



Monitoring Chemicals with Possible Chemical Weapons Applications

The Chemical Weapons Convention (CWC) has a number of provisions with implications for the chemical industry. The Convention not only mandates the destruction and prohibition of chemical weapons and related facilities, but also provides for restrictions on international trade in toxic chemicals and precursors that could be used for weapons purposes. Furthermore, the Convention's monitoring and verification measures involve submissions of declarations regarding a large number of chemicals of varying commercial significance, and inspections by the Organisation for the Prohibition of Chemical Weapons (OPCW) of the facilities where these chemicals are produced, processed or consumed. For its part, it should be noted, the OPCW Technical Secretariat works to avoid undue intrusion and minimise inconvenience to the inspected State Party's legitimate chemical activities, while at the same time maintaining an effective level of surveillance.

Dual-Use Chemicals

The reason for the involvement of a disarmament body such as the OPCW in the monitoring of commercial and industrial activity has to do with the 'dual-use' nature of many chemicals. This means that, in addition to industrial and other applications not prohibited by the CWC, these chemicals have uses directly related to the production of chemical weapons. Thiodiglycol, for example, is both an ingredient in felt-tip pen ink and a precursor to mustard agents. Hydrogen cyanide, which is itself a potent toxic agent and also may be used to make the nerve agent tabun, is commonly used in the manufacture of nylon. Cyanides may also be found in dyes and pigments. Phosphorus trichloride is a precursor to chemicals that can be used to make VX, another nerve agent, but it is also used to produce lubricants and pesticides. Even equipment in certain chemical production facilities can be considered dual-use in the sense that it may be converted to produce chemical weapons or their precursors.

The Convention requires declarations about, and inspections of, industrial facilities that produce, process or consume more than specified threshold amounts of certain chemicals, dual-use and otherwise. As described below, specific requirements and procedures

vary depending on the risk a chemical poses to the object and purpose of the Convention. Based on the degree of this risk and the extent of their commercial application, chemicals are divided into three Schedules, which form an integral part of the Convention.



A chemical plant. The OPCW works to prevent the use of chemicals as weapons while promoting peaceful uses of chemicals

The Three Schedules

Found in the Convention's Annex on Chemicals, each of the three Schedules contains lists of toxic chemicals and precursors with corresponding Chemical Abstracts Service (CAS) registry numbers. These Schedules identify chemicals for the application of verification measures; they do not constitute a definition of chemical weapons. Guidelines articulate criteria for consideration when categorising chemicals into the three Schedules. Additions and amendments to the Schedules can be made in

accordance with procedures described in the Convention. The OPCW maintains a database of up to 32,000 scheduled chemicals on its website, a small portion of all possible scheduled chemicals. Riot control agents (RCAs), such as tear gas and pepper spray, are not included in any Schedule.

Schedule 1

Schedule 1 lists chemicals considered to pose a high risk to the object and purpose of the Convention by virtue of their high potential for use in activities prohibited by the CWC. These chemicals have little or no use for peaceful purposes in commercial or industrial activities. Among them are chemicals that have actually been produced, stockpiled or used as weapons, such as VX, sarin, mustard and two biological toxins—ricin and saxitoxin. Schedule 1 also lists precursor chemicals that may be used in the final single technological stage of production of any of the toxic chemicals listed in the Schedule. The final stage of production does not necessarily have to take place in a laboratory; the Schedule 1 criteria also include those stages that actually take place inside a munition and involve binary weapon components such as DF (a precursor to sarin and soman) and QL (a VX precursor).

Schedule 1 chemicals may only be produced, acquired, retained, transferred or used for purposes not prohibited by the Convention in amounts justifiable for those purposes. The aggregate amount of Schedule 1 chemicals present in a State Party at any given time or acquired or produced by it in any given year for these purposes cannot exceed one tonne. Production may only take place at facilities with characteristics described in the Convention. Each State Party is permitted a single small-scale facility at which Schedule 1 chemicals may be produced for research, medical, pharmaceutical or protective purposes. In addition, Schedule 1 chemicals may be produced for protective purposes at one other facility in aggregate quantities of up to 10 kilograms per annum. Furthermore, production above 100 grams per annum for research, medical or pharmaceutical purposes may take place at other facilities provided the aggregate quantity of Schedule 1 chemicals produced does not exceed 10 kilograms per year per facility. Synthesis of Schedule 1 chemicals for research, medical or pharmaceutical purposes in aggregate amounts of less than 100 grams per year per facility may be carried out in laboratories, which are not subject to any declaration or verification obligations.

Initial declarations about the first three types of Schedule 1 facilities are to be submitted to the OPCW within 30 days of entry into force of the Convention for the State Party. After entry into force, initial declarations on new facilities shall be submitted at least 180 days before the operations at these facilities begin. Declarations regarding projected activities and production at each facility are due 90 days before the start of each year and annual declarations of the previous year's activities must be submitted within 90 days of the year's end.

The OPCW Secretariat is to be informed of transfers of Schedule 1 chemicals between States Parties 30 days in advance. An exception is saxitoxin, which may be needed for emergency diagnosis of paralytic shellfish poisoning. Notification of the transfer of up to five milligrams of saxitoxin may take place at the time of the transfer. Transfers of Schedule 1 chemicals to States not party to the CWC are prohibited.

Inspections are conducted by the OPCW at Schedule 1 facilities to confirm that chemicals and their quantities are correctly declared, undeclared chemicals are not being produced, chemicals are not being diverted to prohibited purposes and the aggregate amount is not more than one tonne. (See Fact Sheet 5 for more on inspections.) Within 180 days of entry into force for the State Party, facility agreements regarding inspection procedures are to be concluded between the State Party and the OPCW. These are to be based on model agreements approved by the Conference of the States Parties. In the case of new Schedule 1 facilities established after entry into force, facility agreements are to be concluded before operations commence.

Schedule 2 and Schedule 3

Schedule 2 lists toxic chemicals and precursors deemed to pose a significant risk to the object and purpose of the CWC because of their lethal, incapacitating or other properties that could enable them to be used as a chemical weapon. Precursors may be used at the final stage of formation, or may be important for the production, of any of the chemicals listed in Schedule 1 or of toxic chemicals listed in Schedule 2. Schedule 2 chemicals are not produced in large quantities for commercial or other purposes not prohibited by the Convention, but may be used to manufacture such things as insecticides, herbicides, lubricants or pharmaceutical products.

Schedule 3 chemicals are similar to Schedule 1 chemicals in that many have been stockpiled or used as weapons, but different in that they generally are produced in large commercial quantities for purposes not prohibited by the Convention. They may represent a risk to the object of the CWC due to their toxicity or to their importance in producing any of the chemicals listed in Schedule 1 or precursors listed in Schedule 2. An example is phosgene, which was used extensively as a chemical weapon during the First World War but is also used in plastics, pesticides and pharmaceuticals.

Initial and annual declarations are required for both Schedule 2 and 3 chemicals. Aggregate national data on the amounts of each chemical produced, processed, consumed, imported and exported during the previous year is to be submitted to the OPCW within 30 days of entry into force for the State Party and, following entry into force, annually no later than 90 days from the end of each calendar year. Declaration requirements apply to plant sites at which Schedule 2 chemicals were produced, processed or consumed in amounts

CWC Schedules of Chemicals			
Schedule	General Criteria for Inclusion	Examples	
		Toxic Chemicals	Precursors
Schedule 1	<ul style="list-style-type: none"> Has been developed, produced, stockpiled or used as a chemical weapon Poses a high risk to the object and purpose of the Convention because of its toxicity or similarity to other Schedule 1 toxic chemicals Used in the final stage of formation of any Schedule 1 toxic chemical Has little or no use for purposes not prohibited 	<ul style="list-style-type: none"> Sarin VX Mustard agents Ricin 	<ul style="list-style-type: none"> DF QL Chlorosarin
Schedule 2	<ul style="list-style-type: none"> Poses a significant risk to the object and purpose of the Convention because of lethal or incapacitating properties Used in the final stage of formation, or important for the production, of any of the chemicals listed in Schedule 1 or Schedule 2, part A Is not produced in large commercial quantities for purposes not prohibited 	<ul style="list-style-type: none"> Amiton BZ 	<ul style="list-style-type: none"> Thiodiglycol Quinuclidin-3-ol
Schedule 3	<ul style="list-style-type: none"> Has been produced, stockpiled or used as a chemical weapon Poses a risk to the object and purpose of the Convention because of lethal or incapacitating properties Important in the production of one or more chemicals listed in Schedule 1 or Schedule 2, part B May be produced in large commercial quantities for purposes not prohibited 	<ul style="list-style-type: none"> Phosgene Hydrogen cyanide 	<ul style="list-style-type: none"> Phosphorus oxychloride

exceeding one kilogram of specially designated toxic chemicals, 100 kilograms of other toxic chemicals or one tonne of chemical precursors in any of the previous three years or facilities at which such chemicals are anticipated to be produced, processed or consumed in excess of these amounts the following year. The same is true for plant sites at which Schedule 3 chemicals were produced in excess of 30 tonnes the previous year, or are anticipated to be produced in that amount the following year. In both cases, initial declarations are due 30 days from entry into force for the State Party, annual declarations on anticipated activities are due no later than 60 days before the beginning of the year in question and annual declarations on the previous year's activity are due 90 days after that year's end. Declarations are also needed for each plant site where Schedule 2 or 3 chemicals were produced for chemical weapons purposes at any time since 1 January 1946. The Conference of the States Parties has also stipulated declaration guidelines for Schedule 2 and Schedule 3 chemicals that are parts of mixtures.

The OPCW undertakes inspections at plant sites at which amounts exceeding 10 kilograms of a Schedule 2A* toxic chemical, one tonne of other Schedule 2 toxic chemicals or 10 tonnes of Schedule 2 precursors were produced, processed or consumed during any of the

previous three years or are anticipated to be produced, processed or consumed the following year. Inspections are also carried out at plant sites that produced more than 200 tonnes of any Schedule 3 chemical during the previous year or are anticipated to produce the following year.

Inspections are carried out to confirm the consistency of declarations with on-site activities, the absence of Schedule 1 chemicals and the non-diversion of Schedule 2 chemicals to prohibited activities. Schedule 2 plant sites are to receive an initial inspection within three years of entry into force of the Convention or, if declared after this period, within one year of the first declaration. Ninety days from the initial inspection, a facility agreement concerning inspection procedures should be concluded unless both the Secretariat and the State Party agree that it is unnecessary. Facility agreements are not drawn up for Schedule 3 plant sites unless requested by the State Party. The Convention includes provisions intended to prevent an excessive number of inspections from taking place at a single plant site or in a single State Party in any given year.

A milestone in the implementation of the CWC and the efforts to prevent the proliferation of chemical weapons, the transfer of Schedule 2 chemicals to or from States

Declaration and Inspection Thresholds		
Chemical Category	Declaration Threshold	Inspection Threshold
Schedule 1	Single small-scale facility / Facility for protective purposes: any amount Other facilities: 100g	Single small-scale facility / Facility for protective purposes: any amount Other facilities: 100g
Schedule 2	2A* (BZ): 1kg 2A (other toxic chemicals): 100kg 2B (precursors): 1 metric tonne	2A* (BZ): 10kg 2A (other toxic chemicals): 1 metric tonne 2B (precursors): 10 metric tonnes
Schedule 3	30 metric tonnes	200 metric tonnes
Unscheduled DOCs	200 metric tonnes (aggregate)	200 metric tonnes (aggregate)
PSF Chemicals	30 metric tonnes	200 metric tonnes

not party to the Convention was prohibited on 29 April 2000, giving further impetus to states that have not already done so to ratify or accede to the treaty. Transfers of Schedule 3 chemicals to non-States Parties are allowed on the condition that they shall be used only for peaceful purposes and are subject to the issuance of an end-use certificate by the receiving state.

Unscheduled Chemicals

Among those chemicals not specifically listed in the Schedules or anywhere else in the Convention are **discrete organic chemicals** (DOCs). The Verification Annex defines DOCs as chemicals 'belonging to the 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 the CAS registry number, if assigned'. Manufacturing operations producing DOCs are referred to as 'other chemical production facilities' (OCPF). These plant sites may be subject to declarations and verification requirements if they produce more than 200 tonnes of DOCs annually. They may also be subject to these requirements if they comprise plants at which more than 30 tonnes of any of the DOCs containing the elements phosphorus, sulfur or fluorine (**PSF chemicals**) are produced. However, some DOCs are exempted, and declarations are not required for plant sites that exclusively produce explosives or hydrocarbons. DOC plant sites that produced an aggregate amount of more than 200 tonnes of DOCs during the previous year, or more than 200 tonnes of any PSF chemical, became subject to verification activities by the OPCW, including on-site inspections, starting in May 2000. As with Schedule 3 facilities, facility agreements are not concluded for OCPFs unless requested by the State Party.

Benefits to the Chemical Industry

With the entry into force of the CWC, commercial and other entities in States Parties dealing with scheduled chemicals or DOCs in the amounts described above now have a number of responsibilities. They must report information to National Authorities for subsequent

submission to the OPCW in the form of declarations. They may also need to prepare for and accept inspection teams from the OPCW.

Nevertheless, chemical industry has supported the CWC from the early stages of the negotiations, for a number of reasons. The Convention encourages trade in chemicals between States Parties by, among other things, providing for the removal of export control barriers. Moreover, the act of accepting inspections may serve to protect firms from unfounded accusations of involvement in chemical weapons-related activities. By following declarations requirements and receiving inspections, a firm can demonstrate its social conscience to the public, enhancing its reputation and its humanitarian profile.

Protecting Confidential Information

The Convention has extensive provisions that aim to protect the confidentiality of the information reported by States Parties in their declarations, and to prevent the release of confidential information as a result of inspections. National governments and the OPCW are required to follow rigorous information handling procedures. The OPCW has a highly secure computer system with stringent controls on access to information. Inspectors are to conform to the highest standards of efficiency, competence and integrity. The inspection process is specifically designed to prevent the inadvertent release of sensitive information. The procedures and equipment used by OPCW inspectors are subjected to close scrutiny to ensure that they achieve the objectives of the inspections with minimal intrusion.

OPCW

Johan de Wittlaan 32
2517 JR The Hague
The Netherlands
Tel: +31 70 416 3300
media@opcw.org
www.opcw.org

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