

The Study on the Considering Cross-Cutting Issues in the Korean Regulatory Inspection Framework

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1. Introduction

In the previous paper[1], it was emphasized that the cross-cutting issues(CCI) are key components in risk-informed and performance-based regulatory inspection process which is named as ROP (Reactor Oversight Process) in the USNRC. Three cross-cutting areas (human performance, safety conscious work environment, problem identification and resolution) may implicitly affect all of the safety cornerstones. In this paper, inspection practices of CCIs in the USNRC have been reviewed and some ideas for implementing CCIs in Korean regulatory inspection system have been proposed.

2. The Review of CCI in USNRC Regulatory Inspection Framework

The CCIs are considered in following inspection programs of USNRC ;

- Baseline Inspection
- PI&R (Problem Identification and Resolution) Inspection
- Supplemental Inspection

2.1 Baseline Inspection Program

The root cause analyses for inspection findings are conducted using the CCI components presented in Table 1 in the baseline inspection program. USNRC inspector should identify possible CCI aspects associated with an inspection finding in inspection report.

Table 1. Cross-Cutting Areas and Components of USNRC

Cross-Cutting Areas		Cross-Cutting Components
Cross Cutting Area	Problem Identification and Resolution	-CAP -Self and Independent Assessments -Operational Experience
	Human Performance	-Decision Making -Resources -Work Control -Work Practices
	Safety Conscious Work Environment	-Environment for Raise Concerns -Preventing, Detecting and Mitigating Perceptions of Retaliation
Other Safety Culture Components		-Accountability -Continuous Learning Environment -Organizational Change Management -Safety Policies

For example, if the inspection finding is identified for risk management inadequacies of the switchyard

maintenance activities of a licensee, NRC inspector is supposed to write associated CCI cause in the inspection report as follows ;

“The cause of this inspection finding has crosscutting aspects associated with work control of the human performance area in that the licensee did not appropriately coordinate switchyard activities incorporating risk insights... “

2.2 PI&R Inspection Program

PI&R program of licensee is voluntary process for detecting and correcting problems. Because one of the fundamental goals of ROP is to establish confidence that each licensee is detecting and correcting problems effectively, this program considered as important in the USNRC. The regulatory inspection for the PI&R program is conducted using IP 71152[2] biennially.

2.3 Supplemental Inspection Program

The graded inspection approach is being applied for the inspection of CCIs in USNRC by using IP 95001[3], 95002[4] and 95003[5] as presented in Figure 2. These procedures have been revised recently to address safety culture consideration. For example, the NRC can impose a licensee to perform an independent assessment of their safety culture when the NRC identified, through the conduct of supplemental inspection procedure, that one or more components of safety culture caused the risk significant performance issues (degraded response column). Furthermore, the NRC should conduct independent safety culture assessment for licensee in unacceptable performance column.

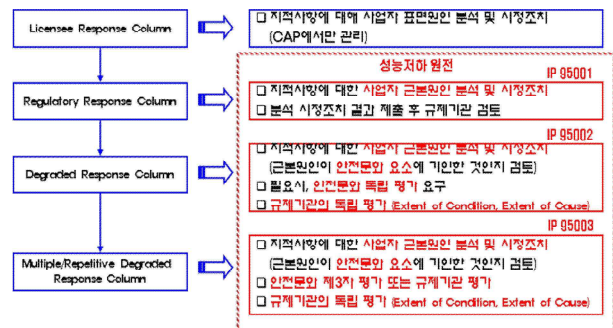


Figure 2. Graded Approach for CCI Assessment in USNRC

3. The Ideas of Implementing CCIs in Korean Regulatory Framework

The cross-cutting aspects are not considered in current nuclear regulatory system in Korea. However, the following attributes of licensee management system are evaluated in periodic NPP inspection process [6].

- Operating Organization and Employee's Qualification
- Education and Training
- Emergency Operation Procedure
- Operational Experience Feedback
- Human Factor Management

These inspection items are very similar to CCI components, while the other CCI components are not included. For example, root cause analysis and safety culture are not considered as formal inspection items. Moreover, considering the risk-informed and performance-based inspection approach which may be implemented in the future, the inspection framework for CCI needs to be developed.

In this regard, the idea of for improving regulatory inspection system including CCI implementation has been proposed in this study as presented in Figure 3 and 4.

Figure 3 presents the proposed idea for improving the relevant regulatory inspection areas considering the CCIs. The regulatory inspection for licensee's root cause analysis and licensee's safety culture assessment may need to be included in formal regulatory process in the future. On the other hand, inspection of all attributes in licensee management system in every refueling outage may not be needed. The graded inspection approach will be needed in the regulatory inspection of licensee management system.

Figure 4 presents the proposed idea for CCI implementation scheme. In this regard, five draft inspection guidelines have been developed in this study, which are ;

- CCI cause classification guideline for inspection findings
- Inspection guideline of human performance
- Inspection guideline of root cause analysis and corrective action
- Inspection guideline of graded corrective action for inspection findings
- Inspection guideline of safety culture

Detailed descriptions on the proposed ideas are documented in reference [7].

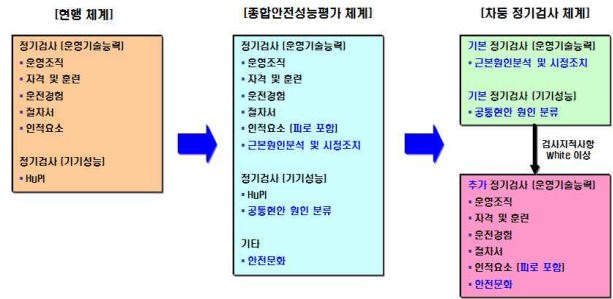


Figure 3. Suggestion for Improving the Relevant Regulatory Inspection Areas for CCI Implementation

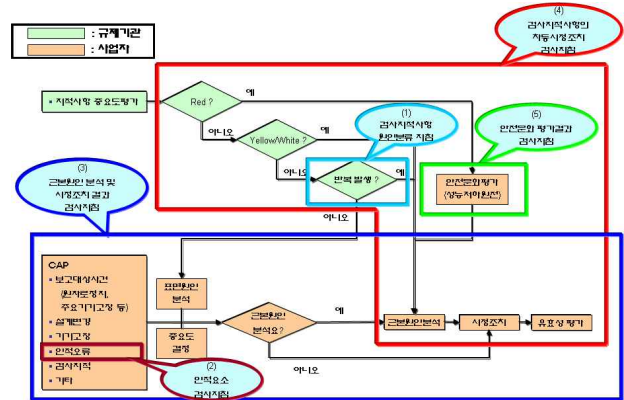


Figure 4. Proposed Idea for CCI Implementation Scheme

4. Conclusion

In this paper, the review of inspection practices for CCIs in US has been performed, and several insights are derived for implementing of CCI in Korea. Moreover, the framework for CCIs in Korean regulatory inspection system has been suggested. The graded approach for the inspection of cross-cutting issues needs to be developed in Korean regulatory inspection system.

REFERENCES

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