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Our reference: NIL38B0001
Your reference:

16 September 2010

Chief Executive Officer
Necsa
P O Box 582
PRETORIA
0001

FOR THE ATTENTION OF DR RM ADAM

Dear Dr Adam

NUCLEAR INSTALLATION LICENCE NIL-38 (VARIATION 0)

1. Please find enclosed one controlled copy of Nuclear Installation Licence No. NIL-38 (Variation 0), being the nuclear authorisation issued to Necsa for the operation of the Fuel Development Laboratories Complex. This document must be controlled in accordance with the Necsa arrangements for controlled documents.

2. The provisions of Nuclear Licence NL27 (Variation 25) are no longer applicable to the Fuel Development Laboratories Complex.

3. The issue of Nuclear Installation Licence No. NIL-38 (Variation 0) –
   i. Gives effect to the Minister's ruling that separate authorisations be issued for the nuclear installations on the Pelindaba site.
   ii. Provides a description of the installation, a clear definition of the scope of actions that may be undertaken by the installation and the associated NNR specified requirements.

4. Please be advised that, with the above-mentioned authorisation now issued to Necsa, the reference numbering for all future correspondence between Necsa and the NNR related to the Fuel Development Laboratories Complex will be as follows:

   i. **Correspondence from Necsa to the NNR:** NIL38AXXXX, where "XXXX" is sequential numbering starting with 0001.

   ii. **Correspondence from the NNR to Necsa:** NIL38BXXXX, where "XXXX" is sequential numbering starting with 0001.

2./..

iii. **NNR Authorisation Requests (NAR's)** will be numbered as follows: NIL38-NAR-XXXX, where "XXXX" is sequential numbering starting with 0001.

iv. **Authorisation Change Requests (ACR's)** will be numbered as follows: NIL38-ACR-XXXX, where "XXXX" is sequential numbers starting with 0001.

v. **Events** will be numbered as follows: NIL38-OCC-XXXX, where "XXXX" is sequential numbers starting with 0001.

5. The issue of this nuclear authorisation does not relieve Necsa of any obligations under any other legislation.

Yours faithfully

Adv BM Mkhize
CHIEF EXECUTIVE OFFICER

NUCLEAR INSTALLATION LICENCE No. NIL-38 (Variation 0)

Nuclear Installation Licence No. NIL-38 (Variation 0) 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 **Fuel Development Laboratories Complex** 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 Fuel Development Laboratories Complex 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 16th day of September 2010

CHIEF EXECUTIVE OFFICER

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 approved processes and or procedures shall be deemed to be licensee processes and or procedures.

c. In these conditions any reference to NNR approved processes and or procedures shall be deemed to be licensee processes and or procedures that have been reviewed and approved by the NNR.

d. The licensee must ensure that once approved no alteration or amendment is made to the NNR approved processes and or procedures unless the NNR has approved 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

The **Fuel Development Laboratories Complex** (FDL) was set up to investigate and to establish the technology for the manufacturing for the manufacturing of PBMR-type nuclear fuel. This includes the investigation and development of new production methods and materials for advance fuel designs.

The Fuel Development Laboratories Complex is located in buildings B-D1, B-D2 and B-C3/C5 on the BEVA site of the Pelindaba West site. These buildings are of concrete and brick construction and the radiologically controlled areas are served with a ventilation system as well as a low activity aqueous effluent system.

Building B-D1 is a 6 level building with 4 levels above ground level and 2 levels below ground level.

Building B-D2 is a 4 level building with 2 levels above ground level and 2 levels below ground level.

Building B-C3/C5 is a 4 level building with 3 levels above ground level and 1 level below ground level.

The Fuel Development Laboratories (FDL) Complex is made up of the following facilities:

- The **Kernel Laboratory** which is located in building B-D2.
- The **Coater Laboratory** which is located in building B-D1.
- The **Graphite Processes Laboratory** which is located in building B-C3/C5.
- **PBMR Quality Control Test Laboratory** which is located in building B-D1.
- **Advanced Coater Facility** which is located in building B-D1.
- The **Uranium Storage Vault** which is located on the third floor in building D1.
- Sections of building **B-C3/C5 under Care and Maintenance**.

a) The **Kernel Laboratory** is located in building B-D2 and occupies the whole of building B-D2. The Kernel Laboratory is used for the development, manufacturing and testing (on laboratory scale) of uranium dioxide (UO_2) kernels for PBMR type fuel.

The objectives of the Kernel Laboratory are to optimise kernel production process parameters and to supply kernels to the other FDL Complex laboratories for development work.

Area D2-0004 in this building is used as the depleted/natural uranium storeroom.

b) The **Coater Laboratory** is located in areas D1-2390, D1-2392 and D1-5310 on the third floor in building B-D1. The Coater Laboratory investigates and develops the coating process of the kernels. Coating of kernels is done by a Chemical Vapour Deposition (CVD) process achieved in a purpose designed 20 kW furnace.

c) The **Graphite Processes Laboratory** is located in areas C5-9113, C5-9114 and C5-9110 in building B-C3/C5. The Graphite Processes Laboratory is used to test and characterise the fuel sphere manufacturing processes. The manufacturing processes are mainly mechanical followed by heat treatment and involves preparation of graphite powders followed by loading in a mould, pressing, machining and heat treatment.

d) **PBMR Quality Control Test Laboratory** is located in areas D1-1113, D1-1303, D1-2120, D1-2121, D1-2131, D1-2150, D1-2250, D1-6100, D1-6200, D1-6222 and D1-6300 in Building B-D1. The PBMR Quality Control Test Laboratory provides analytical service to the Fuel Development Laboratories and analyzes the specified physical and chemical properties of the material utilized in the Fuel Development Laboratories Complex.

The uranium is received in several physical forms, such as solid, liquid (uranium in solution) and gel. The chemical form of the uranium is typically oxide (solids and gels) and nitrate (liquid). The laboratory holds some uranium standards for calibration and verification purposes.

e) **Advanced Coater Facility** (ACF)
The ACF is a 5 kilogram coater and is located in areas D1-2100, D1-2015 and D1-2172 in Building B-D1, with associated equipment in areas D1-2035, D1-2016 and D1-5000.

The ACF is being used to develop the production technology and to optimize the production parameters.

f) The **Uranium Storage Vault**
The Enriched Uranium Storage Vault is located on the third floor of building B-D1 in area D1-1303.

The vault is licensed for storage of uranium enriched up to 10% ^{235}U. The storage is in Safe Geometry Containers (SGC's). The vault has one vault door with 2 keys kept by 2 separate people. The vault is equipped with an electronic motion detection system.

g) **All areas of building B-C3/C5 excluding areas C5-9113, C5-9114 and C5-9110** -
All areas of building B-C3/C5 excluding areas C5-9113, C5-9114 and C5-9110, which is occupied by the Graphite Processes Laboratory are currently under care and maintenance.

3. Scope of Actions that may be undertaken by the Fuel Development Laboratory Complex

a. The **Kernel Laboratory** is authorised for the following activities –
   i. Receipt of natural and depleted uranium in the form of uranium oxide powder.
   ii. Performance of development work to produce UO_2 kernels.
   iii. Sintering of UO_2 kernels.

iv. Storage of:
    1. The associated waste from the development process.
    2. Natural and depleted uranium compounds.
v. Treatment of effluent from the development process.
vi. Transfer of natural/depleted uranium materials to facilities in the FDL Complex authorised to receive said materials.
vii. Treatment and recovering uranium from uranium oxide scrap from fuel manufacturing.
viii. Receipt of waste from the Quality Control Test Laboratory.

b. The **Coater Laboratory** is authorised for the following activities –
   i. Receipt of kernels from the Kernel Laboratory.
   ii. Performance of development work pertaining to the coating of kernels.
   iii. Storage of kernels and coated particles.
   iv. Transfer of kernels and coated particles to facilities authorised to receive said kernels and coated particles.
   v. Receipt of waste from the Quality Control Test Laboratory.

c. The **Graphite Processes Laboratory** is authorised for the following activities –
   i. Receipt of coated particles from the Coater Laboratory.
   ii. Performance of development work in order to produced fuel spheres made up of graphite in which an amount of coated particles are embedded.
   iii. Producing graphite spheres, containing no uranium.
   iv. Storage of coated particles and fuel spheres.
   v. Transfer of coated and over-coated particles and fuel spheres to authorised facilities.
   vi. Receipt waste from the Quality Control Test Laboratory.

d. The **Quality Control Test Laboratory** is authorised for the following activities –
   i. Receipt of various forms of uranium from facilities within the FDL Complex for quality testing.
   ii. Analyses of all the material used in the Fuel Development Laboratories for chemical and physical properties.
   iii. Transfer of generated waste and residual sample back to facility of origin with the FDL Complex.

e. **The Advance Coater Facility** is authorised for the following activities –
   i. Receipt of kernels from the Kernel Laboratory.
   ii. Performance of development work pertaining to the coating of kernels.
   iii. Storage of kernels and coated particles.
   iv. Transfer of kernels and coated particles to facilities authorised to receive said kernels and coated particles.

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v. Receipt of waste from the Quality Control Test Laboratory.

f. The **Uranium Storage Vault** is authorised for the following activities –
   i. Storage of:
      1. Uranium oxides.
      2. Coated particles.
      3. Fuel spheres.
      4. Recovered and scrap material in geometrically safe containers.
      5. Fuel Standards and coated particles in 70 litre drums.

g. **All areas of building B-C3/C5 excluding areas C5-9113, C5-9114 and C5-9110** is authorised for the following activities –
   i. Care and Maintenance activities limited to inspections, radiological protection surveillance monitoring, maintenance and housekeeping;
   ii. Storage of redundant contaminated equipment and waste originating from the decommissioning of the former Y-Plant;
   iii. Transfer of waste generated in the facility to other facilities authorised to receive said wastes.

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 or 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, 2005 Edition, IAEA Safety Standard Series No. TS-R-1, IAEA, Vienna, 2005.

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.

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 inform the NNR in writing of such intention and request the revocation or amendment of the relevant part of the authorisation as appropriate.

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

d. The licensee must prevent persons from carrying out any unauthorised actions on the site.

e. 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.

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

g. 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.

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

i. 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.

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 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.

b. All entries in the health register must be made by an appointed medical practitioner or a person so authorised.

c. The appointed medical practitioner must inform the employee of any medical condition, which could have arisen as a result of occupational exposure to radiation.

d. The licensee must retain the register for a period of at least fifty years from the date of last entry.

e. An employee or former employee must have right of access to his medical records and health register at all times.

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 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.

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

a. The licensee must implement NNR approved processes for the notification, 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.

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 release is made from the site except in accordance with procedures and processes approved by the NNR.

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 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.

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.

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

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. Termination of operation;
   viii. Decontamination; and
   ix. 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.

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 and Safety Management

a. Quality and Safety Management processes and procedures must be established implemented and maintained in respect of all matters that may affect 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 Process Based Licensing (PBL) Manual.

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.

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.

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 plan, as early as possible in the life cycle of the activity or facility. The plan should be revisited and updated as necessary.

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

d. 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.

e. 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.

f. The Licensee must establish and maintain a list of all contaminated areas on the site, which will require decontamination in the future.

24. Organizational Change

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

b. The processes must provide for the classification of changes to the organizational structure or resources according to their safety significance.

c. 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.

25. 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.

26. 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.

27. Inspection Programme

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

28. 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.

PART B-1: SPECIFIED NNR REQUIREMENTS FOR THE KERNEL LABORATORY

B-1.1 The approved Operational Technical Specifications (OTS) for the Kernel Laboratory is document PK-OTS-0001 (Rev 0): *"Kernel Laboratory OTS"*.

B-1.2 The approved Operational Technical Specifications (OTS) for Buildings B-D1 and B-D2 is document PU-OTS-0001 (Rev B): *"Buildings B-D1 and B-D2 OTS"*.

B-1.3 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-1.4 The uranium feed material that may be used in the Kernel Laboratory is limited to depleted uranium and natural uranium only.

B-1.5 The maximum inventory that may be present in the Kernel Laboratory outside of the storeroom described in B-1.6 below is limited to a maximum of 100 kg U only.

B-1.6 The storage of depleted uranium and /natural uranium in the storeroom, situated in area D2-0004, is limited to a maximum of 2000 kgU only.

B-1.7 The Kernel Laboratory may only be operated if the ventilation is functional.

B-1.8 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-1.9 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

PART B-2: SPECIFIED NNR REQUIREMENTS FOR THE COATER LABORATORY

B-2.1 The approved Operational Technical Specifications (OTS) for the Coater Laboratory is document PC-OTS-0001 (Rev 0): "Coating Laboratory OTS".

B-2.2 The approved Operational Technical Specifications (OTS) for Buildings B-D1 and B-D2 is document PU-OTS-0001 (Rev B): *"Buildings B-D1 and B-D2 OTS"*.

B-2.3 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-2.4 The uranium feed material that may be used in the Coater Laboratory is limited to depleted uranium and natural uranium only.

B-2.5 The maximum inventory that may be present in the Coater Laboratory is limited to a maximum of 100 kg U only.

B-2.6 The Coater Laboratory may only be operated if the ventilation is functional

B-2.7 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-2.8 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

BM.

PART B-3: SPECIFIED NNR REQUIREMENTS FOR THE GRAPHITE PROCESSES LABORATORY

B-3.1 The approved Operational Technical Specifications (OTS) for the Graphite Processes Laboratory is document PS-OTS-0001 (Rev 0): *"Graphite Laboratory OTS"*.

B-3.2 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-3.3 The uranium feed material that may be used in the Graphite Processes Laboratory is limited to depleted uranium and natural uranium only.

B-3.4 The maximum inventory that may be present in the Graphite Processes Laboratory is limited to a maximum of 50 kg U only.

B-3.5 The Graphite Processes Laboratory may only be operated if the ventilation is functional

B-3.6 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-3.7 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

PART B-4: SPECIFIED NNR REQUIREMENTS FOR THE QUALITY CONTROL TEST LABORATORY

B-4.1 The approved Operational Technical Specifications (OTS) for the Quality Control Test Laboratory is document PQ-OTS-0001 (Rev 0): *"PBMR Quality Control Laboratory OTS"*.

B-4.2 The approved Operational Technical Specifications (OTS) for Buildings B-D1 and B-D2 is document PU-OTS-0001 (Rev B): *"Buildings B-D1 and B-D2 OTS"*.

B-4.3 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-4.4 The uranium feed material that may be used in the Quality Control Test Laboratory is limited to depleted uranium and natural uranium only.

B-4.5 The maximum inventory that may be present in the Quality Control Test Laboratory is limited to a maximum of 15 kg U only.

B-4.6 The Quality Control Test Laboratory may only be operated if the ventilation is functional

B-4.7 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-4.8 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

PART B-5: SPECIFIED NNR REQUIREMENTS FOR THE ADVANCED COATER FACILITY (ACF)

B-5.1 The approved Operational Technical Specifications (OTS) for the Advanced Coater Facility is document PC-OTS-0002 (Rev A): "Advanced Coater Facility *Operating Technical Specifications (OTS)*".

B-5.2 The approved Operational Technical Specifications (OTS) for Buildings B-D1 and B-D2 is document PU-OTS-0001 (Rev B): *"Buildings B-D1 and B-D2 OTS"*.

B-5.3 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-5.4 The uranium feed material that may be used in the Advanced Coater Facility is limited to depleted uranium and natural uranium only.

B-5.5 The maximum inventory that may be present in the Advanced Coater Facility is limited to a maximum of 45 kg U only.

B-5.6 The Advanced Coater Facility may only be operated if the ventilation is functional

B-5.7 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-5.8 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

PART B-6: SPECIFIED NNR REQUIREMENTS FOR THE URANIUM STORAGE VAULT

B-6.1 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-6.2 The uranium enrichment of material stored in this vault is limited to a maximum of 10% enriched in the ^{235}U isotope with the exception of the material referenced in B-6.7 below.

B-6.3 Uranium stored in this vault may only be stored in Safe Geometry Containers (SGCs).

B-6.4 The Safe Geometry Containers (SGCs).in this vault may not be stacked on top of each other.

B-6.5 No uncontained uranium may be handled in this Storage Vault.

B-6.6 The number of Safe Geometry Containers (SGCs) that may be stored in this Storage Vault is limited to a maximum of sixty six (66) Safe Geometry Containers (SGCs) only.

B-6.7 The storage of Fuel Standards and coated particles in 70 litre drums:

ii. Is limited to three (3) 70 litre drums only.
iii. Is limited to 0.042 kg of ^{235}U only.
iv. The maximum enrichment of these standards and coated particles is limited to < 20% enriched in the ^{235}U isotope.

B-6.8 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-6.9 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

BM.

PART B-7: SPECIFIED NNR REQUIREMENTS FOR THE SECTIONS OF BUILDING B-C3/C5 UNDER CARE AND MAINTENANCE

B-7.1 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
LD-1079 (Rev 1)	Requirements in Respect of Licence Change Requests to the National Nuclear Regulator

B-7.2 Storage of radioactively contaminated equipment is limited to that originating from the operations of the facility only.

B-7.3 Transfers of radioactive material or radioactively 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 authorized to receive said equipment and material.

B-7.4 No off-site transfer of radioactive material or radioactively contaminated equipment may be undertaken by the facility without prior NNR approval.

B-7.5 Further decommissioning of the facility requires prior NNR approval which must be applied for under an Authorisation Change Request (ACR).

B-7.6 The facility must maintain a NNR approved care and maintenance programme.

B-C3 & B-C5	B-C1	B-C2
COORDINATES	COORDINATES	COORDINATES
1 25°47' 03.3"S 27°55' 32.1"E	1 25°47' 01.3"S 27°56' 21.0"E	1 25°47' 00.1"S 27°55' 20.7"E
2 25°47' 55.6"S 27°55' 23.6"E	2 25°47' 52.4"S 27°56' 21.0"E	2 25°47' 50.3"S 27°55' 20.8"E
3 25°47' 58.0"S 27°55' 23.6"E	3 25°47' 52.4"S 27°56' 21.6"E	3 25°47' 50.5"S 27°55' 20.6"E
4 25°47' 56.6"S 27°55' 23.6"E	4 25°47' 52.7"S 27°56' 21.3"E	4 25°47' 49.7"S 27°55' 20.4"E
5 25°47' 57.1"S 27°55' 22.6"E	5 25°47' 53.2"S 27°55' 20.1"E	5 25°47' 49.8"S 27°55' 20.0"E
6 25°47' 56.8"S 27°55' 22.4"E	6 25°47' 52.4"S 27°56' 20.0"E	6 25°47' 49.2"S 27°55' 20.3"E
7 25°47' 55.6"S 27°55' 22.3"E	7 25°47' 53.7"S 27°55' 19.7"E	7 25°47' 49.6"S 27°55' 19.8"E
8 25°47' 54.9"S 27°55' 20.6"E	8 25°47' 54.3"S 27°56' 19.3"E	8 25°47' 50.1"S 27°55' 20.4"E
9 25°47' 53.8"S 27°55' 21.0"E	9 25°47' 52.0"S 27°56' 20.0"E	9 25°47' 49.6"S 27°55' 20.5"E
10 25°47' 53.7"S 27°55' 21.0"E		10 25°47' 50.1"S 27°55' 20.8"E
11 25°47' 53.4"S 27°55' 21.0"E		11 25°47' 50.6"S 27°55' 21.1"E
		12 25°47' 50.8"S 27°55' 21.6"E
		13 25°47' 51.6"S 27°55' 21.3"E
		14 25°47' 51.4"S 27°55' 21.2"E

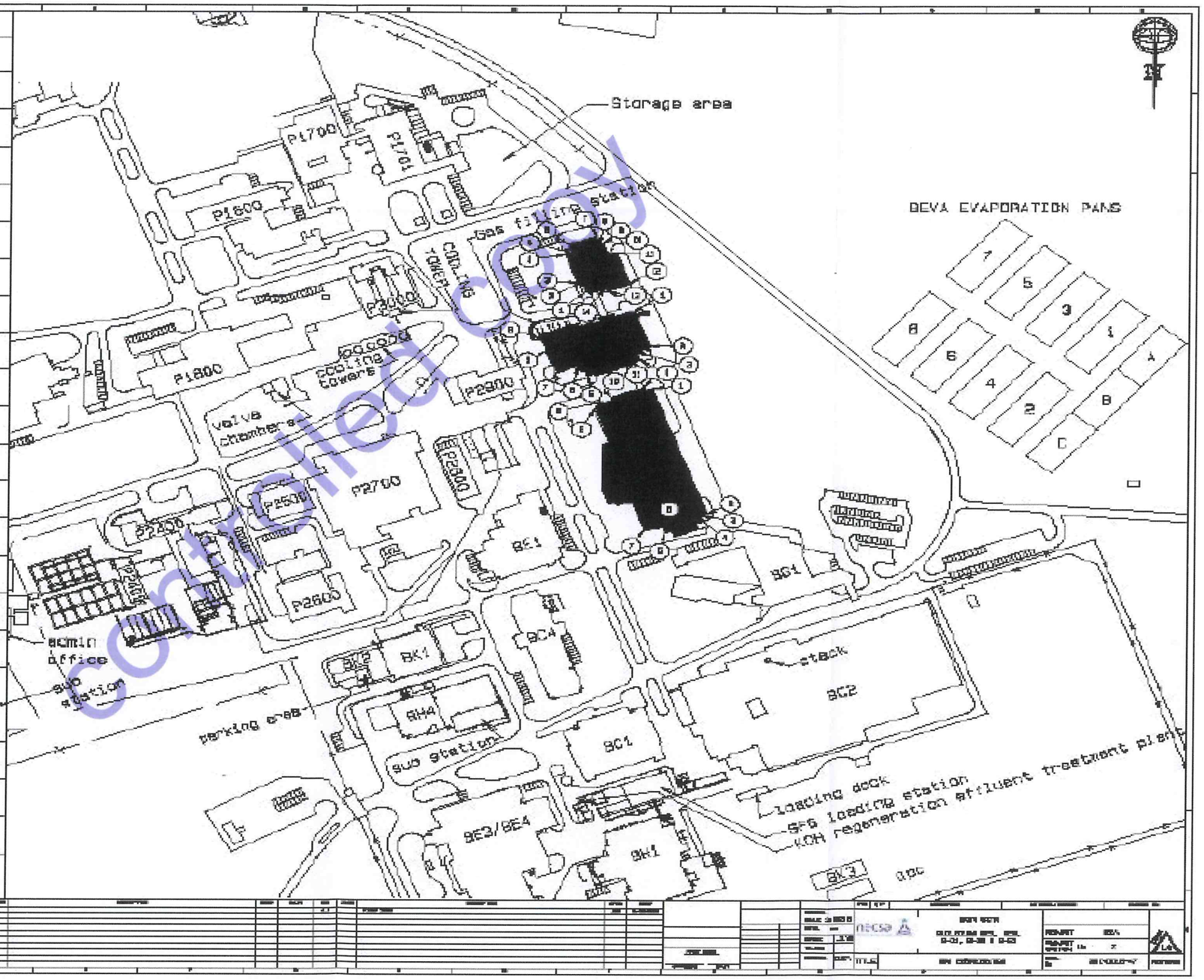

Figure 1: Location of Fuel Development Laboratory Complex on the Pelindaba site