IAEA
International Atomic Energy Agency
Atoms for Peace and Development

Board of Governors
General Conference

GOV/INF/2021/33-GC(65)/INF/7
GOV/INF/2021/34-GC(65)/INF/8
GOV/INF/2021/35-GC(65)/INF/9

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General Distribution
Original: English

THE IAEA AND THE COVID-19 PANDEMIC

Reports by the Director General

IAEA Support to Member State Efforts in Addressing the COVID-19 Pandemic

Progress Update II

IAEA Implementation of Safeguards during the COVID-19 Pandemic

Progress Update II

The Operation, Safety and Security of Nuclear and Radiation Facilities and Activities during the COVID-19 Pandemic

Progress Update II

Foreword

The COVID-19 pandemic continues to have a significant impact on all aspects of our life. At the outset I said that the IAEA would continue to deliver on its mandate. I believe this set of documents demonstrate that we have honoured that commitment, and will continue to do so, including by adapting our working methods to meet the substantial challenges that we have faced.

Since the Agency went into a lockdown in March 2020 the health and wellbeing of our staff has been at the core of all our decisions. In line with the Austrian measures of gradual reopening of all parts of social and cultural life, as well as the recommendations of the VIC Medical Service, I approved a full return of Agency staff to work in the VIC and Seibersdorf Laboratories from 1 July 2021. The health and safety of personnel remains our top priority, and appropriate health and safety measures continue to be in place on the premises.

The Agency is committed to the resilience of its operations, even during such a disruptive event, to ensure that it can continue to implement its legal obligations under relevant safeguards agreements and carry out its activities "without stopping for a single minute". The experience gained through the lockdown and the novel ways of working to deliver on Agency's mandate have helped strengthen our response to Member States needs and programme delivery during these challenging times. Our business continuity and disaster recovery measures to mitigate the effects of the pandemic have proved invaluable.

The Agency continues to support countries in responding to the COVID-19 pandemic, including through the provision of equipment and materials, as well as technical advice and guidance to individual laboratories, the issuance of guidelines and standard operating procedures, and the delivery of targeted webinar series. According to a recent survey, we can confidently say that thanks to the generous support from Member States, private sector and other partners, the Agency has provided testing services that have helped many millions of people in 128 countries and territories in the biggest emergency operation in the history of Agency. But we must remain vigilant, responsible and responsive. While continuing to provide assistance to countries in fighting the pandemic, we also prepare them to respond to emerging challenges such as climate change or outbreaks of zoonotic diseases.

To ensure that the equipment and materials procured to address Member State requests were in alignment with the overall United Nations response, our response was coordinated with United Nations system organizations through the United Nations Crisis Management Team on COVID-19 and the supply chain task force as well as consortia led by the World Health Organization (WHO).

The Agency also significantly adjusted its ways of working to maintain and enhance its support to Member States for the operation, safety and security of nuclear and radiation facilities and activities, undertaking a number of actions to facilitate information exchange among stakeholders, collect feedback, and provide support for requesting Member States in mitigating the impact of COVID-19 pandemic.

Our efforts, as the pandemic itself, have not finished. Many countries still need help. The Agency continues its assistance and I invite donors to continue their generosity in helping us to help them.

Since the last General Conference, three special reports were prepared for the March meeting of the Board of Governors taking stock of the impact of the pandemic on the main areas of our work. These are: *IAEA Support to Member State Efforts in Addressing the COVID-19 Pandemic* (GOV/INF/2021/4); *Safeguards implementation during the COVID-19 Pandemic* (GOV/INF/2021/5); and *The operation, safety and security of nuclear and radiation facilities and activities during the COVID-19 Pandemic* (GOV/INF/2021/6).

These reports have been updated (documents GOV//INF/2021/33, GOV/INF/2021/34 and GOV/INF/2021/35) and bound together by virtue of their common topical relevance, for their publication to the 65th regular session of the General Conference.

I hope you find them interesting, informative, and inspiring.

Rafael Mariano Grossi
Director General

IAEA
Atoms for Peace and Development

Board of Governors
General Conference

GOV/INF/2021/33-GC(65)/INF/7
Date: 26 August 2021

General Distribution
Original: English

For official use only

Item 8 of the Conference's provisional agenda
(GC(65)/1, Add.1, Add.2 and Add.3)

IAEA Support to Member State Efforts in Addressing the COVID-19 Pandemic

Progress Update II

Report by the Director General

Summary

- This document presents an updated overview of the assistance rendered by the Agency to its Member States in their efforts to address the COVID-19 pandemic.
- The Agency delivered rapid and effective assistance to 128 countries and territories to address the outbreak of COVID-19, as a result of generous financial and in-kind support from several Member States and the private sector. In addition to the provision of equipment and materials, Agency support has been delivered in the form of webinars, educational videos, one-on-one laboratory support, technical guidance and expert services.
- The Agency has issued follow up surveys to identify the impact of IAEA support, and conducted studies on the impact of COVID-19 on health services.
- The Agency continues to cooperate with the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO), and is a member of the WHO-led COVID-19 UN Crisis Management Team.

IAEA Support to Member State Efforts in Addressing the COVID-19 Pandemic

Progress Update II

Report by the Director General

A. Background

1. The ongoing COVID-19 pandemic has affected almost every part of the world, with impacts going far beyond the health sector. As of 1 July 2021, the global number of confirmed cases had reached 181,521,067, and the global number of deaths reported had increased to 3,937,437.[1]

2. The IAEA has a long and proven track record of developing and deploying nuclear and nuclear-related techniques for the rapid and accurate detection of animal and zoonotic diseases. Real-time reverse transcription-polymerase chain reaction (RT-PCR) is a key nuclear-derived technique which is used to detect viral pathogens. Other IAEA support for addressing zoonotic disease outbreaks includes capacity building in the use of the sterile insect technique for the suppression of disease-carrying vectors, and the strengthening of networks among national 'One Health' actors from the health, veterinary and wildlife sectors in order to improve national/regional early warning systems. In addition, the VETLAB network assists Member States to improve national laboratory capacities for the early detection and control of transboundary animal and zoonotic diseases that threaten livestock and public health.

3. The Agency has provided support to Member States' efforts to address COVID-19 through the interregional technical cooperation project INT0098, 'Strengthening Capabilities of Member States in Building, Strengthening and Restoring Capacities and Services in Case of Outbreaks, Emergencies and Disasters' which was approved by the Board of Governors at its meeting in November 2019 as part of the 2020–2021 technical cooperation programme.

4. IAEA assistance included the provision of equipment and materials, as well as technical advice and guidance to individual laboratories, the issuance of guidelines and standard operating procedures, and the delivery of targeted webinar series in Arabic, English, French, Russian and Spanish.

5. This document provides an update of the assistance rendered by the Agency to its Member States in their efforts to address the COVID-19 pandemic since the previous report to the General Conference in 2020[2].

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[1] https://covid19.who.int/

[2] GC(64)/INF/4 (an updated to which was issued in January 2021 in GOV/INF/2021/4)

B. IAEA Support to Member States in their Efforts to Address COVID-19

B.1. Delivery of diagnostic and protection equipment

128 countries and territories requested and received assistance (see Annex 1)

290 national laboratories/ institutions received COVID support packages and technical guidance

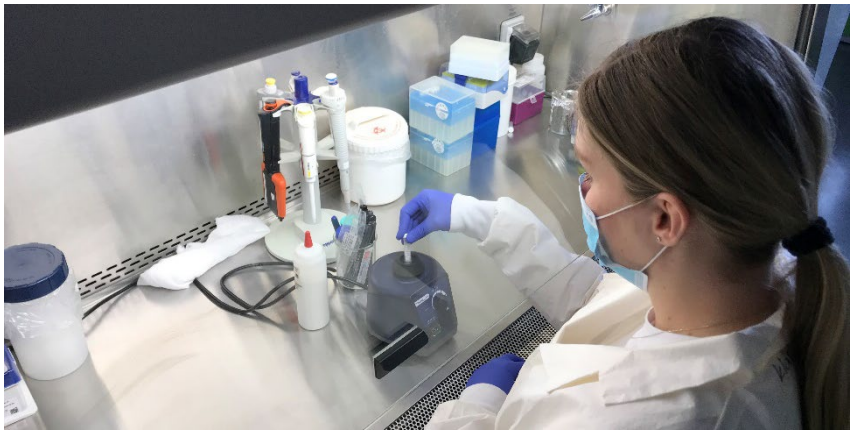
1982 RT-PCR and diagnostic kits and related items ordered for countries

500+ APH counterpart laboratories received updated SOPs, reagent information and validation data, delivered via VETLAB

6. IAEA support was provided in the form of a package of equipment and materials that included detection equipment (real-time RT-PCR and kits) together with reagents and laboratory consumables, as well as biosafety cabinets and equipment for sampling, testing, quality control and personal protection for the safe analysis of samples.

7. By end June 2021, the Agency had issued procurement orders for 1 982 RT-PCR and diagnostic kits and related items, delivered through over 2 500 shipments. One hundred and twenty-eight countries and territories requested and received support.

8. Since the issuance of GOV/INF/2021/4, five additional support packages were provided to Member States. Three requests for additional assistance have recently been received, and the IAEA is taking action to address them.



Equipment being used to assist in the fight against COVID-19 at the State Veterinary Institute, Jihlava, Czech Republic. (Photo: State Veterinary Institute Jihlava, Czech Republic)

9. COVID-19 kits and reagents were tested, and quality checked and confirmed by the Animal Production and Health Laboratory in cooperation with the Austrian Agency for Health and Food Safety, and the results subsequently contributed to ensuring the procurement of reliable kits and reagents. The data generated by the study[3] expand the portfolio of reagents that can be used by laboratories, and have been shared with Member States.

[3] 10.1016/j.jviromet.2021.114200

10. In cooperation with the WHO, the IAEA worked on technical specifications, including minimum requirements, of medical imaging devices necessary for diagnosing COVID-19 complications[4]. These technical specifications were shared with Member States.

B.2. Education, training and guidance

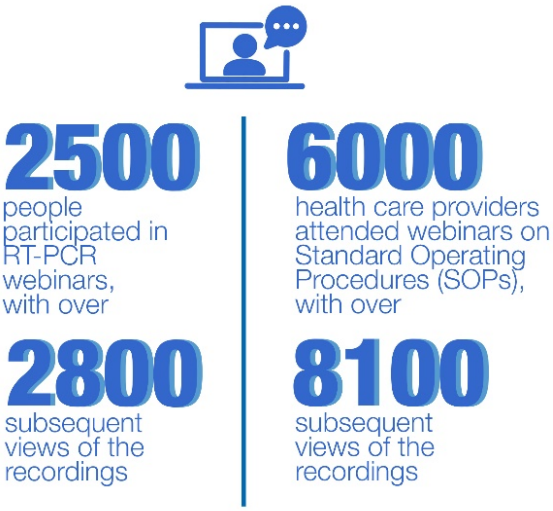
11. To address the urgent need to provide accessible training, guidance and advice as rapidly as possible, the IAEA offered multiple webinars on various relevant topics. The recordings are available on the IAEA Human Health Campus[5].

12. The webinar series, delivered in Arabic, English, French, Russian and Spanish, provided guidance on laboratory requirements for the effective use of real-time RT-PCR: including biosafety and biosecurity frameworks; best practices of sample collection and preparation for real-time RT-PCR; interpretation of results and quality assurance and quality control; and finally a problem solving session. Several webinars were provided in close collaboration with the WHO regional office for the West Pacific[6], and the Pan American Health Organization (PAHO/WHO). The series was replicated in other regions through the WHO regional offices for South-East Asia and the Eastern Mediterranean.

13. The IAEA also provided additional webinars for health care providers in nuclear medicine and radiology facilities, aimed at helping them to adjust their standard operating procedures to minimize the risks of COVID-19 infection among patients, staff and the public. These webinars, unlike the COVID-19 training webinars, focused on providing advice to nuclear medicine, radiology and radiation oncology departments, and on offering best practices in rotation policy, use of personal protection equipment, and other institutional considerations and experiences.

14. The Agency webinars on real-time RT-PCR reached almost 2 500 participants and had over 2 800 subsequent viewers, while webinars on standard operating procedures for health care providers in nuclear medicine and radiology facilities reached over 6 000 participants and had more than 8 100 subsequent

Unpacking IAEA-provided equipment at the Botswana National Veterinary Laboratory in Gaborone. (Photo: Botswana National Veterinary Laboratory)



[4] https://www.who.int/medical_devices/priority/Chapter_8_20167_WHO_Priority_medical_devices_list_for_COVID_19_response_8.pdf?ua=1

[5] https://humanhealth.iaea.org/HHW/covid19/webinars.html

[6] https://www.iaea.org/tcap-covid-19-webinars

viewers. Eighteen instructional videos were made available on the use of personal protective equipment, collection, transportation and storage of samples, real-time RT-PCR for the detection of COVID-19, and the use of serology for evaluation of COVID-19. The videos are available on the IAEA's Human Health Campus website[7], together with a video of frequently asked questions on real-time RT-PCR, and a wide range of information materials on COVID-19[8].

The Bahamas Ministry of Health National Reference Laboratory is using IAEA-provided equipment to detect the COVID-19 virus. (Photo: Bahamas Ministry of Health National Reference Lab)

15. In addition, more than 500 Animal Production and Health counterpart laboratories received updated standard operating procedures, reagent information and validation data, delivered through the VETLAB platform.

16. A technical guidance document, *COVID-19 Pandemic: Technical Guidance for Nuclear Medicine Departments* IAEA/COV/19-1[9], was published in July 2020, with a joint WHO/IAEA document, *COVID-19 Technical specifications for imaging devices: portable ultrasound; mobile radiographic digital equipment; computed tomography (CT) scanning system,* issued in August 2020. Articles were also published in the European Journal of Nuclear Medicine and Molecular Imaging, and the Journal of Nuclear Cardiology.

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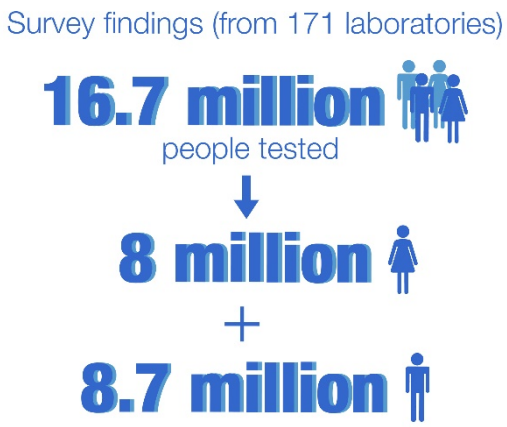
[7] https://humanhealth.iaea.org/HHW/covid19/nmdi/nmdi.html

[8] https://humanhealth.iaea.org/HHW/covid19/index.html

[9] https://www.iaea.org/publications/14733/covid-19-pandemic-technical-guidance-for-nuclear-medicine-departments

B.3. Assessing the impact of IAEA support, and the impact of COVID-19 on health services



17. To confirm that IAEA COVID-19 assistance had reached the intended end-users, and to identify its impact, the IAEA has issued a survey to all laboratories receiving assistance. The survey aims to measure the impact of the support provided by the IAEA, and to assess its sustainability. As of 24 June 2021, the survey findings reveal that the 171 laboratories that have responded so far have provided testing services to over 16.7 million people (8.7 million (52%) men and 8.0 million (48%) women). The IAEA inputs contributed to increasing the capacities of these laboratories.

18. Of the responding laboratories so far, 10.5% had had no PCR machine apart from that supplied by the IAEA. 83% confirmed that the emergency assistance package provided by the IAEA could cover the initial gap in testing needs, and 91% acknowledged that IAEA support had enhanced their ability to detect COVID-19 and other pathogens, or to provide such services.

19. 93% of laboratories confirmed that they would be able to continue to provide testing beyond the initial IAEA assistance. Only 7% reported challenges in continuing testing, due to current global challenges in procuring laboratory reagents and consumables.

20. The IAEA also conducted additional studies, including on the impact of COVID-19 on the provision of nuclear medicine diagnostic and therapeutic procedures. This study demonstrated a significant reduction in the number of diagnostic and therapeutic procedures carried out during the pandemic, and insufficient supplies of essential materials such as radioisotopes, generators and kits. Two new articles, *Impact of COVID-19 on Diagnosis of Heart Disease Worldwide: Findings from a 108-Country IAEA Study* and *Global Impact of COVID-19 on Nuclear Medicine Departments: An International Survey in April 2020*[10], were accepted for publication by external journals.

21. The Joint FAO/IAEA Centre conducted additional research and development activities in collaboration with reference institutions in Member States to evaluate the applicability of a new serological assay for the accurate detection of SARS-CoV2 antibodies in farmed, laboratory and wild animals. Data have been generated and the results shared with Member States to support additional research and surveillance activities at the animal-human interface.

[10] http://jnm.snmjournals.org/content/early/2020/07/23/jnumed.120.249821.full.pdf+html

C. Funding, and Partnerships with the Food and Agriculture Organization of the United Nations and the World Health Organization

22. Member States and the private sector provided generous extrabudgetary funding totalling €27.4 million to support the Agency's COVID-19 related activities (see Annex 2). [11]

23. The United Nations Crisis Management Policy was activated for the COVID-19 pandemic. The IAEA joined the COVID-19 UN Crisis Management Team (COVID-19 CMT) led by the WHO[12] on 25 March 2020. The COVID-19 CMT facilitates and aligns United Nations efforts to enable coherent coordinated action, leveraging synergies and ensuring transparency and accountability in response to COVID-19. Through this cooperation, the IAEA has ensured that the equipment and materials procured to address IAEA Member States' requests are in alignment with the overall UN response.

24. The IAEA has worked closely with the FAO and with the WHO since the beginning of the COVID-19 outbreak in order to provide a coordinated response to requests from its Member States.

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[11] Please note that the contribution amounts include interest.

[12] The COVID-19 CMT also includes the United Nations Development Coordination Office, United Nations Office for the Coordination of Humanitarian Affairs, International Maritime Organization, United Nations Department of Safety and Security, United Nations Children's Fund, International Civil Aviation Organization, World Bank, World Food Programme, Food and Agriculture Organization of the United Nations, United Nations Department of Global Communications, Executive Office of the Secretary-General, Department of Political and Peacebuilding Affairs/Department of Peace Operations, Department of Operational Support, and additional members added as deemed necessary.

IAEA donated equipment was delivered to the National Public Health Laboratory, Malaysia.
(Photo: National Public Health Laboratory, Ministry of Health Malaysia)

Annex 1: Countries and territories that have requested and received IAEA support to address COVID-19 as of 30 June 2021		
AFRICA		
Algeria	Gambia, The (non-IAEA Member State)	Niger
Angola	Ghana	Nigeria
Benin	Guinea (non-IAEA Member State)	Rwanda
Botswana	Kenya	Senegal
Burkina Faso	Lesotho	Seychelles
Burundi	Liberia	Sierra Leone
Cameroon	Libya	South Africa
Chad	Madagascar	Sudan
Congo	Malawi	Togo
Côte d'Ivoire	Mali	Tunisia
Democratic Republic of the Congo	Mauritania	Uganda
Djibouti	Mauritius	United Republic of Tanzania
Egypt	Morocco	Zambia
Eswatini	Mozambique	Zimbabwe
Ethiopia	Namibia	
ASIA AND THE PACIFIC		
Afghanistan	Lebanon	Philippines
Bangladesh	Malaysia	Samoa (non-IAEA Member State)

Cambodia	Maldives (non-IAEA Member State)	Sri Lanka
Fiji	Mongolia	Syrian Arab Republic
Indonesia	Myanmar	Thailand
Iran, Islamic Republic of	Nepal	Viet Nam
Iraq	Oman	Yemen
Jordan	Pakistan	Territories under the jurisdiction of the Palestinian Authority
Kuwait	Palau	
Lao People's Democratic Republic	Papua New Guinea	
EUROPE and Central Asia		
Albania	Hungary	San Marino
Armenia	Kazakhstan	Serbia
Azerbaijan	Kyrgyzstan	Slovenia
Belarus	Latvia	Tajikistan
Bosnia and Herzegovina	Montenegro	Ukraine
Bulgaria	North Macedonia	Uzbekistan
Croatia	Poland	
Czech Republic	Republic of Moldova	
Georgia	Romania	
LATIN AMERICA AND THE CARIBBEAN		
Antigua and Barbuda	Dominica	Nicaragua
Argentina	Dominican Republic	Panama
Bahamas	Ecuador	Paraguay
Barbados	El Salvador	Peru
Belize	Grenada	Saint Kitts and Nevis (non-IAEA Member State)
Bolivia, Plurinational State of	Guatemala	Saint Lucia
Brazil	Guyana	Saint Vincent and the Grenadines
Chile	Haiti	Trinidad and Tobago
Colombia	Honduras	Uruguay
Costa Rica	Jamaica	Venezuela, Bolivarian Republic of
Cuba	Mexico	

Annex 2: Extrabudgetary contributions in Euro (as of 30 June 2021)	
Member State	**Contribution**
Australia	46 023
Canada	3 270 066
Finland	200 000
Germany	500 000
Japan*	3 000 000
Korea, Republic of	260 011
Netherlands	1 500 222
Norway	2 066 748
Pakistan	39 960
Russian Federation	500 000
San Marino	32 866
Sudan	21 000
Sweden	190 947
United Kingdom	562 168
United States of America	10 126 863
Other contributors	
Takeda Pharmaceutical Company Limited	4 104 497
Total	**26 421 370**
In-kind Contributions	
China	1 842 000
Malta	25 000
Total	**1 867 000**
* In addition, Japan contributed 1 million Euro in support of a project ‘Detection of emerging and re-emerging transboundary animal and zoonotic pathogens at the animal human interface’ in connection with the COVID-19 outbreak.	

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(GC(65)/1, Add.1, Add.2 and Add.3)

IAEA Implementation of Safeguards during the COVID-19 Pandemic

Progress Update II

Report by the Director General

Summary

- At the outset of the COVID-19 pandemic, the Director General stated that, despite the difficult situation, the Agency would not interrupt its verification activities. This has required the Agency to implement a series of mitigating actions that have enabled the Agency to conduct all of its most time-critical safeguards activities in the field, and almost all safeguards activities that are normally carried out at Agency Headquarters and at its regional offices.
- The Agency continues to rely on the essential cooperation of States to implement safeguards.

IAEA Implementation of Safeguards during the COVID-19 Pandemic

Progress Update II

Report by the Director General

A. Introduction

1. The impact of the COVID-19 pandemic has been far-reaching. Governments around the world have adopted and implemented strict measures related to health and safety for the containment of the coronavirus, such as physical distancing, restricting travel and the free movement of people, grounding flights and restricting other means of travel, and closing borders. These measures have had a significant impact on the Agency's implementation of safeguards, in particular on its ability to conduct a number of its planned in-field verification activities. This required the Agency to take a number of measures to overcome new challenges or mitigate their impact.

2. This document provides an update on the impact of the COVID-19 pandemic on safeguards implementation since the previous report to the General Conference in 2020.[1]

B. Safeguards implementation

3. The Agency needs to implement safeguards activities – in accordance with the State's safeguards agreement and, where applicable, its additional protocol – to provide credible assurance that the State is meeting its safeguards obligations.

4. Each year, the Agency prepares an annual implementation plan (AIP) for each State with a safeguards agreement in force which specifies the safeguards activities – at Headquarters and in the field – that need to be conducted to attain the safeguards technical objectives for that State.[2] If a planned activity cannot be conducted, or if a safeguards technical objective is not attained or an inconsistency is found, the AIP may be adjusted and follow up activities planned and conducted.

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[1] GC(64)/INF/5 (an update to which was issued in February 2021 in GOV/INF/2021/5).

[2] See GOV/2014/41 and Corr.1, Section C.4.

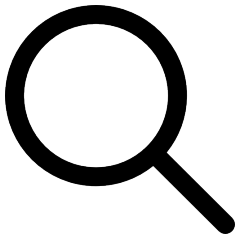
Agency verification activities (1 July 2020 to 30 June 2021)

Inspections:
2249

Design Information Verifications:
708

Complementary Accesses:
201

Inspector and technical staff days in the field:
22 224



B.1. Impact on safeguards implementation and Agency responses

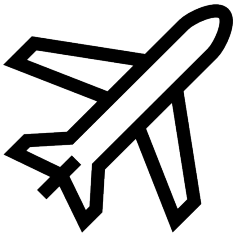
5. From a logistical perspective, the travel restrictions and other health and safety measures introduced by a large number of States in response to COVID-19 are still having a significant impact on the Agency's ability to implement safeguards as planned, particularly those in the field.[3] The Agency, in turn, has taken a number of actions and introduced a number of measures to mitigate this impact as much as possible.

B.2. Business continuity measures

6. The Agency is committed to the resilience of its operations, even during a disruptive event, to ensure that it can continue to implement its legal obligations under relevant safeguards agreements, carry out other verification activities and use safeguards-relevant information on a secure basis. As previously reported, the Agency has drawn on business continuity and disaster recovery measures to mitigate the effects of the pandemic on safeguards activities.

7. The global travel restrictions and health and safety measures introduced by States, and their dynamic nature, present various challenges. Access to reliable and up-to-date information about frequently changing national restrictions and measures poses a particular challenge when planning in-field verification activities. Close collaboration with States, including particularly the Republic of Austria (Austria) as the host State, remains essential to overcome these operational obstacles.

€4.15M of extra-budgetary support to use aircraft charter services has transported **221** Agency inspectors and technical staff to conduct inspections in **12** States.



B.3. In-field verification activities

8. As mentioned above, travel and in-country restrictions have made it harder for the Agency to reach some nuclear facilities, sites and other locations and have also had an impact on the timely shipment of safeguards equipment in support of field activities. In order to accommodate such restrictions, intensive coordination efforts are required at Agency Headquarters. Agency inspectors and technical staff are making extraordinary efforts to fulfil their official duties, for example, by isolating for up to 21 days in their destination State or, instead of flying, by driving long distances and crossing various national borders to conduct verification activities.

9. The cost of transportation, especially relating to conducting in-field verification activities, has exceeded the budgetary travel appropriations. Mandatory quarantine periods, by significantly

[3] For a list of these restrictions and measures see document GC(64)/INF/5.

Inspectors spent a total of
2471 days
in quarantine outside Austria

Operations Division A:
1651 days

Operations Division B:
727 days

Operations Division C:
93 days

extending the length of verification missions, are also adding to the cost. Between 1 July 2020 and 30 June 2021, Agency inspectors on mission spent a total of nearly 2500 days in quarantine outside Agency Headquarters in Austria.[4] This is the approximate equivalent of seven inspectors spending an entire year in quarantine.

10. As indicated previously, in response to the unavailability of many commercial flights, the Agency has concluded contracts for the provision of aircraft charter services to transport inspectors and technical staff to and from States, drawing on €4.15M of extrabudgetary support, €1.78M of which was earmarked specifically in relation to inspectors and technical staff travel to the Islamic Republic of Iran (Iran).[5] This arrangement has already been used successfully to transport some 221 Agency inspectors and technical staff to conduct in-field verification activities in 12 States.

11. In light of COVID-related restrictions, the Agency has adjusted AIPs to focus verification effort on achieving the most time-critical safeguards objectives. Where appropriate or as requested by the host State, it has rescheduled inspections, design information verifications (DIVs) and complementary accesses (CAs). Where necessary and feasible, the Agency is also implementing compensatory measures, such as increased reliance on remote data transmission (RDT), to maintain 'continuity of knowledge' and minimize the future impact of any delayed activities.

12. The most significant challenge to safeguards implementation in 2020 and 2021 was related to the Agency's ability to conduct short notice or unannounced routine inspections in a number of States where such inspection arrangements are in place and where new restrictions have been imposed by States due to the pandemic.[6] In response, the Agency made an assessment and developed a scheme of additional or other mitigating safeguards activities in order to be able to draw credible safeguards conclusions for these States. Despite the difficulties, however, the Agency has been able to conduct all of its most time-critical verification activities.

13. Between 1 July 2020 and 30 June 2021, the Agency conducted 2249 inspections, 708 DIVs and 201 CAs. This reflects the fact that during this period the Agency has inspected roughly the same number of nuclear facilities as in the previous year. These verification activities involved:

- around 14 900 days of inspectors' verification effort and over 26 900 days spent in the field by inspectors and technical staff;[7]

[4] Inspectors from Division of Operations A spent a total of 1651 days in quarantine outside Austria in 2020, inspectors from Division of Operations B spent a total of 727 days, inspectors from Division of Operations C spent a total of 93 days and inspectors from the Office for Verification in Iran spent no days in quarantine in Iran.

[5] As of 30 June 2020, this extrabudgetary support had been provided by Belgium, France, Germany, the United Kingdom, the United States of America and the European Commission.

[6] The ability of Agency inspectors to conduct unannounced or short notice routine inspections in a State enhances the level of deterrence against potential diversion, misuse, or other undeclared activities.

[7] While this data is accurate for the period described, it should not be considered indicative for the whole of 2021. Such statements and activities are based on AIPs and should be considered on an annual basis.

- during 183 duty trips, about 2000 calendar days were spent in the field by 49 technical staff to maintain, upgrade and install safeguards equipment, including 236 days dedicated to safeguards verification activities with 125 person-days of inspection (PDIs) accumulated by staff designated to conduct inspection work;
- 367 shipments of safeguards equipment from Headquarters and 119 return shipments; and
- Equipment Radiation Monitoring Laboratory monitoring of approximately 30 400 items returned from the field, for surface contamination.

14. The availability of the resident Agency staff at the Agency's regional offices in Tokyo and Toronto to conduct verification activities in Japan and Canada, respectively, has helped to overcome some of the problems encountered by staff who have needed to travel across borders to conduct inspections.[8] The two regional offices were instrumental in facilitating the conduct of 264 inspections, 69 DIVs and 21 CAs between 1 July 2020 and 30 June 2021.

15. All safeguards equipment requests from within the Department of Safeguards have been processed, including the provision of verification equipment and personal protective equipment (PPE) to Agency inspectors and technical staff prior to duty travel.

16. The Agency's investment in remote monitoring systems over the past two decades has proved invaluable during the pandemic, with more than 1 600 data streams continuing to deliver safeguards equipment data from facilities in 31 States[9] to Agency Headquarters.

Fig. Agency inspectors and technical staff prepare to use charter aircraft services

[8] Approximately 24% of its inspections were carried out by the Agency are conducted in Canada and Japan.

[9] And Taiwan, China.

B.4. Verification activities at Headquarters and regional offices

17. Overall, as a result of a substantial adjustment of some processes and workflows, regular activities, including all significant projects, carried out at Agency Headquarters and in the regional offices continue to deliver results that are close to pre-pandemic levels, albeit with some delays.

18. State evaluation and the development of new State-level safeguards approaches (SLAs) has continued, while maintaining the security of highly confidential safeguards information. Throughout the pandemic the Secretariat has deployed flexible work arrangements to ensure that staff who need to use the integrated safeguards environment (ISE) to conduct their work have been authorized to access the VIC, while ensuring that the Department remained within the overall ceiling for attendees in those periods when such ceilings were applied.

19. The Agency has continued to provide statements on the activities and results of its in-field verification activities to relevant States: in the period between 1 July 2020 and 30 June 2021, the Agency submitted 1561 statements on inspection results (90(a) statements or equivalent), 564 statements on the conclusion drawn from its inspections (90(b) statements or equivalent) and 630 DIV acknowledgement letters, and 186 statements on CAs (10(a) statements). At times throughout this period there were some delays in providing these statements, partly due to restrictions on the number of staff being able to work at the VIC, and therefore with access to ISE, and partly due to a significant increase in late reporting by States when compared to previous years.

20. At Seibersdorf (Austria) and Rokkasho (Japan), the Agency's safeguards laboratories have remained safe, secure and unaffected by COVID restrictions. All requests from inspectors for environmental sample kits have been met. The processing of new nuclear material samples continues, as does the operation of the large geometry secondary ion mass spectrometer (LG-SIMS) for the analysis of environmental samples. The laboratories have received all inspection samples for analysis from the field and dispatched samples to the Agency network of analytical laboratories (NWAL) as normal.

Fig. Uranium samples, taken during inspections at nuclear facilities, undergoing chemical analysis at the IAEA Nuclear Material Laboratory, Seibersdorf, Austria

B.5. Health, safety and welfare

21. The Agency has placed great store in the health, safety and welfare of its staff during the pandemic and implemented a number of measures to that effect. For example, the Agency has contracted International SOS to provide risk insurance and assistance with the repatriation of any staff who contract or experience the symptoms of COVID-19 while on duty travel abroad. In consultation with the Agency, the Austrian Government arranged a vaccination programme specifically aimed at staff working for the Vienna-Based Organizations, which began its roll-out in May 2021.

22. Some States require recent (within 48 hours) COVID tests for transit as well as arrivals and some facility operators require this as well. This is obliging Agency inspectors to be tested multiple times before and during trips, and in many States it is not always easy to find a testing location or obtain a rapid result. More recently, there has been an easing of the need for testing on return to Austria if the staff member has been vaccinated. Some States have facilitated the Agency's implementation of safeguards by not applying quarantine restrictions or waiving them on submission of negative test results for COVID-19 upon arrival in the country, or by arranging local testing of Agency staff. As of 30 June 2021, a total of 2484 PCR tests had been conducted (1919 pre-travel and 565 post-travel) by the VIC Medical Service for inspectors and technical staff. Along with the commercial availability of testing at Vienna airport and other laboratories in Vienna, this has enabled Agency staff who test negative, in line with the host country requirements, to immediately resume work without the need for quarantine.

23. As of 29 June 2021, 159 Agency staff who work at the VIC and 14 Agency staff who work outside the VIC have at some point tested positive for COVID-19 through a PCR test since the virus was first detected. Only around 5% of the 173 Agency staff who tested positive for COVID-19 through a PCR test were confirmed to have contracted the virus while conducting in-field verification activities outside Austria. Bearing in mind that Agency inspectors and technical staff have spent well over 20,000 days in the field over this period, in scores of different countries, this highlights the effectiveness of the health and safety precautions in place for staff who need to travel abroad to carry out their official duties.

24. The Agency's efforts to address needs for PPE arising from COVID-19 continue, while global shortages remain an issue. Many new items have been procured (e.g. office dividers, door handles, door openers, anti-virus tapes etc.) in order to provide staff with the best available protection.

B.6. Recruitment and training

25. To mitigate the risks of COVID-19 transmission, parts of the Introductory Course on Agency Safeguards (ICAS) were re-designed to integrate remote learning. A total of 23 new inspectors were inducted through ICAS between 1 July 2020 and 30 June 2021, with nine new inspectors who commenced ICAS in March 2021 scheduled to complete the course in autumn 2021. While the Department is building its own capabilities to ensure delivery of training and a number of staff courses have been re-designed and delivered as remote learning, access to external facilities for training has been limited. This has affected the implementation of specialized technical training in particular. Overall, 45 training courses were held between 1 July 2020 and 30 June 2021, 32 of which were conducted remotely and 13 held in person.

Fig. Agency inspectors participating in the ICAS course that commenced in March 2021

B.7. Assistance to States

26. The Agency has developed various approaches in order to continue to deliver safeguards-related training and assistance to States throughout the pandemic and has held a number of national, regional and international courses online, involving a total of 118 participants. The Agency has continued to increase its online offerings via the Agency's Cyber Learning Platform for Network Education and Training (CLP4NET) with over 1100 active/registered users for safeguards-related on-line learning. The Safeguards Traineeship Programme for 2021 commenced in February 2021 with nine participants. The Agency also transformed and held its annual 'Seminar on IAEA Safeguards' for diplomats, usually held at Headquarters, as an online webinar series, which is also now available on the CLP4NET.

27. With regard to the IAEA Comprehensive Capacity-Building Initiative for SSACs/SRAs (COMPASS), the Agency began to implement the COMPASS workplans that were developed for the seven pilot States in the first half of 2021. While internal coordination meetings have become

increasingly hybrid, consultations and events with the pilot States remained mostly virtual during the reporting period, with a number of successful outreach webinars and training courses held remotely. Online briefings on the status of COMPASS continued to be made available to donor States and Member State Support Programmes (MSSPs) upon request.

C. Role of States

28. The Permanent Missions of IAEA Member States in Vienna and their national authorities continue to play a very important role in ensuring the Agency's continued access to nuclear facilities, locations outside facilities), sites and other locations, as well as facilitating movement across borders and transfers through airports. The Agency is grateful for the support received from all States in their interactions with Agency staff during the course of their duties. The Agency also continued holding regular safeguards implementation meetings with State/regional authorities, although most were conducted in a virtual format.

29. Many State authorities have continued to provide the Agency with the reports and declarations required under relevant safeguards agreements, although there has been a significant increase in late reporting by States when compared to previous years. Postal service interruptions have made it impossible for the Agency to send statements to some States. In turn, some States have had problems delivering the required safeguards reports and declarations due to disruptions in air travel (diplomatic pouches) or mail services, although the State Declaration Portal has helped alleviate this problem in a number of cases. Between 1 July 2020 and 30 June 2021, the Agency received 7953 nuclear material accountancy reports. In return, the Agency provided feedback (or addressed) to the State or regional authorities: 431 summary letters and 720 acknowledgment letters. The Agency also provided States with semi-annual book inventories and import/export communication statements (239 original letters and attachments).

30. Most outcomes from the 2020/2021 Departmental Development and Implementation Support Programme for Nuclear Verification, funded by Member States, are expected to be unaffected. Approximately one quarter of individual outputs, however, may experience a delay or be otherwise impacted by restrictions related to COVID-19, such as the current difficulties in accommodating training, and in-field testing of equipment under development.

D. Conclusion

31. At the outset of the pandemic, the Director General stated that, despite the difficult situation, the Agency would not interrupt its verification activities. This report shows that despite the numerous challenges posed by travel restrictions and other health and safety measures, through greater effort and at somewhat higher financial cost, the Agency has continued to implement safeguards effectively during the COVID-19 pandemic. The Agency has effectively adapted itself to the new circumstances by focusing its verification effort on the most critical safeguards activities, both in the field and at Headquarters. Where necessary, it has implemented a series of remedial and mitigating measures.

IAEA
Atoms for Peace and Development

Board of Governors
General Conference

GOV/INF/2021/35-GC(65)/INF/9
Date: 26 August 2021

Restricted Distribution
Original: English

For official use only

Item 8 of the Conference's agenda
(GC(65)/1, Add.1,Add.2 and Add.3)

The Operation, Safety and Security of Nuclear and Radiation Facilities and Activities during the COVID-19 Pandemic

Progress Update II

Report by the Director General

Summary

- This document presents an updated overview of the Agency's support to Member States for the operation, safety and security of nuclear and radiation facilities and activities, including the Agency's actions undertaken to facilitate information exchange among stakeholders, collect feedback, and provide support for requesting Member States in mitigating the impact of the COVID-19 pandemic.
- It also provides summary information on actions taken by operators and regulators during this period.

The Operation, Safety and Security of Nuclear and Radiation Facilities and Activities during the COVID-19 Pandemic

Progress Update II

Report by the Director General

A. Introduction

1. The COVID-19 pandemic is the first of this scale in the history of the nuclear and radiological community and its impact has been far reaching. Governments around the world have adopted and implemented strict health and safety related measures such as physical distancing and travel restrictions. National policy decisions made by governments have direct and indirect repercussions on organizations in the nuclear and radiological field.

2. In Member States, organizations continued to ensure safety, security and continuity of business as the pandemic progressed. The Agency significantly adjusted its ways of working to maintain and enhance its support to Member States. In particular, the Agency's efforts to facilitate information exchange were enhanced in order to gather and share experiences, including good practices, of Member States as the pandemic spread. This rapid mobilization enabled the Agency to understand the specific challenges faced by Member States and to respond with appropriate support.

3. The Agency continues to work under these adjustments, delivering on its mandate through routine and novel ways of working.

4. This document summarizes the actions to ensure the safe, secure and reliable operation of nuclear and radiation facilities and activities undertaken by the Agency and by operators and regulators during the COVID-19 pandemic since the previous report to the General Conference in 2020[1].

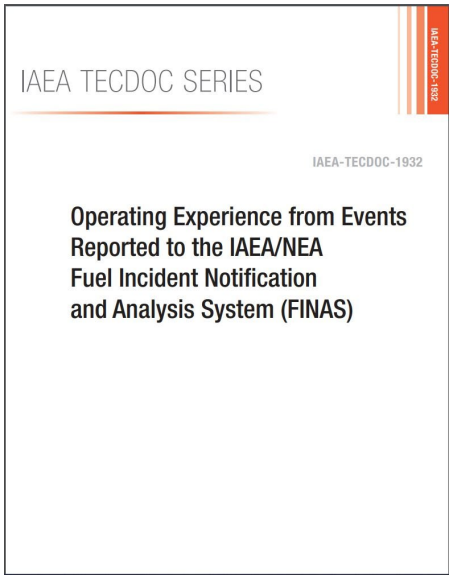
B. Actions Undertaken by the Agency to Support Member States in Mitigating the Impact of the COVID-19 Pandemic

B.1. Facilitating Information Exchange with Member States

5. The International Reporting System for Operating Experience (IRS) for nuclear power plants (NPPs), the Incident Reporting System for Research Reactors (IRSRR) and the Fuel Incident

[1] GC(64)/INF/6 (an update to which was issued in February 2021 in GOV/INF/2021/6).

Notification and Analysis System (FINAS) for nuclear fuel cycle facilities remain fully operational and reports relating to plans and actions taken to mitigate the impact of the COVID-19 pandemic continue to be received from Member States through these systems. The Agency also completed work to further enhance the IT platforms and user interfaces of the IRS, IRSRR and FINAS.



FINAS TECDOC published in 2020

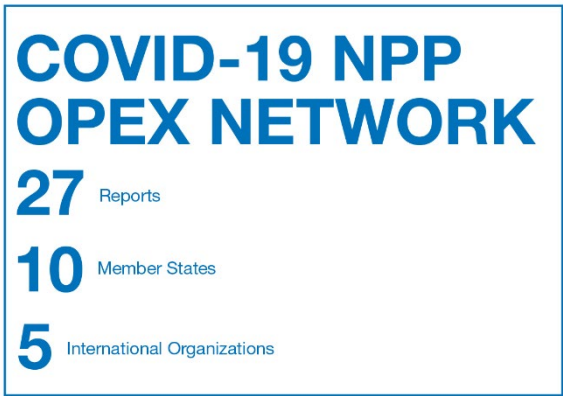
6. The Agency continues to process and disseminate information on incidents reported by States in the Incident and Trafficking Database (ITDB). However, there has been a considerable reduction (~40%) in the number of reported incidents by States during the pandemic compared with recent years.

7. The Agency's Incident and Emergency Centre (IEC) continues to ensure that the communication channels for notification and information exchange on nuclear and radiological emergencies remain fully operational on a 24/7 basis.

8. Member States continue to provide details on the pandemic's impact on NPP performance, including details on outage scope, schedules and timing, through the Power Reactor Information System (PRIS). The Country Nuclear Power Profiles resource continues to be used to gather, collate and summarize officially supplied and published open source information related to the impact of the pandemic on operating NPPs, as well as on advanced new build projects.

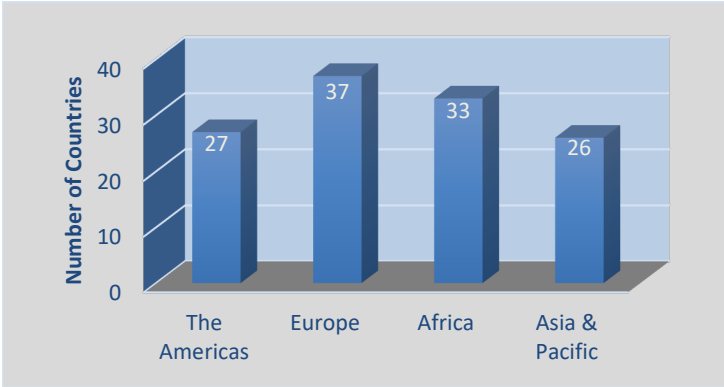
9. The Agency received reports of outage impacts at NPPs in 26 of the 32 Member States with operating NPPs. In some cases, outage scopes were reduced by eliminating non-critical work to minimize external staff brought on-site. In other cases, outages were extended to allow work to proceed at a slower pace that accommodated physical distancing constraints. In yet other cases, entire outages were deferred to the following year. The full impact will play out over at least the next year as future outage plans are revised to complete deferred work.

10. The Agency's international peer-to-peer network, the COVID-19 NPP Operating Experience Network, continues to be utilized for information and experience sharing between operating organizations, technical support organizations, relevant international organizations and other stakeholders, and has proven to be very valuable with 27 reports from 10 Member States and 5 international organizations since the beginning of the pandemic.



11. Operators of research reactors continued to use the Agency's network for research reactors to share information on their status and any remedial measures being implemented.

12. The Agency keeps an open communication with national regulatory bodies for nuclear and radiation safety. In addition, the Agency has conducted a survey with radiation safety regulators with the objective to have a first overview of the impact of the COVID-19 pandemic on the safety of radiation sources and their regulatory oversight. The survey was launched and conducted in April 2020 and responses were received from 93 regulatory bodies.



Number of countries by region responding to the survey by September 2020

13. Following the survey, a second slightly modified survey questionnaire was distributed in August 2020 to seek information regarding: challenges faced by regulatory bodies when executing regulatory programmes; lessons learned to share with other regulators; new regulatory practices that mitigate COVID-19 restrictions; and areas where the Agency's safety standards could be strengthened. A total of an additional 30 responses were received by September 2020.

14. The Agency organized a webinar with more than 300 regulators in the four regions (Latin America, Europe, Africa, and Asia and the Pacific) to discuss the findings of the survey. The main conclusions of the survey were:

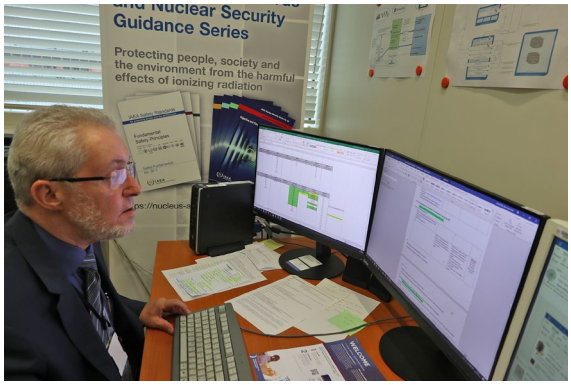
- Regulatory activities were affected by the pandemic in many Member States and some functions such as authorization and inspection were not fully implemented; and
- Regulatory bodies have concerns regarding issues related to the safety and security of radiation sources, including:
    - disused and orphan radioactive sources;
    - lack of medical staff for the medical use of radiation sources;
    - unjustified exposures; and
    - limited provision of technical services to ensure radiation protection.

15. As a main recommendation from the survey, the regulatory bodies have requested more Agency guidance on business continuity under special circumstances, such as performing inspections and other regulatory functions virtually. The Agency has already acted on this recommendation to inform the analysis of safety standards and nuclear security guidance that is underway, and for example is continuing the development of remote inspection guidance.

16. The Agency has also developed a new approach to include specific consideration of regulatory implications of pandemic situations within its Integrated Regulatory Review Service (IRRS) missions. The approach is optional and is now available for future missions. The focus of the approach is on business continuity to maintain delivery of statutory duties and responsibilities for safety. The Agency, at the request of the Member State, can include in IRRS missions a policy discussion on the implications of a pandemic situation and associated challenges for regulatory bodies. To inform the discussion, host countries and IRRS review teams will conduct a review of a baseline set of Agency Safety Requirements which merit special attention, from a pandemic perspective, during the course of the mission.

17. The Agency facilitated a survey of the International Network for Nuclear Security Training and Support Centres (NSSC Network) to better understand the impact of COVID-19 on the role and functions of an NSSC and to share related good practices. The survey responses provided details of how the COVID-19 pandemic has impacted nuclear security core functions and how the impacts were mitigated. During the NSSC Network virtual annual meeting held in April 2021, the Network held a plenary panel session to discuss the results of the survey and further share NSSC experience and lessons learned in mitigating the impacts of COVID-19. The Network members agreed to share summary information from the survey in the form of a case study to be included in a forthcoming Agency publication focused on the pandemic.

B.2. Safety Standards and Nuclear Security Guidance



Updating the file of the status of all safety standards and security guidance documents

18. The process for developing and revising safety standards and nuclear security guidance has continued. Virtual meetings of the Commission on Safety Standards (CSS), the Safety Standards Committees (SSCs) and the Nuclear Security Guidance Committee (NSGC) were held in 2020 and 2021, allowing for the review and approval of documents, and discussion of priorities and policies, including a draft medium term plan for safety standards. Among the drafts endorsed by the CSS in April 2021, a draft Safety Guide on the operating organization for NPPs provides recommendations on ensuring the safe operation of a nuclear power plant during situations in which a large number of personnel might be unavailable, such as during a pandemic.

19. The Secretariat undertook an analysis of safety standards and nuclear security guidance to identify whether pandemic situations are currently addressed, and whether the safety standards and nuclear security guidance in this field should be strengthened. This preliminary gap analysis was reviewed by the SSCs and NSGC at their meetings in June and July 2021 and is being integrated into an update of the medium term plan for the safety standards, which will be presented to the CSS at their next meeting in November 2021. The CSS also decided that no new revisions of individual standards would be undertaken in response to the COVID-19 pandemic before the medium term plan has been agreed by the CSS.

20. In addition, the adequacy of current nuclear security guidance for application in pandemic situations will be considered as part of a comprehensive review of the nuclear security guidance initiated in 2021. Furthermore, if a decision is taken to revise the top-tier guidance in the IAEA Nuclear Security Series, pandemic considerations for nuclear security will be taken into account in the revision, as appropriate. A mechanism has also been established to gather information from Member States on nuclear security related challenges and lessons learned during the COVID-19 pandemic to inform such revisions.

21. The Secretariat is developing a Technical Reports Series publication on experiences in Member States in ensuring safety, security and reliable operation of nuclear and radiation facilities and activities during the COVID-19 pandemic. This publication covers operation, safety and security, is technical in nature, and aims to summarize the actions taken by various stakeholders to manage the risks to the continued operation of facilities and activities posed by the pandemic. It also promotes the enhancement of plans for preparation, response and recovery for future pandemics by sharing the experiences of stakeholders from the pandemic through the identification of good practices; and reviews the impact of the pandemic on the electricity markets and on nuclear power programmes in Member States. The

drafting of this publication is at an advanced stage and the content was used by the Secretariat in developing the preliminary gap analysis for safety standards and nuclear security guidance. The final publication is expected by the end of the year.

22. To continue to support Member States in the application of safety standards and security guidance, some peer reviews and advisory services continued throughout the pandemic, although many were postponed. Novel methods were applied to allow the delivery of multiple peer reviews and advisory services virtually, an example being the IRRS follow-up mission to Lithuania in November–December 2020.

23. The process of the International Physical Protection Advisory Service (IPPAS) has been adapted and preparatory activities for the conduct of IPPAS missions were carried out virtually, including three preparatory meetings and three national workshops. As a virtual conduct of IPPAS missions is not possible due to the sensitivity of information provided or generated during the mission, the majority of these have been postponed at the request of the host countries. Two IPPAS missions (in the Niger in May 2021 and Belarus in June–July 2021) were conducted in person satisfying all strict requirements related to the COVID-19 pandemic.

24. The International Nuclear Safety Group (INSAG) continues to consider the implications of the COVID-19 pandemic on nuclear safety. Reflections on the implications of the response to the COVID-19 pandemic for nuclear safety were the focus of the annual letter sent by the INSAG Chairman to the Director General in June 2020. The letter was circulated to Member States ahead of the 2020 session of the General Conference. The implications of the pandemic were the focus of the INSAG Forum, which occurred in the margins of the 2020 session of the General Conference.

B.3. Emergency Preparedness and Response

25. The Agency's Incident and Emergency System continues to be operational, and a programme of emergency exercises continues to be carried out. The IEC continues to conduct and plan for Convention Exercises (ConvEx) in accordance with existing plans, including the following:

- A ConvEx-1a exercise conducted on 14 October 2020 and a Convex-1b exercise on 14 April 2021 to test the availability of contact points to receive urgent information and to acknowledge receipt;
- A ConvEx-2a exercise conducted on 27 May 2021 to test the availability of contact points to complete the appropriate reporting forms and to upload monitoring data on the Agency's International Radiation Monitoring Information System (IRMIS);

- A ConvEx-2b exercise conducted from 9 to 11 March 2021 with 47 Member States, 3 intergovernmental organizations, 1 regional intergovernmental organization, and 1 Regional Specialized Meteorological Centre of the World Meteorological Organization (WMO) — with 52 participating organizations and States, this was the largest number of participants in a ConvEx-2b exercise since its inception in 2012;

Convex 2b 2021 participants

- A ConvEx-2c exercise conducted with Finland on 9 December 2020 to test arrangements for response to a transnational nuclear emergency;

- Four ConvEx-2e exercises conducted to test the Agency's assessment and prognosis process and tools on 25 August 2020 with France, on 10 November 2020 with the IAEA LEU Bank in Kazakhstan, on 9 December 2020 with the Netherlands, and on 16 March 2021 with the United Arab Emirates;

- A virtual tabletop exercise held in August 2020 that tested the Agency's Response and Assistance Network's (RANET's) operational arrangements, the IRMIS, the Agency's assessment and prognosis process and tools and the Agency's Unified System for Information Exchange in Incidents and Emergencies (USIE); and

- Three internal full response exercises held in the IEC's operational area in December 2020, March and June 2021, to train the Agency's Incident and Emergency System staff on their response procedures. There were special hygiene measures applied to the operations in the IEC's operational area.

26. A review and revision of two safety standards (GSG-14 and GS-G-2.1) was conducted to include aspects related to pandemics and emergency preparedness and response (EPR).

27. Throughout the COVID-19 pandemic, the Agency delivered real-time virtual tours to the IEC for meeting and workshop participants.

28. The Agency published a document in its EPR series entitled *Preparedness and Response for a Nuclear or Radiological Emergency Combined with Other Incidents or Emergencies*, which contains guidance on implementing *Preparedness and Response for a Nuclear or Radiological Emergency*

(IAEA Safety Standards Series No. GSR Part 7) for building adequate EPR arrangements taking into account the impact of the pandemic on EPR.

29. A questionnaire was launched for Emergency Preparedness and Response Standards Committee (EPReSC) members on actions taken by Member States during the pandemic to address its potential impact on national EPR frameworks and resources. Responses from fifteen countries have been received. Based on the responses to the questionnaire the following aspects can be highlighted:

- There have been no declarations of nuclear or radiological emergencies directly related to the pandemic; and
- Regulatory bodies, operating organizations, and offsite response organizations have taken many measures to ensure continuity of adequate EPR capabilities during the pandemic. These measures include:
    - enforcement of relief of activities that would place personnel at risk of contracting the virus (for example, in-person training and exercises);
    - introduction of additional hygiene measures to protect essential response staff (on-site and off-site) and modification of rosters/schedules/turnover procedures to minimize personnel interactions;
    - re-evaluation of response arrangements for a nuclear and radiological emergency, including reference levels, and modification of criteria for protective actions; and
    - some Member States reported that the use of national personal protective equipment stockpiles for the pandemic response have influenced the stockpiles of such equipment prepared for response to a nuclear or radiological emergency.

30. Based on the information collected, more discussions are expected to take place in EPReSC meetings in 2021 to determine the need for development of further guidance on EPR to better address the impact of pandemics in EPR arrangements.

31. The IEC actively utilized virtual tools to continue to deliver training for practitioners, information for both experts and the general public, as well as consultations with Member States' experts. During the reporting period, the IEC conducted 111 webinars, 23 virtual consultancy meetings, 2 virtual meetings of the EPReSC, 3 virtual Technical Meetings, and 22 virtual training events at regional or national levels.

B.4. Meetings of Conventions and Other Legal Instruments

32. The Eighth Review Meeting of the Contracting Parties to the Convention on Nuclear Safety (CNS) was postponed by a consensual decision of the Contracting Parties. A decision was taken not to organize the Review Meeting in 2021. The Presidency has, in consultation with the Agency's Secretariat, proposed a plan of further actions including a framework for wrapping up the eighth review cycle in 2021 by capturing the work conducted during the review cycle in a compendium to support the Eighth and Ninth Review Meetings, which will be merged and held in 2023. The proposal was introduced through a Presidency letter to Contracting Parties. No objection to this proposal was received and the

Presidency proceeded with further steps towards implementation of the plan. In accordance with the plan, a meeting of Officers of the Eighth Review Meeting was held virtually in March 2021 where there was general agreement on the proposed way forward.

33. The Organizational Meeting for the Seventh Review Meeting of the Contracting Parties to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was postponed by a consensual decision of the Contracting Parties and was held as a hybrid meeting over four days from 28 September to 2 October 2020. The Seventh Review Meeting of the Contracting Parties to the Joint Convention planned to be held from 24 May to 4 June 2021 was also postponed by a consensual decision of the Contracting Parties and will be held from 27 June to 8 July 2022. The new date for the Fourth Extraordinary Meeting of the Joint Convention was decided by the Contracting Parties to be 14 to 16 February 2022.

34. The International Meeting on the Application of the Code of Conduct on the Safety of Research Reactors, which was originally scheduled for August 2020, took place virtually in June 2021. Participants discussed the experience of research reactor operators in addressing pandemics.

35. The Open-ended Meeting of Legal and Technical Experts on the Implementation of the Guidance on the Management of Disused Radioactive Sources, which was originally scheduled for June 2020, was converted into four virtual regional meetings which occurred in January 2021 for the Europe region; in March 2021 for the Africa region; in April 2021 for the Asia and the Pacific region; and in June 2021 for the Latin America and the Caribbean region. A virtual meeting is scheduled for August 2021 to enable Member States to learn from the outcomes of the four virtual regional meetings and to further share global experiences in relation to implementation of the Guidance.

36. Two meetings of the Preparatory Committee for the Conference of the Parties to the Amendment to the Convention on the Physical Protection of Nuclear Material were held virtually from 7 to 11 December 2020 and on 1 February 2021, having been postponed from the original dates of 29 June to 3 July 2020. At the meetings, the Parties discussed formal preparations for the Conference, which is planned to take place from 28 March to 1 April 2022, including with respect to a draft agenda and programme, as well as draft rules of procedure for the Conference. The Agency has taken steps to ensure that the situation with respect to the COVID-19 pandemic does not impact the robustness of the preparations for the Conference.

Director General Grossi delivering his opening remarks to the Preparatory Committee

B.5. Collaboration with Other United Nations Organizations and Other International Bodies

37. Regular interaction between the Agency and the World Association of Nuclear Operators (WANO), the Nuclear Energy Agency of the Organisation for Economic Co-operation and Development (NEA) and other organizations continued to enable an effective exchange of information and lessons learned.

38. Through the coordination of the Inter-Agency Committee on Radiological and Nuclear Emergencies (IACRNE), the Agency and the international organizations which are co-sponsors of the Joint Radiation Emergency Management Plan of the International Organizations continued to prepare the ConvEx-3 (2021) exercise which will be conducted in October 2021, based on a nuclear power plant accident

scenario to be hosted by the United Arab Emirates. Four ConvEx-3 (2021) Task Group Meetings were conducted virtually on 8 September 2020, on 23 November 2020, on 7–8 April 2021 and on 17 May 2021. The exercise manual was distributed to participating Member States and international organizations in June 2021. Representatives of the Comprehensive Nuclear-Test-Ban Treaty Organization, European Commission, Food and Agriculture Organization of the United Nations, International Civil Aviation Organization (ICAO), International Maritime Organization, International Criminal Police Organization, World Health Organization (WHO) and WMO participated in the Task Group Meetings.

39. The impact of COVID-19 pandemic on air transport caused significant disruption in the distribution of medical isotopes and radioisotopes. The Agency, in collaboration with the WHO is discussing with the ICAO actions to mitigate similar disruptions and their associated negative impact on vulnerable persons in the future.

40. The Agency hosted two virtual Information Exchange Meetings, in October 2020 and April 2021, to coordinate activities and avoid duplication of activities in nuclear security undertaken by various relevant organizations and initiatives. The participants exchanged information, discussed various themes within nuclear security, and gained a better understanding of activities being undertaken by each organization, particularly including experiences related to conducting activities under the COVID-19-related restrictions.

B.6. Other Support to Member States

41. The Agency initiated a new webinar series on the nuclear supply chain. This webinar series highlights the global view on the world's nuclear supply chain, presents challenges and avenues for the future and takes stock of the recent Agency work in the area. It discusses project delays and temporary shutdowns of NPPs due to the detection of counterfeit items, obsolescence of original technology, and increased reliance on digital equipment. The series included a session on challenges brought by the COVID-19 pandemic including difficulties related to mobility of contractors.

42. The Agency has launched a Nuclear Supply Chain Toolkit to support countries in coordinating among regulators, technical support organizations, owner/operators of nuclear facilities and their suppliers. The toolkit provides examples, case studies and good practices to help ensure that procurement by nuclear power plants, research reactors and fuel cycle facilities is done efficiently and at high quality. It is intended to assist both newcomer and operating countries in the use of sound quality and management principles.

43. Following an explosion in the Beirut port, the Agency responded to Lebanon's request for assistance by deploying an assistance mission with the involvement of RANET. The assistance mission was conducted under pandemic conditions by Agency, Danish and French experts, who confirmed the radiation safety and security of radioactive sources in hospitals in Beirut and checked that no hazard was presented by materials containing naturally occurring radionuclides that are stored at the Beirut port. The mission experts strictly followed the Agency's and the Lebanese authorities' safety regulations to prevent the spread of COVID-19. In addition, environmental samples collected by Lebanon and analysed at laboratories in France (IRSN) and Switzerland (Spiez Laboratory) did not contain elevated radiation levels.

Team members of the international assistance mission to Beirut

44. A new webinar on the Overview of Core-training for Security of Radioactive Material in Use and Storage and Associated Facilities was launched in 2021. The webinar, which provides an overview of the core-training provided by the Agency for the security of radioactive material in use and storage and associated facilities, was designed to engage Member States during the COVID-19 pandemic, and to introduce them to relevant nuclear security e-learning opportunities. Three webinars have been conducted in 2021 in English, French and Spanish.

45. The Agency was able to continue to provide critical support and assistance to remove and consolidate disused sealed radioactive sources. This included the removal of one high-activity disused radioactive source from Bahrain, the consolidation of nine high-activity disused radioactive sources in Colombia, and support to a mission to Brazzaville for the secure management of high-activity radioactive sources, with emphasis on transport, in November 2020.

Experts dismantling a teletherapy head used for cancer care in Colombia in preparation for its safe and secure storage

46. The restrictions stemming from the outbreak of COVID-19 created an opportunity to adapt the manner of engagement also with embarking Member States. Continued assistance to newcomers was ensured through the organization of virtual meetings, expert missions, Integrated Nuclear Infrastructure Training courses and virtual tailored activities in mid-term Integrated Work Plan meetings.

47. The Agency conducted three combined self-evaluation support mission–pre-INIR missions virtually in preparation for the main Integrated Nuclear Infrastructure Review (INIR) missions in Sri Lanka, Uganda and Uzbekistan. The INIR Phase 2 mission to Uzbekistan was held in person from 24 May to 3 June 2021 in Tashkent, taking into consideration all necessary protective measures in line with COVID-19. The INIR Phase 1 follow-up mission to Kenya was held as a face to face meeting in Nairobi from 7 to 11 June 2021. Two other INIR missions to Sri Lanka and Uganda will take place in August and November 2021 respectively.


INIR Phase 2 Mission to Uzbekistan

48. To ensure that the Agency remains fully engaged with Member States to address their physical protection security needs during the COVID-19 pandemic, Agency staff developed an interim virtual solution for conducting parts of the highly sensitive assessment missions remotely, while also taking into consideration the need to protect sensitive security related information. Six virtual assessments have been completed to date in Bolivia, Jamaica, Mali, Sudan, Turkmenistan and Zimbabwe. The Agency also continued supporting Member States in developing and enhancing regulatory frameworks for the physical protection of nuclear and other radioactive material in use, storage and transport. Seventeen Member States were assisted during the reporting period.

49. A hybrid national training course for participants from Rwanda on equipment performance verification in support of major public events was conducted in 2021 in Egypt. The purpose of the course was to train participants in the operation, calibration and maintenance of the radiation detection equipment instruments loaned by the Agency to Rwanda for the upcoming Commonwealth Heads of Government Meeting in Rwanda.

50. E-learning courses on nuclear security, EPR and radiation protection, as well as on infrastructure development, are available to Member States. The Secretariat has noted an increase in enrolments in and completion of these e-learning courses. In addition, the Agency successfully tested and deployed several upgraded e-learning modules as planned. The Agency also provided Member State organizations with training course material in order to conduct training themselves, provided human resource development planning and training support and reviewed Member States' human resource development documentation.

51. The Agency organized webinars on Maintaining Nuclear Safety of Nuclear Fuel Cycle Facilities During a Pandemic in October 2020 and on Maintaining Nuclear Safety of Research Reactors During a Pandemic in November 2020 to discuss the experience of operators and regulators in addressing the pandemic.

C. Actions Undertaken in Member States to Mitigate the Impact of the COVID-19 Pandemic

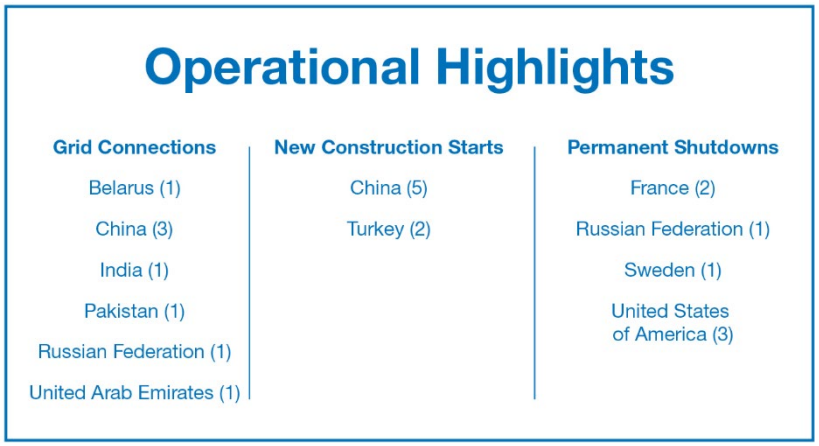
C.1. Nuclear Power Plants

52. Member State actions focused on ensuring the safety and well-being of staff through prompt action to minimize the risk of the pandemic's spread, while maintaining business continuity and adequate levels of safety, security and sustainability of NPPs. No Member State reported the enforced shutdown of any nuclear power reactors resulting from the effects of COVID-19 on their workforce or essential services such as supply chains. Regulatory bodies have generally applied a graded approach during the pandemic and adjusted the scope of regulatory or other inspections based on their safety significance.

53. Member States indicated different levels of impact on planned outages, scheduled maintenance plans or programmes due to limited availability of manpower caused by travel restrictions as well as to protect the health of employees, while ensuring adequate levels of safety and security at NPPs. In some cases, operators have proposed to the regulatory bodies the deferment of the planned outages to 2021, which could result in higher than average yearly contributions to electricity production by nuclear power in 2020. In some cases, economic slowdowns resulted in decreased energy demand leading operators to reduce power or even to shut down reactors.

54. Ongoing and future challenges include the implementation of planned maintenance activities to ensure interim- to long-term reliability. Current mitigation actions minimize the site presence of external staff by deferring non-essential online and outage work to ensure safety. This work is being rescheduled, but uncertainties regarding how the pandemic might progress are posing a challenge for many Member States.

55. Since the pandemic began, eight reactors were connected to the grid and seven construction starts were observed. As planned before the COVID-19 pandemic, seven units have been permanently shut down.[2]



56. The pandemic impacted human resources at new units in Bangladesh, Belarus, Turkey and the United Arab Emirates, but did not stop construction activities. There has been notable progress in newcomer countries despite the challenges arising from the global pandemic. Belarus and the United Arab Emirates have almost completed construction of their first NPPs and their first units went into commercial operation in November and August 2020 respectively. Bangladesh and Turkey have progressed with the construction of their first NPPs.

57. The Agency held a consultancy meeting on the impact of COVID-19 on managing obsolescence, spare parts and replacements in operating NPPs. Participants gave examples of maintaining critical spares while utilizing remote audits and extensions to supplier audits to overcome travel restrictions.

[2] As reported to PRIS up to July 7 2021

58. Actions taken by Member State regulatory bodies focused on maintaining an adequate level of regulatory oversight whilst ensuring the safety and well-being of staff. Regulatory bodies generally reported adopting remote working practices with some able to maintain a physical regulatory presence at nuclear installation sites through resident inspector offices.

C.2. Research Reactors and the Production of Radioisotopes

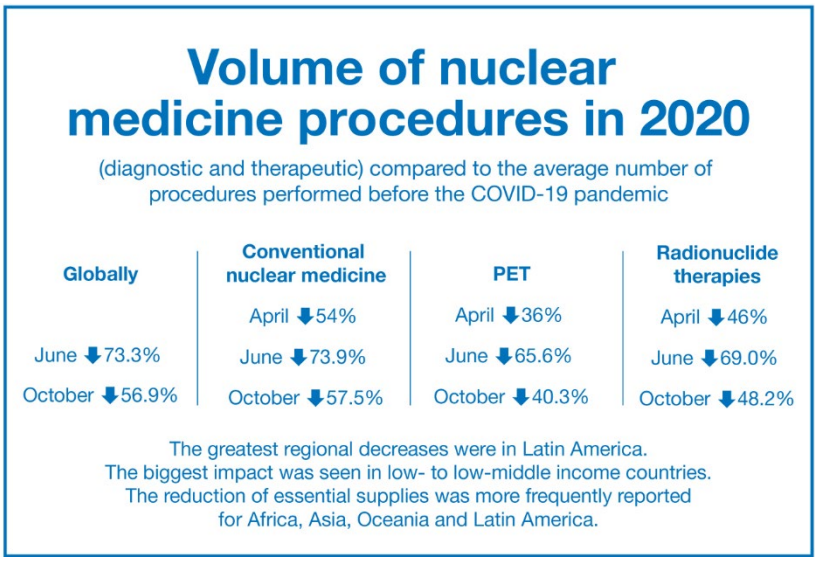
59. Most research institutions and universities, which operate many research reactors for education, training and research, decided to temporarily shut down the facilities in the first months of the pandemic and resumed operation later in 2020. They have also implemented measures to maintain safety of the reactors during the extended shutdown state, for example by partial unloading of fuel from reactor cores and monitoring safety in accordance with existing procedures for long shutdown periods.

60. Most research reactors in operation remain operable, with specific measures implemented to address the pandemic.

61. Production of medical radioisotopes and radiopharmaceuticals has been recognized as an 'essential service' in most countries. The production has generally remained sufficient to meet the demand and overall demand has decreased during the pandemic. In October 2020, Agency staff disseminated information on distribution bottlenecks of medical isotopes at the 2020 European Research Reactor Conference, contributing with a presentation on measures taken and lessons learned with regard to the supply of medical radioisotopes and radiopharmaceuticals, as well as moderating a dedicated panel discussion on stakeholder views on the supply of medical radioisotopes and radiopharmaceuticals.

62. Results of a new Agency online survey held in June and October 2020 on the impact of COVID-19 on nuclear medicine departments of university-based centres, public hospital centres and private centres, were compared to the prior one done in April 2020. The number of nuclear medical procedures remains lower than the average before COVID-19.

63. Globally, the volume of nuclear medicine procedures (diagnostic and therapeutic) decreased by 73.3% in the month of June 2020 and 56.9% in the month of October 2020, compared to the average number of procedures performed before the COVID-19 pandemic, varying markedly between regions and countries, with the greatest regional decreases in Latin America. Reductions affected conventional nuclear medicine, positron emission tomography (PET) and radionuclide therapies. The biggest impact was seen in low and middle income countries. The reduction of essential supplies was most frequently reported for Africa, Asia, Oceania and Latin America.



C.3. Nuclear Fuel Cycle Facilities

64. Most nuclear fuel cycle facilities (NFCFs) continued operation, except some radioactive waste management (RWM) facilities and some mining and processing facilities, which were temporarily shut down.

65. Operating organizations of NFCFs adopted measures to ensure business continuity, nuclear safety and security. Typical measures included prioritization of strategic activities, e.g. maintenance of essential functions in regulatory bodies, sustainability of supply chain and inventories, etc. Similar to NPPs, measures also focused on minimizing the potential transmission of the virus among personnel.

66. The greater challenge to NFCFs, especially those dealing with RWM, lies in managing the significant economic effects of the pandemic. Measures included tighter prioritization of activities and increased resourcefulness in making visible the longer-term benefits of RWM, including possible sharing of RWM facilities between Member States.

C.4. Other Facilities

67. During the Agency's 28th Fusion Energy Conference held in May 2021, the ITER project reported that work continues without interruption at the project site and there had been no significant infections. Some ITER members who supply key components were forced to stop work for several months thereby impacting the supply chain of the project. The project will have a clearer picture of the impact by the end of 2021.

D. Remarks and Way Forward

68. COVID-19 is the first pandemic of this scale in the history of the nuclear industry and its impact has been far reaching. The Agency continues to support Member States under these unprecedented circumstances, delivering on its mandate through routine and novel ways of working. The Agency, in collaboration with peer and partner organizations, will continue to reflect on and share lessons learned from the pandemic and the relevant global response to it.

69. An example of successful delivery through novel ways of working is that the development of safety standards and other Agency guidance continued unabated throughout the period despite the restrictions imposed. A deep analysis of safety standards and nuclear security guidance regarding pandemics was undertaken, including the guidance on emergency preparedness and response.

70. A further example is a number of webinars conducted by the Secretariat, which enabled a far greater audience in Member States to be reached than would have been the case for traditional outreach events.

71. Another example of successful delivery through novel ways of working is the completion of virtual peer review and advisory services. Some aspects of future services could continue to be delivered virtually, but it is anticipated that the vast majority of missions, and other large events such as Convention Review Meetings, would need to have a face to face component. In addition, for meetings that have the main objective to share views and provide the best expertise, resuming in-person formats will undoubtedly have a positive impact, while facilitating discussions and exchanges amongst experts.

72. Response actions have been implemented by operating organizations and regulatory bodies in Member States to ensure safety, security and reliable generation of electricity, production of isotopes or supply of other relevant products and services to the extent possible. The Secretariat is developing a publication synthesising the actions taken by Member States.

73. The nuclear industry needs to monitor its supply chains to ensure that latent risks from broader industrial shutdowns are properly managed to ensure nuclear installation safety, security and reliability in the future. One of the anticipated challenges for Member States is that some companies may close as a result of the economic impact of the pandemic.

74. The Agency is planning a webinar on COVID-19 and its impact on the nuclear power supply chain as a part of its Nuclear Supply Chain Webinar Series. It is foreseen that the webinar will provide examples of responses and future initiatives from Member States and enable feedback to be given to the Agency on additional supply chain themes to explore in the future.

75. Some of the measures taken in response to the pandemic created changes in the operating environment and existing management systems. Nuclear installations need to effectively identify and manage risks resulting from these changes and regulatory bodies need to engage with their organizations to ensure safe, secure and reliable operation. Examples of specific challenges include the effectiveness of oversight by competent authorities during lockdown and other related restrictions, deferred equipment maintenance and design modifications, degradation of personnel knowledge and skills due to increased periods between validation checks, limited or postponed personnel training, and decline in benchmarking activities and safety peer reviews to support continuous safety improvement.

76. The Agency recognizes the need to encourage the governments of the producers and users of medical radioisotopes, the operators of research reactors, and the relevant Member States involved in production and transport of radioisotopes to strengthen arrangements for distribution. Additionally, establishment of regional sources is being explored, such as accelerator-based, alternative production routes for molybdenum-99/technetium-99. These actions will mitigate future potential supply risks in Member States.

77. The Agency will continue to undertake its activities during the ongoing pandemic while regularly reviewing its working methods and continuously adapting to the new circumstances.

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