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### NOTE BY THE DIRECTOR-GENERAL

#### STATUS OF THE FOLLOW-UP TO THE RECOMMENDATIONS ON SCIENCE AND TECHNOLOGY MADE TO THE THIRD REVIEW CONFERENCE

1. This Note sets out the Director-General's views on the status of the follow-up to the recommendations on science and technology made to the Third Special Session of the Conference of the States Parties to Review the Operation of the Chemical Weapons Convention (hereinafter "the Third Review Conference").
2. The Third Review Conference reaffirmed the relevance of developments in science and technology to the Chemical Weapons Convention (hereinafter "the Convention") (paragraph 9.4 of RC-3/3\*, dated 19 April 2013), and noted both the report of the Scientific Advisory Board (SAB) on developments in science and technology submitted to the Third Review Conference (RC-3/DG.1, dated 29 October 2012) and the Director-General's response to the report of the SAB (RC-3/DG.2, dated 31 January 2013). States Parties have thus demonstrated a strong commitment to ensuring that effective policy solutions are developed and that they are grounded in the science underpinning the advice of the SAB.
3. The Annex to this Note summarises action taken and sets out further action, both by States Parties and the Technical Secretariat (hereinafter "the Secretariat") that is necessary in order to implement the 29 recommendations made in RC-3/DG.2. Regarding action by the States Parties, the Director-General wishes to encourage States Parties to:
  - (a) assess the convergence of the sciences (subparagraph 7(b) of RC-3/DG.2);
  - (b) share information on captive use of Schedule 1 chemicals with their chemical industry and report examples of captive use of Schedule 1 chemicals to the Secretariat (paragraph 18 of RC-3/DG.2);
  - (c) assess whether some Schedule 1 chemicals could occur in their industries as by-products or impurities (paragraph 20 of RC-3/DG.2); and
  - (d) further augment outreach and awareness raising (paragraph 28 of RC-3/DG.2).
4. For its part, the Secretariat:
  - (a) is actively keeping abreast of developments in science and technology, including such areas as the convergence of chemistry and biology,



- nanotechnology, and assistance and protection (subparagraph 7(b) and paragraphs 8, 29, and 35 of RC-3/DG.2);
- (b) continues to augment and strengthen laboratory capabilities (paragraphs 9, 24, 25, 30 and 32 of RC-3/DG.2.);
  - (c) has implemented a number of actions on education and outreach; and
  - (d) will consider the further recommendations, as relevant, of the SAB after the temporary working group on verification has provided its report.
5. To highlight the underlying scientific insight of the SAB's recommendations, and to translate that insight into knowledge for the policy-makers to inform their decisions with the relevant scientific advice, as appropriate, the Secretariat has initiated a series of workshops entitled "Science for Diplomats". The first workshop (on analytical chemistry) was held on 9 July, in the margins of the Seventy-Sixth Session of the Executive Council. Policy-makers are encouraged to attend the forthcoming workshops, several of which will likely be held in the margins of meetings of the policy-making organs. In order to address all thematic areas arising from the recommendations on science and technology made to the Third Review Conference, and to start scanning for the science and technology topics that could be relevant at the time of the Fourth Review Conference, the Secretariat intends to continue this series of workshops in 2015 and 2016.

Annex (English only):

Update on Implementation of the Director-General's Response to the Recommendations of the Scientific Advisory Board on Developments in Science and Technology

## Annex

### UPDATE ON IMPLEMENTATION OF THE DIRECTOR-GENERAL'S RESPONSE<sup>1,2</sup> TO THE RECOMMENDATIONS OF THE SCIENTIFIC ADVISORY BOARD<sup>3</sup> ON DEVELOPMENTS IN SCIENCE AND TECHNOLOGY

Recommendation	Status of Implementation
<b>Monitoring Developments in Science and Technology</b>	
<p>“...the <b>convergence of chemistry and biology and other sciences</b> is a development that will likely pose both challenges and opportunities for the Convention”; “...is a field of rapid advances and therefore requires systematic monitoring by the Secretariat and by the SAB”;</p> <p>“...encourage States Parties to submit their own assessments of the <b>convergence</b> of the sciences...”</p> <p>“...increased <b>interaction between technical experts</b> in chemistry and biology.”</p> <p>“...<b>nanotechnology</b> be kept under review...”; “...will first and foremost bring many benefits to States Parties, including in terms of improved counter-measures against chemical weapons...”</p> <p style="text-align: center;">(subparagraphs 7(a), 7(b), 7(c) 8, 29 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>• Both the Technical Secretariat (TS) and the Scientific Advisory Board (SAB) are monitoring developments in science and technology (S&amp;T).</li> <li>• The SAB considers S&amp;T developments at every SAB meeting, at every meeting of the SAB's temporary working groups (TWGs), and during the intersessional period (e.g. with SAB members using their peer networks).</li> <li>• The SAB's TWG on convergence of chemistry and biology has completed two years of work; its final report was endorsed by the SAB on 27 June and has been issued as SAB-21/REP/1/14 on 27 June 2014.</li> <li>• The TS is augmenting its S&amp;T capability and capacity, especially through the Science Policy Adviser (e.g. attendance at S&amp;T conferences and networking with scientists across the world) and by using data mining and analytical tools.</li> <li>• TS is developing processes for summarising and reviewing S&amp;T developments as a basis for deciding when and on what to request more specific advice from the SAB.</li> <li>• The summer 2014 issue of the journal <i>OPCW Today</i> features S&amp;T.</li> <li>• The TS is holding a series of workshops (“Science for Diplomats”) for OPCW delegations in order to strengthen the understanding and</li> </ul>

1 RC-3/DG.2, dated 31 January 2013; noted by the Third Review Conference (paragraph 9.141 of RC-3/3\*, dated 19 April 2013 )

2 In RC-3/DG.2, the Director-General made 29 recommendations; in this table recommendations are presented thematically and some recommendations have been merged.

3 RC-3/DG.1, dated 29 October 2012; noted by the Third Review Conference (paragraph 9.141 of RC-3/3\*, dated 19 April 2013)

Recommendation	Status of Implementation
	<p>involvement of policy-makers in the implementation of S&amp;T recommendations.</p> <ul style="list-style-type: none"> <li>• The SAB’s report on convergence is a good basis for States Parties to make their further assessments.</li> <li>• The Director-General (DG) has appointed experts in biological sciences to the SAB and TWGs.</li> <li>• The SAB and its TWGs, and the TS, have organised side events and discussions at several S&amp;T conferences (e.g. at Synthetic Biology 6.0 and the 15<sup>th</sup> Asian Chemical Congress) and meetings that include discussions of science and technology (e.g. Biological Weapons Convention (BWC) Meetings of Experts and BWC Meetings of States Parties).</li> </ul>
<p>“...request the SAB to keep a watching brief on the development of <b>new destruction technologies</b>.”</p> <p style="text-align: center;">(paragraph 37 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>• Some aspects being discussed by the SAB’s TWG on verification.</li> <li>• The TS can provide support for the SAB to engage experts from States Parties with experience of destruction of chemical weapons and from the chemical industry.</li> </ul>
<b>Laboratory Capabilities and Analysis</b>	
<p>“The Secretariat will continue to monitor developments relating to <b>unscheduled and novel toxic chemicals</b> and will explore ways in which to augment its <b>technical capabilities</b> in this area.”</p> <p>“...notes the SAB’s views on the <b>OPCW Central Analytical Database</b> and...the Secretariat needs to have analytical data on relevant unscheduled chemicals.”</p> <p style="text-align: center;">(paragraphs 9 and 32 of RC-3/DG.2]</p>	<ul style="list-style-type: none"> <li>• The OPCW Laboratory (LAB) is monitoring developments, has noted the SAB’s advice on riot control agents, and is working with the Validation Group to obtain analytical data on relevant unscheduled chemicals.</li> <li>• The LAB is establishing a training laboratory.</li> <li>• The LAB participates in various activities and programmes (e.g. EQuATox).</li> <li>• The OPCW Analytical Database (OCAD) continues to be regularly updated; it currently contains validated data for &gt; 5000 scheduled chemicals.</li> </ul>
<p>“...note the importance of continuing to <b>improve on-site and off-site analysis</b>”</p> <p>“...future such exercises will progress towards the more difficult</p>	<ul style="list-style-type: none"> <li>• Effective capability was demonstrated in the investigation of alleged use of chemical weapons in 2013.</li> <li>• The LAB and OPCW designated laboratories are continually working</li> </ul>

Recommendation	Status of Implementation
<p>analysis of longer-lived biomarkers of exposure, such as protein adducts”</p> <p>(paragraphs 24 and 25 of RC-3/DG.2)</p>	<p>on refining methodologies.</p> <ul style="list-style-type: none"> <li>• Workshops are routinely held with the designated laboratories, and for review of proficiency testing.</li> <li>• The LAB is continuing to improve its capabilities for conducting biomedical sampling and analysis.</li> <li>• Chemical analysis was the topic of the first workshop (on 9 July) in the “Science for Diplomats” series.</li> </ul>
<p>“...a <b>review of the proficiency-testing programme</b> be undertaken”</p> <p>“...resources be made available to enable <b>regular exercises of the entire off-site analysis process</b> to be conducted in conjunction with OPCW field exercises.”</p> <p>(paragraphs 26 and 30 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>• In July 2014, the LAB held discussions with designated laboratories.</li> <li>• Dr. Robin Black, former SAB member, is chairing a group to review the proficiency testing programme</li> <li>• The TS intends to seek funding through the annual programme and budget; not yet done due to the financial situation.</li> </ul>
<b>Verification</b>	
<p>“...the SAB’s view that “any process designed for the formation of a chemical substance should be covered by the term <b>‘produced by synthesis’</b>” and “... reaffirms the SAB’s 1999 recommendation...”</p> <p>“...<b>declaration practices</b> vary greatly among States Parties ... The Secretariat will analyse this situation further ... and will propose policy options that ensure consistency between States Parties.”</p> <p>“Complementary studies by States Parties or relevant organisations could also prove useful”</p> <p>(paragraphs 12, 13 and 14 of RC-3/DG.2 (31 Jan 2013))</p>	<ul style="list-style-type: none"> <li>• The SAB’s TWG on verification is considering the technical aspects of the impact on verification, after which the TS intends to develop policy options.</li> <li>• Will be a topic for one of the “Science for Diplomats” workshops.</li> <li>• The TS intends to engage the chemical, pharmaceutical and biotechnology industry associations to understand the scope of the matter.</li> </ul>

Recommendation	Status of Implementation
<p>“...establishment of a <b>low-concentration limit for Schedule 1 chemicals</b> ...which could be achieved through various mechanisms.”</p> <p>“...encourage States Parties to further discuss this regulatory aspect”</p> <p style="text-align: center;">(paragraphs 21 and 22 of RC-3/DG.2]</p>	<ul style="list-style-type: none"> <li>• The TS intends to issue a Note on its procedure for handling cases of unavoidable Schedule 1 by-products</li> <li>• Schedule 1 issues will be a topic for one of the “Science for Diplomats” workshops.</li> </ul>
<p>“...<b>captive use of Schedule 1 chemicals</b>...an important issue about which the chemical industry needs to be informed through the National Authorities”</p> <p>“...request States Parties to share the relevant information with their chemical industry and to report other examples of captive use of Schedule 1 chemicals to the Secretariat”</p> <p>“...encourage States Parties to assess if some Schedule 1 chemicals could occur in certain types of their industries.”</p> <p style="text-align: center;">(paragraphs 17, 18 and 20 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>• Schedule 1 issues will be a topic for one of the “Science for Diplomats” workshops.</li> <li>• The DG is reminding States Parties of these recommendations.</li> </ul>
Education and Outreach	
<p>“...increased efforts be made nationally, regionally, and internationally to ensure that <b>all those engaged in chemistry are aware</b> of the Convention and its prohibitions and obligations”</p> <p>“...encourage States Parties to include information on the Convention in <b>medical, scientific, and military educational materials and programmes</b>”</p> <p>“...encourage States Parties to promote the development of <b>training and education programmes</b> for individuals who have been granted access to toxic chemicals, in order to raise awareness of the risks, as well as of the obligations of States</p>	<ul style="list-style-type: none"> <li>• The TS issued a strategic non-paper on education and outreach (E&amp;O) on 15 July 2013.</li> <li>• TS issued a S-note to EC-76 on its relevant activities (EC-76/S/4, dated 1 July 2014)</li> <li>• Members of the SAB’s TWG on E&amp;O in S&amp;T help produce materials and interactive tools that the OPCW and others make available to a wide audience (e.g. ”Multiple Uses of Chemicals” website, “Chemistry in Conflict” student workbook and lesson plan for “Fires: A Teacher’s Mission” film).</li> <li>• The TS intends to develop a strategy</li> <li>• The DG has spoken at several high-level events with an E&amp;O focus –</li> </ul>

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<p>Parties under the Convention”</p> <p>“...call upon States Parties to support and encourage the development, promulgation, and adoption of <b>codes of conduct and other voluntary measures</b> by the relevant stakeholders.”</p> <p>(paragraphs 28(a), 28(b), 28(c) and 28(d) of RC-3/DG.2)</p>	<p>ECSITE in May, ACUNS and ESOF in June.</p> <ul style="list-style-type: none"> <li>• Annual meeting of National Authorities in 2012 and 2013, included discussions on E&amp;O.</li> <li>• Argentina champions education in the responsible application of knowledge of dual-use chemicals and held national and regional meetings in 2013 and 2014.</li> <li>• The Seventy-Sixth Session of the Executive Council (in July 2014) had an agenda item (12) on education and outreach, including the introduction by Argentina of a national paper (EC-76/NAT.1, dated 5 June 2014) and the abovementioned note by the TS.</li> <li>• E&amp;O is now an established topic on the agenda of regional meetings of National Authorities on the Chemical Weapons Convention (CWC), e.g. the regional meeting for Africa at which a TWG member facilitated the E&amp;O discussion.</li> <li>• The DG has met with several ministers of education, including in Argentina, Georgia and the Netherlands.</li> <li>• On 20 June, the TS hosted the “Day of Excellence” for Dutch higher education, and informed over 100 participants about the educational materials available from the OPCW.</li> <li>• The OPCW event “Education for Peace: New Pathways for Securing Chemical Disarmament” will be held on 22 and 23 September 2014, followed by the fourth meeting of the TWG.</li> <li>• The TS is engaging the International Union of Pure and Applied Chemistry (IUPAC) on chemical education.</li> <li>• The TS has produced a series of short films (e.g. the “Fires” series), which are available on the OPCW’s website subtitled in official OPCW languages.</li> <li>• The TS intends to organise events in 2015 in the context of the centenary of the first massive use of chemical weapons.</li> <li>• The TS increasingly participates in events organised by States Parties, international organisations, and national and international scientific</li> </ul>

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	<p>societies in order to conduct outreach in practice, in particular at events that bring together a large number of participants or have the potential to create positive ripple effects.</p> <ul style="list-style-type: none"> <li>The TS is exploring engagement with national and regional chemical societies</li> </ul>
<b>Expertise, Training, and Knowledge Management</b>	
<p>“...a <b>well-equipped and well-trained Inspectorate</b> will contribute to the effective, efficient, and consistent application of the Convention’s verification regime”</p> <p>“...request the Secretariat to maintain the necessary <b>technical expertise and knowledge</b> to assist States Parties in the destruction of chemical weapons...”</p> <p>“...the <b>expertise</b> to monitor and verify destruction of chemical weapons stockpiles is an important technical capability that should be maintained.”</p> <p style="text-align: center;">(paragraphs 34, 36 and 37 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>Knowledge management is a strategic enabler in the OPCW’s Medium-Term Plan for 2015-19.</li> </ul>
<b>Assistance and Protection</b>	
<p>“...advances in science and technology provide opportunities for better <b>assistance and protection</b> against chemical weapons. Many of these advances are detailed in the SAB’s report. Regarding a mechanism to share best practices among States Parties...”</p> <p style="text-align: center;">(paragraph 35 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>In 1999, the TS established a network of experts in protection (the Protection Network) who advise on the implementation of best practices and applications of new technologies to incorporate into OPCW training courses.</li> <li>The TS maintains a data bank on best practices for protection. The TS provides training with the support of States Parties with established chemical-emergency mechanisms.</li> <li>The TS has developed a “train-the-trainers” course on assistance and protection.</li> <li>The SAB provided advice on medical counter-measures and treatments for blister and nerve agents in 2014, and is considering a</li> </ul>



Recommendation	Status of Implementation
	<p>follow-up request from the DG.</p> <ul style="list-style-type: none"> <li>Assistance and protection will be a topic for one of the “Science for Diplomats” workshops.</li> </ul>
<b>Other Topics where Recommendations have been Addressed or where Action sits in the Domain of OPCW Policy-Making Organs/States Parties</b>	
<p>“...the SAB has conducted a thorough review of the issue of <b>incapacitating chemical agents (ICAs)</b>...SAB’s recommendation that the Secretariat start preparations for verification activities,..”</p> <p>“...States Parties might consider using the Third Review Conference as an opportunity to further discuss...”</p> <p>“...the Secretariat will pursue efforts to enhance its chemical-analysis capabilities and will work with designated laboratories on this issue”</p> <p style="text-align: center;">(paragraphs 15 and 16 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>States Parties discussed this topic during the Third Review Conference.</li> <li>The TS is ready to contribute if requested by State Parties and the policy-making organs (PMOs).</li> <li>No specific verification preparations are being pursued by the TS with designated laboratories in this particular context.</li> <li>Enhancement of the OPCW’s laboratory chemical-analysis capabilities is ongoing in the context of the broader on-site and off-site sampling and analysis, which could involve any toxic chemical.</li> </ul>
<p>“...exemptions from the current 30-day notification period for <b>transfers of certain Schedule 1 chemicals.</b>”</p> <p style="text-align: center;">(paragraph 11 of RC-3/DG.2)</p>	<ul style="list-style-type: none"> <li>Exemptions would require a technical change to the Convention: not currently considered to result in a net benefit.</li> <li>The OPCW Laboratory can transfer materials to States Parties without the need for such exemption: on an exceptional basis it can act as a facilitator for the transfer of materials between two other laboratories for non-OPCW activities (e.g. analytical tests not involving the OPCW).</li> <li>Additional information is available in the TS non-paper “Potential Utility of a <i>de minimis</i> Rule for Notification of Transfers of Schedule 1 Chemicals” (of 18 April 2011).</li> </ul>