

**EFFECTIVE IMPLEMENTATION
OF THE
CHEMICAL WEAPONS CONVENTION**

**The Chemical Weapons Convention and Discrete Organic
Chemicals**

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The Chemical Weapons Convention and Discrete Organic Chemicals

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Part 6 of Article VI of the Chemical Weapons Convention (CWC) states that facilities specified in Part IX of the Verification Annex shall be subject to data monitoring and eventual on-site verification. Part IX of the Verification Annex is the 'Regime for other chemical production facilities' and there is a declaration requirement for:

- more than 200 tonnes of unscheduled discrete organic chemicals (DOCs) produced by synthesis; and
- more than 30 tonnes if the DOC contains the elements Phosphorus, Sulfur or Fluorine (PSF-Chemicals, PSF-plants)

The CWC text for the above lists excludes 'plant-sites that exclusively produced explosives or hydrocarbons'.

The CWC defines a DOC as follows:

'Discrete Organic Chemical' means any chemical 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 Chemical Abstracts Service registry number, if assigned.

In principle, there are two problems with this text¹ in that elsewhere the CWC defines production as 'its formation through chemical reaction' as opposed to 'by synthesis' and the DOC category is very broad even allowing for the basic production of hydrocarbons and explosives 'exclusively'. The debate on how one should limit the category of DOCs and on what constitutes a method of production which could be of interest to the implementation of the CWC is still ongoing and of major concern both to the Preparatory Commission, embryo National Authorities and the chemical industry because of its potential impact on declaration and inspections costs. The debate is essential but there is a danger that it could be used to weaken other aspects of the CWC's verification provisions by developing definitions that are unnecessarily restrictive.

The main centres of discussions involved Expert Groups under the aegis of Working Group B:

- Combined Group of Experts on Industrial Declarations
- Expert Group on Chemical Industry Facilities
- Joint meetings with the Chemical Industry.

In December 1993 an Expert Group discussed the problem of polymers and stated that only operations concerning monomers should be declared but that there might be a need for declarations involving certain types of biopolymers.²

¹ see Implementation of the Chemical Weapons Convention: Declarations, Discrete Organic Chemicals and Toxics, RG Sutherland, T. Kurzidem, T. Stock, P. Radler, 3rd Workshop of the Pugwash Study Group on the Implementation of the Chemical and Biological Weapons Conventions, Noordwijk, Netherlands, May 1995 for a related discussion.

² PC-V/B/WP.15, Dec. 1993.

This was further clarified in a working paper³ when that group indicated that in its view DOC's should not cover:

- Oligomers and polymers whether or not containing Phosphorus, Sulfur or Fluorine;
- Products manufactured by chemical modification of natural products that are complex mixtures; and
- Chemicals only containing carbon and metal.

and that, within the definition of DOCs, were exclusions for carbon monoxide, carbon dioxide, carbon disulfide and carbonyl sulphide. The group further concluded that 'production by synthesis' in Part IX of the Verification Annex did not include fermentation. The term hydrocarbon was taken to be all inclusive, i.e., irrespective of the number of carbon atoms involved. The question of explosives was subjected to extensive analysis and it was suggested that a formal definition be based on the transport of dangerous goods document, ST/SG/AC.10/1/ REV 5 for explosives, Class 1, division 1:1 (see Annex I). No conclusions were reached regarding facilities producing rocket propellants.

These issues were further discussed at the second Combined Meeting of the Expert Group on Chemical Industry Facilities and Industry Representatives in April 1994 where it was stated that:

proposals have been made by some delegations to exempt such chemical operations as breweries, wineries, various chemicals produced by biological processes, polymer plants etc. from declaration requirements. A complete list of candidate plants and facilities types that should be considered for exemption should be drawn up.⁴

As far as we are aware no such list exists. This paper included a useful series of Industry Verification Fact Sheets of which number 2 (Biotechnology), 5 (Industrial Declaration Forms) are pertinent to the DOC debate.

The Fourth Report on Chemical Industry Issues⁵ did not appear to state any additional progress on DOCs apart from further discussions on 'complex mixture', 'biochemical and biologically mediated processes' in Part IX of the Verification Annex and the definition of explosives. The Fifth Report⁶ did not discuss DOCs and the Sixth Report⁷ only briefly discussed the issues by mentioning (a) 'industrial products having a purity of less than 100 per cent' these were deemed to be DOCs if characterised by one chemical structure; (b) biochemical and biologically mediated processes should only be considered relative to scheduled chemicals; and (c) that chapters 29 of the Harmonised Commodity Description and Coding System (HS System) might be of use in identifying facilities that produce DOCs. The experts also reviewed the problems created by 'Production by synthesis' since the term is undefined in the Convention.

In the Executive Secretary's Retrospective Report⁸ from 1994 in reference to Chemical Industry Issues noted that there was no new understanding with respect to: (a) discrete organic chemicals including PSF chemicals; (b) the definition of production (Paragraph 12(a) of Article II); and (c) production by synthesis used in Part IX of the Verification Annex.

The Working Group's inability to further develop a common understanding on these issues is detailed in their October 1994 Report⁹. The January 1995 meeting of this group concentrated on

³ PC/VI/B/WP.2.

⁴ PC-VI/B/7, April 1994.

⁵ PC-VII/B/WP.7, May 1994.

⁶ PC-VIII/B/WP.5, Aug. 1994.

⁷ PC-VIII/B/WP.10, Sept. 1994.

⁸ PC-IX/6, Dec. 1994.

⁹ PC-IX/B/WP.2, Oct. 1994.

the structure and content of a draft model agreement on a Schedule 2 Plant Site and no further discussion on DOCs emerged.¹⁰

Apart from the combined meeting with industrial representatives there appears to be little advance in understanding of DOCs¹¹ and one of the Expert Groups priority tasks as laid out in the Report of the Commission¹² viz.:

complete discussions on the tentative understandings in regard to discrete organic chemicals including PSF chemicals...

It should be clear from the above that the issues involved in developing declarations with respect to Part IX of the Verification Annex are unresolved and there is no agreed understanding of what must be declared under 'other chemical production facilities'. At this time there is only a minimum level of agreement on what might be excluded in addition to hydrocarbons and explosive, e.g., polymer production, beverage fermentation. It should be kept in mind that the initial concept related to production facilities not presently involved in Schedule 2 or 3 production but with a capability of conversion of their present production to compounds of potential concern to the CWC.

If one makes chemical process capability the guiding principle, the declaration, would be limited to these discrete organic chemicals that are produced by chemical transformations that could be used in the formation of chemical weapons agents. Three lists of chemical processes could be developed based on the intrinsic chemistry involved in schedules 1, 2 and 3. Chemical production facilities would be classified accordingly and an appropriate list of declarable discrete organic chemicals prepared.

The following is suggested as a way to indicate a limitation on the declaration requirement for DOCs. Declarations are required for any discrete organic chemical produced above the threshold and synthesised in a single or multistep process using one or more chemical transformation process described by the Technical Secretariat as one which could be used in the preparation of toxic chemicals of interest to the CWC.

A Working Paper submitted by Sweden¹³ under the title 'Verification of the Chemical Industry within the general pattern of verification for a Chemical Weapons Convention' could provide a rational starting point for such an approach.

Chemical Transformation Processes

1. Alkylation
2. Condensation
3. Dehydrogenation
4. Esterification
5. Halogenation
6. Hydrogenation
7. Isomeration
8. Oxidation
9. Substitution.

The above conversion processes were compiled based on the chemical reactions required to produce the chemicals which appear on the CWC's schedules. Chemical facilities not using such processes could be omitted from these which have to declare their production of discrete organic chemicals.

¹⁰ PC-X/BWP.6, Jan. 1995.

¹¹ *see* Report of the Executive Secretary, PC-XI/8, 21 July 1995, paragraphs 6.12 and 6.13.

¹² PC-XI/7, 27 July 1995.

¹³ CD/1053, Feb. 1991.

In this approach the onus would be on the National Authority to develop a list of chemical production facilities which would be of no interest to the CWC since there would be no possibility of misusing the facility for purposes prohibited by the Convention. The Technical Secretariat would have to monitor new chemical routes to scheduled chemicals and arrange to add other chemical transformation processes to the above list if required.

ANNEX I