Implementation of Capacity Development and Public Awareness for CTBT Verification Regime in Myanmar

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Abstract: Myanmar signed the Comprehensive Nuclear-Test-Ban Treaty (CTBT) in 1996 and ratified it in 2016. As a CTBT ratifying state, Myanmar needs to implement the capability development and public awareness concerning with CTBT verification activities. When implementing the CTBT verification regime, Myanmar considered the linkage between CTBT and sustainable development goals (SDGs). A National Data Centre (NDC) is needed in the country for collecting the data from the stations, differentiating the data quality, prioritizing and storage of the data to conduct with International Data Centre (IDC) of Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). The seismic, hydroacoustic, infrasound and radionuclide technologies are important for identifying the signals generated by a nuclear explosion. Various capacity development and public awareness are important for initial step before the ratification process of the state party. Civil society, change school curriculum, participation in process, organizing workshops and seminars are carried out by policy makers’ decision. International collaboration and citizen awareness are needed to understand the CTBT verification system for monitoring the nuclear explosions in a global context. The Atomic Energy Division (AED) will collaborate with external funding agents like CTBTO to improve skill of human resource for NDC implementation in Myanmar. Young scientists, science administrators and representative will be achieved from this national development initiative. This is focused on research and development in areas potentially relevant to the Treaty’s verification regime.

Key words: CTBT verification regime, SDGs, NDC implementation, capacity building, public awareness.

1. Introduction

The Comprehensive Nuclear-Test-Ban Treaty (CTBT) bans all nuclear explosions everywhere, by everyone, and for all times. It is very important to prevent the huge damage caused by radioactivity from nuclear explosion to humans, animals and plants. Myanmar signed the CTBT on Nov. 25, 1996, only two months after the Treaty opened for signature. The country has shown its support for nuclear weapons free world and the peaceful uses of nuclear energy from 1992 when it became a non-nuclear weapon state party to the treaty on the non-proliferation of nuclear weapons. Myanmar has ratified the CTBT, becoming the 166th nation to do so. The instrument of ratification was deposited in New York on Sep. 21, 2016. In Association of Southeast Asian Nations (ASEAN), Myanmar’s ratification means that nine of the ten ASEAN countries have ratified the CTBT [1].

2. Background Scenario of CTBT and Myanmar

The most important feature of CTBT is including the international monitoring system (IMS) by using the advanced technologies such as seismology, hydro acoustic, infrasound and radionuclide to monitor under the surface of the water and underground of the earth not only for sign of nuclear explosion but also disaster prevention worldwide. There are 337 IMS facilities worldwide to monitor the planet for signs of nuclear explosion with these advanced technologies. The IMS stations use the four states of art technologies. Fifty (50) primary and 120 auxiliary seismic stations monitor shockwaves in the Earth and the vast majority of these shockwaves are caused by earthquakes. Eleven (11) hydro acoustic stations are listened for sound waves from explosions in the oceans that can travel extremely far underwater. Sixty (60) infrasound stations on the
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Surface can detect ultra-low frequency sound waves that are emitted by large explosions. Eighty (80) radionuclide stations measure the atmosphere for radioactive particle in which 40 of them also pick up noble gas. They are supported by 16 radionuclide laboratories [1]. Nowadays, IMS is widely used for prevention of the tsunami by detecting signals related under water earthquake and natural disasters by using advanced instruments and technologies to send the data to regional countries. Moreover, radioactive particles split from the atmosphere by ground and underground nuclear explosion are analyzed by radionuclide station. Myanmar is actively participated and collaborates with relevant ministries to Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO). Myanmar has already joined CTBT training program and e-learning system especially for human resource development and awareness program.

3. Current Situation of Myanmar

Myanmar is a developing country and keen to implement the CTBT verification regime. Myanmar is already participated in natural disaster management especially earthquake and tsunami prediction and data sharing between regional countries and helping for tsunami prevention. Moreover, Myanmar has actively been measured and analyzed for radionuclide fallout by Fukushima nuclear accident collaborating with International Atomic Energy Agency (IAEA). Myanmar is pursuing a four wave’s reform process; the political, economic and administrative reform and development of private sector, aiming to achieve political stability and economic development since 2011. Myanmar is organized the required institutional arrangement for disaster management and endorsed global and regional commitments. Myanmar is trying to promulgate the necessary law and regulation and set up youth volunteer network, training center, emergency operation center and database for disaster risk reduction. Seismic stations have been established various points by Department of Meteorology and Hydrology under Ministry of Transport and Communications in Myanmar. The information on disaster management is shared to public through social media and TV channels. In education sector, Ministry of Education revised the general science subject for studying general knowledge about disaster prevention and peaceful use of nuclear technology.

4. Strategic Implementation for CTBT Verification Regime in Myanmar

The key area to consider for capacity building initiative should be flexible and transparent based on a country approach. This approach will take different situation and respective characteristic will promote synergies between different initiatives concerned for capacity building. To be strengthened capacity development, systematic, institutional and individual levels are needed.

The following procedures for the full ban on all nuclear tests are to be undertaken.

1. Implementing law related CTBT;
2. Formation of National Authority;
3. Establishing International Monitoring System (IMS) Station;
4. Establishing National Data Center (NDC);
5. Formation of On-Site Inspection (OSI) Team.

Myanmar has already submitted the “Myanmar Nuclear Law” to parliament (Pyithu Luttaw) for approving. That law includes 3S issues (Safety, Security and Safeguard). When implementing CTBT related Law, Myanmar must coordinate with international organizations like IAEA and CTBTO. The protection and enforcement of laws to prevent the development of nuclear weapons can provide in areas of judicial authority and control from nuclear explosion, which include adequate judicial and administrative sanctions; prevent the use of illegal or unauthorized use of radioactive devices and machines. National Authority is the focal point of the country that can communicate with state parties and CTBT organization. The main task is to implement the agreement between
CTBTO and our country and cooperate in the implementation of the verification regime and in the development of human resources. In the formation of the national authority, experts from various ministries and departments, experts from atomic energy division, experts from diplomatic corps and national level decision makers will be involved. Ministry of Transport and Communication has some earthquake detection system and may communicate with IMS from CTBTO. Although IMS facilities are not fully installed, NDC can access real-time information to conduct with IDC and can share real-time information for a tsunami alert system. In the formation of the OSI, one of our staffs has been participating in OSI training cycle program of CTBTO and some staffs participate the OSI workshop and advance science course organized by CTBTO. But we already actively cooperate in inspection activities with IAEA.

5. Discussion on Implementation of Capacity Development and Public Awareness in Myanmar

Atomic Energy Division (AED) under Department of Research and Innovation is the focal point of the CTBT verification regime to implement capacity building and public awareness in Myanmar. AED is closely working with other stakeholders to develop capacity related to CTBT. AED actively participates to CTBTO capacity development program and attends the workshop, seminar, meeting frequently. Also most of staffs are studying e-learning modules from CTBTO website to improve their knowledge about comprehensive treaty test ban. After studying from CTBTO training and e-learning, knowledge sharing seminars have to do to colleagues and other stakeholders. Moreover, Department of Meteorology and Hydrology (DMH) generates weather forecast and early warnings for cyclone, storm surge and flood. To make early warning message to be friendly for user, color-coded warning systems are started to use in 2009 and it is informed to the public through media and television. DMH still needs to upgrade the capacity building, equipment and tools for disaster monitoring system in order to improve the quality and accuracy of weather forecast and early warning. Firstly, priority of implementing CTBT verification regime is to share and disseminate the scientific information including advanced technology to scientists and then approaching practical method that can easily be integrated into policies, regulations and implementation plans concerning CTBT verification regime. Capacity development at all levels of society, comprehensive knowledge management and the involvement of science (including behavioral science) in public awareness-raising, media communication, behavior change, and education campaigns should be strengthened.

In education sector, the Ministry of Education (MoE) organized the workshop, seminar and working group meeting about the CTBT. Started from lower secondary school, general science subject is included the study on “earth and space” as lessons. Also upper secondary school curriculum includes a lesson titled “Earthquake and Earth Surface Process” that covers flood, emergencies, earthquake, tsunami, landslides and fire. MoE has incorporated Do’s and Don’ts on various natural hazards into the student exercise book provided by the government.

Myanmar sustainable strategic plans are also implemented to fulfill the sustainable development goals (SDGs). Myanmar Action Plan on Disaster Risk Reduction (MAPDRR-2012) was implemented to participate in the activities of disaster risk management. National Education Strategic Plan (2016-2021) is implemented to get the quality education. At the same time, women scientists are encouraged to participate in every sector according to national strategic plan for the advance of women. Nowadays, Myanmar coordinated and cooperated with regional and international organization to get the partnership to do work together. At the same time, all stakeholders public (government) and private
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(business sector) are closely linked to fulfill the SDGs by doing research, sharing knowledge, monitoring and evaluation, and also ensuring the Science, Technology and Innovation (STI) policy making process.

During the Fukushima incident, AED has prepared monitoring teams in which one team monitored the radioactive fallout from atmospheres by using air sampler in crowded areas and inspection team monitored at airport and harbor for contamination monitoring to the travelers who are coming from Japan and transit countries. All inspectors and staffs are trained in IAEA training program and some are trained in regional training program. All stakeholders are actively cooperated to monitoring team and work together.

National Analytical Laboratory, Department of Research and Innovation is the main laboratory for environmental samples analyzed by advanced instruments such as wavelength dispersive X-ray fluorescence spectrometer, gamma ray spectrometry, scanning electron microscope, atomic absorption spectrometer, inductively couple plasma optical emission spectrometer and inductively couple plasma mass spectrometer, etc. These nuclear related analytical instruments are used to analyze not only country projects but also university research and private sectors.

6. Conclusion

Since Myanmar has ratified in 2016, CTBTO continuously supports atomic energy staffs to achieve the capacity development and to more understand about the CTBT. Also Myanmar can participate the OSI training cycle, advanced science courses, science and diplomacy symposium, NDC staff trainings and also concerning about IMS & IDC trainings. These activities improve the skills to implement the CTBT verification regime in the country. Myanmar tries to implement the CTBT verification regime step by step. Although there are lots of challenges, implementation of capacity building for CTBT verification regime will be priority area by strengthening the strategic collaboration among academia, research institutions, network of regional and international organizations and private sectors to create synergies.

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