# Case Study on Safety Assessment Approach in Yankee and Trojan Decommissioning Plan

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## 1. Introduction

Decommissioning of nuclear facilities has to be accomplished by assuring the safety of workers, the public and the environment because the decommissioning activities are under high radioactivity and significant potential accident. A number of documents must be prepared to help ensure that the decommissioning process is carried out in a safe and efficient manner. There is, however, no experience of safety assessment applied to decommissioning of commercial facilities in Korea.

The safety assessment of a decommissioning plan is applied to identify potential (radiological and non-radiological) hazards and risks [1]. The YNPS (Yankee nuclear power station) decommissioning plan presents an accident analysis that could occur during the period from approval of the decommissioning plan through completion of the final radiation surveys. The TNP (Trojan Nuclear Plant) decommissioning plan presents the results of evaluation and analyses of postulated decommissioning events and evaluates the potential for adverse effects on public health and safety.

The aim of this paper is to illustrate safety assessment methodology to a nuclear facility and the comparison with its hazards expected to result from the YNPS&TNP decommissioning activities.

## 2. Decommissioning plan in Korea

The FDP (Final Decommissioning Plan) document is consists of twelve chapters in NSSC Notice (The guideline to write FDP). The safety assessment contents for decommissioning are listed below:

- ✓ Principle & Criteria, Exposure scenario, Dose assessment, Residual radioactivity, Abnormal occurrence, Hazard

## 3. YNPS decommissioning plan

The decommissioning plan has been prepared in accordance with the requirements of 10 CFR 50.82(b) using guidance.

### *3.1 Accident analysis*

This section of the decommissioning plan presents the accident analysis that assesses impacts of decommissioning on both occupational and public health and safety. The accident analysis considers decommissioning events, fuel storage events, and external events. Analysis of decommissioning events included all phases of decommissioning activities: decontamination, dismantlement, packaging, storage, and radioactive material handling.

### *3.2 Event identification process*

The process includes development of a logic diagram to evaluate all phases of decontamination, dismantlement, and fuel management activities as well as to identify non-radiological events.

- ✓ Events affecting workers, including Radiological and non-radiological events
- ✓ Off-site events affecting public
- ✓ Non-radiological events affecting public
- ✓ Radiological events affecting public
  - Decommissioning activity events
  - Loss of support system events
  - Fire and explosion events
  - External events
  - Spent fuel storage events

### *3.3 Event affecting workers analysis*

Implementation of radiation protection & industrial safety program ensures that potential hazard events are sufficiently minimized.

*3.4 Event affecting public analysis*

Compliance with requirements (Quality assurance plan, Waste management program) ensures that both the probability of occurrence and the consequences of an off-site event do not significantly affect the public health and safety. The ELSA computer program was used to calculate the Exclusion Area Boundary doses relative to the radioactivity released [2].

## 4. TNP decommissioning plan

The Event analysis methodology is generally based on the methodology used in NUREC/CR-0130. In TNP decommissioning plan presents the types of activities that could occur during decommissioning and the accident scenarios for these types of activities.

*4.1 Potential radiological events*

The event analyses with the potential for airborne radioactive releases were classified into four events which are the same events as the radiological events affecting public in YNPS.

*4.2 Non-radiological events*

In the decommissioning plan, there is no decommissioning events identified that would be initiated from non-radiological sources that could significantly impact public. The hazardous materials and wastes will be controlled by Hazardous Material Control Program and the Chemical Work Permit Program [3].

## 5. Conclusion

The safety assessment methodology was reviewed by comparing with YNPS and TNP decommissioning plan. The accident analysis assessed the impact of decommissioning on workers, the public and environment. The evaluation of events that could affect worker's health and safety indicated that implementation of the radiation protection program ensures that these events are sufficiently minimized. Analysis of events that could affect public health and safety indicated that there were no events that could significantly affect public health and safety in both company decommissioning plan. The categorization of a similar chapter is shown in Fig. 1 for the reference.

## REFERENCES


[1] Standard Format and Content for Safety related Decommissioning documents, IAEA Safety Reports Series No. 45.

[2] Yankee nuclear power station decommissioning plan, Revision 0.0, Yankee Atomic Electric Company.

[3] Review of PEG's decommissioning plan for the TROJAN nuclear plant, Oregon department of energy.


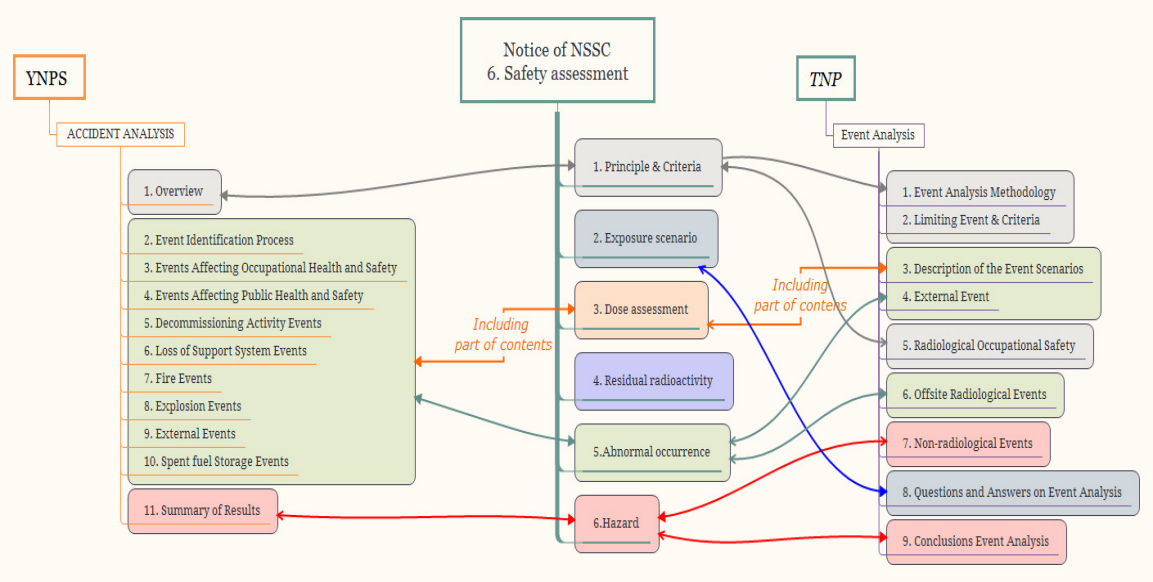


Fig. 1. Similar chapter in YNPS and TNP with NSSC Notice.