IAEA Safety Standards

for protecting people and the environment

Site Evaluation for Nuclear Installations

Safety Requirements

No. NS-R-3 (Rev. 1)

IAEA
International Atomic Energy Agency

2.25. The design of the installation shall be such as to compensate for any unacceptable potential effects of the nuclear installation in the region, or otherwise the site shall be deemed unsuitable.

CRITERIA DERIVED FROM CONSIDERATIONS OF POPULATION AND EMERGENCY PLANNING

2.26. The proposed region shall be studied to evaluate the present and foreseeable future characteristics and the distribution of the population of the region. Such a study shall include an evaluation of present and future uses of land and water in the region and account shall be taken of any special characteristics that could affect the potential consequences of radioactive releases for individuals and the population as a whole.

2.27. In relation to the characteristics and distribution of the population, the combined effects of the site and the installation shall be such that:

(a) For operational states of the installation the exposure of the population remains as low as reasonably achievable and in any case is in compliance with national requirements, with account taken of international recommendations;
(b) The radiation risks to the population associated with accident conditions, including those that could warrant emergency response actions being taken, are acceptably low.

2.28. If, after thorough evaluation, it is shown that no appropriate measures can be developed to meet the above mentioned requirements, the site shall be deemed unsuitable for the location of a nuclear installation of the type proposed.

2.29. The external zone for a proposed site shall be established with account taken of the potential for radiological consequences for people and the feasibility of implementing emergency plans, and of any external events or phenomena that might hinder their implementation. Before construction of the nuclear installation is started, it shall be confirmed that there will be no insurmountable difficulties in establishing an emergency plan for the external zone before the start of operation of the installation.

4.5. A programme of investigation and measurement of the surface hydrology shall be carried out to determine to the extent necessary the dilution and dispersion characteristics for water bodies, the reconcentration ability of sediments and biota, transfer mechanisms of radionuclides in the hydrosphere and exposure pathways.

4.6. An assessment of the potential impact of the contamination of surface water on the population shall be performed by using the collected data and information in a suitable model.

DISPERSION OF RADIOACTIVE MATERIAL THROUGH GROUNDWATER

4.7. A description of the groundwater hydrology of the region shall be developed, including descriptions of the main characteristics of the water bearing formations and their interaction with surface waters, and data on the uses of groundwater in the region.

4.8. A programme of hydrogeological investigations shall be carried out to permit the assessment of radionuclide movement in hydrogeological units. This programme shall include investigations of the migration and retention characteristics of the soils, the dilution and dispersion characteristics of the aquifers, and the physical and physicochemical properties of underground materials, mainly in relation to transfer mechanisms of radionuclides in groundwater and their exposure pathways.

4.9. An assessment of the potential impact of the contamination of groundwater on the population shall be performed by using the data and information collected in a suitable model.

POPULATION DISTRIBUTION

4.10. The distribution of the population within the region shall be determined.

4.11. In particular, information on existing and projected population distributions in the region, including resident populations and to the extent possible transient populations, shall be collected and kept up to date over the lifetime of the nuclear installation. The radius within which data are to be collected shall be chosen on the basis of national practices, with account taken of special situations. Special

attention shall be paid to the population living in the immediate vicinity of the installation, to densely populated areas and population centres in the region, and to residential institutions such as schools, hospitals and prisons.

4.12. The most recent census data for the region, or information obtained by extrapolation of the most recent census data, shall be used in obtaining the population distribution. In the absence of reliable data, a special study shall be carried out.

4.13. The data shall be analysed to give the population distribution in terms of the direction and distance from the nuclear installation. An evaluation shall be performed of the potential radiological impacts of discharges and accidental releases of radioactive material, including reasonable consideration of releases due to severe accidents, with the use of site specific parameters as appropriate.

USES OF LAND AND WATER IN THE REGION

4.14. The uses of land and water shall be characterized in order to assess the potential effects of the nuclear installation in the region and in particular for the purposes of preparing emergency plans. The investigation shall cover land and water bodies that may be used by the population or that could serve as a habitat for organisms in the food chain.

AMBIENT RADIOACTIVITY

4.15. Before commissioning of the nuclear installation the ambient radioactivity of the atmosphere, hydrosphere, lithosphere and biota in the region shall be assessed so as to be able to determine the effects of the nuclear installation. The data thus obtained are intended for use as baseline data in future investigations.

5. MONITORING OF HAZARDS

5.1. The characteristics of natural hazards and human induced hazards as well as the demographic, meteorological and hydrological conditions of relevance to the nuclear installation shall be monitored over the lifetime of the nuclear installation. This monitoring shall be commenced no later than the start of construction and