A Configuration Management System Developed in the Early-Stage of SMR Project

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1. Introduction

The configuration management system was implemented on the basis of the stable document management system of the small modular reactor project currently being performed. To reduce the cost and risk of errors, configuration management is implemented to maintain a balance between design requirements, physical configuration, and facility configuration information [1]. First of all, a change management system was developed and implemented for configuration management. Currently, test scenarios are prepared and evaluated, and training is conducted to users through briefing sessions.

2. System development

A configuration change review procedure was established due to the development of a system mainly aimed at change management [2]. Eventually, as shown in Figure 1, it was implemented as a classification system management, configuration control committee management, configuration control committee operation, follow-up measures, current status, and tracking management.

In the preparation of the configuration change review sheet, it consisted of preparation, distribution approval, designation of reviewers, review, collection of review opinions, and preparation of resolution results. In the operation of the configuration control committee, it was conducted by designating review members, reviewing members, collecting opinions, and approving them. After the approval of the configuration control committee, the change notice and follow-up measures were made.

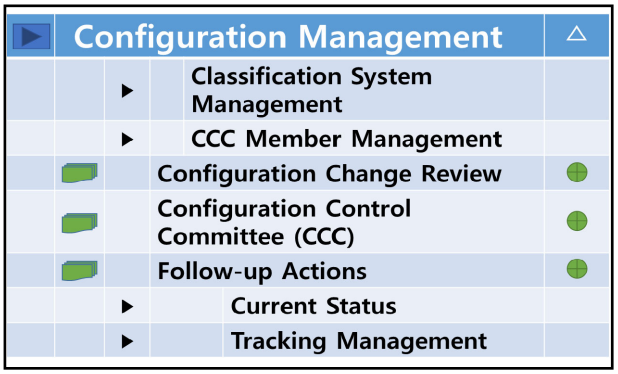

Fig. 1 Step for Configuration Management

In the current status, the management number, registration date, author, design document number, revision number, title, document attachment, safety grade, etc., the subject of review for configuration change, and the committee's convocation are displayed in the inquiry list. The tracking management is divided into two screens, one is a lookup list and the other is linked in the form of a flowchart, so that the association can be known.

3. Requirement management, information management, and interface management

The requirement management was satisfied with simple management of the top-level requirements and design criteria, code and standard requirements, economic impact, probabilistic risk assessment and probabilistic safety assessment, owner requirements, and design requirements documents in classification system management. Considering the budget and work efficiency, it was designed not to track the words and sentences of the design document.

The purpose of information management is to identify and manage Facility Configuration Information (FCI) related to physical configuration and design requirements. They are, identification, categorization, storage, control and tracking, retrieval, minimization, and operational configuration information status management and etc. [1].

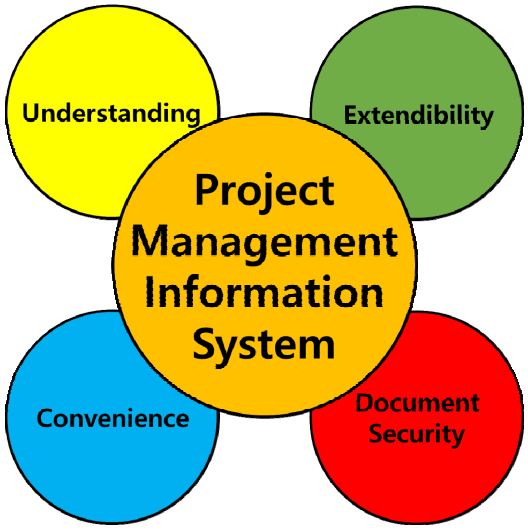

Fig. 2 Information Management

The developed SMR document management system (PMIS) has the following advantages. First, work processes and DB designs based on accurate understanding through long-term collaboration are implemented. Second, the use of the e-government standard platform ensures development, maintenance, and extendibility, which greatly improves the processing speed and response speed. Third, a security system is established through various checks, single server construction, and security solutions. Finally, a user-centered system that continuously collects user opinions is implemented [3]. It is judged that the information management required through this document management system as shown in Figure 2 was done.

Interface management is implemented as user management, user authority management, organizational management, organizational member management, entrusted agency management, and common code management for them [4].

4. Functional testing and user requirements

4.1. Functional testing

The functional test tested the entire configuration management system from the classification system management of configuration management in document management container according to the user test scenario as shown in Figure 3, to the status of configuration change reviews in document storage [5].

SYSTEM NAME	CONFIGURATION MANAGEMENT	PROGRAM ID	TB6CGM006	PROGRAM NAME	RESOLUTION RESULTS
DESIGN	S.K.LEE	DEVELOPMENT	H.J.YU	TEST	K.N.PARK
MENU PATH	Document management> Configuration management> Configuration change review> Prepare resolution results			PROGRAM TYPE	SCREEN
SCENARIO OVERVIEW	Prepare resolution results for the reviewed document. Progress in preparing resolution results for distribution + review requirements combination.				
SCENARIO FLOW	1. Look up target document 2. Prepare resolution results 3. Further review proceeding based on whether to review				
TEST CASE (FUNCTION)					
NO.	CASE ID	CASE NAME	TEST CASE	ANTECEDDENT	EXPECTED RESULT	TEST RESULT (Pass, Fail, NA)
1	UTS-008-001	Inquiry	Resolution results preparation object document inquiry	UTS-007-002 Sending comments	Resolution result preparation target document list output	Pass
2	UTS-008-002	Prepare resolution results	Save resolution results (Correction) · Further review proceeding based on whether to review		Save resolution results (Correction)	Pass
3	UTS-008-003	Detailed inquiry	Inquire details -Content output of previous review order		Output details	Pass
4	UTS-008-004	Download Excel	Download Excel in the query list		Download Excel file	Pass

Fig. 3 Test according to Test Scenario

4.2. User requirements

After a user and manager briefing session, the actual user tests were implemented for about three months, the appropriate requirements were collected and revised accordingly.

5. Conclusions

In the configuration management system, change management was implemented by classification system management, configuration control committee member management, configuration change review document preparation, configuration control committee operation, follow-up measures, current status and tracking management. Since requirement management and information management are implemented within a stable document management system, understanding, extendibility, document security and convenience have been achieved. Interface management was also naturally performed in user management, organizational management, and related company management while developing a document management system. It is expected that the more appropriate configuration management system will be achieved once collecting users' requirements.

REFERENCES

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