Clarification No. 01 Dated 13.05.2022 to Bidders Queries
NIB No. 421 Dated 02.05.2022.

Name of Work: Tender for renewal of Industrial All Risk (IAR) Insurance Policy for the Assets of Tripura Gas Based Power Station (101 MW), TGBPS, Monarchak, Tripura, for a period of 1(one) year w.e.f. 00:00:00 Hours of 23.06.2022.

Sl. No.	Bidders Queries	NEEPCO's Response
	Claim Related Query:	
1	Share Root Cause Analysis [RCA] report.	RCA Report attached separately as **Annexure-I**.
2	Any Consequential Damage.	Damaged of STG Control Valve Spindles.
3	Status of reinstatement – STG.	STG tripped on 11:06 Hrs of 03/07/2020. STG restored and Synchronized on 00:16 Hrs. of 23/08/2020. Till date STG is running satisfactorily.
4	Who has done Repair & Reinstatement.	Control valves repaired at SV Turbo Engineering Works (P) Ltd., #D1 & E2, Industrial Estate, Patancheru, Greater Hyderabad, Telangana-502319. Restoration done at TGBPS site by NEEPCO engineer.
5	Period of Shut Down.	From 11:06 Hrs. of 03/07/2020 to 00:16 Hrs. of 23/08/2020 (Total 51 days shutdown of STG)
6	Post loss measures taken/ Preventive measures taken after claim.	1. Both the Governor Control valves repaired and installed at steam turbine. 2. Adequate spares of Governor System purchased and kept ready for future use. 3. A new set of Control Valve assembly procured and kept at TGBPP Store for future use. 4. Order has been placed for major overhauling of STG. 70% spares already been received at TGBPS Store.
	To share the Inspection report of the plant. If Inspection Report of the Plant is not available, share the following details:	
7	Power Purchase Agreement details.	Power Purchase Agreement attached at **Annexure-II**.
8	Performance Data [PAF, Plant Heat Rate, outage hour (planned & forced), PLF, etc. for last three years].	Performance Data attached at **Annexure-III**.
9	Location & Distance of ONGC well & number of lines connected to the plant.	ONGC GGS Khedabari to Monarchak: 10 KM (6 Nos. active well) and Trishna to Monarchak: 8 KM (02 Nos. well).
10	Daily Requirement of Gas [MMSCMPD] for Full Load.	0.5 MMSCMD
11	Gas Receiving Pressure & Temperature.	19 Kg, 32° C.
12	Does ONGC has Gas Conditioning Skid at your site.	Yes
13	Gas Boosting Compressor [Running: Standby].	One unit Running & One unit Standby.
14	On line Gas Chromatography facility is there or not.	Yes
15	OEMs of the packages like GTG, STG, HRSG, HV Transformers, etc. with technical details.	Details of OEMs of the packages attached at **Annexure-IV**.
16	Lead time of Gas Turbine, Generator, HRSG, Steam Turbine, Generator, Transformers.	One year from techno commercial order.
17	Any O&M contract, if yes specify the name & period.	1. M/s. Swamiana International (P) Ltd., Kolkata: Assistance for O&M of GTG and STG. Annual Maintenance Contract.

		2. M/s. GET Water Solution(P) Ltd., Chennai: Assistance for O&M of Water system, DM Plant, PT Plant, ETP Plant etc. Annual Maintenance Contract. 3. Local Contractor: Round the clock operation of Fire Tender and firefighting system. Annual Maintenance Contract. 4. M/s. Pranjana Associate, Guwahati: Maintenance contract for Fire detection and Protection system and fire fighting system.
18	Control system of GTG & STG package.	Attached under **Annexure-IV.**
19	DC Back up Facility, Capacity test frequency.	Details attached at **Annexure-V.**
20	Details of transmission line like distance [inside & outside the plant], number of towers, crossing any water body/ hilly terrain or not.	1. Monarchak- Rukhia 132 KV Line:28.96 KM 2. Monarchak-Banduar 132 KV Line: 41.45 KM 3. Monarchak-Rabindranagar 132 KV double circuit lines.2.6 KM each. Power evacuation is under TSECL.
21	MOC/Bypass Management System.	Not available.
22	Maintain of SOP.	As per Manual/OEM Guidelines.
23	Safe system of Work: Isolation, LOTO, PTW, LWC, SFF, etc.	Isolation, PTW
24	Maintenance procedure & philosophy of equipment & interlocks.	Details attached at **Annexure-VI.**
25	Off load preservation practices.	GT & ST Kept on Turning condition and HRSG kept on wet preservation.
26	Condition based monitoring facility.	Not available
27	Details of Major & Critical Spare.	Details attached at **Annexure-VII.**
	Details of Fire Safety [Active & Passive].	**Active**: 1. Automatic Fire detection and Co2 extinguishing system at GTG & STG. 2. Emulsifier system at Transformer yards and cable galleries **Passive**: 1. Fire Water & Foam Tender 2. CO & DCP cylinders are in place 3. Sand buckets & Hose pipes are placed in different locations. On Site & Off site Emergency Plan are in place.
28	Overall Security system.	NEEPCO security plus Meghalaya Home Guard. Vital installation kept under CCTV surveillance.
29	Latest Risk Inspection Report.	As Risk Inspection Report is not available, relevant details are provided at Sl. No. 7 to 28 for information and reference. Further, for risk inspection of the Plant, Clause 1.0(b), Section-V: Conditions of Insurance Policy and Clause 2.0(iv), Section-II: Information for Bidders of the Bid Document may please be referred.

13/05/2022

Incident Report/Root Cause Analysis

Tripping of STG at Tripura Gas Based Power Plant, Monarchak, Tripura, NEEPCO Ltd.

Dated 22-07-2020

Date and Time of Incident: 03-07-2020 at 11:06 Hrs.

Location: Steam Turbine governing system.

1	Introduction (brief notes about Steam Turbine trip)	Gas Turbine was commissioned on 11-03-2015 and the Date of Commercial Operation (COD) of Gas Turbine is 24-12-2015. Steam Turbine was commissioned on 14-01-2016 and the Date of Commercial Operation (COD) of Steam Turbine is 31-03-2017. Total capacity of TGBPP, Monarchak is 101 MW. Entire Power generating from this plant is being sold to Tripura State.
2	Affected Building/machinery	Governing System of Steam Turbine.
3	Main Activities	Generation of Electricity. Gas Turbine: 65.42 MW & Steam Turbine: 35.58 MW. Total: 101 MW.
4	Antecedent Conditions of tripping of STG.	(I) Gas Turbine Gen: 62.6MW (II) Gas Press: GBC SUC. PR. 19.33/DISCH. PR.-31.06 Kg/Sq.CM (III) Fuel gas Temp: GT INLET-87°C (IV) GT Exhaust Temp: 629°C (V) Gas Flow rate: 0.4433MMSCMD (VI) Gas Press: GT INLET 31.06Kg/sq. CM (VII) Steam Turbine Gen: 29.1MW (VIII) Steam Press: HP-75.9, IP-25.5, LP-4.4KG/CM^2 (IX) Steam Flow rate: HP-104.8, IP-7.5, LP-6.9 TON/HR. (X) STG Condenser CW Temp (Inlet):37°C (XI) STG Condenser Cooling Water Temp (Outlet):42.7°C (XII) GT Generator Current: 3276A (XIII) STG Generator Current: 1562A (XIV) Line in service: L2, L3 and L4 (XV)ST-2 in service (XVI) SAT 1 & 2 in service. (XVII) Raw Water Reservoir Level: 74% (XVIII) Clarified water Tank Level: 68% (XIX) DM Water Tank 1 & 2 Level: 87% (XX) Lube Oil Pressure: PUMP DICSH. 8.6KG/CM^2, HDR PR. 2.14 KG/CM^2. (XXI) Vibration record: TUR- FRNT-26 MICRON, REAR-47 MICRON. GEN-FRNT-39 MICRON, REAR-18 MICRON

5	Maintenance schedule	Minor overhaul not more than 3years or 20,000 to 25,000 operating hours. Intermediate overhaul after 5 to 6 years or 40,000 to 50,000 operating hours. Major overhaul after 10 to 12 years or100,000 operating hours.
6	Last Maintenance activities	Minor overhaul carried out on 24-07-2019 (at running hours: 19000 Hrs.)
7	Electrical System	Found to be in order.
8	Other utilities like EOT Crane	Found to be in order.
9	Fire Protection system	Automatic Fire Protection System in force with additional Co2, DCPs, Sand buckets are in place.
10	Brief details of the incident	Both GT & ST tripped at 11:06 Hrs. of 03/07/2020 due to rotor earth fault in GT. After rectification work, Gas turbine started immediately and synchronized at 13:38 Hrs. on the same day. During checking before starting steam turbine, it was observed that one HP Governor Valve spindle of Steam Turbine got damaged. On further checking of the operation it is found that the second Control Valve Assembly is also not working. Governor Control valve spindle got bent and stuck. As per the standard practice, all possible measures taken as per procedure for rectification but could not be able to rectify at site due to non-availability of high precession lathe and drill machine and induction heating system. In order to avoid further damage to the equipment, it was decided by the competent authority to send both the control valves assembly to Hyderabad for repairing. Spare control valve normally do not kept in stock. Spare Control valve is also not included under mandatory spare list recommended by the original equipment manufacturer (BHEL). Somehow, we have managed to send the first valve to Hyderabad through Air India Cargo. As informed by the Station Manager, they have suffered inconvenience while transporting the first valve due to COVID-19 situation. In view of COVID-19 there was load restriction in their conveyor belt system. They conveyed their inability at the time of lifting the second valve for transportation. At last the second valve was transported through TCI road transport. To repair the second valves in shortest possible time, second valve was diverted to M/s. S.V.Turbo Engineering Service Pvt. Ltd. Hyderabad.
11	Probable cause	Due to high thrust at the time of sudden tripping of both Gas Turbine and Steam Turbine resulting damage in Governor valve Assembly, which is accidental in nature.

		STG graphical trend is attached for supporting of healthiness of STG parameters before the incident. After thorough inspection and field study it is concluded that the main cause of damages may be due to the reason: 132 KV Grid of Tripura become sensitive particularly during rainy and stormy season, number of machine tripping is higher during that period.
12	Recommendation for improvement	(I) It is recommended to repair existing two number damaged control valves assemblies at the earliest to restore the STG Generation at the earliest. (II) It is recommended to procure a new complete set control valve assembly at the earliest for use in case of urgency and to avoid long term generation loss.

Shri Jayanta Das
उप महाप्रबंधक (वि.यां.)
Dy. General Manager (E/M),
टीजीबीपीपी, नीपको/TGBPP, NEEPCO

Shri Ajit Dubey

Shri Bijoy krishna Das

ANNEXURE -15

त्रिपुरा त्रिपुरा TRIPURA

00AA 217602

POWER SUPPLY AGREEMENT
BETWEEN
NORTH EASTERN ELECTRIC POWER CORPORATION LIMITED
AND
TRIPURA STATE ELECTRICITY CORPORATION LIMITED.
AGARTALA

THIS POWER SUPPLY AGREEMENT is entered into on this Nineteenth day of March Two Thousand Eight between **North Eastern Electric Power Corporation Limited** , a Company incorporated under the Companies Act , 1956 having its registered office at Brookland Compound , Lower New Colony , Shillong –793003 (hereinafter called **"NEEPCO"** which expression shall unless repugnant to the context or meaning thereof include its successors and assigns) as party of the first part and the **Tripura State Electricity Corporation Limited**, a company registered under the Companies Act, 1956 having its registered office at Vidyut Bhawan, North Banamalipur, Agartala, Tripura – 799001 (herein after called **"Bulk Power Customer"**, which expressions shall unless repugnant to the context shall include their respective successors and assigns) as party of the second part.

WHEREAS NEEPCO is the generating company of Government of India and Tripura State Electricity Corporation Limited, the Bulk Power Customer shall be the sole off taker of power from Tripura Gas Based Power Project owned and to be operated by NEEPCO for further consumption / trading by the Bulk Power Customer.

Now, therefore, in consideration of the premises and mutual covenant and conditions set forth herein, it is hereby agreed by the parties hereto as follows:-

1.0 DEFINITIONS

The words/expressions used in this Agreement, unless repugnant to the context shall have the same meanings as respectively assigned to them by the Electricity Act, 2003, as amended from time to time and Act that would come into force as a substitute or otherwise to the above stated Act. The words/expressions mentioned below shall have the same meanings as respectively assigned to them hereunder:-

a.	Month	:	Means English calendar month.
b.	Year	:	Means financial year commencing on 1st April and ending on 31st March.
c.	Project	:	Means Tripura Gas Based Power Project situated at Monarchak, Sonamura Sub-Division, West Tripura District, Tripura owned & to be operated by NEEPCO.
d.	Energy	:	Means the Electrical energy.
e.	Power	:	Means the Electrical Power.
f.	REA	:	Means a monthly statement prepared by the North Eastern Regional Power Committee (NERPC) showing Regional Energy Accounting for each State of North Eastern Region for the purpose of billing.
h.	LC.	:	Means Letter (s) of Credit.
i.	CERC	:	Means Central Electricity Regulatory Commission.
j.	GOI	:	Means Govt. of India
k.	IEGC	:	Means Indian Electricity Grid Code.
l.	MOP	:	Means Ministry of Power.
m	Outage	:	Means the State of component when it is not available to perform its intended function due to some event directly associated with that component.
n.	NERPC	:	Means North Eastern Regional Power Committee.
o.	NERLDC	:	Means North Eastern Regional Load Despatch Center.
p.	DPR	:	Means Detailed Project Report as submitted to MOP at August, 2006 Price level.
q.	TPA	:	Means Tripartite Agreement signed between Govt. of India, Govt. of Tripura and Reserve Bank of India regarding realisation of dues by NEEPCO from the Bulk Power Customer against sale of electricity.
r.	HOD	:	Means Head of Department.

2.0 INSTALLED CAPACITY & ALLOCATION OF POWER:

2.1 The installed capacity of Tripura Gas Based Power Project shall be **104 MW**. The installed capacity is however, subject to de-rating/up-rating of the generating units as determined from time to time by CEA.

2.2 The allocation of power from the project to the Bulk Power Customer, here Tripura State Electricity Corporation Ltd, shall be the entire Ex-Bus power (about 100 MW) of the Project for their consumption and trading outside the State in case of surplus.

3.0 GENERAL OBLIGATIONS:

3.1 NEEPCO is a generating company as defined under Section 2(28) of Electricity Act, 2003 and shall perform duties as defined under section 10 of Electricity Act, 2003 for supply & transmit of Electricity to the Bulk Power Customer.

3.2 NEEPCO shall obtain in principle clearance for setting up the project from appropriate commission / authority including approval of capital cost of project. No time and cost overrun due to reasons attributable to NEEPCO shall be entertained by the Bulk Power Customer.

3.3 The energy to be supplied under this agreement shall be in the form of three phase, 50 Hertz Alternating Current at a Voltage of 132 KV or as applicable. The frequency and voltage shall be subject to fluctuations as per provisions contained in IEGC and as amended from time to time.

4.0 DELIVERY POINT / EVACUATION OF POWER FROM NEEPCO STATION.

The Delivery Point of the power shall be 132KV Bus-Bar of the Project. Evacuation of power from the delivery point of the project up to Surjamaninagar Sub-Station of the Bulk Power Customer shall be through the 132 KV Double Circuit Transmission Line, as will be constructed by NEEPCO or the Bulk Power Customer. The Bulk Power Customer shall convey their decision regarding construction of the above mentioned Transmission Line by them to NEEPCO by 15th April, 2008. In case the Transmission Line is constructed by NEEPCO, the wheeling charge to be worked out by NEEPCO in line with Tariff Regulations of CERC, as applicable from time to time, shall be paid by the Bulk Power Customer to NEEPCO.

5.0 METERING ARRANGEMENTS:

Metering arrangements including its installation, testing, maintenance of meters and collection, transmission and processing of data required for energy exchange shall be governed as per the notification/directives issued by CERC from time to time and as per relevant provisions contained in IEGC and as amended from time to time.

6.0 ACCOUNTING OF ENERGY:

The quantum of energy sold to the Bulk Power Customer out of the energy available for sale shall be the energy as indicated in the REAs issued by NERPC. The REA including amendments, if any, as issued by NERPC shall form the basis for billing purposes and shall be binding on both the parties.

7.0 TARIFF:

7.1 The tariff to be charged and its associated terms and conditions for the energy to be supplied by NEEPCO from the Project shall be determined by CERC and NEEPCO shall file tariff petition before CERC within 6 (six) month from the date of commercial operation of the Project.

7.2 In case the tariff is not determined by CERC or any other competent authority prior to the commencement of commercial operation of the Project, the parties shall agree that NEEPCO may workout the provisional tariff based on CERC's terms and conditions as applicable from time to time as per estimated completion cost for the Project. NEEPCO shall inform the Bulk Power Customer of such provisional tariff. Both the parties shall mutually agree to the provisional tariff for the purpose of billing on provisional basis subject to adjustment as and when the tariff is determined by CERC.

7.3 In addition to the energy tariff and wheeling charge (if applicable) set out, the Bulk Power Customer shall also be liable to pay to NEEPCO, in accordance with any law in force, all payments payable by it on account of taxes, duties, cess, levy, fees or other imposition etc,. levied or to be levied in future as a new tax by the GOI or other authority in respect of generation, transmission and supply of energy including activities incidental and ancillary thereto as per orders of CERC / GOI in this regard.

8.0 BILLING:

8.1 NEEPCO shall prepare bills for the energy supplied to the Bulk Power Customer on the basis of REAs issued by NERPC/NERLDC and Bulk Power Customer shall accept these bills for payment. The bill shall be the aggregate of charges as approved/notified by CERC/GOI from time to time.

8.2 In case Bulk Power Customer has any objection as to the accuracy of any bill(s), it shall lodge a written objection with NEEPCO within 15 days on presentation of such bill(s). On such objection being upheld by NEEPCO, the same shall be rectified within a period of 30 days from the date of receipt of written objection and necessary effect of the same shall be given in the subsequent bill(s). However, payment of such bills should not be kept withheld by the Bulk Power Customer.

8.3 The settlement of all disputed current dues shall be governed as per the directives of CERC/GOI, as issued from time to time.

9.0 PAYMENT:

9.1 For the 1st 12 months of operation, NEEPCO shall raise the bills as per Clause-8.1 of this Agreement against energy supplied and the Bulk Power Customer shall pay the bill within 30 days of receipt of the bill every month. After 12 months of operation, the Bulk Power Customer shall establish a confirmed, revolving, irrevocable Letter of Credit to be established in favour of NEEPCO for an amount equivalent to 105 percent of their average monthly billing of preceding 12 months with appropriate bank, as mutually acceptable to the parties. The LC shall be kept valid at all the time during the validity of this agreement or extended period. The amount of LC shall be reviewed quarterly. NEEPCO shall intimate the revised amount of LC one month in advance of start of the quarter. If still the amount of energy supplied is more than the amount of LC, the payment of excess amount shall be made by the Bulk Power Customer directly on presentation of such bill(s). All the bank charges shall be borne by the Bulk Power Customer.

9.2 NEEPCO shall present bill(s) to the said Bankers with a copy to the Bulk Power Customer. The bill(s) so presented by NEEPCO to the said Bankers shall be promptly paid on their presentation.

9.3 Notwithstanding the above, if the Bulk Power Customer has not signed the TPA, shall pursue to obtain guarantee from its State Government, as per mutually agreed draft to guarantee the performance of the obligations of Bulk Power Customer to make regular payments of the energy bills presented by NEEPCO for power supplied/ to be supplied to Bulk Power Customer from the Project.

10.0 SURCHARGE ON LATE PAYMENT AND REBATE:

10.1 The provision for levy of surcharge and rebate shall be governed as per CERC Regulations applicable from time to time.

10.2 Notwithstanding what is contained above, if the bill(s) are not paid by Bulk Power Customer to NEEPCO within 60 days from the date of billing, NEEPCO shall have the option to regulate the supply of energy to Bulk Power Customer in accordance with the provisions of TPA or directives/guidelines issued by CERC/GOI from time to time.

11.0 ARBITRATION:

11.1 All questions, differences or disputes between the parties arising out of or in connection with this Agreement save and except as provided under clause 6.0 of the agreement to the extent of power vested with NERPC, shall be settled through arbitration in accordance with the provision of Arbitration and Conciliations Act, 1996 and any statutory modifications thereto. However, before referring the matter to arbitration, efforts shall be made by the parties to settle the disputes through conciliation.

11.2 In the event of such question, differences or disputes between the parties, any party may by a written notice of 30 days to the other party, request for appointment of a Sole Arbitrator to be decided mutually by the parties and in case of disagreement within 15 days thereafter to be decided by Chairman, Central Electricity Authority. The appointment of Sole Arbitrator either mutually agreed by the parties or decided by the Chairman, CEA, SHALL be made by Head of Commercial Department of either of the parties along with the reference of dispute between the parties for adjudication by the Sole Arbitrator. The venue of the arbitration proceedings shall be decided by the Arbitrator with the consent of parties. The High Court of Guwahati shall have exclusive jurisdiction in all matters arising under this Agreement.

11.3 The Arbitrator shall reasonably decide his fees. However, the Arbitrator's fees and cost of arbitration proceedings shall be borne equally by the parties. The arbitrator shall publish the award, within a reasonable time.

11.4 Notwithstanding the existence of any question, disputes and differences referred to arbitration, the parties hereto shall continue to perform their respective obligations under this Agreement.

12.0 FORCE MAJEURE:

Both the parties shall ensure compliance of the terms of this agreement. However, no party shall be liable for any loss or damage whatsoever arising out of failure to carry out the terms of this Agreement to the extent that such failure is due to force majeure events such as rebellion, mutiny, civil commotion, riot, strike, lock out, fire, explosion, flood, drought, cyclone, lightening, earthquake, war or other forces, accident, landslide, sabotage, terrorism, malicious act of kidnapping or act of God. But, any party claiming the benefit of this clause shall satisfy the other party of the existence of such an event(s).

13.0 DURATION OF AGREEMENT:

This agreement shall come into force from the date of signing of this Agreement and shall remain operative for 5(five) years from the commercial operation date of the last unit of project provided that this Agreement may be mutually extended, renewed or replaced by another Agreement on such terms and for such further period of time as the parties may agree to. However, the provisions of this agreement shall continue to operate till this Agreement is formally renewed, extended, or replaced, in case the Bulk Power Customer continues to get power from the Project even after expiry of this Agreement without further renewal or formal extension thereof.

14.0 NOTICES:

All notices required or referred to under this Agreement shall be in writing and signed by the authorities mentioned herein below unless otherwise notified. Each such notice shall be deemed to have been duly given, if delivered or sent by registered mail with an acknowledgement due, to the other party.

A. TO NEEPCO :

General Manager (Comml.),
NEEPCO Ltd., Brookland Compound,
Lower New Colony, Shillong-793 003

With a copy to:

Head of Project,
Tripura Gas Based Power Project,
Monarchak, West Tripura District, Tripura

B. BY NEEPCO :

General Manager (Comml.)
NEEPCO Ltd., Brookland Compound,
Lower New Colony, Shillong – 793 003.

With a copy to:

Head of Project,
Tripura Gas Based Power Project,
Monarchak, West Tripura District, Tripura

C. TO Bulk Power Customer :

The Director (Technical),
Tripura State Electricity Corporation Ltd.,
North Banamalipur,
Agartala – 799 001,Tripura.

D. BY Bulk Power Customer :

The Additional General Manager,
Commercial & System Operation,
Tripura State Electricity Corporation Ltd.,
North Banamalipur,
Agartala – 799 001,Tripura.

15.0 IMPLEMENTATION OF THE AGREEMENT:

Any Tripartite Agreement signed between Govt. of India, Govt. of Tripura and Reserve Bank of India regarding realisation of dues by NEEPCO from the Bulk Power Consumer against sale of electricity shall form an integral part of this agreement. In case, any of the provisions of this Agreement are inconsistent with the provisions of the Tripartite Agreement, mentioned above, then the provisions of Tripartite Agreement shall prevail.

IN WITNESS WHEREOF the parties have executed these presents through their duly authorised representatives caused on the day month and year first above written.

19/3/08
(P.K. BORAH).

For and on behalf of
North Eastern Electric Power Corporation Ltd.

महाप्रबंधक (वाणिज्यिक)
नीपको लि., शिलांग
General Manager (Comml.)
NEEPCO. Ltd. Shillong.

WITNESS:-
1. 19/03/08
(Arup Ch. Sarmah)
कार्य प्रबंधक (विद्युत)
महाप्रबंधक (वाणिज्यिक) का कार्यालय
नीपको लि., शिलांग
Sr. Manager (E)
O/O the General Manager (Comml.)
NEEPCO. Ltd., Shillong

2.

19/3/08

For and on behalf of
Tripura State Electricity Corporation Ltd.

WITNESS:-
1. 19/3/08
Er. M. Debbarma
Addl. General Manager
Commercial & System Operation
Tripura State Electricity Corporation Limited
Agartala, Tripura

Dipak Ganguli
Chairman-cum-Managing Director
Tripura State Electricity Corporation Ltd.

2.

TGBPP- KEY PERFORMANCE INDICATOR, 2019-20 (PERIOD: APRIL 2019 TO MARCH 2020)

Month	ACTUAL GEN		STATION CONSUMPTION (Auxiliary)		Colony Consumption		GAS CONSUMPTION	TOTAL LANDED COST OF GAS	CALORIFIC VALUE		SP. GAS CONS	STATION HEAT RATE		PLF	PAF
	GROSS GEN	EX-BUS GEN							NET	GROSS		ON NCV	ON GCV		
	MU	MU	MU	%	MU	%	SCM	Rs in Crore	Kcal/SCM	Kcal/SCM	SCM/KWh	Kcal/KWh	Kcal/KWh	%	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Apr-19	55.159	52.961	2.198	3.98	0.031	0.06	12171791	10.4889092	8273.471	9180.700	0.2207	1825.69	2025.88	**74.85**	**82.15**
May-19	54.841	52.521	2.269	4.14	0.051	0.09	12211494	10.5142520	8266.649	9173.804	0.2227	1840.74	2042.74	**71.99**	**87.95**
Jun-19	56.771	54.453	2.268	3.99	0.050	0.09	12207286	10.5060040	8263.125	9169.863	0.2150	1776.79	1971.77	**77.30**	**85.62**
Jul-19	55.898	53.570	2.259	4.04	0.069	0.12	12299877	10.8098570	8261.847	9168.435	0.2200	1817.95	2017.44	**73.18**	**87.96**
Aug-19	57.755	55.393	2.328	4.03	0.034	0.06	12837382	11.3625665	8259.442	9165.953	0.2223	1835.85	2037.34	**75.74**	**89.32**
Sep-19	52.370	50.075	2.525	4.82	0.031	0.06	11980994	10.4063325	8273.471	9165.659	0.2288	1892.77	2096.88	**70.91**	**84.16**
Oct-19	63.629	61.349	2.737	4.30	0.030	0.05	13623301	11.8312818	8258.133	9164.559	0.2141	1768.11	1962.18	**83.99**	**90.23**
Nov-19	64.546	62.239	2.269	3.52	0.0376	0.06	13719550	11.9146793	8258.006	9164.408	0.2126	1755.28	1947.94	**88.30**	**91.32**
Dec-19	71.872	69.392	2.444	3.40	0.035629	0.05	14804711	12.8473153	8257.599	9164.005	0.2060	1700.96	1887.67	**95.28**	**97.43**
Jan-20	48.265	46.235	1.996	4.14	0.034065	0.07	10500485	9.1205594	8265.187	9167.470	0.2176	1798.17	1994.47	**63.70**	**64.12**
Feb-20	62.839	60.642	2.164	3.44	0.032838	0.05	13009001	11.2895986	8258.224	9164.68	0.2070	1709.63	1897.28	**88.91**	**94.41**
Mar-20	69.513	67.268	2.206	3.17	0.039002	0.06	14357480	12.4634872	8260.484	9166.924	0.2065	1706.15	1893.37	**92.21**	**95.48**
TOTAL/ AVERAGE	**713.458**	**686.098**	**27.66387**	**3.92**	**0.475215**	**0.07**	**153723352**	**122.1922763**	**8262.970**	**9168.039**	**0.216**	**1785.674**	**1981.246**	**79.697**	**87.513**

03/04/2020

Operation incharge, DGM - (E/M)
TGBPP, NEEPCO, Monarchak.

03/04/2020

Shift Incharge- (E/M)
TGBPP, Monarchak

ED (O&M), PI.

TGBPP- KEY PERFORMANCE INDICATOR, 2020-21 (PERIOD: APRIL 2020 TO MARCH 2021)

Month	ACTUAL GEN		STATION CONSUMPTION (Auxiliary)		Colony Consumption		GAS CONSUMPTION	TOTAL LANDED COST OF GAS	CALORIFIC VALUE		SP. GAS CONS	STATION HEAT RATE		PLF	PAF
	GROSS GEN	EX-BUS GEN							NET	GROSS		ON NCV	ON GCV		
	MU	MU	MU	%	MU	%	SCM	Rs in Crore	Kcal/SCM	Kcal/SCM	SCM/KWh	Kcal/KWh	Kcal/KWh	%	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Apr-20	45.905	43.695	2.1717	4.73	0.0383	0.083	10426269	9.4083119	8257.005	9163.327	0.2271	1875.39	2081.24	**61.84**	**67.19**
May-20	44.673	42.218	2.4167	5.41	0.03833	0.086	10401392	9.5963441	8257.409	9163.738	0.2328	1922.61	2133.63	**57.93**	**59.90**
Jun-20	39.972	37.555	2.3828	5.96	0.034	0.086	9916643	9.2606060	8258.971	9165.403	0.2481	2048.97	2273.84	**53.37**	**53.78**
Jul-20	26.799	25.417	1.3500	5.04	0.030	0.112	9952279	9.2936526	8258.794	9165.214	0.3714	3067.05	3403.66	**34.80**	**34.82**
Aug-20	28.085	26.603	1.4503	5.16	0.0317	0.113	9786065	9.1339395	8254.702	9160.994	0.3484	2876.31	3192.10	**36.36**	**36.46**
Sep-20	31.098	29.316	1.7490	5.62	0.033	0.106	7258530	6.7721308	8252.200	9158.364	0.2334	1926.13	2137.64	**41.74**	**42.33**
Oct-20	22.794	21.711	1.0519	4.61	0.031	0.136	5601655	5.2387212	8264.741	9171.671	0.2458	2031.07	2253.95	**29.95**	**30.87**
Nov-20	52.894	50.691	2.1792	4.12	0.02385	0.045	11733326	10.9656498	8259.232	9165.738	0.2218	1832.12	2033.21	**71.69**	**78.94**
Dec-20	48.009	45.882	2.0981	4.37	0.0289	0.060	10847621	10.1040489	8253.279	9159.497	0.2259	1864.83	2069.59	**62.95**	**65.92**
Jan-21	63.987	61.700	2.2583	3.53	0.0287	0.045	13443361	12.4752998	8241.796	9147.200	0.2101	1731.56	1921.78	**84.71**	**95.48**
Feb-21	60.119	57.986	2.1074	3.51	0.0256	0.04	12632471	11.7360867	8251.063	9157.39	0.2101	1733.75	1924.19	**88.20**	**103.10**
Mar-21	68.334	66.035	2.2727	3.33	0.0263	0.04	14260929	13.2419303	8246.328	9152.143	0.2087	1720.96	1910.00	**90.98**	**94.32**
TOTAL/ AVERAGE	**532.669**	**508.809**	**23.48807**	**4.62**	**0.36988**	**0.079**	**126260541**	**117.2267216**	**8254.626**	**9160.890**	**0.249**	**2052.562**	**2277.903**	**59.543**	**63.593**

03/04/2021

ED (O&M), Pl.

Operation incharge, DGM - (E/M)
TGBPP, NEEPCO, Monarchak.

Dy. General Manager (E/M)
TGBPP NEEPCO Ltd. Monarchak.

03/04/2021

Shift Incharge- (E/M)
TGBPP, Monarchak

TGBPP- KEY PERFORMANCE INDICATOR, 2021-22 (PERIOD: APRIL 2021 TO MARCH 2022)

Month	ACTUAL GEN		STATION CONSUMPTION (Auxiliary)		Colony Consumption		GAS CONSUMPTION	TOTAL LANDED COST OF GAS	CALORIFIC VALUE		SP. GAS CONS	STATION HEAT RATE		PLF	PAF
	GROSS GEN	EX-BUS GEN							NET	GROSS		ON NCV	ON GCV		
	MU	MU	MU	%	MU	%	SCM	Rs in Crore	Kcal/SCM	Kcal/SCM	SCM/KWh	Kcal/KWh	Kcal/KWh	%	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Apr-21	54.448	52.582	1.8801	3.45	0.0259	0.048	12065839	11.6682369	8255.334	9160.268	0.2216	1829.41	2029.94	**74.72**	**76.19**
May-21	69.426	67.065	2.3340	3.36	0.0270	0.039	14802027	14.3107606	8253.158	9159.367	0.2132	1759.62	1952.83	**92.61**	**97.20**
Jun-21	66.576	64.257	2.2612	3.40	0.0578	0.087	14251942	13.7781934	8252.729	9158.858	0.2141	1766.66	1960.64	**91.73**	**97.31**
Jul-21	61.045	59.046	1.9335	3.17	0.0654	0.107	14349116	13.8572722	8252.159	9158.347	0.2351	1939.74	2152.74	**81.65**	**85.14**
Aug-21	63.973	61.738	2.1824	3.41	0.0526	0.082	14570263	14.0651618	8248.568	9154.801	0.2278	1878.66	2085.06	**85.24**	**88.72**
Sep-21	54.234	52.131	2.0604	3.80	0.0426	0.079	12278460	11.8600673	8253.762	9160.451	0.2264	1868.63	2073.91	**74.53**	**80.51**
Oct-21	62.794	60.597	2.1531	3.43	0.0439	0.070	14009635	13.5255699	8249.873	9156.378	0.2231	1840.59	2042.83	**84.64**	**89.84**
Nov-21	66.342	64.169	2.1161	3.19	0.0568	0.086	14752112	14.2904043	8249.029	9155.450	0.2224	1834.29	2035.85	**91.16**	**92.20**
Dec-21	43.469	41.943	1.4554	3.35	0.0706	0.162	9240886	8.9820798	8248.476	9154.864	0.2126	1753.51	1946.19	**58.00**	**58.33**
Jan-22	53.848	52.113	1.7218	3.20	0.0802	0.149	11985862	11.9858620	8240.931	9146.632	0.2226	1834.32	2035.92	**72.04**	**73.42**
Feb-22	55.903	53.884	1.9579	3.50	0.0611	0.109	12273054	11.9246073	8245.370	9151.591	0.2195	1810.20	2009.16	**83.94**	**85.67**
Mar-22	65.904	63.499	2.3711	3.60	0.0339	0.051	14237721	13.8500220	8255.014	9161.800	0.2160	1783.39	1979.29	**88.68**	**89.86**
TOTAL/ AVERAGE	**717.962**	**693.024**	**24.4268**	**3.40**	**0.618**	**0.089**	**158816917**	**154.0982375**	**8250.367**	**9156.567**	**0.2212**	**1825.024**	**2025.480**	**81.54**	**84.50**

04/04/2022

ED (O&M), Pl.

Operation incharge, GM (E/M)
TGBPS, NEEPCO, Monarchak.

03/04/2022

Shift Incharge- (E/M)
TGBPS, Monarchak

TGBPS OUTAGES

		2019-2020	2020-2021	2021-2022
GTG	Force Outage in Hrs.	120.9	123.12	234.68
	Planned Outage in Hrs.	5.099	621.07	439.06
STG	Force Outage in Hrs.	434.8	1426	570.3
	Planned Outage in Hrs.	9.2006	739.99	684.183

ANNEXURE-IV

OEMs OF CRITICAL PLANT / EQUIPMENT /MACHINERIES AT TGBPP, NEEPCO LTD, MONARCHAK

Sl. No.	Description of Plant/ Equipment/ Machineries.	Make/Specification
1	GBC (Gas Booster Compressor) Unit 1 & 2 and their Auxiliaries	Motor: Make: BHEL Frame: 1MA7712-2, applicable standard: IS:325/1996, SCIM, 800KW, 2987RPM, 6.6 KV, 83.0 Amp, No load current: 13 Amp. Compressor: Type: BCL:306, Q: 23015 SM^3/hr, 11250 RPM, WP: 30.1 kg/cm^2, Max: 37.6 kg/cm^2, Imp: 06 nos. Imp dia: 300 mm
	GAS TURBINE SYSTEM	
2	Gas Turbine System Unit 1 and their Auxiliaries.	Make: GE Type: Frame 6FA, Base Load: 65.42 MW, Compressor: 18 Stage, RPM: 5231, Altitude: 30.9 M from Sea level. Air In: 30.5^{0}C Relative humidity: 85%.
3	Gas Turbine SFC System	GE Converteam
4	Gas Turbine AVR System	BHEL
5	Gas Turbine Generator: 65.42MW Capacity.	BHEL
6	Gas Turbine Generator Transformers 100MVA	BHEL
7	Gas Turbine Duct including Diverter Damper & Guillotine Damper	Supplied by BHEL Diverter Damper: Bachmann Industries Ltd. Guillotine Damper: Indira Damper
8	GT Lube Oil system & Gas Turbine Air intake system.	Lube oil system: BHEL Air Intake system: Camfil
9	Gas Turbine Co2 Fire Fighting System	Make:Agni Control Pvt. Ltd.
10	Closed Cooling Water Module Fans & Pumps	BHEL
	HRSG SYSTEM	
11	HRSG (Heat Recovery Steam Generator)	BHEL
	HP BFP (Boiler Feed Pumps)Unit 1, 2, 3	Pump: KSB 101M^3/hr, H: 1568MWC, 2950 RPM, 608.6 KW, Suction Pr.: 2.307Kg/cm^2. Motor: BHEL
	STEAM TURBINE SYSTEM	
12	Steam Turbine	BHEL Type: HNK/2.8-4, Rating: Base Load: 35.58 MW, Sale Order: MGA1011001
13	Steam Turbine Generator	BHEL
14	Steam Turbine AVR System	BHEL
15	Pressure parts (Steam Piping & Steam Valves)	BHEL
16	Steam Turbine Generator	BHEL
17	Steam Turbine Lube Oil system	BHEL
18	Steam Turbine Generator Transformers 55MVA	BHEL

19	STG Co2 Fire Fighting System.	Make: New Fire Engineering Pvt. ltd.
20	CW Pump 1,2,3	
21	ACW Pump 1,2	
22	CEP (Condensate Extraction pumps) 1 & 2	
	SWITCH YARD & SWITCHGEAR SYSTEM	
23	132 KV Switch Yard. 132 KV SF6 Breakers: 9 Nos. Alstom Make & CT, PT, EMVT, LA, CVT	Electro- magnetic Voltage Transformer (at Bus), Capacitive Voltage Transformer (at Line)
24	SST Unit 1 & 2 (132/6.6 KV): One in service and one Spare. 20MVA each	Make: BHEL
25	SAT Unit 1,2,3,4 (6.6KV/415V): Two in service and two spares. 2.5MVA each	Make: BHEL
26	132 KV, 11 KV, 6.6 KV, 415 V Switchgear Systems	
27	Cable Galleries	
28	1010 KVA EDG	Cummins engine, Generator: Stamford and overall make: Jackson
	COOLING TOWER SYSTEM	
29	Cooling Tower and CT Fans 1,2,3,4,5,6	Hamman Shriram
30	**WATER SYSTEM**	
31	Intake Water Pump Unit 1,2	BHEL
32	Raw Water Reservoir	
33	HRSCC Unit 1 & 2	
34	DM Plant	
	CONTROL SYSTEM	
35	Mark-VI e for Gas Turbine, CDM System	
36	Max-DNA for Steam Turbine	
	AIR COMPRESSOR SYSTEM	
37	IAPA & NITROGEN SYSTEM, Compressor 1,2,3	IngersollRand
38	Gas Scrubber Unit & entire pipelines system	Scrubber make: Grand Prix
39	Water Pipelines from Intake to TGBPP	BHEL
40	Transformer at Intake: 11/0.415 KV. Transformer at TGBPP: 6.6/11KV substation for Intake Power supply, 11 KV Transmission Lines.	
	FIRE PROTECTION SYSTEM	
41	Pressurized Hydrant system	Supplied by BHEL Vendor: Thermo- System
42	Automatic HVW Spray System	-do-
43	Automatic MVW Spray System	-do-
44	Fire Alarm and Detection System	-do-
45	Plant Emergency AC & DC Power supply System, Battery Chargers/ Inverters etc.	BHEL
46	Clarified Water Tank	BHEL

Annexure-V

DC back up facility

- For switchyard control and protection system **220 Volt DC/ 250 AH** charger and battery back-up system.
- For PLCC power supply **48 Volt DC/ 150 AH** charger and battery back-up system.
- For Station HT and LT panels control and protection power **supply 220 Volt DC/ 550 AH** charger and battery backup system.
- For Gas Turbine emergency drives and control system power supply **125 Volt DC/ 85 AH and 125 Volt DC/170 AH** charger and battery back-up system.
- For UPS system for control panels, HMI, etc. power supply **390 Volt DC / 362 AH UPS battery back-up system**

Transmission line (132 KV)

- **Line 1 and 2 (Monarchak to Rabindranagar) Double Circuit Line, 2.6 KM**
- **Line 3 (Monarchak To Rokhia) 28.96 KM**
- **Line 4 (Monarchak to Banduar) 41.45 kM**

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

COMPUTER FILE NAME

REF. DRG. NO.

SIGN. AND DATE

INVENTORY NO

BHEL DRAWING NO.

CUSTOMER DRAWING NO.

SHT. OF

DRIVE CONTROL PHILOSOPHY

नॉर्थ ईस्ट्रर्न इलैक्ट्रिक पावर कॉरपोरेशन लिमिटेड
भारत सरकार का उपक्रम
NORTH EASTERN ELECTRIC POWER CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)

त्रिपुरा गैस आधारित सी सी विद्युत परियोजना
त्रिपुरा
TRIPURA GAS BASED CC POWER PROJECT
(TRIPURA)

CONSULTANT:
DESEIN PRIVATE LTD.,NEW DELHI

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

	NAME	SIGN.	DATE
DRN.	GANESH KUMAR	–SD–	04.08.11
CHD.	GANESH KUMAR	–SD–	04.08.11
APPD.	PRAKASH	–SD–	04.08.11

NO. OF VAR. –N.A.–

REV.	DATE	ALTERED	CHD./ISSD.	APPD.
02	16.06.12			
01	25.01.12	–SD–	–SD–	–SD–

ZONE

02 — 16.06.12 — ALTERED — CHD./ISSD. — APPD. — ZONE — REVISED AS PER NEEPCO COMMENTS DATED 26.04.12

01 — 25.01.12 — ALTERED –SD– — CHD./ISSD. –SD– — APPD. –SD– — ZONE — REVISED AS PER NEEPCO COMMENTS DATED 30.11.11.

DEPT. PE&SD
CODE 450

UNTOL. DIMS. GR. ~~C/M/F~~

SCALE

WEIGHT (KG)

REF. TO ASSY. DRG. –N.A.–

ITEM NO. –N.A.–

NO. OF ITEMS –N.A.–

BHEL'S CONSULTANT: TRACTEBEL Engineering GDF SUEZ — TRACTEBEL Engineering pvt. ltd. NEW DELHI

TITLE
DRIVE CONTROL PHILOSOPHY

CARD CODE N.A.

DRAWING NO. 4–381–21–02883

REV. 02

SHT. No 1

NO. OF SHT. 11

BHEL Consultant
TRACTEBEL Engineering GDF SUEZ

Project:1x 100 MW NEEPCO Combined Cycle Power Project , Monarchak
Customer: M/s NEEPCO, Monarchak, Tripura
BHEL - HYDERABAD

DRIVE CONTROL PHILOSPHY

DOC. NO: 4-381-21-02883
Rev. no: 02
Date: 16.06.12

Type of Drive	Local Control Station		Valve Actuator		DCS HMI (Control Room)		Switchgear	
	Control	Indication	Control	Indication	Control	Indication	Control	Indication
HT Uni-directional Drives	Start PB(Green)	…….	…….	…….	Start Command	Run --- Red	Stop PB	Run --- Red
	Stop PB(Red) (lockable)	…….	…….	…….	Stop Command	Stop --- Green		Stop --- Green
	L/R Selection	…….	…….	…….	A/M Selection	Trip --- Amber		Trip --- Amber
	…….	…….	…….	…….	…….	RTS-Yellow		Spring Charged - Blue
	…….	…….	…….	…….	…….	…….		Breaker Test Position - White
	…….	…….	…….	…….	…….	…….		Breaker Service Position - Yellow
	…….	…….	…….	…….	…….	…….		Trip Circuit Healthy - Clear
	…….	…….	…….	…….	…….	…….		DC Supply Healthy - Clear
	…….	…….	…….	…….	…….	Motor Current		Ammeter #
LT Uni-directional Drives	Start PB(Green)	…….	…….	…….	Start Command	Run --- Red	Stop PB	Run --- Red
	Stop PB(Red) (lockable)	…….	…….	…….	Stop Command	Stop --- Green		Stop --- Green
	L/R Selection	…….	…….	…….	A/M Selection	Trip --- Amber		Trip --- Amber
	…….	…….	…….	…….	…….	RTS-Yellow	…….	
	…….	…….	…….	…….	…….			Spring Charged - Blue
	…….	…….	…….	…….	…….	…….		Breaker Test Position - White
	…….	…….	…….	…….	…….	…….		Breaker Service Position - Yellow
	…….	…….	…….	…….	…….	…….		Trip Circuit Healthy - Clear
	…….	…….	…….	…….	…….	…….		DC Supply Healthy - Clear
	…….	…….	…….	…….	…….	Motor Current		Ammeter #

DRIVE CONTROL PHILOSPHY

MOVs	…….	…….	Open PB	Open	Open Command	Open --- Red	…….	…….
	…….	…….	Close PB	Close	Close Command	Close --- Green	…….	…….
	…….	…….	Stop PB	…….	A/M Selection	RTS----Yellow	…….	…….
	…….	…….	L/R SS	…….	…….	TS Open---Red with flash	…….	…….
	…….	…….	…….	…….	…….	TS Close---Green with flash		
MOVs with Inching Operation	…….	…….	Open PB	Open	Open Command	Open --- Red	…….	…….
	…….	…….	Close PB	Close	Close Command	Close --- Green	…….	…….
	…….	…….	Stop PB	…….	…….	RTS --- Yellow	…….	…….
	…….	…….	L/R SS	…….	…….	Valve Position	…….	…….
	…….	…….	Handwheel	…….	…….		…….	…….
Solenoid Operated Valves (SOVs)	…….	…….	…….	…….	A/M Selection	Open --- Red	…….	…….
					Open Comm	Close --- Green		
	Manual Reset*	…….	…….	…….	Close Comm		…….	…….
Analog Drives (Pnematic Control Valves)	…….	…….	Handwheel	Position	…….	Position	…….	…….
	…….	…….	…….	…….	Regulation(A/M)	Process Value	…….	…….
	…….	…….	…….	…….	…….	…….	…….	…….
	…….	…….	…….	…….	…….	…….	…….	…….
6.6 kv Incomer Breaker	…….	…….	…….	…….	…….	ON --- Red	…….	ON --- Red
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	OFF --- Green
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	…….	Trip --- Amber
	…….	…….	…….	…….	…….	RTS-Yellow	……. 02	Spring Charged --- Blue
	…….	…….	…….	…….	…….	Incomer Current(R,Y,B)	…….	Test Position --- White
	…….	…….	…….	…….	…….	Incomer Voltage(R,Y,B)	…….	Service Position--Yellow
	…….	…….	…….	…….	…….	Incomer Power	…….	Trip Circuit Healthy --- Clear
	…….	…….	…….	…….	…….	Incomer Reactive Power	…….	DC Supply Healthy --- Clear
6.6 kv Bus Coupler	…….	…….	…….	…….	…….	ON --- Red	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	……. 02	
	…….	…….	…….	…….	…….	RTS-Yellow	…….	
	…….	…….	…….	…….	…….	Bus Voltage(R,Y,B)	…….	

6.6 kv Outgoing Feeder	…….	…….	…….	…….	…….	ON --- Red	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	……. 02	
	…….	…….	…….	…….	…….	RTS-Yellow	…….	
	…….	…….	…….	…….	…….	Outgoing feeder Current(R,Y,B)	…….	
	…….	…….	…….	…….	…….	Outgoing Feeder Power	…….	
415V PMCC Incomer Breaker	…….	…….	…….	…….	…….	ON --- Red	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	…….	
	…….	…….	…….	…….	…….	RTS-Yellow	……. 02	
	…….	…….	…….	…….	…….	Incomer Current(R,Y,B)	…….	
	…….	…….	…….	…….	…….	Incomer Voltage(R,Y,B)	…….	
	…….	…….	…….	…….	…….	Incomer Power	…….	
415V PMCC Bus Coupler	…….	…….	…….	…….	…….	ON --- Red	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	……. 02	
	…….	…….	…….	…….	…….	RTS-Yellow	…….	
	…….	…….	…….	…….	…….	Bus Voltage(R,Y,B)	…….	
415V PMCC Outgoing Feeder	…….	…….	…….	…….	…….	ON --- Red	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	CLOSE Command	OFF --- Green	…….	
	…….	…….	…….	…….	TRIP Command	Trip --- Amber	……. 02	
	…….	…….	…….	…….	…….	RTS-Yellow	…….	
415V MCC Incomer Breaker	…….	…….	…….	…….	…….	Incomer Current(R,Y,B)	…….	Same as 6.6 kv Incomer Breaker
	…….	…….	…….	…….	…….	Incomer Voltage(R,Y,B)	……. 02	
	…….	…….	…….	…….	…….	Incomer Power	…….	
415V MCC Bus Coupler	…….	…….	…….	…….	…….	Bus Voltage(R,Y,B)	……. 02	Same as 6.6 kv Incomer Breaker

DRIVE CONTROL PHILOSPHY

LEGEND:

PB --- Push Button
SS --- Selector Switch
L/R --- Local /Remote selection
A/M --- Auto/Manual Selection
MV-- Main Valve
IBV-- Integral Bypass Valve
IPR--- Interposing Relay
NO--- Normally Open (make to alarm)
NC--- Normally Close (break to alarm)
RTS--- Ready to Start
NRTS--- Not in Ready to Start
R --- Redundant
NR --- Non-Redundant
CV --- Control Valve
SOV --- Solenoid Valve
XL --- Drive feed back
HS --- Drive Command
NA--- Not Applicable
TS-----Torque Switch

Tag Numbering Philosophy :

XL	xxxx	RUN

FeedbackS (DI's) XL
Commands (DO's) HS
(Analog(motor) current) AI
(Position feedback) ZI
(Position Indication) PI
(Psn) PI
(Analog Voltage) AV
(Analog Power) AP
(Analog Energy) AE
(Analog Reactive Power) ARP

Drive Tag No

RUN : Run Indi
TRP: Trip Indi
RTS: Ready to start
STP: STOP Indication/Command
STR: START Command
AM: Auto/Manual
OPN: Open Indication/Command
CLS: Close Indication/Command
R: Current/Voltage for R-phase
Y: Current/Voltage for Y-phase
B: Current/Voltage for B-phase

NOTES:

1 This control philosophy is applicable for Power block drives only. This is not applicable for Soot blower drives
2 All MOVs are integral starter type. Open and Close indication of all types of MOVs shall be provided in respective MCCs of Valves
3 # - Ammeter will be provided for motors rated above 30 KW in LCS & MCC, and the corresponding current signals shall be wired to DCS.
4 Drives will be considered as ready to start (RTS) when the following conditions are met
   a. Stop PB in MCC or in LCS/Actuator not pressed.
   b. MCC/Actuator power supply is healthy.
   c. Remote operation is selected.
   e. All permissives and interlocks are satisfied..
   For contact wiring, break to alarm philosophy shall be used for tripping circuit.
5 Isolators are not considered for AI, AO and DI as the isolation facility is already available on board in the I/O cards.
6 Barriers for AI, AO, DI and DO will be provided for hazardous area signals only.
7 Relay Contact-----NC for trip signal, NO for other signals
8 Interogation voltage for MCC, MOV's feedback signal and other potential free contacts shall be 24 V DC from DCS System.
9 Interogation voltage for DCS start/stop cmd to MCC should be 230 V AC from MCC control circuit.
10 Interogation voltage for MOV actuator's cmd should be 24 V DC from actuator.
11 SOVs will be operating with 24 V DC and all are single coils SOVs.
12 MCC & MOV outputs from DCS shall be routed through Interposing relays.
13 All Interposing relays shall have 4 NO,4 NC contacts. All IPRs shall be part of DCS
14 BHEL will use either 6 pair or 12 pair overall shielded signal cables as required for connecting signals from field/MCC etc to DCS.
15 MOV DI &DO signals are clubbed in multipair cable as the voltage levels are same(i.e 24V DC)
16 Energy signal shall be obtained from Power signal by multiplying with time in DCS
17 IPR Contact rating shall be suitable for breaker closing coil & tripping coil current requirements.

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
I/Os for HT Uni-directional Drives										
1	XLxxxxRUN	Run Indi	Hard DI	MCC	DCS	NO	NR	No		00
2	XLxxxxSTP	Stop Indi	Hard DI	MCC	DCS	NC	NR	No		00
3	XLxxxxTRP	Trip Indi	Hard DI	MCC	DCS	NC	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	MCC	DCS	NO	NR	No		00
5	HSxxxxAM	A/M Sel	Soft DO	DCS HMI	DCS	NA	NA	No		00
6	HSxxxxSTR	Start Cmd	Hard DO	DCS	MCC	NO	R	Y	Momentory contact	00
7	HSxxxxSTP	Stop Cmd	Hard DO	DCS	MCC	NO	R	Y	Momentory contact	00
8	AIxxxx	Motor current	Hard AI	SWGR	DCS	4-20mA	NR	NA	Note-3	00
I/Os for LT Uni-directional Drives										
1	XLxxxxRUN	Run Indi	Hard DI	MCC	DCS	NO	NR	No		00
2	XLxxxxSTP	Stop Indi	Hard DI	MCC	DCS	NC	NR	No		00
3	XLxxxxTRP	Trp Indi	Hard DI	MCC	DCS	NC	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	MCC	DCS	NO	NR	No		00
5	HSxxxxAM	A/M Sel	Soft DO	DCS HMI	DCS	NA	NA	No		00
6	HSxxxxSTR	Start Cmd	Hard DO	DCS	MCC	NO	R	Y	Momentory contact	01
7	HSxxxxSTP	Stop Cmd	Hard DO	DCS	MCC	NO	R	Y	Momentory contact	01
8	AIxxxx	Motor current	Hard AI	SWGR	DCS	4-20mA	NR	NA	Note-3	00
I/Os for MOVs										
1	XLxxxxOPN	Opn Indi	Hard DI	Actuator	DCS	NO	NR	No		00
2	XLxxxxCLS	Cls Indi	Hard DI	Actuator	DCS	NO	NR	No		00
3	XLxxxxRTS	RTS Indi	Hard DI	Actuator	DCS	NO	NR	No	This i/p consists of L/R selection.	00
4	HSxxxxOPN	Open Cmd	Hard DO	DCS	Actuator	NO	NR	No	Momentory contact	00
5	HSxxxxCLS	Close Cmd	Hard DO	DCS	Actuator	NO	NR	No	Momentory contact	00

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
6	HSxxxxAM	A/M Sel	Soft DO	DCS HMI	DCS	NA	NA	No	Wherever Applicable.	00
7	HSxxxxSTP	Stop Cmd	Soft DO	DCS HMI	DCS	NA	NA	No		01
I/Os for MOVs with inching type										
1	XLxxxxOPN	Opn Indi	Hard DI	Actuator	DCS	NO	NR	No		00
2	XLxxxxCLS	Cls Indi	Hard DI	Actuator	DCS	NO	NR	No		00
3	XLxxxxRTS	RTS Indi	Hard DI	Actuator	DCS	NO	NR	No		00
4	HSxxxxOPN	Open Cmd	Hard DO	DCS	Actuator	NO	NR	No	Momentory	00
5	HSxxxxCLS	Close Cmd	Hard DO	DCS	Actuator	NO	NR	No	Momentory	00
6	HSxxxxAM	A/M Sel	Soft DO	DCS HMI	DCS	NA	NA	No	Wherever Applicable.	00
7	ZIxxxx	Valve position	Hard AI	Actuator	DCS	4-20mA	NR	NA		00
8	HSxxxxSTP	Stop Cmd	Soft DO	DCS HMI	DCS	NA	NA	No		01
I/Os for Solenoid Operated Valves										
1	XLxxxxOPN	Opn Indi	Hard DI	SOV	DCS	NO	NR	No		00
2	XLxxxxCLS	Cls Indi	Hard DI	SOV	DCS	NO	NR	No		00
3	HSxxxxOPN/CLS	Open/Close Cmd	Hard DO	DCS	SOV	NO	NR	Y		00
4	HSxxxxAM	A/M Sel	Soft DO	DCS HMI	DCS	NA	NA	No	Wherever Applicable.	00
I/Os for Analog Drives										
1	ZIxxxx	Position feedback	Hard AI	CV	DCS	4-20mA	NR	NA	Wherever Applicable	00
2	XIxxxx	Process Value	Hard AI	Field	DCS	4-20mA	NR	NA		00
3	XYxxxx	Psn	Hard AO	DCS	CV	4-20mA	R	NA		00

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
I/Os for 6.6 kv Incoming & Tie Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLOSE Cmd(on dead bus)	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
7	AIxxxxR	current for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
8	AIxxxxY	current for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
9	AIxxxxB	current for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
10	AVxxxxR	voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
11	AVxxxxY	voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
12	AVxxxxB	voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
13	APxxxx	Power	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
14	AExxxx	Energy	-	-	-	-	-	-	Refer Note (17)	00
15	ARPxxxx	Reactive Power	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
I/Os for 6.6 kv Bus Coupler Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLS Cmd(on dead bus)	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
7	AVxxxxAR	Bus-A voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
8	AVxxxxAY	Bus-A voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
9	AVxxxxAB	Bus-A voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
10	AVxxxxBR	Bus-B voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
11	AVxxxxBY	Bus-B voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
12	AVxxxxBB	Bus-B voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
I/Os for 6.6 kv Outgoing (Non-motors) Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLS Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
7	AIxxxxR	current for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
8	AIxxxxY	current for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
9	AIxxxxB	current for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
10	APxxxx	Power	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
I/Os for 415V PMCC Incoming Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLS Cmd(on dead bus)	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
7	AIxxxxR	current for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
8	AIxxxxY	current for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
9	AIxxxxB	current for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
10	AVxxxxR	voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
11	AVxxxxY	voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
12	AVxxxxB	voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
13	APxxxx	Power	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
I/Os for 415V PMCC Bus Coupler Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLS Cmd(on dead bus)	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
7	AVxxxxAR	Bus-A voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
8	AVxxxxAY	Bus-A voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
9	AVxxxxAB	Bus-A voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
10	AVxxxxBR	Bus-B voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
11	AVxxxxBY	Bus-B voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
12	AVxxxxBB	Bus-B voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
13	AVxxxxCR	Bus-C voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA	If applicable	00
14	AVxxxxCY	Bus-C voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA	If applicable	00
15	AVxxxxCB	Bus-C voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA	If applicable	00

S No	Signal Tag	Signal Description	Type of I/O w.r.t DCS	Signal Source	Signal Destination	Contact Type before activation	I/O card Redundancy	IPR/ Barrier	Remarks	Rev
I/Os for 415V PMCC Outgoing (Non-motors) Breakers										
1	XLxxxxON	ON Indi	Hard DI	SWGR	DCS	NO	NR	No		00
2	XLxxxxOFF	OFF Indi	Hard DI	SWGR	DCS	NC	NR	No		00
3	XLxxxxTRP	TRIP Indi	Hard DI	SWGR	DCS	NO	NR	No		00
4	XLxxxxRTS	RTS Indi	Hard DI	SWGR	DCS	NO	NR	No		00
5	HSxxxxCLS	CLS Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
6	HSxxxxTRP	TRIP Cmd	Hard DO	DCS	SWGR	NO	NR	Y	Momentory contact, Note (18)	00
I/Os for 415V MCC Incoming Breakers										
1	AIxxxxR	current for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
2	AIxxxxY	current for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
3	AIxxxxB	current for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
4	AVxxxxR	voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
5	AVxxxxY	voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
6	AVxxxxB	voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
7	APxxxx	Power	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
I/Os for 415V MCC Bus Coupler Breakers										
1	AVxxxxAR	Bus-A voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
2	AVxxxxAY	Bus-A voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
3	AVxxxxAB	Bus-A voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
4	AVxxxxBR	Bus-B voltage for R-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
5	AVxxxxBY	Bus-B voltage for Y-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00
6	AVxxxxBB	Bus-B voltage for B-Phase	Hard AI	SWGR	DCS	4-20mA	NR	NA		00

FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

DRG. NO. 4-38121-02891

SHT. 01 OF 48

COMPUTER FILE NAME | REF. DRG. NO. | SIGN. AND DATE | INVENTORY NO

DCS LOGIC DIAGRAMS–BOP AREA

CATEGORY OF DWG	APPROVAL	INFORMATION ✓	RECORD	REFERENCE

नॉर्थ ईस्टर्न इलैक्ट्रिक पावर कॉरपोरेशन लिमिटेड
भारत सरकार का उपक्रम
NORTH EASTERN ELECTRIC POWER CORPORATION LTD.
(A GOVERNMENT OF INDIA ENTERPRISE)

त्रिपुरा गैस आधारित सी सी विद्युत परियोजना
त्रिपुरा
TRIPURA GAS BASED CC POWER PROJECT
(TRIPURA)

CONSULTANT: DESEIN PRIVATE LTD.,NEW DELHI

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

	NAME	SIGN.	DATE	NO. OF VAR.
DRN.	GANESH		16.06.12	–N.A.–
CHD.	GANESH		16.06.12	
APPD.	PRAKASH		16.06.12	

DEPT.	UNTOL. DIMS. GR.	SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO. OF ITEMS
PEASD	~~C/M/F~~			–N.A.–	–N.A.–	–N.A.–
CODE 450						

TITLE: DCS LOGIC DIAGRAMS–BOP AREA

CARD CODE: N.A.

DRAWING NO. 4–38121–02891

REV. 00

SHT. No 01 NO. OF SHT. 48

REV.	DATE	ALTERED	REV.	DATE	ALTERED
		CHD/APPD			CHD/APPD
ZONE			ZONE		

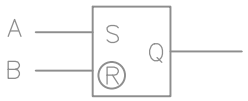
BHEL'S CONSULTANT: TRACTEBEL Engineering GDF SUEZ
TRACTEBEL Engineering pvt. ltd.
NEW DELHI

INDEX

SHT NO	DESCRIPTION	REV NO			
		00A	01	02	03
1	TITLE SHEET	X			
2	INDEX	X			
3	LEGEND	X			
4	TECHNICAL NOTES	X			
5	REFERENCE DRAWINGS	X			
6	LOGIC SCHEME - A1	X			
7	APPLICABLE TAGS FOR SCHEME - A1	X			
8	LOGIC SCHEME - A2	X			
9	APPLICABLE TAGS FOR SCHEME - A2	X			
10	LOGIC SCHEME - A3	X			
11	APPLICABLE TAGS FOR SCHEME - A3	X			
12	LOGIC SCHEME - A4	X			
13	APPLICABLE TAGS FOR SCHEME - A4	X			
14	LOGIC SCHEME - A5	X			
15	APPLICABLE TAGS FOR SCHEME - A5	X			
16	LOGIC SCHEME - A6	X			
17	APPLICABLE TAGS FOR SCHEME - A6	X			
18	LOGIC SCHEME - A7	X			
19	APPLICABLE TAGS FOR SCHEME - A7	X			
20	LOGIC SCHEME - A8	X			
21	LOGIC SCHEME - A8A	X			
22	APPLICABLE TAGS FOR SCHEME - A8 & A8A	X			
23	LOGIC SCHEME - A9	X			
24	APPLICABLE TAGS FOR SCHEME - A9	X			
25	LOGIC SCHEME - A10	X			
26	APPLICABLE TAGS FOR SCHEME - A10	X			
27	LOGIC SCHEME - A11	X			

SHT NO	DESCRIPTION	REV NO			
		00A	01	02	03
28	LOGIC SCHEME - B1	X			
29	APPLICABLE TAGS FOR SCHEME - B1	X			
30	LOGIC SCHEME - B2A	X			
31	LOGIC SCHEME - B2B	X			
32	APPLICABLE TAGS FOR SCHEME - B2A & B2B	X			
33	LOGIC SCHEME - B3	X			
34	APPLICABLE TAGS FOR SCHEME - B3	X			
35	LOGIC SCHEME - B4	X			
36	APPLICABLE TAGS FOR SCHEME - B4	X			
37	LOGIC SCHEME - B5	X			
38	APPLICABLE TAGS FOR SCHEME - B5	X			
39	LOGIC SCHEME - B6	X			
40	APPLICABLE TAGS FOR SCHEME - B6	X			
41	LOGIC SCHEME - C1	X			
42	LOGIC SCHEME - C2	X			
43	LOGIC SCHEME - C3	X			
44	LOGIC SCHEME - C4	X			
45	LOGIC SCHEME - C5	X			
46	LOGIC SCHEME - C6	X			
47	LOGIC SCHEME - C7	X			
48	APPLICABLE TAGS FOR SCHEME - C1,C2,C3....C7	X			

LEGEND

 OR GATE	LOGIC OUTPUT "Q" EXISTS IF ATLEAST ONE OF THE INPUTS EXISTS.
 AND GATE	LOGIC OUTPUT "Q" EXISTS IF AND ONLY IF ALL LOGIC INPUTS EXIST.
 SR FLIP FLOP	LOGIC OUTPUT "Q" EXISTS AS SOON AS INPUT "A" EXISTS, "Q" CONTINUES TO EXIST, REGARDLESS OF THE SUBSEQUENT STATUS OF "A" UNTIL THE MEMORY IS TERMINATED BY LOGIC INPUT "B", EXISTING "Q" REMAINS TERMINATED REGARDLESS OF THE SUBSEQUENT STATE OF "B" UNTIL "A" CAUSES THE MEMORY TO BE SET. S = SET MEMORY R = RESET MEMORY
 NOT GATE	LOGIC OUTPUT "B" EXISTS IF AND ONLY IF LOGIC INPUT "A" DOESN'T EXIST.

HMI : HUMAN MACHINE INTERFACE
MCC : MOTOR CONTROL CENTER
PMP : PUMP
ACT : ACTUATOR
LCP : LOCAL CONTROL PANEL
1W + 1S : 1 WORKING + 1 STANDBY

x min	ON DELAY OF x MINUTES
	ANALOG TO DIGITAL SIGNAL CONVERSION
2 OF 3	2 OUT OF 3 SIGNAL SELECTOR
1 OF 2	1 OUT OF 2 SIGNAL SELECTOR
	SOFT ALARM TO HMI/DCS

XLxxxxxxxRUN : FEED BACK SIGNALS DCS RECIEVED FROM MCC
XLxxxxxxxTRP : FEED BACK SIGNALS DCS RECIEVED FROM MCC
XLxxxxxxxRTS : FEED BACK SIGNALS DCS RECIEVED FROM MCC
XLxxxxxxxOPN : FEED BACK SIGNALS DCS RECIEVED FROM ACT/LCP
XLxxxxxxxCLS : FEED BACK SIGNALS DCS RECIEVED FROM ACT/LCP

HSxxxxxxxSTR : COMMAND SIGNALS FROM DCS SENT TO MCC
HSxxxxxxxSTP : COMMAND SIGNALS FROM DCS SENT TO MCC
HSxxxxxxxOPN : COMMAND SIGNALS FROM DCS SENT TO ACT
HSxxxxxxxCLS : COMMAND SIGNALS FROM DCS SENT TO ACT

TECHNICAL NOTES:

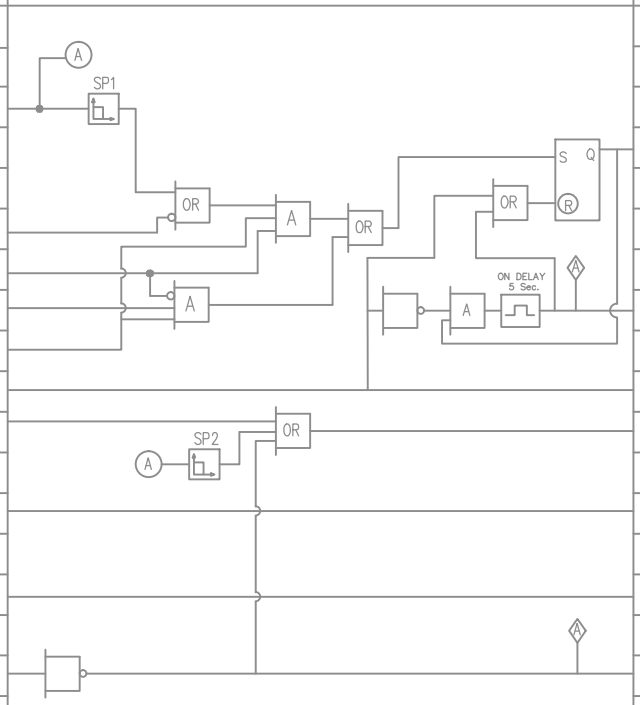
1. COMMON LOGIC DIAGRAMS FOR HT, LT, MOV AND ON-OFF DRIVES ARE DRAWN SEPERATELY AND INDICATED AS A1, A2, ... A11, B1,.....B6, C1....C7.
2. IN THE EACH SCHEME RELEVANT TAG NO'S ARE INDICATED SEPARATELY IN "APPLICABLE TAGS FOR SCHEME-A1, ETC".
3. TYPICAL EXAMPLE FOR TAGS SHEET PHILOSOPHY TO BE FOLLOWED:
   a) For S.no. 1, IN SCHEME A1, REPLACE PMP1 WITH P6901, PMP2 WITH P6902, PROCESS1 WITH LI6939,
   AND SET PINTS AS INDICATED IN "APPLICABLE TAGS" SHEET.
   b) SIMILARLY FOR ALL OTHERS CASES, THIS PHILOSOPHY HAS TO BE FOLLOWED.
4. IN AUTO/MANUAL SIGNAL, AUTO = 1 (I.E. HEALTHY SIGNAL) MANUAL = 0.
5. 2 OUT OF 3 SELECTION: AVERAGE VALUE WILL BE SELECTED IN CASE ALL TRANSMITTERS ARE HEALTHY OR ANY TWO OF THE TRANSMITTERS ARE HEALTHY. AUTOMATIC CHANGEOVER TO THIRD TRANSMITTER WILL BE DONE IF TWO TRANSMITTERS ARE FAILED. ALSO MANUAL SELECTION OF ANY TRANSMITTER WILL ALSO BE AVAILABLE. OR VALUE WILL BE SELECTED BASED 2 OUT OF 3 VOTING IN CASE ALL TRANSMITTERS ARE HEALTHY.
6. THE SET POINT AS INDICATED IS TENTATIVE.
   FINAL SET POINTS WILL BE ADJUSTED DURING COMMISSIONING OF THE SYSTEM.

REFERENCE DRG'S

S. NO	LIST OF P & ID's CONSIDERED	P & ID NO. BHEL DRG NO:	NO. OF SHEETS	Rev. No.
1	NUMBERING PHILOSOPHY	2-38101-02788	1	00
2	STANDARD LEGEND FOR PROCESS & INSTRUEMNTATION DIAGRAM	2-38101-02789	1	00
3	P&ID FOR OFF-BASE FUEL GAS SYSTEM FOR GT	1-38101-04110	3	01
4	P&ID FOR HP STEAM SYSTEM	1-38101-04104	1	01
5	P & ID FOR IP STEAM SYSTEM	1-38101-04105	1	01
6	P & ID FOR LP STEAM SYSTEM	1-38101-04106	1	01
7	P & ID FOR CONDENSTAE SYSTEM UPTO GLAND STEAM CONDENSER	1-38101-04107	1	01
8	P & ID FOR CONDENSTAE SYSTEM DOWNSTREAM OF GLAND STEAM CONDENSER UPTO DEAERATOR(UCFT, CPH & DEAEREATOR)	1-38101-04108	1	01
9	P & ID FOR FEED WATER SYSTEM(HP, IP, LP & RECIR)	1-38101-04109	2	01
10	P & ID FOR CONDENSER COOLING WATER SYSTEM	1-38101-04355	1	02
11	P & ID FOR AUXILIARY COOLING WATER SYSTEM	1-38101-04368	1	01
12	P & ID FOR LP DOSING SYSTEM (HYDRAZINE)	3-38101-03053	1	01
13	P & ID FOR LP DOSING SYSTEM (AMMONOA	3-38101-03054	1	01
14	P & ID FOR SERVICE WATER DISTRIBUTION SYSTEM	3-38101-03080	1	01
15	P & ID FOR POTABLE WATER DISTRIBUTION SYSTEM	3-38101-03081	1	01
16	P & ID FOR DM WATER DISTRIBUTION SYSTEM	3-38101-03082	1	01
17	P ID FOR IA/PA/NITROGEN DISTRIBUTION SYSTEM	3-38101-03083	1	01
18	P & ID FOR PRE TREATMENT PLANT	1-381-01-04455	2	00
19	P & ID FOR CLARIFIED WATER SYSTEM	1-381-01-04456	1	01
20	P & ID FOR DM PLANT	1-38101-04357	4	00
21	P & ID FOR CLOSED COOLING WATER SYSTEM	3-38101-03063	1	02
22	FLOW DIAGRAM FOR SLUDGE TREATMENT SYSTEM	3-38101-03078	1	00
23	P&ID FOR CIRC. WATER CHLORINATION & TREATMENT SYSTEM	3-38101-04613	1	00
24	SCHEME OF WATER AND STEAM CIRCUIT WITH VALVES, FITTING & INSTRUMENTS-HP CIRCUIT	0-24-400-80910	1	01
25	SCHEME OF WATER AND STEAM CIRCUIT WITH VALVES, FITTING & INSTRUMENTS-IP & LP CIRCUIT	0-24-400-80911	1	01

LOGIC SCHEME - A1

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard AI						
						Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI		Soft DI		HMI	Pump1 FAIL TO START cmd	
	Pump1 RTS cmd	MCC	NO	Hard DI						
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI		Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
*	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	



NOTE:-

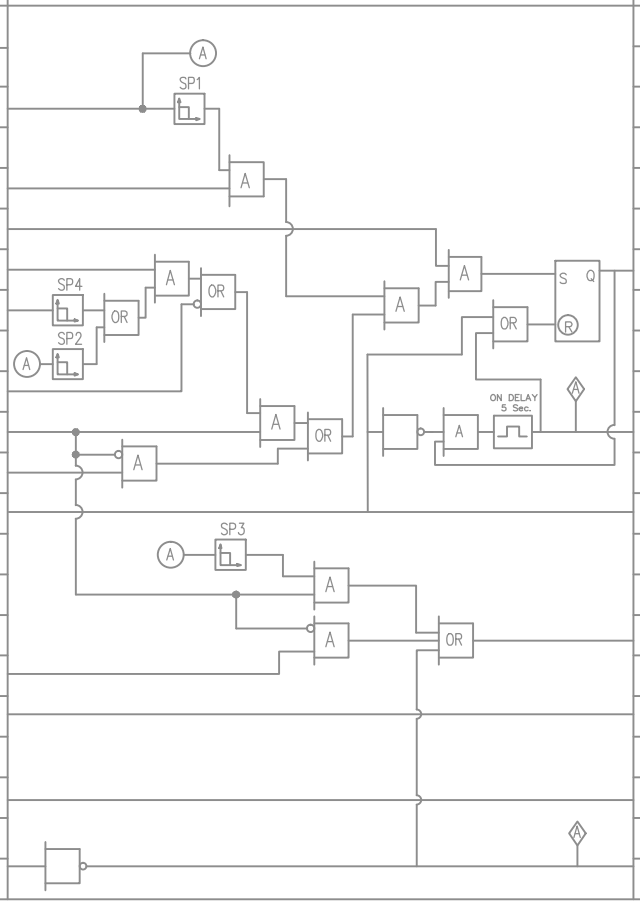
* APPLICABLE FOR NOTE NUMBER 3 OF DRIVE CONTROL PHILOSOPHY.

APPLICABLE TAGS FOR SCHEME–A1

S. No.	PMP1	PMP2	PROCESS-1	Set points Refer Note-6		Applicable Scheme	P & ID	LOGIC DESCRIPTION
	TAG NO.	TAG NO.	TAG NO.	SP1	SP2			
1	P6901	P6902	LI6939	70%	30%	A1	1-381-01-04110(3/3)	1)Auto start on Drain tank level high 2)Auto close on Drain tank level low
2	P6902	P6901	LI6939	70%	30%	A1	1-381-01-04110(3/3)	1)Auto start on Drain tank level high 2)Auto close on Drain tank level low

LOGIC SCHEME - A2

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard AI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard DI						
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI						
XLPMP2OPN	Pump2 Run f/b	MCC/Field	NO	Hard DI		Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
PROCESS-3	PROCESS SIGNAL	Field	-	Hard AI						
XLPMP2CLS	Pump2 Trip f/b	MCC/Field	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI		Soft DI		HMI	Pump1 Fail to Start	
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI						
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
						Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI						
*	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	



NOTE: -

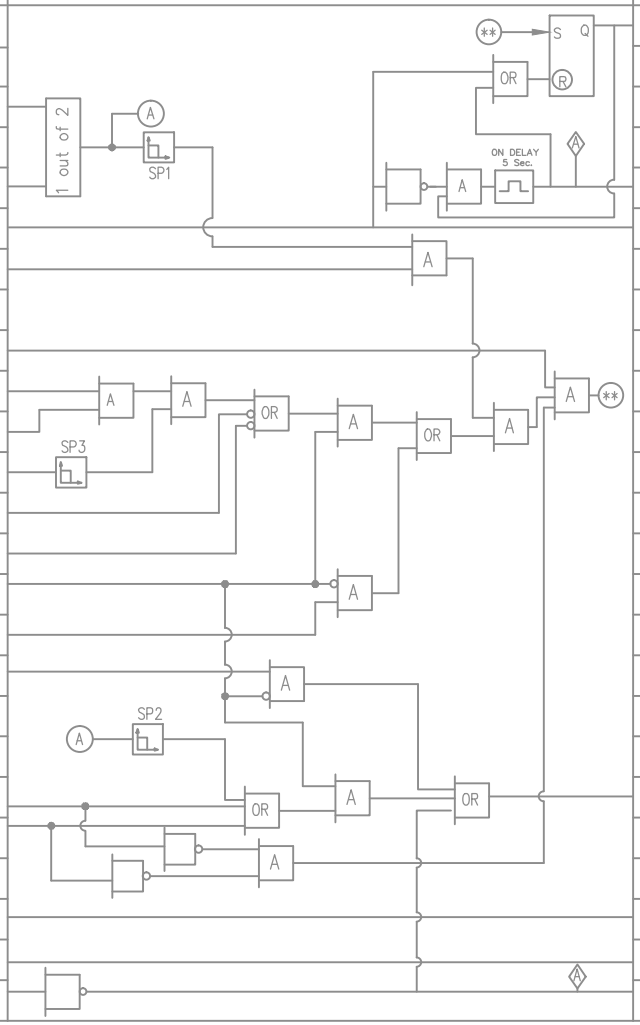
* APPLICABLE FOR NOTE NUMBER 3 OF DRIVE CONTROL PHILOSOPHY.

APPLICABLE TAGS FOR SCHEME–A2

S. No.	PMP1	PMP2	PROCESS-1	PROCESS-2	PROCESS-3	Set points Refer Note-6				Applicable SCHEME	P & ID	LOGIC DESCRIPTION
	TAG NO.	TAG NO.	TAG NO.	TAG NO.	TAG NO.	SP1	SP2	SP3	SP4			
1	P001A	P001B	LI1603	GTV1601	PI1609	60%	70%	20%	10 ata	A2	1-381-01-04107(1/1)	1) Start permissive for any CEP on Hotwell-1 level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low or Hotwell-1 level high, 3) Auto trip working pump on Hotwell-1 level low low
2	P001B	P001A	LI1603	GTV1602	PI1609	60%	70%	20%	10 ata	A2	1-381-01-04107(1/1)	1) Start permissive for any CEP on Hotwell-2 level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low or Hotwell-2 level high, 3) Auto trip working pump on Hotwell-2 level low low

LOGIC SCHEME – A3

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
						Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
LI1801A	DEAERATOR LEVEL	Field	–	Hard AI						
LI1801B	DEAERATOR LEVEL	Field	–	Hard AI		Soft DI		HMI	Pump1 Fail to Start	
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
PROCESS–1	PROCESS SIGNAL	Field	–	Hard DI						
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI						
XLPMP2RUN	Pump2 Run f/b	MCC	NO	Hard DI						
XLPMP3RUN	Pump3 Run f/b	MCC	NO	Hard DI						
PI1813	Disch. Pres.	Field	–	Hard AI						
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
XLPMP3TRP	Pump3 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	–	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	–	Soft DI						
HSPMP1STP	Pump1 Stop cmd	HMI	–	Soft DI						
TIPMP1AHH1	Bearing/Winding Temp. Hi Hi	From A4	–	Soft DI		Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
VIPMP1AHH1	Vibration Hi Hi	VMS Panel	–	Hard DI						
	Pump1 MOTOR CURRENT	MCC	–	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	

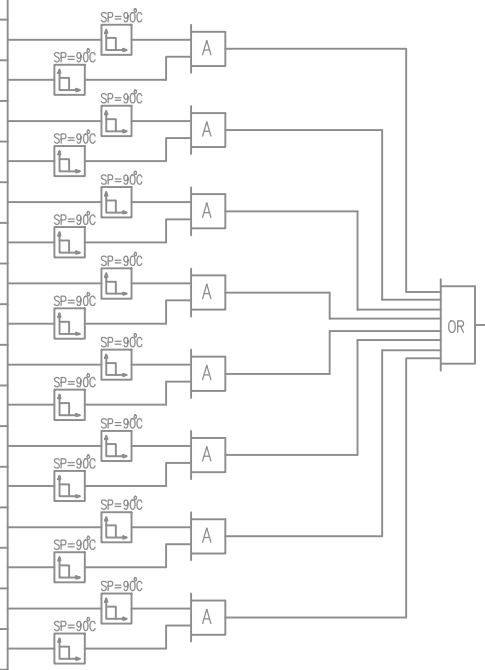


APPLICABLE TAGS FOR SCHEME–A3

S. No.	PMP1 TAG NO.	PMP2 TAG NO.	PMP3 TAG NO.	PROCESS-1 TAG NO.	Set points SP1	SP2	SP3	Applicable SCHEME	P & ID	LOGIC DESCRIPTION
1	P003A	P003B	P003C	GTV1801A	1631 mmWC	500 mmWC	120 ATA	A3	1-381-01-04109(1/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low 4) Auto trip on Pump or motor temp high high 5) Auto trip on pump vibration hi
2	P003B	P003A	P003C	GTV1801B	1631 mmWC	500 mmWC	120 ATA	A3	1-381-01-04109(1/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low 4) Auto trip on Pump or motor temp high high 5) Auto trip on pump vibration hi
3	P003C	P003A	P003B	GTV1801C	1631 mmWC	500 mmWC	120 ATA	A3	1-381-01-04109(1/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low 4) Auto trip on Pump or motor temp high high 5) Auto trip on pump vibration hi

LOGIC SCHEME - A4

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PREOCESS-6(1)	Process signal	Field	-	Hard AI						
PREOCESS-6(2)	Process signal	Field	-	Hard AI						
PREOCESS-6(3)	Process signal	Field	-	Hard AI						
PREOCESS-6(4)	Process signal	Field	-	Hard AI						
PREOCESS-6(5)	Process signal	Field	-	Hard AI						
PREOCESS-6(6)	Process signal	Field	-	Hard AI						
PREOCESS-6(7)	Process signal	Field	-	Hard AI						
PREOCESS-6(8)	Process signal	Field	-	Hard AI		Soft DO	-	DCS	Pump/Motor Bearing/Winding temp high high	TIPMP1AHH1
PREOCESS-6(9)	Process signal	Field	-	Hard AI						
PREOCESS-6(10)	Process signal	Field	-	Hard AI						
PREOCESS-6(11)	Process signal	Field	-	Hard AI						
PREOCESS-6(12)	Process signal	Field	-	Hard AI						
PREOCESS-6(13)	Process signal	Field	-	Hard AI						
PREOCESS-6(14)	Process signal	Field	-	Hard AI						
PREOCESS-6(15)	Process signal	Field	-	Hard AI						
PREOCESS-6(16)	Process signal	Field	-	Hard AI						



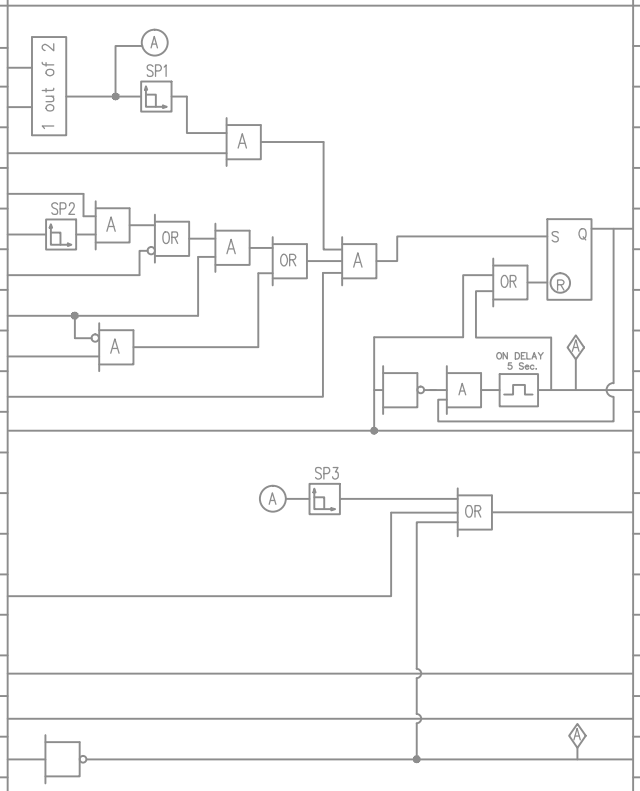
APPLICABLE TAGS FOR SCHEME–A4

S. No.	Applicable for PUMP	PROCESS-6	
1	P003A	TIP003ABT1	TIPM003AWT5
		TIP003ABT2	TIPM003AWT6
		TIPM003ABT1	TIPM003AWT7
		TIPM003ABT2	TIPM003AWT8
		TIPM003AWT1	TIPM003AWT9
		TIPM003AWT2	TIPM003AWT10
		TIPM003AWT3	TIPM003AWT11
		TIPM003AWT4	TIPM003AWT12
2	P003B	TIP003BBT1	TIPM003BWT5
		TIP003BBT2	TIPM003BWT6
		TIPM003BBT1	TIPM003BWT7
		TIPM003BBT2	TIPM003BWT8
		TIPM003BWT1	TIPM003BWT9
		TIPM003BWT2	TIPM003BWT10
		TIPM003BWT3	TIPM003BWT11
		TIPM003BWT4	TIPM003BWT12
3	P003C	0TIP003CBT1	TIPM003CWT5
		0TIP003CBT2	TIPM003CWT6
		TIPM003CBT1	TIPM003CWT7
		TIPM003CBT2	TIPM003CWT8
		TIPM003CWT1	TIPM003CWT9
		TIPM003CWT2	TIPM003CWT10
		TIPM003CWT3	TIPM003CWT11
		TIPM003CWT4	TIPM003CWT12
4	P5202A	TIP5202ABT1	TIPM5202AWT5
		TIP5202ABT2	TIPM5202AWT6
		TIPM5202ABT1	TIPM5202AWT7
		TIPM5202ABT2	TIPM5202AWT8
		TIPM5202AWT1	TIPM5202AWT9
		TIPM5202AWT2	TIPM5202AWT10
		TIPM5202AWT3	TIPM5202AWT11
		TIPM5202AWT4	TIPM5202AWT12
5	P5202B	TIP5202BBT1	TIPM5202BWT5
		TIP5202BBT2	TIPM5202BWT6
		TIPM5202BBT1	TIPM5202BWT7
		TIPM5202BBT2	TIPM5202BWT8
		TIPM5202BWT1	TIPM5202BWT9
		TIPM5202BWT2	TIPM5202BWT10
		TIPM5202BWT3	TIPM5202BWT11
		TIPM5202BWT4	TIPM5202BWT12

S. No.	Applicable for PUMP	PROCESS-6	
6	P5202C	TIP5202CBT1	TIPM5202CWT5
		TIP5202CBT2	TIPM5202CWT6
		TIPM5202CBT1	TIPM5202CWT7
		TIPM5202CBT2	TIPM5202CWT8
		TIPM5202CWT1	TIPM5202CWT9
		TIPM5202CWT2	TIPM5202CWT10
		TIPM5202CWT3	TIPM5202CWT11
		TIPM5202CWT4	TIPM5202CWT12
7	P5301A	TIP5301ABT1	TIPM5301AWT5
		TIP5301ABT2	TIPM5301AWT6
		TIPM5301ABT1	TIPM5301AWT7
		TIPM5301ABT2	TIPM5301AWT8
		TIPM5301AWT1	TIPM5301AWT9
		TIPM5301AWT2	TIPM5301AWT10
		TIPM5301AWT3	TIPM5301AWT11
		TIPM5301AWT4	TIPM5301AWT12
8	P5301B	TIP5301BBT1	TIPM5301BWT5
		TIP5301BBT2	TIPM5301BWT6
		TIPM5301BBT1	TIPM5301BWT7
		TIPM5301BBT2	TIPM5301BWT8
		TIPM5301BWT1	TIPM5301BWT9
		TIPM5301BWT2	TIPM5301BWT10
		TIPM5301BWT3	TIPM5301BWT11
		TIPM5301BWT4	TIPM5301BWT12

LOGIC SCHEME - A5

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard AI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard AI						
PROCESS-3	PROCESS SIGNAL	Field	-	Hard DI						
XLPMP2RUN	Pump2 Run f/b	MCC	NO	Hard DI						
PROCESS-4	PROCESS SIGNAL	Field	-	Hard AI		Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI						
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI		Soft DI		HMI	Pump1 Fail to Start	
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
						Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI						
	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	

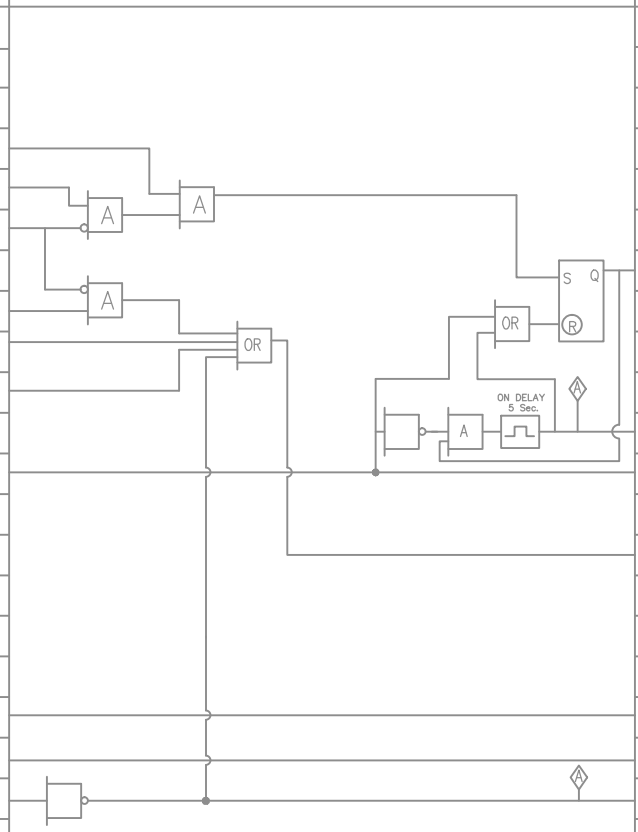


APPLICABLE TAGS FOR SCHEME–A5

S. No.	PMP1	PMP2	PROCESS-1	PROCESS-2	PROCESS-3	PROCESS-4	Set points			Applicable SCHEME	P & ID	LOGIC DESCRIPTION
	TAG NO.	TAG NO.	TAG NO.	TAG NO.	TAG NO.	TAG NO.	SP1	SP2	SP3			
1	P004A	P004B	LI1801A	LI1801B	GTV1835A	PI1827	1631 mmWC	30 ATA	500 mmWC	A5	1-381-01-04109 (1/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low
2	P004B	P004A	LI1801A	LI1801B	GTV1835B	PI1827	1631 mmWC	30 ATA	500 mmWC	A5	1-381-01-04109 (1/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low
3	P005A	P005B	LI1801A	LI1801B	GTV1871A	PI1852	1631 mmWC	7 ATA	500 mmWC	A5	1-381-01-04109(2/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low
4	P005B	P005A	LI1801A	LI1801B	GTV1871B	PI1852	1631 mmWC	7 ATA	500 mmWC	A5	1-381-01-04109(2/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low
5	P006A	P006B	LI1801A	LI1801B	GTV18105A	PI1869	1631 mmWC	7 ATA	500 mmWC	A5	1-381-01-04109(2/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low
6	P006B	P006A	0LI1801A	0LI1801B	0GTV18105B	PI1869	1631 mmWC	7 ATA	500 mmWC	A5	1-381-01-04109(2/2)	1) Start permissive for any BFP on DEAE level normal & Suction valve open, 2) Auto start of stand by pump on Discharge pr. Low 3) Auto trip working pump on DEAE level low low

LOGIC SCHEME - A6

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
						Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI						
PROCESS-1	PROCESS SIGNAL	Field	-	Hard AI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard AI						
						Soft DI		HMI	Pump1 Fail to Start	
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
						Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	

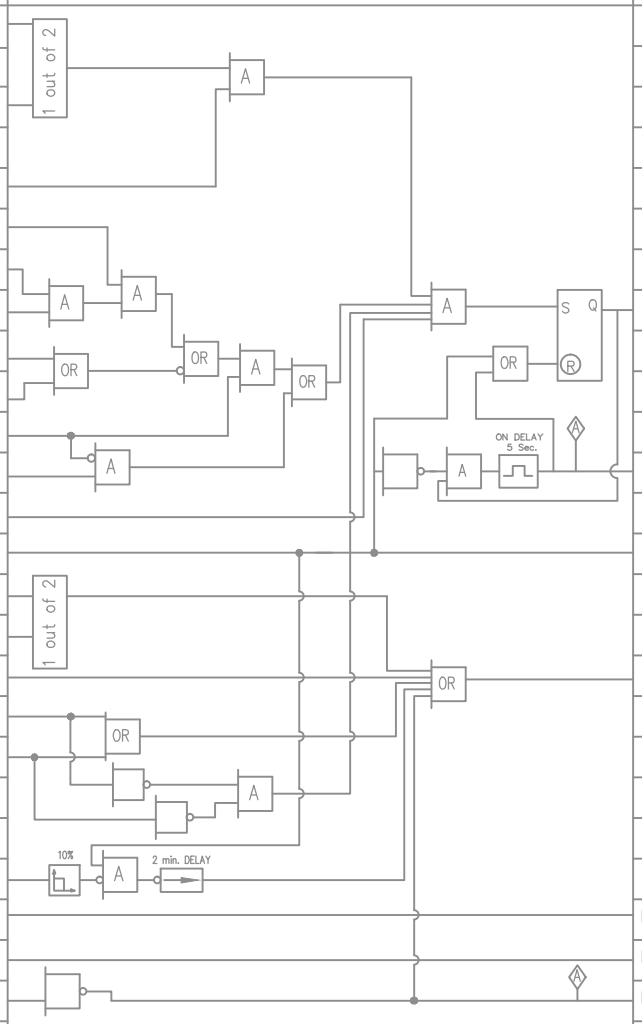


APPLICABLE TAGS FOR SCHEME-A6

S. No.	PMP1 TAG NO.	PROCESS-1 TAG NO.	PROCESS-2 TAG NO.	Applicable SCHEME	P & ID	LOGIC DESCRIPTION
1	CTF5204	LAL5246	VAH5147	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high
2	CTF5206	LAL5248	VAH5149	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high
3	CTF5208	LAL5250	VAH5151	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high
4	CTF5210	LAL5252	VAH5153	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high
5	CTF5212	LAL5254	VAH5155	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high
6	CTF5214	LAL5256	VAH5157	A6	1-381-01-04355(1/1)	1) Auto trip on low oil level in gear box, 2) Auto trip on fan vibration high

LOGIC SCHEME - A7

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
LAN5232A	CW Sump Level Normal	Field	-	Hard DI						
LAN5232B	CW Sump Level Normal	Field	-	Hard DI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard DI						
PROCESS-1	PROCESS SIGNAL	Field	-	Hard DI						
XLPMP2RUN	Pump2 Run f/b	MCC	NO	Hard DI						
XLPMP3RUN	Pump3 Run f/b	MCC	NO	Hard DI		Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
XLPMP3TRP	Pump3 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI		Soft DI		HMI	Pump1 Fail to Start	
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI						
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
LALL5233A	CW Sump Level Low Low	Field	-	Hard DI						
LALL5233B	CW Sump Level Low Low	Field	-	Hard DI						
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI		Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
	Bearing/Winding temp. high	HMI	-	Soft DI						
	Vibration very high	HMI	-	Soft DI						
	Process signal-3	Field	NO	HARD AI						
	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	

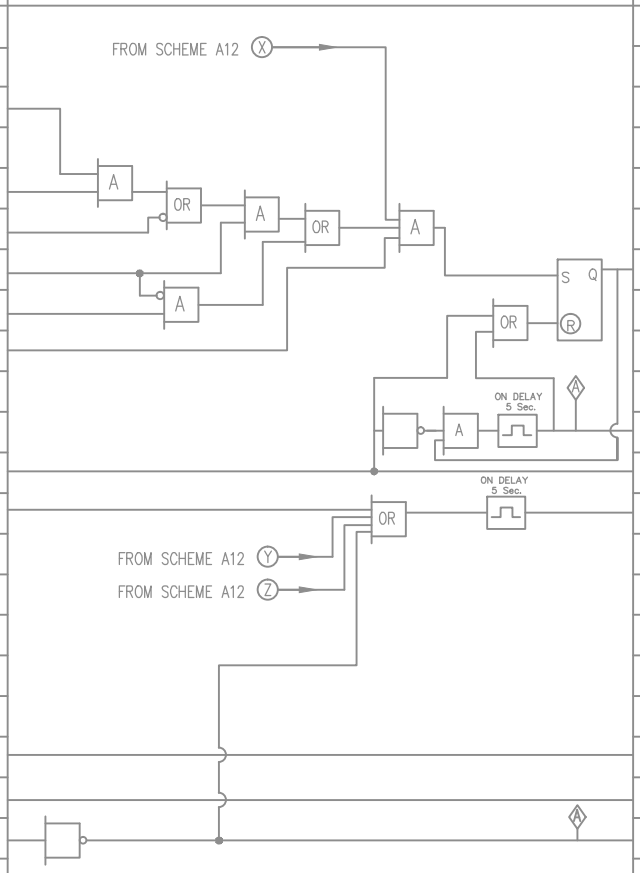


APPLICABLE TAGS FOR SCHEME–A7

S. No.	PMP1 TAG NO.	PMP2 TAG NO.	PMP3 TAG NO.	PROCESS-1 TAG NO.	PROCESS-2 TAG NO.	PROCESS-3 TAG NO.	Applicable SCHEME	P & ID	LOGIC DESCRIPTION
1	P5202A	P5202B	P5202C	PSL5208	RRI5259	ZT5204	A7	1-381-01-04355(1/1)	1) Auto start of standby on discharge pressure low 2) Start permissive for any pump on CW sump level Normal & discharge MOV closed & pump not in reverse rotation 3) Auto trip on CW sump level low low 4) Discharge valve 10% open. 5) Winding Temp. and Vibration.
2	P5202B	P5202C	P5202A	PSL5208	RRI5260	ZT5205	A7	1-381-01-04355(1/1)	1) Auto start of standby on discharge pressure low 2) Start permissive for any pump on CW sump level Normal & discharge MOV closed & pump not in reverse rotation 3) Auto trip on CW sump level low low 4) Discharge valve 10% open. 5) Winding Temp. and Vibration.
3	P5202C	P5202A	P5202B	PSL5208	RRI5261	ZT5206	A7	1-381-01-04355(1/1)	1) Auto start of standby on discharge pressure low 2) Start permissive for any pump on CW sump level Normal & discharge MOV closed & pump not in reverse rotation 3) Auto trip on CW sump level low low 4) Discharge valve 10% open. 5) Winding Temp. and Vibration.
4	P5301A	P5301B	NA	PSL5384	RRI5390A	ZT5389A	A7	2-381-01-04368(1/1)	1) Auto start of standby on discharge pressure low 2) Start permissive for any pump on CW sump level Normal & discharge MOV closed & pump not in reverse rotation 3) Auto trip on CW sump level low low 4) Discharge valve 10% open. 5) Winding Temp. and Vibration.
5	P5301B	P5301A	NA	PSL5384	RRI5390B	ZT5389B	A7	2-381-01-04368(1/1)	1) Auto start of standby on discharge pressure low 2) Start permissive for any pump on CW sump level Normal & discharge MOV closed & pump not in reverse rotation 3) Auto trip on CW sump level low low 4) Discharge valve 10% open. 5) Winding Temp. and Vibration.

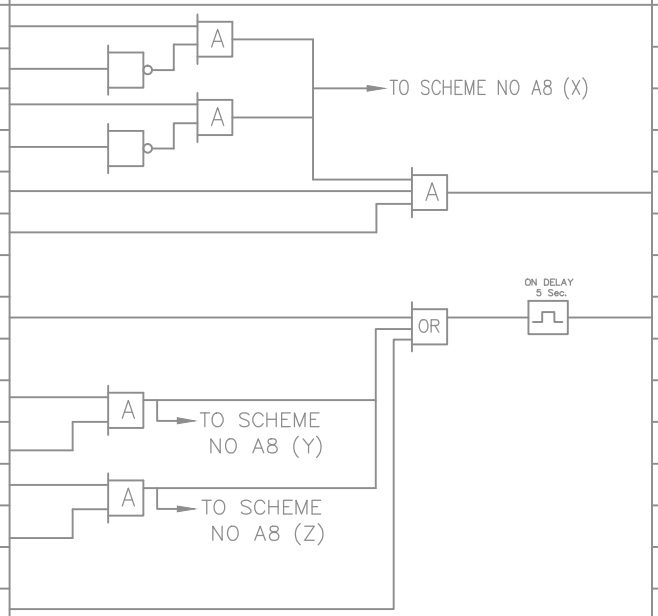
LOGIC SCHEME - A8

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard DI						
XLPMP1RUN	Pump1 Run f/b	MCC	NO	Hard DI						
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI		Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
	Pump1 RTS	MCC	NO	Soft DI						
						Soft DI		HMI	Pump1 Fail to Start	
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI		Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	



LOGIC SCHEME – A8A

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	Tank–1 select	HMI	–	Soft DI						
	Tank–1 level low	FIELD	NO	Hard DI						
	Tank–2 select	HMI	–	Soft DI						
	Tank–2 level low	FIELD	NO	Hard DI						
	Motor ON	HMI	–	Soft DI		Hard DO	NO	DCS	Motor ON	
	Motor RTS f/b	Field	NO	Hard DI						
	Motor OFF	HMI	–	Soft DI		Hard DO	NO	DCS	Motor OFF	
	Tank–1 select	HMI	–	Soft DI						
	Tank–1 level low	FIELD	NO	Hard DI						
	Tank–2 select	HMI	–	Soft DI						
	Tank–2 level low	FIELD	NO	Hard DI						
	Motor Trip	MCC	NC	Hard DI						



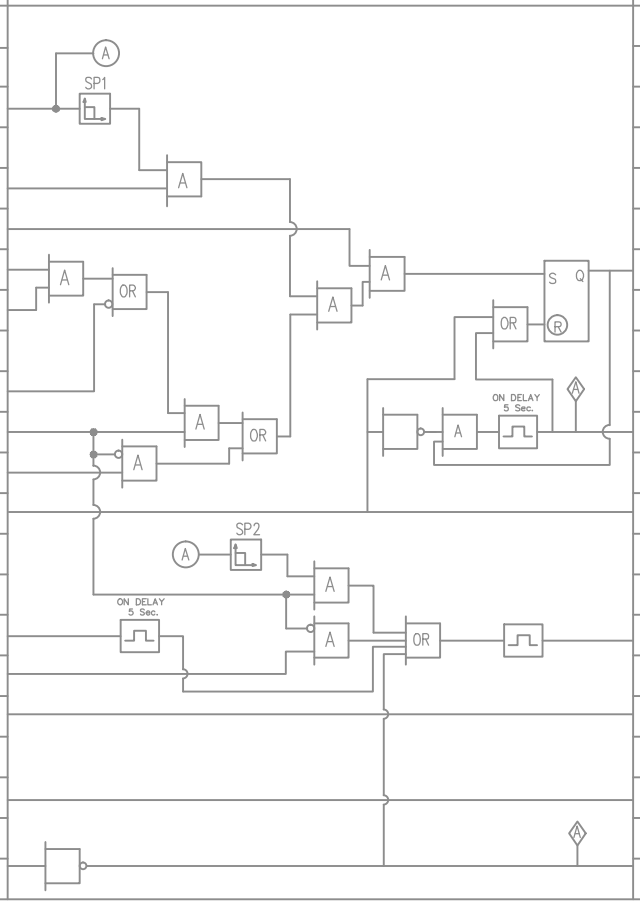
THIS LOGIC IS APPLICABLE FOR HRSG FILL PUMP.

APPLICABLE TAGS FOR SCHEME–A8 & A8A

S. No.	PMP1 TAG NO.	PMP2 TAG NO.	PROCESS-1 TAG NO.	Applicable SCHEME	P & ID	LOGIC DESCRIPTION
1	DMPT-01	DMPT-02	PAL5805	A8	1-381-01-04357(3/4)	1)Discharge pressure low ---> Start-Stand by pump
2	DMPT-02	DMPT-01	PAL5805	A8	1-381-01-04357(3/4)	1)Discharge pressure low ---> Start-Stand by pump
3	RWP-01	RWP-02	PALxxxx	A8	1-381-01-04357(3/4)	1)Discharge pressure low ---> Start-Stand by pump
4	RWP-02	RWP-01	PALxxxx	A8	1-381-01-04357(3/4)	1)Discharge pressure low ---> Start-Stand by pump

LOGIC SCHEME - A9

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard AI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard AI						
XLPMP1RTS	Pump1 RTS f/b	MCC	NO	Hard DI						
XLPMP2OPN	Pump2 Run f/b	MCC/Field	NO	Hard DI		Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
PROCESS-3	PROCESS SIGNAL	Field	-	Hard AI						
XLPMP2CLS	Pump2 Trip f/b	MCC/Field	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI		Soft DI		HMI	Pump1 Fail to Start	
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI						
	Pump1 ON	MCC	NO	Hard DI		Hard DI	NO	HMI	Pump1 ON	
**PROCESS-2	Process Signal	HMI	-	Soft DI		Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI						
*	Pump1 MOTOR CURRENT	MCC	-	HARD AI		HARD AI		HMI	Pump1 MOTOR CURRENT	
	Pump1 OFF	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 OFF	
	Pump1 TRIP	MCC	NC	Hard DI		HARD DI	NC	HMI	Pump1 TRIP DUE TO OVERLOAD	



NOTE: -

* APPLICABLE FOR NOTE NUMBER 3 OF DRIVE CONTROL PHILOSOPHY.

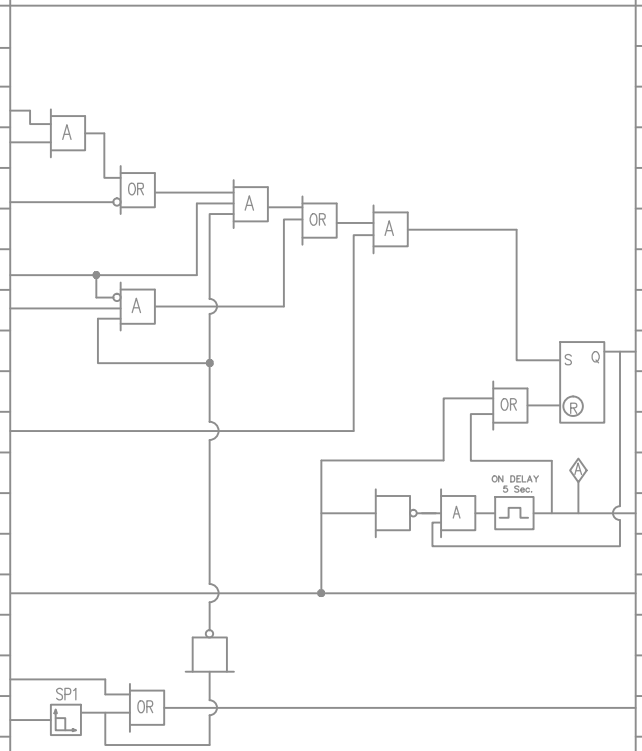
** THIS SIGNAL IS APPLICABLE ONLY FOR RWP.

APPLICABLE TAGS FOR SCHEME–A9

S. No.	PMP1	PMP2	PROCESS-1	PROCESS-2	PROCESS-3	Set points		Applicable SCHEME	P & ID	LOGIC DESCRIPTION
	TAG NO.	TAG NO.	TAG NO.	TAG NO.	TAG NO.	SP1	SP2			
1	P5901A	P5901B	LI5901	PAN1601	PAL5904	3600 mm	1600 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any RWP on RAW water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on RAW water reservoir level low low. 4) Auto trip running pump on discharge pressure high.
2	P5901B	P5901A	LI5901	PAN1601	PAL5904	3600 mm	1600 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any RWP on RAW water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on RAW water reservoir level low low. 4) Auto trip running pump on discharge pressure high.
3	P5903A	P5903B	LI5908	NA	PAL5913	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any potable water pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on potable water reservoir level low low.
4	P5903B	P5903A	LI5908	NA	PAL5913	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any potable water pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on potable water reservoir level low low.
5	P5905A	P5905B	LI5908	NA	PAL5919	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any service water pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on clarified water reservoir level low low.
6	P5905B	P5905A	LI5908	NA	PAL5919	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any service water pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on clarified water reservoir level low low.
7	P5907A	P5907B	LI5908	NA	PAL5925	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any CT makeup pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on clarified water reservoir level low low.
8	P5907B	P5907A	LI5908	NA	PAL5925	3250 mm	2190 mm	A9	1-381-01-04456(1/1)	1) Start permissive for any CT makeup pump on clarified water reservoir level normal. 2) Auto start of stand by pump on Discharge pr. Low. 3) Auto trip working pump on clarified water reservoir level low low.

LOGIC SCHEME - A10

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
PROCESS-1	PROCESS SIGNAL	Field	-	Hard DI						
XLPMP2RUN	Pump2 Run f/b	MCC	NO	Hard DI						
XLPMP2TRP	Pump2 Trip f/b	MCC	NC	Hard DI						
HSPMP1AM	Pump1 A/M Sel	HMI	-	Soft DI						
HSPMP1STR	Pump1 Start cmd	HMI	-	Soft DI						
	Pump1 RTS feedback	MCC	NO	Soft DI						
	Pump1 ON	MCC	NO	Hard DI						
HSPMP1STP	Pump1 Stop cmd	HMI	-	Soft DI						
PROCESS-2	PROCESS SIGNAL	Field	-	Hard AI						
						Hard DO	NO	MCC	Pump1 Start cmd	HSPMP1STR
						Soft DI		HMI	Pump1 Fail to Start	
						Hard DI	NO	HMI	Pump1 ON	
						Hard DO	NO	MCC	Pump1 Stop cmd	HSPMP1STP



APPLICABLE TAGS FOR SCHEME-A10

S. No.	PMP1 TAG NO.	PMP2 TAG NO.	PROCESS-1 TAG NO.	PROCESS-2 TAG NO.	Set points SP1	Applicable SCHEME	P & ID	LOGIC DESCRIPTION
1	P1504A	P1504B	PAL1507	LI1502	30%	A10	3-381-01-03053(1/1)	1) Discharge pr. Low --> Auto start of stand by pump, 2) Hydrozine Tank level low --> trip working pump
2	P1504B	P1504A	PAL1507	LI1502	30%	A10	3-381-01-03053(1/1)	1) Discharge pr. Low --> Auto start of stand by pump, 2) Hydrozine Tank level low --> trip working pump
3	P1404A	P1404B	PAL1407	LI1402	30%	A10	3-381-01-03054(1/1)	1) Discharge pr. Low --> Auto start of stand by pump, 2) Ammonia Tank level low --> trip working pump
4	P1404B	P1404A	PAL1407	LI1402	30%	A10	3-381-01-03054(1/1)	1) Discharge pr. Low --> Auto start of stand by pump, 2) Ammonia Tank level low --> trip working pump

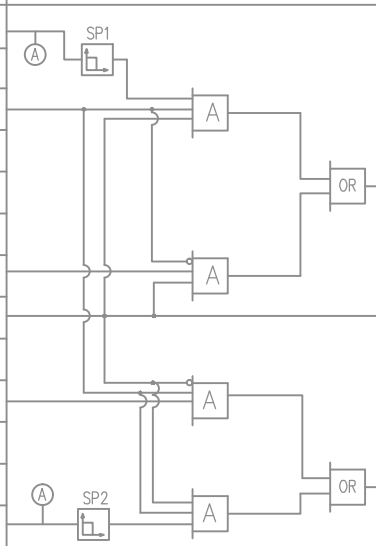
LOGIC SCHEME – A11

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
Mx xxxxSTR	Motor Start cmd	HMI	–	Soft DI	A	Hard DO	NO	MCC	Motor Start	Mx xxxxSTR
Mx xxxxRTS	Motor RTS f/b	MCC	NO	Hard DI						
Mx xxxxSTP	Motor Stop cmd	HMI	–	Soft DI		Hard DO	NO	MCC	Motor Stop	Mx xxxxSTP

NOTE: –
1. THIS LOGIC IS APPLICABLE TO REMOTE OPERATED DRIVES LIKE AGITATOR ETC.

LOGIC SCHEME – B1

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	Process–1	FIELD	–	Hard AI						
	A/M SELECTION	HMI	–	Soft DI						
						Hard DO	NO	DCS	MOV Open Cmd	HSxxxxOPN
HSxxxxOPN	MOV Open cmd	HMI	–	Soft DI						
XLxxxxRTS	MOV RTS f/b	Field	NO	Hard DI		Hard DI	NO	HMI	MOV RTS F/B	HSxxxxOPN
HSxxxxCLS	MOV Close cmd	HMI	–	Soft DI						
						Hard DO	NO	DCS	MOV Close Cmd	HSxxxxCLS
	Process–1	Field	–	Hard DI						
	MOV OPEN F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Open IND.	
	MOV CLOSE F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Close IND.	
	VALVE POSITION	Field	–	Hard AI		Hard AI		DCS	Valve Position	HSxxxxCLS

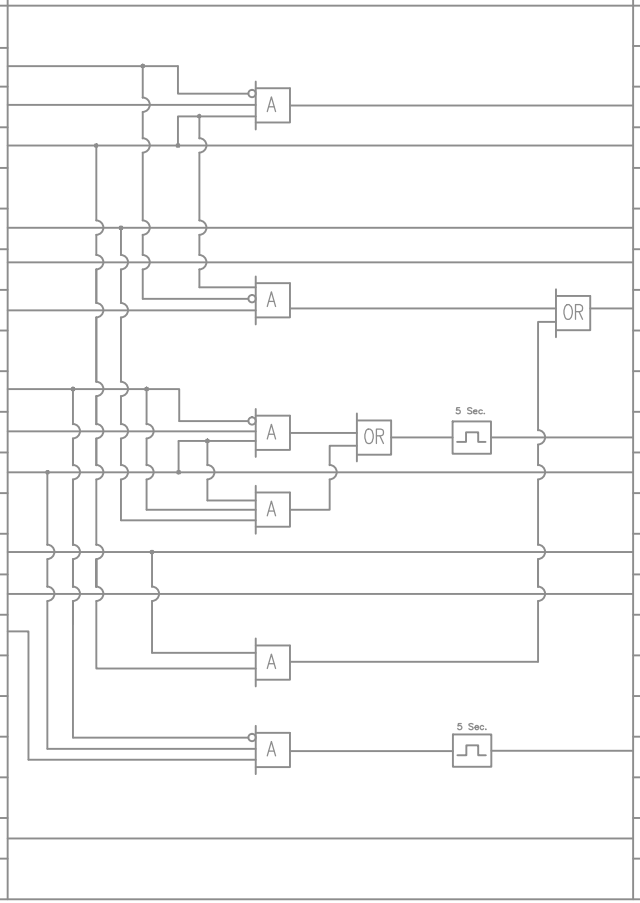


APPLICABLE TAGS FOR SCHEME–B1

S.No.	MOV TAG NO. XXXX	PROCESS-1	SCHEME	P&ID
1	MOV-1115	NA	B1	0-381-01-04104(1/1)
2	MOV-1113	NA	B1	0-381-01-04104(1/1)
3	MOV-1217	NA	B1	0-381-01-04105(1/1)
4	MOV-1314	PT1314	B1	0-381-01-04106(1/1)
5	MOV-1321	NA	B1	0-381-01-04106(1/1)
6	MOV-1332	NA	B1	0-381-01-04106(1/1)
7	MOV-1676	NA	B1	0-381-01-04107(1/1)
8	MOV-1637	NA	B1	0-381-01-04107(1/1)
9	MOV-1632	NA	B1	0-381-01-04107(1/1)
10	MOV-1704	NA	B1	0-381-01-04108(1/1)
11	MOV-1717	NA	B1	0-381-01-04108(1/1)
12	LCL11AA001	NA	B1	0-24-400-80910(1/1)
13	LBA10AA003	NA	B1	0-24-400-80910(1/1)
14	LCL10AA002	NA	B1	0-24-400-80910(1/1)
15	LCL10AA001	NA	B1	0-24-400-80910(1/1)
16	LDJ40AA002	NA	B1	0-24-400-80911(1/1)
17	LCL31AA002	NA	B1	0-24-400-80911(1/1)
18	LCL30AA001	NA	B1	0-24-400-80911(1/1)
19	LCL30AA002	NA	B1	0-24-400-80911(1/1)
20	LCL30AA003	NA	B1	0-24-400-80911(1/1)
21	LCL21AA001	NA	B1	0-24-400-80911(1/1)
22	LBA20AA003	NA	B1	0-24-400-80911(1/1)
23	LCL20AA002	NA	B1	0-24-400-80911(1/1)
24	LCL20AA001	NA	B1	0-24-400-80911(1/1)

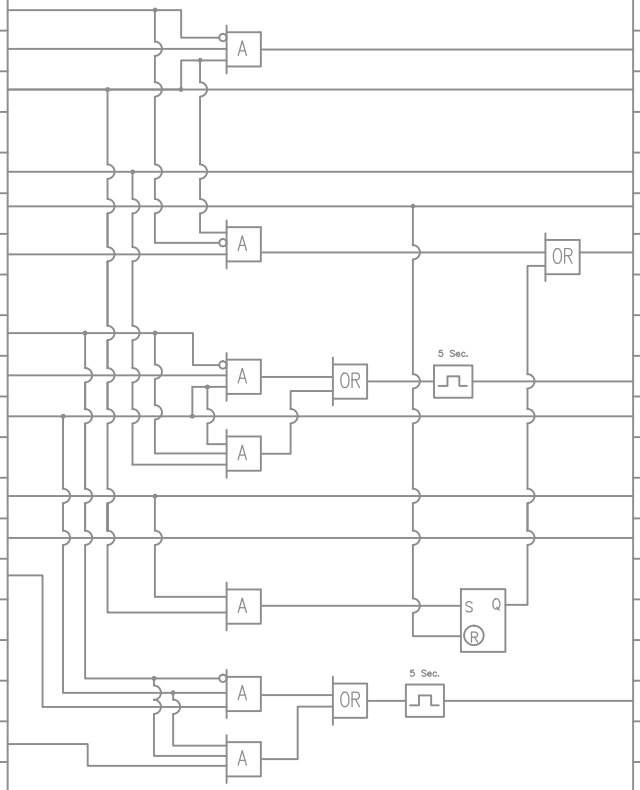
LOGIC SCHEME – B2A

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
MOV1104B	IBV A/M SELECTION	HMI	–	Soft DI						
MOV1104B	IBV OPEN cmd	HMI	–	Soft DI		Hard DO	NO	MCC	IBV OPEN cmd	MOV1104B
MOV1104B	IBV RTS F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV RTS F/B IND.	
MOV1104B	IBV OPEN F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV OPEN F/B INDICATION	MOV1104B
MOV1104B	IBV CLOSE F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV CLOSE F/B INDICATION	MOV1104B
MOV1104B	IBV CLOSE cmd	HMI	–	Soft DI		Hard DO	NO	MCC	IBV CLOSE cmd	MOV1104B
MOV1104A	MAIN MOV A/M SELECTION	HMI	–	Soft DI						
MOV1104A	MAIN MOV OPEN cmd	HMI	–	Soft DI		Hard DO	NO	MCC	MAIN MOV OPEN cmd	MOV1104A
MOV1104A	MAIN MOV RTS F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV RTS F/B IND.	
MOV1104A	MAIN MOV OPEN F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV OPEN F/B IND.	
MOV1104A	MAIN MOV CLOSE F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV CLOSE F/B IND.	
MOV1104A	MAIN MOV CLOSE cmd	HMI	–	Soft DI						
						Hard DO	NO	MCC	MAIN MOV CLOSE cmd	MOV1104A
MOV1104B	IBV POSITION F/B	Field	–	Hard AI		Hard AI	–	HMI	POSITION F/B IND.	MOV1104B



LOGIC SCHEME – B2B

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
MOVxxxx	IBV A/M SELECTION	HMI	–	Soft DI						
MOVxxxx	IBV OPEN cmd	HMI	–	Soft DI		Hard DO	NO	MCC	IBV OPEN cmd	MOVxxxx
MOVxxxx	IBV RTS F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV RTS F/B IND.	
MOVxxxx	IBV OPEN F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV OPEN F/B INDICATION	MOVxxxx
MOVxxxx	IBV CLOSE F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	IBV CLOSE F/B INDICATION	MOVxxxx
MOVxxxx	IBV CLOSE cmd	HMI	–	Soft DI		Hard DO	NO	MCC	IBV CLOSE cmd	MOVxxxx
MOVxxxx	MAIN MOV A/M SELECTION	HMI	–	Soft DI						
MOVxxxx	MAIN MOV OPEN cmd	HMI	–	Soft DI		Hard DO	NO	MCC	MAIN MOV OPEN cmd	MOVxxxx
MOVxxxx	MAIN MOV RTS F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV RTS F/B IND.	
MOVxxxx	MAIN MOV OPEN F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV OPEN F/B IND.	
MOVxxxx	MAIN MOV CLOSE F/B	MCC	NO	Hard DI		Hard DI	NO	HMI	MAIN MOV CLOSE F/B IND.	
MOVxxxx	MAIN MOV CLOSE cmd	HMI	–	Soft DI						
						Hard DO	NO	MCC	MAIN MOV CLOSE cmd	MOVxxxx
MOVxxxx	CEP–X TRIP/OFF	MCC	–	Hard DI						
MOVxxxx	IBV POSITION F/B	Field	–	Hard AI		Hard AI	–	HMI	POSITION F/B IND.	MOVxxxx

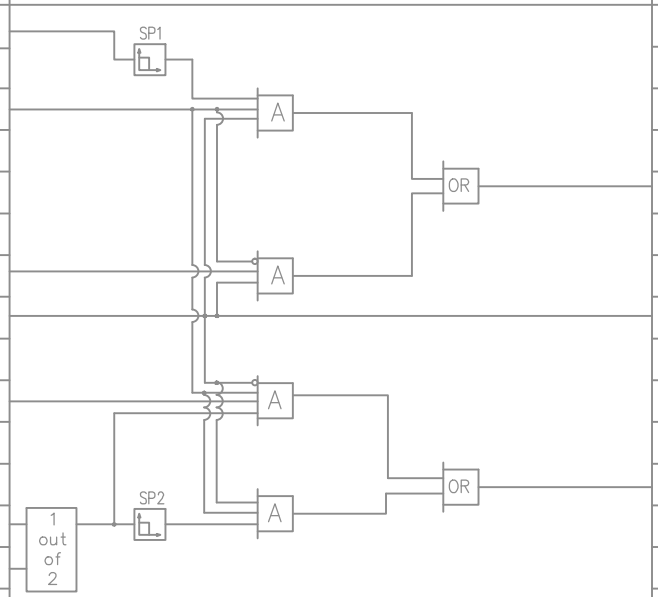


APPLICABLE TAGS FOR SCHEME-B2A & B2B

S.No.	MOV TAG NO. XXXXX	SCHEME	P&ID
1	MOV-1104A AND MOV-1104B	B2A	0-381-01-04104(1/1)
2	MOV-1607	B2B	0-381-01-04107(1/1)
3	MOV-1608	B2B	0-381-01-04107(1/1)

LOGIC SCHEME – B3

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	Process–1	FIELD	–	Hard AI						
	A/M SELECTION	HMI	–	Soft DI						
						Hard DO	NO	DCS	MOV Open Cmd	HSxxxxOPN
HSxxxxOPN	MOV Open cmd	HMI	–	Soft DI						
XLxxxxRTS	MOV RTS f/b	Field	NO	Hard DI		Hard DI	NO	DCS	MOV RTS F/B IND.	HSxxxxOPN
HSxxxxCLS	MOV Close cmd	HMI	–	Soft DI						
						Hard DO	NO	DCS	MOV Close Cmd	HSxxxxCLS
LT1801A	Deaerator level Hi Hi	Field	–	Hard AI						
LT1801B	Deaerator level Hi Hi	Field	–	Hard AI						
	MOV OPEN F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Open IND.	
	MOV CLOSE F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Close IND.	



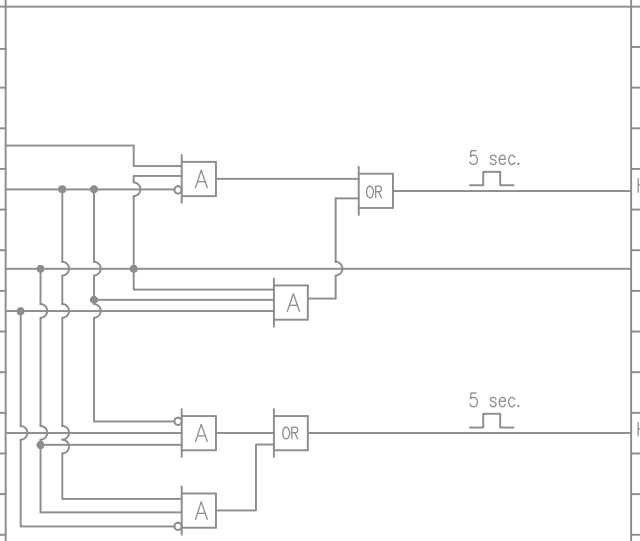
APPLICABLE TAGS FOR SCHEME–B3

S.No.	MOV TAG NO. XXXX	SCHEME	P&ID
1	MOV-1124	B3	0-381-01-04104(1/1)
2	MOV-1117	B3	0-381-01-04104(1/1)
3	MOV-1130	B3	0-381-01-04104(1/1)
4	MOV-1136	B3	0-381-01-04104(1/1)
5	MOV-1150	B3	0-381-01-04104(1/1)
6	MOV-1143	B3	0-381-01-04104(1/1)
7	MOV-1210	B3	0-381-01-04105(1/1)
8	MOV-1204	B3	0-381-01-04105(1/1)
9	MOV-1319	B3	0-381-01-04106(1/1)
10	MOV-1674	B3	0-381-01-04107(1/1)
11	MOV-1679	B3	0-381-01-04107(1/1)
12	MOV-1635	B3	0-381-01-04107(1/1)
13	MOV-1630	B3	0-381-01-04107(1/1)
14	MOV-1702	B3	0-381-01-04108(1/1)
15	MOV-1821	B3	0-381-01-04109(1/2)
16	MOV-1825	B3	0-381-01-04109(1/2)
17	MOV-1829	B3	0-381-01-04109(1/2)
18	MOV-1855	B3	0-381-01-04109(1/2)
19	MOV-1859	B3	0-381-01-04109(1/2)
20	MOV-1891	B3	0-381-01-04109(2/2)
21	MOV-1895	B3	0-381-01-04109(2/2)
22	MOV-5210	B3	0-381-01-04355(1/1)
23	MOV-5214	B3	0-381-01-04355(1/1)
24	MOV-5219	B3	0-381-01-04355(1/1)
25	MOV-5220	B3	0-381-01-04355(1/1)
26	LCL11AA002	B3	0-24-400-80910(1/1)
27	LCL12AA001	B3	0-24-400-80910(1/1)
28	LCH10AA001	B3	0-24-400-80910(1/1)
29	LCH11AA001	B3	0-24-400-80910(1/1)

S.No.	MOV TAG NO. XXXX	SCHEME	P&ID
30	HAH10AA001	B3	0-24-400-80910(1/1)
31	HAH11AA001	B3	0-24-400-80910(1/1)
32	LBA10AA001	B3	0-24-400-80910(1/1)
33	LBA10AA002	B3	0-24-400-80910(1/1)
34	LBA10AA003	B3	0-24-400-80910(1/1)
35	LBA10AA004	B3	0-24-400-80910(1/1)
36	LAE10AA002	B3	0-24-400-80910(1/1)
37	LAE10AA001	B3	0-24-400-80910(1/1)
38	HBW047	B3	0-24-400-80910(1/1)
39	LCL10AA003	B3	0-24-400-80910(1/1)
40	LBW028	B3	0-24-400-80911(1/1)
41	LDJ40AA001	B3	0-24-400-80911(1/1)
42	LDJ40AA002	B3	0-24-400-80911(1/1)
43	LAB30AA001	B3	0-24-400-80911(1/1)
44	LMS001	B3	0-24-400-80911(1/1)
45	LMS031	B3	0-24-400-80911(1/1)
46	LCL31AA001	B3	0-24-400-80911(1/1)
47	LCL30AA003	B3	0-24-400-80911(1/1)
48	LBA30AA001	B3	0-24-400-80911(1/1)
49	LBA30AA002	B3	0-24-400-80911(1/1)
50	LAB20AA001	B3	0-24-400-80911(1/1)
51	LCL21AA002	B3	0-24-400-80911(1/1)
52	LCL22AA001	B3	0-24-400-80911(1/1)
53	IBS031	B3	0-24-400-80911(1/1)
54	LCH20AA001	B3	0-24-400-80911(1/1)
55	LBA20AA001	B3	0-24-400-80911(1/1)
56	LCH20AA002	B3	0-24-400-80911(1/1)
57	LCL20AA003	B3	0-24-400-80911(1/1)

LOGIC SCHEME - B4

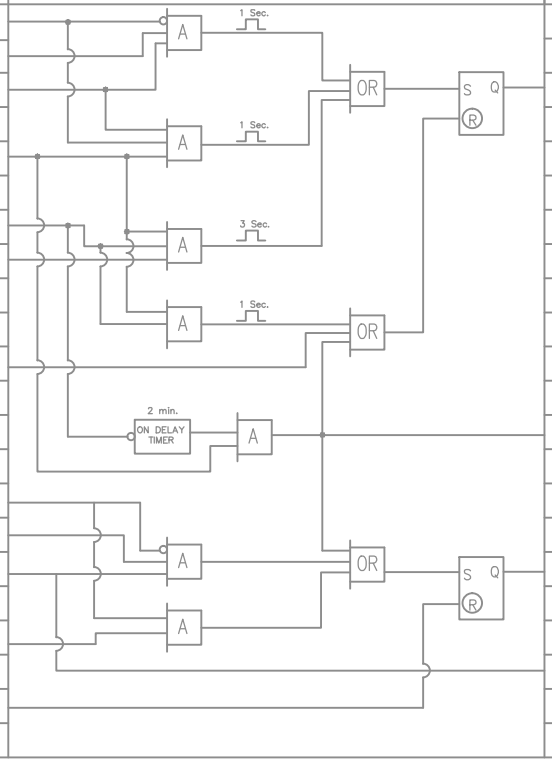
INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
HSxxxxxOPN	MOV Open cmd	HMI	-	Soft DI						
HSxxxxxAM	MOV A/M Sel	HMI	-	Soft DI		Hard DO	NO	DCS	MOV Open cmd	HSxxxxxOPN
	MOV RTS F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV RTS F/B IND.	
PROCESS 1	Process signal-1	Field	NO	Hard DI						
HSxxxxxCLS	MOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	MOV Close cmd	HSxxxxxCLS
	MOV Open F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Open F/B IND.	
	MOV Close F/B	Field	NO	Hard DI		Hard DI	NO	DCS	MOV Close F/B IND.	



APPLICABLE TAGS FOR SCHEME–B4

S.No.	MOV TAG NO. XXXX	PROCESS-1	SCHEME	P&ID
1	MOV-1852A	PMP004A-RUN	B4	0-381-01-04109(1/2)
2	MOV-1852B	PMP004B-RUN	B4	0-381-01-04109(1/2)
3	MOV-1888A	PMP005A-RUN	B4	0-381-01-04109(2/2)
4	MOV-1888B	PMP005B-RUN	B4	0-381-01-04109(2/2)
5	MOV-18117A	PMP006A-RUN	B4	0-381-01-04109(2/2)
6	MOV-18117B	PMP006B-RUN	B4	0-381-01-04109(2/2)
7	LAB10AA001A	NA	B4	0-24-400-80910(1/1)
8	LAB10AA001	NA	B4	0-24-400-80910(1/1)
9	LBA10AA005A	NA	B4	0-24-400-80910(1/1)
10	LBA10AA005	NA	B4	0-24-400-80910(1/1)
11	LBA30AA005A	NA	B4	0-24-400-80911(1/1)
12	LBA30AA005	NA	B4	0-24-400-80911(1/1)
13	LBA20AA005A	NA	B4	0-24-400-80911(1/1)
14	LBA20AA005	NA	B4	0-24-400-80911(1/1)

LOGIC SCHEME - B5

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
HS xxxxAM	MOV A/M sel.	HMI	-	Soft DI						
HS xxxxOPN	MOV Open cmd	HMI	-	Soft DI						
XL xxxxRTS	MOV RTS F/B	MCC	NO	Hard DI		Hard DO	NO	DCS	Open cmd to Actuator box	
	PROCESS -1	Field	NO	Hard DI						
	Valve 10% Open	Field	-	Hard AI						
	Disch. pr. Normal	Field	NO	Hard DI						
	Value full Open F/B	Field	-	Hard AI						
									CWP/ACWP stop logic.	
	MOV A/M sel.	HMI	-	Soft DI						
HS xxxxCLS	MOV Close cmd	HMI	-	Soft DI						
XL xxxxRTS	MOV RTS F/B	MCC	NO	Hard DI		Hard DO	NO	DCS	Close CMD to Actuator box	
	CWP/ACWP trip/off	HMI	-	Soft DI						
						Hard DO	NO	DCS	MOV RTS F/B indicator	
XL xxxxCLS	MOV full close F/B	Field	-	Hard AI						

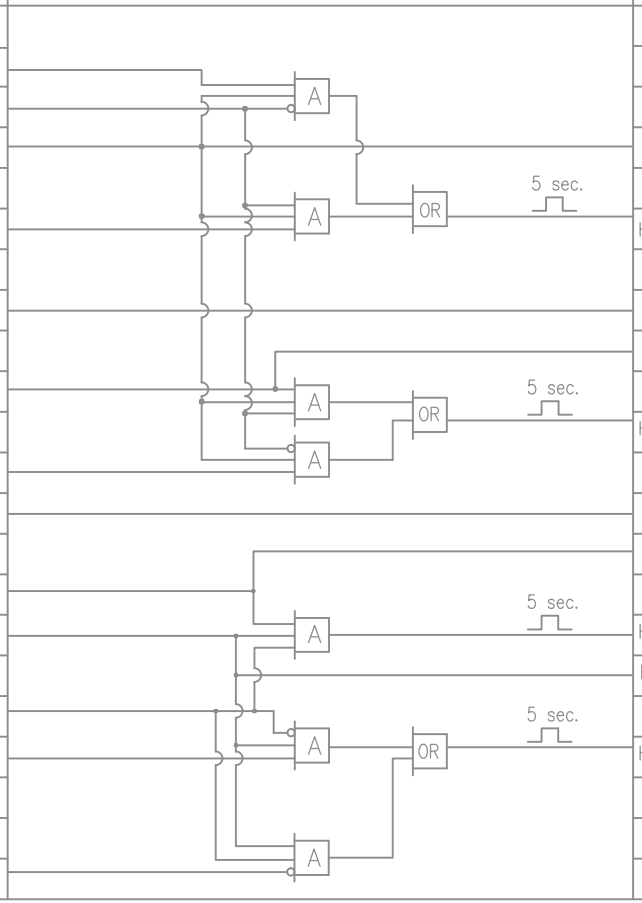
NOTE:
1. HOLDING OF OPEN AND CLOSE COMMAND WILL BE PROVIDED IN DCS THEREFOR IT IS NOT REQUIRE IN ACTUATOR DUE TO LOGIC CONDITIONS.

APPLICABLE TAGS FOR SCHEME-B5

S.No.	MOV TAG NO. XXXX	PMP1	PROCESS-1	SCHEME	P&ID	Remarks
1	MOV-5204	P5202A	PAN5209A	B5	0-381-01-04355(1/1)	1) On start of suction pump --> Open the valve by 10 deg. 2)After 10 deg opening of valve, if discharge pres is normal -->Fully open the valve for 90 deg. 3) On suction pump trip --> Close the valve.
2	MOV-5205	P5202B	PAN5209B	B5	0-381-01-04355(1/1)	1) On start of suction pump --> Open the valve by 10 deg. 2)After 10 deg opening of valve, if discharge pres is normal -->Fully open the valve for 90 deg. 3) On suction pump trip --> Close the valve.
3	MOV-5206	P5202C	PAN5209C	B5	0-381-01-04355(1/1)	1) On start of suction pump --> Open the valve by 10 deg. 2)After 10 deg opening of valve, if discharge pres is normal -->Fully open the valve for 90 deg. 3) On suction pump trip --> Close the valve.
4	MOV-5389A	P5302A	PAN5301	B5	0-381-01-014368(1/1)	1) On start of suction pump --> Open the valve by 10 deg. 2)After 10 deg opening of valve, if discharge pres is normal -->Fully open the valve for 90 deg. 3) On suction pump trip --> Close the valve.
5	MOV-5389B	P5302B	PAN5302	B5	0-381-01-014368(1/1)	1) On start of suction pump --> Open the valve by 10 deg. 2)After 10 deg opening of valve, if discharge pres is normal -->Fully open the valve for 90 deg.

LOGIC SCHEME - B6

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
HSxxxxxAOPN	Bypass MOV Open cmd	HMI	-	Soft DI						
HSxxxxxBAM	Bypass MOV A/M Sel	HMI	-	Soft DI						
XLxxxxxARTS	Bypass MOV RTS F/B	Field	NO	Hard DI		Hard DI	NO	HMI	Bypass MOV RTS F/B IND.	
PROCESS 1	Process signal-1	MCC	-	Hard DI		Hard DO	NO	DCS	Bypass MOV Open cmd	HSxxxxxBOPN
	Bypass MOV close F/B	Field	NO	Hard DI		Hard DI	NO	DCS	Bypass MOV Close F/B IND.	
						Hard DI	NO	DCS	Main MOV Open F/B IND.	
XLxxxxxAOPN	Main MOV Open f/b	Field	NO	Hard DI						
						Hard DO	NO	DCS	Bypass MOV Close cmd	HSxxxxxBCLS
HSxxxxxBCLS	Bypass MOV CLOSE cmd	HMI	-	Soft DI						
	Main MOV close f/b	Field	NO	Hard DI		Hard DI	NO	DCS	Main MOV Close F/B IND.	
						Hard DI	NO	DCS	Bypass valve Open F/B IND.	
XLxxxxxBOPN	Bypass MOV Open f/b	Field	NO	Hard DI						
XLxxxxxARTS	Main MOV RTS f/b	Field	NO	Hard DI		Hard DO	NO	DCS	Main MOV Open cmd	HSxxxxxAOPN
						Hard DI	NO	DCS	Main MOV RTS F/B IND.	
HSxxxxxAAM	Main MOV A/M Sel	HMI	-	Soft DI						
HSxxxxxACLS	Main MOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	Main MOV Close cmd	HSxxxxxACLS
	Process Signal-2	MCC	NC	Hard DI						



APPLICABLE TAGS FOR SCHEME–B6

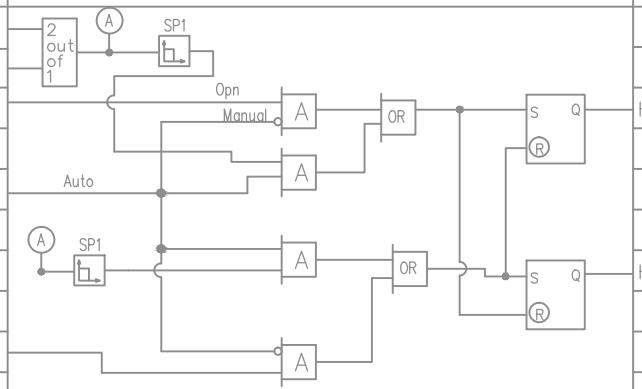
S.No.	MOV TAG NO. XXXX	PROCESS-1 TAG NO.	PROCESS-2 TAG NO.	SCHEME	P&ID	DESCRIPTION
1	MOV-1-1818A & 1818B	XLP003A RUN	P-003A TRIP/OFF	B6	0-381-01-04109(1/2)	AUTO OPEN ON RECEIPT OF HP BFP-1 RUN FEEDBACK
2	MOV-2-1818A & 1818B	XLP003B RUN	P-003B TRIP/OFF	B6	0-381-01-04109(1/2)	AUTO OPEN ON RECEIPT OF HP BFP-2 RUN FEEDBACK
3	MOV-3-1818A & 1818B	XLP003C RUN	P-003C TRIP/OFF	B6	0-381-01-04109(1/2)	AUTO OPEN ON RECEIPT OF HP BFP-3 RUN FEEDBACK

LOGIC SCHEME - C1

INPUT SIGNALS

TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE
L11801A	FW storage Hi lvl	Field	-	Hard AI
L11801B	FW storage Hi lvl	Field	-	Hard AI
HS18010PN	XV1801 opn cmd	HMI	-	Soft DI
XL1801AM	XV1801 Auto/Manual	HMI	-	Soft DI
HS1801CLS	XV1801 close cmd	HMI	-	Soft DI
XL1801PN	XV1801 opn FB	Field	NO	Hard DI
XL1801CLS	XV1801 cls FB	Field	NO	Hard DI

LOGIC STRUCTURE

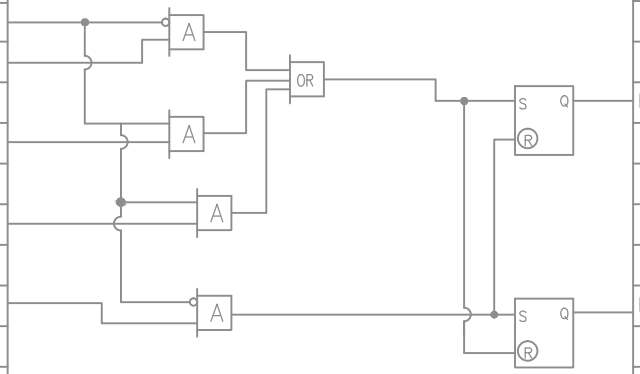


OUTPUT SIGNALS

SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
Hard DO	NO	DCS	XV1801 Open Cmd	HS18010PN
Hard DO	NO	DCS	XV1801 Close Cmd	HS1801CLS
Hard DI	NO	HMI	XV1801 opn FB	XV18010PN
Hard DI	NO	HMI	XV1801 cls FB	XV1801CLS

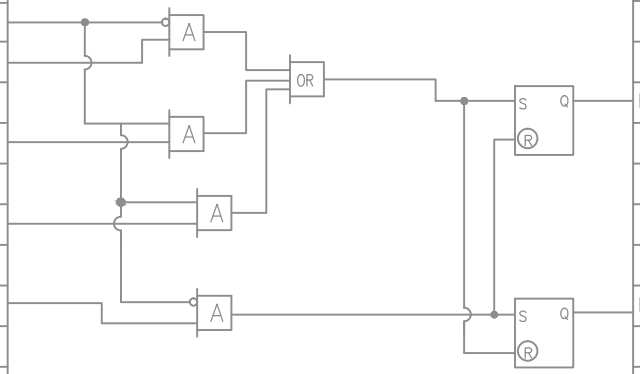
LOGIC SCHEME - C2

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	SOV A/M Selection	HMI	-	Soft DI						
HS69380PN	SOV Open cmd	HMI	-	Soft DI						
						Hard DO	NO	DCS	SOV Open Cmd	HS69380PN
	Emergency/Long shutdown	HMI	-	Soft DI						
	GT fire	MARK VI	NO	Hard DI						
HS6938CLS	SOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Close Cmd	HS6938CLS



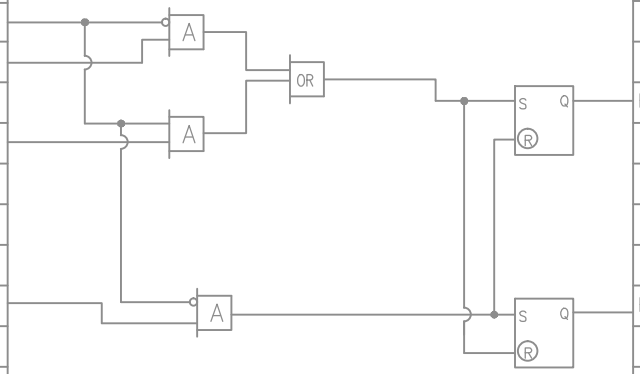
LOGIC SCHEME - C3

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	SOV A/M Selection	HMI	-	Soft DI						
HS6937CLS	SOV Close cmd	HMI	-	Soft DI						
						Hard DO	NO	DCS	SOV Close Cmd	HS6937CLS
	Emergency/Long shutdown	HMI	-	Soft DI						
	GT fire	MARK VI	NO	Hard DI						
HS6937OPN	SOV Open cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Open Cmd	HS6937OPN



LOGIC SCHEME - C4

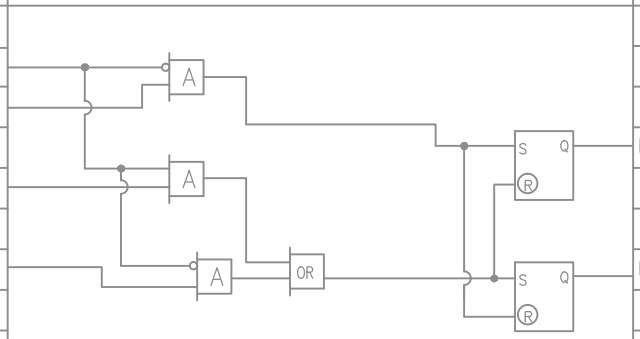
INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	SOV A/M Selection	HMI	-	Soft DI						
HSxxxxOPN	SOV Open cmd	HMI	-	Soft DI						
						Hard DO	NO	DCS	SOV Open Cmd	HSxxxxOPN
	Emergency/Long shutdown	HMI	-	Soft DI						
HSxxxxCLS	SOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Close Cmd	HSxxxxCLS



NOTE:
1. THIS LOGIC IS APPLICABLE FOR SOV6907, SOV6915 AND SOV6916.

LOGIC SCHEME - C5

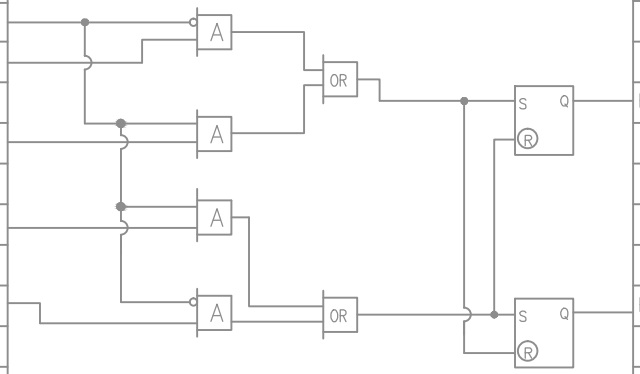
INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	SOV A/M Selection	HMI	-	Soft DI						
HS6904OPN	SOV Open cmd	HMI	-	Soft DI						
						Hard DO	NO	DCS	SOV Open Cmd	HS6904OPN
	Emergency/Long shutdown	HMI	-	Soft DI						
HS6904CLS	SOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Close Cmd	HS6904CLS



NOTE:
1. THIS LOGIC IS APPLICABLE FOR SOV6907, SOV6915 AND SOV6916.

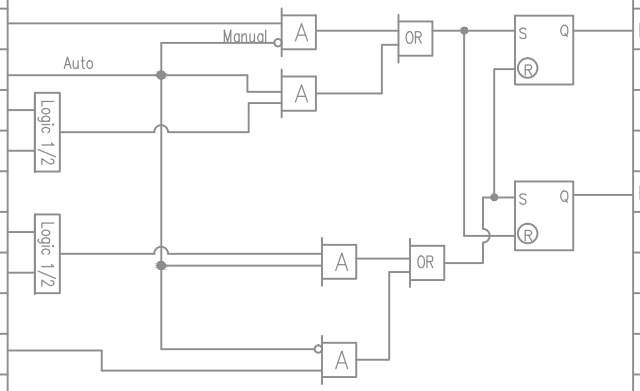
LOGIC SCHEME - C6

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
	SOV A/M Selection	HMI	-	Soft DI						
HS52580PN	SOV Open cmd	HMI	-	Soft DI						
						Hard DO	NO	DCS	SOV Open Cmd	HS52580PN
LAN5232	CT sump lvl Normal	Field	-	Hard DI						
LAN5231	CT sump lvl HI	Field	-	Hard DI						
HS5258CLS	SOV Close cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Close Cmd	HS5258CLS



LOGIC SCHEME - C7

INPUT SIGNALS					LOGIC STRUCTURE	OUTPUT SIGNALS				
TAG No.	DESCRIPTION	LOC	CONT TYPE	SIG TYPE		SIG TYPE	CONT TYPE	LOC	DESCRIPTION	TAG No.
HS69050PN	SOV opn cmd	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Open Cmd	HS69050PN
XL1801AM	SOV Auto/Manual	HMI	-	Soft DI		Hard DO	NO	DCS	SOV Close Cmd	HS6905CLS
LI6905A	Gas Scrubber tank lvl. above HI	Field	-	Hard AI						
LI6905B	Gas Scrubber tank lvl. above HI	Field	-	Hard AI						
LI6906A	Gas Scrubber tank lvl. low	Field	-	Hard AI						
LI6906B	Gas Scrubber tank lvl. low	Field	-	Hard AI						
HS6905CLS	SOV close cmd	HMI	-	Soft DI						



APPLICABLE TAGS FOR SCHEME–C1,C2,C3....C7

S. No.	VALVE TAG NO.		PROCESS-1	PROCESS-2	PROCESS-3	Set points		Applicable SCHEME	P & ID	LOGIC DESCRIPTION
		XXXX	TAG NO.	TAG NO.	TAG NO.	SP1	SP2			
1	XV	- 1801	LI1801A	LI1801B	NA	1681 mmWC	1581 mmWC	C1	1-381-01-04109(1/2)	1)Auto open valve on 50mm above high level of DEAE 2)Auto close valve on 50mm below high level of DEAE
2	BDV	- 6938	NA	NA	NA	NA	NA	C2	1-381-01-04110(3/3)	1) Auto open on Gas scrubber level high high 2) Auto open in case of fire in GT 3) Manual open in case emergency/long shutdown
3	ESD	- 6937	NA	NA	NA	NA	NA	C3	1-381-01-04110(3/3)	1) Auto close on Gas scrubber level high high 2) Auto close in case of fire in GT 3) Manual close in case emergency/long shutdown
4	BDV	- 6915	NA	NA	NA	NA	NA	C4	1-381-01-04110(2/3)	1) Auto open on Gas scrubber level high high 2) Auto open in case of fire in GT 3) Manual open in case emergency/long shutdown
5	BDV	- 6916	NA	NA	NA	NA	NA	C4	1-381-01-04110(2/3)	1) Auto open on Gas scrubber level high high 2) Auto open in case of fire in GT 3) Manual open in case emergency/long shutdown
6	BDV	- 6907	NA	NA	NA	NA	NA	C4	1-381-01-04110(1/3)	1) Auto open on Gas scrubber level high high 2) Auto open in case of fire in GT 3) Manual open in case emergency/long shutdown
7	UB	- 6904	NA	NA	NA	NA	NA	C5	1-381-01-04110(1/3)	1) Auto close on Gas scrubber level high high 2) Auto close in case of fire in GT 3) Manual close in case emergency/long shutdown
8	UV	- 5258	NA	NA	NA	4450 mmWC	4750 mmWC	C6	1-381-01-04355(1/1)	1)Auto open valve on CW sump level normal 2)Auto close valve on CW sump level high
9	LCV	- 6905	LI6905A	LI6906A	NA	70%	30%	C7	1-381-01-04110(1/3)	1)Auto open on gas scrubber level high 2)Auto close on gas scrubber level low

Annexure-VII

Details of Major and Critical Spares

SL No	Main Equipment /Area	Material Description	Stock Quantity (No/Set)	Availability status
1	GBC (Gas Booster Compressor) Unit 1 & 2 and their Auxiliaries	Control valve positioner(Make-Metso)	2	Available
		Vibration probe(Make-Bently Nevada)	6	Available
		Temp Control valve positioner(Make-Fisher)	1	Available
		Proximeter(Make-Bently Nevada)	6	Available
		Compressor Axial displacement probe(Make-Bently Nevada)	1	Available
		Gear box vibration probe(Make-Bently Nevada)	6	Available
		SUCTION CONTROL VALVE DIAPHRAGM	2	Available
		GBC MOROR BEARING DE	1	Available
		GBC MOROR BEARING NDE	1	Available
		GEAR BOX BEARING SET	1	Available
		COMPRESSOR MECHANICAL SEAL DE	1	Available
		COMPRESSOR MECHANICAL SEAL NDE	1	Available
		COMPRESSOR THRUST BEARING		Available
		COMPRESSOR THRUST BEARING	1	Available
2	Gas Turbine	TURNINE GEAR MOTOR(Make-LEROY SOMER CE)	1	Available
		GCV	1	Available
		Wheelspace and exhust thermocouples	1set	Available
		Servo valves for GCV, SRV and IGV(Make-Moog)	1 set for each valve	Available
		AOP motor (GE make)	1	Available
		Spark plug	2	Available
		IBH Control valve positioner(Make-Flowserve)	1	Available
		Air filter pulsing card	1	Available
		HYDROLIC PUMP COMPLETE SET	1	Available
		GENERATOR JOUNAL BEARING DE SIDE	1	Available
		GENERATOR JOUNAL BEARING NDE SIDE	1	Available
		GEAR BOX HAND BEARING MOTOR	1	Available
		STOP RATIO VALVE	2	Available
		P1 CONTROL VALVE FULL SET	1	Available
		P1 FLEXIBLE GAS PIPE	1	Available
		P2 FLEXIBLE GAS PIPE	1	Available
		P3 FLEXIBLE GAS PIPE	1	Available
		P4 FLEXIBLE GAS PIPE	2	Available
		CARBON BRUSH	1 SET	Available
		Fuel nozzle assembly	1 Set	Available (refurbished spare)
		Transition Piece Assembly	1 Set	Sent for refurbishment
		Cap Assembly	1 Set	Available (refurbished spare)
		Liner assembly	1 Set	Available (refurbished spare)
		Nozzle Kit Turbine Stage 1	1 Set	Sent for refurbishment
		Nozzle Kit Turbine Stage 2	1 Set	Sent for refurbishment
		Nozzle Kit Turbine Stage 3	1 Set	Sent for refurbishment
		Shroud set Turbine Stage 1	1 Set	Sent for refurbishment
		Shroud set Turbine Stage 2	1 Set	Available (refurbished spare)
		Shroud set Turbine Stage 3	1 Set	Available (refurbished spare)
		Bucket Kit Turbine Stage 1	1 Set	Sent for refurbishment
		Bucket Kit Turbine Stage 2	1 Set	Sent for refurbishment
		Bucket Kit Turbine Stage 3	1 Set	Sent for refurbishment
3	Diverting damper	SBC CARD	2	All cards are available &Order for complete set is placed (materials are to be received within April 2022)
		POWER CARD	1	
		Terminal card	2	
		GEAR BOX	1 SET	Available
		PAD BEARING	2 SET	Available
4	HRSG	HP main steam valve actuator HMS 42(Make-Auma)	1	Available (repaired spare)
		HP start up vent actuator HMS 30 (Make-Auma)	1	Available
		DRUM MAN HOLE GASKIT	6 SET	Available
		MECHANICAL SEAL DE SIDE	1	Available
		MECHANICAL SEAL NDE SIDE	2	Available

5	HP BFP	IMPELLAR	1	Available
		JOURNAL BEARING DE SIDE	1	Available
		JOURNAL BEARING NDE SIDE	1	Available
		THRUST BEARING	1	Available
		COUPLING BETWEEN MOTOR TO VOITH	2 SET	Available
		COUPLING BETWEEN VOITH TO PUMP	2 SET	Available
		LUBE OIL FILTER	2	Available
		AUTO RECIRCULATION VALVE	1	Available
		Vibration probe(Make-Bently Nevada)	5	Available
		Proximeter(Make-Bently Nevada)	5	Available
6	IPBFP	MECHANICAL SEAL DE SIDE	1	Available
		MECHANICAL SEAL NDE SIDE	2	Available
		AUTO RECIRCULATION VALVE	1	Available
7	LPBFP	MECHANICAL SEAL DE SIDE	1	Available
		MECHANICAL SEAL NDE SIDE	1	Available
		AUTO RECIRCULATION VALVE	1	Available
8	CPHRC	MECHANICAL SEAL	1	Available
9	CEP	MECHANICAL SEAL	1	Available
		PUMP MECHANICAL SEAL	1	Available
10	COOLING TOWER FAN	CT FAN GEAR BOX	1	Available
		CT FAN BLADE	5	Available
		WATER NOZZLE	20	Available
		CT FAN MOTOR(Make-ABB)	1	Available
11	INTAKE RIVER PUMP	PUMP MOTOR	1	Available
		PARTING PLANE FASTENERS FOR OUTER CASING		Available
		STUD M80X6X530X482 P/N HY301010062989	1	Available
		STUD M80X6X430X382 P/N HY301010082989	1	Available
		HEX NUT M80 x 6 P/N HY301010102989	2	Available
		STUD M90X6X450X397 P/N HY301010122989	6	Available
		HEX NUT M90 x 6 P/N HY301010142989	6	Available
		STUD M100X6X475X417 P/N HY301010162989	2	Available
		HEX NUT M100 x 6 P/N HY301010182989	2	Available
		STUD M110X6X580X517 P/N HY301010202989	2	Available
		HEX.NUT M110X6 P/N HY301010222989	2	Available
		EXHAUST HOOD		Available
		SILICON RUBBER 8X3 FOR EXHAUST HOOD P/N HY301253062989	32	Available
		INNER CASING ASSEMBLY P/N		Available
		SEALING FIN FOR INNER CASING P/N HY301020282989	1	Available
		CAULKING WIRE FOR INNER CASING P/N HY301020302989	1	Available
		STEAM GLANDS		Available
		SEALING FIN FOR FRONT STEAM GLAND P/N HY301210072989	1	Available
		CAULKING WIRE FOR FRONT STEAM GLAND P/N HY301210092989	1	Available
		SEALING FIN FOR BALANCE PISTON GLAND P/N HY301220152989	1	Available
		CAULKING WIRE FOR BALANCE PISTON GLAND P/N HY301220142989	1	Available
		SEALING FIN FOR REAR STEAM GLAND P/N HY301320092989	1	Available
		CAULKING WIRE FOR REAR STEAM GLAND P/N HY301320112989	1	Available
		H.P GUIDE BLADE CARRIER		Available
		SEALING FIN FOR HP GUIDE BLADE CARRIERS P/N HY301757952989	1	Available
		CAULKING WIRE FOR HP GUIDE BLADE CARRIERS P/N HY301757972989	1	Available
		OIL GLANDS		Available
		SCRAPPING RING FOR FRONT OIL GLAND P/N HY302320062989	5	Available
		SCRAPPING RING FOR REAR-FRONT OIL GLAND P/N HY302330062989	7	Available
		SCRAPPING RING FOR REAR-REAR OIL GLAND P/N HY302340102989	7	Available
		ROTOR ASSEMBLY		Available
		SEALING FIN FOR ROTOR P/N HY303010172989	1	Available
		CAULKING WIRE FOR ROTOR P/N HY303010192989	1	Available
		PACKING RING P/N HY305020102989	1	Available
		MAIN STOP VALVE		Available
		PIN 20X170 P/N HY305020202989	1	Available
		VALVE SPINDLE P/N HY305020342989	1	Available
		PACKING RING P/N HY305020402989	5	Available
		PACKING P/N HY305020462989	1	Available
		PLATE 1 P/N HY305020502989	3	Available
		PLATE 2 P/N HY305020522989	1	Available
		PISTON SPINDLE P/N HY305020542989	1	Available

CAP NUT P/N HY305020562989	1	Available
NUT M30X1.5 P/N HY305020582989	1	Available
CAP SCREW P/N HY305020602989	1	Available
CAP NUT P/N HY305020662989	1	Available
SL.HEAD GRUB SCREW P/N HY305020772989	1	Available
HEX SCREW P/N HY305020792989	4	Available
ABSTREIFER P/N HY305020802989	1	Available
MCD WASHER P/N HY305020832989	4	Available
TURCON STEP SEAL P/N HY305020852989	3	Available
TRDL SEALING RING ID 61 P/N HY305020862989	1	Available
TRDL SEALING RING ID 54 P/N HY305020872989	1	Available
CIRCLIP P/N HY305020882989	1	Available
CLAMPING SLEEVE 6X60 P/N HY305020892989	3	Available
TRDL SEALING RING ID400 P/N HY305020932989	1	Available
HYDRAULIC ACTUATOR FOR MAIN STOP VALVE		Available
HELICOIL INSERT M24 P/N HY305030222989	3	Available
SEALING WASHER P/N HY305030232989	2	Available
TRDL SEALING RING ID440 P/N HY305030272989	1	Available
TRDL SEALING RING ID460 P/N HY305030282989	1	Available
IP/LP INJECTION STOP VALVE		Available
CLAMPING PIN P/N HY305560282989	1	Available
SCRU SLT CHS A P M5 P/N HY305560322989	3	Available
CLAMPING SLEEVE 4X32 P/N HY305560332989	1	Available
TRDL SEALING RING ID20 P/N HY305560342989	1	Available
TRDL SEALING RING ID64 P/N HY305560352989	1	Available
SEALING WASHER P/N HY305560482989	1	Available
PLUG SCREW P/N HY305560492989	1	Available
CYL CMPRSN SPRING P/N HY305070252989	1	Available
HYDRAULIC ACTUATOR FOR INJECTION STOP VALVE		Available
HELICOIL INSERT M16 P/N HY305070302989	3	Available
VALVE SPINDLE PACKING P/N HY305460102989	2	Available
DISC SPRING P/N HY305460582989	10	Available
CIRCLIP P/N HY305460622989	2	Available
SPH PLAIN BRG P/N HY305460632989	1	Available
CLAMPING SLEEVE 2.5X18 P/N HY305460742989	1	Available
DEVA-SWIVEL BEARING PG09-50.02 P/N HY305470282989	1	Available
CIRCLIP P/N HY305470312989	2	Available
DU-BUSH P/N HY305470342989	2	Available
CYL CMPRSN SPRING P/N HY305470392989	2	Available
THREADED PIN M30 P/N HY305470402989	2	Available
HP CONTROL VALVE		Available
DISC SPRING P/N HY305470482989	4	Available
BUSH P/N HY305470512989	1	Available
BUSH P/N HY305470532989	1	Available
DEVA-SWIVEL BEARING PG09-60.02 P/N HY305470552989	1	Available
PIN DIA 60F7 P/N HY305470602989	1	Available
CIRCLIP P/N HY305470622989	2	Available
DEVA-SWIVEL BEARING PG09-50.02 P/N HY305470632989	2	Available
CIRCLIP P/N HY305470662989	4	Available
SCREW CAP SOC P M10 P/N HY305470672989	2	Available
IP/LP INJECTION CONTROL VALVE		Available
VALVE CONE P/N HY305260082989	1	Available
VALVE SPINDLE P/N HY305260102989	1	Available
PIN DIA 10X20 P/N HY305260162989	3	Available
VALVE SPINDLE PACKING P/N HY305260182989	1	Available
CLAMPING SLEEVE 2.5X28 P/N HY305260402989	4	Available
THREADED PIN M16 P/N HY305260432989	1	Available
THREADED BUSH P/N HY305260452989	1	Available
GRUB SCREW P/N HY305260472989	1	Available
CIRCLIP P/N HY305260532989	2	Available
CYL CMPRSN SPRING P/N HY305260542989	1	Available
MCD WASHER P/N HY305260612989	2	Available
DU-BUSH P/N HY305260642989	2	Available
THRST WASHER P/N HY305260672989	2	Available
CIRCLIP P/N HY305260682989	2	Available
CLAMPING SLEEVE 2.5X18 P/N HY305260772989	1	Available
SPH PLAIN BEARING P/N HY305260882989	1	Available

12	STG	CIRCLIP P/N HY305260932989	2	Available
		DISC SPRING P/N HY305260962989	10	Available
		CIRCLIP P/N HY305261022989	2	Available
		TAPER PIN WITH THREADS DIA8X60 P/N HY305261102989	1	Available
		MCD WASHER P/N HY305261122989	1	Available
		PIN 8M6 P/N HY305261142989	2	Available
		HP PILOT VALVE		Available
		HELICOIL INSERT M16 P/N HY306030142989	4	Available
		HELICOIL INSERT M12 P/N HY306030152989	6	Available
		HELICOIL INSERT M10 P/N HY306030162989	10	Available
		BUSH P/N HY306030262989	1	Available
		BUSH P/N HY306030302989	1	Available
		CONTROL SLIDE P/N HY306030322989	1	Available
		STHR BALL BEARING P/N HY306030452989	1	Available
		SPRING SEAT P/N HY306030462989	1	Available
		CYL CMPRSN SPRING P/N HY306030482989	1	Available
		TRDL SEALING RING ID28 P/N HY306030642989	1	Available
		SLOT TYPE FLOW CONTROL VALVE 12 P/N HY306030752989	1	Available
		SLOT TYPE FLOW CONTROL VALVE 16 P/N HY306030762989	1	Available
		TRDL SEALING RING ID16 P/N HY306030772989	1	Available
		TURCON STEP SEAL P/N HY306030822989	1	Available
		ABSTREIFER P/N HY306030832989	1	Available
		MCD WASHER P/N HY306030842989	1	Available
		HP SERVOMOTOR		Available
		TRDL SEALING RING ID56 P/N HY306110872989	4	Available
		HELICOIL INSERT P/N HY306110882989	1	Available
		CIRCLIP P/N HY306110892989	4	Available
		CIRCLIP P/N HY306110902989	1	Available
		DU-BUSH P/N HY306110912989	1	Available
		DU-BUSH P/N HY306110922989	1	Available
		DU-BUSH P/N HY306110932989	1	Available
		DU-BUSH P/N HY306110942989	1	Available
		PROT ROLLER BEARING P/N HY306110952989	2	Available
		SEAL KIT FOR HYDRAULIC CYLINDER OF HP P/N HY306112002989	1	Available
		SM		Available
		DAMPING DEVICE FOR HP SERVOMOTOR P/N HY306140022989	1	Available
		IP/LP PILOT VALVE P/N	1	Available
		BUSH P/N HY306070142989	1	Available
		BUSH P/N HY306070182989	1	Available
		CONTROL SLIDE P/N HY306070222989	1	Available
		TRDL SEALING RING ID130 P/N HY306070322989	2	Available
		STHR BALL BEARING P/N HY306070352989	1	Available
		SPRING SEAT P/N HY306070362989	1	Available
		CYL CMPRSN SPRING P/N HY306070382989	1	Available
		SPRING SEAT P/N HY306070392989	1	Available
		TRDL SEALING RING ID26 P/N HY306070452989	1	Available
		MCD WASHER P/N HY306070562989	2	Available
		SLOT TYPE FLOW CONTROL VALVE 10 P/N HY306070572989	2	Available
		TURCON STEP SEAL P/N HY306070642989	1	Available
		ABSTREIFER P/N HY306070652989	1	Available
		CYL CMPRSN SPRING P/N HY306070662989	1	Available
		IP/LP SERVOMOTOR		Available
		HELICOIL INSERT M12 P/N HY306120682989	1	Available
		CIRCLIP P/N HY306120692989	2	Available
		CIRCLIP P/N HY306120702989	1	Available
		CIRCLIP P/N HY306120712989	2	Available
		CIRCLIP P/N HY306120722989	8	Available
		DU-BUSH P/N HY306120752989	3	Available
		DU-BUSH P/N HY306120762989	2	Available
		HELICOIL INSERT M6 P/N HY306120772989	1	Available
		PROT ROLLR BEARING P/N HY306120782989	2	Available
		SEAL KIT FOR HYDRAULIC CYLINDER OF LP SM P/N HY306122002989	1	Available
		DAMPING DEVICE FOR LP SERVOMOTOR P/N HY306150022989	1	Available
		CONNECTING PARTS FOR INNER CASING		Available
		ECCENTRIC GUIDE ASSLY P/N HY307680512989	1	Available
		ANGLE RING P/N HY307682562989	4	Available

THREADED BUSH P/N HY307682582989	4	Available
CYL. PIN P/N HY307682602989	8	Available
CONNECTING PARTS FOR B.P. GLAND		Available
ECCENTRIC GUIDE ASSLY P/N HY307680092989	1	Available
SPHERICAL WASHER P/N HY307680242989	4	Available
THREADED CUP 1 P/N HY307680262989	2	Available
THREADED CUP 2 P/N HY307680282989	2	Available
CONNECTING PARTS FOR GBC-1		Available
ECCENTRIC GUIDE ASSLY P/N HY307682102989	1	Available
SPHERICAL WASHER P/N HY307682312989	4	Available
THREADED CUP 1 P/N HY307682332989	2	Available
THREADED CUP 2 P/N HY307682352989	2	Available
CONNECTING PARTS FOR GBC-2		Available
ECCENTRIC GUIDE ASSLY P/N HY307681762989	1	Available
SPHERICAL WASHER P/N HY307681972989	4	Available
THREADED CUP 1 P/N HY307681992989	2	Available
THREADED CUP 2 P/N HY307682012989	2	Available
CONNECTING PARTS FOR GBC-3		Available
ECCENTRIC GUIDE ASSLY P/N HY307681422989	1	Available
SPHERICAL WASHER P/N HY307681632989	4	Available
THREADED CUP 1 P/N HY307681652989	2	Available
THREADED CUP 2 P/N HY307681672989	2	Available
CONNECTING PARTS FOR GBC-4		Available
ECCENTRIC GUIDE ASSLY P/N HY307681122989	1	Available
SPHERICAL WASHER P/N HY307681292989	4	Available
THREADED CUP 1 P/N HY307681312989	2	Available
THREADED CUP 2 P/N HY307681332989	2	Available
ADDL. SPARES		Available
DISC SPRING FOR CASING TO FRONT PEDESTAL HOLDING P/N HY302360402989	4	Available
COMPRESSION BELLOW - REAR BEARING HOUSING P/N HY301320642989	1	Available
LEVER OF HAND BARRING DEVICE P/N HY307640072989	1	Available
SOCKET SPANNER M56 FOR TURB-GEN COUPLING BOLTS P/N HY311070112989	1	Available
TURBINE JOURNAL BEARING DE SIDE	1	Available
TURBINE JOURNAL BEARING NDE SIDE	1	Available
TURBINE THRUST BEARING	1	Available
GENERATOR JOURNAL BEARING DE SIDE	1	Available
GENERATOR JOURNAL BEARING NDE SIDE	1	Available
GOVERNING SKID LUBE OIL FILTER	1	Available
HP GOVERNING VALVE SPARE	1 SET	Available
HP ESV SPARE	1 SET	Available
HP PILOT VALVE	1	Available
IL AND LP PILOT VALVE	1	Available
IL AND LP ESV OIL SIDE O-RING SET	2 SET	Available
HP STEAM DUMP VALVE GLANG PACKING	1	Available
IP STEAM DUMP VALVE GLANG PACKING	1	Available
LP STEAM DUMP VALVE GLANG PACKING	1	Available
CPC Positioner for electronic governor(Make-Woodward)	1	Available
Siemens positioner for APRDS valves	1	Available
Control valve positoner(Make-Metso)	1	Available
Spares for Rotrok/Auma make actuators	2 Set	Available
Bharat Limitorque actuator spares	1 Set	Available
Casing expansion probe	1	Available
HRSG Super heater sparay contol valve positioner (Make-Baker Huges Masonelian)	2	Available
Axial displacement probe(Make-Bently Nevada)	1	Available
Generator vibration probe(Make-Bently Nevada)	2	Available
AOP/MOP Motor (MAKE-BHARAT BIJLEE)	1	Available
Control valve I/p converter	3	Available
RTD for Generator Bearing	4	Available
RTD for Turbine Journal/Thrust Bearing	8	Available
Solenoid valve for Stop valve Open/Close	1	Available
Solenoid valve for remote engaged trip device	1	Available
Solenoid valve for turbine tripping	1	Available
Solenoid valve for Jet spray cooler	1	Available
Vibration Probe	3	Available

		Proximeter	6	Available
		Casing Expansion Probe	1	Available
		(-1)to 1.5 Kg/cm² 150mm dial local bottom mounting	1	Available
		0-6 Kg/cm² 150mm dial local bottom mounting	4	Available
		0- 160Kg/cm² 150mm dial local bottom mounting	2	Available
		0-200 Kg/cm² 150mm dial local bottom mounting	2	Available
		0-60 Kg/cm² 150mm dial local bottom mounting	1	Available
		STG vacuum breaker	1	Available
		STG Aux. Steam (TCV-1103,PCV-1301,UV 5228,XV-1801	2	Available
		GENARATOR HOT/COLD AIR RTD	2	Available
		GENARATOR SPACE HEATER	2	Available
		EARTHING BRUSH-A	8	Available
		EARTHING BRUSH-B	8	Available
		BRUSH HOLDER	2	Available
		FIRE DETECTOR 100˚C	3	Available
		FIRE DETECTOR 80˚C	3	Available
		CLAMPING PIECE	8	Available
		BEARING SEALING RING	4	Available
		SCRAPPER FIN PROFILE	3	Available
		INSULATION SET FOR GENARATOR BEARING	1 SET	Available
13	EDG	PUMP,FUEL TLN	1	Available
		INJECTOR	8	Available
		SWITCH MAGNETIC	2	Available
		MOTOR, STARTING	1	Available
14	CCWM SYSTEM	CCWM Fan Motor(MAKE-BHARAT BIJLEE)	2 No	Available
15	IAPA	PLC with programming (Make-Allen Bradley)	1	Available
		For Dry air skid Control valve with actuator(Make-Aira)	8	Available
		IAPA MOTOR (Make-ABB)	1	Available
		V- Belt	2 Sets	Available
		LP side valve set	1 Set	Available
		HP Side Valve set	1 Set	Available
		LP side channel and spring set	1 Set	Available
		HP side channel and spring set	1 Set	Available
16	SFC	Instantaneous relay plug -in 230 V 50 Hz CO	1	Availabale
		Relay Switching DC 24 V	5	Availabale
		Current Transformer 1500/1 A 20 VA (0 to 1)	1	Availabale
		Current Transformer Builtin bar-crossed primary winding	1	Availabale
		Analogical Converter Type	1	Availabale
		Voltage Sensor output 10 V for 2000 V	1	Availabale
		PSU Quint PS-100-240 AC/24 DC/5	1	Availabale
		PSU Quint PS-100-240 AC/24 DC/6	1	Availabale
		PSU Mini 100-240 VAC 15 VDC 1 A	1	Availabale
		Assembly PSU CU20-09 85-264 VAC	1	Availabale
		Resistor 4.99 Ohms 10 W, A +-0.5%	10	Availabale
		Resistor 475 Ohms +/- 5%	20	Availabale
		Resistor 4120 Ohms 3 W, 0.5%	20	Availabale
		Module Power nterface 315 B	1	Availabale
		PIB measurement board with data processing PIB 101 C	1	Availabale
		PIB measurement board with Optical link,PIB 100G, Unconfigured	1	Availabale
		Module 16 Inputs/16 Outputs BIO 232.1	1	Availabale
		VME card REF: VP 325/022-23	1	Availabale
		Module RC012A, Tropicalised	1	Availabale
		Transformer 3 Ph, 1600/100 V-50 Hz, 200 VA-10 KV	1	Availabale
		SMPS mini power O/P 15V DC(Make-Phoenix contact)	1	Availabale
		SMPS O/P 48V DC JSW 100	1	Availabale
		SMPS O/P 24V DC(Make-Phoenix contact)	1	Availabale
		AC DC contoller card module(CCMI)	1	Availabale
		Auxillary card module	1	Availabale

17	220 V DC station Charger(Make-Dubas)	F-range coil LX4FK220	1	Availabale
		Power supply card	3	Availabale
		Static card	2	Availabale
		Input voltage divider card	2	Availabale
		Power supply Txm fuse resistor assembly	2	Availabale
		Control supply Txm fuse resistor assembly	2	Availabale
		DC DC card module(CCM-2)	1	Availabale
		AC DC card module(CCM-1)	1	Availabale
		Contactor(LC1FDP500A)(Make-C&S)	1	Availabale
18	GT & STG AVR Spares	AC DC converter	2	Availabale
		Pulse Transformer	2	Availabale
		Over voltage protection	1	Availabale
		Discharge field Resistor	1	Availabale
		Thyristor power Module	6	Availabale
		Thyristor fuse	6	Availabale
		UN00663 Module	1	Availabale
		UN00661 Module	1	Availabale
		UN00610 Module	1	Availabale
		UN00662 Module	1	Availabale
		UN52650 Module	1	Availabale
		UN0094 Module	2	Availabale
		UN0096 Module	2	Availabale
		UN0097 Module	2	Availabale
		UN0098 Module	2	Availabale
		UN0099 Module	1	Availabale
		UN0053 Module	1	Availabale
		Switch	1	Availabale
		Transducer 0-60mV/3X(4-20)	1	Availabale
		Transducer Dc volt 0-600V/4-20mA	1	Availabale
		Transformer ,DC VOLT -15-0+15/4-20mA	1	Availabale
		Transformer ,Control 100VA,220/240V	1	Availabale
		Transformer ,200VA YNYNO 110/560V	1	Availabale
		Transformer, 200VA 3PH, YNYNO 400/110V	1	Availabale
		Transducer,0-10V/4-20mA	1	Availabale
		Transducer,AC VOLT,0-165V/4-20mA	1	Availabale
		Transducer,DC VOLT,0-500V/4-20mA	1	Availabale
		Relay AUX 24VDC	1	Availabale
		Relay AUX 240VAC	2	Availabale
		Relay AUX 220VDC	1	Availabale
		Lamp PI Green	1	Availabale
		Fuse HRC 6A	1	Availabale
		Fuse 10A	1	Availabale
		Fuse HRC 25A	1	Availabale
		Fuse HRC 8A	1	Availabale
		Fuse HRC 10A,500V	1	Availabale
		Fuse HRC 2A	1	Availabale
		Fuse HRC 80A	1	Availabale
		Fuse HRC 16A	1	Availabale
		Fuse HRC 16A,415VAC,600VDC	1	Availabale
		Fuse HRC 10A,1000v	1	Availabale
19	GT MARK Vie	IO net NTRON ethernet switch	1	Availabale
		Phonix power supply 28vdc	1	Availabale
		TSVC Servo IO board	1	Availabale
		TBAI Aanolog IO board	1	Availabale
		TBCI combet input board	1	Availabale
		TRLY Relay o/p board*	0	Availabale
		TTUR primary turbine protection	1	Availabale
		TPRO Turbine protection board	1	Availabale
		TVBA vibration IO board	1	Availabale
		PDM Power distribution board	1	Availabale
		MarK Vie processor card	1	Availabale
		PAIC Analog IO pack	1	Availabale
		PDA discrete input IO pack	1	Availabale
		PVIB vibration IO pack	1	Availabale
		PPDA PDM Diagonostic	1	Availabale

		PDOA discrete output IO pack	1	Availabale
		PTOR turbine specific trip IO pack	1	Availabale
		PSVO servo IO pack	1	Availabale
		PPRO backup turbine protection pack*	0	Availabale
20	DCS cards	IOP330B	20	Availabale
		I320A	2	Availabale
		S901A	1	Availabale
		S305A	3	Availabale
		I334A	1	Availabale
		CPO 401	1	Availabale
		I304A	2	Availabale
		I301B	10	Availabale
		I320A	2	Availabale
		I351A	15	Availabale
		D403D	2	Availabale
		D401D	3	Availabale
		S901A	1	Availabale
		R306B	1	Availabale
		D403D	1	Availabale
		D408D	1	Availabale
		D406D	1	Availabale
21	GTG & STG GRP	P345(Make-SCHNEIDER ELECTRIC)	2	Available
		P642(Make-SCHNEIDER ELECTRIC)	3	Available
		P741 (Make-ALSTOM)	1	Available
		P127(Make-ALSTOM)	1	Available
		P643(Make-ALSTOM)	1	Available
22	Switchyard	Spares for 132 KV circuit breaker		Minimal quantity available. Offer being collected as per recomnedations after maintenance during APM Dec 2021
		CT	5	Optimal Quanity available
		CVT	3	Optimal Quanity available
		EMVT	1	Optimal Quanity available