

Elements To Be Taken Into Account For An Appropriate Assessment Of The Effective Dose To Public In Case Of Release Of Bulk Amount Of Contaminated Water Into The Sea

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Abstract: Distribution of radionuclide's in the environment and the associated exposures to workers and the public. Environment assessment is one very important issues related to protection of environment from radionuclide's. The amount to be released which may have typical concentrations of radionuclide's of natural origin, or artificial origin may generate products or wastes that have higher concentrations of radionuclide's or give rise to exposures that should not be excluded from regulatory control. Uranium (U) and thorium (Th) and their decay chain daughter radionuclide are the radionuclide of primary interest released from nuclear installations as well as several other radionuclide's as Cs for different radioisotopes. For an appropriate assessment of dose to public and workers (occupational staff) it is necessary that following elements shall be taken into account for release of the bulk amount of contaminated water into the sea. These element will help the process of calculation the effective dose to populations. Activity concentrations, Total activity and types of radionuclide released Type of radionuclides , Types of radiations, Radio toxicity, Salt extracting, Swimming, Natural evaporations and raining etc.

Exposures and Exposure Pathways.

Distribution of radionuclide's in the environment and the associated exposures to workers and the public Environment assessment is one very important issues related to protection of environment from radionuclide's. Implementations of CLEARANCE is part of a process to determine the environment protection from the point of view of regulatory control, is intended to establish limits for which radioactive materials under regulatory control can be removed from this control. "Clearance of bulk amounts of contaminated waters, with activity concentrations lower than the clearance levels it does not need further consideration taking into account all pathways of exposure to public. The amount to be released which may have typical concentrations of radionuclide's of natural origin, or artificial origin may generate products or wastes that have higher concentrations of radionuclide's or give rise to exposures that should not be excluded from regulatory control. Sometimes also the modification of the chemical or physical form of the contaminated water or material could happen .The regulatory body should recognize that there are some exposure situations that warrant consideration and control (e.g. exposure situations in industries in which material containing radionuclide's of emergencies) Uranium (U) and thorium (Th) and their decay chain daughter radionuclide are the radionuclide of primary interest released from nuclear installations as well as several other radionuclide's as Cs for different radioisotopes. Releases of radionuclide from these facilities are primarily to air or to water. Emissions to air will result in the deposition of particle-reactive radionuclide and increased scavenging of radionuclide from the plume with distance from the source. Mobile radionuclide such as the inert gases will disperse quickly and reach background concentrations a short distance (a few km) from the source. Most of the radionuclide released are particle reactive and partition either from water to sediment or from air to soil. For an appropriate assessment of dose to public and workers (occupational staff) it is necessary that following elements shall be taken into account for release of the bulk amount of contaminated water into the sea. These element will help the process of calculation the effective dose to populations. Activity concentrations, Total activity and types

of radionuclide released Type of radionuclide ,
Types of radiations,
Radio toxicity,
Salt extracting,
Swimming,
Natural evaporations and raining,
Fish concentration and fish migrations,
Currency in the water and distributions in the water ,
Fishing process ,
Depth,
Speed of sink, etc.

In case of releasing the amount of contaminated water on the sea all those elements need to be taken into account and make clear calculation on the dose to public and workers. Only taking into account of all these pathways ore even more you could create a good idea and the risk produced form delivering of contaminated water in the sea. The risk for how long we are the zone of stochastic effect is proportional to the effective dose received by public or by workers. A conservative assessment taking into account all pathways and calculations of the dose will give us a clear idea about the protection of the pubic. And this dose shall be less than 1 mSv per annum and even more optimized to reduce further the stochastic effect. In the dose calculation the conservative approach allows , to play the worst scenario for the public contaminations. Calculations based in the worst scenarios will help the regulators to more satisfied for the dose released to public.

The calculation of individual dose from exposure to radionuclide's in contaminated water.

Exposure pathway

Direct intake of water
External dose
Inhalation contaminated air
Consumption of vegetables fish and see product grown on the contaminated
Area (because of contaminated rain from the evaporations of see water)
Consumption of drinking contaminated

water

Consumption of salt and other products

Sources of input data

The generic guideline values take into account and are adapted for the environmental conditions usual at contaminated sites waters, and are calculated to protect health and the environment at the However, unusual behavior, or other circumstances can lead to higher exposure than the calculated exposure, however, the probability of this is low.

The input data in the model include can include:

- radionuclide specific data, such as decay half-lives, partitioning coefficients,
- dose-conversion factors and transfer factors,
- exposure factors, such as consumption habits and exposure times
- model parameters, such as the dilution factor used in estimation of radionuclide transport.

References

- [1]. Albanian Legislations