




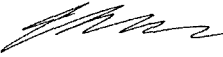
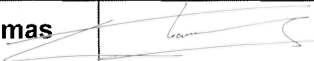
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ESKOM

KOEBERG NUCLEAR POWER STATION

User Requirement Specification

Provide Reactor Pressure Vessel (RPV) automated ultrasonic (UT) and visual inspection (VT) services for Outages 227 and 129 at Nuclear Operating Unit.

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1. DESCRIPTION

Provide Reactor Pressure Vessel (RPV) automated Ultrasonic (UT) and Visual inspection (VT) services for Outages 227 and 129 at Koeberg Nuclear Power Station

The Koeberg Unit 2 Outage 227 inspections shall be performed according to ASME XI 2007 with 2008 Addenda

The Koeberg Unit 1 Outage 129 inspections shall be performed according to ASME XI 2021 edition

The RPV top closure head, RPV closure head nuts and washers, RPV threads in flange and the core support structure are excluded from this URS

2. BACKGROUND

The Inspection and Test Group is required to implement the ISIPRM (In-service Inspection Programme Requirements Manual) developed by the Programme Engineering Department to ensure the integrity of the plant

The ISIPRM was developed as a licensing document which details the in-service inspection programme to be utilised at Koeberg. For RPV inspections, this programme implements the requirements of ASME XI as modified by 10CFR50.55a, as well as Koeberg specific inspection requirements via the ISIPRM Module AUG-06 as further modified by this specification

The ISIPRM forms part of Koeberg Nuclear Power Station's licensing basis and regular reporting to the National Nuclear Regulator (NNR) is done as part of these licensing basis requirements

3. SCOPE OF WORK

The following fully automated ASME Section XI RPV inspections from ISIPRM Module E-B-RPV, E-RA, and Augmented Module AUG-06

- Volumetric (Automated ultrasonic method)
 - RPV Shell and Bottom Head Circumferential Welds
 - RPV Shell-to-Flange Weld
 - RPV Nozzle-to-Vessel Welds
 - RPV Nozzle-to-Safe End Butt Welds
 - Beltline Repair Welds (applicable to Unit 2 only)
 - Full core beltline underclad region (examination is for planar flaws parallel to the RPV axis)

Note: No RPV nozzle underclad inspections are required
 - Safe end-to-pipe welds and safe end-to-elbow welds (applicable to Unit 2 only see Appendix 1 for scope details)
- Visual

VT3 inspections

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- All RPV interior surfaces including
 - Core support pads, support pad welds and surrounding areas
 - Mating surfaces of the upper and lower core support structure attachments to vessel (the vessel flange keyways and the M lower supports)
 - All instrument penetrations and their welds
 - Core beltline and nozzle regions
 - Flange keyways and flange areas between the keyways
 - Nozzle internal surfaces, from 100 mm beyond the nozzle to safe-end weld, back to and including the nozzle radius

VT1 Inspections

- On all RPV nozzle inner radii (as per Code Case N-648-2)

The services provided must include all support work, which must include the following as a minimum

- Certification and qualification of procedures, personnel and equipment in accordance with ASME XI
- Equipment preparation and shipment
- Submission of procedures and intervention files before the start of the intervention

Eskom, or its representative, may perform surveillance of the preparation work and onsite inspections. This could include visit to the Contractor premises, review of documentation and technical meetings with the Contractor.

Daily meetings are to be planned at Koeberg Nuclear Power Station for the duration of the inspection interventions.

All the required inspections must be completed in the least amount of time. The Contractor must specify in its submission the total time required for installation of equipment, the execution of all required inspections, and removal of equipment.

The Contractor shall make provision for adequate coverage for the preparation, execution and evaluation of the inspection scope.

Where work is scheduled on the critical path of the outage, 24 hours per day, and 7 days per week shift cover will be required.

3.1 Requirements for inspections:

The inspection qualification must be provided to show evidence that the NDT system is capable of achieving the defined inspection objectives when applied on Koeberg specific components.

All inspection procedures and Koeberg specific qualification evidence must be submitted to Eskom for review and approval before implementation.

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4. EQUIPMENT

The equipment that will be used must represent the latest technology available, must be reliable and must produce results that will be comparable with future inspection results

All equipment and tools needed to perform the activities will be timeously transported to and removed from site. Reserve equipment, tooling, spare parts and material must be available on site or be made available within a very short time frame in case of equipment breakdowns. The Contractor may not cause work delays resulting in schedule changes due to their equipment or personnel.

All contaminated equipment brought on site shall comply with the requirements of IAEA TS-R-1 "Regulation for the safe transport of radioactive materials"

All contaminated equipment transported on or leaving Koeberg site shall comply with the requirements of KAA-634 "Responsibilities for the radioactive material control programme"

The contractor must provide evidence of performing the inspections under strict safety and radiologically considered guidelines

The Contractor shall evaluate and specify in detail its needs for the onsite work to be supplied by the Employer, such as hoisting, scaffolding, shielding, tenting, fluid supplies, HVAC connection, storage and lay down areas. The Contractor is responsible for the equipment provided to it by the Employer.

5. QUALITY REQUIREMENTS

The scope of work will be subjected to a Quality Management System in accordance with the requirements of quality specification 238-102 Revision 3, Quality and Safety Management Requirements for Nuclear Suppliers Level 2

6. DOCUMENTATION

6.1 To be included in the proposal:

The Contractor shall describe in its proposal the inspection systems, as well as the qualification process, and shall provide sufficient information to show conformity to all requirements of this technical specification

This includes

- A demonstration of its knowledge and technical and practical capability to perform the inspections described in this specification
- Description of the specific equipment used for calibration on site
- List and description of the tooling, equipment, and personnel available (or dedicated) for the inspections, with the current qualification status
- Description of the qualification process
- Description of the organisation on site and of the support from the main office
- Duration of inspection for each weld / item

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- Measures and precautions to guarantee availability of equipment and personnel
- Organisation with co- and sub-contractors (if relevant)

6.2 To be delivered during the contract:

- Inspection procedures (two months before start of inspections)
- Qualification dossiers (two months before start of the inspections)
- Inspection quality plans (one month before start of inspections)
- Personnel certification and qualification records (one month before start of inspections)
- A summary inspection report shall be provided to Eskom before filling of the reactor primary system for reload This summary report will contain
 - Final scope of inspections
 - Reports and follow up of the activities duly completed
 - Results of the inspections
 - Characteristics of indications (dimensions, position, orientation, and drawings) and comparison with previous results
 - Data to confirm the origin and the type of the possible defects (e.g , construction, corrosion, etc)
- A final inspection report shall be provided at the latest 30 days after completion of the inspection This final report will contain
 - Final scope of inspections
 - Description of the inspection conditions
 - Description and results of the calibration
 - Description of the possible deviations to Contractor internal procedures and Employer's specification, with the justification of their acceptability
 - Complete results of the inspections
 - Detailed description of the indications including their interpretation with regard to the ASME XI code, and/or Koeberg's requirements, comparison with the previous results and drawings that clearly show the positions and orientations
 - All data (requested by the *Employer*) related to the results of the inspection or necessary to obtain approval from the relevant authorities

7. CERTIFICATION AND AUTHORISATION OF NDT PERSONNEL

The Contractor shall supply NDT personnel who are certified at least as Level II and Level III in UT and VT inspection methods

The ISIPRM implements the requirements of ASME Section XI as limited by the US Code of Federal Regulations 10CFR50 55 a
As required in 10CFR50 55 a(b)(2)(xviii)(A), NDE personnel certified to Level I and II shall be recertified on a 3-yearly interval in lieu of the 5-yearly interval specified in ASME XI IWA-2314 The Contractor must indicate in its submission its ability to meet this requirement

Authorisation of personnel shall be issued in accordance with KAR-020 "Authorisation of Inspection and Test Personnel and its Sub-Contractors".

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8. TIMING AND PLANNING

The current schedule of tasks and activities are provided in Table 1 below. These dates may change in the future and shall be communicated accordingly when the Outage Task Instructions are issued.

Table 1:

Activity	Period	Venue
Outage - 227	20 April 2026 to 28 August 2026	Koeberg Unit 2
Outage -129	22 May 2028 to 21 July 2028	Koeberg Unit 1

9. TRAINING REQUIREMENTS

9.1 General

All staff are to be adequately trained for the execution of the task.
All training shall be completed prior to the start of the services.

9.2 FFD requirements and competencies

- Security Screening Enrolment, Drug test and Criminal Check
(Please note Criminal check takes few days and only once you pass Criminal Check can the following training be booked)
- Medical examination (to be performed externally and medical results presented to FFD Medical Centre)
- Working at Heights to be performed externally and results presented to FFD centre

It is expected that all contract personnel are competent in the following disciplines:

- Material Handling (Online), assessment at FFD centre
- Plant Induction training (Online), assessment at FFD centre
- Foreign Material Exclusion training (Online), assessment at FFD centre
- Human Performance training (HP) Online, assessment at FFD centre
- Radiation Worker training or Requalification at FFD centre
- Safety Induction Course at FFD centre

Notes

- 1 Plant Induction Training (PIT) is Koeberg specific and shall be for Eskom's account (4hrs training and 2 hrs for assessment)
- 2 Meeting FFD requirements is entirely the responsibility of the Contractor and all activities described in procedure 335-68 paragraph 5.1 are performed offsite at the cost of the Contractor before its employees will be registered on the FFD system

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10. ITEMS TO BE SUPPLIED BY THE EMPLOYER

The Employer shall provide an inspection scope, as well as inspection packages for each inspection inclusive of

- SAP work order for each component
- Radiation Protection Certificate
- Permit To Work with Risk Assessment
- applicable isometric drawings

The Employer shall ensure that all components are adequately prepared for all inspections (E g scaffolding erected, lagging removed, manhole opened, etc)

The Employer shall provide all other equipment and facilities needed for onsite inspections as agreed with the Contractor

11. EQUIPMENT TO BE SUPPLIED BY THE CONTRACTOR

The Contractor shall supply all the necessary inspection equipment, personnel and procedures to conduct the inspections in accordance with ASME XI as specified

The Contractor shall supply its staff with the necessary Personal Protective Equipment (PPE) i.e hard hats, safety shoes, overalls, eye protection and hearing protection

The Contractor shall ensure that the PPE it supplies meets the required SABS standards or equivalent

Ski cabin facilities including furniture, are for the Contractor's cost and for the Contractor to provide. The Employer needs to approve any ski cabin before it is brought onto the Koeberg site, and the Employer can assist by providing a suitable ski cabin specification and power and internet connections to cabins

12 REFERENCES

- 240-123588530 Non Destructive Testing – Qualification of NDT Systems
- 240-123597661 Non Destructive Testing – Personnel Certification Requirements
- KAR-240 Requirements for the Authorisation of Inspection / Testing Personnel at Koeberg Nuclear Power Station
- KAR-020 Authorisation of Inspection and Test Personnel and its Sub-Contractors
- KAA-634 Responsibilities for the radioactive material control programme
- KAA-751 Chemical restrictions and controls at Koeberg (CRACK programme)
- 335-68 Fitness for duty process requirements for work to be performed inside the owner controlled area of Koeberg Power Station

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- 240-119362012: Fourth Interval In-Service Inspection Programme Requirements Manual (ISIPRM) for Koeberg Nuclear Power Station
- 238-102 Revision 3, Quality and Safety Management Requirements for Nuclear Suppliers Level 2.

13.0 APPENDIX 1

Unit 2: Safe end to pipe/elbow welds: inspection scope from ISIPRM Module E-RA

System	Component ID	Description	Method
02RCP001TY	470KB21012-KB2/1C/1	000BA SAFE END TO PIPE WELD	UT
02RCP002TY	470KB21085-KB2/2C/1	000BA SAFE END TO PIPE WELD	UT
02RCP003TY	470KB21012-KB2/3C/1	000BA SAFE END TO PIPE WELD	UT
02RCP007TY	470KB21012-KB2/1F/4	ELBOW TO 000BA SAFE END WELD	UT
02RCP008TY	470KB21012-KB2/2F/4	ELBOW TO 000BA SAFE END WELD	UT
02RCP009TY	470KB21012-KB2/3F/4	ELBOW TO 000BA SAFE END WELD	UT