

## Integration of Database, Assessment and Monitoring sub-modules for SITES

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### 1. Introduction

During the last three years, three sub-modules of Site Information and Total Environmental data management System (SITES) have been developed. The SITES is an integrated program for overall data analysis, environmental monitoring, and safety analysis that are produced from the characteristic investigation and environmental assessment of relevant nuclear facility. The SITES is composed of two main modules as SITES Database Module (SDM) and Monitoring & Assessment (M&A). The M&A module is subdivided into two sub-modules called Safety Assessment System (SAS) and Site Environmental Monitoring System (SEMS) (as Fig.1). This paper is to introduce the design concept of the integration of SITES database, SAS, and SEMS for SITES. The description of each sub-module is also given below.

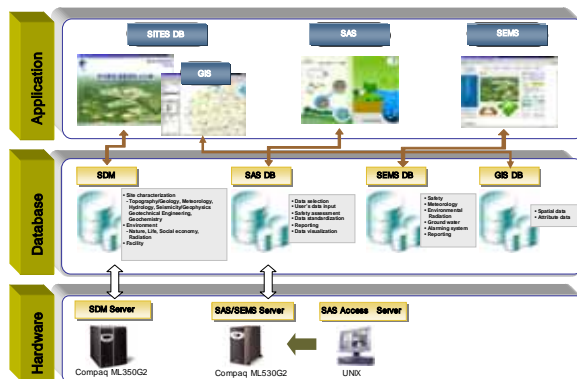


Fig.1 Systematic diagram of SITES Composition (after Park 2004)

### 2. The functions of the SITES and its sub-modules

#### 2.1. Development of the SITES Database (SDM)

In general, for the safe management of radioactive waste repository, the information of site and environment has to be collected and managed systematically from the initial stage of site survey. The SDM manages its data from the site characterization composedly of topography, geology, hydrogeology, engineering geology, etc. Especially, this database system was linked to GIS for realization of the site spatial information.

#### 2.2. Development of the SAS

The SAS module was purposed of the program development for the application and analysis of data from SDM and for the systematic management of the resulted data from the safety assessment (as Fig.2). To develop the control program of safety assessment, all assessment codes were analyzed in their functions. Those safety assessment codes were the AquiferTest, MiniTab, Sufer/Grapher, MODFLOW, GEN II, NAMMU, NAPSAC, MASCOT/MOP, AMBER, HELP, DUST-MS, GWSCREEN, RESRAD, and SAGE.

SAS is operated in Windows environment, but safety assessment codes are operated under the various operating systems (DOS, Windows, and UNIX). For example, the safety assessment codes for rock-cavern type disposal (NAMMU/NAM-DATA, NAPSAC, and MASCOT/ MOP) run under UNIX system. Therefore, TCP/IP protocol and Telnet were used in order to communicate between the data from these systems operated under the different operational environment.

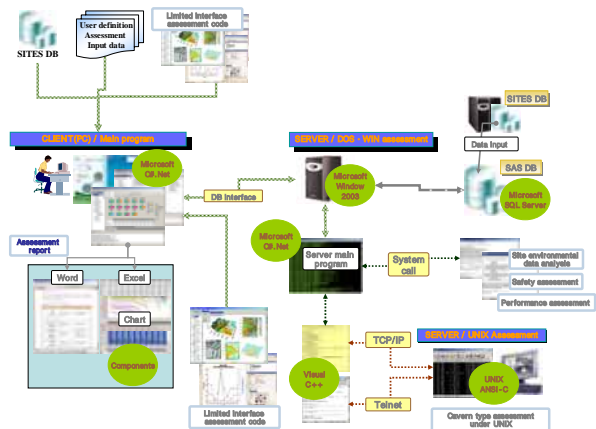


Fig.2. Assessment Procedure in the SAS (after Park 2005)

#### 2.3. Development of the SEMS

SEMS was developed for environmental monitoring of the radioactive waste repository. That is composed of five sub-modules such as data collection module, real time environmental monitoring module, assessment and alarming module, data processing module, and data processing module for verification facility of artificial barrier(as Fig.3).

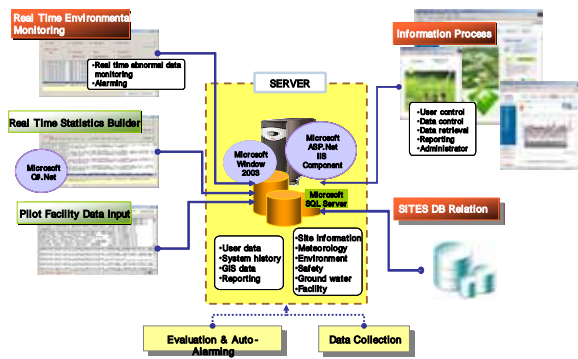


Fig.3 Schematic diagram of the SEMS

### 3. Design Concept of Integration of SITES sub-modules

The integration of the SITES sub-modules is outstandingly differentiated performance from the development of the relevant sub-modules. SITES sub-modules such as SDM, SAS, and SEMS are performing independently in their functions due to its own faculty.

SDM and SAS were developed with Microsoft C#.Net Framework in the Client/Server environment, whereas SEMS was done Microsoft ASP.Net Framework in the Web-based. The development of integrated system of SITES will be based on Client/Server environment. The SDM and SAS will be integrated into one application circumstance, but SEMS is designed as using system selection button in the integrated SITES window through Internet Web Browser. For the users' convenience, the integrated system can be logged on by SSO (Single Sign On: Single time log on can be logged on all system in SITES window) and installed one time setup process.

The system for offering input data from SITES DB to SAS assessment codes had to be developed last year as the first step before site. The second step is to compare SAS assessment result with monitored real data from SEMS, which will be performed this year. With this integration of application, mutual system data link will be performed

SDM will be used from the initial stage of site survey for radioactive waste repository. During this period, collected site data in the SDM can be used as safety assessment input data to the SAS. After assessment using SAS, the result can be compared with those of SEMS environmental monitoring data.

### 4. Conclusion

SDM is developed for data management of site investigation from the initial step. SAS is for safety assessment of the site. And SEMS is for the monitoring of the site environment. These sub-modules are to be combined with application integration. As a result of the integration, SITES will become more useful site

environment data management system. During the last three years, the independent sub-modules for SITES were developed. This fourth year, the development of SITES will be more enhanced and completed by integrating SITES sub-modules.

### ACKNOWLEDGMENTS

This project has been carried out under the National Research Laboratory (NRL) Program supported by Ministry of Science and Technology (MOST), Korea.

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