

2-6 Study Plan for Performance Assessment of High-Level Radioactive Waste Geological Disposal (5-year Plan)

— For Development of Technical Basis for System Performance Assessment in Implementation Phase —

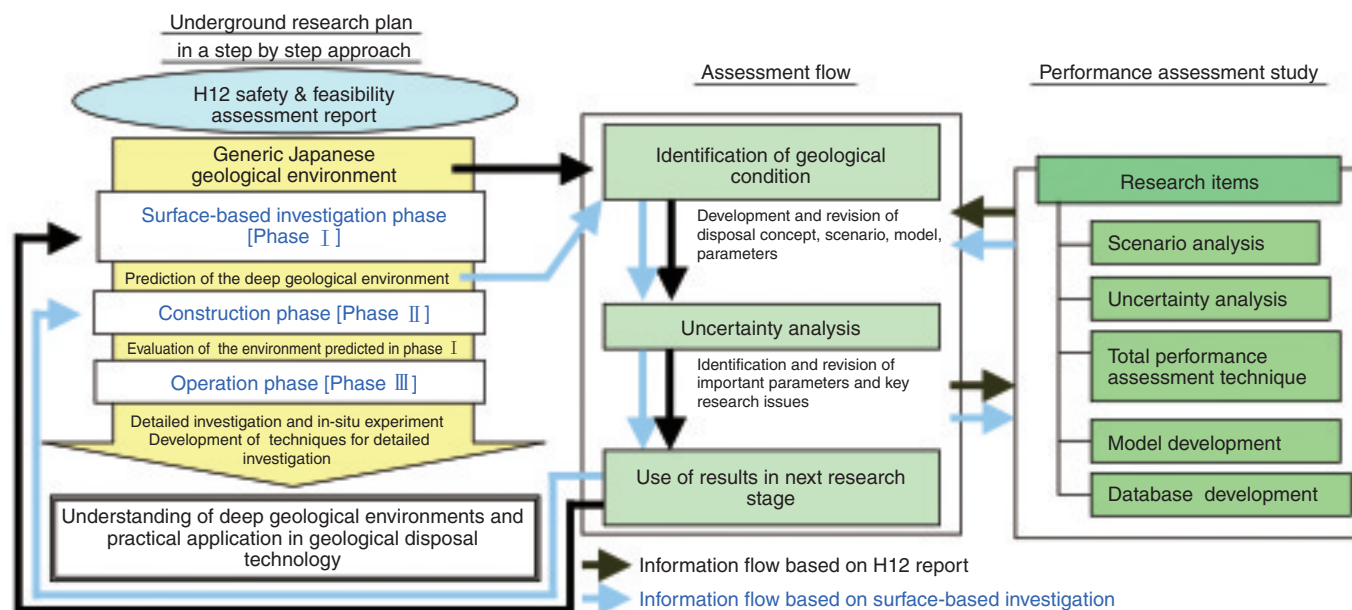


Fig.2-11 Research items of performance assessment study for HLW disposal and procedure of performance assessment in current stage

This study plan is to outline a 5-year plan of research and development (R&D) for performance assessment of geological disposal of high-level radioactive waste (HLW) in JAEA.

This 5-year plan is based on JAEA's mid-term plan which follows the R&D policy specified in "Framework for Nuclear Energy Policy" issued by the Japan Atomic Energy Commission. Moreover, research plans for safety regulation issued by the Nuclear Safety Commission of Japan should be taken into account. The contents of this 5-year plan follows a framework of R&D issues in performance assessment established in "the R&D map", i.e. the mid and long term R&D plan for geological disposal of HLW, developed by JNC and other relevant R&D organizations.

Objectives chosen according to their necessity and the significance in each research plan are clarified in the section "Objectives and the past progress", also summarizing the progress of the H12 Project in establishing the scientific and technical basis for HLW disposal in Japan (H12 report), and of H17 in development and management of a technical knowledge base for the geological disposal of HLW (H17 report). In addition, the next five year plan is described in the section "5-year plan (up to Fiscal 2010)".

The objectives of the performance assessment study are to provide examples of integrated methodologies for safety assessment and also provide as much know-how as possible, for forming a knowledge base that will reinforce the technical

basis upon which implementation and safety regulations of disposal will be based.

The performance assessment study shall develop and test the approaches, tools and databases required to carry out such work for specific sites in the future. Demonstration of applicability up to now has been limited to examination of a few components of the safety assessment model chain. More extensive effort will be invested in further developing the methodology, models and databases used to quantify the long-term safety of a repository on a site-specific basis. Methodology development includes detailed examination of the significance of uncertainties associated with volcanic perturbation and with the representations and parameters used to quantify radionuclide transport in the far-field. Model development shall be focused on improving the capability of codes to reproduce the results of laboratories (e.g. ENTRY), and on field tests which attempt to simulate the behaviour of particular engineered and natural barrier systems as realistically as possible. Database effort will concentrate on the compilation and evaluation of element-specific data (e.g. fundamental thermodynamic, empirical sorption data) which can be used to determine the parameters that can quantify radionuclide release and transport (e.g. solubilities, system-specific Kds) in safety assessments. This last effort, in particular, utilizes data produced in QUALITY, which are integrated with partner databases of projects coordinated by the NEA.

Reference

Miyahara, K. et al., Study Plan for Performance Assessment of HLW Geological Disposal (5-year Plan), 2006, JAEA-Review 2006-015, 29p.