Requirement of Conceptual Design for Decommissioning Information Integration Management System

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1. Introduction

Korea Atomic Energy Research Institute is the sole expert group that has nuclear decommissioning experiences. KAERI is developing a computer code to converge all data collected from KRR-1 & 2 and UCP (Uranium Conversion Plant) decommissioning. To date, many applications related to decommissioning of nuclear facilities are developed, but they do not provide integrated disassembly information management and regeneration environment as they are developed in forms of independent database and application. In addition, various development languages and database are used, which cause problems in system improvement and maintenance.

Therefore, in order to develop "Decommissioning Information Integration management System (DIIMS) of nuclear facilities", a conceptual design is performed with aim of increasing the efficiency of work.

2. Outline of System

Basic design results of system are documented to develop the IIMS for nuclear facilities.

2.1 Development Environment

Table 1. Development environment and specification

Classification		Contents
OS	Server	Windows Server 2012 R2
	Client	Higher than Microsoft Windows 7
Platform	DBMS	RDBMS
	Development Language	C#, WPF

2.2 System Requirement Management

2.2.1 Waste Management Procedures. The data obtained from decommissioning is mostly about waste management. This is an important clue to determine the data input system. All the solid waste generated from decommissioning is regarded as radioactive waste. And the data can be input according to the procedure.

2.2.2 Data Input. Data which is generated from decommissioning site should be input as much and as quickly. The most important thing is to minimize the input errors. In order to solve this problem, it made the input method a code.

2.2.3 Facilities Characterization. It is important to investigate and survey the facilities to decommissioned for establishment of decommissioning plan. The result of the characterization survey of the nuclear facilities is utilized to predict the amount of waste and estimate the cost of decommissioning project.

2.2.4 Decommissioning Work Unit Productivity Yield. The decommissioning work unit productivity yield derives the items which has the lowest level generated from the decommissioning activity and the productivity yield values which the items have. These values are used as data in the decommissioning plan establishment.

2.2.5 Code Management System. It can polysynthetically manage code used in the decommissioning information management system for nuclear facilities.

2.2.6 Decommissioning Process Management. This task consists of 11 steps.

2.2.7 Decommissioning Information Interface.
- Design, equipment/material supplier, decommissioning

work, evaluation process and post-decommissioning operation organization must be able to operate the system applicable to standard identification system.
- The data submitted from the facility design/operator should be able to be identified by all project participants such as the decommissioning company, supplier and worker

2.2.8 Requirement Management. Flexible requirement management system should be constructed through standard requirement management model.
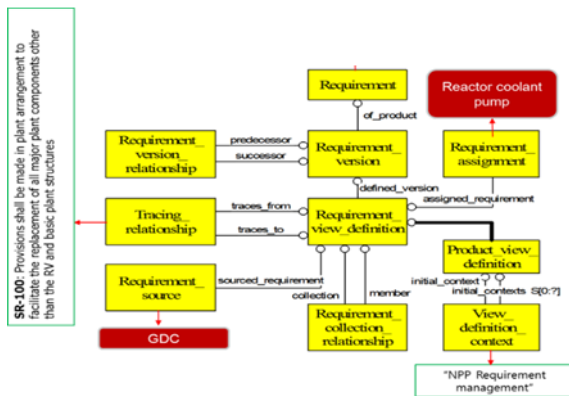

Fig. 1. Requirement management model.

2.2.9 Configuration Management System. Configuration Management system should be constructed for standard management about configuration decommissioning information in DIIMS.
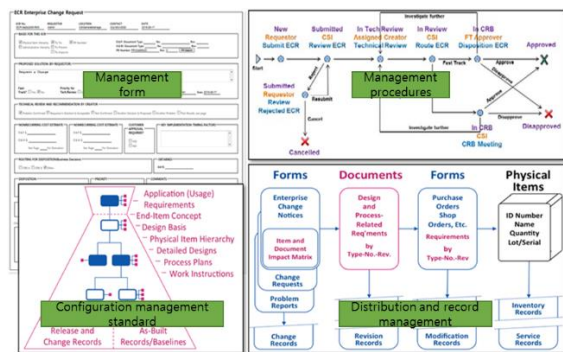

Fig. 2. Example of configuration management system.

2.2.10 System Structure.
- Server/Client and dispersion database environment should be supported.
- Big data should be managed.
- Integrated system functions should be provided by API(Application Programming Interface).
- Multiple databases (correspondence DB, technical

document DB, SSAR reference DB, etc.) should be reduced in complexity by eliminating redundancy with existing processes.

2.2.11 User Interface.
- Interfaces regarding various users should realize.
- Report should be able to produce by extracting data required for the work.
- Decommissioning information should be able to search through simple/advanced search.

3. Conclusion

Many application programs related to decommissioning for nuclear facilities are developed so far. However, it is difficult to offer integrated decommissioning information management and inquiry environment as current programs have independent database and is form of application program system. In addition, there are problems in management and improvement of system due to the various development language and database.

This study develops a conceptual design of DIIMS for nuclear facilities. DIIMS provides a standardized information management environment and engineering software to support the decommissioning engineering work.

In the future, DIIMS would be developed based on the results of this study and it will provide the foundation for standard database management, decommissioning information management environment, and construct continuously expandable decommissioning engineering solution.