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Communication dated 4 August 2022 from the Chair of the International Nuclear Safety Group (INSAG)

On 4 August 2022, the Director General received a letter from the INSAG Chair, Mr Stephen Burns, providing his perspective on current emerging safety issues. The aforementioned letter is circulated herewith for the information of the General Conference.

4 August 2022

Director General Rafael Mariana Grossi
International Atomic Energy Agency
Wagramer Strasse 5
A-1400 Vienna
Austria

Dear Director General Grossi:

I am writing in my capacity as Chairman of the International Nuclear Safety Group ("INSAG"). The terms of reference state that INSAG should provide recommendations on current emerging nuclear safety issues. As the newly appointed Chairman, I intend to fulfil this obligation as did my predecessor, Dr. Richard A. Meserve, not only through the various INSAG reports, but also with an annual letter. This correspondence constitutes this year's installment of the annual letter. Past letters are available on the INSAG website at http://goto.iaea.org/insag.

This letter is written in the context of the potential threat to nuclear safety and security due to military action in the vicinity of nuclear installations.

An attack on a nuclear installation is contrary to the norms reflected in international humanitarian law, as codified in the Geneva Convention and particularly in its additional Protocol I relating to the Protection of Victims of International Armed Conflicts, which specifically prohibits an attack on nuclear electrical generating stations. The IAEA General Conference has adopted Statements, most recently in 2009, prohibiting such attacks.[1] As noted in the General Conference statements, "any armed attack on and threat against nuclear facilities devoted to peaceful purposes constitutes a violation of the principles of the United Nations Charter, international law and the Statute of the Agency."

At the core of the international regime for the peaceful uses of nuclear energy are fundamental principles reflecting the responsibility of both operators and government for the safe and secure operation of nuclear installations and the use of radioactive material. For example, the Convention on Nuclear Safety instructs Contracting Parties to provide a sound legislative and regulatory framework to govern safety and to establish a competent, independent regulatory authority to implement the national framework; moreover, the license holder has the prime responsibility for ensuring the safety of a nuclear installation.[2] Military operations can adversely affect the ability of

[1] GC(53)/DEC/13, Prohibition of Armed Attack or Threat of Attack Against Nuclear Installations, During Operation or Under Construction (2009); GC(XXXIV)/RES/533, Prohibition of All Armed Attacks Against Nuclear Installations Devoted to Peaceful Purposes Whether Under Construction or in Operation (1990); GC(XXIX)/RES/444, Protection of Nuclear Installations Devoted to Peaceful Purposes Against Armed Attacks (1985).

[2] Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, Arts. 7-9. These basic principles are also reflected in the Joint Convention on the Safety of Spent Fuel Management and on the Safety of

the responsible facility operators and the national authorities to ensure adequate safety, security and safeguards at affected installations.

Although States are not expected to intentionally harm a nuclear installation even during a period of armed conflict, the integrity of an installation is still likely threatened by military operations in its vicinity. Design features of the nuclear installation or administrative measures taken by the operator alone may not be sufficient to prevent a major release from the installation. There is a significantly increased probability of an accident or compromise of the safety of the facility as a result of the occurrence of externally induced hazards, such as explosions, the release of toxic or flammable gases, or missile impacts. Such events will have an even higher likelihood if there is military or industrial infrastructure near the nuclear installation which may be the target of a military operation. Apart from the threat posed by military operations, the physical integrity and operational capacity of a nuclear installation can be undermined by disruptions to the supply of critical equipment and services needed to maintain the integrity of the installation's safety and security systems.

Moreover, an armed conflict can clearly have a negative impact on the human factors that are essential for the safe and secure operation of nuclear installations. Full availability of staff and the general working conditions may be adversely affected by military operations. Such circumstances will undoubtedly impose additional physical and psychological burdens on the staff. Apart from the threat posed by military operations, adverse impacts on the installation's security may increase vulnerabilities. Marginal groups acting separately from the State may see an opportunity for terrorist acts such as causing a sabotage event at the installation. An act of sabotage may occur as an act of direct hostility or provocation. If another country takes possession of a nuclear installation, the danger posed by insider threats may also significantly increase.

Military action during times of armed conflict may lead to the disruption of critical communications between responsible authorities and facility operators and of the monitoring of facility status. Such circumstances can also challenge the IAEA's ability to obtain prompt and sufficient information to ensure the international community's understanding of the safety and security status of affected facilities. The availability of such information, as well as uninterrupted monitoring to fulfill safeguards obligations, is critical.

The current situation has led the international community to reflect on the basic principles that are essential to maintaining the safety, security and integrity of nuclear installations, particularly when threatened by armed conflict. In this context, you articulated seven indispensable pillars of nuclear safety and security at a meeting of the IAEA's Board of Governors on 2 March 2022 in the context of the situation in Ukraine:

1. The physical integrity of the facilities – whether it is the reactors, fuel ponds, or radioactive waste stores – must be maintained;
2. All safety and security systems and equipment must be fully functional at all times;

Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, as well as in the Code of Conduct on the Safety and Security of Radioactive Sources (2004), IAEA Doc. IAEA/CODEOC/2004, and the Code of Conduct on the Safety of Research Reactors (2006), IAEA Doc. IAEA/CODEOC/RR/2006.

3. The operating staff must be able to fulfil their safety and security duties and have the capacity to make decisions free of undue pressure;
4. There must be secure off-site power supply from the grid for all nuclear sites;
5. There must be uninterrupted logistical supply chains and transportation to and from the sites;
6. There must be effective on-site and off-site radiation monitoring systems and emergency preparedness and response measures; and
7. There must be reliable communications with the regulator and others.

The task before us is to ensure to the greatest extent possible that the threats posed by armed conflict do not adversely affect the safety and security of nuclear installations. Although the circumstances of an armed conflict may be relatively rare, they warrant an intentional focus on the steps necessary to avoid harm to nuclear installations and to ensure that proper preparations and measures are taken to deter and mitigate the danger. In this context, the IAEA and Member States may wish to undertake additional initiatives as described below.

The IAEA has played a critical role in seeking to obtain and disseminate information on the status of facilities in the conflict zones. When military action threatens a nuclear installation, neighboring States in particular will want to know information necessary to protect their people and environment. The IAEA has adapted existing guidance, such as that related to emergency response, to provide reliable communications with Member States, and that role will continue to be important in the future. Formalizing the IAEA's role through additional guidance and instructions would appear warranted and important to prepare for future situations.

As noted above, international norms and prior statements endorsed by the IAEA General Conference have underscored that nuclear installations should not be subject to the threat of attack by military operations. It may be worthwhile to undertake the development of a formal instrument, perhaps even a code of conduct, to build upon the existing international framework, to further embody the objectives of the "seven pillars" and to build upon them by considering any other basic principles bearing on the objective of ensuring the safety and security of installations that may come under threat of an armed conflict. Consideration should also be given to whether an aspect of future international undertakings would include States' declaring the nuclear facilities that should be protected from military action, for which the 1988 agreement between India and Pakistan provides a model.

In any event, States, with the support of the IAEA, should consider the development of contingency plans to mitigate the risks posed a military action and should prepare to train staff to implement such plans. Such guidance would address, for example, such matters as:

- Assessment of conditions that would merit suspension of facility operation;
- Assurance of redundant power supply to maintain critical systems and assure a continued safe shutdown state (e.g. securing fuel for emergency diesel generators)
- Stockpiling of parts and materials necessary for maintenance and repair of critical systems, structures and components to prepare for potential prolonged isolation of the installation;
- Storage of food, medical and other supplies as well as housing necessary to support plant staff;

- Availability of and capability to call additional staff to the site to provide relief to operators or to perform necessary maintenance.

Similar measures were adopted in response to lessons learnt from the Fukushima Daiichi nuclear power plant accident and in response to the COVID-19 pandemic. Those experiences should be assessed as part of the consideration of contingency plans applicable to nuclear installations in areas threatened by military action.

Moreover, such guidance should also address the assurance of reliable and strong communications and monitoring capabilities at the site to ensure continued information exchange with the regulator and other critical points of contact, the robustness of remote radiation monitoring as well as continuous safeguards monitoring, and the capability to initiate emergency response if necessary. Consideration should be given to means of ensuring independent verification of a facility's status and condition.

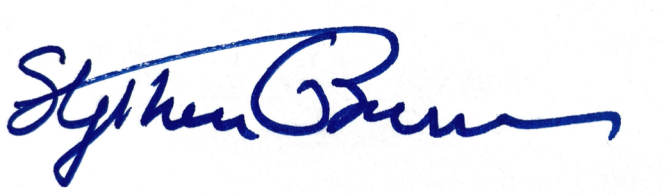
An armed conflict can give rise to unexpected challenges to nuclear safety and security, and Member States should commit to prepare for the assurance in such situations of the safety, security and safeguards of nuclear installations. The importance of the development of firm understandings with regard to facilities in zones that may experience armed conflict is heightened as more countries aspire to build civilian nuclear facilities.

* * *

INSAG will continue to monitor the situation and is prepared to offer further guidance. The INSAG Forum, to be held during this year's General Conference in September, will address the "Safety Aspects of Nuclear Facilities in Armed Conflict Situations". In all events, please feel free to contact me if there are particular issues that you would like INSAG to explore.

Best regards.

Very truly yours,



Stephen G. Burns

cc: DDG Lydie Evrard
INSAG Members