

Technical Information

**Technical Consulting Service for Characterization and
Assessment of External Hazards (Organic and
Biological Debris) related to Ultimate Heat Sink at the
Barakah NPP Units 1 to 4**

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

1.0 PURPOSE

KEPCO E&C is responsible for the engineering and design for the 4 units of Barakah Nuclear Power Plant (BNPP) that are under construction in the United Arab Emirates (UAE). The BNPP design is based on the APR1400 technology.

KEPCO E&C will update FSAR licensing support document; “Characterization and assessment of external hazards related to Ultimate Heat Sink” report (hereafter “UHS report”) in accordance with Owner’s request to apply current environment of Barakah nuclear power plant. Contractor shall perform the site characterization works for large influx debris and biofouling with provided information. KEPCO E&C will use the Contractor’s work as a reference of revision of UHS report. All deliverables, services and/or information under this Contract may be provided to FANR (UAE Federal Authority for Nuclear Regulation) and other entities related to the BNPP project such as KEPCO, Nawah and ENEC.

2.0 TECHNICAL SCOPE OF WORK

Contractor shall perform the site characterization works for the organic and biological debris such as jellyfish, seagrass, microalgae, mussels and bryozoans etc. at BNPP site with the provided data by KEPCO E&C. Based on the provided data, Contractor shall perform the characterization for organic debris which potentially cause the blockage with large influx or biofouling.

Task 1: Characterization for large influx debris

- Contractor shall perform desktop study with the provided data. Jellyfish, seagrass, microalgae and macroalgae should be reviewed.
- Contractor shall identify the species which have potential causing blockage due to large influx of debris, based on consideration of their ecological characteristics (e.g. growth rate, temperature limit, die-off and disposal record of nearby plant’s operation). Seagrass habitat related to sediment layer should be reviewed.
- Contractor shall assess the potential risk for each identified species with considering their habitat, blooming frequency, historical record and composition (size and weight). Variance of background sea water temperature shall be considered.
- Contractor shall recommend revision information to be incorporated in the KEPCO E&C’s UHS report based on Contractor’s assessment.

Task 2: Characterization for bio-fouling

- Contractor shall perform desktop study with the provided data relating the biofouling.
- Contractor shall identify the species which have potential causing biofouling in consideration of their ecological characteristics (e.g. settling and accumulation organism).
- Contractor shall assess the potential risk for each identified species with considering potential growth of biofouling upon the bar screen.
- Contractor shall deliver information to be incorporated in the KEPCO E&C's UHS report based on Contractor's assessment.

3.0 METHOD OF PERFORMANCE

Consulting Schedule

The consulting schedule for the basic tasks shall be until 16 weeks from the Execution Date of the Contract, as follow:

Tasks	Weeks from the Contract Signing															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Task 1 – Characterization for large influx debris																
Review and identifying marine species with provided data																
Assessment for the potential risk																
Preparing report and revision information																
Task 2 – Characterization for bio-fouling																
Review and identifying marine species with provided data																
Assessment for the potential risk																
Preparing report and revision information																
Deliverables (reports)										Interim						Final
Meetings	▼											▼				

Method of Performance

- Contractor shall start the consulting service in accordance with the schedule shown as the above schedule.
- KEPCO E&C will provide information for the consulting service. It will be explained and discussed during 1st kick-off meeting. The Contractor shall discuss and inform of the important technical items raised through this consulting service.
- 1st kick-off meeting will be held in Contractor's office or via tele/video conference with project manager of Contractor and KEPCO E&C during 2 days to review the work plan and schedule etc. Contractor shall deliver the meeting minute within one week after completion of meeting.
- After completion of assessment, the 2nd ERM (Engineering Review Meeting) will be held in Contractor's office or via tele/video conference with project manager, responsible engineer of Contractor and KEPCO E&C during 3 days to review the characterization and assessment results. Contractor shall deliver the meeting minute within one week after completion of meeting.
- The Contractor shall submit an Interim Report before the 2nd ERM. After approval of the Interim Report, and prior to completion of the contract, the Contractor shall submit the Final Technical Report incorporated with comment of KEPCO E&C.
- Contractor shall keep confidential all the data and information from this Contract, and shall not divulge them to any third parties.

Deliverables

- Meeting minute shall be provided within 1 week after the kick-off meeting.
- Interim Report shall be provided within 10 weeks after Execution Date.
- Meeting minute shall be provided within 1 week after the 2nd ERM.
- Final Technical Report shall be provided within 16 weeks after Execution Date

4.0 QUALIFICATION REQUIREMENT

- Contractor shall have qualified person who has experience of engineering service, study and consultancy related to assessment or characterization for marine life.
- Contractor shall have experiences of engineering service, study and consultancy related to Barakah nuclear plant construction/operation.