

## Development of Historical Site Assessment (HSA) Procedure for Decommissioning Nuclear Power Plants

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### 1. Introduction

Site radiation survey and remediation are essential to complete the decommissioning of Nuclear Power Plants (NPPs). Site radiation survey is an important in providing information necessary for decommissioning planning and cost estimate. Therefore, it is necessary to develop relevant guidelines before the commencement of the decommissioning process.

In the regard, NUREG-1575 MARSSIM (Multi-Agency Radiation Survey and Site Investigation Manual) recommends using a series of surveys.

The Radiation Survey and Site Investigation (RSSI) process uses a graded approach, starting with the Historical Site Assessment (HSA) and followed by several radiation surveys leading to Final Status Survey (FSS). The HSA is the first radiation survey to collect existing information that describes the site's complete history from the start of site activities to the present [1]. RSSI process of decommissioning is introduced and summarized at Fig.1. below.

The operators need to establish HSA procedures using the guidelines provided by MARSSIM for the sites and buildings of the NPPs where decommissioning has been determined. So, this paper describes the information collection procedure, selection method and evaluation method for successful HSA.

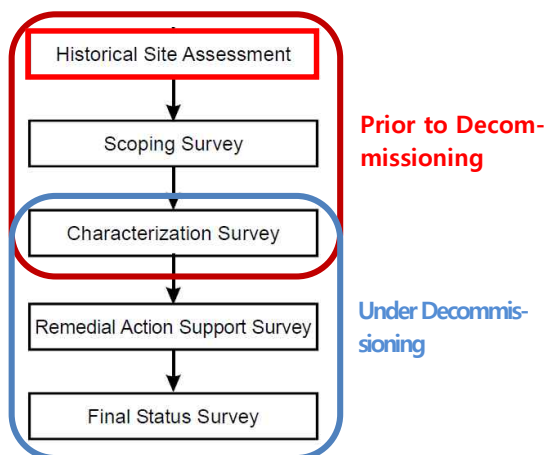


Fig. 1. Conceptual schematic process of RSSI.

### 2. HSA Methodology

The purpose of HSA is to document a comprehensive investigation that identifies, collects, organizes, and

evaluates historical information relevant to the NPPs site.

The HSA needs to describe the physical configuration of site, identifies the radioactive constituents of site contamination, assesses the migration of contaminants, identifies contaminated media and identifies non-impacted areas and impacted areas [1].

The primary objectives of HSA are to;

- Identify potential, likely, or known sources of radioactive and non-radioactive contamination based on existing or derived information, and
- Provide an assessment of the likelihood for contamination migration, and
- Provide initial classification of the site as impacted or non-impacted, and Provide necessary input materials for the next planning.

#### 2.1. Confirmation of survey subject

The site, buildings, SSCs (System, Structure, Components) are first selected as survey targets. If there are other neighbor plants in operation, they should exclude sites and buildings that could affect the safe operation of the plants.

However, SSCs are automatically selected because they are in the building to be decommissioning. Also, should be checked if SSCs are used in common with the neighbor plants in operation.

#### 2.2. Collection of document and data

The document and data to be evaluated must be selected according to whether they meet the purposes of HSA. These should be in accordance with the guidelines and examples and be corresponding or similar field data.

This information is largely divided into plant operating history, radiological status inspection, license and technical specifications revision history and work control document and site modification.

In addition, site characteristics information, groundwater monitoring data and plant design drawings are required.

#### 2.3. Considering factor

- Effective of manpower and resources to input

A lot of manpower and resources are used to obtain information, but there may be less information available for the HSA.

Therefore, the investigator can exclude documents and data for effective collection. However, in order to make such a judgment ultimately, so that professional judgment is important.

- Information validity

The documents and data to be evaluated were made during the construction and decommissioning stages of the NPPs. Therefore, some of the selected documents and data have been created for a long time, so they should be determined according to the result of reviewing the validity of the documents and data. Because, may be little or no value at the present time. Therefore, when relying solely on information from old documents and data, they should be careful and supplemented by other information, such as possible interviews.

- Review of documents and data classification

There may be cases where the classification system and title are different, even though they are the same documents and data throughout the entire operating period of NPPs. Therefore, duplicate or missing documents and data may occur when classified by classification system and title alone.

In order to prevent that, it should be assisted by those who have knowledge of the classification system of documents and data created in the past.

#### 2.4. Review of documents and data

The collected documents and data used to identify significant events that have caused the contamination of systems, buildings, external surfaces, subsurface areas, or waterways, via atmospheric releases, liquid spills or releases, or the breakdown of control of solid radioactive material. For each event, available supporting documentation should be collected and reviewed [2, 3, 4].

#### 2.5. On-site personal interviews

During the preparation of the HSA, numerous individuals from the operating staff, the present staff, as well as vendors and contractors were informally interviewed to verify, provide or clarify data used to develop the HSA document. Individuals who have information on past plant operations related to the site can be requested via questionnaires [2, 3, 4].

#### 2.6. Evaluation of HSA data

Some of the documents and data collected during HSA activities are qualitative or qualitative data of unknown quality. Hence, the evaluation requires profes-

sional guidelines to identify and determine the lot of information on the site. This screening process can serve to provide a site disposition recommendation or to recommend additional surveys [3].

HSA information is used to identify and classify survey areas. Sites and buildings are divided into non-impacted area and impacted areas.

Impacted areas can be evaluation based on known DCGL (Derived Concentration Guideline Level) values based on previous radiation survey with class 1, class 2, or class 3 areas according to the MARSSIM guideline, and these areas should be subjected to a scoping survey or characterization survey [1]. The survey area classification and sizes are shown in Table I.

Table I: Description of classification and size

Type	Impacted Area			Non-impacted Area
Class	1	2	3	-
Ref. DCGL value	Above	Not Ex-pected to exceed	Small frac-tion	Back-ground
Area size	$\leq 100\text{m}^2$	$> 100 \text{ m}^2$ and $\leq 1000 \text{ m}^2$	No limit	Off site
Struc-ture size	$\leq 2000\text{m}^2$	$> 2000 \text{ m}^2$ and $\leq 10,000\text{m}^2$	No limit	Off site

### 3. Conclusion

The ultimate goal of decommissioning is unrestricted release or use of the site. Therefore, the HSA is essential, which is the first step to complete the FSS according to the RSSI procedure.

The HSA conducts a series of actions to collect, review and evaluate existing information describing the entire record of the site from the start of the site activity to license termination. In this paper, we propose a procedure based on the MARSSIM guideline and describe the considering factor, which will be helpful for HSA activities, the first step of decommissioning Kori unit 1.

### REFERENCES

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