

Project Management System for Pyro Project

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1. Introduction

The Pyro project, which was assigned to construct Korea Advanced Pyroprocessing Facility (KAPF) by 2025, as shown in Table I [1], is now under research and development. Through the ROK-US joint research by 2020, the technical and economic feasibilities, and the nuclear nonproliferation acceptance would be verified, and then the construction-oriented works of project will be carried out to install pyroprocess equipment and facilities. This project has a variety of success targets such as development of pyro technology and process equipment, design of equipment and facility, construction, and test operation, and also requires consideration of diplomatic aspects in ROK-US joint research and high commercialization investment as an option for spent fuel management. Therefore, it is essential to properly manage this complex project for success. In this article, we checked the present Korea Atomic Energy Research Institute (KAERI) system for pyro project management, and presented the necessary system to apply the project.

Table I: Major design characteristics of KAPF

Capacity	Throughput: 30 tHM ¹ /y Temporary storage: 20 tHM
Plant type	Semi-independent facility
Annual utilization	55% (200 days/y)
Design life	60 years
Input	PWR ² spent fuel
Output	U- and TRU ³ - ingots, process wastes, facility wastes
Main Processes	-Spent fuel storage, disassembly, extraction & cutting of fuel rods, de-cladding, pulverization, homogenization, pelletizing, off-gas treatment -Electrolytic reduction, electro-recovery, salt & cadmium distillation, U- & TRU-ingot casting, salt waste regeneration -Treatment & storage of process and/or operation wastes

¹ ton Heavy Metal

² Pressurized Water Reactor

³ Transuranic

2. Status of Pyro Project Management System in KAERI

Since planning is recursively performed for considerable time, it is almost impossible for the project management (PM) to be implemented right at the beginning of the project. And, a mature PM system is

required to implement PM properly in a project [2]. KAERI already has several project systems, such as Sodium Fast Reactor (SFR) project and System-integrated Modular Advanced Reactor (SMART) project. At this point when the commercialization of pyro project has not yet determined, the maturity to manage pyro project is analyzed to level 1 for most PMBOK areas [3], as shown in Table II.

Table II: KAPF PM maturity diagnosed by PM² model [2]

PMBOK area	Level 1	Level 2	Maturity level
Integration	-No project plans in structural format -No project information system	-Informal PM tools & practices -Basic project plan & project organizational structure are defined	1
Scope	-No WBS ⁴ -No methodology to control project	-Informal WBS -Process to manage scope	2
Time	-Unrealistic schedule -No standard templates for schedules	-Able to develop informal schedule for planning & tracking -Defined activity list & WBS templates	1
Cost	-No cost estimating process	-Informal cost estimating tools & techniques are available	2
Quality	-Project overruns and reworks are common -No quality audit, QA ⁵ / QC ⁶	-Informal quality management system -Noncompliance issues are addressed through inspection & audit	2
Human resource	-Struggle with concept of project driven organization	-Informal organization chart & staffing management plan	1
Communication	-No formal project performance reporting system	-Informal performance reports & reviews are conducted	1
Risk	-No risk identification process -No formal risk management plan	-Informal identification & analysis for risk	1
Procurement	-No procurement plan in conjunction with market condition analysis	-Informal communication with vendors & suppliers -Informal procurement	1

		management process is defined	
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⁴Work Breakdown Structure

⁵Quality Assurance

⁶Quality Control

3. Project Management System to Manage Pyro Project

3.1 Project Life-cycle Phase

Before building a framework for implementing PM in the pyro project, it is necessary to define the project life-cycle phases for KAPF project. The life-cycle phases, separated by control gates, are used to help plan and manage all major process developments, and phase boundaries are defined at natural points for project progress assessment and “go/no go” decisions [4]. For KAPF project, 6 life-cycle phases from concept study to closing are suggested, as follows;

- Phase 1: Concept & technology development
- Phase 2: Development of process equipment
- Phase 3: Construction of KAPF
- Phase 4: Test operation of KAPF
- Phase 5: KAPF operation
- Phase 6: Closeout

3.2 KAPF Project Management System

In order to manage the KAPF project, which will be expected to start actually in 2011 after ensuring feasibility through ROK-US joint research, the PM systems, including the desired point to be prepared, are suggested in consideration of the current KAERI’s PM maturity, as shown in Table III.

Table III: PM systems to be prepared for KAPF project

Areas	Processes	Expected point to complete
Basic Planning	Develop project charter	Y-3
	Define activity & create WBS	Y-3
	Plan main PM area and approval	Y-2
Numbering system	Develop project numbering system	Y-3
Project management	Develop PM plans	Y-3
	Develop project change management plan	Y-2
	Develop project progress and performance measuring system	Y-2
	Develop integrated project schedule (IPS)	Y-1
	Develop annual progress schedule	Y
Technical management	Develop quality management plans for design and demonstration experiment	Y-3
	Develop general quality management plan	Y-2
	Develop risk management plan	Y-2

	Develop information management plan and operation system	Y-2
Others	Develop procurement management plan	Y
	Education for basic PM	Y-2
	Job training for PM	Y

3. Conclusions

A larger and more complex pyro project with various success goals such as development of pyro technology and process equipment, design of equipment and facility, construction of facility, and trial run, should be managed with a proper PM system. Considering the status of pyro PM maturity, we identified some PM systems that should be prepared for KAPF project and presented them with a desired point to be prepared.

REFERENCES

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