC's requirements and, at the risk of penalties, refuse to cooperate? Could plant managers cope with the data monitoring and inspections? How would plant managers react? What does industry need in terms of assistance from the Organization for the Prohibition of Chemical Weapons and their government? In the end, the group's support of the CWC reinforced that consistently voiced by the trade associations.

Although our sample group was small, the individuals who attended represented a cross-section of industry—from large, multipurpose multinational enterprises to small,

specialty chemical companies. The attendees of this meeting had no real prior exposure to the CWC's provisions, so their reactions might be construed as representative of other senior industry managers when first presented with the treaty's data monitoring and inspection requirements. Furthermore, although the attendees were drawn only from U.S. companies, the international chemical industry shares many of the same concerns about maintaining a competitive edge and minimizing regulatory oversight.

The roundtable was held under the auspices of the Stimson Center's CWC Implementation Project, which is funded by the Carnegie Corporation of New York. The project's objectives are to function as an information clearinghouse, watchdog, problem solver, and proponent of a chemical weapons nonproliferation regime. The meeting took place 2-3 December 1993 in the Stimson Center's conference room and was moderated by the project's director, Amy E. Smithson.

The industry participants were: Dr. Keith Baucom of PCR, Inc.; Mr. Aldo Donnarumma of Sandoz Chemicals Corporation; Mr. Dennis LaJeunesse of Operations Excellence, Inc.; Mr. Elry Lyle of Rhône-Poulenc; Mr. David McKinnon of Hoechst Celanese Corporation; Mr. Lawrence J. Rosen of Pressure Chemical Co.; Mr. William Stewert of Albright & Wilson America; and Mr. Larry Thurston of Dow Chemical Company. *The views expressed by these individuals are their own and do not necessarily represent the policy of their plants or corporations as a whole.*

Also in attendance to facilitate the discussion were Dr. Donald C. Clagett (Head, Industry Operations Branch, Verification Division of the Provisional Technical Secretariat), Mr. Sigmund Eckhaus (Consultant to the Office of Science and Technology Policy, Multilateral Affairs Bureau of the U.S. Arms Control and Disarmament Agency), Dr. Leo ZefTel (Consultant), and Dr. Stanley Fraley (Manager, Policy and Analysis Research Department, Defense Programs Sector of Sandia National Laboratories). Clagett, Eckhaus, and ZefTel functioned as resources on the status of PrepCom deliberations, the technical details of the treaty and its implementation at chemical plants, and the rationales behind the treaty's provisions. Fraley, an arms control verification expert, served as a devil's advocate.

Biographies for these individuals and the industry participants can be found in the Appendix I of this report. The main body of the report presents the edited transcript of the roundtable discussion. Appendix II contains relevant excerpts of a Stimson Center report, *The Chemical Weapons Convention Handbook* (September 1993), which was sent to the participants prior to the meeting and constituted their only real exposure to the treaty prior to the discussion. The highlights of their discussion are summarized below.

Highlights of the Roundtable

The discussion was structured in a way that would lead the industry participants, step-by-step, through the process of CWC data declarations and inspections. The participants were initially taken aback by such factors as the short lead time of some reporting requirements, the multinational composition and size of the inspection teams, the inspectors' scope of access within a chemical facility, and the inspectors' rights to use analytical, photographic, and related equipment to assist them with their work. The industry participants voiced some concerns, but once they understood what safeguards

were available to them, they sought pragmatic ways to make the CWC work, not to defeat the treaty or deny its objectives.

The highlights of the roundtable discussion, which have been grouped under major topic headings, are as follows:

Reporting Requirements

- All participants observed that their plants had some permanent capacity for record-keeping to meet other regulatory requirements, with the level of effort differing according to the size of the facility and the support available from corporate headquarters staff.
- Each participant requested advance notice of when the initial data declaration would be required, given the need in some cases to go back three years in their records. Most asked for six to 12 months notice, but one participant requested three years notice since his current record-keeping system did not track the variables needed. Participants noted that the CWC reporting requirements would be handled by the same staff that fulfills other environmental and safety reporting requirements.
- Most participants felt that the requirement for giving five days advance notice of significant changes in production of Scheduled chemicals was very impractical, given the nature of chemical manufacturing and companies' needs to be responsive to marketplace demands. They agreed that the definition of "significant" in this case will be very important and will determine whether some companies have to engage in almost continual reporting. One participant suggested that updating be done on a quarterly basis.
- Subsequent annual data declarations should not, the participants believed, be a problem from the standpoint of reporting the previous year's totals. However, some participants believed that forecasting the production for the upcoming year would be difficult and were apprehensive that if their forecasts were inaccurate, they would trigger a substantial amount of change reporting.
- In various other guises, chemical industry already provides the U.S. Government with data similar to what is to be reported to the OPCW. Therefore, the data declarations themselves do not appear to be an onerous threat to competitiveness, other than the manpower drain that companies will have to expend to fulfill the CWC's reporting requirements.

Routine Inspections

- Providing the inspectors with access to the data to support what was declared should not be much of a problem. Plant managers would probably evaluate additional requests for information on a case-by-case basis. Some facilities have sophisticated record keeping systems that allow for a number of production variants to be retrieved, but others may have to calculate an approximation of such factors as vessel utilization.

- All but some of the smaller companies will have a standard safety briefing that could be used to brief the inspection team. Some modification may be necessary, however, given the equipment that inspectors will bring with them and may elect to use.
- The participants recommended that the equipment used by inspectors meet accepted safety certification, such as that given by the Underwriters Laboratories.
- Industry participants requested that documentation certifying safety, calibration, and authenticity accompany each piece of equipment, signed and dated by OPCW and U.S. Government officials.
- The participants noted the likelihood that plant officials will want to approve each specific use of the inspectors' equipment on their sites to uphold their safety standards.
- As a norm, chemical companies rigorously control the taking of photographs on their premises. Any inspectors' requests for photographs are likely to be controversial and the plant manager will want to set up protective screens and/or control the angle from which any photographs are taken.
- The participants noted three possible responses to an inspector's request for non-routine samples: decline because of safety reasons; try to find an alternative means to satisfy the request (e.g., sampling at routine points further up or down the line); or, if absolutely necessary, allow the sample to be taken.
- Some participants would have no problem accommodating inspectors' requests to use the plant's laboratory equipment for sample analysis if they had equipment available, the inspectors' requests were not too extensive, and the inspectors' activities in the laboratory were closely supervised.
- During the inspection debrief, the participants stressed the importance of the host facility's existing right to review the contents of the draft report and to negotiate with the inspection team if they believe the report's contents were not confined to the inspection's requirements. Some indicated a willingness to allow inspectors to leave sensitive information in the locked box that inspectors may install at facilities.

Confidential Business Information

- In general, chemical companies regard essentially everything within the boundary line of a plant as confidential business information. Although the CWC's provisions will not allow an inspector to walk about a facility unimpeded, an unfettered knowledgeable inspector could quickly grasp the significant, unique, and confidential aspects of that facility's operations, with the potential for adverse effects for the chemical company.
- Careful definition of plant sites reported, advance planning by plant managers about how to control the inspectors movement through their facilities, and preparation of the facility using shielding of equipment and data will be crucial to efforts to guard confidential business information during an inspection. One participant noted the low odds of having an inspector whose expertise is in the particular

technology that a facility is trying to protect. Others noted that the criticality of most confidential business information usually does not exceed five years.

- The participants were concerned that the inspectors could request access to virtually every part of their facility. Areas of special concern included control panels and storage warehouses.
- One participant recommended that all treaty parties' implementing legislation contain penalties for any OPCW inspectors that violate the confidentiality of the CWC.
- OPCW inspectors should be well-paid, well-trained professionals, employed on a long-term basis. Participants believed such conditions would make an inspector less likely to breach the CWC's confidentiality principles.

Coping with Challenge Inspections

- Industry participants were apprehensive about the prospects of hosting a challenge inspection, but felt the odds they would have to do so were quite low. All indicated they could handle the situation if it arose, but several noted the extra potential for public relations problems in the event of a challenge inspection. The participants believed they would be more likely to cooperate with a challenge inspection, or for that matter, a routine one, if the inspectors clearly articulated from the outset what information they needed.

Informing Industry of Implementation Requirements

- One participant from a facility that will not qualify for inspection until four years after the CWC enters into force noted that this is a relatively brief time span. Some participants felt it was necessary to begin planning now for how they would manage inspectors' access during an inspection.
- All participants noted the urgency of informing industry about these upcoming requirements. Most chemical companies will be subject to these new reporting requirements and could potentially be inspected. This is not a matter of "if," but "to what extent," company "X" is involved in CWC data declarations and inspections, just like Occupational Safety and Health Administration, Environmental Protection Agency (EPA), and other government regulations. The outreach effort needs to be concise and clear and has to be done through multiple sources—trade journals, federal regulations, trade associations, and various mass media outlets.
- One participant noted that chemical industry as a whole should be openly supportive of the CWC. People are suspicious of chemical companies, and if they believe commercial companies are making chemical weapons and precursors or are not cooperating with an effort to ban them, the implementation of the CWC could have very negative implications for the industry.
- Some participants suggested that the U.S. Government test the reporting forms with some chemical companies, both as a tool to heighten awareness of the pending reporting requirement and to solicit industry's input to make the forms more user-friendly.

U.S. Government Assistance

- Given the uncertainty associated with chemical reactions, the participants *strongly* recommended that the U.S. regulations assess penalties only for knowing and willful manufacture of Scheduled chemicals.
- Industry participants favored having a small number—two to four—of U.S. Government officials assist their plant during an inspection. One wanted an official to arrive before the inspection team to help with last-minute planning; another wanted a special U.S. assistance team to be available to augment the small core of regular aides in case something goes awry during an inspection. The agreed roles of the U.S. officials were to coach, counsel, help with interpretation, facilitate negotiation, and mediate the resolution of any disagreement.
- U.S. officials should escort the inspection team to the site with discretion—no flashing lights or sirens—so that neighbors of the chemical plant will not be unduly alarmed.
- Some participants requested that the U.S. Government assign an existing government laboratory, such as an EPA laboratory, the responsibility of providing primary or back-up sample analysis capabilities for the CWC inspections.
- Some companies may need special training on how to deal with the CWC inspections. The participants believed the U.S. Government would have the expertise to provide this assistance, such as an introductory training video and informational kits with suggested strategies for planning, preparations, and general handling of inspections.
- Some participants requested a standard press kit about the CWC and the purpose of inspections so as to avoid misreporting the nature of an inspection.
- One participant requested that the U.S. Government make interpreters available for all languages other than English that are spoken or written by the inspection team to facilitate review of inspectors' notes in order to protect against unauthorized documentation of confidential business information.

Implementation Preparations by Chemical Industry

- Based on what they had learned during the roundtable, the industry participants were already beginning to formulate plans to prepare to implement the CWC at their facility. These preparations included heightening awareness within their companies of the upcoming requirements, modification of their record-keeping systems to facilitate data reporting, planning strategy for hosting inspections, training of employees, and examination of the implications of CWC for near- and long-term business plans. Some companies will have to invest a significant amount of time and resources in planning and education, not to mention reporting. All of the participants, if they had to, said they could handle an inspection at this point.

Impact on Chemical Industry

- For various reasons, some chemical plant managers have already made decisions to quit working with certain Scheduled chemicals. Some participants said they would stop working with Scheduled chemicals given the certainty of an inspection under the CWC; others said this would make no difference in their business plans.
- Participants foresaw the impact of the CWC on U.S. chemical industry operations, competitiveness, trade, innovation, and profitability to be comparable to the institution of other environmental and safety regulations in the United States. Several viewed the implementation of the CWC as just another set of regulations among many.
- The participants noted, however, that the possible inequality in regulations imposed on chemical industry from country to country affects the competitiveness of the U.S. chemical industry. Some of the participants recommended that the OPCW set minimum fines and penalties for violations to avoid inequality between the criminal standards set by the member states that could in turn promote an unfair competitive edge for industries in states that set lower criminal standards.

Like many of their contemporaries in industry, some of these participants, lacking awareness of the CWC's requirements, had previously assumed that a chemical weapons arms control treaty had little or nothing to do with their business. The industry participants were somewhat dubious going into this meeting, as were their CWC expert hosts, who could not predict how the industry participants would react to the scenarios and questions put to the group. In the end, both sides were surprised.

As a group, the industry participants felt that the CWC's goals of banning and destroying chemical weapons were laudable and unarguable objectives that they could support. They believed that industry can manage to live with the implementation of the CWC, which according to one participant, will not be as bad as other existing regulations. Depending upon how the details are settled, both in The Hague and in the United States, this treaty's implementation could be very costly or relatively easy. All of the participants hoped for fair, pragmatic implementation in the United States and in other CWC member states.

Project on the Implementation the Chemical Weapons Convention

The Chemical Weapons Convention (CWC) is a multilateral treaty of unprecedented scope and complexity that will prohibit the development, production, acquisition, stockpiling, retention, transfer, and use of chemical weapons. Implementation of the CWC will involve many "firsts." Among those firsts are the Convention's requirements to monitor CWC-related activities extensively within both the government and civilian sectors of States Parties. To date, more than 150 countries have signed the Convention, which means that great demands will be placed upon the new international monitoring agency, which is being created from scratch to attend to these tasks. Yet another important first will involve the elimination of an entire category of weapons of mass destruction according to the Convention's ten-year timetable.

The extraordinary nature of the efforts needed to implement the CWC prompted the Stimson Center to launch a project to monitor the preparations for implementing the CWC and to serve as a watchdog, information clearinghouse, and advocate for the most effective chemical weapons nonproliferation regime possible. The initiation of the CWC Implementation Project coincided with the signing ceremonies for the Convention, which were held in Paris 13–15 January 1993. Project programming includes:

- A periodic newsletter, *The CWC Chronicle*, to inform officials in government, industry, the diplomatic community, and interested observers about important developments related to the CWC's implementation.
- Analytical reports aimed at helping to promote discussion and resolution of difficult issues involved in implementing the CWC. Additional materials highlighting prominent events and problems facing the Convention are published in journals and other publications.
- Occasional meetings featuring knowledgeable speakers and offering an opportunity for round table discussion of various aspects of the Convention's implementation. The project is funded by the Carnegie Corporation of New York and is directed by Amy E. Smithson. Keir A. Lieber assisted her in editing this report, which was reviewed by all of the roundtable's participants and by Michael Krepon, president of the Stimson Center.

The Henry L. Stimson Center was founded in 1989 as a non-profit, non-partisan institution devoted to public policy research and education. The Stimson Center concentrates on particularly difficult national and international security issues where policy, technology, and politics intersect. The Stimson Center's projects assess the sources and consequences of international conflict, as well as the tools needed to build national security and international peace. They deal with regional security (peacekeeping, preventive diplomacy, and confidence-building measures), U.S. foreign and defense policies, arms control measures and their verification, and other building blocks of international security.

A.E.S.

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List of Abbreviations

CAP	Community Advisory Panel
CBI	Confidential Business Information
CIC	Chemical Industries Council
CMA	Chemical Manufacturers Association
CWC	Chemical Weapons Convention
EPA	Environmental Protection Agency
ISO	International Standards Organization
OPCW	Organization for the Prohibition of Chemical Weapons
OSHA	Occupational Safety and Health Administration
OSIA	On-Site Inspection Agency
P&ID	Piping and Instrumentation Diagram
PFIB	Perfluoroisobutylene
PTS	Provisional Technical Secretariat
SOCMA	Synthetic Organic Chemical Manufacturers Association
TSCA	Toxic Substance Control Act
UL	Underwriters Laboratories
UN	United Nations

Industry Round Table Discussion

Ms. Smithson: Those who are working to implement the Chemical Weapons Convention (CWC) need to learn from you about how best to proceed. This treaty has been shaped mostly by diplomats and scientific experts from governmental agencies. Some of the CWC's negotiators, despite strong backgrounds in arms control and other disciplines, have never set foot in a chemical plant. Yet, commercial chemical plants will be heavily involved in implementing the CWC. Those that produce, consume, acquire, import, and export the "dual-use" chemicals controlled by the CWC will be required to report data and host inspections. Recognizing the potential for problems, representatives from chemical industry trade associations contributed to central parts of the CWC, namely the annexes on chemicals, verification, and confidentiality.

The CWC requires that states that ratify the treaty also enact "implementing legislation," which passes the requirements of the treaty to chemical companies and individuals. The CWC requires that such legislation contain criminal penalties—enforced in this case by the U.S. Government—for non-compliance with the CWC's requirements. The implementing legislation is still being drafted at this time, but the CWC was sent to the U.S. Senate for its consent to ratification on 23 November 1993. The CWC could enter into force as early as January 1995.

This group represents a microcosm of chemical industry—from companies large and small making a variety of chemical products. Your only introduction to this treaty has been to read an overview of its provisions, as provided in *The CWC Handbook*. So, your comments may be viewed as representative of how many of your contemporaries in industry might react to the CWC's implementation. This group might be able to propose pragmatic suggestions for those who are determining the details of the CWC's implementation. In short, you will be the reality check for the Preparatory Commission (PrepCom), Provisional Technical Secretariat (PTS), and U.S. Government officials. Over the next few months, the inspection procedures for the Organization for the Prohibition of Chemical Weapons (OPCW), which will contain the new monitoring agency that will administer the CWC, and the U.S. Government's rules and regulations to comply with the CWC will be finalized. I brought you here because, frankly, we need your advice.

I will focus our discussion on the operational implications of CWC implementation for your individual chemical facilities and industry in general. Some of the CWC's reporting and inspection requirements resemble those of the U.S. Environmental Protection Agency (EPA) and Occupational Safety and Health Administration (OSHA), which are already in effect at your facilities. A principal difference between these U.S. Government oversight activities and the CWC's implementation is that no U.S. citizens, aside from escorts, will be on the inspection teams that visit U.S. facilities. The information that U.S. chemical companies report to the OPCW will also be handled by international civil servants drawn from CWC treaty parties around the world.

Current U.S. Reporting Requirements

Ms. Smithson: Chemical plants are required to make some data submissions for the Toxic Substance Control Act (TSCA) every four years and there are some submissions that are made every fifteen days in cases of substantial risk. How many people does your plant have to work on these data submissions and how long does it take to prepare them?

Mr. McKinnon: No one at my plant works on this full time, but three specialists and the clerical staff in our environmental, health, and safety office, who normally track TSCA and EPA data, pitch in when a deadline is approaching to gather the information and complete the forms. Every month I sign a pile of reports—just for the state—that are a half-inch thick. Last year, we had about ten people generating data for over one quarter, just for the Clean Air Act, testing every stack and pipe.

Mr. Lyle: We have one person who keeps records for OSHA, EPA, and other requirements, but the compilation is done at the corporate level, where Rhône-Poulenc has an extensive staff for this type of activity.

Mr. Donnarumma: We have at least one person dedicated to reporting activities at my site, but not full-time. Other support comes from the plant's environmental and safety staff and the final report assembly takes place at corporate headquarters. I would estimate that these reporting requirements consume at least one full man year's worth of labor per site.

Mr. LaJeunesse: A company I am familiar with has 170 employees, of which four of them dealt with TSCA, EPA, OSHA, and other federal and state regulations. Probably twenty-five percent of their effort went into reporting and record-keeping requirements. Some reports are due every quarter and require an intense effort for several weeks. Other reporting requirements are almost constant. For a company of that size, I think it is normal to have at least one person devoted solely to reporting.

Mr. Rosen: We probably consumed about two-thirds of a man year in reporting, not counting some of our waste shipment reporting.

Dr. Baucom: We have three full-time people for our reporting requirements, with another five who contribute according to the focus of a report.

Mr. Stewert: Our environmental office has five people, our safety office four. All their activities help produce these reports, but the reporting itself probably takes about two man years of effort.

Mr. Thurston: Dow's plants vary from a few hundred employees to about six thousand. The ratio of man-years for environmental reporting to total employees is probably in the range of 1:200.

The CWC's Data Reporting Requirements

Dr. Clagett: Depending upon which Scheduled chemicals a plant works with, it may be required to make data declarations on production, processing, consumption, import, and export of those chemicals. The treaty defines production as the manufacturing, including by biochemical process, of a chemical covered under the CWC. The CWC does not define processing in the way that a chemist normally thinks of the term. Processing

involves manipulating the chemical without chemically changing it. The CWC's processing definition includes distilling, precipitating, recrystallizing, solvent cycling, or any other process that does not modify the chemical. Whether repackaging is captured by this definition is still under discussion. Consumption, according to the treaty, is converting a Scheduled chemical to something else using a chemical reaction. Acquisition, import, and export are defined as one would expect them to be.

Dr. ZefTel: Under TSCA, if a plant is making a material that is not isolated by "normal" means but by chemical analysis is known to be present, it does not have to be reported. In this case, if a Scheduled chemical can be isolated, it has to be reported to guard against diversion.

For example, in the process of making tetrafluordethylene, one percent of the yield is perfluoroisobutylene (PFIB), which is one of the very toxic chemicals listed in the Schedules. Normally, the PFIB is destroyed in an exit stream that is destined for incineration because PFIB has no civilian uses. However, a cheater that is purportedly making millions of pounds of tetrafluordethylene could divert that one percent PFIB stream and over the course of a couple of years accumulate a significant stockpile of PFIB. For this reason, if a plant is making a Scheduled chemical that is readily isolated, it has to be reported.

Dr. Clagett: Data declarations are triggered by thresholds for production, processing, consumption, import and export of Scheduled chemicals and discrete organic chemicals. Again, depending upon the chemical, these thresholds range from 100 grams to 200 metric tons. Initial data declarations will occur within 30 days after entry into force. Annual declarations will be within 60 days after the turn of the year and a report on projections for the coming year is due within 90 days. A Schedule 1 plant must give notice of changes in this forecast 180 days before they occur, while Schedule 2 and 3 facilities must give five days notice of changes—above or below—projected production levels. Approval from the OPCW or the U.S. Government is not required before such a change is enacted. The key word here is notification. However, the ranges for what would denote a significant level of change in production that would require these 180 and 5 day notices have not been determined yet.

Assembling the Initial Data Declaration

Ms. Smithson: For the initial data declaration, Schedule 2 plants must go back and track the production, processing, consumption, import, and export for the preceding three years. Schedule 3 plants must report their last three years production, import, and export. Facilities that fall under the other category must report production data for the previous calendar year only. Depending upon which category or categories your plant falls under, can the record-keeping capacity at your plant handle such a requirement? How much advance notice would you need in order to be able to put together an initial data declaration?

Mr. Rosen: In my case, three years. My facility would probably fall within the Schedule 3 or "other" category. If the OPCW requires three years of data and somebody does not already collect that data, it will take three years. Plants can keep data on whatever variable if they know in advance to do so. Under these circumstances, some of

these declarations will certainly lack accuracy. I will change my record-keeping now that I know of this requirement.

Mr. Thurston: Finding the data is not going to be a major problem, but assembling it in the desired format will require some effort. At my plant, I would like six-months notice. For Dow as a whole, this would probably require several man-years worth of effort.

Mr. Stewert: I would think six to twelve months notice would be needed for Albright & Wilson to gather this data. The data compilation would take a full-time effort by a couple people.

Dr. Baucom: My plant could do it in a few months, but we are required only to go back one year in our production records.

Mr. LaJeunesse: A small, one-site company could probably pull this data together on three months notice, once they understood clearly the treaty's definitions and requirements.

Mr. Donnarumma: We already keep this type of records, but the burden of assembling this report will fall on the same managerial and environmental staff that have to meet all of the other reporting deadlines. Even in a case like mine, where the plant has a good database, I would prefer to set priorities and would need six to twelve months notice so that I do not overtax my staff.

Mr. Lyle: My plant also needs six to twelve months, partly because I will be working this matter with Rhône-Poulenc headquarters in France.

Mr. McKinnon: Three to six months would suffice for me, but I have the same problem of overloading my staff with these reports. However, as I read the CWC's Schedules and the description of the "other" production facilities—plants that make unScheduled discrete organic chemicals or discrete organic chemicals containing phosphorous, sulfur, or fluorine—these terms will catch about everybody.

Dr. ZefTel: For the sake of fairness, the OPCW requires reporting from and will be inspecting facilities which they do not necessarily expect to find in violation of the CWC. No chemical plant will receive more than two routine inspections per year, unless during one of those the OPCW finds something suspicious that cannot be resolved and a challenge inspection follows.

Problems with the Change Reporting Requirement

Mr. McKinnon: This five-day notice reminds me of proposals for the Clean Air Act, which require advance notice and public comment if a plant is going to change processes. Many in industry think this requirement is evidence that the government does not understand how chemical plants actually operate. Customers change their minds about how much of a product they want, and plants are always trying to improve production efficiency.

Mr. Donnarumma: The definition of a significant change would depend on a plant's baseline operations. A significant quantify for a small plant would probably not be that significant for a larger facility.

Mr. Stewart: Market need will determine what a plant produces. Every chemical company can start the year with a manufacturing plan and a CWC data declaration, but as the months pass, the demand changes and the plants will reformulate their product mix. Instead of making 100,000 pounds of product "A," a plant might not make any, but it would produce 200,000 pounds of product "B" in response to new customer orders. My plant has this type of month-to-month operational flexibility and we often change our processes by an order of magnitude. Depending upon what constitutes a significant change, I may need two or three people just to deal with this, which would be expensive. Once a plant trips the reporting thresholds and becomes subject to inspection, I see no need to continue reporting changes, except if a plant is handling Schedule 1 chemicals.

Dr. Baucom: I do not understand why the OPCW is interested in anything beyond whether a plant has triggered the threshold reporting requirement or not. A plant either is covered or it is not, and industry certainly does not want another burdensome reporting requirement like these change notices appear to be.

Mr. McKinnon: If my plant gets an order tomorrow for immediate production of a Scheduled chemical that requires filling within three days, I clearly cannot give five days notice. There may be reasons for this notification requirement, but it is not realistic from a practical industry standpoint.

Mr. LaJeunesse: For these annual reports, if the state has to submit its report to the OPCW by November 1st, then industry will have to submit its data to the government for compiling by mid- to late summer. This is totally out of sync with industry's normal annual planning, which is always subject to rapid changes in the marketplace. These reporting requirements could be rough in every sense of the word.

Mr. Donnarumma: If a plant produces or plans to produce above a threshold it should be subject to inspection. The difference between 373 tons or 850 tons should not matter for this treaty.

Mr. Thurston: The requirement should be that plants report the maximum that they plan to produce and maybe their maximum capacity and as long as they stay under those levels, no change reporting should be required.

Dr. Baucom: That is the only reading that makes any sense.

Mr. Rosen: I do not believe this five-day requirement is going to be an issue because a plant is projecting annual production. If I project producing one thousand tons, I certainly know five days before whether I am going to treble that production.

Mr. LaJeunesse: I agree. If a plant's estimate is high, it may incur an inspection, but at least it will not have to report daily. If the OPCW insists on keeping these change notifications in as they are currently conceived, then the OPCW's rules and the U.S. legislation have to be written such that a plant will give notice after it has confirmed an unanticipated priority order and revised its production plan. Otherwise, a plant could end up reporting on orders that fall through.

Ms. Smithson: Is this five-day notice requirement at all realistic?

Mr. Thurston: No.

Mr. McKinnon: No. I have to deal not only with the added time that the U.S. Government will need to process it, but the time that I need to send a report through headquarters. That leaves no time at all.

Mr. Donnarumma: The only way I can deal with that is to estimate high and be exempt from a change if it is lower than the estimate.

Mr. Stewert: I agree that this is not practical and I could not handle it on a routine basis. This requirement is a nightmare.

Dr. Clagett: If this is any comfort, the rationale behind this requirement is that a political ruckus would occur if inspections found major differences between the quantities declared and what was found on site during an inspection. Hence, they created the concept of updating.

Dr. ZefTEL: While there can be legitimate commercial reasons for a plant to increase production, if no change notice is given and the inspectors show up and find a plant making significantly more Schedule 2 or 3 chemicals, they could consider this an indication of intent to produce chemical weapons.

Mr. LaJeunesse: Industry has to update significant information for the EPA under the Superfund Amendment and Reauthorization Act Title Three, which includes the community's right to know. These updates are done on a set timeline. Rather than open-ended, continuous updating, could the OPCW not ask for these significant changes, however they are defined, on a quarterly basis? Plants that experienced a significant change would report it, those that did not would send in a no-change form or would not be required to report. A quarterly report would be an improvement on the five-day requirement.

Mr. McKinnon: Industry will try to comply with this requirement, but it is obvious that this will be extremely difficult, especially if the regulation writers go overboard on the implementing legislation. Certainly, no criminal penalties should be attached to this five-day notice requirement.

Providing Annual Declarations

Ms. Smithson: After your plant has completed its initial data declaration, will subsequent data declarations, where you will be required to track production, processing, and consumption of Scheduled chemicals, pose a problem?

Mr. Donnarumma: Reporting the past year's activities will not be a problem, but predicting the next year's will be very difficult. If I am off by whatever the OPCW decides is a significant amount, I trigger all of those crazy change reporting requirements.

Mr. Lyle: I agree totally.

Mr. Rosen: My plant, which will probably fall in the "other" category, would only have to report production data for previous calendar year, which I can do without any problem.

Mr. Stewert: The information for the previous year's activities will be there, but the forecasting and the change declarations are going to be extremely difficult in my case.

I am concerned, however, that these routine declarations reveal how much a facility ships and to where, which gets into the demographics of product distribution.

Dr. ZefTEL: Export/import data is declared by the country, not by the specific customer within that country.

Mr. McKinnon: This will not be a problem, because chemical industry already provides a lot of that data to the government. People can obtain it under the Freedom of Information Act.

Mr. Donnarumma: Countries may try to use these aggregate declarations to help them target areas of business. Foreign competition would love to have access to where and how much of chemicals "X," "Y," and "Z" the United States or a particular company ships elsewhere. By the way, I would expect challenge inspections to come from countries trying to manipulate this system to gain a competitive edge.

Pre-inspection Activities: The Safety Briefing

Ms. Smithson: Some of what will take place during a routine inspection bears a resemblance to the twenty-nine Code of Federal Regulations 19-10-119 safety process audits that OSHA conducts or other regulatory inspections. When a group of visitors or a U.S. Government inspector comes to your site, do you have a standard safety briefing that you give them? Would you be able to tell a CWC inspection team right offhand whether there are any special safety regulations at your site, such as a "no-beards-because-of-respirator-use" policy?

Mr. LaJeunesse: Some small companies might not have a standard safety briefing, but they should not have much of a problem fielding one because OSHA requires certain safety practices. Companies in the mainstream of the chemical industry will have no trouble providing an initial safety briefing to an inspection team.

Mr. Rosen: Some smaller companies, however, may go more than a decade without seeing an OSHA inspection and therefore may not be as aware of OSHA requirements or have any standard safety protocols.

Dr. Baucom: Most plants receive inspections and know how to handle people who come in and address these safety issues.

Mr. Thurston: Unlike an OSHA compliance audit, these inspectors will actually be in the midst of a plant, using detection equipment and sampling. This would require a much different level of safety indoctrination and introduction than what would be done for a typical OSHA inspection.

Mr. McKinnon: We have a routine briefing. If a plant has a safety briefing, it can be used for this purpose if there are no language barriers, which I am assuming will not be a problem. However, this group would bring in instrumentation, which OSHA does not do. We would want to make sure these instruments are intrinsically safe. For instance, using a flame detector in parts of some buildings could create a problem. Also, when an OSHA inspector walks through, he never asks for a sample of what is inside a barrel or a reactor.

Dr. ZefTel: An inspector will ask the plant manager's permission for a plant operator to take whatever samples may be needed. Also, instead of one or two OSHA inspectors, a CWC inspection team for commercial sites may have ten to twelve people.

Mr. LaJeunesse: On one site, that big a group?

Ms. Smithson: On one site. A routine inspection takes place not because the OPCW assumes a facility has violated the treaty, but just to make sure that a facility's activities are consistent with its declaration. The inspectors will report the facts, not make compliance judgements. Aside from their primary missions of determining consistency with declarations, the inspectors will also verify the absence of Schedule 1 chemicals and that Scheduled chemicals are not being diverted into a covert weapons program. In doing so, they may elect to follow a pipeline from a reactor to see where it goes. If the inspectors cannot figure out why what they see does not line up with the declaration, they may start to look even further.

Dr. ZefTel: Any chemical plant that has stainless steel equipment and uses glass-lined piping is essentially capable of making some chemical weapon agents. Given how widespread these capabilities are, basically everybody in the chemical industry can, but of course does not, make some agents. So the chemical trade associations argued that all chemical plants should be eligible for inspection on the premise that equally-capable facilities should be treated equally. They also believed that the wider the inspection net was cast, the more likely potential violators would be deterred. Finally, they wanted the inspections to focus everywhere, not just on developed countries' facilities.

The Proposed List of Inspectors' Equipment

Ms. Smithson: If the inspectors cannot confirm something visually, they will look for other methods to do so, including sampling and using some of the detection equipment they bring. Since the inspectors do not know what they will find at every site, they will be carrying equipment to assist them in their work, when necessary. All of this equipment will have been selected with advice from technical experts, with safety in mind. When this equipment comes into the country, the U.S. Government will verify that the inspectors' equipment is indeed the OPCW's approved equipment. Finally, that the inspectors will have had some safety training and they will have heard the safety briefing that is part of the pre-inspection process. Please examine this list of proposed equipment and comment upon whether or not there are any special safety requirements or needs for your particular facility if such equipment were to be used at your site.

Mr. Thurston: If they have tape measures, levels, calipers, and ultrasonic thickness gauges, they will clearly be more hands-on than any OSHA or EPA inspection we have ever had.

Mr. Donnarumma: I do not have too much of a problem with the equipment listed, but what I would expect is that before the inspectors use any of it, they have the permission of the people who run the facility. The plant's operators would have to know exactly how the equipment operates to preserve plant safety.

Dr. Clagett: Caution should be taken using electrical-source equipment in areas of a plant that have electrical classification. Observing such rules can avoid catastrophe, a

spark contact that blows up a plant. According to the safety manual being written now in The Hague, the inspectors will be subject to the safety requirements of that manual unless there is a higher standard in the plant being inspected.

Mr. Stewert: Looking at the list, I do not have a problem with anything on it, as long as we will be allowed to talk with the inspectors about what they will use and how.

Mr. Rosen: If possible, the implementing legislation should insist that this equipment conform to the electrical classifications of facilities.

Mr. Donnarumma: The site manager is held criminally liable under OSHA regulations for what happens at his site around the clock. This equipment would have to be approved by the site officials so they could assure that it in no way compromises the safety of any operations on that site.

Mr. Thurston: Aside from the electrical issue, lots of devices in the chemical industry are sensitive to x-ray or radio frequency sources. Level gauges, nuclear gauges, density gauges, flow meters, and communication equipment all may be sensitive to these sources and affect plant operations and safety.

Mr. McKinnon: I would want to see an Underwriters Laboratories (UL) certification, so that, short of taking apart a complicated piece of equipment, I would know that it meets a widely approved safety standard. If they use UL-type standards that are understood to be intrinsically safe, then plant operators may feel comfortable allowing such equipment on their sites.

Mr. Donnarumma: I would like to see a certification of the equipments' safety, signed by Mr. "Jones" of the U.S. Government, who will be liable if something blows up because it is used.

Mr. Thurston: The equipment should be recertified after use, repair, or modification to ensure it continues to meet accepted safety and calibration standards.

Dr. Baucom: My company has never been faced with this type of situation before, so I would also want some certification because if use of this equipment resulted in an accident at my plant, we would have lawsuits. I would want documentation that supported my decision to allow use of this equipment.

Mr. Stewert: When testing equipment comes with a certification, like UL, we do not take it apart. We install it and then check the calibration. If the inspectors' equipment had similar safety certification, plus OPCW and U.S. Government signed and dated certification, we would not have a problem. We would still want to define where this instrument can be used within the plant site.

Ms. Smithson: After the inspection team has heard your safety briefing, what would the reaction of your employees be if they decided to take precautions above and beyond those followed at your plant, such as wearing protective "moonsuits"?

Mr. Donnarumma: I would explain to my employees why they were doing it, but that would be fine.

Qualifications and Tenure of OPCW Inspectors

Dr. Clagett: The OPCW will have a pool of some 250 inspectors, chosen partly with regional diversity in mind, which means a broad spectrum of people from the five United Nations (UN) regions. U.S. industry can expect to see inspectors from Africa, Europe, Asia, and South America. To qualify, candidates must have appropriate education and/or experience, and they will also receive standard comprehensive training. Their term of employment could range from two to five years. Some have suggested short-term employment to maximize the renewal of skills available to the OPCW and to promote cost-effectiveness. Others have recommended hiring older personnel from industry, those nearing retirement who would not be returning to jobs in industry. The U.S. will have the opportunity to reject inspectors, but they probably will not be doing so on the basis of whether inspector "X" knows all about polycarbonates and therefore should not inspect Dow's Freeport facility. A team will probably be composed of the U.S.- approved inspectors that the OPCW has available.

Mr. LaJeunesse: What basis will the United States use to screen inspectors?

Dr. Fraley: The U.S. screened inspectors from the International Atomic Energy Agency inspectors from a list of names submitted. Typically, the U.S. position was to accept basically everyone, as long as the inspector's home country had a reasonably non-discriminatory policy with respect to the inspectors that they would allow. We ran a "name check" against these people and if we came up with something really bad on a given individual, we were more likely to put that person on our reject list. It would surprise me if a different policy were used to screen OPCW inspectors. The United States tends to want to show the world that it can put up with this type of inspection regime.

Mr. Lyle: I want these inspectors to be well-paid, well-trained professionals with long-term employment with the OPCW. Permanence and good pay will give them less incentive to purposefully hunt for confidential business information. Knowing that the U.S. Government can screen out some inspectors, that there will be some randomness in the selection of an inspection team reduces the possibility that one of my competitors can mount a conspiracy through these inspections.

Mr. McKinnon: Having chemical engineers and other knowledgeable people on this inspection team can be an advantage. For example, they will understand if a plant manager tells them it is not safe or routine to sample from a certain point.

Dr. Baucom: People from industry who are nearing retirement age would be good, experienced candidates for inspectors.

Confidential Business Information

Ms. Smithson: Confidential Business Information, or CBI, can be anything from chemical formulas to the temperatures and timing of reactions, key additives, a unique shaped reactor, other process, production, marketing, and sales information. The CWC guidelines will allow plant officials hosting an inspection to log off computers, shroud or mask things. What, in general, do you consider to be CBI at your plant? How do you protect that when visitors or EPA and OSHA inspectors come to your site?

Mr. Thurston: Dow has a fairly rigorous program of technology protection and confidential business information protection, led by the technology centers. Dow basically considers all design and operating information for its plants and facilities to be CBI. This includes equipment selection, vendors, size, type, numbers of items, customer lists, and the sources of raw materials.

Dow goes to great lengths to write guidelines and train its employees to protect that information. Facility managers will select a route for visitors and control their path and what they see, including how fast they walk through the plant. All visitors sign a waiver that includes a confidentiality agreement and a "hold-harmless" safety and accident clause. When EPA and OSHA come, Dow limits their access to what they need to do their job. Information that is supplied to them that may be considered confidential will be stamped "Dow Confidential." Whenever possible visitors will be bound by a secrecy agreement, which is normally worked out before they arrive on site. Dow asks to review the notes of EPA and OSHA inspectors to make sure they have not recorded anything unnecessary. In some cases, we ask them to change the wording of a report to make it less specific to a piece of technology. Any information supplied to EPA and OSHA for permit activities goes through an approval process that includes screening for CBI.

Dow has never willingly given outside authorities plant drawings that describe how any process functions, whether engineering drawings or flow diagrams. If I could simplify it down to blocks showing primary chemicals going in, a block for the process step, and the product going out, I would probably let visitors have that.

Mr. Stewert: That is exactly what we do for customers or other people, but we do not give them piping and instrumentation diagrams (P&IDs) that show all of the details: vessels, sizes, critical instrumentation, and flows.

Ms. Smithson: Would you let an inspector look at a P&ID but not physically remove it from the site, taking away only a simplified drawing if he needed to?

Mr. Lyle: I would feel uneasy about even that if I knew that inspector would later be working for one of my competitors. I discuss my plant's business only in generic terms. I will say I use a catalyst, but never which one. I will prevent a visitor from seeing what catalysts I have on site to make sure that he cannot deduce which one I might be using.

Dr. Baucom: The EPA and OSHA inspectors that I have seen are not extremely knowledgeable in chemical processing. These CWC inspectors will probably be experts, able to quickly grasp what a plant is doing and the significance of a particular aspect of a process. We will have to be very careful to reveal only as much as needed to meet the goals of these inspections.

Ms. Smithson: You have just described the confidentiality principle upon which CWC inspections will operate. The inspectors are only supposed to ask for as much as they need to ascertain those three main objectives of an inspection: consistency with declarations, absence of Schedule 1 chemicals, and non-diversion of Scheduled chemicals. They are to probe no further unless they find ambiguities or abnormalities. Is there a way in this particular situation for a CWC inspector to get what he needs to know in order to understand those things and for a plant manager to guard the confidentiality of P&ID drawings? Could a conversation describing your process generically or a

simplified block drawing enable an inspector to understand what is taking place at a facility?

Mr. Rosen: With OSHA's labeling and safety requirements, everything is labeled, from catalysts stored in the warehouse to the pipes throughout the facility. Inspectors could learn a great deal just walking through the plant.

Dr. Fraley: If an inspector detects something that leads him to believe that a facility is diverting chemicals, he will want to know a great deal about whether and how that facility could modify its process to do so.

Mr. LaJeunesse: Even with our regular business partners, we share such information only on a need-to-know basis. Trusting an international group of strangers may be difficult.

Mr. Rosen: Pressure Chemicals manufactures product for other companies, so we have in our control their confidential information. We stand to lose their business if one of our customers refuses to allow us to cooperate or if we do and their CBI is compromised. The same would apply to licensee situations.

Mr. Lyle: This whole thing hinges on confidentiality, because if a knowledgeable inspector saw my control panel, he could walk out with my whole process.

Mr. Donnarumma: Everything inside our plant boundary line, we consider confidential to our business. If expert inspectors come to my plant, controlling their access in such a way that I am one hundred percent sure, or highly confident, that my CBI has not walked away with them is going to be very difficult.

Mr. LaJeunesse: A large facility with multiple units or plants may have only one dealing with Schedule 2 or 3 materials. It will want to define in its declaration and facility agreement that one plant as the reporting site. Thus the whole facility would not be immediately exposed to inspection, unless the inspection team found something awry. All reporting would refer to only plant "X" within the whole site.

Mr. Stewart: Given the quantity of Scheduled chemicals we produce, the inspectors would want to look at all areas of my facility. They do not have to see very much to figure out my process. So, all of this is a shock. My plant will have to devise a way to satisfy the inspectors, which will be difficult given the quantity of Scheduled chemicals we produce routinely.

Dr. Fraley: In the mock inspections at Department of Energy nuclear weapons facilities, we did a lot of prior preparation. For example, we practiced walk-throughs of areas of the facility the inspectors would visit with an eye toward what they would see that we did not want them to see, and we covered those items—like pieces of equipment, employees lists. With a lot of effort, we were usually able to prepare a facility so that an inspector performing legitimate inspection tasks under our supervision would not get information we did not want to reveal.

Mr. Stewart: I cannot cover up 25,000 gallon storage tanks or 2,000 gallon reaction vessels. So, we will want to plan with the inspectors up front exactly what they want to verify and then accommodate them the best we can. We would need to lay out a map or

a route that will go directly to what the inspectors want to see, whether it is a receiving area for raw materials or pipe lines to the reactor or the storage area. If we carefully plot the route, that should not be a major problem, as long as we shield our flow, temperature, and pressure indicators, and our process control panel. We could allow the inspectors to look at the vessel, to sample the raw material going in and the finished product coming out, to walk the lines to and from storage tanks or from vessel to vessel. An inspection will be a major task for my plant.

Mr. McKinnon: My concern is that we do not give away the store, so to speak, and thereby make ourselves even increasingly non-competitive in a global business context. Four highly-knowledgeable people can learn an astounding amount in a plant in one hour. If an inspector asked to go into a certain building, we would probably tell them we need thirty minutes or so to put up some protective screens. For instance, we would put welding shields in front of the control panel, but the plant operator would be able to continue his work behind them.

Mr. Lyle: At Rhône-Poulenc, I could not elaborate today exactly what is and is not confidential, so we have to develop a plan, well in advance of the 48-hour notice given just before the inspection.

Dr. Baucom: Perhaps the best approach would be to understand what it is that the inspectors are after then figure out beforehand how to help them get the information they need. If a plant manager makes it difficult for the inspectors to find the information, they will stay for the full amount of time allowed, whether that be 96 or 24 hours.

Mr. McKinnon: From a practical point of view, the odds are low to begin with that a cutting-edge expert in a particular technology will be in this inspector corps and will be plucked from a group of more than 250 inspectors to come to a plant that specializes in that technology. Considering that plants will be doing their best to protect their CBI, the odds go even lower that this individual, if he is on the team, will walk away with what that plant is really trying to protect. If, by some chance, the inspector does happen to be a world-class expert, after two years with the OPCW what he knew may be no longer relevant. His expertise is dated and he is less of a threat. On the other hand, I can let the average chemical engineer in my plant and, if I have done my planning, he probably cannot learn a whole lot. If I can control what information the inspectors take with them, then I am in an even better position.

Mr. Thurston: If an inspector is not allowed to write down anything but the essential information that relates to treaty compliance, then he will have a more difficult time remembering the other things he may have seen. If he gets sent to thirty plants in a year, it will all become fuzzy.

Mr. Rosen: Very few real trade secrets, the formula for Coca-Cola, for instance, are protected to the extent that they do not become obsolete. Having executed secrecy agreements with many big companies, my experience is that it is very rare that the period of confidentiality criticality goes beyond about five years.

Mr. McKinnon: After that time period, many things may be obsolete, anyway.

Examination of Plant Records

Ms. Smithson: When an inspection team arrives, they will probably want to examine the records associated with a plant's data declarations before proceeding with other inspection tasks. Would you be able to pull this information from your record-keeping system?

Mr. LaJeunesse: Once notice of an inspection arises, a plant manager could extract the raw materials, outputs, and process information that he knows the inspectors will need from the plant's record base. The receiver or the supplier on purchase orders can be masked. The strategy is to provide them documentation that supports the data declaration. This can be done and is not an issue. I would evaluate requests for additional information on a case-by-case basis.

Mr. Thurston: If they asked for an additional specific piece of information, I might query my data base and print it out, but I would not let them wander through my computer files.

Mr. Rosen: Virtually all chemical companies have reporting requirements and will have the capability to track purchases, uses, consumption, waste disposal, and maximum quantity on hand for almost every chemical that comes and goes during a given period of time. Some of this information can be very sensitive. For example, we buy one key raw material from the only two major suppliers of it in the world. I would not want either supplier to know how much I buy from the other. If the inspector were asking for this particular piece of information, I would have, I believe, a reasonable case to make a very specific claim of confidentiality.

Ms. Smithson: The inspectors may ask to see certain types of information in your records, including records for production, processing or consumption, operational records for reactors, records for on-site and off-site dispatches, waste disposal, and maintenance records.

Mr. Rosen: A batch plant may use a vessel to make one hundred different products during the year, but may not keep records on all of the reactors in the system. The records may show that so many batches of this or that compound were made. I cannot, however, go to one repository and retrieve the usage of a particular reactor system during a specific period of time. We make hundreds of different items in a year, and we may campaign something for a day, a week, or a month. My capacity has nothing to do with what my production records show.

Mr. Donnarumma: I run a batch plant too, but we have invested significant sums in a sophisticated record-keeping system, which a small operation may not do. We have data bases for each reactor that tell what has been done, when, how, and when they were down and for what reasons.

Mr. Stewart: Although we could generate data for all of the batch processing that took place in a particular vessel within a time period, that still leaves the inspector without an answer for the utilization of that vessel. Therefore, we would have to calculate the cycle time, the volume, and the number of products made in that vessel to specify

the utilization of reactor "A" within a period of time. There is no direct approach to vessel utilization, but a good approximation of the utilization of a vessel can be obtained.

Mr. LaJeunesse: Generally a plant will keep an operator's log, maintenance records, employee time sheets, and raw material supply records to support some explanations of idle time on a reactor, for example if one process was stopped to fill a higher priority order.

Potential Facility Areas for Inspection

Ms. Smithson: After reviewing your records, the inspectors are likely to confirm what they have found by visiting various areas of your facility. Please examine the list of areas where the treaty says inspectors may ask to go. What is your reaction to this list?

Mr. McKinnon: One has to be very careful to keep the inspectors' access very tightly focused on exactly what needs to be shown to answer their questions.

Mr. Thurston: By the time they trace some pipes, they will have gone through the whole plant.

Mr. Eckhaus: When a plant declares that it makes chemicals "X," "Y," and "Z" in building 36, the inspectors will focus on building 36 and its support facilities, which may be a tank farm, a control laboratory, or something else. A routine inspection will not be a fishing expedition. If the inspectors believe they have due cause, say they detect traces of the agent GB, then they may also ask to see buildings 1, 7, and 14. The inspectors can interview employees as they go about their work. Plant management and lawyers can be present. The plant manager may be able to give them a reasonable explanation that satisfies their request, but it is up to plant managers to grant access. The inspectors will note in their report how much cooperation they got and whether their concerns were satisfied.

Dr. Fraley: I would suggest checking any intrusive requests for access with other members of the inspection team, who may find a colleague's request unnecessary or suggest another way to address it. I seriously doubt that an entire ten or twelve-man team will conspire to steal your CBI.

Mr. LaJeunesse: After we have a year of implementation under our belt, I will probably feel more comfortable, but until then, there will be a lot of uncertainty.

Dr. Baucom: I realize that Schedule 3 and other facilities may not be inspected for four or five years after implementation begins, but that time can pass quickly. Once we enter that period, they could come to my site for a 24-hour inspection.

Dr. Clagett: Inspections at "other" production facilities will be by random choice, which will be computer generated.

Mr. Rosen: My facility, which is capable of making darned near anything, would fall in the Schedule 3 and "other" category. My major concern is having inspectors in my storage areas, where I have several hundred drums and containers with labels that typically indicate the shipper, among other confidential information. I have to protect

my customers' confidentiality. While I can cover the shippers' names, masking the compounds would violate too many other rules and regulations.

Mr. Thurston: I would have real heartburn if they asked to look at my control panels.

Mr. McKinnon: We are all concerned about access to control panels, because that is the core of the process. This becomes a Catch-22 situation: A plant manager trying to prove he is not making a Scheduled chemical has to tell the inspectors what he is making.

Dr. Clagett: If the plant manager can explain to the inspectors why he is running at a certain capacity or temperature, there should be no problem and they should not make an issue of insisting on seeing the control panel. Ways can be found to get the inspectors the information they need.

Mr. Rosen: In most cases, a plant manager is likely to be willing to show either the plant's equipment, the reactors and such, or the control panel, but not both.

Requests for Photographs

Ms. Smithson: If an inspector wanted to take a photograph at a certain juncture, he would ask one of your personnel to take two photographs—one for the inspector and one for you—using the inspectors' camera. The same would hold true for any samples taken.

Dr. Baucom: Many facilities have, for years, had rules against photography within a plant.

Mr. McKinnon: If someone has a really pressing, legitimate need for a picture in my plant, we will take the picture, develop it, and then have our experts review it to make sure that it does not show anything confidential.

Mr. Stewert: I would want to control the angle at which photographs were taken to make sure that process control equipment or monitors are not captured.

Requests for Samples

Ms. Smithson: If an inspector asks for a sample from a point where you normally do not sample, how would you handle the request?

Mr. Stewert: My concern was pulling a sample from the primary reaction vessel, which will reveal the ratio of the intermediates and the raw material used to make that product.

Mr. LaJeunesse: If the inspection team asks for a sample other than raw materials or at a point where we do not normally sample, we would tell them it is too hazardous to open a valve because of temperature and pressure.

Mr. Rosen: Assuming that these are very suspicious inspectors, they could assert that a drum of raw materials does not contain what its label says it does and ask for a sample. Although we do not usually sample from sealed drums of product or raw materials, in this case I think we would, even though the process may contaminate the

contents and it would be costly. If possible and I understood the reasons for their request, I would try to accommodate them.

Mr. Donnarumma: To avoid problems and costs with sampling from a sealed drum of product, I would take the inspector to the point where I sample my product before it goes into the drum to make sure it has met my quality specifications. I would then show him the documentation that supports how many drums I have filled with finished product and how the labels on the drum support that. The inspector should accept that as reasonable to save me costs and trouble.

Dr. Fraley: There could be a problem if the inspector believes you have a fake set of books and are making Schedule 1 chemicals illegally. A cheater would have set up a sampling point so that the inspector gets the results desired by the cheater. In that case, it would probably be advisable to go ahead and open up that sealed drum.

On-Site Sample Analysis

Dr. Clagett: The inspectors will probably bring a portable gas chromatograph with them. These instruments have reached a state of sophistication where they have the library capability for storing the traces and the characteristics of these compounds of interest, both the Schedule 1 materials and by-products. They will run an analysis to see if the sample matches the library traces for Schedule 1 materials, not a graduate school analysis of the ingredients of a product. Computers will just screen for Schedule 1 chemicals using software "windows." They could set up this equipment in a desert, the mountains, or outside a building using their own generator, if a plant will not or cannot provide power. The inspectors may ask you to provide a hooded protected area for their analysis.

Ms. Smithson: Or, they may ask to use your equipment to analyze it. Would this request be an issue or concern?

Mr. Donnarumma: We would have to understand their methods and the objective of their analysis. I will want only my employees to use our equipment, but I would be happy to take and split a sample, have both sides run half, and compare the results.

Mr. McKinnon: We would not have any problem if the inspectors wanted to put a sample in our machine for a standard test. If they wanted to look for something different, we would want to make sure that their suggested method and calibration was in fact going to pick it up. We would not want to use a method that gives a spike they say is on Schedule 1, but we know otherwise. This would be tantamount to indicting ourselves because we did not understand their method. The U.S. Government might back up sample analysis at a designated laboratory, such as an EPA laboratory. The EPA is trying to develop some emission limits and they just came in and took samples all over our plant and at several other plants. These samples were split.

Mr. McKinnon: I would let them in my lab. Why not?

Mr. Rosen: I would too, depending on what type of analysis we are doing at the time. In some cases, we would prefer to have a sample run at a U.S. laboratory that uses standards.

Mr. Thurston: Depending on the circumstances, I would let them in my lab too, but I would want to control their activities so they do not contaminate other work and limit their time in my lab so CBI is not compromised.

Dr. Baucom: We would cooperate, but I would not want them to shut us down by taking over my whole laboratory.

Mr. Stewert: If we have equipment available, and this individual is escorted by one of our employees, I would not have a problem allowing inspectors to use my equipment.

Mr. Donnarumma: I would more than cooperate with anything that the inspectors request, as long as it is reasonable, does not disrupt operations, present a safety hazard or risk, or compromise CBI. I would like them to finish their job as soon as possible and leave.

Mr. Lyle: If they make their purposes and needs clear in the beginning, we will know what our facilities are and we will do whatever we can do to make the inspection run smoothly, within our safety and confidentiality considerations. But in some cases, even with our analytical capabilities, we would probably look for an outside laboratory to do this work.

Dr. Baucom: An existing government laboratory ought to be able and qualified to develop the capabilities to conduct the sample analysis required for the CWC.

Mr. Thurston: The EPA has laboratories with standards that could do this type of sample analysis.

Dr. Fraley: As a taxpayer, I would oppose needlessly setting up a new laboratory for this purpose. The U.S. Government should, however, establish this capacity in an existing laboratory to protect its industry and the United States from spurious test results.

Dr. ZefTel: Any sample that goes off-site will be coded so that the recipient laboratory will not know where it came from. In addition, it will be sealed to protect against tampering.

Mr. Thurston: One of the things that I would guard against is the degradation of samples that are transported long distances for analysis, which may make a plant look as though it was making something it was not.

Ms. Smithson: Only if the inspectors cannot resolve ambiguities using analysis on site would they take a sample off-site for additional analysis.

Debriefing and the Content of Inspection Reports

Ms. Smithson: The inspection team will debrief plant managers after the inspection. During this time, it is reasonable to expect them to review with plant officials what information they feel necessary to take from the site.

Mr. Thurston: In that case, I am assuming that I will have the right to review their draft report so I will know what is going into the file. I can negotiate with them to strike information I feel is beyond the scope of their inspection. I will want to review whatever notes an inspector takes, whether handwritten or on tape, to make sure that his

information has to do with the inspection and is not extraneous information that he might use for other purposes. If these notes are not in English, the U.S. Government will need to provide an interpreter. An inspector will be deterred from trying to take my CBI if he knows that I will be reviewing his notes.

Mr. McKinnon: Unless they find something drastically wrong, the inspectors should not need to take much information off-site. They should have to negotiate for any documents they copy or take away from a plant. In these negotiations, U.S. officials should take industry's need to protect CBI seriously, very seriously.

Mr. Eckhaus: The treaty provides for a locked storage box to be left at the facility. A plant manager might let the inspectors look at some sensitive records but require them to be left in this locked box.

Mr. McKinnon: Yes, if a plant manager sketched on a P&ID to prove a point and did not want the information in the final report, but the inspectors wanted it noted for a subsequent inspection team, then it could be put into this locked box. Having ten inspectors touring a plant is one thing, but if they are not allowed to write down anything unrelated to CWC compliance and that type of information does not make it into a permanent file, that information dies with them. Whatever makes it into the final report should be generic, related only to whether the plant did or did not pass the inspection.

Dr. Clagett: The final report will be specific in regards to answering the three basic questions, and it should have nothing else entered. It could be less than one page. What would not go in the reports is the type of processes a plant is using or even necessarily what chemicals it makes, unless they have something to do with Scheduled chemicals.

Mr. LaJeunesse: I think it is absolutely critical that access to inspection reports within the OPCW be strictly controlled.

Dr. Fraley: Controlling access within a computerized system is difficult because the person responsible for password control typically has access to all the data, as do the staffers who are responsible for analyzing all the information in a different country. Confidentiality is likely to be maintained to the extent that only those who work at the OPCW have direct access to this information. Access should be kept to the absolute minimum.

The Arrival of an Inspection Team

Mr. Rosen: How will these inspectors arrive at my front gate? My facility's neighbors get scared to death when we test our alarms. I do not want an inspection to agitate them unnecessarily.

Mr. LaJeunesse: I can just see these trucks pulling up with twenty people, sirens flashing, and Chemical Weapons Convention emblazoned for all to see. Or, they could come by helicopters or C-130 aircraft. The people living nearby will immediately jump to the conclusion that the chemical facility is making chemical weapons and the plant will have a public relations disaster on its hands.

Mr. Eckhaus: Upon arrival in the United States, the inspectors will be met by the U.S. On-Site Inspection Agency (OSIA), which will inspect and certify their equipment.

Once OSIA knows the site to be visited, they will notify the individual that a company has designated on its data declaration as the point of contact. OSIA has about twelve hours to get the inspectors to the designated site, so they may use helicopters, rental cars, or whatever is most efficient and quick for the circumstances.

Number of U.S. Escorts

Ms. Smithson: Some additional U.S. Government officials, probably from the Arms Control and Disarmament Agency or from the Commerce Department, will accompany the inspection team's OSIA escorts, who are trained in the CWC and how to protect your interests during an inspection. How much assistance do you think you will want—the minimum necessary or the maximum the U.S. Government can give you?

Mr. McKinnon: I would want some advance help, maybe one official arriving early to go over plans to host the inspection and give us some advice. Smaller companies should find this particularly helpful.

Dr. Baucom: The government should provide expert help in developing strategies of how companies should deal with this—the best ways to protect information and to build a plant escort team to interact with the inspectors. Many companies will be doing this on a one-time basis, but the government will be doing it every year.

Dr. Fraley: The U.S. Government, though, has a conflict of interest in that the United States will want the OPCW's inspections in other countries to be extremely thorough. The government would want to demonstrate that the United States will allow OPCW teams lots of access so they can compel other countries to do the same. On the other hand, the U.S. Government really wants to make it easy on U.S. facilities. This conflict of interest will exist at the policy level, not with OSIA's escorts, who can be counted on to follow the treaty to the letter, probably giving U.S. facilities the benefit of the doubt.

Mr. Rosen: Government officials should be the treaty experts, able to advise plant managers what is appropriate, when or whether they have a right to say "no" to an inspector's request. That type of advice would give me some confidence in dealing with the inspection.

Dr. Baucom: We will not have done anything wrong as far as the CWC is concerned, so we would want to be well organized, provide the inspectors with what they need so they would leave as soon as possible.

Mr. Donnarumma: Government officials should be the coaches helping chemical plants through the inspection. They have the expertise, but I am not sure that I could handle a 1:1 ratio of U.S. officials to inspectors.

Mr. McKinnon: I would want maybe four U.S. Government helpers, unless the inspectors will go off individually, in which case I would obviously need more.

Mr. LaJeunesse: I would take two good people.

Mr. Stewert: I would take about ten to twenty percent of the total OPCW inspectors, which would translate into two people for a twelve-man team. In addition, I would expect

the U.S. officials to coach, counsel, facilitate negotiation, and mediate the resolution of any disagreement. My employees will be the primary guides or escorts at our facility.

Mr. Thurston: I would like two good folks to help with interpretation, answering questions, and resolving differences. The U.S. Government should also have a special assistance team on-call for extra help if a real problem develops at a site. A point in case would be if an inspection team decided to start going through an entire plant site, chasing a diversion theory, then the U.S. Government would fly in six more people.

The Possibility of a Challenge Inspection

Ms. Smithson: If another country goes to the OPCW and asserts that a U.S. chemical plants is making chemical weapons, presenting some evidence to that effect, the OPCW is obligated to conduct a challenge inspection. A team of ten to fifteen inspectors would be at the perimeter of that plant within two days of when notice is given of the pending inspection. The state that issued the challenge may not place an inspector on the OPCW's team but can request that an observer accompany the team, a request that the U.S. Government can decline. Managers at the challenged facility, along with U.S. officials, can control what type and how much access the inspection team gets, but the amount of cooperation will be one of the factors that the inspectors evaluate.

The options for controlling access are similar to those for routine inspections. They include shrouding, logging off computers, and approval of sampling and photographing. In addition, one person, not the entire team, might be allowed into certain parts of the facility. Or, the entire area could be divided into randomly numbered segments and the inspectors asked to choose a percentage to inspect. This technique allows the inspectors to see some, but not all of a facility. This team will be trying to ascertain whether the challenged plant has violated the treaty, and the United States is obligated to cooperate with it. Once inside the perimeter, the inspectors will have 84 hours to complete their task. The team is supposed to specify what area or areas of the challenged plant are of concern. Ideally, a blanket request to see the entire facility would not be tolerated. Finally, the inspectors will debrief plant managers before they leave.

Having heard this scenario, I would ask whether you could quickly come up with an idea of what areas in your plant you would most have to protect under such circumstances?

Mr. Donnarumma: If I have prepared properly for a routine inspection, I could handle this.

Mr. Lyle: We would have to develop a very firm plan as to what we really wanted to protect, which we have yet to do. Even then, we may end up protecting too much or too little.

Mr. McKinnon: We probably could deal with this. As I understand it, the odds of the team that the OPCW pulls together on short notice having an expert in the specific area or areas of technology we would most need to protect are pretty low. Knowing that the OPCW cannot stack an inspection team with ex-employees of my main competitors makes me feel better about this. Plus, we can control their access.

Ms. Smithson: Under what circumstances, when you have already identified something as CBI you feel is beyond the scope of the inspection, and shrouded or otherwise covered it, would you allow an inspector access to that data or item?

Mr. Stewert: Negotiation at the time, in consultation with U.S. officials, would determine this. I may be able to find another way to satisfy the inspectors' concerns, such as sampling from a different point farther up or down the line. However, if I am told I will be subject to prosecution by the U.S. Government if I do not lift that shroud, then I would probably lift it.

Mr. Thurston: My reaction will depend on the tone of the inspection team. If they come in and instantly want to go through my plant, I will call a "time out." If they have a cooperative attitude and it is obvious they are really just after what logically I would want if I were in their shoes making an evaluation about possible prohibited activities at my plant, we will cooperate. If it gets down to a point where they need access to one specific piece of data—behind that shroud or testing what is in drums "X," "Y," and "Z"—to satisfy their concerns, then I would probably give them access. I would want to know what they needed to wrap up their inspection.

Mr. McKinnon: My degree of cooperation is going to depend on the consequences, the penalties. This team may ask to probe in areas where we normally do not. The results of a challenge inspection cannot hinge upon a transitional molecule of sarin—what may be there during the process, for instance in the vapor space, but decomposes or burns off and is not there at the end. Unexpected and unknown transitory chemicals may exist in chemical reactors. How the implementing legislation is written is going to be important, because I do not want to be penalized for something I did not know I was making.

Mr. Thurston: I agree. We are not required today to do trace analysis for all of these chemicals in recycle streams or side streams because those are not chemicals of interest to us in our manufacture. If the inspectors start digging, they may find trace quantities of these chemicals.

Mr. LaJeunesse: Many fundamentals that apply to hosting a routine inspection would apply in this situation also, but the stakes are somewhat higher. This is a matter of pre-planning, plant managers knowing where to draw the line and where to concede or compromise. Odds are this will not be an everyday event and none of us will see a challenge inspection.

Dr. Fraley: Remember that the treaty is not between the inspectors and the company, but between the OPCW and the U.S. Government, which will have a significant input into the decisions made during a challenge inspection. Plant managers will be negotiating with U.S. officials and the OPCW inspectors.

Mr. Donnarumma: That will be a real headache. Plus, a challenge inspection would be much more of a public relations dilemma. An allegation of cheating is going to be much more difficult to explain to the media and the local community than a routine inspection.

Handling an Inspection

Ms. Smithson: Having reviewed the basic components of an inspection, if you received 48 hours or less notice that an inspection team was headed toward your plant, could you handle it?

Mr. McKinnon: I would have to make sure I had enough of my staff ready to work with them, because every inspector group is going to need a one or two person chase patrol. Before I arrived, my plant hosted one of the National Trial Inspections. One lesson we learned was to be prepared to deal with the media. We would probably focus more on explaining this to the community than on what the inspectors will do when they arrive. We would be initiating a damage control operation for community relations using explanatory press releases.

Mr. Rosen: I would issue a press release notifying my community how honored Pressure Chemical is to host an international inspection team in support of chemical weapons disarmament and nonproliferation. My local Congressman should be told so he can release a supportive statement, maybe take a picture with the inspectors.

Mr. Lyle: Some companies may need special training on how to deal with these CWC inspections, because, just like any other inspection, if a plant manager gets confrontational, the inspectors will be suspicious and want to dig deeper and deeper.

Mr. Thurston: The trade associations, the Chemical Manufacturers Association (CMA) and the Synthetic Organic Chemical Manufacturers Association (SOCMA), and the U.S. Government need to start working now with the media so that by the time these inspections roll around they will deal with these situations as fairly as possible.

Mr. LaJeunesse: Someone—SOCMA, CMA, the government—should put together a kit that plants could use to deal with the media. The contents would include a sample press release that explains the treaty, its good purposes, and why a routine inspection is just routine. It should explain that this site produces materials “X,” “Y,” and “Z” which are used for commercial products but are covered by the treaty. The plant could fill in the blanks, date it, and release it to the media. My plant would also greet the inspectors with a welcome sign, putting a positive tone on the inspection. I would also assemble the records associated with my data declaration because I know they will want to examine them. All of this could be done as part of a preplanning exercise.

Mr. Lyle: From my auditing experience, the more convenient it is for an auditor to find what he is looking for, the more likely an inspector will leave early. I would gather the records I know they will need, expect them to go out in the plant to check some things, and do what I could to help them do their job quicker. We had better plan for this onslaught, because otherwise we would not be able to handle it. We would probably ask our corporate headquarters for resources and manpower, similar to how we handle a safety emergency, a spill of some kind. Rhône-Poulenc would probably train and dispatch regional CWC support teams to help individual plants respond to inspections.

Mr. McKinnon: Hoechst Celanese would probably take the same type of approach.

Mr. Donnarumma: We would be able to handle it. I would probably put my emphasis on community communications so that there would not be a misunderstanding about why we were being inspected.

Mr. LaJeunesse: A company would have to do some preplanning. In the past, we had to scramble to gather records and prepare the site when we received a three-day notice that the EPA was coming to check our Resource Conservation and Recovery Act compliance. For the CWC's requirements, we should build on our experience with preparing for other regulatory inspections, using the people that know how to respond. We might try to draft a CWC inspection plan and put it on the shelf.

Mr. Rosen: My plant is ready, but we could not physically move a group of twelve inspectors around my site, much less their U.S. Government escorts. We would have to break this team into two groups, but I would not have enough plant management escorts available if they separated into six groups. We would have to shut down if they demanded that.

Dr. Clagett: A facility agreement could address this type of situation.

Dr. Baucom: With our chemists and compliance staff, we could handle it. But we would also probably pull people in purchasing, customer service, shipping and receiving, and manufacturing to support the inspection team.

Mr. Stewert: We would need to develop a response plan, similar to those we use for emergency response or an OSHA inspection, but we could handle a CWC inspection. Like some of the others, my biggest concern is community relations. My community already knows we have hazardous materials on site and if they believe that we are making illegal weapons, if it is not handled correctly, they would probably force us to shut down.

Mr. Thurston: I am sure we could get through a routine CWC inspection, but clearly preplanning is important. Some technology or information would probably be exposed in the process; whether it got lost or not will depend on the integrity of the inspectors. The implementing legislation for all treaty parties should have penalties for inspectors that violate the confidentiality of their work for the OPCW.

Appropriate Penalties

Mr. Thurston: In instances of bona fide violations, the OPCW should set some minimum standards for fines and other penalties for violations. Otherwise, the fine for a reporting failure in country "X" could be \$10, but \$10,000 in country "Y." Companies in country "X" will not feel compelled to comply and they could get some competitive advantage.

Dr. Fraley: If a company does not report, the country, not the company is in violation of the CWC. The country becomes subject to sanctions or other penalties. Most scenarios about cheating hold that violations will be engineered by governments, not individual companies.

Mr. McKinnon: Penalties should fit the crime. I do not think a fine for this molecule of sarin we keep talking about is appropriate, but if somebody—company or country—

intentionally violates this treaty, then they should receive the maximum penalties possible.

Mr. Rosen: Industry will be more motivated to cooperate if there are some criminal penalties associated with intentionally making prohibited chemicals, with not reporting correctly, or not cooperating with an inspection, which I assume will be in the implementing legislation.

Mr. Rosen: The legislation has to be specific about intentional manufacture because they should not be allowed to throw the book at you if they found one molecule of sarin floating around your pipe. Words like “knowingly,” “willfully,” and “intentionally” need to be in this legislation.

Mr. Stewert: I agree, because we cannot predict exactly what will happen inside a reactor and some things may appear during a process that are not present in the end product.

Dr. ZefTel: No accusation is going to be made on the basis of one finding. If a plant makes glue, and the team comes and finds five parts per billion of a degradation product of sarin, the plant will not be convicted as violating the treaty on that alone.

Dr. Clagett: In such a case, the plant may wish to change its process so that this material is destroyed as it is made, so that it is not discharged into the ground, into water, or into the atmosphere.

Outreach to Industry

Mr. LaJeunesse: It is not too soon to go into Community Advisory Panels (CAPs) and start educating them about the CWC and its inspections. CAPs are the mechanisms that each plant is supposed to use to develop an ongoing dialogue with community leaders, environmentalists, and other interested citizens. The CAPs address topics such as new regulations and emergency response planning. Companies may also want to talk to the editorial boards of local newspapers, informing them how their plant is part of this UN effort. A press release about an actual inspection would then come out against this more proactive and positive background.

The U.S. Government also needs to help get the word out to industry. They should prepare a nice fifteen minute video introducing the treaty, its global nature, its requirements. Company officials could show the video to the local community advisory panel to acquaint them with the general picture and then tell them how their plant fits in, what to expect in terms of routine inspections. The government might test the prototype reporting forms with some sites over the next few months to make the CWC's requirements seem more imminent.

Mr. Thurston: This video would be a valuable tool for plant to introduce their employees to the CWC as well.

Mr. McKinnon: Perfect. Getting industry's attention on this subject may not be easy. When OSHA and EPA start talking about “criminal liability” people pay attention. The penalties that will accompany noncompliance with the CWC's requirements should be emphasized.

Dr. Baucom: Over a year ago I received information about a CWC conference, but it was long, confusing, and did not make enough of an impression on me to get me to attend. The point for most of industry is that they are going to be subject to this reporting requirement and could potentially be inspected, period. This is not a matter of if company "X" is involved, but to what extent, just like OSHA, EPA, and other regulations.

Mr. McKinnon: Concise is the key word here: People's interest in an article seems to be inversely proportional to its length.

Mr. Lyle: Along with the video, the government needs to provide a basic informational kit that includes key points of contact listed so that industry officials can get accurate answers to questions. The contacts, and alternates if possible, should be listed with telephone numbers, both for the U.S. Government and The Hague. This subject should be brought up at the Chemical Industries Councils (CICs) throughout the United States, which have community functions every year and could help increase community awareness of what is involved in a CWC inspection.

Plans of Action

Ms. Smithson: The earliest possible entry into force is January of 1995. Now that you understand what is involved in the CWC's data declarations and routine and challenge inspections, what, if anything, will you now go back to your plant and do with regards to the CWC?

Mr. Thurston: First, I will write a summary of this meeting for our senior manufacturing management, regulatory, and compliance staffs. I will recommend that we begin immediately figuring out how we will adopt our current programs to comply with the CWC's likely requirements, based on the assumption it will be ratified, and that we begin the process of training and educating our personnel. The training video tape would be very helpful. Each facility needs to develop an understanding of what Scheduled chemicals, if any, they use and what requirements they will face. Dow also needs to determine how to draw the boundaries for coverage of a plant or plants within a larger integrated facility. They need to identify what data to gather and prepare a plan for a routine inspection. Historically, Dow has also done internal test runs of upcoming EPA and OSHA requirements at some facilities, and that approach might be taken with these CWC preparations. Dow would probably deal with a challenge inspection as a special case.

My estimate is that this would require at least an hour of introductory training per employee. With 50,000 employees, this alone is a significant time commitment. Plant managers and some technical staff will invest much more than an hour laying the groundwork for reporting and inspections. For any given plant, these preparations will require at least two or three man-weeks worth of effort. The same level of effort will probably be required to maintain it.

Mr. Rosen: In the past, my plant consumed some Schedule two chemicals in the manufacture of specialty chemicals, a high value, relative low-volume business. In the future, we would avoid working with these chemicals, given the probability of an inspection.

Mr. Lyle: For other reasons, we have already made that type of decision at my plant.

Mr. McKinnon: Plants change their processes occasionally to keep off of lists for various reasons, but using a Scheduled CWC chemical would not necessarily drive Hoechst Celanese to get out of that chemistry.

Mr. Donnarumma: DuPont gave up dyes, which was less than one percent of their business, because this business had a lousy image in the market.

Mr. Stewert: Every chemical we make is a phosphorous-based chemical, and they are all perfectly legal to manufacture. This treaty will not change what we do with Schedule 2 and 3 chemicals. I plan to prepare a summation of the meeting and its implications for Albright & Wilson. From my vantage point, we cannot wait, we urgently have to begin formulating the plans for this treaty's implementation, especially at our Charleston, South Carolina facility, which I know will be inspected. Charleston has about 250 people and eight different production units. This plant makes in excess of 200,000,000 pounds a year of various mixes of phosphorus material. We need to incorporate the CWC's implementation into our strategic business plans, allocate the required resources, develop plans for inspections, and prepare an educational program for our employees. I too would like an authoritative video tape to help me with that task.

When we prepared my facility for the International Standards Organization (ISO) 9000 series of quality program certifications, it required about eight to ten man-years of effort. Now that we have good documentation in place, I would estimate that these CWC preparations would take five to six man months. Someone within the safety and health, environmental, or production planning process areas will direct and coordinate the effort. Finally, Albright & Wilson, Limited is a multi-national operation and its worldwide divisions need to know what is coming. We need to set up communications and plans throughout the corporation about this.

Dr. Baucom: The only way my company would really be affected is if we received a challenge inspection, and I think the chances of that are extremely small. Still, I plan to share this information, discuss it with the company's management team, and plan who would be involved in the unlikely event that we did get challenged.

Mr. Rosen: I will summarize for my key staff how this might affect us. We will probably examine the need to change our database to better support the reporting requirements, which should not represent much of a problem. We will consider what reporting position Pressure Chemical might take in terms of a plant or units within the facility. Since I know that working with Schedule 2 chemicals is likely to bring on an inspection, we will probably not do so in the future. We will just take different projects. My facility probably will not be inspected often, maybe once every decade or so. I do not see a big burden, and I would not prepare for an inspection until I received notice for one. In the event of an inspection, since we do proprietary work for other companies, we would probably shut down many of our batch operations and put all of our materials back in the warehouse during the 24 hours of inspection. This would be a good day to take inventory.

In my role as chairman of the Small Business Committee at SOCMA, I would think most of my associates would be similarly situated. The unScheduled organic chemical or other category is going to encompass almost everybody, but the consequences of that are not drastic for an individual facility. These companies certainly need to be made aware of this because they are best suited to evaluate how it might affect them.

Mr. LaJeunesse: In my current role as a consultant, I will probably share this information with the CIC in North Carolina, which reaches a lot of small North Carolina companies. They might consider holding an educational seminar in 1994 on the upcoming regulations. Other CIC's might take a proactive role in getting this information out to their members. In addition to the video, it would help to have sample reporting forms and the other informational kits to help explain these requirements to companies in a way that would not upset them. The more sources the companies hear this from, the better. Eventually, it will sink in.

Mr. Donnarumma: I will not use overkill. I will just communicate this as simply another requirement that will take some effort. The staff that normally handles reporting will start putting together the proper databases for the CWC reporting. We will probably try to define how we will declare the different plants within our facility, thinking of the boundaries for possible inspections. Simple explanatory documents and a video would be extremely important for this to go well. I would not plan an educational program as intensive as we had for the ISO 9000 certification, but people have to be aware of this because of the new reporting requirements and the potential liabilities. Maybe one man-year of effort is involved in this. I will also inform other divisions of Sandoz that may be affected.

Mr. Lyle: First, I need to find out what the awareness level is at the corporate level, because Rhône-Poulenc has plants everywhere. I would initiate an evaluation against the CWC's Schedules to see how this will impact us. Rhône-Poulenc is so large that no one person, or group of people, can make this evaluation. It is not too early to start this process now, and, again, I could sure use that video. Everyone at the corporate and plant management levels should have an awareness that this is definitely coming. Later, we will take this process down to the operations level. We need to estimate what resources will be needed to comply. Perhaps I can learn something from how other plants are handling this, so good communications within the industry, whether through the CIC or the trade associations, will really be key.

In strategic terms, this will have some impact on Rhône-Poulenc's one-, three-, and five-year plans. We may decide to stop making certain products or change the way we make them, to move product lines or consolidate some operations so that all of the processes that use Schedule 2 or 3 chemicals are centralized at one or two sites. The impact could be a lot softer if the corporation has global or nationwide reporting strategy for all these sites. For instance, we developed a plan for ISO 9000 implementation at one site and then used that as a learning tool for other sites. In this case, we might identify the implications for a site, develop a draft facility agreement for it, and then form our own "inspection" team for a mock audit. We have done this before with other training tasks, moving with that model from site to site. I would not commit at this point to hosting a National Trial Inspection—although we have done it in the past—but I believe that a host company can learn a great deal from doing that. I know that at some point,

my plant will be inspected, and I will not wait until I get notice of an inspection to plan for it.

Mr. McKinnon: I too will go back and tell some of my colleagues what I have heard and institute some of the same planning and training processes. I think this is one issue that chemical industry as a whole wants to be in front of nationwide. People are suspicious of chemical companies, and if they think we are making chemical weapons or not cooperating with an effort to ban them, this could be a real problem. I have some concerns about the implementing legislation. This treaty is a good idea, but the right things can be done the hard way or the easy way. Governments sometimes make things more difficult than necessary.

For instance, the government should let some practical users critique these reporting forms. I have seen some poorly designed forms implemented, which might be avoided in this case if a few plant managers helped them make these forms user-friendly, easy to understand and complete.

My biggest concern is that the clock toward implementation is ticking and if the word does not get to more of chemical industry soon, this will be pushed upon us at the last moment. We do not have the tools—forms and plans—to implement this at present. January of 1995 is only thirteen months away. My plant, and the industry as a whole, has got the capability to do this reporting, to host these inspections. We have to work through some things, but this will be manageable.

Mr. Lajeunesse: Industry can be a major ally, but it will be difficult for industry to do this without some help. The principle at stake here is one cannot be argued with—reduction and control of chemical weapons.

Impact of the CWC on U.S. Industry

Ms. Smithson: Do you think that the CWC will have a significant impact on U.S. chemical industry operations, competitiveness, trade, innovative ability, and profitability?

Mr. McKinnon: The biggest danger in competitiveness terms is how much information will generally be made available to individual countries about the individual U.S. sites that have reported. If this information is kept in aggregate form, then much of what might be made available can already be obtained from U.S. Government databases and reporting requirements, such as which facility makes which chemical and what plant capacities are. In aggregate form, the data we have to declare is probably not terribly significant from a competitiveness viewpoint. If it affects competitiveness, it affects profitability.

Mr. Stewart: A declaration that requires a plant to reveal what type of product it makes and what country it ships it to reveals the geographical region of that plant's product line. This information could be found elsewhere, but now it is all in one place. All of this reporting will require some resources, so there will be costs associated with implementing the CWC in my plant, which affects my competitive edge. Another cost could be if I decide not to produce a Scheduled chemical because of reporting requirements and the potential for inspections. Finally, if some of our trading partners in other

countries do not join the CWC and, according to the treaty, we cannot trade in Scheduled chemicals with them, that would have a significant impact.

Mr. Thurston: I agree. Similar to some of the major environmental regulation, TSCA, and Superfund regulations, this treaty will have a significant impact on U.S. industry operations, competitiveness, profitability. The level of reporting and record-keeping is going to be similar. Training, now and on a continual basis, will be required. U.S. chemical industry has been through this kind of an exercise enough times to be pretty well programmed to establish the procedures to comply. I cannot say the same for other countries, which may not have much in the way of environmental or safety regulation. In comparison to companies in those countries, I know that U.S. companies will spend more money per capita complying with these new regulations than they will. We have already lost some of our competitive edge because of environmental regulations, and the CWC may cause us to lose even more of our competitive edge. Industry cannot stop this, but it can manage it in a way that minimizes that loss.

Mr. Lyle: Initially I was thinking about this in terms of possibly losing technology, but that is not really my concern now. This will have an economic impact and we will have to develop a strategy and set aside the resources to deal with the reporting and inspections. Decisions about continuing to produce some chemicals will also impact our bottom line. However, we all already know that the competitive playing field is not level at present. Governments in some countries are right behind their industry. In some cases, governments provide a pool of resources to help with research or addressing some issues, which is not the case in the United States. My main U.S. competitor is not going to offer help if I get in trouble. U.S. companies are more or less on their own in the marketplace.

Dr. Baucom: Realistic definitions for some of these terms that are still being crafted could make implementing the CWC less burdensome, but I fear the worst with things like this five-day reporting requirement. The goal should be to enable this treaty to accomplish its purpose, but do so in a way that holds damage to industry to the very minimum.

Mr. Rosen: In the specialty chemical industry, there is bound to be some effect on innovation because we will avoid the use of certain materials. This will limit the industry's capability, but I do not believe it will have as big an effect on innovation as several other types of regulations that have been promulgated in the last five years or so. I do not share these concerns about competitiveness because it certainly will not affect my kind of high-value goods business. Overall, I am assuming that this will be handled reasonably, fairly, and that the intent of the treaty will be carried out even-handedly. Therefore, it should not have an effect on trade or competitiveness.

Living with the CWC

Ms. Smithson: Finally, within the framework that we have discussed for CWC implementation, would you support the implementation of this treaty? If not, what modifications would you suggest?

Mr. Donnarumma: Most of this had already been decided, but yes, I can support the treaty. The goals of the treaty are certainly very worthwhile, and we can live with this thing. We have lived through, and continue to live through, worse.

Mr. Thurston: I think we can manage to live with the treaty. Industry should try to influence the enabling legislation and the implementation phases as much as possible to make this as palatable as possible. We need to get rid of the existing chemical weapons. The aspects of the treaty that enable the OPCW to monitor the destruction of stockpiles and possibly preclude the production and development of those existing weapons are good. However, I am not sure that the CWC will achieve the complete elimination of chemical weapons. Countries or individuals that want to cheat will find ways to develop other uncontrolled harmful or lethal chemical agents.

Mr. Rosen: I can live with this treaty.

Mr. LaJeunesse: So can I.

Mr. McKinnon: We can live with it, but I hope the implementing legislation does not complicate our lives unnecessarily or reduce our competitiveness worldwide.

Mr. Lyle: The implementing legislation could make this costly or easy. If this is done right, it will not impact on industry's bottom line, because we already have the environmental, health, and safety structure there.

Mr. Stewert: I think this treaty is needed and its intent is good. The imposition of reporting requirements and these inspections will cause an operational burden, but we will comply with this just as we have with other process safety management, OSHA, and EPA requirements. In the end, we do not really have a choice.

Appendix I: About the Participants

Keith Baucom is Vice President of Technology for PCR, Inc., where he has been employed by PCR since 1969. A University of Florida Ph.D., Dr. Baucom has worked in research and development, business, and regulatory roles at PCR. He is active on the Silicone, Environmental, Health, and Safety Council, the area Local Emergency Planning Committee, the Florida Chemical Industry Council, the Gainesville Area Chamber of Commerce and he is Chairman of the Fluorine Division of the American Chemical Society. Founded in 1953, PCR, Inc. manufactures organo-silicon products—which are used to make polymer composites, semiconductors, adhesives, sealants, and coatings—and organo-fluorine intermediates—used in the manufacture of pharmaceuticals, polymers, and functional fluids.

Don Clagett is currently Head of Industry Operations Branch in the Verification Division of the Provisional Technical Secretariat of the Organization for the Prohibition of Chemical Weapons. A Yale University Ph.D. in Chemistry, Dr. Clagett was employed with W.R. Grace, but spent most of his career in industry with General Electric. He has worked in research and process development, pilot plant scale-up operations, and chemical engineering process safety. He holds numerous patents in the areas of chemistry and polymer chemistry, including melt process nylon. Dr. Clagett became involved in Chemical Weapons Convention (CWC) matters as General Electric's representative to the Chemical Manufacturers Association's (CMA's) working group on the CWC.

Aldo Donnarumma is Vice President of Operations at Sandoz Chemicals Corporation in Charlotte, North Carolina, and is a member of its Executive Committee. He oversees operations of the company's manufacturing units and is responsible for safety and environmental performance and compliance. Mr. Donnarumma holds an M.S. in Chemical Engineering and was previously manager of the company's Martin Plant. Sandoz Chemicals Corporation manufactures a wide variety of dyes, pigments, and specialty chemicals for major U.S. industries including textile, paper, leather, metal, plastics, household and personal products, coatings, inks and electronics. The company employs about 1,250 people. Sandoz Corporation is a wholly owned U.S. subsidiary of Sandoz Ltd. of Switzerland, a worldwide producer of pharmaceuticals, chemicals, dye-stuffs, specialty foods, and agrichemicals.

Sigmund R. Eckhaus, P.E., is a consultant for the U.S. Arms Control and Disarmament Agency (ACDA). Educated at Johns Hopkins University as a Chemical Engineer, Mr. Eckhaus has over 35 years experience as a civilian engineer with the United States Army employed at the Chemical Research Development and Engineering Center (CRDEC) in Maryland. Throughout his career he was involved in process development and producibility of chemical agents and munitions systems. He retired from the CRDEC in January 1986 as the Associate Technical Director for Producibility.

Stanley Fraley is the manager of the Policy and Analysis Research Department within the Defense Programs Sector at Sandia National Laboratories, Albuquerque, New Mexico. He served as an adviser to the U.S. delegation to the Intermediate-range Nuclear

Forces negotiations in 1987 and as the U.S. chair of the Inspection Protocol Working Group. He received his Ph.D. in Engineering Science at the University of Tennessee. Dr. Fraley also worked at the U.S. Mission to the International Atomic Energy Agency and at ACDA.

Dennis LaJeunesse is the founder and President of Operations Excellence Inc., a consulting firm specializing in regulatory compliance, quality, and general manufacturing support for small and medium size organizations. A Chemical Engineering graduate and registered professional engineer, Mr. LaJeunesse has been in the chemical industry for more than 26 years. He has held a variety of operations assignments with Exxon Chemical and was Vice President of Operations with Ausimont USA and High Point. Mr. LaJeunesse has been active in the Chemical Industrial Councils of New Jersey and North Carolina and is currently a member of the North Carolina council's Long Range Planning Committee and the Synthetic Organic Chemical Manufacturers Association's (SOCMA's) Responsible Care Committee.

Ely Lyle is the Technical Manager of the Rhône-Poulenc plant in Baltimore, Maryland. He is responsible for process safety, project engineering, new technology, new product introduction, and total quality at the site. A University of Morgan B.S. in Chemistry, Mr. Lyle has been employed at Rhône-Poulenc for 25 years. Previous work experience has been as Production Manager and Operations Manager. Rhône-Poulenc employs just under 100 people at the Baltimore facility, which manufactures ethoxylates, sulfates, and monomers, performance concentrates, and various other speciality chemicals.

David McKinnon is the Plant Manager of Hoechst Celanese Corporation's facility in Coventry, Rhode Island. He has a degree in Chemical Engineering from the University of Waterloo and an MBA from the University of South Carolina. Mr. McKinnon joined Celanese Canada in 1969 as a development engineer at the Kingston, Ontario facility. In 1971, he transferred to the United States and has had manufacturing, engineering, technical, and business group assignments at several locations. The Coventry facility employs 870 people and specializes in producing dyes, pigments, and pharmaceuticals.

Lawrence J. Rosen, currently the Chairman and CEO of Pressure Chemical Co. in Pittsburgh, Pennsylvania, had previously served as its President from May, 1975 through June, 1991. A lawyer by education, Mr. Rosen's involvement in the chemical industry includes his service as a director of the Pennsylvania Chemical Industry Council, as a Governor of SOCMA, and as Chairman of SOCMA's Small Business Committee. Pressure Chemical Co., a small company with about forty employees, specializes in the scale-up of chemical processes from the bench scale into the pilot plant, as well as in the manufacture of semi-commercial quantities of fine organic chemicals, pharmaceutical intermediates, organometallics, specialty polymers and anhydrous metal chlorides.

Amy E. Smithson is a Senior Associate at the Henry L. Stimson Center, where she currently directs the CWC Implementation Project, which is funded by the Carnegie Corporation of New York. A specialist in arms control verification, Ms. Smithson is the co-editor of *Open Skies*, *Arms Control*, and *Cooperative Security* (St. Martin's Press, 1992) and the author of numerous journal articles on various arms control topics. She

previously worked for Pacific-Sierra Research Corporation and the Center for Defense Analyses. She holds an M.A. in Government from Georgetown University and is a Ph.D. candidate at the George Washington University.

William Stewert is the Distribution Quality Manager for Albright & Wilson Americas' Specialty Chemical Group. He holds an M.S. in Chemistry and was previously employed as a Research Chemist with E.I. DuPont. At Albright & Wilson Americas, Mr. Stewert has held positions as Laboratory Supervisor, Laboratory Manager, Quality Assurance Manager, and Corporate Production Planner. Albright & Wilson Americas, a subsidiary of Albright and Wilson Limited, specializes in producing phosphorus-based chemicals, including phosphorous halides, phosphoric acid, and industrial food-grade phosphate chemicals. Its line of organophosphorus chemicals include flame retardants, metal extractants, water treatment chemicals, lubricant additives, and intermediates for pharmaceuticals and agrochemicals.

Larry Thurston, of The Dow Chemical Company, is presently the Technical Manager of a global technology center for polycarbonate and blends manufacturing in Freeport, Texas. He graduated with a B.S. in Chemical Engineering from the University of California Davis and joined Dow Chemical in Midland, Michigan. In his twenty-five years with Dow, Mr. Thurston has had a mix of responsibilities including research, manufacturing, and environmental management. Dow manufactures and supplies more than 2,000 products and services, including chemicals and performance products, plastics, hydrocarbons and energy, and consumer specialties. The company operates 178 manufacturing sites in 33 countries, and employs about 61,000 people around the world.

Leo ZefTel is currently a consultant to firms and trade associations. After receiving his Ph.D. in Organic Chemistry from the University of Rochester, Dr. ZefTel joined DuPont in 1951. He retired from the company in 1989 as Manager of Material Resources in the manufacturing division of the chemicals department. He spent most of his career at DuPont's largest multi-product, multi-purpose facility, the Chambers Works in Deepwater, New Jersey. During his tenure, the Chambers Works manufactured over 1500 products, including dyes, intermediates and specialty chemicals. Dr. ZefTel began attending the CMA's CWC Group in 1987 and ever since has been involved in representing industry interests regarding the CWC.

Appendix II: Selected Excerpts from *The Chemical Weapons Convention Handbook**

Overview

The Chemical Weapons Convention will prohibit the development, production, acquisition, stockpiling, retention, transfer, and use of chemical weapons. Unprecedented in its scope and complexity, the Convention is the most significant agreement to stem the proliferation of weapons of mass destruction since the 1968 Nuclear Non-proliferation Treaty. The Convention was opened for signature in Paris on 13 January 1993, and has since been signed by over 150 countries. The Convention will enter into force 180 days after the sixty-fifth instrument of ratification is deposited or 13 January 1995, whichever comes later. The two-year interim is planned to allow for the establishment of the international administering organization and implementing procedures. During this time, treaty signatories are preparing for the Convention's entry into force by organizing national authorities to supervise domestic implementation requirements and participating in the Preparatory Commission in the Hague. However, the exact date for the treaty's entry into force is dependent upon the speed with which signatories ratify the treaty.

The governing body of the CWC will be the Organization for the Prohibition of Chemical Weapons (OPCW). The international monitoring agency of the OPCW, the Technical Secretariat, will be responsible for data monitoring, routine on-site inspections, and challenge inspections. The treaty requires participating states to establish a National Authority to be the main point of contact with the OPCW. The Technical Secretariat will notify a country of a pending inspection through the National Authority, which will provide the escorts for inspections and also submit required information on CWC-related activities to the Technical Secretariat. The National Authority will be responsible for ensuring that government and civilian facilities within their country's jurisdiction are complying with the treaty.

While governments are the entities that will be legally bound by the Convention's provisions, corporations and individuals involved in activities related to the treaty also need to be subject to its provisions. Therefore, the Convention requires states to pass implementing legislation that will obligate individual citizens and corporate entities to abide by the treaty. One of the primary features of implementing legislation will be penal codes for individuals within a state's jurisdiction found to be in violation of the Convention. Also included will be regulations requiring the reporting of controlled activities to the National Authority, the acceptance of routine and challenge inspections, and the harmonization of export control laws in accordance with the Convention's objectives.

Schedule of Chemicals

The negotiators of the Convention devised a system for characterizing chemicals based on their risk to the purpose and objectives of the Convention. This system places chemicals on three lists or "Schedules," according to their toxicity and military and commercial utility. (See Table 1.) Schedule 1 contains military agents and super toxic

**The Chemical Weapons Convention Handbook* was published by The Henry L. Stimson Center's CWC Implementation Project in September 1993.

Table 1: CWC-Controlled Chemicals

Schedule 1: Military Agents with No or Low Commercial Use	
<ul style="list-style-type: none"> • Alkyl phosphonofluoridates (e.g., the nerve agents Sarin and Soman) • Alkyl s-aminoethyl alkyl phosphonothiolates and corresponding alkylated or protonated salts (e.g., the nerve agent VX) • Sulfur mustards (e.g., mustard gas) • Lewisites • Alkyl phosphonyldifluorides 	<ul style="list-style-type: none"> • Alkyl phosphoramidocyanidates (e.g., the nerve agent Tabun) • Alkyl s-aminoethyl alkyl phosphonites and corresponding alkylated or protonated salts (e.g., QL, a key precursor for VX) • Nitrogen mustards • Ricin • Saxitoxin

Schedule 2: High Risk Precursors and Toxic Chemicals with Moderate Commercial Use	Chemical Abstract Registry Number
• Amiton: O,O-Diethyl S-[2-(diethylamino)ethyl] phosphorothiolate and corresponding alkylated or protonated salts	78-53-5
• PFIB 1,1,3,3,3-Pentafluoro-2-(trifluoromethyl)-1-propene	382-21-8
• BZ: 3-Quinuclidinyl benzilate	6581-06-2
• Chemicals, except for those listed in Schedule 1, containing a phosphorus atom to which is bonded one methyl, ethyl, or propyl (normal or iso) group but not further carbon atoms, e.g., Methylphosphonyl dichloride Dimethyl methylphosphonate Methylphosphinyl dichloride Ethylphosphonyl dichloride Diethyl ethylphosphonate <i>Exemption: Fonofos: O-Ethyl S-phenyl ethylphosphono-thiolothionate</i>	676-97-1 756-79-6 676-83-5 1066-50-8 78-38-6 944-22-9
• N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) phosphoramidic dihalides e.g., Dimethyl phosphoramidic dichloride	677-43-0
• Dialkyl (Me, Et, n-Pr, or i-Pr) N,N-dialkyl (Me, Et, n-Pr, or i-Pr)-phosphoramidates e.g., Diethyl N,N-dimethylphosphoramidate	2404-03-7
• Arsenic trichloride	7784-34-1
• 2,2-Diphenyl-2-hydroxyacetic acid	76-93-7
• Quinuclidine-3-ol	1619-34-7
• N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethyl-2-chlorides and corresponding protonated salts e.g., 2-chloroethyl trimethylammonium chloride Diethylaminoethyl-2-chloride	999-81-5 100-35-6
• N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethane-2-ols and corresponding protonated salts e.g., Diisopropylethanolamine <i>Exemptions: N,N-Diamethylaminoethanol and corresponding protonated salts</i> N,N-Diethylaminoethanol and corresponding protonated salts	96-80-0 108-01-0 100-37-8
• N,N-Dialkyl (Me, Et, n-Pr, or i-Pr) aminoethane-2-thiols and corresponding protonated salts e.g., 2-Diethylaminoethanethiol	100-38-9
• Thiodiglycol: Bis(2-hydroxyethyl)sulfide	111-48-8
• Pinacolyl alcohol: 3,3-Dimethylbutane-2-ol	464-07-3

Table 1: CWC-Controlled Chemicals (cont.)

Schedule 3: High Commercial Volume Dual-Use Chemicals	Chemical Abstract Registry Number
• Phosgene: Carbonyl dichloride	75-44-5
• Cyanogen chloride	506-77-4
• Hydrogen cyanide	74-90-8
• Chloropicrin: Trichloronitromethane	76-06-2
• Phosphorus oxychloride	10025-87-3
• Phosphorus trichloride	7719-12-2
• Phosphorus pentachloride	10026-13-8
• Trimethyl phosphite	121-45-9
• Triethyl phosphite	122-52-1
• Dimethyl phosphite	868-85-9
• Diethyl phosphite	762-04-9
• Sulfur monochloride	10025-67-9
• Sulfur dichloride	10545-99-0
• Thionyl chloride	7719-09-7
• Ethyldiethanolamine	139-87-7
• Methyldiethanolamine	105-59-9
• Triethanolamine	102-71-6

Source: The Convention's Annex on Chemicals.

chemicals with very limited commercial use. The treaty specifically bans all activities using the twelve super toxic agents listed on Schedule 1, with the exception of permitted research activities with these agents, which will be closely monitored. Schedule 2 chemicals have low to moderate utility in the commercial sector, but are considered high risk chemicals because they can be used as chemical weapons or precursors to chemical weapons. Schedule 3 chemicals are used in large quantities by commercial industry, but also pose a risk in that they have been used as chemical weapons or precursors. The Convention permits the continued production of thirty-one "dual-use" chemicals, which are listed on two additional Schedules depending on their degree of toxicity and their military and commercial utility.

Schedule 1, 2, and 3 chemicals will be monitored according to their risk, with the most stringent requirements applied to the chemicals on Schedule 1. Activities involving the chemicals on Schedules 2 and 3 must be reported and are subject to inspections to ensure that they are not being diverted from commercial to military purposes. The Convention allows for changes in the chemicals listed on these Schedules.

Countries that decide not to join the CWC will be denied access to trade in Schedule 2 chemicals three years after the Convention's entry into force. Thereafter, treaty parties may only trade in Schedule 2 chemicals with other States Parties. Until then, signatories are required to receive assurances (end-user certificates) that Schedule 2 and Schedule 3 chemicals transferred to non-signatories are not used for purposes prohibited by the Convention. Five years after the CWC enters into force, the Conference of State Parties will weigh the application of trade restrictions on Schedule 3 chemicals, such as barring transfer to non-States Parties. Article XI of the Convention also encourages the "fullest possible" exchange of chemicals, equipment, and scientific information among treaty

Table 2: Thresholds for Annual Data Declarations and Routine Inspections

Type of Facility	Type of Activity to be Reported for Previous Calendar Year and Anticipated for Next Calendar Year	Annual Production Threshold for Reporting	Threshold for Inspections
Schedule 1	Production, processing, consumption, acquisition, import and export data	<ul style="list-style-type: none"> • 100g 	<ul style="list-style-type: none"> • 100g
Schedule 2	Production, processing, consumption, import and export data	<ul style="list-style-type: none"> • 1kg benzilate • 100kg (Amiton, PFIB) • 1 metric ton for other Schedule 2 chemicals 	<ul style="list-style-type: none"> • 10kg benzilate • 1 metric ton (Amiton, PFIB) • 10 metric tons for other Schedule 2 chemicals
Schedule 3	Production, import and export data	<ul style="list-style-type: none"> • 30 metric tons 	<ul style="list-style-type: none"> • 200 metric tons
Other chemical production facilities	Production data for previous calendar year only	<ul style="list-style-type: none"> • 30 metric tons for discrete organic chemicals containing phosphorous, sulfur, or flourine; • 200 metric tons for other unscheduled discrete organic chemicals 	<ul style="list-style-type: none"> • 200 metric tons

Source: The Verification Annex of the CWC.

parties. States Parties are not to maintain among themselves any restrictions or impediments to chemical trade, development, and promotion of knowledge for industrial, agricultural, research, medical, pharmaceutical, or other peaceful purposes.

Data Monitoring Requirements for Industry

Initial and annual data declarations will form the basis upon which the international inspectorate will monitor the destruction of chemical weapons and associated production facilities, guard against the diversion of commercial dual-use chemicals to prohibited chemical weapons production, and oversee permitted activities. Inspectors will spend most of their time correlating activities at declared sites with the data submitted about them. If inspectors find anomalies between the declared data and activities at a site, further investigation could follow. The data submitted will help the Technical Secretariat focus its inspections on "high risk" sites, such as a weapons storage facility or a commercial plant that uses large quantities of Schedule 2 chemicals.

Within thirty days of the CWC's entry into force and annually thereafter, states must declare the nature of the activities at commercial industrial sites that produce, process, or consume the dual-use chemicals on Schedules 2 and 3. States must submit data about an individual commercial facility when *yearly* production, processing, or consumption of Schedule 2 chemicals or production of Schedule 3 chemicals exceeds threshold quantities. (See Table 2.) An initial data declaration must be made for any

commercial facility that produced, processed, or consumed a Schedule 2 chemical above the specified threshold amount within the three previous calendar years. Similarly, initial declarations must be made for sites that produced more than thirty metric tons of a Schedule 3 chemical during the previous calendar year. Declarations are not required when facilities use Schedule 2 or 3 chemicals in low concentrations in mixtures. Separate annual declarations are required sixty days before the beginning of the calendar year for anticipated plant activities above the thresholds during the coming year.

The information that must be provided for individual commercial facilities declared under these guidelines includes the name of the plant site and its ownership, the precise location of the facility, the number and precise location of plants within the declared site, their main activities, and the chemical names, common or trade names, structural formulas, and Chemical Abstracts Service registry numbers, if assigned. For Schedule 2 plants, the declaration must also include a description of the declared activities (e.g., production capacity, dedicated or multi-purpose plant). Statements about the anticipated production, processing, consumption, import, and export of Schedule 2 chemicals must include the purpose of the activity, the product types involved, and information about the sale or transfer of the chemical to another industrial facility, trader, or state. Declarations about the nature of anticipated production of Schedule 3 chemicals can be made in ranges, such as 30 to 200 metric tons. Plant sites that previously produced Schedule 2 chemicals for weapons purposes must declare such activities, providing information on the plants and chemicals involved, the dates and quantity of production, the recipient parties, and the end product, if known.

In addition to Schedule 2 and 3 activities, each State Party must prepare an initial list of "other chemical production facilities" that is to be annually updated. Facilities in this category are not actually producing any of the chemicals on Schedules 1, 2, or 3, but have the potential to do so. The plant sites that must be listed are those that during the previous calendar year produced by synthesis either more than 200 metric tons of unScheduled discrete organic chemicals or more than thirty metric tons of an unScheduled discrete organic chemical containing the elements phosphorus, sulfur, or fluorine, which are the basic building blocks for making chemical weapons. "Other chemical production facilities" that exceed threshold limits must declare the plant name and ownership, precise location, main activities, and approximate number of plants in the site.

If a commercial site at any time since 1 January 1946 produced a Schedule 2 or 3 chemical for chemical weapon purposes, the nature of that activity must be stated in the initial data declaration. Information submitted for such sites must include the name of the facility, its ownership and precise location, and the specific plants within the site involved in the declared activity. For each Schedule 2 or 3 chemical produced for weapons purposes, the chemical name, common or trade name, structural formula, and Chemical Abstracts Service registry number must be provided. In addition, the declaration must include the dates when the chemical was produced, the quantity produced, the location to which the chemical was delivered, and, if known, the final product.

Table 3: Guidelines for Routine Inspections

Type of Facility	Initial Inspection	Advance Notice of Inspection	Duration of Inspection	Facility Agreement
Chemical Weapons Production	Mandatory	48 Hours	According to facility agreement	Mandatory
Chemical Weapons Storage	Mandatory	48 Hours	According to facility agreement	Mandatory
Chemical Weapons Destruction	Mandatory	36 Hours	According to facility agreement	Mandatory
Permitted Schedule 1 Activities	Mandatory	36 Hours	According to facility agreement	Mandatory
Schedule 2	Mandatory	48 hours	96 hours	Mandatory, unless otherwise agreed
Schedule 3 and other chemical production facilities	Optional	120 hours	24 hours	Optional

Source: The Convention's Verification Annex.

Routine Inspections

Sites that are declared because of their activities with Schedule 1, 2, and 3 chemicals as well as other chemical production facilities will be subject to routine inspection. (See Table 2.) The purposes of Schedule 2 and 3 inspections are to ensure that Schedule 1 chemicals are not being produced, the activities taking place are consistent with data declarations, and the chemicals produced are not being diverted for military purposes. In general, these inspections are to be conducted in a manner that causes the least possible inconvenience to the inspected state and disturbance to the host facility.

Commercial facilities that produce, process, or consume Schedule 2 chemicals in quantities in excess of specified thresholds are subject to inspection at any time. (See Table 3.) These facilities are to receive an initial inspection during which a facility agreement is to be prepared, unless otherwise agreed. The facility agreement delineates the specific areas within the site where the inspection has access. The need for and frequency of subsequent inspections at each Schedule 2 site will be based upon evaluations of the nature of the activity taking place and the site's risk factors such as toxicity, convertibility, and quantity. However, no site is required to receive more than two routine inspections in a calendar year. Inspections at Schedule 2 sites will be conducted with forty-eight hours notice and will last no longer than ninety-six hours, unless otherwise agreed.

A commercial facility that produces an aggregate quantity of more than two-hundred metric tons of any dual-use Schedule 3 chemical during the past year or anticipates aggregate production over that threshold during the coming year will be subject to routine inspection at any time. The Technical Secretariat will select sites for such inspections randomly, with an emphasis on achieving an equitable geographic distribution of inspections. No one site is required to receive more than two routine inspections per calendar year. These inspections will take place with 120 hours advance notice and are to last no longer than twenty-four hours, unless otherwise agreed. The onset of

Table 4: Potential Access Areas During Routine Inspections

- Areas where feed chemicals or reactants are delivered or stored;
- Areas where manipulative processes are performed upon the reactants before they are put into reaction vessels;
- Feed lines from these areas to the reaction vessels, along with their associated valves, flow meters, and other equipment;
- The external surfaces of reaction vessels and ancillary equipment;
- Lines from the reaction vessels leading to long- or short-term storage or to equipment where further processing with declared Schedule 2 chemicals will take place;
- Control equipment associated with any of these items;
- Equipment and areas for waste and effluent handling; and
- Equipment and areas for disposition of chemicals not up to specification.

routine inspections at other production facilities will begin by the fourth year after the Convention enters into force, unless the Conference of States Parties decides otherwise.

The host state will receive advance notice of a pending inspection, the site to be inspected, the names of inspectors and their assistants, and the place and approximate time of arrival of the inspection team. At the beginning of all inspections, the plant managers will be expected to brief the inspection team about the facility, its activities, and the safety measures to be followed while on the premises.

The treaty provides that the inspection team will have the right of “unimpeded access” to various areas on-site. (See Table 4.) However, the host state or facility has the right to object to requests from the inspection team if it feels that a request goes beyond the inspection’s purpose. The inspectors are allowed to bring equipment, such as a mass spectrometer or other devices, to assist them with their tasks. (See Table 5.) The Preparatory Commission and later the Technical Secretariat will select, test, and approve the inspectors’ equipment. The equipment carried by the inspectors will be specifically designed for the type of inspection to be conducted.

Inspectors can interview personnel at the facility, review documentation and records, have photographs taken at their request, and request clarification of ambiguities that arise during the inspection. The inspectors can request that samples be taken, for example, from a reactor vessel, an effluent stream, or a bulk storage tank. The analysis of such samples would be done at the site, if possible, but samples could be transferred to approved OPCW laboratories off-site for additional analysis, if needed. Before leaving, the inspection team will meet with host officials to tell them the preliminary findings of the inspection and to clarify any remaining ambiguities. Final reports on inspection activities, due ten days after the inspection is completed, will contain only facts pertinent to the Convention and will be treated confidentially.

Confidentiality Guidelines and Safeguards

The Convention’s verification regime seeks to establish a balance between the need for inspectors to have enough access to detect prohibited activities and the need for countries and chemical companies to protect sensitive information. The Convention’s

Table 5: Potential Types of Inspection Equipment

<ul style="list-style-type: none"> • Measuring equipment (e.g., scales, tape measures, levels, range finders, calipers, ultrasonic thickness gauges) • Photographic equipment (e.g., still cameras, video cameras); • Detector equipment; • Sample collection, preparation, and transfer equipment; • Sample screening equipment (e.g., radiographic, acoustic/ultrasonic, neutron interrogation); • Sample analysis equipment (e.g., gas chromatography-mass selective detection, Fourier transform infrared spectroscopy, liquid chromatography); • Equipment to mark and secure items (e.g., tamperproof seals, marks, tags); • Site location and identification equipment (e.g., Global Positioning System, maps, site diagrams, satellite photography, compass); • Protective and safety equipment (e.g., personal protection, decontamination, safety clothing); • Medical equipment and supplies (e.g., antidotes); • Communications equipment (e.g., satellite link radios); • Miscellaneous equipment (e.g., calculators, night vision equipment, computers, tool kit, cassette recorders, power supply).
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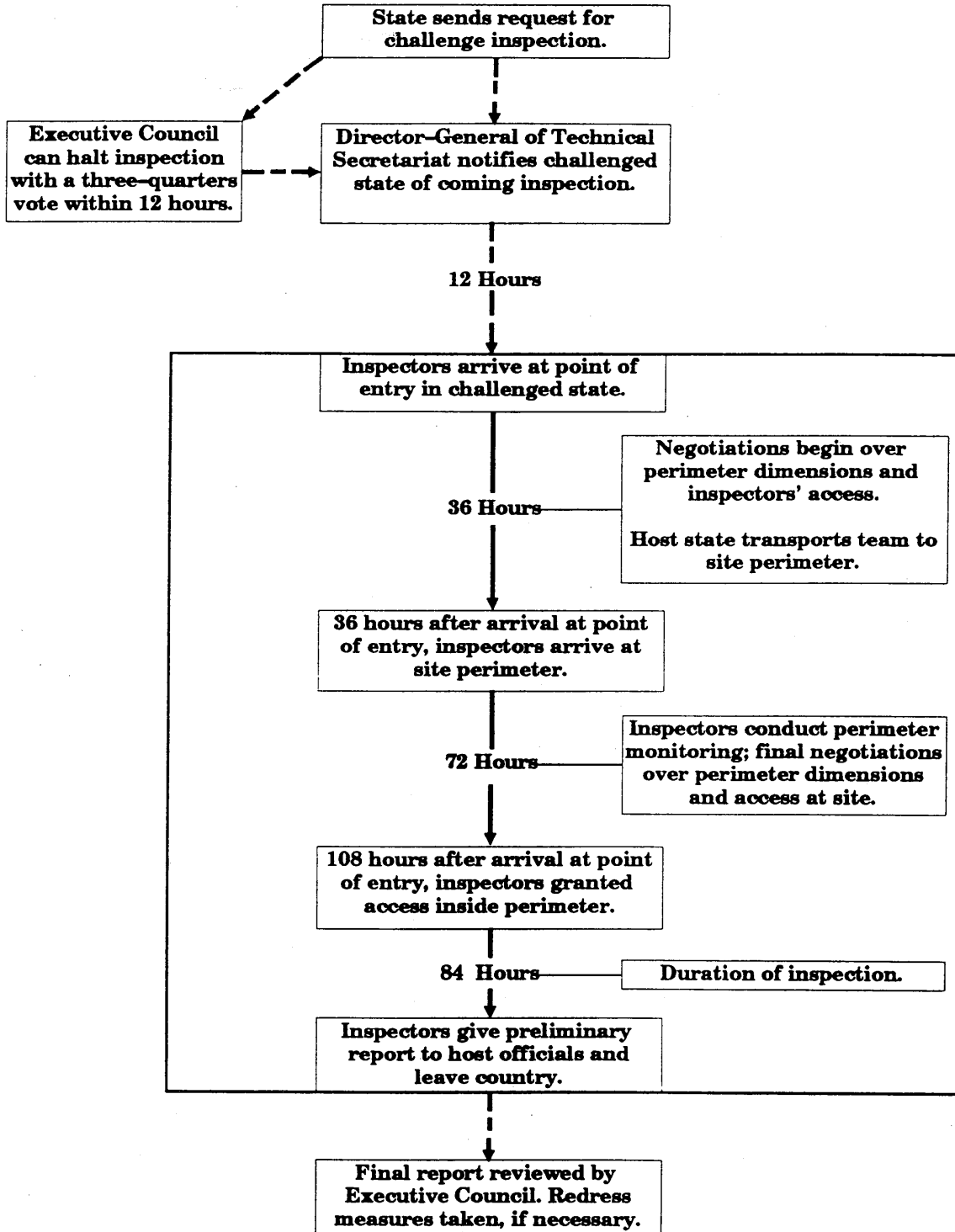
confidentiality rules will govern the data monitoring and inspection process. The Technical Secretariat is obligated to safeguard all confidential or proprietary information derived from data declarations and its monitoring activities at civilian and military facilities, just as States Parties are obligated to treat confidentially any information that the OPCW supplies to them. The Technical Secretariat will establish a classification system and a secure storage capacity to handle sensitive information. The Technical Secretariat will publicly release general information concerning the CWC's implementation but will provide sensitive information concerning a specified activity or facility only when a State Party gives express permission.

While on site, inspectors are to ask for only the minimum amount of information and access needed to accomplish their tasks. The monitoring equipment used by inspectors, such as gas chromatographs and mass spectrometers, will be designed to collect information needed to monitor compliance with the CWC without allowing inspectors to exceed their mandate and collect sensitive and proprietary information that is outside the scope of treaty-related activities.

Challenge Inspections

Any treaty party that suspects another State Party of conducting activities prohibited by the Convention has the right to ask for a challenge inspection of the suspect site. The Director-General notifies the state being challenged of the location of the inspection site no less than twelve hours before the inspection team will arrive at the point of entry in the challenged state. Once the inspection team lands, the host state is obligated to transport the inspectors to the perimeter of the suspect site within thirty-six hours. (See Figure 1.) The dimensions of the perimeter are subject to negotiation, but must be ten meters outside of any building or security structures.

Figure 1: Timeline for Challenge Inspections



Source: The Convention's Verification Annex.

Once at the perimeter, the inspectors are allowed to examine traffic logs, take photographs and videos, and go under escort to other parts of the perimeter. When agreement upon the final perimeter is reached, the inspectors are also allowed to take air, soil, and effluent samples and to use monitoring instruments within a fifty meter band around the perimeter. Host officials must allow the inspectors access inside the perimeter within 108 hours—four and a half days—after the inspection team initially arrives. Unless otherwise agreed, the inspection inside the perimeter will last no longer than eighty-four hours.

Challenge inspections will be guided by the principle of “managed access,” which ostensibly allows inspectors enough access to determine whether the site is indeed involved in prohibited activity while also allowing the facility under inspection to protect sensitive information unrelated to the Convention. The extent of access to any particular place or places within the site, the exact nature of inspection activities, and the information that the host officials are to provide to the inspection team are subject to negotiations between host officials and the inspection team. Officials at the site can turn off computers, protect sensitive business or national security information, and shroud all or parts of sensitive displays, equipment, and stores of goods. Host officials can also restrict sampling to the presence or absence of Schedule 1, 2, or 3 chemicals and their degradation products. While inspectors technically have the right to go into any part of any building, in practice they will rarely cover all areas of a suspect site. In particularly sensitive situations, the inspectors may select a percentage of buildings and random areas within those buildings for inspection. Host officials may request that only an individual inspector enter particularly sensitive areas. In compiling their report, inspectors will take into account the nature of the cooperation and access provided by host officials.

The Convention contains several provisions against using challenge inspections as a pretext for snooping for national security or commercial secrets. If the Executive Council deems a request for a challenge inspection frivolous, abusive, or beyond the scope of the CWC, a three-quarters vote of its members within twelve hours can halt the challenge inspection. Otherwise, the challenge inspection proceeds as requested. If, however, the Executive Council finds that a completed challenge inspection was abusive, it can require the requesting state to pay all or part of the costs of the inspection. States are obligated to request a challenge inspection only when it concerns a matter directly related to compliance with the CWC. Subject to the approval of the host state, the state requesting the challenge inspection may send an observer—not an inspector—with the inspection team.

