

Licence No.: FANR/NF/2020/001/Rev. 1

Amended Licence for the Operation of Unit One of the Barakah Nuclear Power Plant

Under the powers provided in Articles (5), (6), (26)(1) and (28)(3)(a) of the Federal Law by Decree No. 6 of 2009 Concerning the Peaceful Uses of Nuclear Energy (the Law), and having considered that the proposed activities of Nawah Energy Company P.J.S.C. comply with the requirements of the Law and applicable FANR regulations, the Federal Authority for Nuclear Regulation (the Authority) hereby amends and replaces the 'Licence for the Operation of Unit One of the Barakah Nuclear Power Plant' (Licence No. FANR/NF/2020/001, issued on 16 February 2020), and hereby grants this amended Licence (the Licence) - to:

Nawah Energy Company P.J.S.C. (the Licensee)

being a private joint stock company established in Abu Dhabi (industrial licence No: IN-2003241).

This Licence authorises the Licensee to conduct the following Regulated Activity set forth in Article (25)(5) of the Law:

Operation of a Nuclear Facility¹

and related Regulated Activities listed in Section 1 of Schedule 1 of this Licence.

The Licence conditions are set forth in Schedule 2. The description of the Barakah NPP Unit 1 and its Operation is provided in the Licence application documents referenced in Schedule 3 and the Licensee's commitments associated with the issuance of this Licence are described in a document referenced in Schedule 3. Schedule 4 provides for interpretation of certain terms used in this Licence.

This Licence shall remain in force until:

- it is suspended or revoked by the Authority;
- it is amended by the Authority;
- it is surrendered by the Licensee, subject to acceptance by the Authority;
- the Authority issues a Licence for Decommissioning of the Barakah NPP Unit 1; or
- the expiry of sixty (60) years from the date of issuance of Licence No. FANR/NF/2020/001, issued on 16 February 2020.

This Licence is granted without prejudice to any future decision of the Authority regarding the Operation of the Barakah NPP Unit 1.

¹ For the purposes of the Licence, the Nuclear Facility is Unit One of the Barakah Nuclear Power Plant, hereinafter referred to as "Barakah NPP Unit 1".

Description of Amendments to Licence No. FANR/NF/2020/001 (issued on 16 February 2020):

- 1) revised description of the authorised Regulated Activities listed in Section 1(a) and Section 1(d) of Schedule 1
- 2) addition of a new authorised Regulated Activity in Section 1(e) of Schedule 1
- 3) revised wording of Licence conditions 1(a), 1(b), 1(f), 2(a), 2(b), 4(c), 6, 6(b)(2)(ii)(2), 6(b)(3)(i), 6(b)(3)(ii), 6(c)(i), 8, 9(a), 9(b), 9(c), 9(e), 10(b), 10(c)(i), 10(c)(vi), 10(c)(vii), 10(d), 13 and 14(a) in Schedule 2
- 4) deletion of Licence condition 2(e) and Licence condition 6(b)(1) in Schedule 2
- 5) addition of a new paragraph in Licence condition 5(b) and Licence condition 6(c)(ii) in Schedule 2
- 6) addition of a new Licence condition 15 in Schedule 2; and
- 7) addition of new references in Schedule 3.



Abdulla At Suwaidi

Chairman of the Board of Management of the Federal Authority for Nuclear Regulation

Issued in Abu Dhabi

08 March 2021

The Licence comprises this page, the preceding page and the following schedules, which together form an integral part of the Licence:

- Schedule 1: (1 page) Regulated Activities Authorised
- Schedule 2: (6 pages) Licence Conditions
- Schedule 3: (1 page) Application Documents and Commitments
- Schedule 4: (1 page) Interpretation

Any reference to 'schedule' in the Licence means a reference to a schedule of this Licence.

Schedule 1

Regulated Activities Authorised

1. This Licence authorises:
 - a) Commissioning, including with Nuclear Fuel, and Operation at maximum of a total Nuclear Reactor core heat transfer rate to the Nuclear Reactor coolant of 3,983 MW thermal power of the following Nuclear Facility: Barakah NPP Unit 1 located in Al Dhafra region of the Emirate of Abu Dhabi, United Arab Emirates, as described in the Licence application documents referenced in Schedule 3 (Application Documents);
 - b) possession, use, handling and storage of nuclear material directly associated with the Operation of the Barakah NPP Unit 1;
 - c) import, export or re-export of nuclear material and regulated items directly associated with the Operation of the Barakah NPP Unit 1;
 - d) possession, use, handling, storage, import or export of Radioactive Material and radiation generators supporting the Operation of the Barakah NPP Unit 1, as well as Radioactive Material and radiation generators associated with the Safety and Nuclear Security of the Barakah NPP Unit 3 and Unit 4.
 - e) The transportation within the State of unirradiated Nuclear Fuel for the Operation of the Barakah NPP Unit 1.
2. The Licensee is required to obtain all necessary Licence(s) from the Authority for the conduct of any other Regulated Activity.
3. The Licensee shall obtain all necessary licences, permits and authorisations from other government entities for the conduct of any Regulated Activities authorised by the Authority under this Licence and update the Authority on any change relating to the aforementioned licences, permits and authorisations.

Schedule 2

Licence Conditions

This Licence is subject to and the Licensee shall comply with the Licence conditions specified and incorporated below:

1. Law, Regulations, Licence and the Licensee's submissions:

The Licensee shall conduct the Regulated Activities authorised by this Licence in accordance with:

- The Law, and any amendment thereto;
- The Federal Law by Decree No. 4 of 2012 Concerning Civil Liability for Nuclear Damage (the Nuclear Liability Law), and any amendment thereto;
- The applicable regulations issued by the Authority pursuant to the Law and Nuclear Liability Law;
- The terms and conditions of this Licence;
- The Licensee's commitments associated with the issuance of this Licence and described in a document referenced in Schedule 3; and
- The Application Documents, as updated pursuant to Licence conditions 5, 14(a) and 14(c), inclusive of documents referenced in the Application Documents, included as attachments to the Application Documents or submitted under separate cover.

2. Safeguards obligations:

- The Licensee shall maintain up-to-date, complete and correct design information in the format of a design information questionnaire (DIQ) for the Barakah NPP Unit 1 and in the level of details specified by the Authority that reflects the "as built" design of the Barakah NPP Unit 1. The Licensee shall submit the DIQs to the Authority in accordance with the requirements for the provision of design information included in the applicable regulations (the Submitted DIQs). Any changes requested by the Authority to the Submitted DIQ shall be completed by the Licensee and submitted to the Authority within twenty (20) working days.
- The Licensee shall conduct the Regulated Activities authorised by this Licence, including but not limited to the category, quantity and purpose of use of nuclear material, involved in the conduct of such Regulated Activities, in a manner consistent with the relevant Submitted DIQ.
- The Licensee shall conduct the Regulated Activities authorised by this Licence in accordance with the Licensee's procedures for physical inventory taking and nuclear material accountancy and control that have been approved in writing by the Authority (the Approved Safeguards Procedures).
- The Licensee shall notify the Authority in writing about any changes in the Approved Safeguards Procedures. Any changes proposed by the Licensee to the Approved Safeguards Procedures, which may affect the application of the safeguards obligations, the physical inventory taking of nuclear material or the nuclear material accountancy and

control at the Barakah NPP Unit 1 shall be approved by the Authority in writing prior to their implementation by the Licensee.

3. Transfer of Licence:

This Licence, any part hereof, or any right hereunder shall not be transferred or assigned, either voluntarily or involuntarily, directly or indirectly, through any transfer of control of this Licence or transfer of control of the Licensee to any Person.

4. Modifications:

The Licensee shall:

- Obtain written approval of the Authority prior to implementing modifications that may result in significant implications for Safety, safeguards, or which may have an impact on the Licensee's liability for nuclear damage or financial security. In evaluating the significance of the modification, the Licensee shall use the guidance provided by the Authority.
- Obtain written approval of the Authority prior to implementing changes to the Physical Protection plan in accordance with the relevant regulations issued by the Authority.
- Keep records of all modifications, analyses and evaluations either in support of approval of requests in accordance with Licence condition 4(a) or in support of conclusions that the modifications did not require approval of the Authority.

5. Update of documents:

The Licensee shall:

- Submit to the Authority an updated Final Safety Analysis Report within six (6) months after each refuelling outage at the Barakah NPP Unit 1;
- Submit an update of the Probabilistic Risk Assessment (PRA) Summary Report after each modification that may affect significantly the results of the PRA or in absence of such modifications to submit a regular update every three (3) years. The first regular update of the PRA Summary Report shall be submitted to the Authority three (3) years after beginning of commercial Operation of the Barakah NPP Unit 1;
- Annually provide to the Authority the following:
 - a renewed insurance or financial security in the amount, extent determined by the Nuclear Liability Law and of such type, terms and from sources approved by the Authority; and
 - a renewed industrial licence of the Licensee.

6. Reporting:

The Licensee shall provide reports to the Authority in accordance with the relevant regulations issued by the Authority and specific requests by the Authority. In addition, the Licensee shall provide reports in accordance with Licence conditions 6(a), 6(b) and 6(c). Items reported in accordance with the regulations issued by the Authority do not require additional reporting under Licence conditions 6(a), 6(b) and 6(c).

a) Regular Reporting

The Licensee shall provide quarterly reports to the Authority on the Barakah NPP Unit 1 operational performance, operating data and Physical Protection in accordance with the guidance provided by the Authority.

b) Event Reporting:

1. Not Used

2. Prompt Notification

- i. The Licensee shall notify the Authority within four (4) hours of discovery of a Nuclear Security event in accordance with the guidance provided by the Authority.
- ii. The Licensee shall notify the Authority within twelve (12) hours of discovery by the Licensee of:
 - 1) any violation of the conditions of this Licence;
 - 2) any Accident or event having occurred during the conduct of the Regulated Activities authorised by this Licence that affects or has the potential to affect and have implications for Safety or safeguards;
 - 3) any incident or circumstances leading the Licensee to believe there is or there may have been a loss or loss of control of nuclear material;
 - 4) any event that prevents the ability of the International Atomic Energy Agency or the Authority's ability to verify nuclear material involved in the Regulated Activities authorised by this Licence;
 - 5) any incident or circumstances leading the Licensee to believe there is or there may have been an interference in the operation of safeguards containment or surveillance device or other equipment, including data transmission equipment, installed at the Barakah NPP Unit 1.

3. Follow up Reporting

- i. For the prompt notifications required by Licence conditions 6(b)(2), the Licensee shall submit to the Authority an initial report within forty-eight (48) hours, which shall include, inter alia, the date, description and circumstances of the reported event.
- ii. Unless specified otherwise by the Authority or in the relevant regulations, the Licensee shall submit to the Authority a final report within sixty (60) days of each prompt notification referred to in Licence condition 6(b)(2) above.

c) Other Reporting

- i. The Licensee shall notify the Authority within seven (7) days of discovery by the Licensee of any claim concerning nuclear third party liability made or filed before a court against the Licensee, and any payment effected by the Licensee in fulfilment of a compensation claim under the Nuclear Liability Law.
- ii. The Licensee shall annually provide the Authority with an inventory that includes records of the location and description of each radiation generator and Radioactive Source. The activity and form of each Radioactive Source shall be specified in the inventory.

7. Access to facilities and documents, and assistance:

The Licensee shall provide the Authority and its authorised representatives with access to any place, to any document, record or report or to any person under the Licensee's control or the control of any of the Licensee's affiliates, contractors, subcontractors, suppliers, agents or other legal entities acting on behalf of the Licensee, and shall provide all assistance necessary to enable the Authority to inspect in accordance with the Law the conduct of the Regulated Activities authorised by this Licence.

8. Records:

The Licensee shall develop, maintain and implement arrangements for making and retaining adequate and detailed records of compliance with the conditions and requirements of this Licence and shall retain all the foregoing records as required by Licensee's Quality Assurance Program approved by the Authority.

9. Operating Limits and Conditions:

The Licensee shall comply with the operating limits and conditions specified in technical specifications and "Operating Limits and Conditions for the Structures Systems and Components (SSCs) credited in Severe Accidents" in the Application Documents as follows:

- The technical specifications and "Operating Limits and Conditions for SSCs credited in Severe Accidents" shall not be modified by the Licensee without prior approval of the Authority; these documents are not within the scope of Licence condition 4.
- The basis of technical specifications and "Operating Limits and Conditions for SSCs credited in Severe Accidents" are not considered as part of the technical specifications and may be modified in accordance with Licence condition 4.
- Temporary deviation from technical specifications and "Operating Limits and Conditions for SSCs credited in Severe Accidents" shall be authorised by the Authority in exceptional circumstances after a written application by the Licensee and written approval of the Authority.
- The Licensee shall verify that all SSCs in "Operating Limits and Conditions for SSCs credited in Severe Accidents" are fully functional before a return to power operations (MODE 1) following a refuelling outage.
- After exceeding any Safety limit for the Barakah NPP Unit 1, the Licensee shall obtain a written approval from the Authority prior to return to power operations (MODE 1).

10. Inspection and Testing:

The Licensee shall have an Inspection and testing program, as applicable, for all the items important to safety, which shall meet the following requirements:

- For in-service Inspection and testing, the Licensee shall:
 - Apply American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI 'Rules for In-service Inspection of Nuclear Power Plant Components', along with the limitations and supplementary provisions, ASME BPVC edition and addenda acceptable to the Authority.
 - For SSCs not covered under ASME BPVC, Section XI, apply ASME Code for Operation and Maintenance of Nuclear Power Plants (ASME OM Code) edition and addenda acceptable to the Authority, along with the limitations and supplementary provisions.
- The Licensee shall develop and apply an Inspection and testing program for non-ASME code items important to safety, where Inspection and test requirements shall be commensurate with the Safety significance of the SSCs.
- For the Inspection and testing programme for all items important to safety, the Licensee shall:

- i. For each Inspection interval for the duration of this Licence, submit an Inspection and testing program to the Authority at least three (3) months prior to its implementation. The Inspection intervals shall be in accordance with the codes and standards applicable to the Inspection and testing program. For non-ASME code items important to safety, such Inspection intervals shall be commensurate with their Safety significance.
 - ii. Submit to the Authority revisions to the Inspection and testing program, along with justification for such revisions and alternate Inspection and testing programme proposals, at least three (3) months prior to implementing such revisions.
 - iii. Submit to the Authority outage scope Inspection and testing program for each refuelling outage at the Barakah NPP Unit 1 at least three (3) months prior to its implementation by the Licensee.
 - iv. Submit to the Authority a summary report of the outage scope Inspection and testing results within three (3) months of the completion of Inspection and testing for each refuelling outage, including the results of the Inspection and testing conducted during the Barakah NPP Unit 1 operating cycle, if any. The summary report shall include changes in the refuelling outage scope Inspection and testing due to emerging issues, if any, along with reasons and justifications for such changes.
 - v. Submit to the Authority an integrated Inspection and testing report for the complete Inspection interval within six (6) months of completing the planned Inspection and testing for the applicable Inspection interval.
 - vi. Submit to the Authority an agreement and supporting procedures with an authorised inspection agency (AIA), qualified per ASME QAI-1 standard to provide services for activities related to SSCs, including but not limited to those required under ASME BPVC Section XI and its referenced codes and standards. In case of any changes in the agreement including a change to its terms and conditions, in the supporting procedures, change of the AIA and termination of the agreement with the AIA, the Licensee shall promptly resubmit these documents to the Authority.
 - vii. Submit to the Authority detailed information related to the performance demonstration of the applied non-destructive examination methods applied where applicable, in accordance with ASME BPVC Section XI.
- d) The Licensee shall develop and apply a material surveillance program for the Nuclear Reactor pressure vessel at the Barakah NPP Unit 1 in accordance with the guidance provided by the Authority.

11. Refuelling Outages:

The Licensee shall receive prior written approval of the Authority before returning to power operations (MODE 1) following a refuelling outage.

12. Limited Scope Periodic Safety Review:

The Licensee shall carry out a limited scope periodic Safety reviews in accordance with the guidance provided by the Authority covering the first five (5) years of the commercial Operation of the Barakah NPP Unit 1. The Licensee shall submit to the Authority, within one year of the completion of five (5) years of commercial Operation of Barakah NPP Unit 1, a report thereon. The report shall include but not limited to the lessons learned

from operating experience and the implications of the site-specific conditions on the Safe Operation of the Barakah NPP Unit 1.

13. Possession and use of Radioactive Material and radiation generators:

The Licensee shall establish, implement and maintain the protection and safety programme required by the Authority for possession and use of Radioactive Material and radiation generators supporting the Operation of the Barakah NPP Unit 1, as well as Radioactive Material and radiation generators associated with the Safety and Nuclear Security of the Barakah NPP Unit 3 and Unit 4.

14. Corporate Governance:

- a) The Licensee shall notify the Authority of:
 - i. any material changes to the Licensee's corporate identity and/ or Licensee's governance structure prior to making such changes;
 - ii. any change in the list of reserved matters in Section 5.7 of the Nawah Energy Company Shareholders' Agreement not later than thirty (30) days after the said changes are made;
 - iii. a decision of its Board of Directors to remove from duties any senior officer not later than thirty (30) days after the said decision is made;
 - iv. any other material changes to the governance arrangements in Application Documents not later than sixty (60) days after the said changes are made;
- b) At no time shall the Chief Executive Officer, General Counsel or Chief Nuclear Officer of the Licensee simultaneously be a Senior Officer of either the Emirates Nuclear Energy Corporation (ENEC) or Barakah One Company.
- c) The Licensee shall provide to the Authority annually upon the issuance of this Licence updated copies of the governance related Application Documents, unless otherwise specified by the Authority.

15. Transport Security Plan:

- a) The Licensee shall provide the Authority with a transport security plan for each transportation of unirradiated Nuclear Fuel for the Operation of Barakah NPP Unit 1 and shall obtain prior written approval of the Authority before the transportation takes place.
- b) The Licensee shall notify the Authority in writing at least three (3) working days before the proposed date and time of the transportation of unirradiated Nuclear Fuel, and shall receive confirmation of receipt of the notification from the Authority before such transportation takes place.
- c) The Licensee shall provide to the Authority a written report on the results of the implemented transport security plan for each transportation of unirradiated Nuclear Fuel to the Barakah NPP Unit 1 within thirty (30) days after the said transportation is completed. This report shall include, inter alia, any deficiencies in the physical protection system noted during the transportation.

Schedule 3

Application Documents and Commitments

1. Barakah Nuclear Power Plant Units 1 and 2 (Barakah NPP 1&2) - Operating License Application (ENEC Letter ENA-FANR-15-0087L, dated 26 March 2015)
2. Barakah NPP Units 1 and 2 Operating License Application – Updated List of Application Documents Supporting Unit 1 Operating License (Nawah Letter LRA-FANR-LTR-20-0029, dated 10 February 2020)
3. Barakah NPP Unit 1 – Commitments Associated with Unit 1 Operating License Issuance (Nawah Letter LRA-FANR-LTR-20-0022, dated 30 January 2020)
4. Barakah Nuclear Power Plant Units 1, 2, 3 & 4 - Nawah Request for Amendment of the BNPP Unit 1 Operating License and Submittal of a Supplement to BNPP Units 2, 3 and 4 Operating License Applications to Authorize Transportation of Unirradiated Nuclear Fuel (Nawah Letter LRA-FANR-LTR-20-0283, dated 15 December 2020)

Schedule 4

Interpretation

1. Capitalized terms used but not defined in this Licence shall have the meaning ascribed to them in Article (1) of the Federal Law by Decree No. 6 of 2009 Concerning the Peaceful Uses of Nuclear Energy and in Article (1) of the Federal Law by Decree No. 4 of 2012 Concerning Civil Liability for Nuclear Damage.
2. The terms "nuclear material", "nuclear material accountancy" and "physical inventory" shall have the meaning ascribed to them in Article (1) of Authority's Regulation for the System of Accounting and Control of Nuclear Material and Application of Additional Protocol (FANR-REG-10), as amended by the Authority.
3. The term "import", "export", "re-export" and "regulated items" shall have the meaning ascribed to them in Article (1) of Authority's Regulation for the Export and Import Control of Nuclear Material, Nuclear Related Items and Nuclear Related Dual-Use Items (FANR-REG-09), as amended by the Authority.