



NOTE BY THE DIRECTOR-GENERAL

**RESPONSE TO THE REPORT OF THE THIRTY-SECOND SESSION
OF THE SCIENTIFIC ADVISORY BOARD
15 – 17 JUNE 2021**

1. This Note presents the Director-General's comments on the report of the Thirty-Second Session of the Scientific Advisory Board (SAB) (SAB-32/1, dated 17 June 2021) and the ongoing work of the Board.
2. Science underpins the Chemical Weapons Convention (hereinafter "the Convention"). Understanding the impact of scientific and technological evolution is a key aspect of the full and effective implementation of the Convention. The Director-General appreciates the SAB's continued hard work and dedication in providing scientific advice to him, the Technical Secretariat (hereinafter "the Secretariat") and, ultimately, the States Parties.
3. The Director-General recalls that six members of the SAB will be leaving the Board in 2021; a formal call for nominations has been issued (S/1927/2021, dated 26 January 2021), with a deadline for submissions of 30 August 2021.

Response to the Report of the Thirty-Second Session of the Scientific Advisory Board

4. The SAB met virtually for its Thirty-Second Session from 15 to 17 June 2021. The session was chaired by Chairperson Dr Christophe Curty and supported by Vice-Chairperson Dr Andrea Leisewitz. The report of the session was issued as SAB-32/1, dated 17 June 2021.
5. In her opening remarks, the Director of the Verification Division informed the SAB of the developments within the division over the past few years, upcoming considerations, and scientific and technological areas where the SAB's consideration may be beneficial (paragraphs 5.1 to 5.11 of SAB-32/1).
6. The Director of Verification highlighted the ongoing focus on industry inspections and efforts at optimising these, as well as declarations made by States Parties. She noted the continued efforts of the Verification Division to stay prepared for a number of potential situations moving forward, such as the possibility of possessor States joining the Convention in the future, or the use of chemical weapons by non-State actors.
7. Lastly, the Director of Verification noted the active work of the OPCW Laboratory in both its ongoing activities of analysing routine and non-routine mission samples, as well as its preparations for moving its operations to the new Centre for Chemistry and Technology (ChemTech Centre) once the construction is completed.



8. After careful review of the report of the Thirty-Second Session of the SAB, the Director-General submits the following comments.

Recommendations to the Director-General (paragraph 1.6 of SAB-32/1)

9. The Director-General thanks the SAB for the recommendations submitted through SAB-32/1. The Secretariat's work must be based on rigorous and robust scientific principles and methodologies, and the Director-General commends the SAB on its continued efforts to support this approach. The Director-General submits the following perspectives on the SAB's recommendations from its Thirty-Second Session:
- (a) In response to the recommendation in subparagraph 1.6(a) of SAB-32/1, relating to support for a joint workshop with the International Union on Pure and Applied Chemistry (IUPAC) to aid in the SAB's preparation for its scientific report for the Fifth Review Conference,¹ the Director-General supports the SAB's recommendation to again work with IUPAC on this matter. The Director-General notes that this ongoing collaboration is underpinned by the Memorandum of Understanding signed by the two organisations in 2016, and that bringing in a trusted and knowledgeable partner like IUPAC to continue to assist the SAB in this regard is logical.
 - (b) In response to the recommendation in subparagraph 1.6(b) of SAB-32/1, for the Director-General to consider convening a workshop related to the use of artificial intelligence (AI) in chemistry, the Director-General shares the Board's conclusion that this is an important emerging field of science and technology that may impact the Convention and the work of the OPCW. The Director-General supports the Board's idea to convene a workshop on the topic, either independently or within the context of another meeting or conference. Given the potential for this field to impact all areas of non-proliferation and disarmament, the Director-General suggests that the SAB consider involving other relevant organisations and entities, such as the United Nations Office for Disarmament Affairs, the United Nations Office on Drugs and Crime, the Implementation Support Unit of the Biological Weapons Convention, and others, to participate in the discussions. This is in fact a field of science that should be considered in the broader context of non-proliferation and disarmament.
 - (c) The Director-General notes subparagraph 1.6(c), recommending that the Secretariat consider bolstering its outreach and capacity-building events to States Parties with additional information related to dissemination technologies. The Director-General agrees with the notion that understanding dissemination approaches and technologies is crucial in preventing the use of chemical weapons. The Director-General supports further discussions within the Secretariat about how it can better equip States Parties with the knowledge and understanding needed about dissemination techniques to actively prevent chemical weapons use, especially considering the potential to provide enhanced capacity-building activities with the new ChemTech Centre.

¹

The Fifth Conference of the States Parties to Review the Operation of the Chemical Weapons Convention.

The impact of artificial intelligence in the chemical sciences (paragraphs 6.1 to 6.16 of SAB-32/1)

10. Computers are further integrating themselves into society and playing pivotal roles in science and technology at a fast pace. The use of computer processing power and AI in chemistry research and development is allowing for even greater creativity and control over the discovery and synthesis of existing and new chemical compounds. In addition, computers are assisting in understanding—and even predicting—physical and chemical properties associated with these compounds. This is a topic of increasing importance due to the impact it may have on the Convention and the work of the OPCW. The Director-General encourages the SAB to continue considering this topic and looks forward to receiving its further recommendations on the matter.
11. The Director-General thanks Dr Ahmed Saeed, SAB member, for his comprehensive summary of the state of the field and outlining the advances that have been made and current applications of the technology (paragraphs 6.2 to 6.4 of SAB-32/1).
12. In reference to the advanced synthesis planning by computers (paragraphs 6.5 to 6.10 of SAB-32/1), the Director-General recognises that the potential to use AI to aid in the design and synthesis of chemical compounds, both existing and new, is becoming a reality. While there are many beneficial applications of this technology, there is a concern that it could be misused. The Director-General requests that the Board continue to monitor developments in the ability to use AI to design new chemical compounds and in the application of AI to finding novel synthetic routes for existing compounds.
13. Regarding the improved prediction of organic compound properties (paragraphs 6.11 to 6.16 of SAB-32/1), the Director-General sees great utility in using computer modelling and simulation to estimate and predict properties of chemical compounds. The Director-General recognises the challenges in experimentally determining chemical and physical properties and the benefits that predictive methods bring. The Director-General reminds the Board that with the recent addition of more chemicals to the Convention's Annex on Chemicals, there is a need to accumulate all known information regarding these compounds and, where no literature exists, to find a way to acquire this information. The Director-General notes that predictive methods may prove useful in this regard and asks the Board to continue to monitor advances in this area.

Established and emerging technologies for the dissemination of chemical agents (paragraphs 8.1 to 8.9 of SAB-32/1)

14. A complete understanding of the methods of the dispersal and dissemination of chemicals is important for the implementation of the Convention. The Director-General commends Mr Günter Povoden, a member of the SAB, on not only updating the Board on the types and characteristics of different dissemination techniques, but also for providing this information to the members of the Secretariat who attended the SAB's Thirty-Second Session as observers. The concise history of the uses of different techniques to disperse chemicals, as well as an explanation of some of the technologies behind those techniques, is very useful to the Secretariat.

Detecting organophosphate chemical warfare agents using low-magnetic field nuclear magnetic resonance spectroscopy (paragraphs 9.1 to 9.8 of SAB-32/1)

15. The Director-General acknowledges the Board's efforts to stay abreast of new and emerging methods used to detect chemical threats. The presented application of nuclear magnetic resonance spectroscopy for the detection of nerve agents in the field is novel and innovative. While not yet mature enough to be utilised by the Secretariat in its work, the Director-General asks that the SAB monitor this and all other emerging techniques used to detect chemical warfare agents. It is critical that the Secretariat stay abreast of new and emerging tools that could enhance its routine and non-routine mission work.

Current and future activities of the Scientific Advisory Board (paragraphs 10.1 to 10.8 of SAB-32/1)

16. The SAB has continued its efforts in preparing its scientific review in the lead-up to the Fifth Review Conference to be held in 2023, commencing and making progress on the work of the Temporary Working Group (TWG) on the analysis of biotoxins, and in its plans to organise several topical workshops—one of which will be coordinated with the Chemical Industry Coordination Group (CICG) and the chemical industry at large. The Director-General thanks the SAB Chairperson Dr Christophe Curty and Vice-Chairperson Dr Andrea Leisewitz for their continued leadership and work in 2021.
17. The Director-General notes the ongoing progress the Board is making towards its scientific report for the Fifth Review Conference. Both the Director-General and States Parties highly value the input that the SAB generates for each Review Conference, and appreciate the amount of dedication and work that goes into each one. The Director-General recognises the challenges that the Board faces given the restrictions on travel and in-person meetings due to the COVID-19 pandemic and is pleased to see the Board making use of virtual platforms to continue its work. The Director-General notes the use of the virtual breakout rooms, which have assisted the Board in its deliberations for the scientific report.
18. The TWG on the analysis of biotoxins held its first meeting virtually on 3 and 6 May 2021. The 15-member group, comprised of nine current SAB members and six external experts, has finalised its first report, and convened for a second time in the second half of June.² The Director-General expresses his appreciation to Dr Daan Noort and Dr Suzanne Kalb, the Chairperson and Vice-Chairperson of the TWG, respectively, and all the TWG members for their expedient commencement of TWG meetings and their enthusiasm. The Secretariat will benefit from a better understanding of the analysis of biotoxins, and the Director-General will continue to monitor the TWG's progress via its consideration by the SAB.
19. In relation to the SAB's initiative to organise a joint workshop with the chemical industry, the Director-General is appreciative of the progress made and the inclusion of the CICG in workshop planning and preparations. The Director-General recognises the importance of the chemical industry in the OPCW's work, and fully supports the SAB's efforts to include industry representatives, both when monitoring the state of science and technology, and when providing advice.

²

See "Summary of the First Meeting of the Scientific Advisory Board's Temporary Working Group on the Analysis of Biotoxins" (SAB-32/WP.1, dated 6 May 2021).

20. The Director-General thanks the European Union for providing funding for both the Plant Biomarker Challenge and the work of the TWGs.
21. The Director-General appreciates the quality, rigor, and substance of the SAB's recommendations and general provision of advice. The Director-General notes that the SAB has scheduled its Thirty-Third Session in November 2021 at the OPCW Headquarters in The Hague. The Director-General looks forward to the possibility of meeting with the SAB members again in person this fall, should the pandemic conditions allow for an in-person meeting.

--- 0 ---