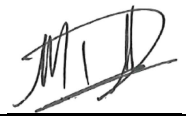
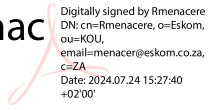
ESKOM

KOEBERG NUCLEAR POWER STATION

User Requirement Specification

Performance of an ASME Section XI and ASME OM Codes Update for the Koeberg 5th Interval In-Service Inspection Programme (ISIP)

PREPARED BY:		**Mubeen Dollie**
REVIEWED BY:	Rmenacere 	**Redouane Menacere**
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1. OBJECTIVE

The Employer requires the provision of engineering services to Eskom to prepare the Koeberg Nuclear Power Station In-Service Inspection (ISI) 5th ten year Interval ASME Section XI programme requirements inclusive of updates to the Risk-informed inspection programme. This includes generation of supporting documentation required to effect implementation of the 5th ten year ISI Interval to ensure acceptance of the revised requirements by Eskom and the South African National Nuclear Regulator (NNR).

Additionally the Employer requires the generation of the Koeberg Nuclear Power Station In-Service Testing (IST) 5th ten year Interval based on ASME OM Code programme requirements inclusive of appendices II and IV of the ASME OM Code.

It is expected that the objective for ISI related work will be achieved by reviewing, evaluating and updating the current 4th Interval ISI programme requirements to reflect and incorporate changes between the 4th Interval ISI Code of Record and the 5th Interval Code of Record proposed by the Contractor as modified by 10CFR50.55a.

It is expected that the objective of the IST related work will be achieved by reviewing and providing recommendations related to the documentation generated by the Employer for that relevant scope of work.

Note at Koeberg the In-service Inspection Programme (ISIP) refers to both the ISI and IST Programmes.

2. DESCRIPTION OF THE SERVICE

The detailed scope of work for the Contractor is described below. All deliverables due to the scope described below shall become part of the project final report.

2.1 Conduct a Project Kick-off Meeting

It is expected that project kick-off meeting be held between the Contractor and Eskom personnel. The aim of this is to ensure that deliverables of relevant project scopes are clearly understood and to allow opportunity to discuss all relevant aspects of the project i.e. general goals, objectives, requirements, communication protocols both with Eskom and or NNR etc. Eskom may extend an invitation to the NNR to attend the kick-off meeting

as appropriate. Minutes of kick-off meetings shall be maintained by the Contractor and shall form part of the project final report. This meeting is inclusive of ISI and IST programme requirements.

2.2 Generate and Maintain a Design Input Log

The execution of this project will require the review of various Koeberg and or industry documents, codes and standards etc. To this end the Contractor shall generate and maintain a Design Input Log to identify the documents and the revision of each document used throughout the project. The final Design Input Log shall be submitted to Eskom with the project final report including of hardcopies of industry documents that Koeberg might need to effect implementation of the updated proposed programme requirements for the 4th ISI Interval.

2.3 Conduct a Review of United States Regulatory Requirements for Section XI Implementation

The Contractor shall conduct a review of the limitations and modifications imposed on the proposed 5th Interval ISI programme requirements listed in the United States Code of Federal Regulations, Title 10, Part 50, Section 55a (10CFR50.55a) to determine which will be incorporated into the Koeberg 5th Interval ISI Programme.

Note - It is considered that deviations to the limitations and modifications listed in 10CFR50.55a may be required due to South African ISI framework or context. The Contractor shall as part of this review project deliverable prepare justifications or relief supporting documentation as required for those instances where Koeberg identify that a 10CFR50.55a limitation or modification will not be met.

Attention is also drawn to the fact that 10CFR50.55a receives frequent regulator updates as directed by the US NRC. The Contractor shall ensure that updates to 10CFR50.55a that occur during the duration of the execution of this project also be reviewed as described above and be evaluated for incorporation into the Koeberg 5th Interval ISIP.

2.4 Perform an ASME XI Code Comparison

The Contractor shall perform a line by line comparison to identify changes that occurred between the current 4th Interval Code of Record (2007 Edition with 2008 Addenda) and the proposed Code of Record for the 5th Interval. Eskom will prescribe the new code edition for the 5th Interval. It is required that all changes be clearly identified, described in detail and assessed for impact. Results of this deliverable shall be presented to Eskom.

The line by line comparison shall be performed on the following ASME subsections identified in Table 1 below:

Table 1: ASME Section XI Code Comparison Scope

Subsection	Description
IWA	General Requirements
IWB	Requirements for Class 1 Components of Light-Water Cooled Plants
IWC	Requirements for Class 2 Components of Light-Water Cooled Plants
IWD	Requirements for Class 3 Components of Light-Water Cooled Plants
IWE	Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants
IWF	Requirements for Class 1,2,3 and MC Components Supports of Light-Water Cooled Plants
IWL	Requirements for Class CC Concrete Components of Light-Water Cooled Plants
Appendices	Mandatory
Appendices	Non-Mandatory

2.5 Perform a RI-ISI Period and end of Interval Review

The Contractor is required to update the current Koeberg RI-ISI programme for the end of 2nd Period review (4th Interval) as well as complete the end of Interval RI-ISI review for application during the subsequent 5th Interval.

2.6 Perform a Review of Applicable ASME XI Code Cases

The Contractor is required to review the current ASME Section XI code cases in use as part of the 4th Interval ISIPRM as well as ASME Section XI code cases currently available or in draft, to determine which code cases are to be identified for use as part of the ISIPRM 5th Interval. Code cases shall be compared to Regulatory Guide 1.147 to determine if they have

been adopted for use and if any limitations or stipulations on their use have been assigned by the US NRC. The Contractor shall provide recommendations to Eskom on which code cases are proposed for use during the 5th Interval and include advantages or industry constraints on their use. This shall include the review of the latest US NRC endorsed edition Code Case N-729 and its impact on Koeberg's ISIPRM Augmented Module AUG-05 ("In-service Inspection of Reactor Pressure Vessel Heads").

2.7 Generation of In-Service Inspection Programme Requirements Manual (ISIPRM)

This is one of the primary deliverables of the contract and results from the information gathered and completion of the activities identified above. The ISIPRM documents the ISI examination requirements for the Koeberg 5th Interval. It also serves as a summary document for the NNR to inspect and audit the Koeberg ISI programme. In addition the ISIPRM details topics such as deviations, inspection qualification requirements, regulatory commitments and augmented examination requirements.

The Contractor shall prepare the Koeberg ISIPRM basic scope modules for the 5th Interval and submit to Eskom as part of the project final report. It is expected that Eskom review of the Contractor submittal will result in comments or clarification requests. The Contractor shall ensure that all comments reviews and clarifications are adequately captured.

2.8 Generation of the In-Service Testing Programme Requirements Manual (ISTPRM) including mandatory appendices II and IV

This is one of the primary deliverables of the contract and results from the information gathered and completion of the activities identified below. The ISTPRM documents the testing requirements for the Koeberg 5th Interval. It also serves as a summary document for the NNR to inspect and audit the Koeberg IST programme. In addition, the manual details deviations, test plans, regulatory commitments and augmented testing requirements.

It is expected that Eskom review of the Contractor submittal will result in comments or clarification requests. The Contractor shall ensure that all comments reviews and clarifications are adequately addressed.

The Contractor shall generate the 5th Interval ISTPRM inclusive of Mandatory Appendices II and IV with relevance to the points described below:

2.8.1 Conduct a Review of United States Regulatory Requirements for ASME OM Code Implementation

The Contractor shall conduct a review of the limitations and modifications imposed on the proposed 5th Interval IST programme requirements listed in the United States Code of Federal Regulations, Title 10, Part 50, Section 55a (10CFR50.55a) to determine which will be incorporated into the Koeberg 5th Interval IST Programme. Additionally, NUREG, Generic Letters, or any relevant instructions applicable to IST shall be taken into account during this review.

Note - It is considered that deviations to the limitations and modifications listed in 10CFR50.55a may be required due to South African IST framework or context. The Contractor shall as part of this review project deliverable prepare justifications or relief supporting documentation as required for those instances where Koeberg identify that a 10CFR50.55a limitation or modification will not be met.

2.8.2 Perform an ASME OM Code Comparison

The Contractor shall perform a line-by-line comparison to identify changes that occurred between the current 4th Interval Code of Record (2004 Edition with 2006 Addenda) and the proposed Code of Record for the 5th Interval. Eskom will prescribe the new code edition for the 5th Interval. It is required that all changes be clearly identified, described in detail and assessed for impact. Results of this deliverable shall be presented to Eskom.

The line-by-line comparison shall be performed on the following ASME subsections identified in Table 1 below:

Table 1: ASME OM Code Comparison Scope

Subsection	Description
ISTA	General Requirements
ISTB	Inservice Testing of Pumps in Light - Water Reactor Nuclear Power Plants
ISTC	Inservice Testing of Valves in Light - Water Reactor Nuclear Power Plants
ISTD	Preservice and Inservice Examination of Dynamic Restraints (Snubbers) in Light - Water Reactor Nuclear Power Plants
Appendices	Mandatory (Appendix II and IV)
Appendices	Non-Mandatory

2.8.3 Perform a Review of Applicable ASME OM Code Cases

The Contractor is required to review the current ASME OM Code cases in use as part of the 5th Interval ISTPRM as well as those that are currently available or in draft, to determine which code cases are to be identified for use as part of the ISTPRM 5th Interval. Code cases shall be compared to Regulatory Guide 1.147 to determine if they have been adopted for use and if any limitations or stipulations on their use have been assigned by the US NRC. The Contractor shall provide recommendations to Eskom on which code cases are proposed for use during the 5th Interval and include advantages or industry constraints on their use. Such recommendations shall follow the relief request format which will be submitted to the regulator for approval.

2.9 Control of Project Generated Documentation

Documentation generated during the project may take the form of meeting minutes, memorandums or emails etc. These are valuable sources of information and could be needed to support possible future queries either from Eskom or the NNR on issues relevant to the ISIP. The Contractor shall control the generation of these project documents and include them in the project final report.

2.10 ISIP Skills Transfer and Training

Part of Eskom plan to develop staff in the areas considered as specialized field where local training is not equipped to achieve the desired outcome. To this end the contractor shall include in their proposal, the development and training of Eskom personnel.

The types of training scenarios envisaged are:

- Generic training which will take the format of online classroom training to Eskom personnel. This should cover the basis (High level code requirements and US NRC limitations with interpretations and practical implementation guidelines, if possible significant OE and general industry best practices related to ISI) for the revised requirements of the 5th Interval ISIP. The target audience here ranges from ISIP novice to ISIP experienced level personnel. This shall also include specific in-depth training on the Risk-Informed methodologies and application.

- Job shadow training aimed at the ISI and IST programme engineers. This shall include job shadowing at the contractor or other clients premises for similar work being performed. Of interest specifically is job shadowing training associated with Risk-Informed ISI updates, Repair/Replacement Programmes, Code Inquiries, IST subprograms development such as

mandatory Appendix II, III, IV and Interpretations, and attendance of ASME Code Committee Meetings.

3. QUALIFICATION OF KEY PERSONNEL

Personnel providing the services described above shall be at least mid-career level (i.e. more than 15 years' experience) and have specific experience related to performing ISI and Risk-inform ISI code updates to ASME Section XI at other nuclear utilities. Personnel shall be contributory members of ASME committee or sub committees. Personnel shall have demonstrated track record in the application of ASME Section XI and 10CFR50.55a. Personnel involved in the project deliverables shall be certified / registered professional engineers.

Personnel responsible for the deliverable described in Section 2.10 shall have the same qualifications and experience as described above but relevant to IST.

The Contractor is to include resumes of proposed personnel to be used and Eskom shall audit such records accordingly.

4. TIMING AND PLANNING

4.1 Part 1 (covers section 2.1 through to 2.9, except 2.5)

The work is to be executed from: Date of contract placement

The required completion date is: 31 June 2025 (for scope described in section 2.1 through to 2.9)

Note: for item 2.5, the Risk Informed end of interval review shall be completed after the end of the 4th Interval, which is provisionally scheduled to end in June 2026. The contract end date should take this into account.

4.2 Part 2 (covers section 2.10, and part of 2.5)

The work is to be executed from: Date of contract placement

The required completion date is: 30 June 2027 (for scope described in section 2.5 and 2.10 or alternatively revised proposal date by the Contractor if acceptable to Eskom).

5. ITEMS TO BE SUPPLIED BY THE EMPLOYER

All documentation relevant to this project and identified by the Contractor shall be supplied by Eskom. These include but may not be limited to:

240-119362012 – 4th Interval In-Service Inspection Programme Requirements Manual (ISIPRM)

240-97087308 - 4th Interval In-Service Testing Programme Requirements Manual (ISTPRM)

6. ITEMS TO BE SUPPLIED BY THE CONSULTANT

All project deliverables as identified in section 2 generated during the course of this project unless otherwise agreed by the employer.

7. QUALITY REQUIREMENTS

The Quality Management System (QMS) of the supplier shall conform to the requirements of ISO 9001:2015, ASME NQA-1 or equivalent standard. The Contractor shall perform the work identified in section 2 in accordance with his own procedures. Eskom review and acceptance of the Contractors work is required before final documentation handover.

8. PRICING STRUCTURE

The pricing structure shall be itemized as per the identified scope in section 2 of this document.

9. APPLICABLE DOCUMENTS

10.1 36-188 Rev 0, Quality Management Manual for Nuclear Generation.

10.2 DSG-318-087 – Quality requirements for the procurement of assets, goods and services.

10.3 240-119362012 – 4th Interval In-Service Inspection Programme Requirements Manual (ISIPRM)

10.4 240-97087308 - 4th Interval In-Service Testing Programme Requirements Manual (ISTPRM)