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**SWITZERLAND**

**INCLUSION OF DATA ON NON-SCHEDULED CHEMICALS IN THE OPCW  
CENTRAL ANALYTICAL DATABASE TO FACILITATE COMPREHENSIVE  
CHEMICAL WEAPONS ANALYSIS**

**Introduction**

1. The OPCW Central Analytical Database (OCAD) is a reference library of analytical data. It contains validated spectroscopic and chromatographic data of chemicals of relevance to the Chemical Weapons Convention (hereinafter “the Convention”). Its primary purpose is to enable on-site analysis with approved OPCW inspection equipment as provided for in the Convention.
2. Furthermore, it has become the most important validated reference library for OPCW Designated Laboratories and those laboratories aspiring to Designation. It also assists States Parties laboratories in the analysis of samples for their own purposes, including analysis related to chemical terrorism.
3. The OCAD is today the only validated reference library of chemicals relevant to the Convention that is available to all Member States. It is therefore essential that the OCAD be as comprehensive as possible.
4. Data intended for inclusion in the OCAD is submitted by Member States' laboratories to the OPCW Validation Group, which ensures the technical validity of the data. The Validation Group recommends the inclusion of new data to the Director-General, who in turn submits the data to the Executive Council (EC) for consideration and approval of the inclusion.
5. Recently there has been difficulty in achieving endorsement by the EC of data on non-Scheduled chemicals. In some instances, this has also delayed acceptance of data on Scheduled chemicals. Such delays are damaging the efficacy of the Convention's verification regime.
6. Switzerland has made major contributions to the OCAD and wishes the OPCW to continue the development of this analytical reference library as the most comprehensive database for chemical weapons analysis.



7. It is the intention of this paper to explain the importance of the inclusion of relevant non-Scheduled chemicals to the OCAD, in order to assist States Parties, when data on relevant non-Scheduled chemicals is submitted to the EC.

### **The Role of the OCAD in Chemical Weapons Analysis**

8. The inspection team performs analysis to confirm the identity of declared Scheduled chemicals or to check for the absence of undeclared Scheduled chemicals. For these purposes, a very specific database that contains selected chemicals is required, which lead to the development of the OCAD.
9. When OPCW inspection teams perform on-site analysis, they do so with approved OPCW inspection equipment, a Gas Chromatograph - Mass Spectrometer (GC-MS). In order to detect and identify relevant chemicals with this equipment, GC-MS analysis data is searched against the reference database, the OCAD.
10. Any chemical not contained in the OCAD cannot be identified with the GC-MS. Consequently, if the inspection team has a concern about a possible presence of a particular undeclared Scheduled chemical, without the reference data in the OCAD, the absence of that chemical cannot be confirmed.

### **The Role of non-Scheduled Chemicals in Chemical Weapons Analysis**

11. There are different reasons why some non-Scheduled chemicals are important:
  - (a) They are a technical necessity due to the analytical methodology employed (analytical derivatives);

Inspection teams conduct on-site analysis with an OPCW GC-MS instrument. In order for a chemical to be analysed by this methodology it must be able to pass through a GC column. A number of Scheduled chemicals are not amenable to direct GC-MS analysis, because of their reactivity or volatility. The universally accepted method of analysis for these chemicals is to convert them into chemical derivatives, some of which are non-Scheduled chemicals. One example would be Lewisites, which are generally analysed as Thiol-derivatives. In the case of Lewisite 1, it is the absence of its non-Scheduled Thiol-derivative, when adding a Thiol derivatisation agent, which allows the confirmation of the absence of Lewisite in the sample.

- (b) They are important and well known oxidation / degradation products of Scheduled chemicals:

Scientific publications show that important Scheduled chemicals are converted into characteristic non-Scheduled chemicals by degradation or oxidation, such as is the case with Sulfur Mustards. Important degradation products of Sulfur Mustards are their hydrolysis products. The only Scheduled hydrolysis product of the Sulfur Mustards is Thiodyglycol. The hydrolysis products of the other Sulfur Mustards under Schedule 1 are non-Scheduled chemicals. It has been recognised in OPCW Proficiency Testing many years ago, that characteristic non-Scheduled degradation products of Scheduled chemicals

must be reported, including also the oxidation products of Thiodiglycol: Thiodiglycolsulfone and -sulfoxide. Without the addition of these important non-Scheduled chemicals to the OCAD, an inspection team is unable to check conclusively, whether the respective Scheduled chemical or its characteristic degradation product were in the sample

- (c) They are required for investigations of use of chemical weapons...

For investigations of use of chemical weapons conducted under Article IX and Part X of the Verification Annex non-Scheduled Chemicals may not just be required because of the analytical methodology or because they are important oxidation / degradation products of Scheduled chemicals. In the case of Riot Controls Agents (RCAs), they may be the target of the analysis. RCAs are arguably the most likely class of non-Scheduled chemicals to be used as a chemical weapon. Historically the first use of such agents in war often preceded the use of more toxic chemicals.

- (d) ...or during a challenge inspection

RCAs were used for the scenario of the challenge inspection exercise in Switzerland in 2004. Because RCAs are not part of the OCAD, on-site analysis was conducted during the exercise in open mode. This was done to allow the inspection team the use of a commercial database which contains RCAs - an unlikely practice for a real challenge inspection.

### **The Implication of non-Scheduled Chemicals for Verification Activities**

12. The addition of data on non-Scheduled chemicals to the OCAD is intended solely for analytical purposes to facilitate comprehensive analysis of the presence or absence of chemicals relevant to the Convention.
13. It would be a misinterpretation to claim that the addition of certain important non-Scheduled chemicals to the OCAD would lead to additional obligations for States Parties. In particular, such an inclusion does not imply that these chemicals are, or should become, Scheduled. Neither are there any implications for the chemical industry (including additional declarations).
14. The addition of non-Scheduled chemicals to the OCAD must be limited to the chemicals necessary. There must be a demonstrated requirement for such a chemical to be added to the OCAD. The relevance shall continue to be assessed for each chemical by the Validation Group.

### **Considerations**

15. The OCAD is intended solely to aid in the analysis of chemicals of relevance to the CWC. For the sampling and analysis regime to be credible we must take into account the following pertinent facts:
  - (a) By technical necessity, during chemical analysis, a number of Scheduled chemicals are converted to, and identified as, chemical derivatives, of which

some may be non-Scheduled. Therefore, data on these non-Scheduled analytical derivatives must be included in the OCAD.

- (b) Some key oxidation / degradation products of Scheduled chemicals are non-Scheduled chemicals, they must be added.
  - (c) The Convention clearly prohibits, in Article I (5), the use of riot control agents as a method of warfare. It is thus wholly appropriate for data relating to riot control agents to be included in the OCAD.
  - (d) Data on OCW &/or ACW are relevant under Article I obligations since these particular chemicals have been weaponised.
  - (e) Unless the OCAD includes data of certain important non-Scheduled chemicals, it may not be possible during on-site analysis to identify certain chemicals or check comprehensively for the absence of undeclared Scheduled chemicals. In such cases off-site analysis would be needed.
  - (f) The OCAD must include all data necessary to identify relevant chemicals that might be encountered during inspection activities, ranging from routine to allegations of use. In the latter context, this may also aid in the treatment of casualties.
16. In February 2007, meetings of the SAB and its Temporary National Group on Sampling and Analysis both recommended: ‘the inclusion of riot control agents in the context of allegations of use, non-Scheduled degradation products of Scheduled chemicals considered relevant to verification, and chemicals related to old chemical weapons (OCW) and abandoned chemical weapons (ACW) in the OPCW Central Analytical Database (OCAD), and the selective use of data from the OCAD in accordance with the inspection aims as specified in the Convention’. Moreover, the report of the IUPAC/OPCW International Workshop: Impact of Advances in Science and Technology on the Chemical Weapons Convention, which took place in April 2007, noted that: ‘..... there are also gaps in the analytical capabilities of the OPCW. With regard to on-site analysis, the main gap is the absence of non-Scheduled chemicals from the OCAD database’.
17. Inclusion of data in the OCAD does not imply that the chemical concerned is, or should be, Scheduled. There is no suggestion that the Schedules should be extended to include these chemicals.
18. It is important to recognise that concerns of States Parties regarding commercial confidentiality are addressed by the right of the States Parties to request the operation of the OPCW Dual Mode Software in blinded mode.

### **Recommendations**

19. Switzerland therefore recommends that, to ensure the continuing viability and scientific credibility of the Convention’s verification regime, the Second Review Conference should:

- a) endorse the inclusion of data on relevant non-Scheduled chemicals in the OCAD;
- b) reaffirm the right of States Parties to protect commercial confidentiality by the use of OPCW Dual Mode Software; and
- c) encourage States Parties to continue to submit data on both Scheduled and relevant non-Scheduled chemicals for inclusion in the OCAD.

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