

**CHEMICAL INDUSTRY INSPECTIONS UNDER THE
CHEMICAL WEAPONS CONVENTION JOHN HART**

verification matters

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Acknowledgements

There are a number of difficulties in preparing a report such as this. First, there are literally several hundred discrete policy issues to be considered. Second, outsiders can find it hard to discern the daily operations of the Organization for the Prohibition of Chemical Weapons, partly because of its efforts to minimise the possibility of sensitive information being disclosed. Some of the information is ‘confidential business information’ obtained during inspections of the chemical industry. Some of it is considered sensitive for political or institutional reasons. Finally, people and organisations involved in implementing the Chemical Weapons Convention have different views about what is or is not occurring.

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Introduction

On-site inspections (OSIs) are one of the principal means for verifying state party compliance with the 1993 Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction (CWC).¹ The purpose of OSIs is to detect evidence of non-compliance, add to the deterrent effect of the verification system as a whole and enhance confidence that the treaty is being implemented effectively. There are two ways in which the chemical industry can be subject to OSIs under the CWC.² One is if the industry produces chemicals listed in the three 'schedules' of the treaty's Annex on Chemicals, covering approximately 20,000 substances that are believed to have relevance to chemical weapon (CW) production.³ States parties are required to provide regularly a range of information on 'facilities' or 'plant sites' that produce, consume or handle Scheduled chemicals. They must also declare whether they possess CW, CW production facilities or CW storage facilities. The other is through the application of the 'general purpose criterion', which is meant to capture any chemicals not listed in the Annex by banning the development, production and stockpiling of *all* chemicals except for legitimate, peaceful purposes.⁴ Under this criterion, all chemical industry may, in principle, be subject to inspection to ensure that prohibited activities are not occurring. States parties are obliged to take steps to apply the criterion.⁵ If one or more states parties believe an unlisted chemical needs to be covered, they can seek agreement from the other states parties to have the Annex on Chemicals amended or, if appropriate, they can request a challenge inspection.

Thus far, however, chemical industry osis have been based entirely on so-called Schedule 1, 2 or 3 chemicals, listed in the Annex on Chemicals, and certain unscheduled discrete organic compounds, some of which may contain phosphorus, sulphur or fluorine (DOC/PSF) and which are regarded as relevant to CW production.⁶ The unwillingness of states parties to extend the scope of chemicals subject to systematic inspection reflects a desire to limit the regime's scope in order to minimise cost and intrusiveness, as well as a lack of credible information that a party is using unscheduled chemicals for non-peaceful purposes.

OSIs are carried out by a professional cadre of inspectors employed by the Organization for the Prohibition of Chemical Weapons (OPCW), which monitors and verifies compliance with the CWC. Based in The Hague, Netherlands, it consists of three organs: the Conference of the States Parties (CSP), the Executive Council (EC), and the Technical Secretariat (hereinafter the 'Secretariat'). The CSP is the OPCW's decision-making body, and it meets in regular session once a year. Its duties include appointing the Director-General and approving the annual budget. Any major, unresolved compliance concerns are eventually forwarded to the CSP. The EC, for its part, convenes in regular session four-to-five times a year, deliberates specific implementation matters and prepares recommendations for consideration and possible adoption by the CSP. Finally, the Secretariat is responsible for implementing CWC provisions, including OSIs.

Some of the principal issues affecting chemical industry inspections are: the handling and processing of information derived from state party declarations, as well as data derived from national technical means (NTM)⁷ and open-source literature; the degree of on-site access permitted to inspection teams; the frequency of inspections and the 'risk' posed by different types of 'facilities' and 'plant sites' to the CWC; and key OSI procedures and implementation issues, including sampling and the selection and use of approved equipment and procedures for possible challenge inspections.

There is an inherent tension that invariably affects the conduct of chemical industry inspections. On the one hand, OSIs need to be effective and efficient and the frequency of inspections needs to be set accordingly. Inspections must encompass enough of the chemical industry in each state party to provide assurance that prohibited activities are not occurring. On the other hand, industry naturally wishes to restrict the scope and intrusiveness of inspections in order to protect confidential business information (CBI). States, to varying degrees, also interpret guidelines and principles in order to restrict the scope of the treaty, both to assist their industry in its desire to protect CBI and to protect state secrets. Equally important, there are costs to industry associated with the time that inspected facilities must devote to hosting inspections and with the amount of paperwork that states parties must process. These costs are partly determined by the size of the inspection teams and by the frequency of inspections at different facilities.

Chemical industry inspections

The OPCW currently employs about 200 inspectors, who are full-time employees of the Secretariat and form the bulk of the Inspectorate Division. This body handles operational matters directly related to the conduct of inspections. The Verification Division, meanwhile, processes declarations and manages technical and political issues emanating from the inspections.

Inspection procedures

The OPCW's Standard Operating Procedure (SOP) informs the planning and conduct of all OSIs, including the designation of inspection team members, their privileges and immunities, standing arrangements such as the designation of one or more points of entry (POE) through which inspection teams are authorised to enter the state party, use of approved equipment and inspection activities. The SOP also contains

formats for every type of information exchange between the Secretariat and states parties. When the Secretariat plans to inspect a given facility, for example, it provides the state party with information, such as the numbers of inspectors and approximate time of arrival of the inspection team at the POE, using the draft 'notification of inspection' format contained in the SOP. The state party has one hour in which to respond if it envisages any difficulties in receiving the inspection. Aspects of the inspection, such as exact timing, may be modified to meet exigencies. Otherwise the inspection proceeds according to plan. The Secretariat then provides the inspected state party with the precise time of arrival of the inspection team. In the case of systematic inspections, inspection teams travel on regularly scheduled commercial flights from Amsterdam's Schipol airport. During a challenge inspection or an investigation of alleged use of CW, however, an inspection team would almost certainly use a chartered aircraft along with a standing diplomatic clearance number for non-scheduled aircraft in order to allow the plane to enter a state party's air space safely. Unlike systematic inspections, states parties must accept challenge inspections within the timeframes specified in the CWC.

A typical OPCW industry inspection team consists of four-to-five persons. Once the team has arrived at the POE, the inspected state party must transport the team and its equipment and supplies to the inspection site within 12 hours. Prior to leaving the POE, the state party's 'host team' may examine the inspection team's equipment. On arrival at the site, an industry representative provides the team with a pre-inspection briefing. Based on this consultation, the team devises an inspection plan. Interaction between the OPCW and the inspected state party formally takes place between the heads of the inspection team and the host team, respectively. In some states parties, the interaction between the inspection team and the inspected state party is carried out strictly between these two representatives. During inspections in other states parties, by contrast, interaction may take place directly between inspection team members and facility representatives.

Right of access

An inspection team's right of access to a state party's territory and facilities is not unlimited. Access is managed in two ways. First is through the application of the provisions of the CWC as a whole, including the detailed timeframes for carrying out challenge inspections set out in the treaty's Verification Annex. Second, in cases where access is disputed, 'managed access procedures' may be invoked.

Access is restricted by the treaty as a whole because chemical industry OSIs are designed only to confirm the consistency of information contained in a member state's declarations. This is achieved by ascertaining the nature of the 'facility' or the 'plant site', and determining whether declared and/or undeclared chemicals have been diverted for prohibited purposes. Teams conducting systematic inspections do not attempt to prove the absence of undeclared chemicals, but rather look to confirm the contents of the declaration. This limits the intrusiveness of the inspection. Any inconsistencies can be clarified either on-site or during the preparation of the Final Inspection Report (FIR), which takes place at OPCW headquarters after the inspection team has returned.

Degree of access also varies according to the type of inspection being conducted. Inspection access is, for example, regulated for Schedule 1 facilities and Schedule 2 plant sites by 'facility agreements'. This is the main method by which inspection team access is managed in practice, and may be necessary in order to conduct inspections without violating domestic laws prohibiting unreasonable searches and searches without warrants. These agreements are signed by the Director-General and a state party representative, such as the head of the national delegation or 'national authority' (the national body that implements the CWC). They include: a preamble that gives the facility's name and address; general CWC provisions relating to approved inspection equipment and its use; specific health and safety procedures; and arrangements to protect confidential information. They also indicate the facility's normal working hours, as systematic inspections of the chemical industry are only carried out during those times.

Managing access is necessary to protect CBI, which, in turn, is dealt with through, *inter alia*, the development of sound facility agreements, reasoned use of clarification procedures,⁸ and, where appropriate, managed access techniques. The latter can result in the shrouding of control panels, the turning off of equipment, or the restriction of entry to only an agreed percentage of buildings randomly selected. Managed access techniques are used at any particular facility or plant on the basis of agreement between the inspection team and the inspected state party. They assume greater importance for Schedule 3 and DOC/PSF plants since facility agreements are not generally concluded for them. This is because inspections of such sites are ‘random’ and are therefore too infrequent, and because such sites are subject to a lower level of verification than Schedule 1 facilities and Schedule 2 plant sites.

On-site activities

The inspection team may examine certain production or consumption areas, analyse samples and review written records. Samples may be taken by representatives of the inspected state party under the observation of the inspection team. The inspection team may then conduct its analysis on-site or the sample may be transported off-site to a designated OPCW-approved laboratory. At the end of the inspection, preliminary findings are shown to officials of the inspected state party, allowing an opportunity for comment and discussion. Information considered to be unrelated may be removed by mutual agreement. The facility agreement (if one exists) may also be updated at this time. This may be necessary because a facility or plant may significantly modify its types and methods of production over the course of a single year. In addition, specific OSI-related concerns may be addressed administratively by revising facility agreements. The inspected state party’s representatives may ‘acknowledge’ or ‘take note of’ the preliminary findings. As the team prepares to leave the country, the inspected party may once again check its equipment.

Contribution of OSI activities to the final compliance assessment

Much information about the nature of the facility or plant site can be acquired through physical observation. Initial and routine inspections provide a baseline, and have the added benefit of enhancing the experience and expertise of individual inspectors and of the Secretariat overall. In many cases, judgements by experienced chemical engineers are important in establishing the probability of prohibited actions having taken place. Discovering whether illicit activities are occurring, though, largely rests on calculating the difference between inputs and outputs of chemicals at a given facility or plant site and assessing the likelihood of chemicals being diverted at intermediate stages (for Schedule 1 facilities and Schedule 2 plant sites).⁹ Chemical industry inspectors generally are involved in both chemical industry inspections and chemical weapon destruction inspections. This is partly because the presence of chemical industry experts enhances the effectiveness of verification of the latter. Conversely, the presence of chemical weapon experts on industry inspection teams enhances the effectiveness of such inspections. Any specific OSI assessment may have unique elements not foreseen by the general guidelines and principles for conducting inspections. Some degree of flexibility may then be required by both the inspection team and the inspected state party in order to achieve the inspection goals.

Completion of inspection and final assessment

Once the inspection team returns to the Secretariat, the team leader works with a designated planner in the Industry Verification Branch to produce an FIR. The Verification Division handles the rest of the process, which must be completed within 10 days of the end of the mission. The planner prepares a memorandum to the Director-General, highlighting any outstanding issues, and sends the inspected state party a copy of the FIR. Any comments must reach the Director-General no later than 30 days after the inspection is completed. The Director-General may approach the state party in an attempt to resolve

any uncertainties. If unsuccessful, the issue is referred to the EC. Outstanding matters must be resolved before the file can be closed.

Types of OSIs under the CWC

On-site inspections of the chemical industry can be divided into three categories: initial inspections, systematic inspections and challenge inspections.

Initial inspections

Initial inspections are equivalent to baseline inspections in other arms control and disarmament treaties. Under the CWC, the concept of an ‘initial inspection’ applies only to Schedule 1 facilities and Schedule 2 plant sites, since the frequency of inspection of Schedule 3 and DOC/PSF plant sites is ‘random’ and, therefore, too infrequent. These inspections allow the Secretariat to familiarise itself with each site and to acquire much of the information on specific risk factors (for Schedule 2 plant sites only) that will be used in planning subsequent inspections. Such factors include types of process equipment and isolation and safety features. Initial inspections for Schedule 1 facilities and Schedule 2 plant sites are also useful for finalising a facility agreement between the OPCW and a state party.

Systematic inspections

Systematic inspections are carried out, *inter alia*, to verify the destruction and non-diversion of chemical weapon stockpiles held by the states that have declared them, to ensure that declared former production facilities are converted or destroyed in accordance with treaty provisions, and to make certain that dual-use facilities are not engaged in prohibited programmes.

Challenge inspections

A challenge inspection is, politically and technically, the most serious and difficult type of OSI under the CWC. A challenge may be based on information derived from the OPCW itself or from states parties' NTM. It may occur at the request of one or more states parties which believe that another state party is in fundamental violation of the treaty—namely, the development, production, stockpiling or use of CW.

The timeframes for conducting a challenge inspection are detailed and potentially critical to the success of the mission.¹⁰ The Director-General is obliged to acknowledge within one hour the receipt of a request for an inspection, including specific information concerning the site, such as the requested perimeter. He must then inform the EC of the challenge inspection request at least 12 hours before the planned arrival of the inspection team. The EC may, with a three-quarters majority vote, stop the inspection from proceeding (the so-called red light procedure). Unless this occurs the challenged state party is required to transport the inspection team from the officially designated POE to the final perimeter within 24 hours. Discussions to establish an agreed perimeter may continue for up to 24 hours. During any perimeter discussions the inspection team seals all entrances and exits, except for the main entrance, and monitors the perimeter. Although the challenged state party may invoke managed access procedures, including the right to remove sensitive paperwork, log off computer systems and shroud sensitive equipment, responsibility for satisfying compliance concerns lies with the challenged state party. The duration of a challenge inspection may not exceed 84 hours once the final perimeter has been set.

There has been no challenge inspection to date. Although there have been informal allegations and rumours circulated that one or more parties is in violation of the treaty, as far as the OPCW is officially concerned, no states parties are currently under suspicion of fundamentally violating the treaty.¹¹ There is concern in some quarters that the regime has lost some credibility because no state party has been willing to request a challenge inspection.¹² The information used to back a challenge inspection must,

however, be credible to other states parties. There is a risk that information provided to support a challenge inspection request may be incomplete because the requesting state party might be unwilling to reveal its NTM 'sources and methods'. The information might therefore be insufficient to convince the OPCW membership of the need for any given challenge inspection.

States parties have given conflicting and inconsistent signals (if any) about the likelihood of a challenge inspection ever occurring, partly because governments are hesitant to cast aspersions on treaty compliance by another country. A challenged state party could reciprocate with a challenge inspection request of its own, although the EC and the Director-General are empowered to prevent challenge inspections deemed frivolous or abusive.¹³

Views differ, furthermore, on how and under what circumstances a challenge inspection should be initiated. A number of states parties, like China, feel that they are such a serious undertaking that they should be an option of last resort, especially in view of the political damage they might cause. Other states parties, such as the US, believe that informal consultation and clarification should not be considered a mandatory prerequisite to a challenge inspection, since they may give a violator time to take steps to evade detection. In fact, it seems likely that, if a challenge inspection does take place, the US will initiate it. It has already questioned the veracity or completeness of declarations by other states parties.¹⁴ Until April–May 2000, however, the US was in a relatively weak political position in the OPCW because it had not submitted its own industry declarations.

Some insights into how an actual challenge inspection might be carried out can be found in the results of a practice challenge inspection held at a military facility near Sao Paulo, Brazil, in October 1999.¹⁵ Based on a challenge by a fictitious country, Pangea, the inspection was conducted in 'real time' to maximise its didactic value.¹⁶ The principal problem encountered was that the OPCW team was initially unable to detect the target chemical, thiodiglycol (TDG), a possible sulphur mustard precursor, with its Gas Chroma-

tograph/Mass Spectrograph (GC/MS) detector in either blinded¹⁷ or open mode.¹⁸ It also discovered that the timeframe for moving support equipment with civilian aircraft could not be met over great distances. And negotiations to set the final perimeter and start the 84-hour inspection clock proved difficult.¹⁹ Yet the Secretariat did demonstrate that it could field a team and conduct a challenge inspection.

The Brazilian exercise also underscored the need to explore more fully the politico-psychological dimensions of challenge inspections. This could be done by holding further practice and systematic inspections. The expertise needed to carry out an actual challenge inspection could be acquired from a generalisation of lessons learned, the development of case studies and more practical experience.

Implementation of on-site inspections

As of 27 April 2001, the OPCW had completed 82 inspections of Schedule 1 facilities, 167 of Schedule 2 plant sites, 65 of Schedule 3 plant sites, and 51 of DOC plant sites. Most of these inspections have gone smoothly. According to one OPCW source, approximately 99 percent of outstanding problems have been resolved. In testimony before the US House of Representatives' Subcommittee on National Security, Veterans Affairs, and International Relations, the Assistant Secretary of Commerce for Export Administration, R. Roger Majak, said that:²⁰

The [civilian chemical industry] sites we have worked with have been very co-operative, and have provided positive feedback concerning the conduct of these inspections. The [OPCW] inspection teams have been uniformly respectful, professional and competent. So far, all industry inspections have been completed successfully, and while a few significant issues have arisen, there have been no findings of non-compliance.

Most of the problems that have occurred have been addressed in subsequent consultations and usually have been resolved well before the facility or plant site has been re-inspected. Chemical industry inspections have not been confrontational. Inspection teams have been granted access and industry representatives have tried to be accommodating. In fact, there have been more problems between inspection

teams and host teams than between inspection teams and the chemical industry. This is mainly due to the fact that some governments insist on strict and literal interpretation of treaty requirements. Any implied latitude in the interpretation of treaty provisions is carefully avoided.

Outstanding implementation problems

A number of unresolved implementation problems have reduced the effectiveness of the chemical industry verification regime, including: inconsistency of data; access to 'facilities' and 'plant sites'; access to records; disputes over the copying of inspectors' notebooks; acquisition and use of information by inspectors; protection of CBI; the use of sampling; and disagreements over the approved equipment list.

Inconsistency of data

The Secretariat has experienced difficulties in processing declarations partly because of inconsistencies in how 'facilities' or 'plant sites' are declared from year to year.²¹ Some appear in successive declarations under different names or not at all. To a certain extent, this is due to the fact that some chemical industry is consolidating its activities in order to minimise its exposure to OPCW verification and, hence, to decrease or eliminate the associated costs. In some cases, companies have reduced the number of facilities or plant sites declarable under the Convention. In other situations, firms have modified production processes that use scheduled chemicals.²² Such alterations also reflect the dynamic nature of the industry, which can change significantly over the course of a single year as a result of market forces.

Another problem relates to inconsistencies in how states parties provide the Secretariat with 'aggregate national data' on the production, processing, consumption, import and export of Schedule 2 chemicals, and on the production, import and export of Schedule 3 chemicals.²³ States parties have used at least

30 different methods to collect information and report on transfers of Schedule 2 and Schedule 3 chemicals, making the Secretariat's task of compiling such data more difficult. This problem is the subject of continuing discussion between states parties and Secretariat staff. In the main, states parties have been unable to harmonise their methodologies.²⁴ Finally, there have been discrepancies between data provided by importers and exporters of chemicals deemed declarable under CWC reporting requirements.²⁵ Figures can fluctuate by a factor of 10 to 100.²⁶

Several scheduled chemicals are not being declared to the OPCW. In at least one case this is due to disagreements over whether states parties should declare CWC-listed chemicals that are produced and consumed during intermediate stages of production. The specific case behind the discussion of this issue, referred to as 'captive use',²⁷ is whether 3-Quinuclidinyl benzilate (BZ), a Schedule 2 chemical that has been developed for use as a hallucinogenic chemical weapon in the past and is produced and consumed during an intermediate stage of a production process for peaceful purposes, should be declared.²⁸ Some plant sites do not declare BZ, as it is considered to be an intermediate substance that is not isolated. Other states parties, however, feel that it should be declared because the chemical compound could be isolated.

Perfluoroisobutene (PFIB) is another Schedule 2 chemical previously developed as a CW that is not being declared by some states parties.²⁹ There are an estimated 19 facilities producing PFIB, of which only five have been declared to the OPCW. The technical reason why PFIB has not been declared is that Schedule 2 and Schedule 3 chemicals appearing in mixtures at 'low concentration' need not be declared. The quantitative low concentration declaration thresholds have not been agreed for Schedule 2A and 2A* (PFIB appears under Schedule 2A).³⁰ The higher the declaration threshold, the more the scope of the CWC's application and associated costs are reduced. By adjusting the quantitative low concentration declaration thresholds, a state party can, therefore, either include or exclude scheduled chemicals from having to be declared.

In at least some instances, the PFIB percentage appearing in mixtures is apparently in excess of 50 percent. Such cases ought to be declared, since it is illogical to consider anything above 50 percent as 'low'.³¹

Degree of access to facilities and plant sites

Discussions have taken place among states parties and between inspection and host teams on the meaning of 'plant' or 'plant site' and the degree of access that should be allowed beyond plants that are the focus of the inspection. Some relatively minor disagreements have surfaced concerning the boundary of a co-existing facility. More importantly, there has been occasional lack of agreement on granting access in Schedule 1 facilities to 'consumption areas'—where intermediate chemicals are consumed as part of the production process—on the grounds that only final 'production areas' should be inspected.³² A 'facility' can consist of more than one production, processing or consumption 'plant'. But some states parties have argued that only production areas should be inspected. By contrast, greater access is granted to Schedule 1 'facilities'. This is reflected in the use of the term 'facility', as opposed to 'plant' or 'plant site'.³³

Admission to a number of production, processing or consumption areas in some Schedule 2 plants was initially of concern to inspectors. In at least one case, the inspected party did not wish to grant entrance to the production area because one of the steps in the production process was not patented and not listed in the flow charts showing the production route.³⁴ Since then, however, access has not been much of a problem. This may be because industry fears were allayed once it realised that it did not have to reveal CBI.

Admittance to Schedule 3 plant sites to verify 'declared main activities' has been contested in some cases, but all such instances have been resolved. The degree of access to consumption areas at Schedule 3 plant sites was of some concern, but these fears have also largely been allayed as a result of agreements between the OPCW and the inspected state party. The specific reasons why access was denied are unclear, but they were undoubtedly related to protection of CBI.

Access to records

An issue that has been raised between inspection teams and the inspected state party during Schedule 2 and Schedule 3 inspections is how far back in time the team should be allowed to go when checking site records. Access to production data and output figures has been the subject of continuing debate. The underlying question that inspection teams have tried to address is the purpose of production. In an effort to answer this question, it is helpful, and perhaps necessary, to identify end products.

The Secretariat has produced a paper recommending that normal record reviews at Schedule 2 plant sites encompass only the previous three years and only the past year at Schedule 3 and DOC/PSF plants.³⁵ The Industry Cluster—an informal group of experts that, between EC sessions, considers unresolved industry-related issues—is deliberating the matter.

Copying inspectors' notebooks

The matter of whether and under what circumstances an inspector's notebook may be examined and/or copied by the inspected party has received much attention in the OPCW and among some observers.³⁶ Inspected states wish to minimise the possibility of a negative verification appraisal based on uncertainties that may be essentially 'procedural' or 'technical'. The CWC outlines debriefing procedures under which the inspection team and the inspected party discuss preliminary findings and attempt to clarify ambiguities before the team departs.³⁷ Some states have expressed concern over what they regard as significant differences between the preliminary findings, as communicated on-site by the inspection team, and the FIR. It is notable that team members have the right to attach dissenting assessments to the FIR.³⁸

Following intensive discussions in 1997, the OPCW revised its SOP in 1998 so that the inspected state party has the right to view and, if it wishes, copy an inspector's notebook. The original intention of the CWC drafters seems to have been to accord an inspection team's 'papers and correspondence' the same

inviolability as documents in the possession of diplomats.³⁹ Some outside observers feel that the right of the inspected state party to duplicate notebooks calls into question the principle of diplomatic immunity under international law. This decision could also cause inspectors to feel constrained in recording their views, especially in relation to suspected violations while on site or when the team's preliminary report is being drafted. Inspectors differ on whether this is likely. Inspectors from some countries may feel constrained by the possibility that their future job prospects might be in jeopardy as a result of adverse findings they make—for instance, in respect of a close ally of their country. It is important to note, however, that Secretariat employees are international civil servants and are, therefore, obligated to represent only the OPCW. In future, steps could perhaps be taken to provide a degree of anonymity to inspectors. This may not be feasible, though, especially in cases where notes are taken in different languages, which would indicate the inspector's nationality, and where the size of the inspection team is small.

The inspector notebook issue shows the gap between the apparent intent of the CWC negotiators and treaty implementation. The emergence of such differences is not necessarily a negative development. Some degree of flexibility is required during the implementation of any agreement, as theory rarely matches practice and conditions change after a treaty is negotiated, especially if there is a prolonged period before entry into force. In addition, the treaty contains internal inconsistencies and ambiguities which must be resolved one way or the other. The notebook decision is a matter of concern, however, not only because it is perceived by some as transgressing a CWC provision,⁴⁰ but also because it tends to entrench the pre-eminence of an inspected state party's concerns and interests over those of the OPCW.

Acquisition and use of information

Chemical industry inspections are based on information provided in state party declarations. The purpose of non-challenge inspections is to confirm the consistency and accuracy of the contents. Open-source

literature and information derived from NTM are not supposed to affect the conduct of systematic chemical industry inspections. It is conceivable, however, that compelling data could be acted on regardless of how it was derived or circulated. The use of information derived from NTM, in particular, is a politically sensitive issue, which states parties discussed during the deliberations of the Preparatory Commission (1993–97). The issue has surfaced periodically since entry into force of the CWC. The Secretariat uses non-official information for training and background purposes, but not as a basis for an inspection mandate.⁴¹ Although industry inspections are driven by the contents of declarations, information obtained through NTM will almost certainly constitute the foundation of a challenge inspection request.

Protection of confidential business information

The interpretation of managed access differs widely among states parties. In general, successful implementation of chemical industry inspections could be facilitated by the adoption of more uniform standard reporting procedures and by wider adherence to international codes on ‘good manufacturing practice’; the overall effect of which would be to enhance transparency. Well-run facilities or plant sites that adhere closely to industry regulatory codes and guidelines are easier to inspect and tend, for example, to keep better records. Inspection teams that encounter chaotically run sites may require additional information and more intrusive access in order to fulfil their mandates.

Sampling

CWC negotiators expected that sampling would be more frequently employed and would have more impact on the verification of industry sites than has been the case. In fact, it was not until March 2001 that OPCW analytical equipment was actually used in an industry inspection. Some states parties have insisted that samples be left on-site (in sealed containers) and that they not be analysed abroad at OPCW-

designated laboratories. (The OPCW operates one analytical laboratory in Rijswijk, Netherlands. All other laboratories must be periodically tested and accredited by the Organization.) In some cases, samples have been analysed in a national laboratory. But no samples have yet been taken off-site by OPCW inspectors.

Practical problems associated with obtaining definitive, reliable results from analytical equipment were not fully appreciated by those involved in developing OPCW procedures. For instance, some difficulties have arisen in regard to implementing the blinded mode concept. During routine industry inspections, the OPCW is generally only allowed to use GC/MS monitors in blinded mode. Readings could thus be of limited use, since the answer is either yes or no. Any GC/MS should first be calibrated on-site using test samples. It is necessary to ensure that the instrument is properly calibrated and functioning, such as checking for leaks in gasket seals and ascertaining the proper functioning of the air intake pump. Given that calibration sometimes takes many hours, and that time for Schedule 2, Schedule 3 and DOC/PSF inspections is limited, the practicality of using some analytical equipment to support industry inspections has been questioned. Samples must also be taken from exactly the right place, an issue that manifested itself during the practice challenge inspection in Brazil, and must be acquired and handled according to an agreed protocol to avoid contamination or destruction. Finally, the test results should be reproducible.

Although the Preparatory Commission developed sampling and analysis protocols, a wider understanding of the issue only occurred after implementation. The presence of trace quantities of scheduled chemicals or their degradation products, for example, might not be a valid indication of undeclared scheduled chemical activities. This is due to the fact that a large number of reactions can theoretically take place between chemicals at the micro-level, involving substances intentionally used on-site, or the presence of naturally occurring chemicals or pollutants. The ability of modern analytical equipment to detect trace chemicals, together with operating detection equipment in blinded mode, limits the inspection team's

ability to appreciate the context in which their readings were taken.⁴² The political implications of false positive readings are only now being more widely appreciated.

Approved equipment list

The OPCW's approved inspection equipment list consists of administrative equipment, medical equipment, occupational health equipment, portable equipment, and protective and safety equipment.⁴³ Discussion in the Organization on the approved list has centred on whether certain types of equipment regarded as dual-use should be made commercially available to all states parties, since it could contribute to offensive CW programmes. Some of the equipment appears on export control lists, such as those of the Australia Group, an informal arrangement between 32 countries that attempts to co-ordinate national export controls in order to prevent the proliferation of chemical and biological weapons.⁴⁴ Some states, like China and Iran, feel that such informal chemical weapon-related export control arrangements should not be applied against states that are parties to the CWC.

A second issue is that the principle of 'equitable geographic distribution' should be taken into account when considering items for inclusion on the list. Hence the country of origin of the item should be considered. There is great reluctance among some delegations to make any changes to the list in order not to open it up to major or open-ended revision.

Some inspected facilities have been unwilling to allow on-site a number of items on the equipment list, and some states parties have systematically excluded the use of specific items. Some inspected states parties, for example, have insisted that inspection teams use a facility's hard hats, goggles or coveralls, rather than those belonging to the inspectors. This may be necessary to satisfy domestic health and safety regulations, or might be related to the fact that clothing can act as chemical 'sorbents', meaning airborne particles or chemical compounds may adhere to clothing and be characterised by subsequent chemical

analysis. Some parties do not allow the use of Global Positioning System (GPS) devices or secure voice telephones that emit electromagnetic radiation,⁴⁵ while some prohibit the use of flammability/explosive/air quality monitors. OPCW inspection teams have had no problems accommodating such requests. But some restrictions on sampling and testing equipment are thought by some to be against the spirit of the CWC. The EC is considering these matters.

Issues of concern

Increasing 'unresolved uncertainties'

There appears to be a trend towards more unresolved issues, or 'uncertainties', arising during chemical industry inspections. (The term 'uncertainty' is a neutral one used to avoid any implication that a state party's compliance with the CWC is being queried.) If an uncertainty remains unresolved it is possible that the matter will become more serious and the state party's treaty compliance status will then be called into question.

In February 2001 there were seven uncertainties in four states parties, compared with one in late 2000.⁴⁶ This could suggest that some states parties may be becoming less willing to resolve uncertainties, which, in turn, may be a reflection of a reduced level of political commitment to the regime. It could also reflect a change in OPCW inspection procedures or it could mean that OPCW inspectors have improved as they accumulate more experience. As yet, the absolute number of uncertainties is too small to permit any firm conclusions to be drawn. More important, perhaps, would be the potential political fallout if any of these uncertainties were formally considered by the EC and the press published alarmist reports alleging that 'chemical weapons inspectors uncover "uncertainties" in plant x'. This could undermine public confidence in the effectiveness of the CWC.

Attempts to redefine key terminology

Another recent development is that, during informal discussions within the OPCW, some states parties have attempted to define a ‘plant’ as a single item of equipment, namely a reactor vessel or a distillation column. Also, some of the language in the draft protocol to the Biological and Toxin Weapons Convention (BTWC)—which, until mid-2001, was being negotiated by an Ad Hoc Group in Geneva, Switzerland—has apparently been used in some cases in relation to industry inspections. Chemical industry ‘inspections’ have been referred to as ‘visits’. And at least some ‘challenge inspections’ have been termed ‘investigations’ within the OPCW. This softening of terminology suggests that a number of states parties are attempting to recast at least some chemical industry inspections as confidence-building measures rather than verification measures.

Maintaining the competence of the Secretariat

OPCW inspection teams are known for their professionalism and competence. Secretariat personnel have unique expertise, including that gained from experience with the UN Special Commission on Iraq (UNSCOM) and with national CW programmes. Maintaining this proficiency will require sustained political and financial commitment by states parties. It is important that steps be taken to ensure that the Secretariat retains an institutional memory. Key officials could be encouraged (or required) on their retirement to prepare a report summarising their experience. Such reports could be made available to newly-recruited Secretariat staff. Also, the current seven-year tenure policy for Secretariat staff should be revisited. In particular, individuals with specialised expertise, especially those with natural science backgrounds, should be encouraged to remain longer. Finally, the lessons learned by UNSCOM, which are currently being considered by its successor, the UN Monitoring, Verification and Inspection Commission (UNMOVIC), should be made available to the OPCW.

Funding of inspections

At the beginning of 2001, the Organization entered a period of unprecedented financial uncertainty, mainly due to lower than projected reimbursements for certain 'direct costs of verification', which inspected states parties are required to pay.⁴⁷ As a result, planned OSI activities for 2001, including those related to industry, will probably have to be curtailed.⁴⁸ The full complement of chemical industry inspections in 2001 was supposed to be 132, but funding did not exist during the first half of the year to complete all of them, unless cutbacks in expenditures were made elsewhere in the Organization. The Secretariat, nevertheless, conducted 25 chemical industry inspections, on an unreduced schedule, prior to the sixth CSP from 14–19 May 2001. The CSP did not, however, allocate additional funding for 2001. States parties were enjoined to contribute to a voluntary fund to defray the budgetary shortfall, but based on past experience of other treaty regimes, this retreat to volunteerism is unlikely to succeed. Any reduction in the inspection schedule for the chemical industry will be focused on Schedule 2 and 3 plant sites.⁴⁹

The number of chemical industry inspections is likely to remain between 100 and 150 a year. Demands for industry inspections are unlikely to change significantly in the near term, partly because almost every state with significant chemical industry is already a CWC state party.⁵⁰ One way that chemical industry inspections could, in principle, be extended is by reconsidering the extent to which biotechnology firms are subject to CWC provisions. This could result from the increasing overlap between 'chemical' and 'biological' industrial processes. More specifically, biotechnology could be made subject to CWC inspections in one of two ways. One is how the CWC term 'production by synthesis' is interpreted and whether a single interpretation is eventually adopted by consensus.⁵¹ If it were taken to include 'biological and biologically mediated processes', this would allow for more extensive inclusion of biotechnology firms. The second derives from the fact that, in principle, the Convention covers toxins and, in particular,

saxitoxin and ricin. However, some states parties, including the US, maintain that ‘production by synthesis’ does not include ‘biological and biologically mediated processes’.⁵² In addition, the OPCW has taken decisions, which are not unreasonable, limiting the verification of production, transfer and use of saxitoxin for peaceful purposes and essentially excluding from verification ricin produced as a by-product of castor bean oil production.

Frequency of inspections and quantitative risk assessment

More generally, discussions are continuing on a number of OSI implementation issues, including frequency of inspections and quantitative risk assessments. For some, the inspection regime for the chemical industry is too infrequent and, as a consequence, too predictable. Inspections (following the initial inspection) at Schedule 3 or DOC/PSF sites will hardly ever occur (see annex 2). This concern is counterbalanced to some extent by the fact that an inspection at a Schedule 3 or DOC/PSF site could, in principle, take place. As a result, a state party contemplating prohibited activities at a declared plant site should feel constrained from doing so. Another related concern is that a stricter regime for Schedule 1 and Schedule 2 chemicals could push potential ‘proliferators’ towards alternate, less traditional chemical weapon production routes, using chemicals that are more easily obtainable and more commonly used in the chemical industry.

Finally, some states parties claim that minute quantities of Schedule 1 chemicals and less than 100 metric tonne quantities of Schedule 2 chemicals pose less of a risk to the CWC than the hundreds of Schedule 3 plant sites and thousands of DOC/PSF plant sites producing above 200 metric tonnes per year.⁵³ They have suggested, therefore, that some of the OPCW’s inspection resources be shifted from Schedule 1 and Schedule 2 to Schedule 3 and DOC/PSF sites. There was discussion about reallocating resources during the fourth CSP in 1999, partly motivated by the perception that Western European

chemical industry was being unfairly targeted.⁵⁴ This was largely due to the fact that, at the time, the US had not yet submitted its industry declarations. Although the US submitted its declarations in April–May 2000, there is still support for such a shift. This is partly because of a desire to achieve a more balanced geographic spread of inspections and partly due to the belief that, since most Schedule 2 plant sites tend to be more heavily concentrated in Western countries, verification resources should be transferred to Schedule 3 chemicals produced in states that may be more of a proliferation concern.⁵⁵

The key to assessing the present and future effectiveness of the CWC is, perhaps, how the general purpose criterion operates within the formalised system of declarations and OSIs. If there is concern that a state party may be developing chemicals not listed in the Annex on Chemicals for use as CW, then one or more states parties will have to formally or informally alert the OPCW under the provisions of Article IX, up to and including the use of the challenge inspection mechanism.⁵⁶

Conclusion

The effectiveness of the CWC is in large part a function of the success of OSIs. From an operational point of view, almost all chemical industry inspections appear to have gone smoothly since the treaty entered into force in 1997. There have been differences between how chemical industry inspections were envisaged in the treaty and actual implementation. The main differences have been a lack of agreement during some inspections between the inspection team and the host team on physical access rights within ‘plant sites’; and the fact that samples have not been taken routinely during inspections—sampling has almost never been carried out and there has been heavier than expected reliance on plant records by inspection teams. These differences, which partly reflect the political positions of states parties, may change over the next few years as the inspection regime matures. To date, most of the inspections have been initial inspections or Schedule 1 and Schedule 2 inspections. Now that the initial inspections have largely been concluded, hesitation about allowing sampling by states parties may diminish as OPCW inspections become increasingly more established. Also, some inspection resources may be shifted to Schedule 3 and DOC/PSF plant sites. Inspection issues may also change as chemical weapon stockpiles are gradually eliminated and attention moves to other CWC-related matters, such as technical assistance and co-operation.

However, there are at least two outstanding areas of concern. One is the potential effect that the OPCW’s recent financial difficulties might have on the frequency and quality of industry inspections, and on the Organization’s ability to retain experienced staff. Second, there were renewed efforts by some states parties

in early 2001 to reduce the scope and intrusiveness of chemical industry inspections. Such a restricted approach to treaty implementation has implications for the verification regime as a whole, including the extent to which it might become more of a confidence-building mechanism, as opposed to a regime where treaty compliance of all types of facilities is verified with a high degree of confidence through greater levels of intrusiveness and more frequent inspections.

Although there have been attempts to quantify the effectiveness of various aspects of CWC implementation,⁵⁷ such efforts have inherent limitations, especially since the concept of 'risk' contains an inherently subjective element. Only by taking into account specific implementation issues can outside observers develop an appreciation of how much verification might be 'sufficient'. Ultimately, the only unambiguous indicator of whether OSIs are effective or not will be a documented case of fundamental non-compliance that has (or has not) been uncovered by an OSI. Otherwise, one will never be able to say with absolute certainty that prohibited activities are not occurring. OSI issues, including frequency of inspection, risk factors and degree of access, should, nevertheless, be considered and applied with a view to reducing uncertainty within reasonable financial and legal limits.

Annex one

CWC prohibitions and chemical industry declaration requirements

According to the cwc, a ‘chemical weapon’ consists of one or more of the following:⁵⁸

- toxic chemicals and their precursors that are in a type and quantity not consistent with the object and purpose of the Convention;
- munitions and devices that are *specifically designed* to cause harm or death through the use of toxic chemicals and their precursors; or
- any equipment that is *specifically designed* to be used directly in connection with the munitions and devices as defined above.

For the purposes of the cwc, any chemical that, via its chemical action on life processes, can cause death, temporary incapacitation, or permanent harm to humans or animals, is considered a ‘toxic chemical’.

Yet only a small section of the chemical industry⁵⁹ is subject to declaration requirements or to osis. This is achieved in two ways. One is through the implementation of a verification regime to monitor producers and consumers of selected chemicals listed in the three schedules in the cwc Annex on Chemicals. The second is through the use of the general purpose criterion, whereby the OPCW considers the purpose for which a toxic chemical is produced.

Chemicals or families of chemicals were included in the CWC schedules if they had been developed as CW or CW precursors or were deemed to be 'dual use' in nature.⁶⁰ In addition, some unscheduled discrete organic chemicals,⁶¹ including those containing phosphorus, sulphur or fluorine, are subject to OPCW monitoring and verification. It is important that these DOC/PSFs be captured by the verification regime, since the number and variety of chemicals produced are so large (in the thousands) and because the plant sites producing them are relatively easy to reconfigure. This is mainly due to the fact that many commercial orders are customised to meet highly specific customer requirements.

The verification regime is tailored according to the types and/or quantities of chemicals listed in the CWC schedules or of certain unlisted DOC/PSFs. Schedule 1 chemicals are considered to pose a 'high' risk to the object and purpose of the Convention. Most CW agents and their principal precursors are listed here. Schedule 2 chemicals are deemed to pose a 'significant' risk to the object and purpose of the CWC, while Schedule 3 chemicals are largely dual-use in nature and are considered to pose 'some' risk to the object and purpose of the CWC.

There is an implied range of threat levels, with Schedule 1 chemicals posing the greatest danger and Schedule 3 and DOC/PSF plant chemicals the least. Depending on whether the chemical is Schedule 1, 2, or 3 or a DOC/PSF, there is some flexibility in terms of the allocation of inspection resources and the level of verification. This is partly because the level of verification is dependent on the quantity of chemicals involved. Minute quantities of Schedule 1 chemicals would probably pose less of a threat to the object and purpose of the CWC than hundreds of tonnes of a Schedule 2 chemical. The OPCW also evaluates the danger posed by each facility or plant site individually. There are differing views on how much flexibility there is or ought to be in allocating inspection resources and the level of verification across Schedules 1, 2, 3 and DOC/PSF facilities or plant sites. The question of relative risks posed by facilities and plant sites and the level of verification that should be applied is a major ongoing issue for the OPCW.

A declared Single Small Scale Facility (SSSF) may produce up to one metric tonne of Schedule 1 chemicals for 'research, medical, pharmaceutical or protective purposes' per year.⁶² Two types of 'other facilities' producing Schedule 1 chemicals are also permitted. The first type is allowed to produce up to 10 kilogrammes a year for 'protective purposes' at a single facility other than the SSSF.⁶³ The second type may produce Schedule 1 chemicals in quantities over 100 grammes a year for 'research, medical or pharmaceutical purposes'.⁶⁴ There is no limit on the number of these latter facilities,⁶⁵ but they may not produce in excess of 10 kilogrammes of Schedule 1 chemicals per annum.⁶⁶

If an 'other facility' produces less than 100 grammes of Schedule 1 chemicals for research, medical or pharmaceutical purposes, it does not have to be declared.⁶⁷ Any facility wishing to produce over 100 grammes, though, must declare this intention to the Secretariat 180 days before production begins.

Plant sites that produce, process or consume Schedule 2 chemicals must be declared if they comprise one or more plants that will produce, process or consume more than: one kilogramme of a chemical designated '*' in part A of Schedule 2; 100 kilogrammes of any other chemical listed in part A of Schedule 2; or one metric tonne of a chemical listed in part B of Schedule 2.⁶⁸ If the plant site consumed, processed or produced Schedule 2 chemicals in the above-mentioned quantities at any time during the previous three calendar years, the site must also be declared.⁶⁹

Plant sites that produced more than 30 metric tonnes of a Schedule 3 chemical at any time during the previous calendar year or that are expected to produce more than 30 metric tonnes of a Schedule 3 chemical during the next calendar year must be declared.⁷⁰ Significantly, the CWC does not require declaration of 'consumption' or 'processing' of Schedule 3 chemicals. (This limits the scope of declarations and on-site inspections at Schedule 3 plant sites.)

Facilities that produce non-scheduled chemicals may also have to be declared. In particular, facilities that produce by synthesis more than 200 metric tonnes of discrete organic chemicals must be declared

in a party's initial declaration.⁷¹ If the DOC contains phosphorus, sulphur or fluorine, then the plant site must be declared in the initial declaration if the quantity is over 30 metric tonnes a year.⁷² In part, these requirements were devised because some plants can be used to produce many different types of chemicals.

Annex two

Frequency of inspection and analysis of risk

Schedule 1 facilities

Risk factors for Schedule 1 facilities were developed by the Secretariat and were based on the work of the Preparatory Commission.⁷³ An algorithm is currently being used by the Secretariat, containing risk factors such as facility characteristics and the nature of on-site activities. The algorithm has apparently still not been discussed in the Industry Cluster, a group of experts that periodically discusses industry-related CWC issues. Risk results obtained through the application of the algorithm have not indicated any great differences between the majority of facilities. This is not surprising, since the few declared Schedule 1 facilities are mainly small laboratories. In other words, the facilities are very similar in terms of the risk they pose. It is unlikely, therefore, that states parties will reconsider the subject of risk posed by Schedule 1 facilities in the foreseeable future.

Schedule 2 plant sites

Risk factors for Schedule 2 plant sites during initial inspections include: the toxicity of the chemical; the amount in storage; quantities of feed stocks; production capacity and capabilities; ease of convertibility of production; and capabilities for storage and filling of toxic chemicals on-site.⁷⁴ Frequency and intensity

of inspection criteria are also given in the cwc.⁷⁵ The criteria are to take into account, *inter alia*, the results of the initial and subsequent inspections. The first CSP further elaborated risk assessment in relation to the characteristics of the plant site and the nature of activities carried out.⁷⁶ Taking these developments into consideration, the Secretariat developed a risk algorithm in which each criterion was assigned a numerical weighting factor.⁷⁷ The numbers would be added and normalised. This algorithm was implemented when Schedule 2 inspections began in November 1998 and resulted in a numerical spread of risk values from 0.2 to 2.0. Approximately 90 percent of the values were at or below 1.5.

This first risk algorithm was criticised by inspectors and some states parties. Problems included poorly defined differences between non-applicability determinations and zero numerical entries,⁷⁸ and questions about the relative importance of weight factors. Some inspectors also felt that the qualitative perception of risk, as observed during inspections, did not match the quantitative risk values resulting from the application of the calculations. And it was discovered that the internal procedure for using and interpreting risk values could lead to an open-ended scale of poorly defined risk values.

A task force of inspectors considered the issue some three years ago. A series of bilateral discussions between the Secretariat and states parties began in parallel, leading to the production of a revised risk algorithm, which addressed the shortcomings.⁷⁹ The Director-General instructed that it be implemented immediately. The risk values produced by the revised algorithm can, in theory, range from -1.85 to +6.6. Although states parties reacted positively to the use of the revised algorithm, it was noted that the scale—derived from a modified Boltzman statistical distribution of normalised risk values—was difficult for non-technical people to understand. The Secretariat thus developed a 0–100-point linear risk scale based on a simple summation of risk factors.⁸⁰

The Secretariat proposed that Schedule 2 plant sites should either be inspected 10 times in 10 years (high frequency), seven times in 10 years (medium frequency) or four times in 10 years (low frequency).⁸¹

The application of risk values available in October 1998, using the initial risk algorithm, resulted in eight percent 'high risk', 17 percent 'medium risk' and 75 percent 'low risk' determinations. After reviewing where their Schedule 2 plant sites were likely to be placed in the three-tier frequency of inspection system, states parties indicated that they felt that state-of-the-art plant sites were unfairly penalised for being more flexible and easily convertible, for producing, processing or consuming at high levels, and for possessing rigorous environmental controls. In addition, some states parties felt that it was inappropriate to have a Schedule 2 plant site inspected more regularly than a Schedule 1 facility. Some states parties indicated that they would not accept risk categories that labelled some plant sites 'high risk' because of the negative connotation, and that they could not agree to any frequency of subsequent inspection of Schedule 2 plant sites that was more than four-to-five times in 10 years.

Consequently, the Secretariat proposed a revised maximum frequency of inspection.⁸² Two risk categories were assigned to Schedule 1 facilities:

- 20 times in 10 years for SSSFs and 'other facilities'; and
- 15 times in 10 years for SSSFs.

Five maximum frequencies of inspection in five risk categories were assigned to Schedule 2 plant sites, according to an 'A-E' labelling system.⁸³ Under the risk assessments determined using the linear scale,⁸⁴ each risk category represents a 20 percent spread. So, for example, category A (highest risk) is given values between 81 and 100, while B is allocated values from 61–80. Adding the two risk levels from the previous three-tiered scale together with the linear risk scale effectively displaced plant sites into lower risk categories.

The new five-tier frequency arrangement was much discussed during the inter-sessional consultations leading up to the eighteenth session of the EC on 15–18 February 2000. States parties continued to make suggestions on how to adjust the risk algorithm in order to reduce the emphasis on the differences in

plant site risk differentiation and to take into account the characteristics of ‘modern’ chemical production. The Secretariat then recalculated the risk assessments for initially inspected plant sites using the new algorithm⁸⁵ and noted that 90 percent of Schedule 2 plant sites fell into risk category E, while the remaining 10 percent fell into categories C and D. Thus the overwhelming majority of Schedule 2 plant sites fell into the lowest risk category possible. This is despite the fact that there are at least 15–20 plant sites that are Schedule 2A and 2A*. In addition, some Schedule 2B sites produce at the relatively high level of 500–1,000 metric tonnes per year. These observations led some parties and Secretariat staff to question whether the trend in development of Schedule 2 risk assessment and frequency of inspection was moving too far away from the intent of the CWC, as specified in paragraphs 18 and 20 of part VII of the Verification Annex and decision 32 of the first CSP.⁸⁶ Although some states were hopeful that the EC would make a decision on Schedule 2 risk assessment and frequency of inspection, it was decided that additional Industry Cluster consultations should take place while states parties considered how to pursue the matter further.

Schedule 3 plant sites

In contrast to selection of Schedule 2 plant sites for inspection, Schedule 3 and DOC/PSF plant sites are not discussed in terms of ‘risk’ to the Convention. Schedule 3 and DOC/PSF plant sites are selected using a two-stage random method. The state party is first selected based on a weighting factor ‘f’ that is determined by the following equation: $f(x) = 0.5\sqrt{x+1}$, where ‘x’ is the number of inspectable plant sites in that state party.⁸⁷ Once the state party is identified, plant sites are selected using weighting factors assigned to an array of determinants, including number of plants at the plant site, production ranges and whether the plant site is ‘mixed’.⁸⁸ In May 2000, the fifth CSP confirmed the EC’s decision⁸⁹ regarding the methodology for establishing a two-stage random selection method for Schedule 3 plant sites. This will be reviewed four years after its implementation.

DOC/PSF plant sites

The CSP has not agreed on methodologies for selecting DOC/PSF plant sites for inspection. The Secretariat is currently using the approach that was least objected to by states parties during Industry Cluster consultations. Like the methodology used for Schedule 3 plant selection, it is a two-stage random process. The state party is first identified using the equation $f(x) = \sqrt[3]{x+1}$, where 'x' is the number of inspectable plant sites in that state party's territory. The plant sites are then selected with their weighting factors, such as the number of DOC plants, the number of PSF plants, the production range, and the number of inspections carried out at the plant. No DOC/PSF plant site is to receive more than two inspections per year and the combined number of Schedule 3 and DOC/PSF plant site inspections within a state party is not to exceed 20 inspections or three plus five percent of the total aggregate number of Schedule 3 and DOC/PSF plant sites declared by a state party (whichever of these two figures is lower).

Endnotes

¹ The text of the cwc can be downloaded from www.opcw.org.

² For an introductory overview of verification of non-production of cw agents in the chemical industry, see S. Johan Lundin (ed.), *Non-Production by Industry of Chemical-Warfare Agents: Technical Verification Under a Chemical Weapons Convention*, Oxford University Press, Oxford, 1988, and Ralf Trapp, *Verification Under the Chemical Weapons Convention: On-Site Inspection in Chemical Industry Facilities*, Oxford University Press, Oxford, 1993.

³ 'Note by the Director-General, a review of the status of analytical support for OPCW verification activities', OPCW document S/81/98, 30 October 1998, p. 1.

⁴ Paragraph 1, Article II.

⁵ In practice, the degree to which national authorities attempt to implement the general purpose criterion varies widely. Implementation involves surveying chemical industry activities and considering how processes or materials might be adapted for a cw programme. Information derived from 'national technical means' (see endnote seven) may also be included in such an assessment.

⁶ See Annex I.

⁷ NTM is generally taken to mean the use of remote monitoring techniques, such as satellites, which are under state jurisdiction and control. It is also a euphemism for all information available to a state, including that collected by intelligence organisations. Arms control negotiators have tended to avoid attempts to define NTM.

⁸ Paragraph 51, Part II, Verification Annex.

⁹ There is, however, no attempt to calculate differences between inputs and outputs at DOC/PSF plants. This reflects a lower level of verification applied to DOC/PSF plants generally.

¹⁰ Detailed challenge inspection procedures are contained in Part x, Verification Annex.

¹¹ The Director-General of the OPCW, José Bustani, issued the following statement in December 2000 with regard to allegations that Iran was violating the cwc: '... the Secretariat wishes to reiterate that it has no reason whatsoever to question Iran's full compliance with the cwc, and that the application of verification measures in Iran is strictly in accordance with the Convention. There are no grounds for any concern or ambiguity in this regard. Furthermore, all verification activities in the Islamic Republic of Iran have been conducted in an atmosphere of openness and transparency, and with the full co-operation of the Iranian Government. Equally, none of the 140 other State Parties has raised any such concerns within the OPCW, which is the sole competent and legitimate authority to verify compliance with the Convention'. See Organization for the Prohibition of Chemical Weapons, Office of the Director General, 'Statement by the Director-General of the OPCW', 8 December 2000.

¹² John Hart, 'The cwc: compliance concerns and challenge inspections', *The ASA Newsletter*, no. 81, 14 December 2000, pp. 13–14.

¹³ See Paragraphs 8–25, Article IX.

¹⁴ During the fifth CSP, the US representative stated: ‘My government has carefully reviewed declarations, and in some cases, has had questions. As the Conference was informed last year, we have sought to address these questions through bilateral consultations under Article IX of the Convention, and in some cases have done so successfully. Some States Parties, I regret to say, have not been responsive to our inquiries. Nevertheless, we will continue to engage these States Parties bilaterally before contemplating other measures’ (United States of America, Statement to the Conference of the States Parties on the Status of Implementation of the Convention, OPCW document, C-V/NAT.2, 18 May 2000).

¹⁵ Beginning in the late 1980s, some states parties—Australia, the UK and the US, for example—began unilaterally to conduct various types of inspections, including practice challenge inspections, in order to develop ‘managed access’ procedures and to determine the feasibility of detecting illicit activities.

¹⁶ The exercise also had some theatrical moments. The team was escorted from Sao Paulo airport to their lodgings in an armed convoy with sirens sounding. Side roads were blocked to allow the convoy to pass without stopping. Team members were given ‘uncomfortable’ rooms guarded by armed men. Brazil also considered, but rejected, sending military aircraft to ‘buzz’ the plane carrying the team, so as to enhance the ‘realism’ of the exercise.

¹⁷ Blinded mode is when GC/MS detectors are equipped with specialised software that provides inspectors with a yes/no reading on the presence of chemicals listed in the OPCW database. The software was developed to reduce the intrusiveness of OSIS.

¹⁸ The wipe sample has to be taken at precisely the right location, in this case a reactor vessel. It is generally rather difficult to analyse TDG using GC/MS. The sample size may have been too small. A review of sulphur mustard production routes is given in Julian Perry Robinson and Ralf Trapp, ‘Production and chemistry of

mustard gas’, in S. Johan Lundin, (ed.), *Verification of Dual-Use Chemicals Under the Chemical Weapons Convention: The Case of Thiodiglycol*, Oxford University Press, Oxford, 1991, pp. 4–23.

¹⁹ The host team started the inspection clock by inducing an inspection team member to cross the facility perimeter while placing seals on exit and entrances.

²⁰ ‘Testimony of The Honorable R. Roger Majak, Assistant Secretary of Commerce for Export Administration, Before the House Subcommittee on National Security, Veterans Affairs, and International Relations: The Biological Weapons Convention: Status and Implications’, Washington, DC, 13 September 2000, available at www.house.gov.

²¹ Some states parties have declared ‘mixed plant sites’ either as a Schedule 2 or a Schedule 3 site. Mixed plant sites are sites where more than one type of declarable chemical industry activity is taking place. A Schedule 2 plant site, for example, may be co-located with a DOC/PSF plant site.

²² One company that manufactured flame-retardants switched from using a scheduled chemical, dimethyl phosphite, to a non-scheduled chemical in order to avoid CWC reporting and inspection provisions.

²³ States parties may not transfer Schedule 2 chemicals to non-state parties from 29 April 2000. See Paragraph 31, Part VII, Verification Annex. States parties are obliged to take specific measures to ensure that Schedule 3 chemicals exported to non-CWC states parties will not be used for purposes prohibited by the CWC. The CSP will decide whether any additional restrictions should be applied to transfers of Schedule 3 chemicals when it meets in 2002.

²⁴ The reasons include differences in ‘low concentration’ limits used to identify declarable shipments of mixtures (most chemical transfers between countries are mixtures) and the fact that some states parties have not responded to enquiries from other states parties. This issue has been discussed by states parties since the

Preparatory Commission period. (The Preparatory Commission was the body established to elaborate OPCW rules and procedures and to establish the Organization before entry into force. It operated from 1993 until 1997.) The low concentration limit for Schedule 2B and Schedule 3 chemicals is 30 percent. See 'Decision, guidelines regarding low concentration limits for declarations of Schedule 2 and 3 chemicals', OPCW document C-V/DEC.19, 19 May 2000. The second CSP referred the aggregate national data issue to the EC. The matter remains unresolved. See 'Decision, reporting requirements of aggregate national data for Schedule 2 and 3 chemicals', OPCW document C-II/DEC.8, 5 December 1997.

²⁵ Paragraphs 7 and 8, Article VI; Paragraph I, Part VII, Verification Annex; and Paragraph I, Part VIII, Verification Annex.

²⁶ Schedule 2 and 3 chemicals occurring in mixtures at 'low concentration' limits need not be declared. The CWC does not provide numerical thresholds. Final consensus on low concentration limits has not been achieved.

²⁷ 'Captive use' has been defined within the OPCW as: 'the case of the production of a Schedule 2 chemical and its subsequent further conversion without isolation in the same reaction vessel/unit to form another product'. The issue is complicated by differing views on whether intermediate chemicals stored in day tanks should be declared, as well as the extent to which day tanks are or are not used. A 'day tank', as opposed to a 'storage tank', is a temporary chemical holding tank. The case of phosgene—a Schedule 3 chemical used as a CW agent during the First World War—which is widely used in the production of pesticides and pharmaceuticals, is a good example of a chemical intermediate which is often stored in day tanks.

²⁸ BZ is typically produced by the reaction of 3-quinuclidinol with diphenylchloroacetyl chloride in a stirred tank reactor at low concentration. It is frequently converted to clindinium bromide without further isolation by adding ethylene dibromide to the reactor.

²⁹ PFIB was initially listed as a Schedule 1 chemical during the CWC negotiations.

³⁰ The sixth CSP, which met in May 2001, was again unable to agree on a quantitative limit and has referred the matter back to the EC. Some states parties are unwilling to have PFIB declared. It appears that only a small number of Western countries are opposed, for reasons that are unclear.

³¹ The original US domestic chemical industry implementing legislation, however, set the declaration threshold limit for Schedule 3 chemicals appearing in mixtures at low concentration at 80 percent.

³² See Paragraph 8, Part VI, Verification Annex.

³³ 'Facility' is always used in connection with Schedule 1 producers or consumers, while 'plant site' is always used with Schedule 2, 3, or DOC/PSF chemicals. Although the drafters of the CWC did not intend this to happen, there is a *de facto* distinction between a 'facility' and a 'plant site' under which access to plant sites is more restricted. This distinction may be due to the fact that most Schedule 1 facilities are laboratories, while Schedule 2, 3 and DOC/PSF plants are industrial sites. An industrial site may comprise multiple and distinct 'plant sites'. See Paragraph 6, Part I, Verification Annex.

³⁴ Some companies choose not to patent their innovations, since patents are publicly available and of limited duration. Yet trade secrets, such as catalysts and industrial production configurations, can offer greater financial gain—if successfully maintained.

³⁵ OPCW document, EC-XVI/TS.I, 13 August 1999.

³⁶ See Walter Krutzsch and Ralf Trapp, *Verification Practice Under the Chemical Weapons Convention*, Kluwer Law International, The Hague, 1999, pp. 19–21.

³⁷ Paragraph 60, Part II, Verification Annex.

³⁸ Paragraph 62, Part II, Verification Annex.

³⁹ The Verification Annex, for example, states that: "The papers and correspondence, including records, of the inspection team shall enjoy the inviolability accorded to all papers and correspondence

of diplomatic agents pursuant to Article 30, paragraph 2, of the Vienna Convention on Diplomatic Relations. The inspection team shall have the right to use codes for their communications with the Technical Secretariat' (Paragraph 11(c), Part II, Verification Annex).

⁴⁰ Paragraph 11(c), Part II, Verification Annex).

⁴¹ There do not appear to be any formal OPCW guidelines governing the use of NTM.

⁴² Trace amounts of sulphur mustard have been occasionally detected at or near facilities where no CW production is taking place. In one case, trace amounts of sulphur mustard were detected near a chlorination plant located close to a plant using dye containing thiodiglycol. Sulphur mustard can be produced using HCl and thiodiglycol. See Robert J. Mathews, 'Australian experience in practice inspections and chemical analysis of the CWC', unpublished paper presented at CWC Verification Seminar, Tokyo, Japan, 22–23 March 1995, p. 4.

⁴³ The initial approved list was adopted during the first CSP. OPCW document D-1/DEC.71, 23 May 1997. The list is also available on CD-ROM, entitled OPCW, Approved Inspection Equipment, 1999.

⁴⁴ The Australia Group was established in 1985, largely in response to CW use in the 1980–88 Iran–Iraq War. See www.australiagroup.net.

⁴⁵ Electromagnetic radiation emissions have the potential to interfere with instrumentation and control elements. The use of devices that emit electromagnetic radiation, such as cellular telephones, two-way radios, and laptop computers, is, therefore, controlled at industrial sites.

⁴⁶ 'Opening statement by the Director General to the Executive Council at its twenty-third session', OPCW document EC-XXIII/DG.13, 20 February 2001, para. 15.

⁴⁷ CW possessors are supposed to meet inspector salaries during the inspection period. As a result, OPCW budgetary planning assumed that up to 10 percent of the annual budget would be reimbursed. If an inspection does not take place the salary must still be paid. Budgetary planning is complicated by a range of issues, including

the fact that the frequency and level of intrusiveness of inspections are subject to adjustments at the working level. The matter is also connected to management issues and the fact that some states parties would apparently like to reduce the size of the Secretariat. A more comprehensive treatment of the OPCW's budgetary problems is contained in the 'Opening statement by the Director General to the Executive Council at its twenty-third session', OPCW document EC-XXIII/DG.13, 20 February 2001. The CSP raised the 2002 budget by 2.8 percent and encouraged voluntary contributions. It is unclear whether cuts will be made in the inspection schedule or elsewhere. Voluntary contributions may cover the shortfall in reimbursements of the direct costs of inspection under Articles IV and V. As of June 2001, there were no clear indications of how much financial assistance might be forthcoming.

⁴⁸ As of 27 April 2001, the number of chemical industry inspections was as follows: Schedule 1 (2); Schedule 2 (18); Schedule 3 (0); and DOC/PSF (3).

⁴⁹ The Director-General has indicated that Schedule 2 and Schedule 3 inspections could be reduced by up to 20 percent and 52 percent, respectively ('Executive Council concludes its twenty-fifth session' *Secretariat Brief*, no. 28, OPCW document, 20 July 2001, p. 2).

⁵⁰ Israel and Taiwan are notable exceptions.

⁵¹ See Annex 1.

⁵² See endnote 73.

⁵³ Quantitative declaration thresholds are provided in Annex 1.

⁵⁴ In 1998, 79 percent of OPCW industry inspections were carried out in eight states parties, mainly European. A total of 101 states parties received no industry inspections whatsoever. See Daniel Feakes, 'Progress in The Hague, developments in the Organization for the Prohibition of Chemical Weapons, quarterly review no. 28', *The CBW Conventions Bulletin*, no. 46, December 1999, p. 14.

⁵⁵ 'It remains Australia's view that the inspection regime cannot be said to be fully effective until it places appropriate weight on the

inspections of Schedule 3 and DOC plant sites, in a manner that ensures appropriate geographic spread of inspections' ('Statement by HE Ted Delofski, Head of the Australian Delegation to the Fifth Session of the Conference of States Parties to the Chemical Weapons Convention', The Hague, 16 May 2000). CWC negotiators divided the globe into five geographic groupings. The principle of 'equitable geographic distribution' is taken into consideration when considering some issues, including the distribution of inspections.

⁵⁶ Both the Secretariat and the national authorities have an obligation to ensure that the general purpose criterion is being implemented. Consideration given to implementing the criterion varies among governments. Some CWC national implementing legislation, such as that of the UK, mentions it specifically, while other legislation does not. Since entry into force, however, many states parties have tended to minimise implementation of industry declarations and verification requirements in order to protect CBI and to reduce the burden on the chemical industry and overall financial costs. Yet individual member states should be consistent in how they implement the criterion. And there should not be complete reliance on the challenge inspection mechanism. Basic difficulties concerning implementation of the general purpose criterion are twofold. First, there is no uniform method for researching the activities of governments and of the chemical industry in order to determine cases where the criterion should be applied. Such efforts will always be uneven to some extent. Second, implementing the criterion may require the amendment of CWC schedules, a process that could prove politically difficult.

⁵⁷ See Annex 2.

⁵⁸ Paragraph 1, Article II.

⁵⁹ The basic CWC provisions dealing with non-prohibited production of chemicals are contained in Article VI (Activities Not Prohibited Under This Convention), and Parts VI (Regime for Schedule I Chemicals and Facilities Related to Such Chemicals), VII (Regime

for Schedule 2 Chemicals and Facilities Related to Such Chemicals), VII (Regime for Schedule 3 and Facilities Related to Such Chemicals) and IX (Regime for Other Chemical Production Facilities) of the Verification Annex.

⁶⁰ Dual-use chemicals are those that can be used for either prohibited or non-prohibited purposes.

⁶¹ The CWC defines a discrete organic chemical as 'any chemical belonging to a class of chemical compounds consisting of all compounds of carbon except for its oxides, sulfides and metal carbonates, identifiable by chemical name, by structural formula, if known, and by Chemical Abstracts Service registry number, if assigned' (Paragraph 4, Part I, Verification Annex).

⁶² Paragraph 9, Part VI, Verification Annex. SSSFs are also subject to other restrictions. For example, such facilities must be configured for batch production only.

⁶³ Paragraph 10, Part VI, Verification Annex.

⁶⁴ Paragraph 11, Part VI, Verification Annex.

⁶⁵ Provided the aggregate quantity of Schedule I chemicals in the state party does not exceed one metric tonne.

⁶⁶ Paragraph 11, Part VI, Verification Annex.

⁶⁷ Paragraph 12, Part VI, Verification Annex.

⁶⁸ Paragraph 3, Part VII, Verification Annex.

⁶⁹ Paragraph 3, Part VII, Verification Annex.

⁷⁰ Paragraph 3, Part VIII, Verification Annex.

⁷¹ Paragraph 1, Part IX, Verification Annex. The declaration provides approximate aggregate ranges of DOCS produced at each plant site—under 1,000 metric tonnes, between 1,000 and 10,000 metric tonnes, and over 10,000 metric tonnes. Verification activities at 'other' chemical production facilities began in May 2000, as a result of the fourth CSP not deciding otherwise (per the requirements of Paragraph 22, Part IX, Verification Annex). There is still no consensus among delegations on the CWC term: 'production by synthesis'. The CSP has not reached agreement on whether this should include

'biochemical and biologically mediated processes'. US instructions to its civilian industry state that 'chemicals and chemical mixtures produced through biological or bio-mediated' processes are not subject to DOC/PSF declaration requirements. The OPCW Scientific Advisory Board, however, has said that 'it is no longer possible to make a clear distinction between "chemical" and "biological and biologically mediated" processes'. Informational literature distributed by the US Department of Commerce's Bureau of Export Administration (BXA) also states that the BXA has specifically designed declaration forms for US industry 'to require the minimum amount of information for the United States to meet its obligations under the Convention'. Most states parties interpret the Chemical Weapons Convention provisions narrowly, thereby reducing the costs of verification.

⁷² Paragraph 1, Part IX, Verification Annex.

⁷³ PrepCom document, PC-XVI/B/WP.3, 6 February 1997.

⁷⁴ Paragraph 18, Part VII, Verification Annex.

⁷⁵ Paragraph 20, Part VII, Verification Annex.

⁷⁶ OPCW document, C-1/DEC.32, 16 May 1997.

⁷⁷ OPCW document, EC-X/DG.9, 29 July 1998.

⁷⁸ In one situation a zero value might be chosen for a risk factor. In another situation, some risk factors may not apply and are simply

not summed. One could not adequately differentiate between these two situations by looking at the normalised risk value.

⁷⁹ OPCW document, EC-XIV/DG.4, 13 January 1999.

⁸⁰ OPCW document, EC-XVI/DG.5, 1 September 1999.

⁸¹ OPCW document, EC-XII/TS.2, October 1998.

⁸² OPCW document, EC-XVI/TS.3, September 1999.

⁸³ A equals 10 times in 10 years, B equals seven times in 10 years, C equals five times in 10 years, D equals four times in 10 years, and E equals three times in 10 years.

⁸⁴ OPCW document, EC-XVI/DG.5, September 1999.

⁸⁵ OPCW document EC-XVI/DG.5, September 1999.

⁸⁶ OPCW document C-1/DEC.32, 16 May 1997.

⁸⁷ The square-root function is applied to reduce the difference in weighting factors between states parties with only a few 'inspectable' plant sites and those with many plant sites. This is in the interest of promoting 'equitable geographic distribution'. See Paragraph 14, Part VIII, Verification Annex.

⁸⁸ A plant site is 'mixed' when activities declarable under differing inspection and verification regimes are taking place on-site simultaneously. For example, the plant site could be producing Schedule 2 and Schedule 3 chemicals.

⁸⁹ OPCW document EC-XVII/DEC.7, 1 December 1999.