

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 9/MP/2016

Coram:

Shri Gireesh B.Pradhan, Chairperson

Shri A.K.Singhal, Member

Shri A.S.Bakshi, Member

Dr. M.K.Iyer, Member

Date of Hearing: 08.3.2016

Date of order: 16.5.2016

In the matter of

Petition under Section 79(1) (c) and Section 79(1) (k) of the Electricity Act, 2003 read with 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 and Regulation 111-113 (Inherent Powers) and Regulation 115 (Power to Remove Difficulties) of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999.

And

In the matter of

Petition seeking connectivity of NHPTL Laboratory with 765 kV & 400 kV Bus at ISTS Bina sub-station of POWERGRID for bay charging at No Load initially further at on Load for Short Circuit Testing of Electricity Equipment and for that purpose, approval of the connections agreement for No Load and On Load conditions under Central Electricity Regulatory Commission (Grant of Connectivity, Long Term Access and Medium Term Open Access in inter-State Transmission and related matters) Regulations, 2009

And

In the matter of

National High Power Test Laboratory Pvt. Ltd.
First Floor, Core-8, Scope Complex,
7, Area, Lodhi Road, New Delhi-110 003

....Petitioner

VS.

1. Power Grid Corporation of India Limited
'Saudamini', Plot No. 2
Sector-29, Gurgaon-11 001

2. Power System Operation Corporation of Limited
B-9, Qutub Institutional Area,
Katwarisarai, New Delhi-110 066

3. Central Electricity Authority,
Sewa Bhawan, R.K.Puram, New Delhi-110 066.

4. Western Regional Load Despatch Centre
F-3, MIDC Area, Marol, Andheri (East), Mumbai-400 093

5. Central Power Research Institute (CPRI)
PB N O. 8066, Sir C V Raman Road,
Sadashivanagar, Bangalore-650 080

6. Madhya Pradesh Power Transmission Corporation Ltd.
Shakit Bhawan, Jabalpur, Madhya Pradesh

..Respondents

The following were present:

Ms. Swapna Seshadri, Advocate for the petitioner
Ms. Pragya Singh, POSOCO
Shri Ashok Rajan, POSOCO
Shri S.R. Narasimahan, POSOCO
Ms. Jyoti Prasad, PGCIL
Shri Swapnil Verma, PGCIL
Shri R.K.Malviya, MPPTCL

ORDER

The petitioner, National High Power Test Laboratory Pvt. Ltd.(NHPTL), has filed the present petition seeking connectivity of NHPTL`s laboratory with 765 kV and 400 kV Bus at ISTS Bina sub-station of PGCIL for bay charging at No Load initially and further at On Load for short circuit testing of electrical equipment and for approval of the Connection Agreement for No Load and On Load conditions under 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).

2. Gist of the submission of the petitioner is as under:

(a) On 1.9.2008, Hon`ble Minister of State for Power, Government of India convened a meeting to set up an ‘Online High Power Test Laboratory’ in India by a Joint Venture company formed by equal equity participation amongst

NTPC, NHPC, PGCIL and DVC. Accordingly, the petitioner was incorporated as a Joint Venture company of NTPC, NHPC, PGCIL and DVC on 22.5.2009 with an equity debt ratio of 40:60 to set up a Laboratory with 765 kV and 400 kV Bus at ISTS Bina sub-station of PGCIL for On-Line Short Circuit Testing of electrical equipment.

(b) At present there is no facility in India which can do short circuit test of transformers rated above 90 MVA or transformers above 220 kV. Therefore, in view of the planned capacity expansion, it has become imperative for having equipment testing facility of high capacity within the country at par with international standards.

(c) The issue with regard to connection of the petitioner's laboratory to Western Grid at Bina 765/400 kV sub-station was discussed in the 30th and 39th Standing Committee Meetings of Western Region held on 8.7.2010 and 30.11.2015, respectively. CEA vide letter dated 8.9.2010 conveyed its concurrence after getting confirmation from the petitioner that in case of fault during transformer testing, the protection would be provided by an instantaneous relay at test facility.

(d) After completion of erection of extension bays No. 401, 402, 425, 701, 702 and 713, CEA vide its letter dated 23.10.2015, granted its clearance for charging these bays to the petitioner. Accordingly, the petitioner sent the CEA's clearance to PGCIL Bina and requested PGCIL to charge the bay Nos. 401, 425, 702 and 713 at No Load. In response, PGCIL vide its email dated 6.11.2015 intimated the petitioner that it being the owner of the laboratory, had

problem to apply, on its own, to WRLDC for obtaining charging code for No Load charging and execute a connection agreement.

(e) The issue was discussed with CTU. The petitioner was advised to submit a draft No Load Agreement for approval to CTU which was submitted to CTU on 13.11.2015. The issue was further discussed with POSOCO. POSOCO directed the petitioner to execute connection agreement for both No Load and On Load connectivity in terms of CEA's notification dated 21.2.2007.

(f) The petitioner vide its letter dated 30.12.2015 requested POWERGRID Bina/RHQ Vadodara to install of SEM's at NHPTL 765/400 kV at the earliest. The petitioner has taken the permanent connection from MPPKVVNL and installed the energy meters for meeting the auxiliary power requirement. The point of connection for the auxiliaries is on the State grid and is not related to the point of testing which needs to be carried on the ISTS.

(g) The test facility is ready. However, the petitioner is facing connectivity problem as it does not fall under the category of "applicant" as defined in the Regulation 2 (b) of the Connectivity Regulations. Therefore, the petitioner has filed the present petition as a special case.

3. Against the above background, the petitioner has prayed as under:

(a) Exercise the powers under Section 79 (1) (c) read with Regulations 111 and 113 read with Regulation 115 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and permit connectivity to the grid to the petitioner;

(b) Permit the petitioner to sign the connection agreement for No Load/On Load conditions with CTU considering this laboratory as an exceptional case;

(c) Approve the No Load/On Load draft connection agreement;”

4. The petition was admitted on 4.2.2016 and notice was issued to the respondents to file their replies. During the course of hearing, the representative of Power System Operation Corporation of Limited (POSOCO) submitted that there are three basic issues which need to be addressed, namely (a) Connection Agreement between CTU and the petitioner as per the CEA Technical Standards for Connectivity to the Grid; (b) The transmission charges payable by the petitioner could also be clarified by the Commission and some arrangement needs to be specified for payment. (c) The petitioner should register as a user with WRLDC. The Commission could specify the nominal fee payable to WRLDC for each short circuit test since each testing would necessitate a number of coordination activities. The representative of POSOCO further submitted that while studies were carried out from the grid perspective, it is also necessary to appreciate the impact of voltage dip during short circuit testing on sensitive consumers nearby. Therefore, MPPTCL should be impleaded as party to the petition. Accordingly, the petitioner impleaded MPPTCL as party to the petition.

5. POSOCO was directed vide Record of the Proceedings for the hearing dated 4.2.2016 to file its comments on (a) draft Connection Agreement. (b) How access for the arrangement in the instant petition shall be treated? (c) How scheduling for the arrangement in the instant petition shall be done? (d) How RLDC charges shall be levied on the petitioner? (e) Any other charges, if any, to be levied on the petitioner.

6. Reply to the petition has been filed by POSOCO and CTU.

7. POSOCO, vide its affidavit dated 11.2.2016, has submitted as under:

(a) With regard to draft Connection Agreement, POSOCO has submitted that the test facility of the petitioner at Bina is of national importance. At the same time an online short circuit test laboratory has a definite impact on the grid whenever short circuit tests are performed on the equipment. Therefore, connectivity should be allowed only after the Connection Agreement is signed between the petitioner and CTU in terms of Regulation 6 (7) of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007. The following clauses should be suitably incorporated in the Connection Agreement:

(i) Since, the testing facility at NHPTL, Bina would be drawing power/current from ISTS, provisions regarding installation of Special Energy Meters (SEMs) should be included. Though the short circuit duration would be for a period of 250 milliseconds only and no active energy is expected to be drawn, boundary meters would still be required as per the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006.

(ii) Since the facility would be drawing large currents, any delay/malfunctioning of protective equipment may have an adverse impact on the grid. Therefore, protection arrangements required for this high power testing laboratory should be clearly spelt out.

(iii) Clauses with regard to current drawn and voltage dip permissible under different test conditions should be included in the connection agreement.

(iv) Availability of real time data of NHPTL short circuit testing facility is of paramount importance as the facility would draw large amount of current at the time of testing. Therefore, PMU at 765/400 kV Bina (PG) sub-station should be provided to record the voltages and current drawn by NHPTL's feeder and visualise real time system conditions. Accordingly, clauses pertaining to telemetry and installation of PMU at 765 kV Bina sub-station of PGCIL should be included in the Connection Agreement. All circuit breakers in NHPTL premises at voltage level 400 kV and above should be telemetered to WRLDC as is being done for other entities such as generators.

(v) Time synchronized Event Loggers (ELs) at NHPTL end are also required to know the exact time of operation of circuit breakers at the test lab during the testing period. Therefore, provision in this regard should be included in the Connection Agreement.

(vi) Since NHPTL would be the first of its kind user which is connected to ISTS, a provision for any future technical requirement should be kept which would need to be fulfilled by the petitioner within a reasonable time whenever required by CTU/RLDCs.

(b) Even though the petitioner would be connected to ISTS, any short circuit test conducted by the petitioner would have an impact on nearby sub-stations in terms of voltage dip. Depending on the MVA rating of the transformer being tested, such voltage dip as per studies is expected to be up to 40% for a period of 250 milliseconds. Although, the grid is expected to be stable following such tests, such

voltage dip may impact the sensitive nearby bulk consumers. Motors could stall during such voltage period leading to load loss and sensitive electronic equipment forming part of any control equipment could also operate in an unintended fashion. Considering these aspects, MPPTCL which is STU, should be made party to the Connection Agreement as the provision for tripartite Connection Agreement exists in the Central Electricity Authority (Technical Standards for connectivity to the grid) Regulations, 2007.

(c) With regard to treatment for the access, POSOCO has submitted that during the testing of transformers by the petitioner, the grid would be providing the short circuit current and would be subjected to stress during the time of testing of equipment. Though the usage of transmission would be for a period of 250 milliseconds but support of grid during the testing is paramount. Unlike a generator or bulk consumer who either inject or draw MW into or out of the ISTS, the petitioner would ordinarily neither inject nor draw MW from the ISTS. However, as per studies carried out by CPRI on behalf of the petitioner, the Short Circuit (SC) test power ranges from 800 MVA to approx. 10,000 MVA depending on the MVA capacity of the transformer being tested. These would be at a very low power factor close to zero (of the order of 0.01 to 0.05). The maximum SC power could be converted to a nominal MW value (using this power factor) for the purpose of applying Grid Reliability charges as per the Central Electricity Regulatory Commission (Sharing in inter-State transmission charges and losses) Regulations, 2010 as amended from time to time. In future, if the petitioner is granted further connectivity/LTA/MTOA for MW drawal from the ISTS, the normal transmission charges as per the relevant Regulations would be payable additionally.

(d) With regard to scheduling for the arrangement, POSOCO has submitted that there will not be any MW exchange between the petitioner and ISTS. Therefore, scheduling of any MW power is not envisaged. Since WRLDC would have to co-ordinate for every testing, the following procedure should be adopted for the same:

(i) For every testing at the High Voltage Transformer Testing (HVTR) Lab, NHPTL shall submit an Open Access Application three days in advance with MW quantum as zero and specifying the time slots for the day in which testing is proposed and shall pay all other charges except transmission charges as per the Central Electricity Regulatory Commission (Open Access in inter-State Transmission System) Regulations, 2009.

(ii) All charges for Short Term Open Access such as application fee (Rs 5000/- per application/testing) and Operating charge of WRLDC (Rs.1000/- day per application/testing) would be applicable for each testing. In this regard, required payment shall be made by the petitioner on a monthly basis even though Open Access Regulations emphasises on the 3rd working day.

(iii) The petitioner should submit one application per day clearly mentioning the time period of testing during the day.

(iv) WRLDC would issue the approval indicating time window in line with any other open access application with intimation to SLDC, Madhya Pradesh and NLDC. All efforts would be made to accommodate the dates sought by NHPTL. In exceptional cases, there could be a rescheduling of date/time.

(v) On the day of test, real time code would be taken by the petitioner from WRLDC and the short circuit test performed at HVTR Laboratory. The Event Logger outputs would be mailed to WRLDC after the test.

(iv) PGCIL, Bina shall send weekly SEM data to WRLDC on a regular basis.

(v) For Medium Voltage Transformer Testing (MVTR) Laboratory, the petitioner would only inform WRLDC a day in advance of the test. Similar procedure for High Current Low Voltage (HCLV) Laboratory and High Power Synthetic (HPS) Laboratory would be formulated by WRLDC in consultation with NHPTL subsequently.

(e) With regard to RLDC charges to be levied on the petitioner, POSOCO has submitted that the petitioner should be registered as user of WRLDC under the Central Electricity Regulatory Commission (Fees and Charges of RLDCs and other related matters), Regulations, 2015. Accordingly, the petitioner would be required to pay one time registration charges. In absence of any LTA/MTOA granted to the petitioner, it may not be subjected to monthly WRLDC Fees and Charges for the time being. After grant of LTA/MTOA by CTU, the petitioner shall share WRLDC Fees and charges w.r.t. to LTA/MTOA quantum along with other users of WRLDC. However, the charges for each test at HVTR Laboratory would be payable.

(f) POSOCO has prayed as under:

(i) Direct the petitioner to sign a Tripartite Connection Agreement with CTU and MPPTCL as a special case as the same also falls under the ambit of Connectivity Regulations. The agreement could incorporate the suggestions

given above, in the interest of security of the grid and submit the same to POSOCO and WRLDC so that further approvals could be conveyed for short circuit testing of equipment by the petitioner.

(ii) Direct CTU to grant interim connectivity to the petitioner for No Load testing till further order.

(iii) Specify the Grid Reliability Charges payable by the petitioner.

(iv) Direct the petitioner to register as a user of WRLDC by paying the prescribed registration fees.

(v) Specify the Operating Charges payable to WRLDC for each short circuit test carried out by the petitioner at HVTR Laboratory.

8. The petitioner vide its rejoinder affidavit dated 4.3.2016 has submitted that it undertakes to comply with all feasible/viable future technical requirements as conveyed by CTU/RLDCs. The petitioner has further submitted that all the conditions imposed by POSOCO/WRLDC are acceptable to the petitioner and that it undertakes to abide by any reasonable procedure finalized by POSOCO/WRLDC/CTU. The petitioner has submitted that as an exceptional case, the petitioner should be either exempted from registering as a user or be registered as a user without the need to pay registration charges. The petitioner has submitted that it undertakes to pay the charges for each test at the laboratory. However, there is no question of levying open access charges on the petitioner.

9. CTU in its reply dated 7.3.2016 has submitted as under:

(a) The petitioner does not fall specifically under the category of applicant as defined in Regulation 2 (b) of the Connectivity Regulations.

(b) Since the petitioner is not a generating company or a bulk consumer and requires the connectivity only for the purpose of testing the ICTs and other electrical equipment, the standard Connection Agreement applicable for other applicants does not apply to the petitioner. Therefore, the petitioner's prayer to permit connectivity to the grid and allow it to sign Connection Agreement for no load/ on load conditions with CTU as an exceptional case.

(c) POSOCO has contended that connectivity of NHPTL to the grid should be allowed after Connection Agreement is signed between the petitioner and CTU. The petitioner himself has prayed to permit it to sign Connection Agreement and has submitted draft Connection Agreement along with the petition. Therefore, the intentions are quite clear that connection to ISTS Network shall be permitted only after signing of the Connection Agreement. POSOCO has suggested insertion of additional clauses in the Connection Agreement which have been duly incorporated in the draft Connection Agreement submitted with the petition.

(d) POSOCO has raised its concern with regard to protection system. It is clarified that multilayer protection system has been provided by NHPTL and PGCIL

(e) Voltage dip under the test conditions shall itself be dependent on the grid condition prevailing at different point of time. These shall be affected by future growth in the nearby network. Therefore, the updation of the study shall be required from time to time based on the growth of network as well as

practical experience. Accordingly, such operating conditionalities should be separately dealt with from the Connection Agreement.

10. In the next hearing on 8.3.2016, learned counsel for the petitioner submitted that all conditions put forward by POSOCO are acceptable to the petitioner and the petitioner would abide by any reasonable procedure finalized by POSOCO/WRLDC/CTU.

11. The Commission directed Chief (Engg.) of the Commission to convene a meeting with the petitioner, the respondents and MPPTCL to resolve the issues and submit a report in this regard to the Commission. Accordingly, Chief (Engg.) after confirming with the stakeholders, namely representatives of NHPTL, CEA, CTU, PGCIL, POSOCO and MPPTCL submitted its minutes of meeting held on 11.3.2016 to the Commission which are extracted as under:

“1. The representative of POSOCO stated that the petitioner has already been granted permission for charging and no load tests. He stated that POSOCO has vide affidavit dated 11.2.2016 submitted its comments on scheduling procedure and RLDC charges to be levied on the petitioner. He added that the petitioner will draw power for 250 ms during each test and it has already installed Energy Meter. For providing real time data during test to WRLDC, the petitioner needs to telemeter all Circuit Breakers/switches at 400 kV level & above which is yet to be done. He stated that SCADA system would not be able to capture data for 250ms and the PMU installed at Bina (MP) can only measure voltage dip during the test but not the current drawn by NHPTL during short circuit testing. He proposed that PMU should be installed at PG (Bina) to measure current of NHPTL feeder and voltage dip during each test. Further considering the high current during short circuit, protection core of Current Transformer (CT) may be used for current measurement instead of measurement core.

2. The representative of petitioner stated that as confirmed by POWERGRID, the executing agency of NHPTL on deposit work basis, the expected date of installation of PMU is 25th March 2016 and that of Data gateway is 28th April 2016. He stated that if the same is not installed as per timelines, POSOCO shall permit NHPTL to conduct Trial test on TBEA

transformer which is ready for testing and the test parameter shall be made available to POSOCO by NHPTL offline.

3. Regarding Connection Agreement, following was discussed:

- (i) The representative of NHPTL stated that so far as tripartite agreement is concerned, NHPTL is of the view that this is not required because NHPTL bay is directly connected to POWERGRID 765 & 400kV ISTS Bina, not MPPTCL Substation. Above the all, MPPTCL, themselves do not feel any necessity to be a part of Tripartite agreement. MPPTCL to submit a letter to CERC in this regard.
- (ii) The representative of CTU stated that they have submitted the revised Connection Agreement to NHPTL after incorporating suggestions of POSOCO and they are ready to sign Connection Agreement with the petitioner.
- (iii) The representative of MPPTCL stated that they may not be insisted to become party to the Connection Agreement. However, they agreed to provide no objection certificate in this regard.
- (iv) Representative of CTU and NHPTL confirmed that Connection Agreement will be signed within one week. Chief (E), CERC stated that a copy of the signed connection agreement should be filed with the Commission.

4. Regarding transmission charges and RLDC fees & charges, following was discussed:

(a) RLDC Fees & Charges: The representative of POSOCO suggested that NHPTL needs to be registered at RLDC. He also stated that since MW scheduling of power shall not be there, NHPTL may not be levied system operation and market operation charges as applicable to other Users of ISTS. However, RLDC may levy a nominal charge as Application Fee and operation charges for each test.

(b) Transmission charges:

a. The representative of CPRI stated that a similar test facility of CPRI is there in Bhopal (connected at 132 kV) with a short circuit rating of 100 MVA. In this case, they are paying charges on the basis of Maximum Demand (MD) charges for 500 kVA along with energy charges for 13800 units to M.P. DISCOM each month. This is based on historical agreement signed more than 25 years back.

b. After discussion, it was felt that based on similar principles, 10,000 MVA short circuit rating of NHPTL with the power factor of .005, works out to a notional 50- MW for which Reliability Charges as per CERC (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 could be applied. It was further stated that the petitioner is

dependent on the strength of the grid for its commercial business and hence should be charged the reliability charges.

c. The representative of the petitioner stated that NHPTL laboratory is a national asset as it would facilitate short circuit test of transformers within the country economically. Hence an enabling environment may be provided to compete with global players. Presently transformers are taken to other countries which require at least 6 months time out of which test preparation time of the transformer is only about 20 days and cost of testing is around Rs. 4.5 crore including the cost of transportation which is about 55% of the total testing cost. He stated that the petitioner is new in the area of transformer testing and they need to compete with globally established players in this area and therefore, the petitioner may be waived off the transmission/Reliability charges initially for 1 to 2 years or minimal charges should be imposed to make this facility competitive. He stated that this may be reviewed after 2 years.

d. It was decided that these aspects could be placed before the Commission for it to take an informed view.

5. Regarding transmission access, following was discussed

(a) Transmission Access: Representative of POSOCO stated that since the lab will not be drawing any active power it may not be asked to seek short-term open access/MTOA/LTA. He suggested that they will prepare a scheduling and operating procedure for the lab and file the same with the Commission which will include the details of scheduling and operating charges to be paid by the lab and all other modalities related to scheduling. The representative of NHPTL stated that all the suggestions by POSOCO are acceptable to the petitioner.

6. Regarding system study Report submitted by NHPTL following was discussed

(a) The representative of CPRI stated that in the present case a testing on 500 MVA 765/400 kV single phase bank of transformer is not recommended initially. In case of a failure of the test transformer and failure of back-up protection system, the series reactance is 2 ohms only whereas it should be 4 ohms for the system to remain stable.

(b) It was decided that CEA, POSOCO, CTU shall jointly give a go ahead on the system study report before the trial testing can be performed by NHPTL For 500 MVA transformers testing, any modification in the system, if

required, NHPTL will do the same in consultation with CTU, POSOCO and CEA and 500MVA transformers testing shall only be done after approval of CEA and CTU.

“10. After discussion during the meeting, following was decided agreed upon by the participants:

- a. The petitioner shall be registered with RLDC as a “User”.
- b. The petitioner, NHPTCL and CTU shall sign Connection Agreement as submitted by CTU within a week and submit the same to the Commission
- c. MPPTCL shall give NoC within 3 days that shall form part of Connection Agreement.
- d. POSOCO shall submit the procedure for registration with WRLDC, application for short circuit testing as well as the approvals to be issued by WRLDC as well as all the associated application formats to the Commission within 2 weeks.
- e. For 500 MVA transformers testing, any modification in the system, if required, NHPTCL will do the same in consultation with CTU, POSOCO and CEA and 500 MVA transformers testing shall only be done after approval of CEA and CTU.
- f. Subject to above, there is no technical constraint in on load testing of transformers at the facility of NHPTL.”

Analysis and decision:

12. We have considered the submissions of the petitioner and the respondents and perused minutes of meeting and documents on record. The following issues arise for our consideration.

- (a) Whether National High Power Test Laboratory (NHPTL) can be granted connectivity under the Connectivity Regulations?
- (b) What shall be the format of Connection Agreement for No Load/On Load conditions with CTU?
- (c) What will be the scheduling procedure for approval of testing at NHPTL? How RLDC charges shall be levied on the petitioner?
- (d) How access for the NHPL shall be treated and what will be the transmission charges for such access?

The issues have been dealt with in subsequent paragraphs.

Issue No. 1: Whether National High Power Test Laboratory (NHPTL) can be granted connectivity under the Connectivity Regulations?

13. The petitioner has submitted that National High Power Test Laboratory which is independent, standalone, state-of-the art, professionally managed, international class. As per the decision taken by Government of India, Ministry of Power in 2008 on the proposal of CPRI, on Line High Power Test Laboratory in India has been set up with an aim to provide full range of short circuit testing for the electrical equipment manufacturing industry and power utilities in conformance to Indian and International Standards. According to the petitioner, as on date, India hosts testing facilities to handle short circuit test of transformers rated up to 90 MVA or transformers up to 220 kV and no facility is available in India which can do short circuit test of transformers rated above 90 MVA or transformers above 220 kV. Due to the lack of proper testing facilities, manufacturers/power utilities send their equipment to overseas testing labs such as KEMA, CESI, etc. The petitioner has submitted that there are certain countries, namely Holland (KEMA), Italy (CESI), Canada (IREQ), France (EDF), South Korea (KERI), China (Shenyang test station), Brazil (CEPEL), Mexico (LAPEM), USA (PSM) and Russia (VAI), which majorly constitute the complete market for short circuit testing facility for the high power transformers. Based on the discussions with the JV partners, it is understood that most of the testing demand from India is met by Holland (KEMA). The petitioner has submitted that total time taken for testing of the transformer by KEMA is about 6 months. The test preparation time of the transformer is about 20 days and rest of the time is consumed in transportation, obtaining the clearances and preparation of the transformer for testing. The cost of testing is around Rs. 4.5 crore including the cost of transportation which is about 55% of the total

testing cost. This entails incurring huge cost on transportation and keeping inventories for a longer duration and on many occasions the testing gets delayed due to long waiting periods at the testing facilities and other contractual issues in transportation. The petitioner has submitted that in case of failure of the transformer during testing, there may be repeat trip of transformer to KEMA resulting in further loss of foreign exchange and time. The petitioner has submitted that on line testing laboratory is one of its kind at such high capacity in the country and few in the world and it would provide following advantage to the nation:

- (i) The time required in testing will be reduced leading to reduction in the delivery time and thus saving in time and cost of the project.
- (ii) The test facility would save the foreign exchange as equipment will not be required to be sent to foreign test laboratory.
- (iii) Govt. of India has a plan to augment the generation/transmission capacities in 12th 5 Year plan (2012-17) which involves lots of high rated equipment (up to 765 kV range). Therefore, timely testing would help in achieving the targets.
- (iv) The testing facility would give fillip to R&D in the country.
- (v) The testing facility could also be used by the neighbouring countries (SAARC countries, ASEAN, Middle East countries) as it may have lower testing and the transportation cost and it will earn foreign exchange.
- (vi) Setting up testing facility in India shall provide an opportunity for India to become a global hub for testing and certification of electrical equipment.

14. The petitioner has submitted that it has already taken the permanent connection from MPPKWNL and got installed the energy meters to meet the auxiliary power requirement. The point of connection for the auxiliaries is on the State Grid and is not related to the point of testing which needs to be carried on the ISTS. The petitioner has submitted that its laboratory does not fall specifically under the category of applicant as defined in Regulation 2 (b) of the Connectivity Regulations. The petitioner has submitted that it is not a generating company or a bulk consumer and it requires the connectivity only for the purpose of testing the ICTs.

15. CTU has supported the contention of the petitioner that its laboratory does not fall specifically under the category of applicant as defined in Regulation 2 (b) of the CERC Connectivity Regulations.

16. We have considered the submissions of the petitioner and the respondents. It is noted that the petitioner has set up an online testing laboratory to conduct short circuit test of electric equipment up to 765 kV using grid network at Bina, MP and seeks electrical connectivity of the laboratory with 765 kV and 400 kV bus at ISTS, Bina sub-station of PGCIL for charging of bays at No Load initially and further On Load. Regulation 2(1)(b) of the Connectivity Regulations, defines the term "Applicant" who can apply for connectivity with ISTS under the Connectivity Regulations. Regulation 2(1)(b) of the Connectivity Regulations is extracted as under:

"2 (1)(b) Applicant means

(i) The following in respect grant of connectivity:

(a) A generating station with installed capacity of 250 MW and above, including a captive generating plant of exportable capacity of 250 MW and above or;

(b) A Hydro Generating station or generating station using renewable source of energy, of installed capacity between 50 MW and 250 MW.

(c) One of the Hydro Generating stations or generating stations using renewable sources of energy, individually having less than 50 MW installed capacity, but

collectively having an aggregate installed capacity of 50 MW and above, and acting on behalf of all these generating stations, and seeking connection from CTU at a single connection point at the pooling sub-station under CTU, termed as the lead generator, or;

(d) A bulk consumer;

(e) Any renewable energy generating station of 5 MW capacity and above but less than 50 MW capacity developed by a generating company in its existing generating station of the description referred to in sub-clauses (b)(i)(a) to (c) of this clause and seeking connectivity to the existing connection point with inter-State Transmission System through the electrical system of the generating station;

(f) Any company authorised by the Central Government as Solar Power Park Developer;

(ii) a generating station including a captive generating plant, a consumer, an Electricity Trader or a distribution licensee, in respect of long-term access or medium-term open access, as the case may be;”

17. Perusal of the above provisions reveals that the petitioner does not fall under any category of Applicant who can apply for Connectivity with ISTS. According to the petitioner and CTU, online test facility is of national importance and benefits of this laboratory are to be enjoyed by all indigenous electric equipment manufacturers and power utilities. It is noted that the test facility is one of its kind and the possibility of coming up of similar kind of another facility is very rare. Therefore, we are not inclined to initiate the process to amend the Connectivity Regulations to make the entities like petitioner as eligible entity under ‘Applicant’ in the Connectivity Regulations. However, in exercise of power conferred under Regulations 111, 112, 113 and 115 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999, we direct CTU to sign Connection Agreement with the petitioner as a special dispensation.

Issue No. 2: What shall be the format of Connection Agreement for No Load/On Load conditions with CTU?

18. The petitioner has submitted that the issue regarding signing of Connection Agreement for No Load/On Load conditions was discussed with CTU and the petitioner was advised to submit a draft No Load Agreement for approval by CTU which was submitted to CTU on 13.11.2015. Even prior to the above, a draft (On Load) Connection Agreement was submitted to CTU for its approval along with the system study report by the petitioner. The petitioner has submitted that a meeting was held between CEO, NHPTL and CEO, POSOCO on the issue, in which POSOCO directed the petitioner to sign Connection Agreement for both No Load and On Load connectivity in terms of CEA notification dated 21.2.2007. Subsequently, POSOCO intimated that since under the Connectivity Regulations, only bulk consumers, generators and Distribution Companies can be connected to the ISTS network, certain mechanism is to be evolved to include the testing laboratory as a Connectivity Applicant. The petitioner has contended that the impact on the grid during short circuit test would be relevant only when the Laboratory would draw Short Circuit test current from the grid. The petitioner has prayed for "No Load Charging" in which laboratory shall utilize voltage at 765/400kV for pre-commissioning test on the bays and there is no load during the charging initially and further for On Load charging. The petitioner has also prayed to grant it permission to sign the Connection Agreement for No Load/On Load conditions with CTU. The petitioner has submitted that it would sign the Connection Agreement once the draft agreement already submitted to CTU is approved.

19. POSOCO has submitted that the test facility of the petitioner at Bina is of national importance. At the same time an online short circuit test laboratory has a definite impact on the grid whenever short circuit tests are performed on the

equipment. POSOCO has requested to allow connectivity to the petitioner after the Connection Agreement is signed between the petitioner and CTU. POSOCO has submitted that signing of Connection Agreement is a statutory requirement as per Regulation 6 (7) of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations, 2007. POSOCO has suggested that the following clauses may also be suitably incorporated in the Connection Agreement:

(a) Since, the testing facility would be drawing power from ISTS, the provisions regarding installation of Special Energy Meters (SEMs) should be included in the Connection Agreement. Though the short circuit duration would be for a period of 250 milliseconds only and no active energy is expected to be drawn, boundary meters would still be required as per the CEA (Installation and Operation of Meters) Regulations, 2006.

(b) Since the facility would be drawing large current, any delay/malfunctioning of protective equipment may have an adverse impact on the grid. Therefore, protection arrangements required for this high power testing laboratory should be clearly spelt out.

(c) Clauses with regard to current drawn and voltage dip permissible under different test conditions should be included in the Connection Agreement.

(d) Availability of real time data of NHPTL short circuit testing facility is of paramount importance as the facility would draw large amount of current at the time of testing. Therefore, PMU at 765/400 kV Bina (PG) sub-station should be provided to record the voltages and current drawn by NHPTL's feeder and visualise real time system conditions. Accordingly, clauses pertaining to

telemetry and installation of PMU at 765 kV Bina substation of PGCIL should be included in the Connection Agreement. All circuit breakers in the premises of NHPTL at voltage level 400 kV and above should be telemetered to WRLDC as is being done for other entities, such as generators.

(e) Time synchronized Event Loggers (ELs) at NHPTL end are also required to know the exact time of operation of circuit breakers at the test lab during the testing period. Therefore, the provision in this regard should be included in the Connection Agreement.

(f) As NHPTL would be the first of its kind user which is connected to ISTS, a provision for any future technical requirement should be incorporated in the Connection Agreement which would need to be fulfilled by the petitioner within a reasonable time, if required by CTU/RLDCs.

(g) Other standard clauses of any Connection Agreement should also be included in the draft Connection Agreement.

20. POSOCO has contended that even though the petitioner would be connected to ISTS, any short circuit test conducted by the petitioner would have an impact on nearby sub-stations in terms of voltage dip and depending on the MVA rating of the transformer being tested, such voltage dip as per studies is expected to be up to 40% for a period of 250 milliseconds. According to POSOCO, although the grid is expected to be stable following such tests, such voltage dip may impact the sensitive nearby bulk consumers. POSOCO has submitted that motors could stall during such voltage period leading to load loss and sensitive electronic equipment forming part of any control equipment could also operate in an unintended fashion.

21. CTU has submitted that since the petitioner is not a generating company or a bulk consumer and requires the connectivity only for the purpose of testing the ICTs and other electrical equipment, the standard Connection Agreement applicable for other applicants does not apply to the petitioner. CTU has submitted that the petitioner should be permitted to sign Connection Agreement with CTU for No Load/ On Load conditions as an exceptional case. With regard to POSOCO`s concern that additional clauses should be inserted in the Connection Agreement, it is clarified that additional clauses have already been incorporated in the draft Connection Agreement. POSOCO vide its letter dated 19.3.2015, has sought details about the special condition incorporated in the Connection Agreement. The Connection Agreement for connectivity of NHPTL at No Load/On Load is a specifically drafted agreement which is unlike any other connection of generator or bulk consumer. The same upon finalization shall include necessary special conditions to address all the concerns which have been raised by all parties. With regard to the concerns pertaining to protection system, it is clarified that multilayer protection system has been provided by NHPTL and PGCIL. The basic protection philosophy is as under:

- (i) At PGCIL sub-station: Two nos. of Main Current Differential Relay (I and II) and Over Current Relay and Earth Fault Relay have been provided in each feeder for 400kV and 765kV connection.

- (ii) At NHPTL sub-station: Two nos. of Main Differential Relay (I & II) and Over Current Relay and Earth Fault Relay have been provided in each feeder for 400kV and 765kV connection.

(iii) At each laboratory HVTR and MVTR: Two nos. of Over Current Relay & Earth Fault Relay have been provided in each 400kV and 765kV bay. Each relay has multiple programmable current and time thresholds.

(iv) Definite time delay threshold for maximum duration (250ms) of test current shall be ensured by NHPTL at laboratory HVTR and MVTR.

(v) The Relay settings for Current and Time duration shall be set for Short Circuit testing of each object and test cases.

22. CTU has submitted that with regard to POSOCO's concerns regarding installation of PMU for real time visualization in RLDC/ NLDC, PGCIL is already in the process of installing the same at NHPTL Bina and the provisions are being made in the existing Control and Monitoring System (CMS) at NHPTL Laboratory to extend real time data to WRLDC/NLDC using gateway server and wide band communication link.

23. During the meeting convened by Chief (Engineering) on 11.3.2016, the issue regarding Connection Agreement was discussed. In the said meeting, the representative of CTU submitted that it has submitted the revised Connection Agreement to NHPTL after incorporating suggestions of POSOCO and CTU is ready to sign Connection Agreement with the petitioner. The representative of NHPTL stated that since NHPTL`s bay is directly connected to PGCIL 765 and 400kV ISTS, tripartite agreement is not required. The representative of MPPTCL submitted that it is not insisting to become party to the Connection Agreement. However, the representative of MPPTCL agreed to provide no objection certificate in this regard. The

representatives of CTU and NHPTL confirmed that they have agreed on the format of Connection Agreement which would be signed within one week.

24. MPPTCL, vide its letter dated 6.4.2016, has intimated as under:

(a) MPPTCL is not connected directly with the facility of NHPTL. The facility is connected with ISTS point of PGCIL at Bina.

(b) Since, MPPTCL lines are connected to the separate bus of PGCIL, there is no direct connectivity with MPPTCL system to NHPTL's laboratory.

(c) MPPTCL does not require to sign the Connection Agreement as it is a bilateral connection between NHPTL and PGCIL.

(d) As regards POSOCO's concern for the nearby consumers during the short circuit test, the system study report submitted by CPRI and finalized in consultation with PGCIL, CEA and POSOCO appears to be taken care of all these aspects and generally found to be in order.

(e) As per meeting held on 11.3.2016 with the Chief (Engg.), MPPTCL issues "No Objection" to the petitioner. However, in case of any financial liability, MPPTCL would not be liable.

(f) The petitioner is requested to start testing of transformer in the phased manner so that the interest of all could be protected.

25. We have considered the submissions of the petitioner and respondents. It is noted the petitioner has already been granted permission for charging and no load test. It is further noticed that CTU has incorporated provisions suggested by POSOCO in the draft Connection Agreement to On Load and On Load. According to the petitioner, it is ready to comply with all the provisions with regard to grid security and to provide all data required by WRLDC. MPPTCL, vide letter dated 6.4.2016, has

intimated that since signing of Connection Agreement is a bilateral issue between the petitioner and CTU, MPPTCL does not want to become the third party to the Agreement as it is not directly connected to the test facility of the petitioner. MPPTCL has issued "No Objection" to the petitioner for signing of Connection Agreement with CTU which shall form part of the Connection Agreement. During the meeting held on 11.3.2016, the petitioner and CTU had agreed on the format of Connection Agreement. Accordingly, we direct CTU and the petitioner to sign Connection Agreement as mutually agreed between the petitioner, CTU and POSOCO within one week of issue of order and submit the copy of the Connection Agreement independently to the Commission within one week thereafter.

Issue No. 3: What will be the scheduling procedure for approval of testing at NHPTL? How RLDC charges shall be levied on the petitioner?

26. POSOCO has submitted that although the petitioner will draw current only for a very short duration of 250ms during each short circuit test but the petitioner would have to closely coordinate with WRLDC before each short circuit test considering the impact on the power system. According to POSOCO, real-time code would need to be taken by the petitioner to conduct each test. POSOCO has submitted that since this would require some coordination by WRLDC, the petitioner should be registered as user of WRLDC as per the Central Electricity Regulatory Commission (Fees and Charges of RLDCs and other related matters), Regulations, 2015. Accordingly, the petitioner would be required to pay one time registration charges. POSOCO has contended that in absence of any LTA/MTOA granted to NHPTL, NHPTL shall not be liable to pay monthly WRLDC's fees and charges for the time being and after grant of LTA/MTOA by CTU, the petitioner shall share WRLDC fees and charges w.r.t. to LTA/MTOA quantum along with other Users of WRLDC. However, the charges for

each test at HVTR laboratory would be payable by the petitioner. POSOCO has submitted that since there will not be any MW exchange between the petitioner and ISTS, the petitioner should not be levied system operation and market operation charges as applicable to other users of ISTS. However, RLDC may levy a nominal charge as application fee and operation charges for each test. POSOCO has submitted that since WRLDC would have to co-ordinate for every test, the following procedure should be adopted for the same:

- (a) For every test at the High Voltage Transformer Testing (HVTR) Laboratory, NHPTL shall submit an Open Access Application three days in advance with MW quantum as zero and specifying the time slots for the day in which test is proposed and shall pay all other charges except transmission charges as per the provisions of the Central Electricity Regulatory Commission (Open Access in Inter-State Transmission System) Regulations, 2009 as amended from time to time.
- (b) All charges for Short Term Open Access such as application fee (Rs 5000/- per application/testing) and Operating charge of WRLDC (Rs.1000/- day per application/testing) would be applicable for each test. The petitioner is required to make payment on monthly basis even though Open Access Regulations emphasises on the 3rd working day.
- (c) The petitioner shall submit one application per day clearly mentioning the time period of testing during the day.
- (d) WRLDC would issue the approval indicating time window in line with any other open access application with intimation to SLDC, Madhya Pradesh and

NLDC. All efforts would be made to accommodate the dates sought by NHPTL. In exceptional cases, there could be a rescheduling of date/time.

(e) On the day of test, real time code would be taken by the petitioner from WRLDC and the short circuit test performed at HVTR Laboratory. The Event Logger outputs would be mailed to WRLDC after the test.

(f) Weekly SEM data shall be sent by PGCIL Bina to WRLDC on regular basis.

(g) For Medium Voltage Transformer Testing (MVTR) Laboratory, the petitioner would inform WRLDC a day in advance of the test. Similar procedure for High Current Low Voltage (HCLV) Lab and High Power Synthetic (HPS) Lab would be formulated by WRLDC in consultation with NHPTL subsequently.

27. POSOCO was directed vide minutes of the meeting dated 11.3.2016 to submit procedure for approval of testing at NHPTL. POSOCO, vide its letter dated 29.3.2016, has submitted the procedure for approval of testing at NHPTL which would be followed by all concerned in the petition.

28. We have considered the submissions of POSOCO. Since, the petitioner will not draw any MW from the grid, it shall not pay System Operation (SO) and Market Operation (MO) charges as applicable to other users of the grid. In our view, the petitioner would have to closely coordinate with WRLDC before each short circuit test considering the impact on the power system which would require some coordination by WRLDC. Accordingly, we direct that the petitioner be registered as 'User' of WRLDC under the provisions of the Central Electricity Regulatory Commission (Fees and Charges of RLDCs and other related matters), Regulations, 2015. The petitioner

shall pay one time registration charges as a 'User' in line with the provisions of the Central Electricity Regulatory Commission (Fees and Charges of RLDCs and other related matters), Regulations, 2015 and shall pay testing charges as per the approved procedure of POSOCO.

29. We have perused the procedure for approval of testing at NHPTL submitted by POSOCO. The procedure is attached at Annexure-I of this order. We accord our approval to the procedure and direct the petitioner and other parties concerned to follow the procedure in letter and spirit. In case any difficulty arise in implementation of procedure, POSOCO, NHPTCL and other stakeholders are granted liberty to approach the Commission for removal of difficulty.

Issue No. 4: How access for the NHPTL shall be treated? What will be the transmission charges for such access?

30. POSOCO has submitted that during the testing of transformers by the petitioner, the grid would be providing the short circuit current and would be subjected to stress during the time of testing of equipment. Though the usage of transmission would be for a period of 250 milliseconds but support of grid during the testing is paramount. POSOCO has submitted that unlike a generator or bulk consumer who either inject or draw MW into or out of the ISTS, the petitioner would ordinarily neither inject nor draw MW from the ISTS. However, as per studies carried out by CPRI on behalf of the petitioner, the Short Circuit (SC) test power ranges from 800 MVA to approx. 10,000 MVA depending on the MVA capacity of the transformer is being tested. POSOCO has submitted that these would be at a very low power factor close to zero (of the order of 0.01 to 0.05) and the maximum SC power could be converted to a nominal MW value (using this power factor) for the purpose of applying Grid

Reliability charges as per the provisions of Sharing Regulations. POSOCO has submitted that in future, if the petitioner is granted further connectivity/LTA/MTOA for MW drawal from the ISTS, the normal transmission charges as per the Commission's Regulations would be payable additionally by the petitioner. POSOCO has submitted that CPRI has a similar online short circuit test laboratory at Bhopal (100 MVA short circuit power) and it has been in operation for many years. The arrangements in respect of transmission charges or any other charges, etc. in respect of this facility could be studied for a better understanding.

31. The petitioner has contended that since it is not carrying on any activity of sale or purchase of power by using the ISTS for which open access charges are payable, the petitioner should not liable to pay any transmission charges. The petitioner has stated that it is going to draw miniscule power for 250 ms when the ICT is being tested for which it is willing to pay the required charges. Since, the petitioner is not taking any open access, no open access charges can be levied on the petitioner. The petitioner has submitted that if the CPRI Laboratory is indeed paying any transmission/open access charges, the same needs to be brought out for the petitioner to respond.

32. The issues regarding treatment of access and transmission charges were discussed during meeting held on 11.3.2016. In the said meeting, the representative of CPRI stated that a similar test facility of CPRI is in Bhopal (connected at 132 kV) with a short circuit rating of 100 MVA and CPRI is paying charges on the basis of Maximum Demand (MD) charges for 500 kVA along with energy charges for 13800 units to the distribution companies of M.P. each month, based on historical agreement signed more than 25 years back. The representative of the petitioner stated that since its laboratory is a national asset which would facilitate short circuit test of transformers

within the country economically, an enabling environment should be provided to compete with global players. The representative of the petitioner further stated that presently transformers are taken to other countries which require at least 6 months time out of which test preparation time of the transformer is only about 20 days and cost of testing is around Rs. 4.5 crore including the cost of transportation which is about 55% of the total testing cost. The representative of the petitioner stated that since the petitioner is new in the area of transformer testing and need to compete with globally established players in this area, it should be waived off the transmission/Reliability charges initially for 1 to 2 years or minimal charges should be imposed to make this facility competitive and it should be reviewed after 2 years. After discussion, it was felt that based on similar principles as adopted at the existing test facility of CPRI, 10,000 MVA short circuit rating of NHPTL with the power factor of 0.005, works out to a notional 50 MW for which Reliability Support Charges as per the provisions of the Central Electricity Regulatory Commission (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 could be applied. In the said meeting, it was further stated that since the petitioner is dependent on the strength of the grid for its commercial business, should be charged with the reliability charges.

33. We have considered the submissions of the petitioner, the respondents and perused the minutes of the meeting held on 11.3.2016. It is noted that although the petitioner would not draw any MW from the grid, the petitioner is connected to the national grid and drawing reliability from the grid by virtue of being connected to the grid for its commercial business. Since, the petitioner would not draw any MW from the grid, it shall not be required to apply for any type of access. However, the petitioner shall be levied Reliability Support Charges corresponding to 10,000 MVA multiplied by pf of 0.005) as discussed during the meeting held on 11.3.2016 in terms

of Sharing Regulations [i.e.10,000x0.005xReliability Support rate (Rs./MW/month] for the entire month. POSOCO is directed to compile pattern of short circuit drawl MVA by the petitioner and file the report in this regard to the Commission for a six month period beginning from the date of 1st commercial test. The charges recovered from NHPTL shall be reimbursed back to long term+medium term open access customers in next month bill.

34. The petition is disposed of in terms of the above.

Sd/-
(Dr. M.K.Iyer)
Member

Sd/-
(A.S. Bakshi)
Member

Sd/-
(A. K. Singhal)
Member

Sd/-
(Gireesh B. Pradhan)
Chairperson