Change Management Process in PMIS for Small Modular Reactor

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1. Introduction

While developing a small modular reactor, a project management information system (PMIS) was developed. For this PMIS, a high-level document management system (DMS)was implemented based on the experience accumulated while developing the DMS for three research reactors. It was decided to add a configuration management system to this PMIS. In the configuration management of this project, only the change management part was designed first. This paper describes the change management process developed within the PMIS in operation.

2. Advantages of small modular reactor PMIS

The advantages of developing a small modular reactor PMIS following the research reactor are as follows. First, a work process and DB design based on accurate understanding through long-term collaboration were implemented. Second, by using the standard platform, development and maintenance as well as scalability were secured, and processing speed, throughput, and response speed were greatly improved. Third, the source of unauthorized persons was blocked through ID, password, and IP check. In addition, security measures were established through the establishment of a single server and a document security solution (DRM). Lastly, user opinions were continuously collected. As a result, a user-oriented User Interface/User Experience system was implemented [1].

3. Change management

The purpose of configuration management for nuclear facilities is to verify that the construction, operation, maintenance and testing of the physical facility conforms to the requirements specified in the design documentation. Configuration management generally includes change management, requirements management, information management, and interface management. In the nuclear industry, change management was emphasized in order to maintain consistency with design requirements, physical shape, and configuration information from a safety point of view. Although change management is widely applied from the planning stage to the entire life cycle of a project, the importance of change management is emphasized especially in the operation stage. The recent trend is tracking management and baseline management for change management.

Common change management technology features include:

1) Maintaining the consistency of the three elements such as design requirements, physical shape, and facility shape confirmation
2) Analysis and documentation of planned changes
3) Process changes according to safety, regulation, and economics
4) Engineering analysis such as probabilistic safety assessment (PSA) and probabilistic risk assessment (PRA)
5) Linking and controlling cost and schedule
6) Traceability, etc. [2].

However, 4) and 5) cannot considered at this stage due to project circumstances, but will be considered in the next stage.

4. Change management procedure

As shown in Figure 1, the change management procedure in the PMIS consists of four major parts: configuration change review request, configuration change request review and confirmation, configuration change approval by the configuration control committee (CCC), and configuration change notification and follow-up actions.

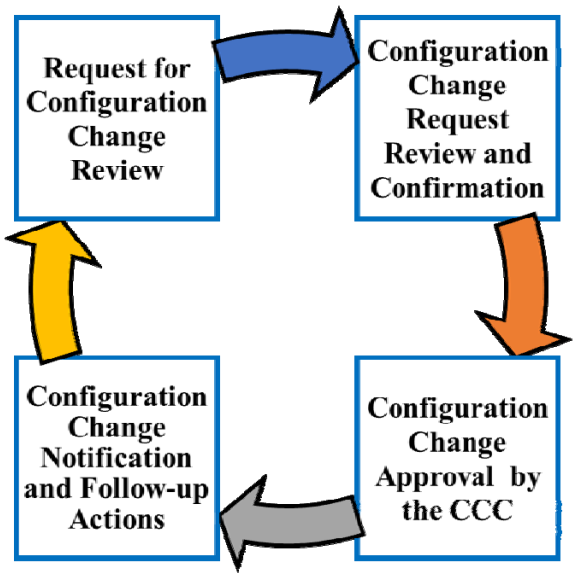

Fig. 1 Change Management Work Procedure

4.1. Request for configuration change review

In case of configuration change, if the target of configuration management is SSCs (Structures, Systems, Components), a 'configuration change review request (CCRR)' should be prepared. The engineer of preparation department prepares the CCRR and gets approval.

4.2. Configuration change request review and confirmation

The approved CCRR is distributed to reviewers according to the work flow implemented in the PMIS. Configuration changes that significantly affect the safety, cost, and schedule of the reactor require review and approval by the configuration control committee (CCC). Review group send their opinions on configuration change to the CCC [3]. Changes management will be managed by a risk management engineer and will be reviewed qualitatively through probabilistic risk assessment (PRA). The design change will ensure safety and eliminate risk to the reactor and plant.

4.3. Approval of configuration change by configuration control committee (CCC)

The CCC is held according to the configuration change review received in PMIS. The chairperson convenes the committee to review the configuration change case. According to the review result of the committee, the result of approval or rejection of the configuration change is notified to the relevant group. The detailed work of the committee will be defined later.

4.4. Approved configuration change notification and follow-up actions

When the change request is approved, the configuration change is automatically notified in the PMIS to the relevant group. The person who prepares the configuration change request revises the design document and design drawing approved for the configuration change. The group affected by the configuration change performs an impact assessment on the known design change, and the results are registered in the PMIS [4].

5. Conclusions

The PMIS with understanding, scalability, security, and convenience has been developed and is being operated stably. After that, it was decided to develop the configuration management function, and the development started through collecting related information, visiting related companies, meeting, and preparing document. Currently, the development service has become a contract, and a use case specification has been prepared. Now the process procedures are being written. Based on these things, a rudimentary configuration management, especially a change management system, is being implemented. After that, we intend to implemented a high-level configuration management system by accommodating the continuous demands of users.

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