

**Petition for**  
**In principle approval of Additional Capitalization for up**  
**gradation of HMI Servers of Gas Turbine and HMI**  
**workstation of MAX DNA system**  
**of**  
**Dholpur Combined Cycle Power Plant**

Submitted to  
Rajasthan Electricity Regulatory Commission  
Jaipur  
by  
Rajasthan Rajya Vidyut Utpadan Nigam Limited  
Vidyut Bhavan, Janpath, Jaipur

**January-2020**

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## A1: BACKGROUND

1. Rajasthan Rajya Vidyut Utpadan Nigam Ltd (RVUN) was incorporated under the Companies Act 1956, as one of the five successor companies of erstwhile Rajasthan State Electricity Board (RSEB) to take over the electricity generation business in the state of Rajasthan. The existing power stations and those under commissioning in the state sector were transferred to RVUN as per the Rajasthan Power Sector Reforms Transfer Scheme, 2000 notified by State Government provisionally on 19th July 2000 and finally on 18<sup>th</sup> January 2002.
2. RVUN has entered into Long Term Power supply-Purchase Agreements (PPA) in respect of existing and future power projects for 25 Years with the three Discoms on 28.09.06, 07.06.2007, 18.05.2010 and further supplementary PPA was signed on date 29.06.2015 which includes DCCPP (330 MW).
3. The COD details of DCCPP 330 MW are given below:

**Table-1**

Particular	GT#1	GT#2	STG
Installed Capacity (IC)	110 MW	110 MW	110 MW
Date of COD	01.03.2008	01.03.2008	01.03.2008

## A2: SALIENT FEATURE OF PETITION

1. In this instant petition, RVUN seeks In-Principle approval of the Hon'ble Commission towards additional capitalization proposals to be carried out at Dholpur Combined Cycle Power Plant (330 MW) under Regulation 17(3) (a) of RERC Tariff Regulations, 2019.
2. The proposal for up gradation of C&I system has been approved by RVUN BoD in its 289<sup>th</sup> meeting held on 11.07.2019 enclosed as **Annexure-A1 & A2**. RVUN is filing this petition for In-Principle approval of additional capitalization of Rs 9.71 Cr. plus GST as applicable for up gradation of HMI workstation of MAX DNA system of Steam Generator (C&I) and existing HMI and Control System from Mark VI to Mark VIe or equivalent control system of both Gas Turbine for DCCPP under regulation 17(3)(a) of RERC Regulations, 2019 read with Annexure-i (C)(p,q) reproduce as under:

*“17. Additional capitalization*

*(3) In case of replacement of assets deployed under the original scope of the existing project after cut-off date, the additional capitalization may be admitted by the Commission, after making necessary adjustments in the Gross Fixed Assets, Debt and Equity as per sub-Regulation (8) below, subject to prudence check on the following grounds:*

*(a) The useful life of the assets is not commensurate with the useful life of the project and such assets have been fully depreciated in accordance with the provisions of these Regulations; “.*

*Annexure-1*

<i>Description of Assets</i>		<i>Depreciation (%) (Salvage Value 10%) (Straight line Method)</i>
<i>C.</i>	<i>Assets Purchased New</i>	
<i>p</i>	<i>I.T. equipments</i>	<i>15.00</i>
<i>q.</i>	<i>IT/SCADA software</i>	<i>9.00</i>

It is submitted that the HMI workstation of MAX DNA system of Steam Generator (C&I) and existing HMI and Control System both Gas Turbine has been obsolete.

3. It is submitted that proposed replacement works are essentially required for efficient and successful operation of a generating station, as detailed in subsequent paras, which were included in the original capital cost of the project.
4. Two works have been identified for additional capitalization under regulation 17(3)(a) of RERC Tariff Regulations 2019 likely to be taken up during FY 2019-20 and onwards. Details of the proposals are as below.

**Table-2: Summary of Additional capitalization proposal**

Sr. No.	Description of Proposal	Estimated Cost (Rs. excluding taxes)	Taxes such as GST at present rate (18%)	Total Estimated Cost (Rs. including taxes)	Expected/Tentative time schedule for implementation from date of RERC order
A	Up gradation of HMI workstation of MAX DNA system used as STG (C&I)	1,20,78,270.00	21,74,089	1,42,52,359	12 Months
B	Up Gradation of existing HMI and Control System from Mark VI to Mark VIe or equivalent control system of both Gas Turbine for DCCPP	8,49,10,465.00	1,52,83,884	10,01,94,349	06 months
C	Total Amount without IDC (Rs)				11,44,46,708
D	Total IDC @12.55%(Rs)				40,37,934
E	Total Amount with IDC (Rs)				11,84,84,642

5. The above rates are exclusive of any other taxes, duties and transit insurance etc.

6. **Original System Cost Details:**

**Table-3:Original System Cost Details**

Particulars	Amount (Rs. In cr.)	Amount (Rs. In cr.)
	MAX DNA System used as STG (C&I)	HMI servers of Gas Turbines from existing Mark VI control system
COD	01.03.2008	01.03.2008
Original cost of system	1.198	6.533
Depreciated from 01.04.2004 to 31.03.2009 (Regulation period)	0.025	0.364
Depreciated from 01.04.2009 to 31.03.2014 (Regulation period)	0.316	1.725
Depreciated from 01.04.2014 to 31.03.2019 (Regulation period)	0.316	1.725
<b>Depreciated Value left over upto 31.03.2019</b>	<b>0.540</b>	<b>2.719</b>

### **A3: ITEM WISE WORK DETAILS TO BE CARRIED OUT AT DCCPP, DHOLPUR**

- 1) The work details of two proposals for Additional Capitalisation at DCCPP, Dholpur are following as under:

#### **A. Up gradation of HMI workstation of MAX DNA system used as STG (C&I)**

- i. There are two gas turbines & one steam turbine (GT # I, II & STG) installed at DCCPP, Dholpur are running since 01.03.2008. The Gas Turbine 1&2 have control system MARK VI & STG has control system MAX DNA.
- ii. The HMI workstation of MAX DNA control system is provided for operation and control of STG, HRSG-1, HRSG-2 & BOP areas. This system was supplied by M/s BHEL EDN Bangalore. This system consists of one MAX ENGINEERING WORKSTATION (EWS), one MAX STORIAN WORKSTATION (max HIST), one MAX LINK WORKSTATION (max LINK) and four MAX OPERATOR WORKSTATION (OWS).
- iii. Critical Problems persisting in MAX DNA system are:
  - a) OWS-4 PC hangs frequently and become inoperative in running condition.
  - b) OWS-1 and OWS-2 are not in working condition. Due to availability of only two PCs i.e. OWS-3 and OWS-4, linked PC was placed in place of OWS-2. So only three PCs are arranged in control room out of which one PC OWS-4 hangs frequently.
  - c) Historian PC hangs frequently while running during working condition by which all trends get affected and trends cannot be obtained for that duration.
  - d) In EWS PC, trends cannot be obtained as & when required.
  - e) The software/hardware of secondary DPU of CRE 07 has been corrupted/not working.
  - f) Link PC is not linking with GT PC, therefore, parameters are not available in MAX DNA system for the purpose of analysis.

- iv. A letter for deputing service Engineer for attending the problems regarding HMI/workstation of MAX DNA system was sent to M/s BHEL, Jaipur vide letter D. 3196 dt. 13.10.17 (enclosed as **Annexure – B**). BHEL did not respond to this letter. Further, numbers of E-mails for deputing service Engineer to attend the existing MAX DNA problems were sent (enclosed as **Annexure-C**).
- v. Further, M/s BHEL, Jaipur sent an E-mail on dated 29.03.18. Via this E-mail BHEL strongly recommended that deputation of Service Engineer will not serve the purpose of resolving problems regarding HMI/Workstation of MAX DNA system because HMI/workstation of MAX DNA system which is in use at DCCPP, Dholpur is quite old and obsolete and outlived their service life so some of these machines are slow in response & hanging quite frequently. Facsimile of email enclosed as **Annexure-D**.
- vi. BHEL service Engineer also visited the site on 04.07.18 to try to repair and keep system healthy. MOM of meeting between RRVUNL-Dholpur & M/s BHEL EDN Bangalore for servicing of MAX DNA HMI system installed at DCCPP, Dholpur on dt. 05.07.18 is enclosed as **Annexure-E**. For smooth functioning of MAX DNA system, M/S BHEL EDN, Bangalore recommended that since HMI hardware (HP Compaq DC7600 and DC7900) and operating system (Windows XP) is very old and obsolete, so up gradation of the full system to latest HMI hardware and software for better stability/performance/security of MAX DNA system is required.
- vii. Looking to the suggestion, RVUN decided to upgrade the MAX DNA system and asked for budgetary offer vide letter D. 51 dt. 04.04.18 (enclosed as **Annexure –F**).
- viii. Offer was received from M/s BHEL, Jaipur through E-mail dt. 02.05.18, quoting Rs. 1,34,20,300/- excluding all taxes/duties/GST as approx. cost (enclosed as **Annexure - G**) for up gradation of HMI/workstation of MAX DNA system.

- ix. M/s BHEL, EDN Bangalore furnished their revised rates after offering 10% discount on quoted rates in the negotiations . Accordingly, revised cost works out to Rs. 1,20,78,270 plus GST as applicable and revised G-Schedule enclosed as **Annexure – H**.
- x. The WTD accorded approval for award of up gradation of HMI/workstation of MAX DNA system used as STG C&I, Dholpur (enclosed as **Annexure-I**) as per the revised schedule of price of M/s BHEL with 10% discount on their quoted rates i.e. Rs. 1,20,78,270 plus GST as applicable.
- xi. Major advantages of upgrading HMI/workstation of MAX DNA system with are under:
- It will ensure smooth and trouble free operation by HMI/Workstation of MAX DNA.
  - It will ensure better control and analysis of plant parameters and critical situations.
- xii. The aforesaid Additional Capitalization is essential for efficient and successful operation of a generating station. It is, therefore, requested to the Commission for Approval of Additional Capitalization towards up - gradation of existing HMI/workstation of MAX DNA system used as STG C&I, with estimated cost of Rs. 1,20, 78,270 plus GST and other taxes at actuals at DCCPP, Dholpur, under Regulation 17 (3) (a) of RERC Regulation 2019.

**B. Up Gradation of existing HMI and Control System from Mark VI to Mark VIe or equivalent control system of both Gas Turbine for DCCPP.**

- i. There are two nos. of HMI Servers which are installed for control and monitoring of data of two nos. of Gas Turbines (2X110 MW) frame -9E at DCCPP, Dholpur.



- ii. The typical HMI's are computer running Windows-2000 operating system with communication drivers for the data highways and CIMPLICITY operator display software. The operator initiates commands from the real time graphic displays and can view real time turbine data and alarms on the CIMPLICITY graphic displays. Detailed I/O Diagnosis and system configuration are available using toolbox software. An HMI can be configured as a server or work/operating station.
- iii. On dated 30.03.2018, it was found that one no. GT HMI Server#1 was not working. After checking it was found that the SMPS and Hard Disc of Server#1 got damaged/corrupted.
- iv. In view of this, M/s BGGTS was asked to depute service engineer to resolve the problem vide letter no. D. 30 dated 03.04.18, D. 71 dated 05.04.18 and D. 104 dated 06.04.18 (**Annexure -J**). In response to these letters, M/s BGGTS , replied that due to phasing out of the technology the GE had stopped manufacturing the Mark VI Control system in 2009 & usual support for spare parts is only extended upto 10 years and the last day to buy spare parts for retro fit applications are available till September'19 through GE's designated offices & recommended to go for up gradation of the whole existing control system with latest version for better reliability. The same is enclosed as **Annexure-K**.
- v. Accordingly, M/s BGGTS furnished their offer for up gradation of HMI servers for MARK-VI to VIe system costing Rs. 3,00,71,226.00 +GST and all other applicable charges extra.
- vi. M/s BGGTS was asked for some queries vide letter no. D. 3922 dated 03.12.18 (**Annexure -L**). M/s BGGTS replied vide letter no. Q18-0054a/02 dated 26.12.2018 (**Annexure-M**) that:
  - a. HMI which is a PC with installed engineered software of toolbox ST CIMPLICITY can serve only for 7 years. This is due to hardware & software modification from different vendors like Microsoft, HP & others.
  - b. As the current Mark VI control system is obsolete & getting phase out in December'18 its spare are not guaranteed from January'19. M/s BGGTS proposed partial migration, using which life can be extended for another 3 years.

- vii. M/s BGGTS also provided details of phase wise migration/ up gradation to Mark VIe and full panel up gradation of existing Mark VI control system to Mark VIe control system.
- viii. **After comparison, it was found that option of full panel up gradation of Mark VI to Mark VIe is better option to go for up gradation as the total work completion time is approx. 06 months and life is 15 years. The total cost of work is Rs. 10,10,30,000.00 which is less than the option of phase wise migration/ up gradation.**
- ix. In view of this, M/s BGGTS was asked to furnish fresh offer for full panel up gradation of existing MARK VI control system to MARK VIe control system of both Gas Turbines vide letter no. D. 4289 dated 02.01.19 (**Annexure-N**).
- x. Accordingly, M/s BGGTS vide letter no. Q18-0054 B dated 03.01.2019 (**Annexure-O**) had submitted offer including price schedule for Full panel up gradation of existing Mark-VI control system to Mark-VIe control system. In this offer total life of the system is considered as 15 years w.e.f. date of supply and cost of work as Rs. 10,10,30,000.00 +GST and other applicable charges extra.
- xi. Further, site authority vide E mail dt 16.02.19 also asked M/s Siemens to furnish their offer for up gradation existing Mark-VI control system to Mark-VIe control system. M/s Siemens representative visited the Dholpur site on dt. 27.02.19 (MoM enclosed as **Annexure-P**) and agreed to supply latest state of art control system –SPPS T3000 for both gas turbines and control system upgraded along with latest window platform available in market. M/s Siemens also assured that after up gradation of GT control system to SPPS T3000 control system there shall be no effect on functioning of STG control system. M/s Siemens has successfully performed similar up gradation work at various sites such as NTPC Dadri CCPP, Tata Trombay CCPP and many more.
- xii. M/s Siemens furnished their budgetary offer dt. 25.03.19 for up gradation of existing Mark VI control system (**Annexure-Q**). As per offer, the estimated cost is Rs. 8,49,10,465.00 +GST for design, engineering, supply, erection installation and commissioning in place of existing control system plus support for minimum 15 years from date of supply..

- xiii. THE WTD in their meeting held on 02.05.19 accorded approval for award of up gradation of existing HMI control system from Mark VI to Mark VIe or equivalent control system through open tender enquiry (enclosed as **Annexure-R**) with estimated cost of Rs 8,49,10,469/- plus GST.
- xiv. Major advantages of upgrading existing HMI control system from Mark VI to Mark VIe or equivalent control system are under:
- a) To reduce inventory of spares.
  - b) Reduction of peripherals.
  - c) For ensuring smooth and trouble free performance BY HMI.
  - d) For better control and analysis of plant parameters and critical situations.
- xiii. The aforesaid Additional Capitalization is essential for efficient and successful operation of a generating station. It is, therefore, requested to the Commission for Approval of Additional Capitalization towards up - gradation of HMI Servers of Gas Turbine from existing Mark VI control system to Mark VIe control system with estimated cost of Rs. 8,49,10,465.00 plus GST at DCCPP, Dholpur, under Regulation 17 (3) (a) of RERC Regulation 2019.

#### **A4: RESPONDENTS**

The respondents are (i.e. JVVNL, Jaipur/ AVVNL, Ajmer/ Jd.VVNL, Jodhpur/ RUVNL, Jaipur) for the above petition.

#### **A5: PRAYER**

RVUN humbly requests the Hon'ble Commission to:-

- (a) In-Principle approval for additional capitalization towards Up gradation of HMI workstation of MAX DNA system used as STG (C&I) , with estimated cost of Rs. 1,20,78,270/- plus GST & IDC and Up Gradation of existing HMI and Control System from Mark VI to Mark VIe or equivalent control system of both Gas Turbine for DCCPP with

estimated cost of Rs. 8,49,10,465/- plus GST & IDC at DCCPP, Dholpur.

- (b) Pass such further order or orders as this Hon'ble Commission may deem just and proper in the circumstances of the case.

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