

**Technical Consultation for
Engineering of Induction Melting System & General
Arrangement of Radioactive Waste Treatment Facility
from Decommissioning of Pressurized Heavy Water
Reactor**

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KEPCO ENGINEERING & CONSTRUCTION COMPANY, INC.

[Appendix A - SCOPE OF SERVICES AND METHOD OF PERFORMANCE]

1.0 PURPOSE

During to the decommissioning of Pressurized heavy water reactor, large amount of radioactive waste is generated. Most of the radioactive waste generated by decommissioning is metal and it is necessary to install the Induction Melting System which minimizes the final disposal volume of metal for economic benefit. Since the Induction Melting System consists of many equipment with a large-scale, it is required to set up the layout of the radioactive waste treatment facility to construct the metal melting system.

Therefore, the purpose of technical consultation is to perform technical support to prepare a purchase specification of the Induction Melting System and to develop general arrangement including equipment layout for the radioactive waste treatment facility from experienced consultant.

Additionally, deliverables from technical consultation might be shared with Korea Hydro & Nuclear Power Co., Ltd. (KHNP) according to the terms and condition of the prime contract.

2.0 TECHNICAL SCOPE OF WORK

Contractor shall provide the following engineering services to KEPCO E&C as described in the following tasks:

Task 1: Provide Technical Report of Induction Melting System

Contractor shall provide Technical Report for Induction Melting System. Technical Report shall include comprehensive explanation of decontamination and melting process (waste acceptance criteria to the facility, criteria for input to the melting furnace, distribution and contents of nuclides in ingot). In addition, technical report shall include the design and operation experiences of off-gas treatment system and remote control concept.

Task 2: Provide Design Report of Induction Melting System for Purchase Specification

Contractor shall provide Design Report for Purchase Specification of Induction Melting System. Design Report shall include scope of supply, design and interface requirements, required and maximum expected utility information, waste acceptance criteria (Radiological,

Pretreatment etc.) & nuclide fraction and sampling method of the product, capacity information, installation and maintenance method, manufacturing and quality requirement, proper configuration information and licensing requirement for licensing to design and purchase commercial induction melting system as a minimum. KEPCO E&C will provide basic information for the development of the Design Report (for example, amount of waste to be processed, required time period, waste treatment facility layout, etc.).

Task 3: Provide General Arrangement of Radioactive Waste Treatment Facility

Contractor shall elaborate an arrangement for all main process and components of the Radioactive Waste Treatment Facility. Each process (reception, cutting, measurement, decontamination, volume reduction and conditioning, transportation and storage for Ingot decay) shall consider a smooth process flow and proper space utilization. The type and quantity of major component for each process and facility location and estimated size are provided by KEPCO E&C, but the size and arrangement of each equipment should be derived according to the Contractor's experience. Also, waste size, operating and maintenance space for the utility shall be considered.

Task 4: Provide Facility Description Report of Radioactive Waste Treatment Facility

Contractor shall provide a Facility Description report for Radioactive Waste Treatment Facility. Process flow chart including the required systems and component for each process shall be provided. In addition, the basis for the calculation of each area, overview specification, application, cost of major equipment and the optimal operation plan for facility shall be included.

Task 5: Provide Final Consultation Documentation

Contractor and KEPCO E&C will conduct one technical meeting in Contractor's office, and the Contractor is required to arrange a site tour of radioactive waste treatment facility to confirm the treatment process. Contractor is required to prepare the technical meeting to review the deliverables, and present the introduction of the company, waste treatment process and Induction melting system. Contractor shall submit a Final Consultation Documentation reflecting comments by KEPCO E&C.

3.0 METHOD OF PERFORMANCE

Consulting Schedule

The consulting schedule for the basic tasks (Task 1 to 5) shall be 8 weeks from the Execution Date of the Contract, as follow:

Activity ID	Activities/Deliverables	Responsibility	Deliverable Submittal Due Date
Task 1	Technical Report of Induction Melting System	Contractor	TO + 4W
Task 2	Design Report of Induction Melting System for Purchase Specification	Contractor	
Task 3	General Arrangement of Radioactive Waste Treatment Facility	Contractor	
Task 4	Facility Description Report of Radioactive Waste Treatment Facility	Contractor	
Task 5	Final Consultation Documentation	Contractor	TO + 8W

TO = Execution Date

W = Weeks

Method of Performance

- All the tasks above should be performed based on technically acceptable and sound basis
- Contractor shall request additional relevant information necessary for consultation from KEPCO E&C within 10 days after Execution Date. KEPCO E&C will provide the information, if available, within 7 days from the request..
- In order to discuss the matters relevant to the services, correspondences can be made via email.
- The facility review in the consultation shall be based on the commercial facility.
- Contractor shall submit the Final Consultation Documentation(Task 5) which resolved KEPCO E&C's comments within 8 weeks after Execution Date via e-mail.
- After KEPCO E&C's review on deliverables of Task 1~4, the Contractor shall host a face to face technical meeting to discuss on KEPCO E&C's comments with KEPCO E&C. The venue shall be the Contractor's office. Contractor shall resolve comments on the deliverables

of Task 1~4 and reflect those to the Final Consultation Documentation of Task 5. However, KEPCO E&C may decide to replace the face to face technical meeting with video conference or e-mail, considering unexpected situation such as COVID-19.

- If the Contractor needs to change any participant of performing the Service, the Contractor shall get prior approval by KEPCO E&C.
- Contractor shall keep confidential all the data and information from this Contract, and shall not divulge them to any third parties.

4.0 DOCUMENTS SUBMITTAL REQUIREMENTS

- All documents shall be provided in English and Microsoft Word format.

Deliverables

- Technical Report of Induction Melting System
- Design Report of Induction Melting System for Purchase Specification
- General Arrangement of Radioactive Waste Treatment Facility
- Facility Description Report of Radioactive Waste Treatment Facility
- Final Consultation Documentation

5.0 QUALIFICATION REQUIREMENT

- Contractor shall have experience of designing, manufacturing or operating of Induction Melting System.
- Contractor shall have experience of designing or operating of a radioactive waste treatment facility.

Attachment (This part will be attached to the Contract. Please fill in the blanks and submit with proposals)

List of Participants to Perform the Services

Name	Position	Rate/Hour(EUR)

- Proposed personnel shall not be changed without prior approval of KEPCO E&C. In case of unavoidable personnel change, the Contractor shall submit an alternative man power plan with similar or equivalent level of expertise and obtain approval from KEPCO E&C.