

**NOTE BY THE DIRECTOR-GENERAL****THE IMPACT OF 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-Second Session of the Scientific Advisory Board (SAB) (SAB-22/1, dated 21 July 2015).
2. An understanding of developments in science and technology is crucial to the full and effective implementation of the Convention, especially in regard to Articles II to XI. Therefore, robust technical advice from the SAB is vital to the work of the Technical Secretariat (hereinafter "the Secretariat") and to the States Parties.
3. A call for voluntary contributions to support the work of the SAB was issued in January this year (S/1237/2015, dated 22 January 2015). The Director-General encourages States Parties to carefully consider the Note. No fresh contributions have been received for the past 12 months; the balance of this trust fund is now only about EUR 25,000.

**REPORT OF THE TWENTY-SECOND SESSION OF THE SCIENTIFIC
ADVISORY BOARD**

4. The SAB met in The Hague, the Netherlands, for its Twenty-Second Session from 8 to 12 June 2015. The report of that session was issued as SAB-22/1.¹
5. In her opening remarks, the Deputy Director-General congratulated Christopher Timperley on his election as Chairperson and Cheng Tang on his election as Vice-Chairperson of the SAB. She also conveyed the Director-General's gratitude to Alejandra Graciela Suárez, Djafer Benachour, Michael Geist, Muhammad Zafar-Uz-Zaman, Slavica Vučinić, and William Kane (who will all be leaving the Board this year) for their contributions to the SAB during their terms of office.
6. After a careful study of the report of the Twenty-Second Session of the SAB, the Director-General is pleased to submit to the Executive Council (hereinafter "the Council") the comments below.

1 www.opcw.org/fileadmin/OPCW/SAB/en/sab-22-01_e_.pdf



Developments in science and technology (paragraphs 6.1 to 6.21 and 11.1 to 11.3 of SAB-22/1)

7. The reaffirmation by the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention of the relevance of developments in science and technology to the Convention (paragraph 9.4 of RC-3/3*, dated 19 April 2013) demonstrates the strong commitment of States Parties to ensuring that effective policy solutions are grounded in the science underpinning the SAB's advice. The SAB will soon be starting preparations for its report on developments in science and technology to be submitted to the Fourth Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention, covering the full breadth of the SAB's terms of reference. The Secretariat will, as usual, provide administrative support for the SAB in this endeavour.

Scientific and technological elements of verification technologies, emerging technologies, and new equipment (paragraphs 7.1 to 7.13 of SAB-22/1)

8. The Director-General expresses his appreciation to the SAB and the members of the temporary working group (TWG) on verification for their recommendations and report (which has been issued by the Secretariat as SAB/REP/1/15, dated June 2015),² with which he agrees. He is especially grateful to Roberto Martínez-Álvarez for ably chairing this TWG.
9. As we have seen in the past couple of years, for example in the context of investigations of alleged use of chemical weapons, verification remains the cornerstone of the Convention: it is imperative that the Organisation have the full set of capabilities necessary for effective implementation of the Convention's verification regime, including for non-routine situations. Action to implement the SAB's recommendations on verification is set out in the annex to this Note; most action is for the Secretariat to implement directly. The Secretariat is proposing action for Member States on the following matters and intends to develop specific proposals:

(a) For the Industry Cluster:

- (i) exemption of certain other chemical production facilities (OCPFs) from declaration requirements (recommendation 9a);
- (ii) review/reassessment of the impact of the product group codes in the OCPF site-selection methodology (recommendation 9b); and
- (iii) revision of verification thresholds for certain OCPFs (recommendation 10); and

2 www.opcw.org/fileadmin/OPCW/SAB/en/Final_Report_of_SAB_TWG_on_Verification_-_as_presented_to_SAB.pdf

- (b) For the policy-making organs:
- (i) additions to the list of approved inspection equipment (recommendation 4);
 - (ii) exemption of certain OCPF's from declaration requirements (recommendation 9a);
 - (iii) revision of verification thresholds for certain OCPF's (recommendation 10);
 - (iv) additions to the OPCW Central Analytical Database (recommendation 15); and
 - (v) resource implications.
10. It is important to engage both experts and policy-makers in the relevant communities. The Chairperson of the SAB will present the SAB's verification report during the Meeting of Experts of the Biological Weapons Convention in Geneva, Switzerland, in August this year.

Further scientific and technological advice relevant to the Convention

Education and outreach in science and technology (paragraphs 8.1 to 8.3 and 8.6 to 8.13 of SAB-22/1)

11. The Director-General expresses his appreciation to the SAB and the members of the TWG on education and outreach in science and technology for their recommendations and report (which has been issued by the Secretariat as SAB/REP/2/14, dated November 2014)³, with which he agrees. He is especially grateful to Djafer Benachour for ably chairing this TWG, which has now concluded its work.
12. The report on education and outreach was made available to States Parties at the time of the annual meeting of National Authorities at the end of 2014. The Director-General has since established a task force in the Secretariat and recommended to the Council that the Secretariat establish an Advisory Board on Education and Outreach (EC-79/DG.11, dated 29 May 2015).⁴ The SAB's recommendations on education and outreach will be implemented through these two mechanisms.

Assistance and protection: medical countermeasures and treatment of exposure to nerve agents (paragraphs 8.4 and 8.5 of SAB-22/1)

13. The SAB's further advice on best practices for preventing and treating the health effects that arise from acute, prolonged, and repeated organophosphorus nerve agent exposure has been issued in a working paper (SAB-22/WP.2/Rev.1, dated

3 www.opcw.org/fileadmin/OPCW/SAB/en/Education_and_Engagement-v2.pdf

4 www.opcw.org/fileadmin/OPCW/EC/79/en/ec79dg11_4_.pdf

10 June 2015).⁵ The advice augments the frame of reference for medical professionals and emergency responders who may not have knowledge of symptoms and treatment options related to exposure to chemical warfare agents. The Secretariat is in particular considering how best to use the advice in assistance-and-protection training courses and workshops.

Scheduled chemicals and advice on the Annex on Chemicals (paragraphs 9.1 and 9.2 of SAB-22/1)

14. The Director-General thanks the SAB for agreeing to provide technical advice on isotopically-labelled scheduled chemicals and on stereoisomers of scheduled chemicals, and looks forward to receiving responses to these questions by the middle of 2016.

Experiences from other relevant advisory boards (paragraphs 10.1 to 10.4 of SAB-22/1)

15. The Director-General encourages the SAB to continue to invite guest speakers to SAB meetings, in particular those from international organisations and advisory bodies.

FUTURE WORK AND OTHER BUSINESS OF THE SCIENTIFIC ADVISORY BOARD

16. Interaction between the SAB and the policy-making organs has increased in the past four years. This continued during the Twenty-Second Session of the SAB: representatives of 28 States Parties were briefed by the SAB Chairperson and Vice-Chairperson on 11 June 2015;⁶ the highest-ever participation in such briefings is testimony to the importance of science and technology in policy-making. Additional means by which interaction is enhanced include a regular item on science and technology on the agenda of the annual meetings of National Authorities and a series of workshops entitled “Science for Diplomats”.⁷ The Secretariat will continue to support these activities.
17. In 2016 and 2017, the SAB will need to meet twice a year. 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. The Secretariat will seek to support the holding of the specific workshops that the SAB has identified; funding is available in particular through the European Union Joint Action on support for OPCW activities.

5 www.opcw.org/fileadmin/OPCW/SAB/en/sab-22-wp02_e_.pdf

6 www.opcw.org/fileadmin/OPCW/Science_Technology/Diplomats_Programme/SAB-22_Briefing_to_States_Parties_11_June_2015.pdf

7 www.opcw.org/special-sections/science-technology/science-for-diplomats

MONITORING DEVELOPMENTS IN SCIENCE AND TECHNOLOGY

18. It is encouraging to see that the SAB increasingly shares insight on relevant developments in science and technology, such as the continuing convergence of the sciences, aspects related to security, new production methods such as the use of biomass, the increasing importance of “green chemistry”, integration of chemical measurement technologies with informatics to improve chemical detection, and chemical forensics (see, for example, paragraphs 6.2 to 6.16, 6.19, 7.12, and 7.13 of SAB-22/1). As part of the SAB’s standing item on assessment of developments in science and technology, further insight should be shared and generated, not only during SAB sessions, but also between sessions. Administrative support from the Secretariat for attendance of SAB members at relevant conferences will be increased in the next two years.
19. In the past year, the Secretariat has further augmented its monitoring of developments in science and technology, for example through the review of publications and patents and active engagement with scientific communities (such as participation in relevant conferences, and use of online scientific resources and communities). The Secretariat’s new periodical, “Science & Technology Monitor”,⁸ designed to further engage scientific experts and policy-makers, has helped to identify technical topics of interest, such as:
 - (a) new approaches and tools for chemical analysis (including biosensors and molecular diagnostics), which strengthen routine inspections, investigations of alleged use of chemical weapons, fact-finding missions, and challenge inspections;
 - (b) new and emerging methods of chemical production, which will likely inform site-selection methodologies under Article VI; and
 - (c) economic, socio-political and regulatory driving forces of developments in science and technology, which help inform full and effective implementation of Articles IV to VII, IX, and XI.
20. These efforts should be further augmented, which will require additional technical expertise and informatics.
21. Secretariat staff members have continued to contribute to the creation of original insights, published in peer-reviewed scientific journals, notably on topics relevant to verification, such as sampling and analysis.⁹
22. The Secretariat’s “chemical informatics for facilitating international collaboration” project, financially supported by the European Union,¹⁰ will facilitate scientific collaboration with emerging sensor and smart-device technologies, and other

8 www.opcw.org/special-sections/science-technology/science-technology-monitor

9 O. Terzic, H. Gregg, P. de Voogt, *Trends in Analytical Chemistry* (2015), 65, 151–166. [dx.doi.org/10.1016/j.trac.2014.10.012](https://doi.org/10.1016/j.trac.2014.10.012).

10 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2015.043.01.0014.01.ENG (17 February 2015)

informatics tools. The project will also create new insight into how the vast amount of data that is gathered in the public domain can be considered as a tool for full and effective implementation of international obligations, including those under the Convention.

23. In addition to creating original scientific insight, activities such as those described above support education and outreach, vis-à-vis the full range of OPCW stakeholders, for full and effective implementation of the Convention, as do the Secretariat's programmes under Article XI.

Annex (English only):

Action to Implement the Recommendations Made by the Scientific Advisory Board in its Report on Verification

Annex

ACTION TO IMPLEMENT THE RECOMMENDATIONS MADE BY THE SCIENTIFIC ADVISORY BOARD IN ITS REPORT ON VERIFICATION¹¹

Recommendation from the SAB	Implementation	Expected outcomes/results
<p>Recommendation 1: The Secretariat should consider adopting a comprehensive, more analytical approach to verification utilising all available and verifiable information.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Strengthen the overall approach to verification. Explore different ways of working – based on past experiences, notably non-routine missions since 2013 as well as best practices from verification regimes of other organizations. Enhance cross-unit interaction by using project-based management coupled with clear accountabilities. Review the organisational structure to ensure it is fit for purpose in light of future verification needs. Simplify the internal-control regime. Augment the systematic information analysis – conceptual frameworks (including determination of the key information needed for effective verification and how to obtain it), staff posts, and information tools. Assess the degree of implementation of the CWC and determine how to address any gaps. Augment training in the relevant technologies/techniques/tools, e.g. data analysis and geographical mapping capabilities. • <u>Resource implications</u> (Medium-Term Plan and annual Programme and Budget): Staffing and investments in and maintenance of IT systems. 	<ul style="list-style-type: none"> • Reduced risk of re-emergence of chemical weapons through a comprehensive verification regime that is relevant to all future challenges. • Increased completeness of declarations. • Reduced declaration discrepancies.
<p>Recommendation 2: The Secretariat should acquire the capability to use open-source information on a routine basis.</p>	<ul style="list-style-type: none"> • Secretariat informal paper of 31 July 2012 refers. • <u>Secretariat</u> – current use of publicly available information includes: <ul style="list-style-type: none"> ○ Maintaining technical expertise of staff members for effective verification. ○ Assessing developments and trends in the chemical industry 	<ul style="list-style-type: none"> • Tailored assistance to current and emerging States Parties for full and effective implementation of Article VI. • Increased completeness of declarations.

¹¹

SAB/REP/1/15, dated June 2015, www.opcw.org/fileadmin/OPCW/SAB/en/Final_Report_of_SAB_TWG_on_Verification_-_as_presented_to_SAB.pdf

Recommendation from the SAB	Implementation	Expected outcomes/results
	<p>to enable provision of expert advice to States Parties (e.g. papers for industry cluster consultations).</p> <ul style="list-style-type: none"> ○ Supporting National Authorities to identify declarable activities and facilities to ensure complete declarations, e.g. through training and use of publicly available databases. ○ Using and improving reference tools for States Parties that compile lists of OCPFs (e.g. S/1026/2012). ○ Evaluating trade in chemicals and trade declarations, and helping to address declaration discrepancies and inconsistencies. ○ Background information when inspection teams prepare for missions (routine and non-routine). ○ Assessing developments and trends to prevent re-emergence of chemical weapons. <ul style="list-style-type: none"> ● The Secretariat’s chemical informatics project provides insight into use of publicly available information for chemical measurements. ● To further strengthen the effectiveness of verification, <u>potential further use</u> of publicly available information could include – subject to further exploration by the Secretariat in dialogue with States Parties: <ul style="list-style-type: none"> ○ Using tailored Verification Assessment Teams (on request) to support States Parties in ensuring that declarations are complete. ○ Assessing, validating and reporting on the completeness and quality of information (such as trade in scheduled chemicals) declared to the Secretariat by States Parties. ○ Selecting relatively more declared plant sites of relatively high relevance to the objects and purpose of the CWC for inspection, and fewer of low relevance. ○ Assessing information provided by the inspected State Party 	<ul style="list-style-type: none"> ● Reduced declaration discrepancies. ● Reduced risk of development of new types of chemical weapons. ● Authoritative technical analysis of publicly available information for use by States Parties to support prevention of use of chemical weapons.

Recommendation from the SAB	Implementation	Expected outcomes/results
	<p>when resolving issues that have arisen during inspections.</p> <ul style="list-style-type: none"> ○ Development of a database of past use of chemical weapons by non-states actors for use by the TS and SPs in preventative efforts. ● <u>Resource implications</u> (Medium-Term Plan and annual Programme and Budget): Staffing. 	
<p>Recommendation 3:</p> <p>The Secretariat should put in place an information management structure that can provide the support required for the verification process.</p>	<ul style="list-style-type: none"> ● <u>Secretariat</u>: Conduct an independent review of the Verification Information System in 2016. Articulate a governance framework for verification information and records management. Implement the Enterprise Content Management system to replace current document management systems and offer new possibilities in terms of data analysis. Explore expansion of the Secure Information Exchange to e.g. secure exchange of information between deployed inspection teams and OPCW headquarters. Implement the Schedule 1 mission planning and inspection report data management functionality in the VIS. Consolidate and expand geo-spatial capability in support of more coordinated information management structure. Augment training in the relevant technologies/techniques/tools. Maintain the current powerful geo-spatial tools (such as Arc-GIS) and analytical capabilities. Maintain and further develop relationships with partner providers (such as EU SATCEN). ● <u>Resource implications</u> (Medium-Term Plan and annual Programme and Budget): Investments in and maintenance of IT systems and tools, as well as contracting of specialised services or additional staff posts. 	<ul style="list-style-type: none"> ● Effective and user-friendly management of information. ● Cost-effective verification. ● State-of-the-art business-enabling technology platform in support of all verification activities – easily scalable (up and down) to future needs.
<p>Recommendation 4:</p> <p>Remote/automated monitoring technologies should be added to the list of approved inspection equipment.</p>	<ul style="list-style-type: none"> ● <u>Executive Council</u>, based on Secretariat proposal, including consideration of: use of remotely operated technology, online monitoring systems and remote transmission, remote interviews, and live video coverage of key elements of investigations. Implement encrypted data transmission between inspection teams and the Technical Secretariat. 	<ul style="list-style-type: none"> ● Effective verification in all situations. ● Increased security for personnel deployed to the field.

Recommendation from the SAB	Implementation	Expected outcomes/results
	<ul style="list-style-type: none"> • <u>Secretariat</u>: Draw on recent experience in relation to Syria, such as use of sealed visual recording equipment, chain-of-custody technical tools for collecting evidence, encrypted IT, remote and secure transmission of information and products (i.e. mapping) to field environments in support of deployed missions, tracking devices for Secretariat staff deployed in high security environments. Consider developing aerial video/camera capability for use in IAUs and perimeter monitoring for CIs. Assessment of low-cost electronic sensors is part of the Secretariat’s chemical informatics project. 	
<p>Recommendation 5: The Secretariat should look into the option of using satellite imagery for the planning of non-routine missions, in particular for IAU and CI.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Draw on recent experience from activities in relation to the Syrian Arab Republic (including the fact-finding missions) and Libya, for use of satellite imagery – as well as other technologies and techniques such as 3-dimensional modelling, GIS data fusion, large data sets – in both future non-routine activities and in routine verification. Draw on experiences from other international organisations. Consider holding an OPCW exercise in 2017 as part of a multi-year plan for IAU and CI exercises that involve all Secretariat capabilities: operational, legal, technical (including geo-spatial analysis and computer forensics), security, policy, procedural. Augment training in the relevant technologies/techniques/tools. Solidify capability to fuse current satellite capability, geo-spatial analysis, and drone imagery for specific missions. • <u>Resource implications</u> (MTP and annual Programme and Budget): Funding for exercises, State Party co-organiser(s) of exercises, investments in and maintenance of IT tools, as well as contracting of specialised services or additional staff posts. 	<ul style="list-style-type: none"> • Effective verification in all situations. • Increased security for personnel deployed to the field.

Recommendation from the SAB	Implementation	Expected outcomes/results
<p>Recommendation 6: The Secretariat should visit the National Authorities to obtain assurance on the accuracy and completeness of declarations. The outcome of such visits may impact on the inspection frequency.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Develop a conceptual approach. Pilot bilateral visits with interested States Parties (based e.g. on experiences from the previous technical-assistance-visit programme). Develop a programme that takes into account the also the action taken in relation to recommendation 1. • <u>Executive Council</u>: Based on experiences with the pilot programme, consider more systematic, comprehensive programme for all States Parties. Consider synergies with other relevant conventions/treaties and their implementing entities. • <u>Resource implications</u> (MTP and annual Programme and Budget): Travel cost and possibly staffing. 	<ul style="list-style-type: none"> • Full and effective implementation of Articles III-VI. • Increased completeness of declarations. • Level playing field in the chemical industry. • Cost-effective verification.
<p>Recommendation 7: The Secretariat must commission an independent review of all activities pertaining to the missions carried out in the Syrian Arab Republic.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: An independent review of all activities conducted by the OPCW in relation to the Syrian Arab Republic (both in the field and at headquarters) and the associated work (preparatory and operational), done between October 2012 and December 2015, will be conducted in 2016. • <u>Resource implications</u> (2016 Programme and Budget): Consultancy. 	<ul style="list-style-type: none"> • An Organisation that remains relevant to any future challenge. • A Secretariat ever better prepared effectively to address any future non-routine situation, in relation to both current and future States Parties. • New knowledge gained in non-routine verification transferred to routine verification.
<p>Recommendation 8: The list of declarable OCPFs submitted by States Parties should include all facilities which fall under the definition/requirement of paragraph 1 of Part IX of the Verification Annex, regardless</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Issue declaration guidance to States Parties. Support States Parties to make full use of all OPCW tools and guidance. 	<ul style="list-style-type: none"> • Increased completeness of declarations. • Level playing field in the chemical industry. • Consistent application of the verification regime across States Parties.

Recommendation from the SAB	Implementation	Expected outcomes/results
of the purity level of a DOC or DOC mixtures produced.		
<p>Recommendation 9:</p> <p>Not all facilities that fall under Part IX of the Verification Annex should be considered of the same relevance to the object and purpose of the Convention. The TWG recommends a practical approach for enhancing the utilisation of verification resources for OCPF declaration and on-site inspection processes.</p>	<ul style="list-style-type: none"> • See (a), (b) and (c) below. 	<ul style="list-style-type: none"> • More effective verification. • Continued strong support from the global chemical industry for sound and proportionate implementation of the CWC. • Adaptation of the verification regime in line with developments in the chemical industry.
<p>Recommendation 9a:</p> <p>The OPCW policy-making organs should exempt certain OCPFs from declaration requirements.</p>	<ul style="list-style-type: none"> • <u>Industry cluster</u>: Discussion based on Secretariat proposal. • <u>Executive Council</u>: Decision 	
<p>Recommendation 9b:</p> <p>The Secretariat should reassess which product group codes are highly relevant to the Convention. Facilities declared with these product group codes should be subject to a higher probability to be selected for inspection.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Review the performance of the site-selection methodology. • <u>Industry cluster</u>: Potential discussion depending on Secretariat review. 	

Recommendation from the SAB	Implementation	Expected outcomes/results
<p>Recommendation 9c:</p> <p>For facilities in product group codes that are considered less relevant, the Secretariat should identify appropriate mechanisms to augment the declared information with validated and credible sources to allow for an assessment regarding the need for on-site inspection.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: The review and potential discussion on implementation of recommendation 9(b) will inform Secretariat guidance to States Parties and Secretariat action. • Action to implement recommendations 1, 2 and 3 will also be relevant. 	
<p>Recommendation 10:</p> <p>The verification thresholds for OCPFs producing highly relevant chemicals, and the possibility of revision of the product group codes, should be addressed by the SAB as well as the industry cluster.</p>	<ul style="list-style-type: none"> • <u>Industry cluster</u>: Discussion, including briefing(s) by members of the Scientific Advisory Board. • <u>Policy-Making Organs</u>: Decision to change verification thresholds. • <u>Scientific Advisory Board</u>: In its report to the Fourth Review Conference. 	<ul style="list-style-type: none"> • Adaptation of the verification regime in line with (i) scientific and technological developments and (ii) developments in the chemical industry.
<p>Recommendation 11:</p> <p>The OPCW should increase the staff of the OPCW Laboratory to cope with various aspects of IAU, biomedical samples, trace environmental analysis, toxins, and on-site analysis. Establishing a network of DLs for biomedical sample analysis should be a high priority.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Hire one additional Senior Analytical Chemist (for a total of five chemists in the OPCW Laboratory). Implement the action plan for proficiency tests that will, <i>inter alia</i>, lead to a programme to designate laboratories for off-site analysis of biomedical samples. • <u>Resource implications</u> (MTP and annual P&B): Staffing and costs for biomedical proficiency tests. 	<ul style="list-style-type: none"> • Adaptation of the verification regime in line with scientific and technological developments. • All types of investigations and investigation scenarios effectively handled.

Recommendation from the SAB	Implementation	Expected outcomes/results
<p>Recommendation 12: Lessons on chemical sampling and analysis from the OPCW's support to the 2013 United Nations Mission to Investigate the Use of Chemical Weapons in the Syrian Arab Republic, and all subsequent OPCW activities in relation to the Syrian Arab Republic must be identified and implemented.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: See response to recommendation 7 	<ul style="list-style-type: none"> • All types of samples and sampling scenarios effectively handled in non-routine situations. • New knowledge of sampling and analysis gained in non-routine verification transferred to routine verification.
<p>Recommendation 13: PTs should incorporate a broader range of chemicals, and at a wider range of concentrations, to prepare laboratories for IAU-type scenarios.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: The OPCW Laboratory will start sending additional (optional) samples alongside the normal proficiency test samples in order to gage the ability of participating laboratories to analyse samples for trace components. 	
<p>Recommendation 14: The Secretariat should expedite toxin identification exercises.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: The OPCW Laboratory will start sending additional (optional) samples alongside the normal proficiency test samples in order to gage the ability of participating laboratories to analyse samples for toxins. 	<ul style="list-style-type: none"> • Adaptation of the verification regime in line with scientific and technological developments in regard to all chemicals, whether existing or yet to be discovered.
<p>Recommendation 15: Continuous additions to the OPCW Central Analytical Database (OCAD) are recommended to allow the OPCW to meet all its mandated inspection aims, including IAU.</p>	<ul style="list-style-type: none"> • <u>Executive Council</u>: Decision, based on regular Secretariat proposals validated by the Validation Group. • <u>Secretariat</u>: The OPCW Laboratory is developing a method to select information from a large database, which will allow the Executive Council more easily to include data of relevant non-scheduled chemicals in the OCAD. 	

Recommendation from the SAB	Implementation	Expected outcomes/results
<p>Recommendation 16: Developments in analytical instrument portability, miniaturisation and disposable biosensors should be periodically reviewed by the Secretariat and the SAB for potential applicability to on-site analysis.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Continue to monitor developments in instrumentation, e.g. consider in-house testing of commercially available “point-of-care” diagnostic platforms. Explore collaboration with the industry and States Parties to develop instrumentation tailored to the needs of the OPCW. Acquire new instrumentation for Article VI inspections (to increase portability). Low-cost electronic sensors are being evaluated in the Secretariat’s chemical informatics project. • <u>Scientific Advisory Board</u>: In its report to the Fourth Review Conference. 	
<p>Recommendation 17: The Secretariat should monitor developments in chemical forensics.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>: Continue to monitor developments in chemical forensics, together with Designated Laboratories. Explore collaboration with the industry and States Parties to develop methodology tailored to the needs of the OPCW. Develop the capability of the OPCW Laboratory for chemical forensics. • <u>Scientific Advisory Board</u>: Assess development in an expert workshop in 2016 and in the Board’s report to the Fourth Review Conference. 	<ul style="list-style-type: none"> • Effective investigations of alleged use and other non-routine situations. • Adaptation of the verification regime in line with scientific and technological developments.
<p>Recommendation 18: The Secretariat should augment its capability to monitor and forecast developments in science and technology of relevance to the Convention and its verification regime.</p>	<ul style="list-style-type: none"> • <u>Secretariat</u>, in tandem with the Scientific Advisory Board – drawing also on scientific organisations and networks. • <u>Secretariat</u>: Ensure all relevant staff are kept up-to-date on technology related to detection, production, and destruction of existing and potential chemical weapons. Maintain active engagement with scientific communities (especially innovation communities) to evaluate novel developments – both in person and through social media, newsletters, etc. • <u>Resource implications</u> (MTP and annual P&B): Staffing and information/analytical tools. 	<ul style="list-style-type: none"> • Adaptation of the verification regime in line with scientific and technological developments.