

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 408/MP/2014

Coram:

**Shri Gireesh B.Pradhan, Chairperson
Shri M. Deena Dayalan, Member
Shri A.K.Singhal, Member
Shri A.S.Bakshi, Member**

Date of Hearing : 27.10.2014

Date of Order : 10.11.2014

In the matter of

Petition seeking Commission`s permission to continue injection of infirm power in Southern Grid till declaration of COD of Unit-I of Kudankulam Nuclear Power Project or 22.1.2015, whichever is earlier.

And

In the matter of

Nuclear Power Corporation of India Ltd.,
Nabhikiya Urja Bhawan,
Anushaktinagar, Mumbai-400 094

...Petitioner

Vs

1. The Member Secretary
Southern Regional Power Committee,
29, Race Course Cross Road, Bangalore-560 009
2. General Manager (Commercial)
Power Grid Corporation of India Limited,
Southern Regional Transmission System-II
Pragati Mahalakshmi, South Block (2nd and 3rd Floor)
No. 62, 3rd Cross MEI Road, Industrial Suburb
Yashwantpura, Bangalore-560 022
3. Executive Director
Power System Operation Corporation (POSOCO) SRLDC
29, Race Course Road, Bangalore-560 009



4. The Chief Engineer (Planning)
T.N. Generation and Distribution Corporation Ltd.
6th Floor, Eastern Wing, 144 Anna Salai, Chennai-600 002
 5. The Chief Engineer/Corporate Planning TRAC
Kerala State Electricity Board,
8th Floor, Vidyuthi Bhawanam,
Pattom, Thiruvananthpuram-695 004
 6. Director (Commercial)
State Power Purchase Co ordination Committee
Power Company of Karnataka Ltd.
Kaveri Bhawan, Bangalore-560 009
 7. The Superintending Engineer
Puducherry Electricity Department
137, NSC Bose Road, Puducherry-605001
 8. Chief Engineer (Commercial)
A.P. Power Coordination Committee
Vidyut Soudh, Khairatabad
Hyderabad-500 082
- ..Respondents**

Parties present:

Shri Sandeep Sarwate, NPCIL
Shri S.Mulklalwar, NPCIL

ORDER

This petition has been filed by the petitioner, Nuclear Power Corporation of India Ltd. seeking permission of the Commission for injection of infirm power into the grid during testing including full load testing beyond the period of 6 months from the date of first synchronization up to the declaration of the commercial operation of the unit-I of Kudankulam Nuclear Power Project (2X1000 MW) (hereinafter referred to as 'the project') in terms of 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 ('Connectivity Regulations') as amended from time to time.

2. The petitioner in this petition has submitted that Unit-I (unit) of project was test synchronized on 22.10.2013 and since then it is injecting infirm power into the grid. The project is First of its Kind (FOK) units being commissioned in India. Numerous commissioning tests are to be performed at various stages of commissioning of the unit to evaluate the system responses to various transients. The test results are to be evaluated internally and submitted to regulatory authority i. e . Atomic Energy Regulatory Board (AERB) for review. The consent for proceeding to the next stage of commissioning is obtained from regulatory authorities. This is a repetitive process till AERB grants permission for continuous operation of the unit at 100% full power before declaration of COD.

3. The Commission vide its order dated 16.7.2014 in Petition No. 158/MP/2014 had allowed injection of infirm power from the unit of the project for testing including full load testing till 22.10.2014 or upto the declaration of commercial operation of the unit, whichever is earlier. The petitioner has submitted that due to problems in the turbine, COD could not be achieved by 22.10.2014. The petitioner has submitted that first and 2nd stage turbine blades and diaphragm have been damaged which are being replaced by taking from



Unit-II. The replacement of blades and diaphragm would take about from 7 to 8 weeks time. Therefore, the COD is expected to be achieved by 22.1.2015.

4. The petitioner has submitted the current status of tests of unit of the project as under:

(a) The tests of Phases A and B have been completed before synchronization. Unit of the project was synchronized with grid on 22.10.2013. Subsequently, all tests of Phase C1 were carried out and were completed on 3.1.2014. On 24.1.2014, clearance from AERB was obtained to carry out Phase C2 activities which were started on 24.1.2014. The petitioner has submitted that the following transients and dynamic tests are conducted:

- (i) Testing of reactor characteristics;
- (ii) Testing of loss of power to the station;
- (iii) Turbine trip test;
- (iv) Test of turbine partial load changes; and
- (v) Testing of tripping of one feed water pump.

(b) Since number of tests involve electrical load connection or disconnection of the project from the grid, permission of SRLDC was required to be taken for conduct of tests. On number of times as per the request of SRLDC, tests involving load changes were postponed to



accommodate the grid exigencies requirements. Certain deficiencies were found during testing which needed shutdown of the reactor to rectify and repeat the tests.

(c) The test result of Phase C 2 was submitted to AERB for review and seeking clearances to conduct next phase of commissioning activities i.e. Phase C3 tests. After satisfactory review, AERB accorded clearance to conduct set of Phase C3 commissioning tests with following stipulations:

(a) Conduct Phase C3 test at 90% power level and submission of the results for review and clearance for conduct of Phase C3 tests at 100% power level.

(b) Conduct Phase C3 test at 100% power level and stable operation of unit for a period of seven days and submission of test results for review and granting permission for continuous operation of Unit.

(d) After obtaining clearance from AERB on 1.5.2014, power was raised to 90% FP. Tests of Phase C3 at 90% power level were started on 5.5.2014. The next stage i.e. Phase C-3 activities started after 101 days from the start of Phase C-2. The petitioner has submitted that the following major tests were carried out during 90% FP stage:

(a) Testing of reactor characteristics;



(b) Gross load rejection test; and
(c) System response to various simulated transients.

(e) After completion of 90% FP test, tests reports were submitted to AERB. Subsequent to satisfactory review by AERB, clearance was obtained on 20.5.2014 for power raise beyond 90% FP up to 100% FP for conduct of Phase-C3 commissioning tests at 100% power level. On 7.6.2014, power was raised to 1000 MW. During the course of conducting of Phase C-3 tests, unit tripped on three occasions on disturbances in secondary side during the tests- preparation/test. Fine tuning of secondary side controllers were also carried out. Phase C3 commissioning test at 100% power level could be started on 20.6.2014. The petitioner has submitted that the following transients and dynamic tests are conducted:

- (a) Testing of reactor characteristics;
- (b) System Response to tripping of one reactor coolant pump and two reactor coolant pumps;
- (c) Passive heat removal system (PHRS) performance;
- (d) System response to one of Turbine Driven Feed Pump switched off;
- (e) Net Load Rejection Test (NLRT);
- (f) Response of Reactor Automatic Power Controller to various disturbances; and
- (g) All the dynamic tests involving power changes are done in close coordination with SLRDC. Clearance from Southern grid/SLRDC is



given based on the overall power situation and tests are normally planned accordingly.

5. The petitioner has submitted that the next activity i.e. unit cold shutdown for Containment Integrated Leak Rate Test (ILRT) as per AERB stipulation was started after 70 days from the start of phase C-3. In addition to mandatory containment ILRT test, other maintenance activities and surveillance tests were also taken up. The test results were submitted to AERB for its review and application seeking permission for restart of unit after cold shutdown and using reactor power to 100% FP. After satisfactory review, AERB accorded clearance for operation of the unit up to 100% FP for limited duration (phase C-3 stage) till 31.12.2014 with following stipulations:

(i) NPCIL should submit separate application for Regular Operation along with submissions as per the requirements specified in AERB Codes/Safety Guides for review.

(ii) After the cold shutdown, unit was synchronized to grid on 15.7.2014 and COD was planned in the month of September 2014, well before 22.10.2014. However, while raising power, an increase in turbine thrust bearing temperature was observed and the temperature touched the operational limit on reaching power level of 850 MW. For attending this technical problem, turbine-generator was taken off the bar and reactor was shut down on 26.9.2014. Turbine high pressure casing is being dismantled



to carrying out inspection of the turbine and identify the problem along with specialists of the turbine manufacturer from Russian Federation.

6. The petitioner has submitted that though it was estimated that all the tests and outage for mandatory containment leak rate test would be completed by 22.10.2014, however, rectification of the technical turbine related problem may take two more months.

7. No reply has been filed by the respondents.

8. During the course of hearing on 27.10.2014, the representative of the petitioner reiterated the submission made in the petition.

9. We have considered the prayer of the petitioner. The fourth proviso to Regulation 8 (7) of the Connectivity Regulations, as amended from time to time, provides 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."

10. The petitioner has submitted that after cold shut down, unit was synchronized into the grid on 15.7.2014 and COD was planned in September 2014, well before 22.10.2014. However, while raising power, an increase in turbine thrust bearing temperature was observed and the temperature touched the operational



limit on reaching power level of 850 MW. For attending to the technical problem, Turbine-Generator was taken off the bar and reactor was shut down on 26.9.2014. The petitioner has submitted that Turbine High pressure casing is being dismantled for carrying out inspection of the turbine and identify the problem along with specialists of the turbine manufacturer from Russian Federation. The petitioner has submitted that technical problem relating to the turbine would be resolved by 22.12.2014 and one month time has been sought for eventualities during the above rectification work.

11. Taking into consideration the technical problem faced by the petitioner, we allow extension of time for injection of infirm power into the grid for the commissioning tests including full load test of unit up to 22.1.2015. We direct the petitioner to file the status of rectification work by 30.12.2014.

12. With the above, the Petition No. 408/MP/2014 is disposed of.

Sd/-
(A.S.Bakshi)
Member

sd/-
(A.K.Singhal)
Member

sd/-
(M. Deena Dayalan)
Member

sd/-
(Gireesh B. Pradhan)
Chairperson

