

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 346/MP/2022**

**Coram:  
Shri I.S.Jha, Member  
Shri Arun Goyal, Member  
Shri P.K.Singh, Member**

**Date of Order: 6<sup>th</sup> December, 2022**

**In the matter of**

Petition seeking permission to continue interchange of infirm power including drawl of start-up power under Deviation Settlement Mechanism (DSM) beyond the prescribed period of six months from the date of first synchronisation i.e beyond 9.1.2023 till declaration of commercial operation date of KAPP-3 or up to 9.7.2023, whichever is earlier.

**And  
In the matter of**

Nuclear Power Corporation of India Limited (NPCIL),  
Nabhikiya Urja Bhavan/ Vikram Sarabhai Bhavan,  
Anushaktinagar,  
Mumbai, Maharashtra – 400094

**...Petitioner**

**Vs.**

Western Regional Load Dispatch Centre,  
F-3, MIDC Area, Andhri (East),  
Mumbai-400 094

**...Respondent**

**ORDER**

This Petition has been filed by the Petitioner, Nuclear Power Corporation of India Limited, under Clause (7) of Regulation 8 of the Central Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium term Open access in inter-State transmission and related matters) Regulations, 2009 (hereinafter referred to as “the Connectivity Regulations”) with the following prayers:

*“(a) Permit inter-change of infirm power including drawl of start-up power under Deviation Settlement Mechanism (DSM) beyond 9.1.2023 till declaration of Commercial Operation Date of KAPP-3 or 9.7.2023, whichever is earlier.*

*(b) Pass such order(s) as deemed fit by the Commission.”*

2. Kakrapar Atomic Power Project 3 and Project 4 of the Petitioner is located at Kakrapar, Surat District in the State of Gujarat and is being implemented in two stages consisting of Unit-I and Unit-II of 700 MW each. The project is first indigenous 700 MW Pressurised Heavy Water Reactor (PHWR).

3. The Commission in its order dated 1.6.2022 in Petition No. 144/MP/2022 had allowed to draw the start-up power and to inject infirm power into the grid for commissioning tests including full load test of Kakrapar Atomic Power Project 3 (in short 'KAPP-3') up to 9.1.2023. The Petitioner has submitted that KAPP-3 was first synchronized with the grid on 10.1.2021. However, it could not be declared under commercial operation due to the following reasons:

(a) In KAPP-3, various 'First of A Kind (FOAK) Systems' i.e. Passive Decay Heat Removal System and Containment Spray System, etc. have been provided for enhancement of safety features of the plant. As per the guidelines of Atomic Energy Regulatory Board (AERB), various experiments, namely, phase-C physics experiments, secondary cycle system performance tests and TG full load rejection, etc. are required to be demonstrated successfully at lower power before raising to full power. This has added to delay in completing full load testing. Since KAPP-3 employing partial boiling of Primary Heat Transport (PHT) system, stage-wise clearance will be given for full power operation after detailed review.

(b) KAPP-3 achieved the milestone of first synchronisation with the grid on 10.1.2021 and, thereafter, started injecting infirm power into the grid. Reactor power was raised in steps to 50% of full power. In order to ensure the effective cooling of pump room air, several modifications were carried out in pump room ventilation system. KAPP-3 was shut down from 28.4.2021 for implementing the required modifications to address temperature and ventilation issues in areas of reactor building which are not accessible during the unit operation.

(c) As the Plant design contains many new design features, resolution of issues which were observed during power operation up to 50% FP have necessitated further analysis and in-depth review at several tiers of NPCIL and regulatory body, namely AREB.

(d) After implementing the modifications and following reviews at several tiers of NPCIL and AEREB, permission for trial un at 50% FP was granted by AREB in July, 2022 to evaluate the effectiveness of the modifications carried out. KAPP-3 reactor was made critical on 18.7.2022. TG was synchronized with Western grid on 20.7.2022. Reactor power was raised in steps to 50% FP and thereafter, the generator has been injecting infirm power of approximately 350 MW into the grid. As on 1.11.2022, the unit has generated 635.35 Mus.

(e) The efficacy of these modifications was assessed with reactor power at 50% FP. The structural modifications are found to be satisfactory, but there is a need to further augment heat removal capacities to achieve the margins required for full power operation. Based on the assessment and data analysis, an independent chilled water system was installed to augment the heat removal capacity at reactor building for which unit was shut down for around two months. Further, stage-wise clearance from AERB for power raise beyond 50% FP upto 100% FP will be obtained after successful installation and commissioning of independent chilled water system.

(f) Since KAPP-3 & 4 is India`s flagship project for 700 MWw PHWR fleet mode of reactors being constructed at different sites in India, the successful resolution of design issues is of prime importance so that these modifications can be implemented in all other projects including KAPP-4.

4. The Petitioner has submitted the current status of works and milestones of KAPP-3 as under:

(a) After completion of commissioning activities and obtaining the regulatory clearance from AERB, the reactor was made critical on 22.7.2020.

(b) First synchronization of KAPP-3 generator was done on 10.1.2021 and KAPP-3 had been injecting infirm power into the grid.

(c) From 28.4.2021 to 20.7.2022, unit was under shut down to carry out various modification works in areas of reactor building, which are not accessible during unit operation.

(d) After completion of these modifications, reactor was made critical and TG was synchronized on 20.7.2022. Reactor power was raised in steps to 50% FP for trial run to evaluate efficiency of the modifications.

(e) After review of the data, it was decided to install and commission an independent chilled water system to augment the heat removal capacity. This activity is expected to be carried out in December, 2022 to January, 2023.

(f) Clearance for stage-wise power raise beyond 50% FP upto 100% FP would be obtained from AREB after successfully demonstrating the efficacy of the modification.

(g) KAPP-3 would be re-started only after implementation of independent chilled water system. Further raising of reactor power beyond 50% FP upto 100% FP would be done in steps and after getting stage-wise clearance from AREB. Balance testing including full load testing would be carried out after raising reactor power to FP.

5. The Petitioner has submitted that due to reasons beyond its control, it could not declare commercial operation of KAPP-3.

6. The Petition is admitted by circulation.

### **Analysis and Decision**

7. The Petitioner has submitted that due to increase in temperatures in certain areas of reactor building, KAPP-3 was shut down for implementing the required modification to address temperature & ventilation issues. Therefore, the commissioning and testing activities of KAPP-3 were delayed. Accordingly, the

Petitioner has sought permission for inter-change of infirm power including drawl of start-up power up to 9.7.2023 or actual date of commercial operation of KAPP-3, whichever is earlier.

8. We have considered the submissions of the Petitioner. The fourth, fifth and sixth provisos to Regulation 8(7) of the Connectivity Regulations provide as under:

*"Provided that the Commission may in exceptional circumstances, allow extension of the period for inter-change of power beyond the period as prescribed in this clause, on an application made by the generating station at least two months in advance of completion of the prescribed period:*

*Provided further that the concerned Regional Load Despatch Centre while granting such permission shall keep the grid security in view:*

*Provided also that the infirm power so interchanged by the unit(s) of the generating plant shall be treated as deviation and the generator shall be paid/charged for such injection/drawal of infirm power in accordance with the provisions of the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014, as amended from time to time or subsequent re-enactment thereof."*

9. We are of the view that non-availability of start-up power or not allowing injection of infirm power may hamper the progress of commissioning work resulting to further delay in declaration of COD of KAPP-3. Accordingly, we finding it an exceptional circumstance, hereby allow the Petitioner to draw the start-up power and further to inject the infirm power into the grid for commissioning tests including full load test of KAPP-3 up to 9.7.2023 or actual date of commercial operation, whichever is earlier. We expect the Petitioner to make all sincere efforts to ensure the synchronization of KAPP-3 of the project by this date. It is reiterated that the Petitioner shall approach RLDC for necessary permission which is required to be granted after considering the grid security.

10. Accordingly, the Petition No.346/MP/2022 is disposed of in terms of paragraph 9 of this order. Let an extract copy of the order be provided to the RLDC for needful and compliance.

**Sd/-  
(P.K. Singh)  
Member**

**sd/-  
(Arun Goyal)  
Member**

**sd/-  
(I.S. Jha)  
Member**