

Policy Brief # 79

Safeguarding Regional Health, Environment and Avoiding Tension and Constraint to Neighborly Relations through Sound Nuclear Waste Management.

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¹*Safeguarding Regional Health, Environment and Avoiding Tension and Constraint to Neighborly Relations through Sound Nuclear Waste Management.

Introduction

Nuclear accidents have happened in the past. In March, 1979, an accident occurred in a PWR (nuclear reactor cooled by water under pressure) commercial nuclear reactor, at Three Miles Island, near Harrisburg, Pennsylvania, USA. The reactor core was severely damaged but there was little escape of radioactivity (Iodine & rare gases Krypton & Xenon) beyond the containment (Roberts et al 1990). The health consequences were considered minimal (Kemeny 1979). The accident in RBMK (graphite-moderated water-cooled reactor) large commercial nuclear reactor, in April, 1986, at Chernobyl, Ukraine (former USSR) was worse. The emitted overheated fragments of fuel, followed by a gas explosion shattered the top of reactor, opening its core to the atmosphere. The escape of radioactivity continued for nine days and the resulting nuclear cloud gradually spread to northern, eastern and western Europe (Roberts et al 1990; Beck 1994).

The nuclear accidents may continue to happen in future, accidentally (earth quakes; floods), leakage from nuclear plants and routine decommissioning of end of life nuclear plants, Failures of trusted safeguards/automation, miscalculations of risk quantum or needed security or due to possible nuclear plant workers' poor training, know how, inefficiency or even possible neglect. The enormous reported creditable research and data, establishes the releases of most hazardous radiations and radionuclides (like volatile Iodine-131 and Cesium-137) and the resulting, known established horrific human and environmental consequences, amounting to destruction of human life, health and environment (huge fertile land) at an unimaginable scale (UNSCEAR Report, 2019).

Nuclear reactor accident Fukushima, Japan (2011)

In March, 2011, a major nuclear reactor accident occurred at Fukushima Daiichi nuclear power station in Japan, follow up to an earthquake (9.0 magnitude), flooding the nuclear reactor/s there, also flooding the emergency generators, leaving the plant without power for the cooling systems. Finally, the reactor/s melted down with the enormous release of the flammable hydrogen gas and an explosion, with simultaneous release of volatile radioactive chemicals into the environment (Brumfiel and Fuyuno 2012). According to published reports (including UNSCEAR 2019) besides

¹ *This policy brief is based on an invited statement made at UN Human Rights Council 47th meeting (UNHRC47) parallel event: "Impacts of Nuclear Waste Water on Marine Ecology and Human health," organized by All China Environment Federation (ACEF), Beijing, July 13, 2021.

damage to food crops, water, fertile land, 100, 000 people were displaced, many of them, later on, could safely return to their homes.

Among others, the disposal of post Fukushima accident accumulated large volume of nuclear waste water (including post –accident waste cooling water), is still an issue, of concern to the Governments of Japan and those of her neighboring countries - ***Where & how?***, to avoid tension and any undesired constraints to good neighboring relations in the region.

Challenges to nuclear waste management

Regional problem, if any, needs regional response, both in terms of expression of concern and raising alarm as well as sharing diversified responsibilities, to address the remedial challenge/s. The “Quality” of Safety and Security, with regard to pre-, during- and post nuclear accidents be the entire responsibility of the concerned country, as well as that of the affected or likely to be affected neighboring community of the different coastal countries around, with all their possible cooperation and support.

In many ways, “Ocean” issues can be considered similar to “Atmosphere”, one being sea of water and the other that of air. Both are not static but dynamic vast bodies and of use, benefits, concerns, impacting lives of many people and enhancing the responsibilities of their governments, as well as industrial sector & civil society organizations, in many coastal countries. Any issue relating to sea pollution, by any contaminant/s (chemical, biological or non-/radioactive- waste), like air pollution, is a local as well as a regional issue. Like air, there are “*No Borders*” for contaminants to travel in sea, nor these needs any “*Passport or Visa*” for travelling anywhere. Therefore, decisions taken towards sea pollution control, environmental protection and safeguarding public health, must be in the “*local as well regional context*”, with transparency, stakeholder’s involvement, their collective wisdom & similar as well as diversified responsibilities.

There are certainly difficulties and challenges to face, while soughing out a collective decision, not only at regional level but also at local level, as there are two “*Decision Makers*”, entirely different in many ways, including in their means of information collection, working ways, perceptions & priorities for the same issue – (i) the “*Politicians*” and (ii) the “*Experts*” (and also the so-called Experts). Since there are always two sets of Politicians (Government & Opposition) and most unfortunately, also two sets of Experts, an *immediate urgent decision* even on environment and public health related issue of national and regional alarming concern/s, gets delayed, due to political & academic “*Shuttle Cock*” and usually resulting in the most undesired continued environmental degradation and consequently, also causing adverse health impacts on the population - local sufferings to a greater extent and comparatively, lesser extent on the regional population..

There are challenges in setting up / agreeing to health & environmental standards (including Radiation Dose, Emergency Reference Levels & others) due to different intensity of the released radioactivity/radionuclides from a nuclear plant - (i) startup & closing, (ii) during normal operation (iii) failure/ accident and (iv)post-accident.

The National environmental legislation, environmental laws or Quality/Safety standards/limits/levels of one country may not be all relevant and adequate for another country and hence could not be applied. Stringent regulations, especially for safeguarding public health, enhance cost, on times, beyond affordability and resulting in weak implementation.

There are also difficulties in long term/prolonged monitoring & data collection, due to extremely low level contaminant (released radiations & radionuclides) present in the affected environment segments (both living & non-living) and lack of facilities for the same. There could also be likely inappropriate comparative data analyses, collected by different research and other institutions/parties, in view of different equipment being employed (their varying precision limits/scale); poor inadequate instrument calibration (expansive standards/inaccessibility issues), different methodologies employed and different skill/capability of the analytical staff/analysts.

Recommendations

Only treated nuclear waste water (NWW), preferably, not above the radioactivity level of drinking water, be discharged in any environment segment (including sea) also taking into consideration the annual background (natural) radioactivity which must not be above an agreed reference level.

The NWW discharge standards/ limits should not be based on radioactivity concentration or level but rather on its total quantum present in the enormously large volume of NWW. All such standards be based on the potential risk to the “*Vulnerable Population*” (not healthy adults), including children, through consultative meeting/s of the representatives of the neighboring countries.

Such discharge of large volume of NWW could be carried out according to an agreed schedule, in as many small portions as possible, by a team, including members, invited by the host country, from 3 – 5 neighboring countries, to further enhance the much needed “*Trust*” level among the countries of the region.

Immediately after the release of the treated NWW, a carefully designed, rigorous, strong and sustainable monitoring (of all segments of environment – human, food (especially fish), crops (Priority rice), water, air, soil etc.) be started over an appropriate period of time, to ensure sustainable radioactivity level below the permissible agreed standards.

To avoid release of enormously large volume of NWW (million tons), the volume of the NWW be reduced as much as possible, by employing best environmental practices (BEP) and best environmental technologies (BET), , prior to its treatment to the desired radioactivity level limit for the final discharge. Smaller volume/weight could always be most conveniently handled, with considerable overall cost reduction.

Finally, the “*Reduction at Source*,” the time tested all time successful *preventing approach is most strongly recommended*, to minimize all forms of nuclear wastes production (including NWW). This is possible in more than one way and can also be effectively achieved through peaceful negotiation of the longstanding, old age unresolved conflicts, like Kashmir. In this regard, recently,

the Prime Minister of Pakistan emphasized, "The moment there is a settlement on Kashmir, the two neighbors would live as civilized people. We will not need to have nuclear deterrents." (Dawn 2021)

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