National Nuclear Regulator

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Enquiries: S Thugwane
Our Reference: NIL02B1408
Your Reference:

26 March 2024

Group Chief Executive Officer
Necsa
PO Box 582
PRETORIA
0001

FOR THE ATTENTION OF MR. L TYABASHE

Dear Sir

NUCLEAR INSTALLATION LICENCE NIL-02 (VARIATION 4)

(1) The NNR has embarked on a process of reviewing the conditions of authorisation for nuclear installations on the Necsa Pelindaba site.

(2) As part of the review process, Necsa was afforded the opportunity to comment on the proposed amendments to the existing conditions of authorisation. The Necsa comments were considered in the NNR finalisation of conditions of authorisation.

(3) The reasons for the amendments are to address –
(a) Alignment with international safety standards and regulatory practices,
(b) Adoption of current edition of IAEA Regulations for Safe Transport of Radioactive Material (i.e., SSR-6),
(c) Additional requirements and wording that provide clarification and prevent ambiguity on the current conditions of authorisations,
(d) Incorporation of the new NNR logo and template for nuclear authorisations.

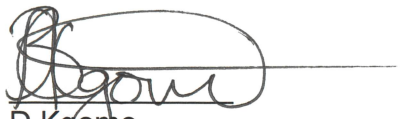
(4) Please find enclosed one controlled copy of Nuclear Installation Licence No. NIL-02 (Variation 4), being the nuclear authorisation for the SAFARI-1 Research Reactor. This document must be controlled in accordance with the Necsa arrangements for controlled documents.

(5) Please note that this original controlled copy together with that maintained by the NNR represent the only two authoritative originals of the nuclear authorisation.

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Please address all correspondence to the Programme Manager: NTWP.

Yours faithfully



D Kgomo
CHIEF EXECUTIVE OFFICER: NATIONAL NUCLEAR REGULATOR
Copy: L&SA Records

National Nuclear Regulator

NUCLEAR INSTALLATION LICENCE No. NIL-02 (Variation 4)

Nuclear Installation Licence No. NIL-02 (Variation 4) issued in terms of the provisions of Section 23 of the National Nuclear Regulator Act, Act 47 of 1999 (hereinafter referred to as the Act)

to

THE SOUTH AFRICAN NUCLEAR ENERGY CORPORATION (Necsa)
(hereinafter referred to as the licensee)

for

the operation of the **SAFARI-1 Research Reactor** on the farm Weldaba 567 JQ (formerly Welgegund 491 JQ), in the magisterial district of Brits in the North West Province, known as the Pelindaba site. The site referred to in this licence refers to the defined portion of the Pelindaba site on which the SAFARI-1 Research Reactor is constructed (see Figure 1).

The Nuclear Installation Licence is not transferable and is effective from the date of issue, subject to adherence with –

(i) the Conditions of Authorisation in PART A; and
(ii) the Specified NNR Requirements in PART B.

Issued at Centurion on this **26th day of March 2024**

Ms Ditebogo Kgomo
CHIEF EXECUTIVE OFFICER

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PART A: CONDITIONS OF AUTHORISATION

(1) General

(a) In these conditions any reference to an agreement, approval, directive, specification, notification, process or any formal communication between the NNR and the licensee, and vice versa, shall be deemed to be a reference to a written document.

(b) In these conditions any reference to processes, procedures or arrangements shall be deemed to be licensee processes, procedures, or arrangements, unless explicitly stated to be otherwise.

(c) In these conditions any reference to the Act, shall be deemed to be a reference to the National Nuclear Regulator Act, Act 47 of 1999, as amended.

(d) The licensee must ensure that once approved or accepted by the NNR, no alteration or amendment to the approved or accepted processes is implemented unless the NNR has approved or accepted the said alteration or amendment.

(e) Where in these conditions, the NNR requires any matter to be approved or to be carried out only with its consent or to be carried out as it directs, the NNR may –

(i) from time to time modify, revise or withdraw, either wholly or in part, any such approval, directive or consent.

(ii) approve, either wholly or in part, any modification or revision or any proposed modification or revision to any matter for the period being approved.

(f) The English text of the licence is the official text of the licence.

(2) Facility Description

(a) The **SAFARI-1 Research Reactor** is situated in Building P-1800 on the Pelindaba west side of the Necsa site.

(b) SAFARI-1 is a tank-in-pool type research reactor of similar design to the Oak Ridge Reactor. It is a light-water-moderated and cooled, beryllium and water reflected research reactor designed and built as a general research tool, falling in the class of research reactors commonly known as Material Test Reactors (MTR).

(c) The Reactor is operated at thermal powers up to 20 MW and is utilised chiefly for the commercial production of medical isotopes, activation

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analyses, material modification (such as the neutron transmutation doping of silicon for the semiconductor industry) and numerous support services such as neutron radiography and neutron diffraction, which are of both industrial and academic interest.

(3) Scope of Actions that may be undertaken by the Installation

(a) The **SAFARI-1 Research Reactor** is authorised to be operated at thermal powers up to 20 MW.

(b) The following activities may be undertaken subject to the safety envelope covered in the SAFARI-I safety case:

(i) **In-Core Facilities (Hollow Elements, Thimbles, Hydraulic and Pneumatic Rabbit Systems)**

[1] Irradiation of target material for the production of isotopes.
[2] Irradiation of target plates for the production of isotopes.
[3] Irradiation of samples for neutron activation analysis.
[4] Irradiation of samples for materials testing.
[5] Measurements to determine core and/or in-core rig parameters.

(ii) **Reactor Beam Tubes**

[1] Operation of equipment for the collimation and/or transmission of neutron and/or gamma beams for research or commercial experiments.
[2] Utilisation of transmitted neutron and/or gamma beams for:
[a] Neutron radiography
[b] Neutron diffraction
[c] Prompt gamma neutron activation analysis
[3] Measurements to determine beam characteristics and parameters.

(iii) **Pool Side Facility**

[1] Neutron transmutation (e.g., doping of silicon crystals for semiconductors).
[2] Material modification (e.g., colouration of gemstones and metallurgical research).
[3] Production of medical and other isotopes.
[4] Irradiation of samples for neutron activation analysis.
[5] Measurements to determine pool side facility characteristics and parameters.

(iv) **Large Facility**

[1] No authorised activities

(v) **Pneumatic Transfer System**

[1] Material modification (e.g., colouration of gemstones).
[2] Irradiation of samples for neutron activation analysis.

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[3] Measurements to determine core and/or pneumatic facility characteristics and parameters.

(vi) **In-Pool Facilities**

[1] Irradiation of materials using the gamma fluxes from the fuel storage racks.
[2] Irradiation of semi-precious stones to enhance their colours.
[3] Storage of fuel, irradiated samples and radioactive materials, equipment and components.

(vii) **In-Pool Gammametry Facility**

[1] Measurement of the gamma radiation spectrum emitted from a variety of sources.

(viii) **Dry Gamma Facility**

[1] Gamma irradiation of a variety of targets for various purposes (e.g., to kill bacteria in organic targets; sterilise living organisms for pest control and to evaluate radiation tolerance of organisms or manufactured items such as electronic circuitry).

(ix) **Hot Cell Facilities**

[1] Processing and/or handling of radioactive materials and sources, including the transfer of such items from transport containers for use in the reactor facility or the transfer of such items to transport containers for shipment out of the reactor building.
[2] Handling of irradiated fuel for inspection, measurement of parameters or shipment to dry storage or final disposal.
[3] Handling and maintenance of radioactive items used in the reactor or in experiments.

(x) **Three (3) Inch Facility**

[1] Used as a detector location.

(xi) **K 11 Waste Storage Area**

[1] Storage of drums filled with low level waste.

(xii) **K 18 Waste Storage Area**

[1] Storage of beam tube plugs and other radioactive equipment/tools/components such as rigs, jigs, collimators, and unused low density fuel racks.

(xiii) **Canal Pool**

[1] Storage of recovered radioactive sources and in-core and Mo holders, Fuel Elements End Adapters, Control rod lower members and Control Rod cadmium sections.

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(4) Demarcation of Site Boundary, Site Plans, Designs and Specifications

(a) The licensee must maintain a plan of the site (hereinafter called the site plan) showing the location of the boundary of the site and every building, plant or facility on the site.

(b) The licensee must demarcate the boundaries of the site by fences or other appropriate means and all such fences or other means used for this purpose must be properly maintained.

(c) Prior to making any change to the site, which impacts or has the potential to impact on health, safety, or the environment as contemplated in the Act, the licensee must submit to the NNR an amended site plan and schedule, for approval.

(d) The licensee must submit, to the NNR, such plans, diagrams, designs, specifications, or other information relating to the buildings, plants or any other facilities on the site as the NNR may specify.

(5) Physical Security

(a) The licensee must ensure the safety and security of the –
(i) site; and
(ii) all installations and persons thereon.

(b) The physical protection system must be designed to protect against the design basis threat, theft or diversion of radioactive material and sabotage.

(c) The licensee must prevent unauthorised persons from entering the site or any part thereof.

(6) Transport

(a) The transportation of radioactive material, any equipment or objects contaminated with radioactive material must be carried out in compliance with the relevant provisions of the International Atomic Energy Agency's Regulations for the Safe Transport of Radioactive Material, 2018 Edition, IAEA Safety Standard Series No. SSR-6 (Rev. 1), IAEA, Vienna, 2018.

(b) The licensee must ensure that no radioactive material is brought onto the site or conveyed from the site, except in accordance with processes approved by the NNR.

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(c) All on site transport of radioactive material or any equipment or objects contaminated with radioactive material must be carried out in compliance with processes approved by the NNR.

(d) The licensee must keep a record of all radioactive material consigned to and from the site. Such record must –
   (i) contain particulars of the amount, type and form of such radioactive material, the manner in which it was packaged, the name and address of the person to whom it was consigned to or from and the date when it left or arrived on the site.
   (ii) be preserved for a period acceptable to the NNR.

(e) The licensee must not undertake any transport of radioactive material to sites, installations or persons not appropriately authorised to receive such material.

(7) Restrictions on Dealing with the Site

(a) The licensee may not lease, assign, or grant possession to use –
   (i) the site, or any portion thereof; or
   (ii) any radioactive material,
   to any person not in possession of an appropriate nuclear authorisation, where such an authorisation is required.

(b) The licensee must submit an annual confirmation of the inventory of all radioactive material in the facility.

(c) The licensee shall ensure that no nuclear material is brought onto the site except in accordance with adequate arrangements made by the licensee for this purpose.

(d) The licensee shall submit for NNR approval such part or parts of the said arrangements as the NNR may specify.

(e) The licensee must inform the NNR in writing of such intention and request the revocation or amendment of the relevant part of the authorisation as appropriate.

(f) The licensee remains responsible for compliance with all conditions of authorisation until such time as said conditions are revoked or amended.

(g) The licensee must prevent persons from carrying out any unauthorised actions on the site.

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(h) The licensee must ensure that no radioactive material intended for use in connection with any new installation, process or modification to the existing installation is brought onto site for the first time without consent of the NNR.

(i) The licensee must ensure that no radioactive material is stored on the site except in accordance with processes approved by the NNR.

(j) The licensee must ensure that every person authorised to be on the site receives instructions (to the extent that this is necessary having regard to the circumstances of that person being on the site) as regards the risks and hazards associated with the nuclear installations and their operation, the precautions to be observed in connection therewith and the actions to be taken in the event of an accident or emergency on the site.

(k) The licensee must implement approved processes for suitable training of all persons who have responsibilities for any operations which may affect safety.

(l) The licensee must ensure that suitable and sufficient methods are employed on the site for the purposes of informing persons thereon of each of the following matters –
(i) the meaning of any warning sign used on the site.
(ii) the location of any exit from any place on the site, where such exit is provided for use in the event of an emergency.
(iii) the measures to be taken by such persons in the event of any emergency.

(8) Radiological Protection

(a) The licensee must implement the approved processes for the purposes of ensuring radiological protection of employees, members of the public and the environment, both on the site and off the site, as a consequence of authorised actions.

(b) The normal operational exposure of individuals must be restricted to ensure that neither the effective dose nor the equivalent dose to relevant organs or tissues exceeds any relevant dose limit specified by the NNR.

(c) The licensee's radiological protection processes must, under all operating states of the authorised actions or facilities ensure that –
(i) effective radiation doses, including committed effective doses, to persons;
(ii) the number of people who are exposed; and
(iii) the likelihood of incurring exposures to radiation,
are kept as low as reasonably achievable.

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(d) A dose register of every occupationally exposed worker must be established and maintained in a form acceptable to the NNR. The licensee must retain the register for a period of at least fifty (50) years from the date of last entry.

(e) The licensee must implement NNR approved processes for the purposes of control of radioactive sources.

(9) Medical Surveillance and Health Register

(a) A comprehensive medical surveillance programme and health register must be maintained in a form approved by the NNR.

(10) Radioactive Waste Management

(a) The licensee must implement NNR approved processes for the minimisation and safe management of radioactive waste on the site.

(b) The radioactive waste management programme must –
(i) ensure the identification, quantification, characterisation and classification of any radioactive waste generated.
(ii) provide for the necessary steps leading to safe clearance, authorised discharge, disposal, reuse or recycling; and
(iii) provide for the safe storage of radioactive waste between any waste management processes.

(c) The safety of radioactive waste storage options must be assured for the envisaged period of storage.

(11) Documents, Records, Authorities and Certificates

(a) The licensee must keep adequate records to demonstrate compliance with the conditions of this licence.

(b) The licensee must implement and maintain an approved document management system to ensure that every document required, every record made, every authority, consent or approval granted and every directive or certificate issue in pursuance of these conditions of licence is preserved for thirty (30) years or such other period as the NNR may approve.

(c) Operational reports must be submitted to the NNR at predetermined periods, approved by the NNR, and must contain such information as the NNR may require on the basis of the nuclear installation's safety assessment.

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(12) Events (including Incidents or Accidents) on the Site

(a) The licensee must implement NNR approved processes for the notification, classification, recording, investigation and reporting and closeout of events (incidents, accidents, etc.) occurring on the site –
(i) in accordance with requirements specified by the NNR.
(ii) as required by any other condition attached to this licence; or
(iii) as the licensee considers necessary, provided such is not inconsistent with (i) or (ii).

(13) Emergency Planning and Preparedness

(a) The licensee must implement NNR approved processes related to preparedness for and response to any event, (incident, accident, etc.) or other emergency arising on the site and their associated impacts.

(b) The licensee must ensure that such processes include procedures to ensure that all persons, in the employ of the licensee, who have duties in connection with such processes are properly trained and instructed in –
(i) the performance of the processes.
(ii) the use of any equipment that may be required; and
(iii) the precautions to be observed.

(c) Where such processes require the assistance or cooperation of, or it is expedient to make use of the services of any person, local authority or any other body; the licensee must ensure that such persons, local authority or other body are consulted in the periodic review and update of such processes.

(d) The licensee must ensure that all such processes are exercised and tested at such intervals and at such times and to such extent as the NNR may specify or, where the NNR has not so specified, as the licensee considers necessary to ensure their continued viability.

(14) Environmental Protection

(a) The licensee must implement NNR approved processes for the protection of public health and the environment arising from the nuclear installation's authorised activities.

(b) The licensee must ensure that no radioactive effluent is released from the site except in accordance with procedures and processes approved by the NNR.

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(c) The licensee must implement NNR approved processes and procedures for environmental monitoring and surveillance.

(15) Duly Authorised and Suitably Qualified and Experienced Persons

(a) The licensee must implement NNR approved processes and procedures for ensuring that only suitably qualified and experienced persons perform any duties, which may affect the safety or security of operations on the site, or any duties assigned by or under these conditions of licence.

(b) Such processes and procedures must make provision for the appointment, as appropriate, of duly authorised persons to control and supervise operations, which may affect plant or facility safety and security.

(c) The licensee must make and implement adequate arrangements for suitable training for all persons on site who have responsibility for any operations, which may affect safety or security.

(d) The licensee must submit for NNR approval such part or parts of said arrangements as the NNR may specify.

(16) Safety Committee

(a) The licensee must implement processes and procedures relating to safety committee(s) to oversee and manage its safety responsibilities and to which it refers for consideration and advice –

(i) matters required by or under this licence.

(ii) safety policies, procedures, processes or documents required by these conditions of licence or as the NNR may specify and any subsequent alteration or amendment to said processes or documents.

(iii) any matter affecting safety on or off the site which the NNR may specify; and

(iv) any other matter, which the licensee considers should be referred to a safety committee.

(b) The terms of reference of any such safety committee must be submitted to the NNR.

(c) The licensee must ensure that the members of any such committee are suitably qualified and experienced, so as to enable said committee to consider any matter likely to be referred to it and to advise the licensee authoritatively and, so far as practicable, independently.

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(d) The licensee must ensure that a safety committee shall consider or advise only during the course of a properly constituted meeting of that committee. Minutes must be kept of all such meetings.

(e) The licensee must within fourteen (14) days of any meeting of any such committee, submit to the NNR a full and accurate record of all matters discussed at that meeting including in particular any advice given to the licensee.

(f) The licensee must submit to the NNR copies of any document, or any category of documents considered at any such meetings that NNR may specify.

(g) The licensee shall notify the NNR as soon as practicable if it is intended to reject, in whole or in part, any advice given by any such committee together with the reasons for such rejection.

(h) Notwithstanding paragraph (d), where it becomes necessary to obtain consideration of, or advice on, urgent safety proposals (which would normally be considered by a safety committee) the licensee may do so in accordance with arrangements made for the purpose by the licensee, considered by the relevant safety committee and approved by the NNR.

(17) Safety Documentation

(a) The licensee must implement NNR approved processes and procedures for the production and assessment of safety cases consisting of documentation to justify safety during the following lifecycle phases of the installation –

(i) Siting.
(ii) Design.
(iii) Manufacture of component parts.
(iv) Construction.
(v) Commissioning.
(vi) Operation.
(vii) Temporary or extended shutdown.
(viii) Termination of operation.
(ix) Decontamination; and
(x) Decommissioning.

(b) The safety case must include a risk assessment and demonstration of compliance with the Regulations on Safety Standards and Regulatory Practices as well as any other requirements and guidance prescribed by the NNR.

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(c) The licensee must establish and implement processes for the periodic and systematic review and reassessment of safety cases.

(d) The licensee must if so directed by the NNR, carry out a review and reassessment of safety and submit a report of said review and reassessment to the NNR at such intervals, within such period and for such matters or operations as may be specified in the directive.

(18) Quality, Security and Safety Management

(a) Quality, Security and Safety Management processes and procedures must be established, implemented and maintained in respect of all matters that may affect security or safety in order to ensure compliance with the conditions of this licence.

(b) The licensee must comply with all NNR approved or NNR accepted documents contained in the Necsa SHEQ-INS system.

(c) The licensee must submit to the NNR such copies of records or documents made in connection with the aforementioned processes and procedures as the NNR may specify.

(19) Modification to Design of Existing Plant or Facility

(a) The licensee must comply with NNR approved processes and procedures relating to control of modification to the design of existing plant, facility or system design including modifications that may be of a temporary nature.

(b) The aforesaid processes must provide for the classification of modifications according to their safety significance.

(c) Where appropriate modifications must be divided into stages and where the NNR has so specified the licensee must not commence nor thereafter proceed from one stage to the next of the modification without the prior approval of the NNR.

(d) The processes must include a requirement for the provision of adequate documentation to justify the safety of the proposed modification and shall where appropriate provide for the submission of such documentation to the NNR.

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(20) Construction and Commissioning of Plant or Process

(a) The licensee must implement NNR approved processes and procedures relating to the construction and commissioning of any plant, facility or process.

(b) Where appropriate, construction and commissioning of the plant or process may be divided into stages. If so specified by the NNR, the licensee must not commence with any stage nor proceed from one stage of the construction or commissioning to the next without the prior approval of the NNR.

(21) Limits and Conditions on Operations

(a) The licensee must, in respect of any operation that may affect safety, produce a safety case to demonstrate the safety of the operation and identify the limits and conditions necessary in the interest of safety. The limits and conditions of operation must be submitted to the NNR for approval.

(b) The licensee must ensure that operations are controlled and carried out in compliance with NNR approved limits and conditions on operations at all times.

(c) Where the person appointed in terms of paragraph 15(a) identifies any matter indicating that the safety of any operation or the safe condition of any plant is compromised, that person must bring it to the attention of the relevant facility management, who must forthwith take appropriate action to ensure that the matter is appropriately notified, recorded, investigated and reported to the NNR.

(d) The NNR may in the interests of safety, at any time revoke, amend or impose any limiting condition on operations.

(22) Examination, Inspection, Maintenance and Testing

(a) The licensee must implement NNR approved processes for the regular, periodic and systematic examination, inspection, maintenance and testing of all plant, systems, structures and components, including software.

(b) The aforesaid processes must provide for the preparation of a plant maintenance schedule for each plant or facility. The licensee must submit to the NNR for its approval, such part or parts of any plant maintenance schedule as the NNR may specify.

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(c) The licensee must ensure that a full and accurate report of every examination, inspection, maintenance or test, of any part of a plant, system, structure or component, indicating the date thereof and signed by a suitably qualified and experienced person appointed by the licensee, is made.

(d) The licensee must ensure, in the interests of safety, that examination, inspection, maintenance and test of a plant or any part thereof is carried out –
(i) only by suitably qualified and experienced persons.
(ii) in accordance with written procedures.
(iii) within the intervals specified in the plant maintenance schedule; and
(iv) under the control and general supervision of a suitably qualified and experienced person appointed by the licensee for that purpose.

(e) When any examination, inspection, maintenance or test of any part of a plant reveals any matter indicating that the safe operation or safe condition of that plant may be affected, the suitably qualified and experienced person appointed to control or supervise any such examination, inspection, maintenance or test shall forthwith bring it to the attention of the relevant facility management who shall take appropriate action and ensure the matter is then notified, recorded, investigated and reported in accordance with approved processes.

(23) Decommissioning

(a) The licensee must implement NNR approved processes for the decommissioning of facilities or any part thereof on the site.

(b) The licensee must submit for approval a decommissioning strategy and an initial decommissioning plan, as early as possible in the life cycle of the activity or facility, but no later than 12 months from the date of issue of this licence.

(c) The decommissioning strategy and initial decommissioning plan should be revisited and updated as necessary.

(d) The initial decommissioning plan must address –
(i) Quantities and nature of radioactive material arising from decommissioning activities.
(ii) Envisioned timeframes for the conduct of decommissioning activities; and
(iii) Assessment of decommissioning cost with basis for the assessment and the means of financial resourcing (actual ring-fenced funds) for decommissioning.

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(e) A detailed decommissioning plan must be submitted to the NNR for approval prior to the commencement of decommissioning activities.

(f) It must be demonstrated to the NNR that sufficient resources will be available from the time of cessation of operations until termination of the period of responsibility.

(g) Where appropriate decommissioning may be divided into stages. If so specified by the NNR, the licensee may not commence with nor proceed from one stage of the decommissioning to the next without the prior approval of the NNR.

(h) The licensee must establish and maintain a list of all contaminated areas on the site, which will require decontamination in the future.

(24) Funding for Decommissioning and Radioactive Waste

(a) The licensee must, on an annual basis –
  (i) provide a confirmation of the level of financial resourcing (actual ring-fenced funds) available for decommissioning, and management of radioactive waste as well as;
  (ii) the measures being implemented in the event that the financial resourcing (actual ring-fenced funds) is determined as being insufficient.

(b) The financial resourcing shall be provided by way of –
  (i) A fund established and accepted by the Regulator; or
  (ii) A financial guarantee issued by duly registered bank, or any other bank or financial institution approved by the regulator; or
  (iii) Any other financial instrument acceptable by the regulator.

(c) The financial resourcing must be reviewed and updated annually or if there are material changes.

(d) The right to use the financial resourcing shall be approved by the regulator upon submission by the authorisation holder.

(25) Organisational Capability and Management of Organisational Change

(a) The licensee has the prime responsibility for safety and security of the authorised facility, activities within the facility and radioactive material on the site.

(b) The licensee must provide and maintain adequate financial and human resources to ensure the safe operation and security of the authorised site.

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(c) The licensee must implement NNR approved processes to control any change to its organisational structure or resources that may have a bearing on health, safety, and the environment as contemplated in the Act.

(d) The processes must provide for the classification of changes to the organisational structure or resources according to their safety significance.

(e) The processes must include a requirement for the provision of documentation to justify the safety of the proposed change and shall where appropriate provide for the submission of such documentation to the NNR.

(26) Financial Security

(a) The licensee must annually provide proof to the NNR that any claim for compensation to an amount contemplated in Section 30(2) of the Act can be met.

(27) Public Safety Information Forum

(a) In order to inform the persons living in the municipal area in respect of which an emergency plan has been established, in terms of Section 38(1) of the Act, on nuclear and radiation safety matters, the licensee must establish a Public Safety Information Forum as prescribed.

(28) Self-Inspection Programme

(a) Pursuant to the provisions of Section 26(2) of the Act, the licensee must implement a self-inspection programme to ensure compliance with all conditions of the nuclear installation licence.

(29) Display of the Nuclear Installation Licence

(a) To ensure public access to the conditions specified in this licence, the licensee must at all times display copies of this Nuclear Installation Licence at the entrance to the installation in the following languages – English, SeTshwana and Afrikaans.

(b) The licensee must provide to the NNR documented proof that the translations into SeTshwana and Afrikaans are true and accurate translations of the original English text.

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(30) Implementation of Written Instruction for all Operations that may affect Nuclear Safety, Radiation Safety or Nuclear Security

(a) The licensee must ensure that all operations that may affect nuclear safety, radiation safety or nuclear security are conducted in accordance with written instructions (operating instructions).

(b) The licensee must implement NNR approved processes for the preparation, review, and amendment to all operating instructions.

(c) Said instructions are to be submitted to the NNR for information and whenever any operating instruction is amended or revised said amendments or revisions must be submitted to the NNR within fourteen (14) days of approval of the amendment.

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PART B: SPECIFIED NNR REQUIREMENTS FOR THE SAFARI-1 RESEARCH REACTOR

B-1 The SAFARI-1 Research Reactor facility is authorised to operate until 31 December 2030.

B-2 The reactor is authorised to be operated at thermal powers up to 20 MW under steady state operational conditions using 26 to 31 Low Enriched Uranium (LEU, maximum enrichment of 19.75 ± 0.2% ^{235}U) fuel assemblies and six (6) control rods.

B-3 The approved Operational Technical Specification (OTS) for SAFARI-1 is Document RR-VSK-1000 (Rev. 15): *"Operating Technical Specifications (Standing Orders) for the SAFARI-I Research Reactor".*

B-4 The licensee must comply with the requirements, as per the NNR requirements documents, listed in the table below –

Document number	Description
RD-0014 (Rev 0)	Emergency Preparedness and Response Requirements for Nuclear Installations
RD-0016 (Rev 0)	Requirements for authorisation Submissions Involving Computer Software and Evaluation Models for Safety Calculations
RD-0024 (Rev 0)	Requirements on Risk Assessment and Compliance with Safety Criteria for Nuclear Installations
RD-0026 (Rev 0)	Decommissioning of Nuclear Facilities
RD-0034 (Rev 0)	Quality and Safety Management Requirements for Nuclear Installations
RD-0038 (Rev 0)	Notification of Events at Facilities and Activities Authorised by NNR Nuclear Technology and Waste Projects Department
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-5 The number of in-core bypass passages is limited to the equivalent of thirty-three (33) standard hollow elements for all core configurations.

B-6 Unless otherwise approved by the NNR, the maximum permissible fuel clad temperature, determined for any normal operational or anticipated operational occurrence conditions, is 125°C.

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B-7 Storage of waste drums in K11 Waste Storage Area is limited to a maximum of one hundred and sixty (160) steel drums stacked to a maximum of two (2) tiers high.

B-8 The maximum dose rate for each drum in K11 Waste Storage Area shall not exceed 2000 µSv/h on contact and 1000 µSv/h at a 0.5 m distance.

B-9 Acceptable housekeeping practices must be maintained in the storage of equipment in the K18 Waste Storage Area.

B-10 Stacking of waste in the canal pool is prohibited.

B-11 The reactor pool contains:
(a) 12 high density fuel racks with a capacity of 24 fuel elements;
(b) 3 Low density fuel racks with a capacity of 16 fuel elements; and
(c) 1 Control rod racks with a capacity of 10 control rods.

B-12 Transfers of radioactive material and contaminated equipment from the facility to other facilities on the Pelindaba site must comply with the requirements for on-site transfer and may only be undertaken to facilities that are appropriately authorised to receive said equipment and material.

B-13 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

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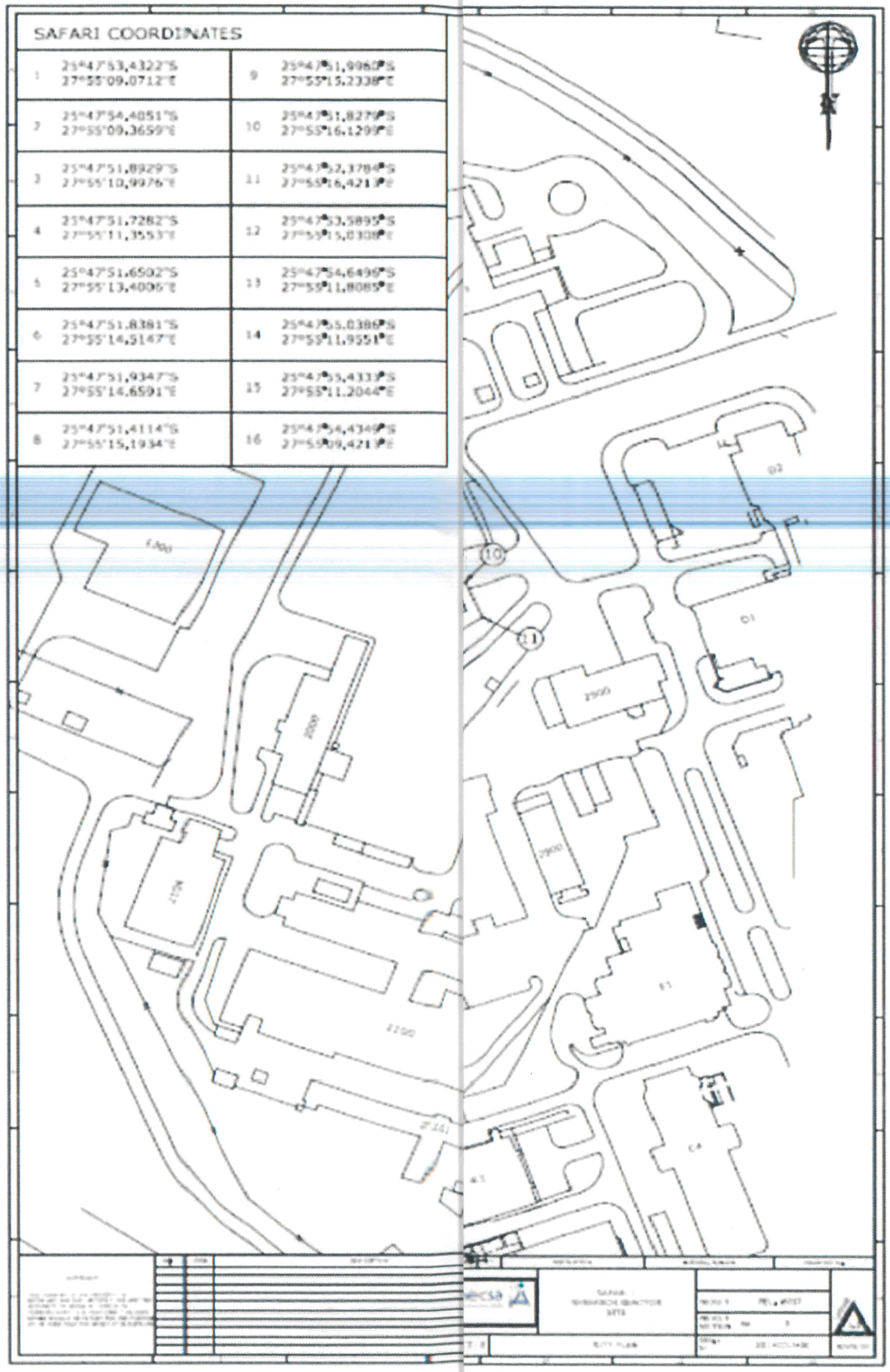


Figure 1: Location of the SFARI

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