

Site Monitoring of LILRW Repository: Korean Case

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1. Introduction

Radioactive waste repository has to be isolated and taken cared of directly or indirectly until the level of the radioactivity of the waste kept in the repository goes down to as the nature. It could be hundreds years, or millions years depends on the nature of the materials in the repository. Therefore, the repository needs to be monitored until such time of periods. It is called site monitoring. This study introduces a brief summary of the regulatory rules and practices applied to the Korean low-and-intermediate level of radioactive waste (LILRW) repository and the case of Gyung-ju site.

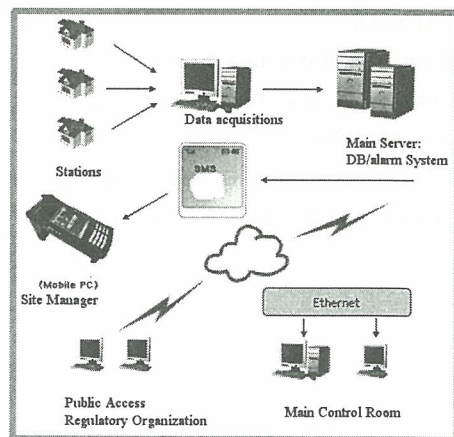
2. Main

There are mainly three purposes of the site monitoring of the LILRW repository:

- 1) Confirmation of site models & design input data been built up during the site characterization stage before the construction and operation permit,
- 2) Early detection and warning at any abnormal signals or any unexpected leakages of radioactive materials or accidents; and
- 3) Build-up of site-specific baseline data useful for long-term predictions on changes in site stability condition, diffusion rate, stress-field etc.

The regulatory rule for the site monitoring in Korea requires the utility to describe specific plans for pre-operational, operational and post-closure site monitoring in the site characterization report (SCR). Items for the monitoring are hydrology (surface water, groundwater and seawater), geochemistry, meteorology, seismicity, faulting, geo-engineering (stability of slopes, tunnels and silos), site boundary surveillance, population, human activities. Sampling locations for the site monitoring are mainly within the site except some surface water samples situated around the site, consisting of surface water (3 within the site and 15 outside), groundwater (6), seawater (2), meteorology (2), seismicity (2), faulting (planning), tunnel/silo stability (depends on the tunnel condition during construction), site boundary surveillance, population, and human activities. Intervals of data acquisition are variable depending on the items, for example, constant monitoring for meteorology, seismicity, faulting, water level, water conductivity, site boundary surveillance, tunnel/silo stability (during operation); daily to weekly for the tunnel/silo stability during construction; and seasonal for the hydro-chemistry and geo-chemistry.

The utility has to submit two site monitoring reports each year, in September for the first half of the year and March for the next half. Most of the activities involved in the site monitoring should be assured by the quality control and the same as for the data sampled and analyzed. In addition, the utility has been developing a computer based operating system called 'site monitoring DB & alarm system' for the Gyung-ju site. The public should get access to concurrent data from the site monitoring of the Gyung-ju repository site as soon as it gets into the operation.



Conceptual diagram showing data transmission, DB & alert system (KHNP, 2008)

3. Concluding remarks

The site monitoring will be on until the end of the period of institutional control. Institutional control involves activities to prove that the engineering/natural barriers stay in functional as originally designed for, such as site monitoring, access control, maintenance, recording, etc. The period shall be designed to meet the Performance Objectives as well.

Further Readings

- [1] KINS/GE-W001, 2005, Safety Review Guide (SRG) for LILWR. 2.3 "Plans for monitoring and examination of the site"
- [2] MEST Notice 2008-53 "Standard format and contents of site characteristics report for low and intermediate level radioactive waste repository"
- [3] MEST Notice 2008-56 "Siting criteria for low and intermediated level radioactive waste repository"
- [4] MEST Notice 2008-57 "Technical requirements for the operation and control of low and intermediate level radioactive waste disposal facility."
- [5] KHNP 2008 "Safety Analysis Report prepared for the Gyung-ju LILRW repository. Chapter 2.3 "Plans for monitoring and examination of the site".