

Quality Assurance of Head-end Process of PYRO

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1. Introduction

In Research & Development (R & D), quality assurance is defined by all planned and systematic activities to obtain reproducible and reliable data with reduced uncertainty. Thus, the quality assurance in research activities is necessary to achieve reliability of experimental data. Especially, ensuring the stability of spent fuel is important because a PYRO process deals with highly radioactive materials inside the spent fuel. Therefore application of the R&D quality assurance is necessary and important to ascertain the reliability of the data in PYRO process from lab-scale research and development step.

In this study, the quality assurance requirements for nuclear facility application were reviewed for the head-end process of PYRO, and project quality assurance plan was established. The quality assurance was applied to input process into the hot-cell using mock-up facility.

2. Project Quality Assurance Plan

There are four important factors in quality assurance in field of R&D activities; quality assurance of experimental methods, quality assurance of equipments, quality assurance of materials, and quality assurance of experimental testers. To meet these factors, 18 items of the quality assurance general requirements for nuclear facility application

are listed up. [1] To apply quality assurance to R&D activities, it is necessary to review these 18 items and to select the items if necessary. Then the researchers have to fill in the project quality assurance plan and check the selected items. Fig. 1 shows the form of project quality assurance plan and the 18 items of quality assurance requirements. [2]

Fig. 1. Form of Project Quality Assurance Plan.

3. Apply Quality Assurance to the Head-end Process

We applied quality assurance to input process of equipment into the hot-cell of head-end process project. We reviewed 18 items and selected several items to perform in head-end process project: 1. Organization, 2. Quality Assurance Program 5. Instructions, Procedures, and Drawings, 11. Test Control, 12. Control of Measuring and Test Equipment, 16. Corrective Action, 17. Quality Assurance Records, 18. Audits. We established project quality assurance plan and checked the items

selected to execute. Fig. 1 also shows the established project quality assurance plan and selected items to execute. [3] We also established the operating procedures and test checklists as shown in Fig 2 and 3 respectively. [4]

ACKNOWLEDGEMENT

This work was supported by the Korea Institute of Energy Technology Evaluation and Planning (KETEP) granted financial resource from the Ministry of Trade.

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Fig. 2. Operating Procedure on the input process of compactor into the DFDF using mock-up facility.

Fig. 3. Test Checklist.

4. Conclusion

To apply quality assurance to R&D activities, we reviewed the 18 items of quality assurance requirements and selected the items needed. Then we filled in the project quality assurance plan and checked the selected items. We also established the corresponding operating procedures and test checklists. These quality assurance activities for PYRO process are expected to increase the reliability of safe management of spent fuel.