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RFQ Number	NTP-PRJ-MM-RFQ-25-0056 – Rev 3 - Ageing Management
Request for Quotation Date	2025/08/18
RFQ Closing Date	2025/09/02
RFQ Closing Time	15:00
Compulsory Site Briefing	Online clarification meeting to be requested if required
Site Briefing Date	N/A
Contact Person	Itumeleng Mathibe / Tel: 012 305 5163
Quotation Validity	90 Days from the closing date
Submission Details	RFQ Response must be sent to: Itumeleng.Mathibe@ntp.co.za Technical Clarifications Tshepiso.Matshidiso@ntp.co.za
RFQ Description	Support services to address gaps in the ageing management processes and programmes at SAFARI-1 to comply with IAEA SSG-10 in preparation for the nuclear license extension application (LTO).

Dear Service Provider

Kindly provide a quotation for goods and or services as outlined in section 2 of this document.

1. Introduction

The South African Nuclear Energy Corporation Limited (Necsa) is a state-owned public company (SOC), registered in terms of the Companies Act, (Act No. 61 of 1973), registration number 2000/003735/06.

The Necsa Group engages in commercial business mainly through its wholly-owned commercial subsidiaries: NTP Radioisotopes SOC Ltd (NTP), which is responsible for a range of radiation-based products and services for healthcare, life sciences and industry, and Pelchem SOC Ltd (Pelchem), which supplies fluorine and fluorine-based products. Both subsidiaries, together with their subsidiaries, supply local and global markets, earning valuable foreign exchange for South Africa and are among the best in their field in their respective world markets.

Necsa's safety, health, environment and quality policies provides for top management commitment to compliance with regulatory requirements of ISO 14001, OHSAS 18001 and RD 0034 (Quality and Safety Management Requirements for Nuclear Installations), ISO 9001 and ISO 17025.

Necsa promotes the science, technology and engineering expertise of South Africa and improves the public understanding of these through regular communications at various forums and outreach programmes to the community. We are a proudly South African company continuously striving, and succeeding in many respects, to be at the edge of science, technology and engineering related to the safe use of nuclear knowledge to improve our world.

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For more information on Necsa, please visit: WWW.Necsa.co.za

2. Background

SAFARI-1 reached 60 years of safe operation in March 2025. Its Nuclear Installation License expires on 31 December 2030. Necsa intends to apply to the National Nuclear Regulator (NNR) for a license extension until 31 December 2040. Therefore, a periodic safety review (PSR) and an ageing management assessment are required to support Necsa's application for a license extension (also referred to as Long Term Operation – LTO). The IAEA may be invited to conduct a Safety Aspects of Long-Term Operation (SALTO) mission to assist Necsa with ensuring readiness for safe LTO.

A description of the SAFARI-1 reactor is provided in **Annexure 1**.

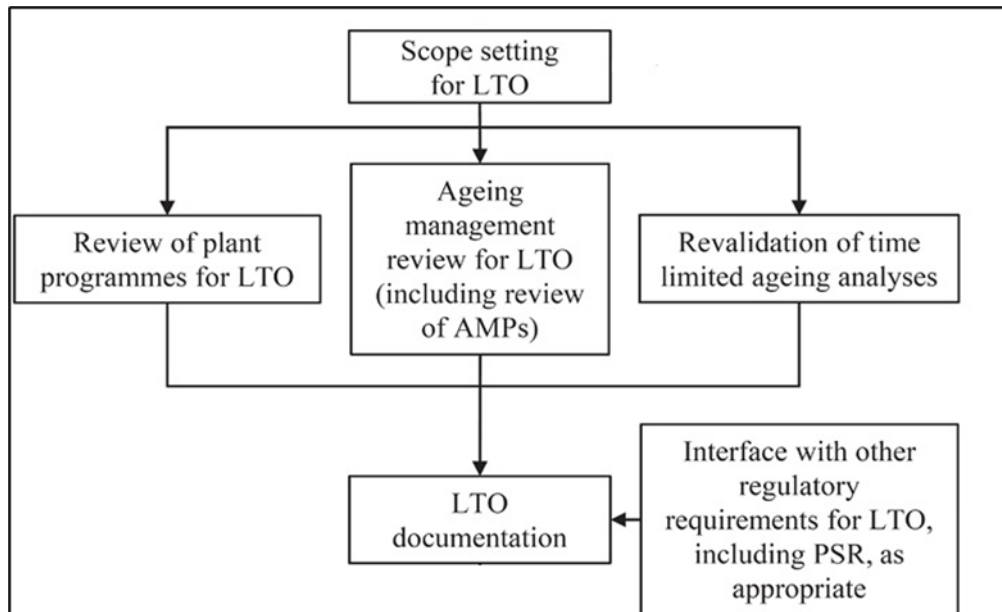
3. Description

The requirement is for support services to address gaps in the ageing management processes and programmes at SAFARI-1 to comply with IAEA SSG-10. Compliance with the requirements in SSG-10 is intended to support Necsa's nuclear installation license extension application. The gaps in SAFARI-1's ageing management processes and programmes will be identified through self-evaluation, the planned PSR and/or the IAEA SALTO mission. However, some gaps have already been identified and are included in the scope.

4. Scope of Work

The Contractor's scope entails providing support to Necsa to satisfy the requirements for ageing management at SAFARI-1 as set out in IAEA SSG-10. An overview of the scope of work is shown in the figure below.

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Particular consideration shall be given to applying a graded approach as recommended in SSG-10 and detailed in IAEA SSG-22.

The services by the Contractor include the following:

4.1 Collaborate/Interface with the SALTO and PSR teams to confirm the ageing management gaps at SAFARI-1.

The contractor shall:

- Participate/support in an ageing management self-evaluation of SAFARI-1.
- Review the outcomes from the PSR, IAEA SALTO mission and inputs from SAFARI-1 self-evaluation to confirm the ageing management gaps and propose solutions.
- Consider NNR requirements related to ageing for LTO that may not have been identified during PSR and the SALTO mission.
- Make recommendations on the scope of ageing management actions required for LTO.

Deliverable:

- A consolidated list of ageing management gaps and actions that need to be resolved for LTO.

4.2 Review and update the SAFARI-1 ageing management system procedure(s) to comply with SSG-10.

The contractor shall:

- Review the suite of SAFARI-1 ageing management procedures.
- Consider the findings identified in the consolidated list of findings (see section 3.1).
- Update the suite of ageing management system procedures to comply with SSG-10 and

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incorporate actions stemming from the findings.

Deliverable:

- Ageing management system procedure(s) that address the requirements in SSG-10 and incorporate actions stemming from the findings.

4.3 Scope setting for LTO/ Updated screening of SSCs

The contractor shall:

- Compile a consolidated list of all SAFARI-1 SSCs using the available equipment lists and sources of information.
- Identify the list of equipment not directly included in the SAFARI-1 license but necessary for the safe operation of SAFARI-1 (referred to as support infrastructure SSCs).
- Develop and document a methodology for classifying the SSCs' importance to safety using the guidelines provided in SSG-10 and the method for controlling and updating the list.
- Verify and validate the equipment list for accuracy through plant walkdowns of a sample of SSCs. The sample should be increased based on the number of discrepancies identified.
- List the SAFARI-1 SSCs that are in scope and require ageing management programs as defined in SSG-10.
- List the non-SAFARI-1 SSCs that are in scope and require ageing management programs.
- Consider the findings identified in the consolidated list (see section 3.1) related to scope setting, if any.
- Group the SSCs that are similar, subject to comparable service conditions, environmental conditions and can be managed by the same ageing management programme (AMPs), see SSG-10 Annex I.

Deliverables:

- A procedure documenting the methodology used for determining the SSCs that are in scope and the control of updates to the list, approved by the NNR.
- A verified and validated list of SAFARI-1 and SAFARI-1 support infrastructure SSCs that are in scope.
- Justification for those SSCs excluded from the list.

4.4 Ageing Management Review (AMR)

The contractor shall, for each SSC in scope:

- Review the service conditions.
- Group SSCs that are similar as recommended in SSG-10.
- Utilize SAFARI-1 and international operating experience (e.g. IGALL), and the fundamental knowledge and understanding of ageing, as input to determine the ageing effects and degradation mechanisms.
- Determine if the SSC's ageing is adequately managed through existing plant programmes.

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Consider the actual condition, monitoring data and the failure history.

- If not, review and update the existing plant programmes or compile a new ageing management programme. Utilize international operating experience as input to determine effective ageing management programmes.
- Determine if there are SSCs that require an inspection in the short term, based on the ageing management review.
- Verify that existing and new ageing management programmes are consistent with the elements as described in IAEA SSG-10 clause 5.3.

Deliverables:

- A procedure documenting how the ageing management review is conducted and the results of the ageing management review.
- A verified and validated list of SAFARI-1 and SAFARI-1 support infrastructure SSCs with degradation mechanisms.
- A list of SSCs that require an inspection in the short term, before the license expiry date, and the inspection type.
- Updated or new ageing management programmes for all in-scope SSCs that are consistent with the elements described in SSG-10.

4.5 Time-limited ageing analysis

The contractor shall:

- Consider international experience and SAFARI-1 design basis documentation to determine the SSCs that are subject to a time-limited ageing analysis (TLAAs) or have a qualified life that expires.
- Revalidate the biological shield time-limited ageing analysis using available reports and analyses. Alternatively, compile an ageing management program for the biological shield.
- Revalidate the Reactor Vessel and associated components' time-limited ageing analysis using available reports and analyses.

Deliverables:

- A list of TLAAs that need to be revalidated, including qualified equipment.
- A revalidated TLAA (or and AMP) for the biological shield that demonstrates safe operation until 2040 and satisfies SSG-10 requirements for TLAAs (or AMPs).
- A revalidated TLAA for the Reactor Vessel that demonstrates safe operation until 2040 that satisfies SSG-10 requirements for TLAAs.

4.6 Review of other ageing management programmes and processes applicable to important safety SSCs

The contractor shall:

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- Identify and review other programmes such as plant chemistry control, in-service inspection, preventive maintenance and periodic testing programmes that are used for ageing management of SSCs.
- Identify and review other programmes, such as plant health monitoring, database management and work management processes that need to be coordinated with existing or new ageing management programmes for testing and monitoring of ageing of SSCs.
- Review and update these programmes:
 - To align with the new ageing management procedures and programmes.
 - To incorporate findings from PSR and the SALTO mission.
 - To comply with the elements described in IAEA SSG-10 clause 5.3.

Deliverables:

- A list of existing programmes and/or processes affected and requiring updates.
- Updates to affected processes and procedures.
- Documents for new processes and procedures for effective implementation of ageing management.

4.7 Develop a process for managing obsolescence proactively

The contractor shall:

- Review existing processes to manage obsolescence.
- Interface with the PSR and SALTO teams to determine the findings related to obsolescence.
- Determine the list of important to safety SSCs that are not fully functional and are delayed in repairs due to obsolescence.

Deliverables:

- A procedure for proactively managing obsolescence at SAFARI-1.
- A list of active obsolescence issues to be addressed.

4.8 Compile a SAFARI-1 Ageing management report for LTO

The contractor shall:

Compile a report on the ageing management for LTO. The report will serve as a summary of documented evidence of an effective ageing management system at SAFARI-1 to support the LTO safety case. The report shall include the following topics:

- Ageing management processes and procedures.

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- Scope setting process and methodology.
- Ageing management review process.
- Time-limited ageing analyses.
- Compliance with the elements of an ageing management programme.
- Obsolescence.
- Consolidated list of ageing management findings and corrective actions.
- Results of the ageing management scoping and reviews.
- Corrective actions and findings addressed and ageing management improvements implemented.
- A schedule of the remaining actions needed to be completed before the license expiry date and after the license expiry date.

Deliverable:

- SAFARI-1 Ageing management report in support of LTO.

5. Project team and categories of labour required

The Contractor shall provide a project structure to execute the project and is sufficiently resourced with suitably qualified and experienced resources to meet the agreed timelines. The Employer reserves the right to examine the certification of personnel chosen by the Contractor.

6. Timing and planning

The preliminary timeline for submission of all documentation to the NNR in support of Necsa's license extension application is 31 December 2027. This is to afford the NNR sufficient time to evaluate Necsa's application for a license extension. However, the PSR documentation, consisting of the individual PSR reports, global assessment report and integrated implementation plan is expected to **be completed and submitted to the NNR no later than 1 July 2027.**

The documents, as part of the contractor's deliverables, shall be completed and ready for submission to the NNR (if applicable) in the timelines shown in the table below:

The overall project timeline is expected to start: **15 September 2025**

The project is expected to end: **31 December 2027.**

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Document	Content	Scope section	Estimated completion
Ageing management system procedure(s)	Ageing management system procedure(s) that address the requirements in SSG-10 and incorporate actions stemming from the findings.	Section 4.2	Dec 2025
Ageing management scope setting methodology document	Describes the methodology and process used to determine and control the list of in-scope SSCs.	Section 4.3	Mar 2026
Equipment list indicating in-scope SSCs for SAFARI-1 and SAFARI-1 support infrastructure	An equipment list indicating the in-scope SSCs and their degradation mechanisms	Section 4.3 and Section 4.4	Mar 2026
The ageing management review process	A procedure documenting how the ageing management review is conducted and the results of the AMR.	Section 4.4	May 2026
An initial consolidated list of ageing management findings	A list of ageing management findings from the self-evaluation and the SALTO mission, actions to be taken, leads and timelines to address the findings. A description of how the list will be controlled.	Section 4.1	May 2026
Updated existing ageing management programmes	All existing AMPs updated to comply with SSG-10 and address the findings from the AMR	Section 4.4	Nov 2026
New AMPs	All new AMPs updated in compliance with SSG-10 and address the findings from the AMR	Section 4.4	Feb 2027
TLAAs	All TLAAs identified and revalidated for 2040	Section 4.5	May 2027
Other, existing ageing management programmes	All other, existing AMPs updated to comply with SSG-10 and address the findings from the AMR	Section 4.6	May 2027

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Document	Content	Scope section	Estimated completion
Obsolescence procedure	A procedure for proactively managing obsolescence	Section 4.7	Nov 2026
A list of active obsolescence issues	A list of active obsolescence issues	Section 4.7	Nov 2026
Ageing management report	An ageing management report documenting evidence of an effective ageing management programme to support LTO	Section 4.8	July 2027

7. Working hours and work location

Normal working hours apply, but there is flexibility for remote work and alternate working hours.

8. Training

Training, medical testing and security clearance will be required for staff who need to access the facility's site and networks.

9. Necsa's scope of supply

The *Employer* is responsible for the provision of:

- Training associated with enabling the *Contractor* to gain access to the site.
- Provide access to the relevant data needed for the PSR.
- Facilitate communication with the NNR.

10. Pricing

- All prices quoted to include all applicable taxes.
- Price must be fixed and firm
- Price should include additional cost elements such as freight, insurance until acceptance, duty where applicable, disbursements etc.
- Quotation must be completed in full, incomplete quote could result in a quote being disqualified.
- Payment will be according to Necsa's General Conditions of Purchase.

11. Evaluation

a. Phase 1- Functionality Evaluation / Technical Evaluation

Where functional or technical evaluation criterion is applicable, assessment will be performed in terms of the criterion listed below and the criterion may include Technical, Performance, Quality and Risk.

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If the Bidder's response to the Technical templates does not indicate that the Bidder can support an acceptable technical solution, the Bidder's response will be rejected and not evaluated further.

Together the Technical, Performance & Quality and Risk criteria make up the functionality criterion and a Bidder's Proposal will be evaluated for functionality out of a possible 100 points. Only RFQ responses achieving an evaluation score of greater than the set threshold points out of the possible 100 points and which score a number of points for functionality that is greater than or equal to the set threshold points of the number of points achieved by the highest scoring Bid for functionality will be selected to progress to the second stage.

b. Phase 2 - Evaluation In Terms Of Preferential Procurement Policy Framework Act, 2022

This bid will be evaluated and adjudicated according to the 80/20 point system, in terms of which a maximum of 80 points will be awarded for price and 20 points will be allocated based on the specific goals (B-BBEE status level).

	POINTS
PRICE	80
SPECIFIC GOALS (B-BBEE status level)	20
Total points for Price and SPECIFIC GOALS	100

Preference goal

B-BBEE status level contributor

B-BBEE Status Level of Contributor	Number of points (80/20 system)
1	20
2	18
3	14
4	12
5	8
6	6
7	4

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8	2
Non-compliant contributor	0

12. Required Documentation

- Tax Clearance Certificate (Tax pin issued by SARS)
- Declaration of interest (SBD 4)
- BEE Certificate / Applicable Affidavit if classified as EME
- Letter of Good Standing (COID) only if Applicable due to the nature of work required
- Any other document or certification that might have been requested on this RFQ

13. Important

- c. Quotation must be submitted on or before the RFQ closing date and time stated above.
- d. Orders above R 30 000 will be evaluated according to the PPPFA 80/20-point system and a functionality scorecard where applicable and the ones above R 1 Million will be subjected to the tender process.
- e. This RFQ is subjected to the Necsa's General Conditions of Purchase, Preferential Procurement Policy Framework Act 2000 and the Preferential Procurement Regulations, 2022, the General Conditions of Contract (GCC) and, if applicable, any other legislation or special conditions of contract
- f. Failure on the part of a bidder to submit proof of B-BBEE Status level of contributor together with the bid, will be interpreted to mean that preference points for specific goals are not claimed.
- g. The purchaser reserves the right to require of a bidder, either before a bid is adjudicated or at any time subsequently, to substantiate any claim in regard to specific goals, in any manner required by the purchaser.
- h. For a Bidder to obtain clarity on any matter arising from or referred to in this document, please refer queries, in writing, to the contact details provided above. Under no circumstances may any other employee within Necsa be approached for any information. Any such action might result in a disqualification of a response submitted in competition to this RFQ.
- i. No goods and/or services should be delivered to Necsa without an official Necsa Purchase order.
- j. Necsa reserves the right to; cancel or reject any quote and not to award the RFQ to the lowest Bidder or award parts of the RFQ to different Bidders, or not to award the RFQ at all.
- k. The supplier shall under no circumstances offer, promise or make any gift, payment, loan, reward, inducement, benefit or other advantage, which may be construed as being made to solicit any favour, to any Necsa employee or its representatives. Such an act shall constitute a material breach of the Agreement and the Necsa shall be entitled to terminate the Agreement forthwith, without prejudice to any of its rights
- l. By responding to this request, it shall be construed that: the bidder, hereby acknowledge to be fully conversant with the details and conditions set out in the Necsa's General Conditions of Purchase, Preferential Procurement Policy Framework Act 2000 and the Preferential Procurement Regulations,

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2022, the General Conditions of Contract (GCC), Technical Information and Specifications attached, and hereby agree to supply, render services or perform works in accordance therewith

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Annexure 1 – general description of the SAFARI-1 reactor

SAFARI-1 is a tank-in-pool type research reactor of similar design to the ORR reactor at Oak Ridge, Tennessee, USA. SAFARI-1 is a high neutron flux, light water-moderated and cooled, beryllium and light water reflected research reactor designed and built as a general research tool, falling in the class of research reactors commonly known as Materials Test Reactors (MTRs). The reactor currently uses low-enriched uranium-silicon aluminium alloy plate-type fuel assemblies of conventional MTR design and can be operated at thermal powers up to 50 MW. The present operation of the reactor is limited, for various reasons (historical, economics and technical), to 20 MW thermal, which is reflected in the operating licence.

The reactor facility is situated on the Pelindaba site of NECSA in Northwest Province, approximately 27 kilometres west of the Pretoria central business district. The region is rural in nature, except for a few small towns around the Hartebeestpoort dam.

The Pelindaba site is ideally suited to an installation such as the SAFARI-1 reactor facility, since it is very stable, with no recent seismic activity. The reactor facility is located at the top of a low hill.

The main buildings and structures comprising the reactor facility are:

- The reactor building, consisting of the reactor hall, a process wing containing the primary and secondary cooling systems, inlet and exhaust ventilation fan yards, an electrical wing, various laboratories and an office wing;
- The cooling towers, comprising the ultimate heat sink for the facility; and
- A ventilation exhaust chimney stack.

The reactor building is a multi-level structure, housing all the nuclear systems, including the reactor itself. The reactor hall is an engineered confinement structure, designed to prevent or minimise radiation and radioactive contamination leakage under all conditions. Within the reactor hall is the reactor pool, containing the reactor vessel and core, and a storage pool.

The upper volume of the reactor hall, houses a 25-ton gantry crane. The crane is also equipped with a 2.5-ton auxiliary hoist.

Within the reactor hall, a series of rooms contain the equipment for the reactor, pool and secondary water systems. These include:

- Pool Equipment Room
- Pump Compartments
- Reactor Heat Exchanger Compartment
- Chemical Mixing Compartment
- Degasifier Compartment
- Reactor Demineraliser Compartments
- Reactor Demineraliser Pump and Filter Compartment
- Secondary Pumps and Storage Tank Compartment

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The electrical and ventilation wing is divided into two main areas. One side houses the reactor ventilation supply equipment, and the other side is made up of a series of rooms, which contain the transformers, batteries, interconnected UPS and the diesel generator.

An emergency control room is equipped with emergency communications equipment, emergency procedures as well as a computer, which is connected to the building network.

The three cooling towers consists of outer shells of concrete, each divided into two cells with a common basin. Inside each cell, the air circulation is provided by means of a galvanised steel fan driven by a motor.

The tank room floor area is filled with storage tanks containing demineralised and process water. The core of the reactor is enclosed inside a tank, known as the reactor vessel, which in turn is located in an almost 9 m deep pool of water. The Reactor vessel is a welded aluminium cylindrical tank with flanged heads at either end. The overall height between flange faces is about 4.5 m with an internal diameter of about 1.6 m. The vessel was designed for an internal pressure of about 250 kPa and a temperature of about 65 °C.

The pool is divided into three parts, which can be separated from each other by means of removable gates. The three parts are:

- The reactor pool where the reactor vessel is located.
- The storage pool is used mainly for the storage of irradiated fuel elements and radioactive equipment
- The canal pool forms part of the laboratory area and connects the pool to the hot cell. It is used for transporting active equipment, elements and irradiated samples to the hot cells.

The primary cooling system of the reactor circulates cooling water through the reactor vessel to cool the core. A separate cooling system circulates water through the pool to control the pool water temperature and purify the water. Both of these circulating systems are closed loops and the heat they carry away from the reactor is transferred via heat exchangers to a secondary cooling system, which is an open circuit system that disposes of the heat through evaporation-type cooling towers to the atmosphere.

To maintain the purity of the primary coolant, it is subjected to demineralisation and degasification systems. There are two demineralisers for the primary coolant.

Further technical details are available, for free download, of a tank-in-pool, Oak Ridge Research reactor type here. <https://digital.library.unt.edu/ark:/67531/metadc1035054/>.

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