

**NOTE BY THE DIRECTOR-GENERAL****THE IMPACT OF THE DEVELOPMENTS IN SCIENCE AND TECHNOLOGY
IN THE CONTEXT OF THE CHEMICAL WEAPONS CONVENTION**

1. This Note sets out the Director-General's views on the impact of developments in science and technology in the context of the Chemical Weapons Convention (hereinafter "the Convention") and includes comments on the report of the Twenty-Third Session of the Scientific Advisory Board (SAB) (SAB-23/1, dated 22 April 2016).
2. An understanding of developments in science and technology is crucial to the full and effective implementation of the Convention, as scientific and technological underpinnings are found throughout its articles. With reference to the current and highly visible work of the OPCW, scientific advice has been especially important in terms of the support of designated laboratories for contingency operations. In this time of change and transition in the mission of the OPCW, there is recognition that effectively preventing the re-emergence of chemical weapons will require ever greater levels of science policy maker partnerships.
3. A call for voluntary contributions to support the work of the SAB was issued in January this year (S/1344/2016, dated 29 January 2016). The Director-General encourages States Parties to carefully consider this Note.
4. The Director-General wishes to remind States Parties that three members of the SAB will complete their second term in 2016. States Parties wishing to submit nominations to the SAB must do so by 12 August 2016. Nominations can be submitted to the science policy adviser in accordance with S/1343/2016 (dated 28 January 2016).

**RESPONSE TO THE REPORT OF THE TWENTY-THIRD SESSION OF THE
SCIENTIFIC ADVISORY BOARD**

5. The SAB met in The Hague, the Netherlands, for its Twenty-Third Session from 18 to 22 April 2016. The session was chaired by Dr Christopher Timperley, with Mr Cheng Tang as the Vice-Chairperson. The report of the session was issued as SAB-23/1.
6. In his opening remarks, the Director-General thanked the members of the SAB for their efforts in science engagement and for their engagement with and briefings to States Parties, both within and outside the OPCW. These engagements have brought greater visibility to the SAB and its work across the disarmament community.



The Director-General was pleased to see more than 30 States Parties in attendance at the Chairperson's briefing on 21 April on the margins of the Twenty-Third Session of the SAB.¹ The SAB Chairperson will next brief States Parties on the margins of the Twenty-Fourth Session of the SAB in October 2016.

7. After a careful review of the report of the Twenty-Third Session of the SAB, the Director-General is pleased to submit to the Executive Council the comments below.

Follow-up to the Scientific Advisory Board's recommendations (paragraphs 6.4 to 6.10, 7.1 and 7.2, and 9.20 and 9.21 of SAB-23/1)

8. The Director-General appreciates the clarity of the recommendations he has received from the SAB. The resulting action plans, facilitated by the Technical Secretariat (hereinafter "the Secretariat"), have provided a mechanism to engage States Parties and to inform policy. SAB recommendations are reflected in the work plans of units across the Secretariat, particularly for the OPCW Laboratory and within the science monitoring activities of the Secretariat. The Secretariat's efforts in working with States Parties to bring SAB recommendations forward are further demonstrated by the establishment of the Advisory Board on Education and Outreach (ABEO) (C-20/DEC.9, dated 3 December 2015), a decision informed by recommendations from the final report of the Temporary Working Group (TWG) on Education and Outreach.²
9. The Director-General notes that points of action from the recommendations in the final report of the TWG on Verification³ related to the implementation of Article VI are being discussed within the industry cluster (especially with regard to biobased chemical production) and at dedicated technical workshops. Updates to the plan of action developed for these recommendations (Annex to EC-80/DG.7, dated 28 August 2015) are forthcoming. The March 2016 industry cluster discussions have revealed a need to review Recommendation 19 of the final report of the TWG on Convergence of Chemistry and Biology:⁴ "The TS should review the technical feasibility of converting a bio-based chemical processing facility to produce chemicals of concern to the CWC". As the SAB will be reviewing developments in industrial chemical production technologies in support of its report to the Fourth

¹ The presentation from this briefing is available at:
www.opcw.org/fileadmin/OPCW/SAB/en/21_April_SAB_Briefing_to_States_Parties-for_print.pdf

² Education and Engagement: Promoting a Culture of Responsible Chemistry (SAB/REP/2/14, dated November 2014). Available at:
https://www.opcw.org/fileadmin/OPCW/SAB/en/Education_and_Engagement-v2.pdf

³ Verification Report of the Scientific Advisory Board's Temporary Working Group (SAB/REP/1/15, dated June 2015). Available at:
www.opcw.org/fileadmin/OPCW/SAB/en/Final_Report_of_SAB_TWG_on_Verification_-_as_presented_to_SAB.pdf

⁴ Convergence of Chemistry and Biology: Report of the Scientific Advisory Board's Temporary Working Group (SAB/REP/1/14, dated June 2014). Available at:
www.opcw.org/fileadmin/OPCW/SAB/en/TWG_Scientific_Advisory_Group_Final_Report.pdf

Review Conference,⁵ the Director-General has asked that information with relevance to this recommendation be included.

Developments in science and technology (paragraphs 7.3 to 7.9 and 12.2 and 12.3 of SAB-23/1)

10. The Director-General notes that the monitoring of developments in science and technology continues to illustrate convergent trends in science, and he appreciates the SAB's practice of inviting guest speakers who can provide updates from other sectors with chemistry relevance, especially with regard to the Biological and Toxins Weapons Convention (BTWC).
11. The Director-General acknowledges the efforts required to keep abreast of and report on scientific developments across a complex, technologically evolving landscape; he encourages collaboration with relevant partners and their networks in support of these actions. The Secretariat will continue to support these efforts, both internally and in partnership with external stakeholders.

Scientific and technological elements of verification technologies, emerging technologies, and new equipment (paragraphs 8.1 to 8.11 of SAB-23/1); advice relevant to sampling and analysis (paragraphs 9.1 to 9.5 of SAB-23/1); and science and technology relevant to assistance and protection (paragraphs 9.6 to 9.14 of SAB-23/1)

12. As we work in the face of challenges to our mission, for example in the context of investigations of alleged use of chemical weapons, verification remains the cornerstone of the Convention. The Director-General emphasises that the Organisation requires access to the full set of capabilities necessary for the effective implementation of the Convention's verification regime, including for non-routine situations. Access to advice and information on relevant science and technology is critical in this respect, especially with the Secretariat's intention to establish a Rapid Response Assistance Team (S/1381/2016, dated 10 May 2016). In this regard, the Director-General considers it valuable to have the Secretariat brief the SAB on relevant science and technology issues in its work. He expresses appreciation to the SAB for its watching brief developments relating to sampling and analysis and assistance and protection. An SAB that remains well informed on these issues is a valuable resource that can be called upon should technical advice useful for investigations, off-site analysis, or incident response be required.
13. The SAB's advice on best practices for chemical weapons sample stability and storage has been issued in a working paper (SAB-23/WP.2, dated 25 May 2016). The paper provides valuable advice on best practices for maintaining sample integrity and understanding analytical results. It contains an informative and comprehensive review of scientific literature combined with best practices from designated laboratories on storing bulk, environmental, and biomedical samples relevant to chemical agents. As no other compilations of this kind were found to be available in

⁵ Fourth Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention.

scientific literature, the Director-General encourages the SAB to publish the review in an appropriate scientific journal. Additionally, the Secretariat will share the advice with its partner laboratories and through its analytical chemistry training courses. Furthermore, the Secretariat will organise a “Science for Diplomats” briefing to inform States Parties on the content of the report.

Science advice mechanisms (paragraph 9.15 of SAB-23/1)

14. The Director-General supports the continued collaboration and sharing of efforts that have resulted from the engagement of Secretariat staff and SAB members with other science advice systems. Recently, this has involved workshops to assess trends in science relevant to the BTWC (September 2015), discussions on an effective science advice mechanism for the BTWC (April 2016), and participation as an observer in the Fifth meeting of the United Nations Secretary-General’s Scientific Advisory Board (May 2016). With more emphasis being placed on the importance of scientific inputs into policy and decision-making in a number of international forums, other science advice initiatives are actively looking at the nearly 20-year experience of the OPCW SAB to inform their own practices.

Advice relevant to education and outreach in science and technology (paragraphs 9.16 to 9.19 and 9.22 to 9.24 of SAB-23/1)

15. The Director-General expresses his appreciation to SAB members whose activities within scientific networks have helped raise the visibility of the OPCW and its work across scientific communities. It is important to continue to build and expand these networks as they augment our capabilities to monitor science and technology and support broader efforts in education and outreach. A briefing on these activities and the experiences gained was provided to the ABEO during its inaugural meeting in April 2016. The Director-General was pleased to learn that The Hague Ethical Guidelines have been endorsed by the International Union of Pure and Applied Chemistry,⁶ and that the Guidelines were adopted into the drafting of the Global Chemists’ Stakeholders Code of Ethics.⁷ He thanks all the SAB members who contributed to the drafting of The Hague Ethical Guidelines.

Scheduled chemicals and advice on the Annex on Chemicals: isotopically labelled scheduled chemicals and stereoisomers of scheduled chemicals (paragraphs 10.1 to 10.4 of SAB-23/1)

16. The SAB’s advice on isotopically labelled scheduled chemicals and stereoisomers of scheduled chemicals has been issued in a working paper (SAB-23/WP.1, dated 28 April 2016). The paper provides practical advice on how to treat chemicals that have parent structures contained within the Annex on Chemicals, but are altered through isotopic labelling or by isolating a unique stereoisomer. The advice on how to use Chemical Abstracts Service (CAS) numbers is pertinent to complete and accurate declarations of scheduled chemicals. The Secretariat intends to organise a “Science for Diplomats” briefing to inform States Parties on the content of the paper.

⁶ See www.opcw.org/news/article/iupac-endorses-the-hague-ethical-guidelines/

⁷ See <http://www.acs.org/content/acs/en/global/international/science-and-human-rights.html>

Advice on central nervous system acting chemicals (paragraphs 11.1 to 11.8 of SAB-23/1)

17. The Director-General notes that the SAB has previously considered this topic and made recommendations to the Third Review Conference⁸, aspects of which have been taken forward within designated laboratories (RC-3/DG.1, dated 29 October 2012). He is pleased to see that the SAB was briefed on this previous work by one of its principal contributors and appreciates the efforts made to remain informed on the technical dimensions of this issue.

FUTURE WORK AND OTHER BUSINESS OF THE SCIENTIFIC ADVISORY BOARD

18. This year and again in 2017, the SAB will hold two sessions. Several factors determine the number of SAB sessions held each year, including the scope of the SAB's technical deliberations, the costs involved, and the Secretariat's follow-up to the SAB's recommendations. Looking at matters in terms of a five-year perspective, two sessions need to be held in each of the two years preceding a review conference (when the SAB is developing its report on science and technology for the review conference). One session will usually be sufficient in the year of a review conference, as well as in each of the two subsequent years.
19. The Secretariat will organise workshops on chemical forensics (June 2016); chemical warfare agents, toxicity, emergency response, and medical countermeasures (September 2016); trends in industrial chemical production (2017); and emerging technologies relevant to the Convention (2017) to inform the report of the SAB to the Fourth Review Conference. Funding for these workshops is available in particular through the European Union Joint Action in support of OPCW activities. Briefings on outcomes of these workshops will be provided to States Parties.
20. In support of engagement within the scientific community, the SAB's standing agenda item on the assessment of developments in science and technology includes sharing of insights, not only during SAB sessions, but also between sessions. The Secretariat continues to provide administrative support for the attendance of SAB members at relevant conferences.
21. The Secretariat has further augmented its activities in monitoring developments in science and technology, through the review of publications and patents, and the use of online scientific resources and communities with support from SAB members. These activities will continue to expand ahead of the Fourth Review Conference. Particular attention will be given to the following: new approaches and tools for chemical analysis (including biosensors and molecular diagnostics) that strengthen routine inspections, investigations of alleged use of chemical weapons, fact-finding missions, and challenge inspections; new and emerging methods of chemical production that will likely inform site-selection methodologies under Article VI; and the economic, sociopolitical, and regulatory driving forces of developments in science and

⁸ Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention

technology that help inform full and effective implementation of Articles IV, V, VI, VII, IX, and XI of the Convention.

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