



# NATIONAL NUCLEAR REGULATOR

*For the protection of persons, property and the environment against nuclear damage.*

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**Our reference:** k10000806N

9 October 2013

**Senior Manager (Nuclear Licensing)  
c/o Nuclear Licensing  
Koeberg Nuclear Power Station  
Private Bag X10  
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Dear Sir

## **KOEBERG NUCLEAR POWER STATION: KOEBERG NUCLEAR INSTALLATION LICENCE NIL-01 VARIATION 18**

Please find attached Variation 18 of NIL-01. The variation has been made for two reasons:



- To transfer the operational requirements on the use of dry storage casks to a directive for consistency with the rest of the licence.
- Removal of the revision numbers of documents referred to in the licence and to capture these in directives issued by the NNR for consistency with other authorisations issued by the NNR.

The changes are summarised as follows:

### Operational requirements on the use of dry storage casks

Sections 3.7 to 3.9 of Variation 17 address operational restrictions on the use of the Castor X/28F casks as follows:

3.7 Loading of Framema spent fuel into Castor X/28F casks. Each spent fuel assembly must have a maximum concentration not exceeding 3,25%, have spent a minimum period of 10 years in spent fuel pool storage, and have an average burnup not exceeding 35,6 GWd/t.

3.8 Transport of Castor X/28F casks each loaded with up to 28 spent fuel assemblies between the Fuel Buildings of Unit 1 or 2 and the designated area in the Low Level Waste Building, henceforth referred to as the Cask Storage Building.

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3.9 Storage of a maximum of 4 Castor X/28F casks in the Cask Storage Building until 31 March 2013.

These requirements are now captured in a directive entitled:

**KOEBERG NUCLEAR POWER STATION: NNR DIRECTIVE: STORAGE, AND TRANSPORT ON-SITE, OF SPENT FUEL IN SPENT FUEL DRY STORAGE CASKS**

Sections 3.7 to 3.9 of Variation 17 are replaced with the following:

3.7 Storage, and transport on-site, of spent fuel in spent fuel dry storage casks in accordance with NNR Directive "Storage, and Transport On-Site, of Spent Fuel in Spent Fuel Dry Storage Casks".

This removes the operational detail from the main text of NIL-01 for consistency with regulatory control of all other aspects of plant operations.

Removal of the revision numbers of documents

The motivation is that NNR procedures would require a new variation of NIL-01 whenever a revision number of a document in the appendix to NIL-01 is changed. To avoid unnecessary administration, and to harmonise NIL-01 more closely with other authorisations, the appendix to NIL-01 has been removed and the revision numbers will be captured in a directive issued by the NNR whenever a revision number of a document is changed.

In this regard the following changes have been made:

Inclusion of the wording "All documents referred to in this licence are the versions as directed by the NNR" added to front page.

Removal of the appendix to NIL-01

The words "...in the revision specified in the appendix to this Licence.." are removed from the following sections of NIL-01:

1.4	1.5	2.1	2.2	4.1	4.4	4.5	4.6
4.7	5.1	6	6.1	6.2	7.1	8.1	9.1
10.1	10.3	11.1	12.1	16.1	17.3	17.4	18.4

The wording of 11.1 has been changed to reflect the reference previously given in the appendix. The wording has been changed from:

Transport of radioactive material or any equipment or objects contaminated with radioactive material off site must comply with the relevant provisions of the

International Atomic Energy Agency's "Regulations for the Safe Transport of Radioactive Material" in the edition specified in the appendix to this Licence.

To:

Transport of radioactive material or any equipment or objects contaminated with radioactive material off site must comply with the relevant provisions of the International Atomic Energy Agency Safety Standard Series, No. TS-R-1 "Regulations for the Safe Transport of Radioactive Material".

The revision numbers of the documents referred to in NIL-01 Variation 18 are stipulated in a directive entitled :

**KOEBERG NUCLEAR POWER STATION: NNR DIRECTIVE: REVISION NUMBERS OF DOCUMENTS REFERRED TO IN NIL-01 VARIATION 18**

Please address all correspondence to the Manager: Koeberg Programme.

Yours faithfully



**T Hill**  
**Manager: Koeberg Programme**



**NUCLEAR INSTALLATION LICENCE NO. NIL-01**  
**(Variation 18)**

In terms of section 21 of the National Nuclear Regulator Act (Act No. 47 of 1999)  
Nuclear Licence No. NIL-1 (Variation 17), granted

to

**ESKOM**

for

the construction and operation of the nuclear installation known as KOEBERG  
"A" NUCLEAR POWER STATION, situated on the site of Cape Farm No. 34, also  
known as Duynefontein, in the magisterial district of Malmesbury in the Western  
Cape,

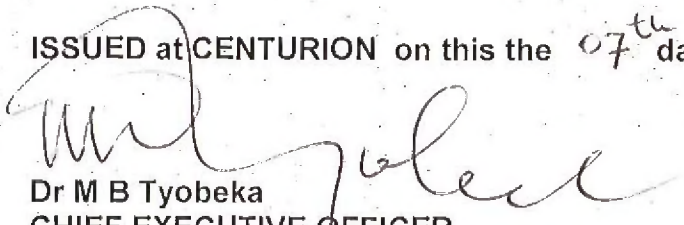
is hereby varied

in terms of section 23 of the National Nuclear Regulator Act .

The conditions identified below or later revisions to these conditions as are  
approved by the National Nuclear Regulator, (hereinafter referred to as the  
Regulator) must be adhered to.

All documents referred to in this licence are the versions as directed by the NNR.

ISSUED at CENTURION on this the 07<sup>th</sup> day of October 2013.

  
Dr M B Tyobeka  
CHIEF EXECUTIVE OFFICER  
NATIONAL NUCLEAR REGULATOR

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## LICENCE CONDITIONS

### 1.0 PLANT DESCRIPTION AND CONFIGURATION

- 1.1 The installation comprises two three-loop pressurised water reactor units with their turbine generators and associated plant, each unit designed for a gross fission power output of 2775 MW thermal.
- 1.2 The fuel design of fuel assemblies, including lead assemblies, and associated fuel rods must be approved by the Regulator prior to use in the Koeberg reactors.
- 1.3 The Regulator's approval for the use of any particular fuel design must be based upon the Licencee's justification of the fuel's anticipated satisfactory performance under specified operating conditions. The Regulator's approval is given via the acceptance of the reload core design for each specific reactor reload as required under Condition 17.4.

Furthermore, the Regulator's re-approval is required for every change in the Plant's operating conditions where this change will have an impact upon the fuel's performance.

- 1.4 Modifications to the plant must be carried out in accordance with the requirements of the LD-1012: "Requirements in Respect of Proposed Modifications to the Koeberg Nuclear Power Station".
- 1.5 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:
  - Control of Plant Design and Configuration
  - Modifications made to the plant or any other change which may impact on nuclear safety.

### 2.0 SAFETY ASSESSMENT

- 2.1 The Safety Assessment of the installation, which includes the probabilistic risk analysis, must be updated on a regular basis, at a frequency acceptable to the regulator, and reflect the current status of the installation, the site and its environs.

The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

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- The safety assessment of the installation.
  - The risk assessment and demonstration of compliance with the safety criteria of the NNR in accordance with the requirements of RD-0024: "Requirements on Risk Assessment and Compliance with Principal Safety Criteria for Nuclear Installations".
- 2.2 The Licensee must comply with the provisions specified in KAA-709 "Process for Performing Safety Evaluations, Screenings, and Safety Justifications".

### 3.0 SCOPE OF ACTIVITIES THAT MAY BE UNDERTAKEN

The scope of activities undertaken under the authority of this Licence must be limited to the following:

- 3.1 Transport to and from site and the handling and storage on site of fuel assemblies and fuel pins, whether new, irradiated or dummy.
- 3.2 Loading of fuel assemblies into and the handling of such assemblies from the reactors of units 1 and 2.
- 3.3 Operation of the reactors of units 1 and 2 at any power level up to 2775 MW thermal.
- 3.4 Processing of material comprising, containing or contaminated with radioactive material, other than that contained in irradiated fuel assemblies, by concentration and storage on site of solid wastes and by treatment and disposal, as normal operational discharges, of radioactive gaseous and liquid effluent.
- 3.5 Transport to and from site and the storage and use on site of radioactive material other than nuclear fuel as well as items contaminated with radioactive material.
- 3.6 The possession on site of any artificial radioactive nuclides, other than that contained in radioactive waste and spent nuclear fuel, and the use thereof by any competent party, subject to such provisions for the use and control of such radioactive material as are contained in this Licence.
- 3.7 Storage, and transport on-site, of spent fuel in spent fuel dry storage casks in accordance with NNR Directive "Storage, and Transport On-Site, of Spent Fuel in Spent Fuel Dry Storage Casks".

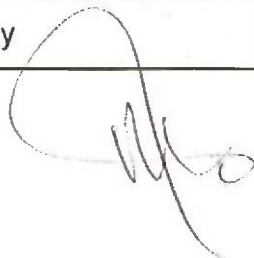


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#### 4.0 CONTROLS AND LIMITATIONS ON OPERATION

- 4.1 The station must be operated in accordance with the Operating Technical Specifications and the provisions specified in 36-197: "Koeberg Licensing Basis Manual".
- 4.2 The control room and the emergency shut-down panel controls must be manipulated only by individuals licensed by the Regulator as reactor operators or senior reactor operators, except that a trainee operator may manipulate the controls as part of his training under the direction and in the presence of a licensed reactor operator or senior reactor operator. Access to the emergency shut-down panel and work on the emergency shut-down panel must only be undertaken in the presence of a licensed reactor operator or senior reactor operator.
- 4.3 Two operators licensed by the Regulator must be present at the controls in the control room of each reactor at all times after the first fuel assembly has been loaded into the core and until such time as all fuel assemblies have been unloaded from the core.
- 4.4 All reactor operators and senior reactor operators licensed by the Regulator must comply with the requirements of LD-1081: "Requirements for Operator Licence Holders at the Koeberg Nuclear Power Station".
- 4.5 All candidates for reactor operator and senior reactor operator licences must comply with the requirements of LD-1092: "Requirements for Initial Operator Licensing at Koeberg Nuclear Power Station".
- 4.6 The simulator used in the initial and requalification training of reactor and senior reactor operators must comply with the requirements of LD-1093: "Requirements for the Full Scope Operator Training Simulator at Koeberg Nuclear Power Station".
- 4.7 The Licensee must comply with the provisions and requirements relating to the medical evaluation of nuclear power plant personnel, as contained in LD-1077: "Requirements for Medical and Psychological Surveillance and Control".
- 4.8 Fuel assemblies must be stored in the fuel buildings of Unit 1 and 2 in the following areas, manner and quantities in respect of each fuel building:

AREA	MANNER	QUANTITY
New fuel storage area	Dry	60 assemblies (maximum)





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Spent fuel pool	Under water	1536 assemblies (maximum) provided that sufficient storage space is maintained in the spent fuel pool to permit complete unloading of the fuel in the reactor.
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## 5.0 MAINTENANCE AND IN-SERVICE INSPECTION

5.1 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

- In-service inspection of components, including the monitoring of the reactor pressure vessels for radiation embrittlement.
- Monitoring and maintenance of the plant.
- Inspection, Survey, Testing and Monitoring of the Containment Structures, Aseismic Bearings including upper and lower raft, and the Soil Cement Sub-foundation.

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## 6.0 OPERATIONAL RADIATION PROTECTION

The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding radiation protection.

### 6.1 Radiation Dose Limitation

Radiation doses to persons occupationally exposed to ionising radiation on the site, to other persons on the site and to members of the public, arising from operations at the site, discharge of effluent from the site and transport of any item or material from the site, must be in compliance with the system of dose limitation specified in RD-0022: "Radiation Dose Limitation at Koeberg Nuclear Power Station".

### 6.2 Radiation Protection Organisation

The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

- Radiation protection organisation.

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- Operational radiation protection, artificial radioactive nuclides (other than that contained in radioactive waste and spent nuclear fuel), training and medical control of radiation workers, radiation monitoring instrumentation, respiratory protection, optimisation of protection, radiological surveillance and radiation shield verification, together with reviews and technical audits thereof.
- The requirements relating to personnel dosimetry together with reviews and technical audits thereof.

6.3 A Health Register must be maintained in a form approved by the Regulator. Entries in the Health Register must be certified by an Appointed Medical Practitioner. This register must be retained by the Licensee for a period of fifty years from the date of the last entry.

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

After consent has been obtained from the employee or former employee, as the case may be, the Licensee must, on the request of the NNR provide access to the employee's medical records and health register. The NNR may, with the consent of the employee or former employee, as the case may be, appoint an independent medical practitioner to assist in the conduct of a review of said records.

6.4 A Radiation Dose Register must be maintained in a form approved by the Regulator. This register must be retained by the Licensee for a period of fifty years from the date of the last entry.

## 7.0 EFFLUENT MANAGEMENT

7.1 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

- Control over the discharge of radioactive material in liquid and gaseous effluent together with reviews and technical audits thereof.
- The discharge of radioactive material in liquid and gaseous effluent.

## 8.0 WASTE MANAGEMENT

8.1 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the generation, processing and disposal of radioactive waste and reviews and technical audits thereof.

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## 9.0 ENVIRONMENTAL MONITORING

9.1 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

- Environmental monitoring programme together with reviews and technical audits thereof.
- Meteorological monitoring programme together with reviews and technical audits thereof.

## 10.0 EMERGENCY PLANNING AND PREPAREDNESS

10.1 The Licensee must comply with the requirements of RD-014: "Emergency Preparedness and Response Requirements for Nuclear Installations".

10.2 The Licensee must establish a Public Safety Information Forum in order to inform the persons, living in the municipal area for which an emergency plan has been established, on nuclear and radiation safety matters.

10.3 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding the following:

- An emergency plan being established and maintained in a state of preparedness and being subject to reviews and technical audits.
- Management and mitigative measures to be taken as a result of a severe accident.
- Responsibilities and training of staff in severe accident management.

## 11.0 TRANSPORT

11.1 Transport of radioactive material or any equipment or objects contaminated with radioactive material off site must comply with the relevant provisions of the International Atomic Energy Agency Safety Standard Series, No. TS-R-1 "Regulations for the Safe Transport of Radioactive Material".

## 12.0 PHYSICAL SECURITY

12.1 The Licensee must comply with the provisions specified in 36-197: "Koeberg Licensing Basis Manual" regarding physical security.



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### 13.0 DECOMMISSIONING

- 13.1 The Licensee must implement processes for, and submit to the Regulator for approval, the decommissioning strategy and plan for the nuclear installation or any part thereof on site.
- 13.2 The Licensee must demonstrate to the Regulator the availability of sufficient resources to enable the implementation and completion of decommissioning activities.

### 14.0 FINANCIAL SECURITY

- 14.1 The Licensee must on an annual basis provide proof to the NNR that any claim for compensation to an amount contemplated in section 30(2) of the act, can be met.

### 15.0 INSPECTION PROGRAMME

- 15.1 The Licensee must implement an inspection programme to ensure compliance with all conditions of the nuclear installation licence.

### 16.0 QUALITY MANAGEMENT

- 16.1 All activities embodied in the scope of this Licence must comply with the requirements of quality management contained in LD-1023: "Quality Management Requirements for Koeberg Nuclear Power Station".

### 17.0 ACCEPTANCE AND APPROVAL

- 17.1 Movement of fuel into, out of or within either reactor core may take place only with the prior approval of the Regulator.
- 17.2 Neither unit may be brought to criticality after shut-down for refuelling or after shut-down caused by or consequent upon an accident, except with the written approval of the Regulator.
- 17.3 A request for a change to a licence condition or to any document referred to in this Licence must be made in accordance with the requirements of LD-1079: "Requirements in Respect of Licence Change Requests to the National Nuclear Regulator".

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17.4 For each reactor reload the Licensee must submit to the Regulator for its acceptance the core design documentation as specified in 36-197: "Koeberg Licensing Basis Manual". This documentation must be submitted prior to the planned criticality of the core.

## 18.0 REPORTS

- 18.1 An accounting and operating records system must be established and maintained to the satisfaction of the Regulator and reports must be made available to the Regulator of all fuel movements and consequent changes in material balances and fuel inventories, if so requested by the Regulator.
- 18.2 Reports on the operation of the station must be submitted to the Regulator at periods determined by the Regulator and must contain such information as may be required by the Regulator from time to time.
- 18.3 Test results of the Soil Cement Sub-foundation referred to in Condition 5.1 must be reported to the Regulator in such a form that changes of properties can be related to time and that trends are made visible.
- 18.4 Occurrences as identified in LD-1000 "Notification Requirements for Occurrences Associated with Koeberg Nuclear Power Station" must be reported to the Regulator in accordance with the provisions of that document and as required by RD-0025 "Emergency Communication with the National Nuclear Regulator".

## 19.0 GENERAL

- 19.1 Notwithstanding the provisions of the above conditions, the Licensee must not permit any part of the plant to be modified or any procedure to be amended in any manner which would be contrary to the safety requirements of the Regulator.
- 19.2 The Licensee must ensure the implementation and maintenance of a safety culture program to encourage a questioning and learning attitude to radiation protection and nuclear safety and to discourage complacency.
- 19.3 The Licensee must not permit any activities on site that are not directly or indirectly necessary for the operation of the nuclear installation. Any development on the site must be place bound in compliance with the Structure Plan for the region.

This Licence is effective from the date of issue.

