OPCW

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UPGRADING THE OPCW CHEMICAL LABORATORY TO A CENTRE FOR CHEMISTRY AND TECHNOLOGY

Background

1. The OPCW Laboratory is an embodiment of the OPCW's commitment to science and technology (S&T). It is central to the effectiveness and integrity of the verification regime. Furthermore, it also contributes to the development and maintenance of capabilities in States Parties through the network of designated laboratories and beyond.

2. Despite the worldwide taboo over the use of chemical weapons, the stark reality is that chemical weapons have continued to be used, and their re-emergence is a real concern against which the OPCW remains vigilant. When an incident occurs, it can be difficult to identify immediately whether it is an accidental release or a hostile act. In all cases, countries need to respond immediately, which includes identifying chemicals involved and determining swift responses, from medical treatment of victims to decontamination and remediation of the scene. The effects of some toxic chemicals are rapid and the window of opportunity to preserve life can be severely limited. Additionally, authorities need to attribute and apportion responsibility and investigate how the toxic chemicals were acquired in order to prevent recurrence. However, many countries lack such capabilities, which hampers efforts to bring perpetrators to justice.

3. In order to strengthen the OPCW's S&T capabilities to fully address the real threat of chemical weapons, as well as to support capacity building in our States Parties, the OPCW Laboratory should be expanded and bolstered with additional capabilities benefiting from recent advances in S&T. As the OPCW has been operating for several years on the basis of a zero nominal growth budget, a practice that will continue for the foreseeable future, a trust fund with voluntary contributions will be required for this initiative.

Goals and objectives

4. The key goal for this project is an upgrading of the OPCW Laboratory to a Centre for Chemistry and Technology ("the Chemtech Centre") to keep pace with current threats and remain fit for purpose ahead of future threats. Another goal is to enhance the capability to lead the network of partner laboratories in research activities on chemical weapons investigation as well as to assist States Parties in research and capacity-building activities, if need be, with the Chemtech Centre providing critical

support. In this way, the Chemtech Centre will be a hub for relevant laboratories and experts, creating the knowledge repository needed to tackle chemical threats worldwide.

5. The project envisions the following objectives:

(a) Augmenting analytical capabilities: Instrumentation and analytical science is a dynamic field. This means that the OPCW must continually develop analytical techniques and methods to ensure their relevance. Particular emphasis should be placed on chemical forensics, an expertise that goes beyond the simple analysis of toxic chemicals. Chemical forensics not only facilitates identification of chemicals that might have been used in a chemical incident, but possibly the synthetic route of their production. Such forensic capability could, in certain cases, be the basis for attributing attacks to perpetrators, including non-State actors, and perhaps their production facilities.

(b) Augmenting the capability to test, evaluate, and deploy equipment: The safety of inspectors under dangerous conditions is another area requiring new approaches and investment. The OPCW should continue to acquire equipment that will enable inspections with a higher degree of safety for inspectors, such as unmanned systems for sample collection, remote inspections, and protective equipment. To that end, the OPCW seeks an augmented capability to test, evaluate and deploy commercial equipment for use by the Technical Secretariat (hereinafter "the Secretariat"). This capability would also enable the OPCW to test other commercial equipment upon request of States Parties and provide practical advice on it, if need be.

(c) Obtaining the capability to engage in research activities: The Chemtech Centre should lead the network of partner laboratories by engaging in research activities on chemical weapons investigations that are not or cannot be addressed by external partners due to capability, confidentiality, or other issues. While the OPCW staff will focus on research relevant to the Chemical Weapons Convention verification regime, the Chemtech Centre could host experts from States Parties to enable them to accomplish research and development in areas such as new decontaminating agents, medical countermeasures, methods for identifying use of toxic industrial chemicals, new detection devices, and molecular mechanisms of action of toxic chemicals among others.

(d) Augmenting training capability: While it is essential that the OPCW be able to provide a continuous training programme due to tenure policy, the current training programme is limited, to some extent, by OPCW Laboratory infrastructure and capability. The OPCW needs significant enhancements to its training programmes, including sampling and subsequent handling of highly hazardous materials such as chemical warfare agents inside the facility with highest safety standards and best practices[1]. It will also enable the OPCW to

[1] Field training will be conducted using surrogates.

provide in-house capacity-building programmes for States Parties, which would be to the same standard as that received by OPCW staff. This will contribute for more in-depth sharing of knowledge among all concerned parties.

(e) Increasing the number of the designated laboratories: The OPCW's designated laboratories system comprises external laboratories that have been certified by the OPCW, where samples taken during investigations are analysed. The results of analyses in these designated laboratories play an essential role in judicial processes. Increasing the number of designated laboratories with enhanced regional diversity is crucial for the OPCW to stand ready for investigations of toxic chemicals anytime and anywhere in the world. At this moment, most designated laboratories are located in Western and Asian countries, and there are no laboratories in Latin America or Africa. Training scientists from these laboratories is a necessary element in expanding this network of laboratories, and is a key role for the Chemtech Centre.

(f) Obtaining the investigatory capability to assist judicial process: Credibility of evidence is critical. To ensure the integrity of OPCW findings in any potential judicial process aimed at bringing perpetrators to justice, the OPCW needs to be equipped with solid investigatory capability that will meet accepted judicial standards in terms of accuracy and appropriateness of procedures for toxic chemical analysis. This includes chemical forensics capability, training of inspectors in sampling and analysis, and maintaining the chain of custody. Due consideration would also be given for the procurement of laboratory tools used in the forensic sciences for effectively cross-referencing, validating, and linking together information related to investigation sites, materials collected and analysed, and individuals interviewed.

(g) Obtaining the capability to safely synthesise small quantity of chemical weapons agents: The capability to safely synthesise chemical weapons agents on a research and development scale is critical for the Chemtech Centre. It will enable the OPCW to further enhance analytical, research, and investigatory capabilities along with a capability to test commercial equipment related to chemical weapons for use by the Secretariat. It could also deliver some aspects of mandatory inspector training, such as toxic chemicals training.

Infrastructure and equipment

6. Pending the detailed analysis involving experts, the following infrastructure and appropriate equipment might be required to reach the above goal:

(a) Increased laboratory bench space within and outside of fume hoods;

(b) Laboratory space with special requirements for specific purposes such as sample handling, NMR[2] analysis, inspection mission preparation, database development, chemical synthesis, chemical forensics, and biochemistry;

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[2] Nuclear magnetic resonance.

(c) High hazard synthesis laboratory;

(d) Laboratory information management system;

(e) Engineering/electronics laboratory (also for use by the Equipment Store);

(f) Computer-based modelling/simulation laboratory;

(g) Secure archive and chemical storage for samples;

(h) Multipurpose large-capacity space for conferences, meetings, or training. In case of emergencies, this space and other laboratory infrastructure can be used for the OPCW's disaster recovery and business continuity site;

(i) Multipurpose communication room which can be used for, inter alia, live troubleshooting or live web conferences. It could also be used to deliver science-based reach-back capability round-the-clock to inspection teams in the field;

(j) Other training-related areas such as basic and advanced training laboratories, an outside training area, and a demonstration area;

(k) Enhanced office space;

(l) Enhanced equipment store; and

(m) Technical installations including an advanced air-handling system and an elevator for freight.

Estimated cost

7. In the initial phase of this project, the requirements statement will be developed based on which several plans with detailed estimates will be prepared. After the evaluation, one plan that meets the requirements statement with the lowest possible total cost will be recommended. Pending the comprehensive requirements assessment, the cost for this project is estimated to be EUR 20 to 25 million. The running cost of the Chemtech Centre would be incorporated in the future operational budgets, including any decrease in rent of the current Rijswijk facility if a new building is built[3].

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[3] The rent fee for the Rijswijk facility is EUR 121,000 per year.