

## Fourth Review Conference of the Chemical Weapons Convention

Remarks by Dr Christopher Timperley, Chair of the OPCW Scientific Advisory Board

26 November 2017

Mr Chairman,

Excellencies,

Distinguished colleagues,

Ladies and gentlemen,

(**Slide 1**) The Scientific Advisory Board (SAB) was established in accordance with Article VIII of the Convention to enable the Director-General to render to the Executive Council and Conference of States Parties specialised advice in areas of science and technology relevant to the Convention. (**Slide 2**) It is my pleasure today to summarise the recommendations from the SAB's report on science and technology to the Fourth Review Conference documented in RC-4/DG.1 of 30 April 2018. The advice was arrived at by drawing on the following sources:

- The SAB reports to the previous 3 Review Conferences;
- The 8 regular Sessions of the SAB since the Third Review Conference;
- Findings from 4 SAB Temporary Working Groups addressing: the convergence of chemistry and biology, education and outreach, verification, and recently, investigative science and technology,
- (**Slide 3**) The 4 SAB workshops held in 2016 and 2017, organised with external partners and funded in part by the European Union, on chemical forensics (in Helsinki, Finland), medical countermeasures and emergency response (in Paris, France), innovative technologies (in Rio de Janeiro, Brazil), and trends in chemical production (in Zagreb, Republic of Croatia);
- (**Slide 4**) 5 intersessional responses to questions from the Director-General on medical treatments for casualties of chemical agent exposure, scheduled chemicals, sample storage and stability, and riot control agents;

- The participation of SAB members in international scientific meetings, including the Spiez CONVERGENCE workshop series, and the interactions of the Board with other scientific advisory mechanisms;
- The expertise of the members of the Board, and
- Scientific literature and patents across diverse areas of relevance.

**(Slide 5)** During the review, the SAB received over 450 briefings from over 200 individuals from 56 States Parties and produced 32 reports. This represents an increase in the Board's productivity and a sustained determination to provide science advice of the highest quality. The recommendations now provided are grouped into 8 themes, as shown on the screen, and provided in this executive summary brochure (HOLD UP BROCHURE).

Although new chemicals are discovered every day, the broad scope of the Convention ensures they are covered under its terms. Scientific advances have occurred across disciplines, including in the understanding of the molecular machinery of life (**Slide 6**). These have been facilitated by an increased ability to manipulate genetic information. Biologically-mediated processes have been used for the production of chemicals in quantities that could make them declarable under the Convention. The Secretariat should continue to review developments in biomediated processes and work across areas of overlap between the Chemical Weapons Convention and the Biological Weapons Convention.

**(Slide 7)** Although biomediated processes do not currently appear to be suitable for producing traditional chemical warfare agents in large quantities, the OPCW should monitor developments closely. In the view of the SAB, any process designed for the formation of a chemical substance should be covered by the term "produced by synthesis". As production facilities using biomediated processes to produce chemicals increase, their relevance to the Chemical Weapons Convention should be assessed.

**(Slide 8)** The chemical industry has evolved since the schedules were finalised 25 years ago. A review of the schedules should be considered to assess whether: (a) the chemicals currently listed are in the appropriate schedule, and (b) any toxic chemicals or precursors should be added or removed. Whether it is technically feasible to accurately monitor Schedule 3 chemicals produced in very large quantities (e.g. over 100,000 tons/year) warrants consideration.

Chemical Abstracts Service (CAS) numbers to define chemicals covered by the schedules should not solely be relied upon. To ensure consistency of declarations, if a chemical is included in a schedule, all isotopically-labelled forms and stereoisomers of that chemical should be included, and therefore declared.

**(Slide 9)** Technical discussions of central nervous system (CNS)-acting chemicals are exhausted. There is no value in revisiting the science as the facts and dangers remain unchanged. The Secretariat should be prepared to develop capabilities to conduct missions involving alleged use of CNS-acting chemicals, including sample collection and the addition of analytical data to the OPCW Central Analytical Database (OCAD).

**(Slide 10)** In view of the use of toxic industrial chemicals (TICs) as weapons, the Secretariat should seek to identify markers that may be formed through reactions of TICs with living tissue or materials present in the environment and assess the utility of such markers in investigations.

**(Slide 11)** The Secretariat should also enhance its efforts to strengthen the capabilities of international laboratories to identify the hostile use of toxins and analyse samples for toxins.

**(Slide 12)** The development of Unmanned Aerial Vehicles to deliver payloads for permitted purposes should be monitored to assess risks of development of new chemical weapon delivery.

**(Slide 13)** Verification might benefit from risk assessment methods used in the chemical industry, specifically those facilitating safer process design, and regulatory compliance. Efforts to ensure the verification regime remains effective would benefit from more extensive engagement with industry experts.

Many facilities worldwide produce toxic chemicals that may be relevant to the Convention in quantities below current declaration thresholds (e.g. highly active pharmaceutical ingredients or toxins used for cosmetic purposes or cancer therapy). The corresponding verification thresholds for facilities producing such chemicals should be addressed.

Effective verification requires assessment of all relevant information pertaining to a site and State Party, rather than the evaluation of a single inspection. The Secretariat should move toward an integrated approach where the separate elements of information are combined and analysed systematically.

The Secretariat should review the Verification Information System (VIS), develop new templates for Article VI inspection reports that would make it possible to upload the entire report to the VIS as a searchable document, and explore possibilities for the secure transmission of documents and data between inspection sites and OPCW Headquarters.

**(Slide 14)** Satellite imagery has proven useful in planning contingency operations and the Secretariat should consider cooperating with other international organisations and experts to enhance its capability to interpret and apply satellite information to non-routine operations.

**(Slide 15)** To enable inspectors to operate in dangerous or remote areas, the Secretariat should review remote and automated monitoring technologies to identify where they could be beneficial and added to the list of approved inspection equipment.

**(Slide 16)** Analytical data for chemicals that pose a risk to the Convention and would help differentiate permitted activities from prohibited activities should be added to the OCAD. This could include isotopically-labelled relatives, and stereoisomers and salts, of scheduled compounds; TICs; CNS-acting chemicals; riot control agents; bioregulators, toxins; and unscheduled chemicals identified as posing a risk to the Convention.

**(Slide 17)** To strengthen the capability of the designated laboratory network to analyse operational samples, preparedness to do so should be a factor in maintaining designation. The network should be expanded geographically and in capabilities. Technical data related to sample analyses conducted for the OPCW should be shared and published in peer-reviewed scientific journals, enabling all laboratories to benefit from proven methods and technologies.

Given the requirement for the OPCW to investigate alleged use of non-scheduled toxic chemicals, the capability to detect and identify their traces and associated degradation and reaction products should be strengthened through suitable exercises.

In view of the critical role of biomedical samples in investigations of alleged use, the OPCW should encourage further research on markers of exposure to toxic chemicals. And maintain a collection of reference samples and technical data, on abandoned chemical weapons, the environmental fate of toxic chemicals, and impurities associated with nerve and blister agents.

The Secretariat could develop a repository of technical information on the environmental impact of old, abandoned, and sea-dumped chemical weapons. This would improve the understanding of the environmental fate of chemical warfare agents.

**(Slide 18)** Investigative techniques required for verification of use of toxic chemicals include approaches used by the forensic community. The Secretariat, in consultation with relevant experts, should identify forensic techniques to assess their applicability for its own activities.

To enhance its capability to assist States Parties to respond to an incident involving toxic chemicals, the Secretariat should strengthen its preparedness, and monitor advances in detection, decontamination, physical protection, and medical countermeasures.

The Secretariat should engage with technical experts to ensure its efforts to assist States Parties with chemical safety and security have a sound scientific foundation. And encourage research in chemical security to prevent toxic chemicals from being acquired by non-State actors with the intent to use them as chemical weapons. The research support programme under Article XI provides a possible mechanism.

**(Slide 19)** Some States Parties, where the economies are either developing or in transition, have expressed interest in improving their chemical safety and security capabilities, specifically with regard to monitoring the transfer of chemicals into and out of their territories. The Secretariat should strengthen its partnerships with international organisations engaged in the research and development of technologies for this purpose. And pursue collaborative projects with such organisations to develop additional internal expertise to assist States Parties.

**(Slide 20)** Greater interaction between the SAB and Secretariat staff who perform operational roles would strengthen the ability to identify science and technology issues facing the OPCW and enhance the Board's ability to provide practical and actionable advice.

**(Slide 21)** Given the increasing degree to which scientific and technological change impacts the effective implementation of the Convention, the Secretariat should continue to strengthen its capability to monitor and forecast developments and their implications.

The Secretariat and SAB should monitor areas most likely to have the greatest impact on verification. These include chemicals and technologies that increase the probability of the hostile use of chemicals, and technologies that can improve capabilities for verification.

**(Slide 22)** In view of the increasingly interdisciplinary nature of advances in science and technology relevant to the Convention, the SAB should continue to build close working relationships with relevant professional societies and science advisory bodies of other relevant international organisations to enable it to identify and assess developments that may impact upon the Convention or the OPCW.

The Secretariat should adopt a systematic approach to continued professional development of its technical experts to ensure that they possess the knowledge and expertise to identify, evaluate, and apply scientific and technological advances relevant to their work. The SAB welcomes the upgrade of the OPCW Laboratory to a Centre for Chemistry and Technology.

**(Slide 23)** SAB briefings to States Parties and “Science for Diplomats” events have facilitated greater discourse between scientists and policymakers, and raised scientific awareness. These should continue.

**(Slide 24)** As my term on the SAB ends this year, after 4 years as the chair, I wish to close with some personal thoughts and reflections. Over the last 5 years the Board’s visibility has risen in line with its technical output. Its advice to the Director-General and States Parties has been published as OPCW documents and peer-reviewed scientific articles. We thank all SAB members past and present for their dedication **(Slide 25)**. I will leave a Board that is energised, efficient, respectful of all members, and speaks as one. The impartial advice to policymakers will continue with the same ethos through the leadership of the Chair Elect, Mr Cheng Tang, and Vice-Chair Elect, Dr Christophe Curty. Under their able guidance, the Board will continue to disseminate its message – a message of diplomacy and science for peace – to all regions of the world.

The SAB thanks the staff and interns of the OPCW, all contributors and representatives of States Parties, for the support extended in The Hague and during visits abroad. It appreciates the generous funding from the European Union, and States Party contributions to the SAB Trust Fund. We thank those countries that hosted the SAB workshops **(Slide 26)**, and the many international science academies and societies, including the International Union of Pure and Applied Chemistry (IUPAC), for strong and enduring partnerships. We also thank the United Nations and its Biological Weapons Implementation Support Unit, the Comprehensive Nuclear Test Ban Treaty Organisation (CTBTO), industry, academia, and civil society, for sharing valuable insights.

The Board expresses deep appreciation to the OPCW Science Policy Adviser and SAB Secretary, Dr Jonathan Forman, for performing both roles brilliantly. We thank the Director-General, Ambassador Fernando Arias, for his guidance and confidence in the Board, and look forward to serving him further as the technical tasks of the OPCW continue to evolve.

**(Slide 27)** A collective optimism and spirit of purpose is necessary to achieve a world free of chemical weapons. A sunny sky unclouded by chemical weapons is a vista we must all seek.

I request that this statement is issued as an official document of this conference and posted on the OPCW public website.

Thank you.