

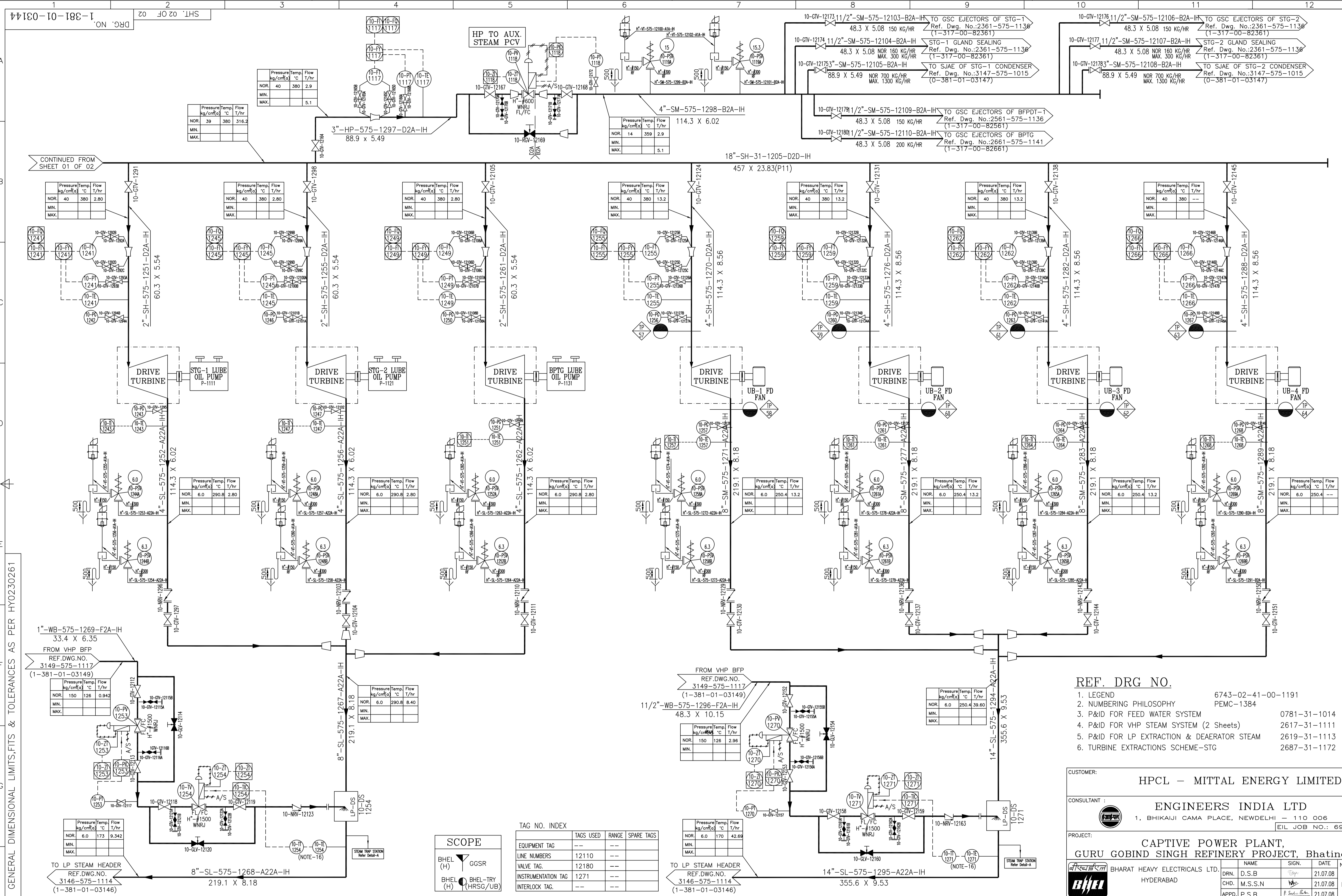






1-381-01-03144  
SHT. 02 OF 02  
DRG. NO.

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GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY02030261

COMPUTER FILE NAME: 1-3810103144-502-R00  
SIGN. AND DATE: REF. DRG. NO.

Revision table with columns: REV., DATE, ALTERED CHD/APPD, ZONE.

SCOPE  
BHCL (H) GGSR  
BHCL (H) BHCL-TRY (HRSG/UB)

TAG NO. INDEX table with columns: EQUIPMENT TAG, LINE NUMBERS, VALVE TAG, INSTRUMENTATION TAG, INTERLOCK TAG.

- REF. DRG NO. 1. LEGEND 6743-02-41-00-1191
2. NUMBERING PHILOSOPHY PEMC-1384
3. P&ID FOR FEED WATER SYSTEM 0781-31-1014
4. P&ID FOR VHP STEAM SYSTEM (2 Sheets) 2617-31-1111
5. P&ID FOR LP EXTRACTION & DEAERATOR STEAM 2619-31-1113
6. TURBINE EXTRACTIONS SCHEME-STG 2687-31-1172

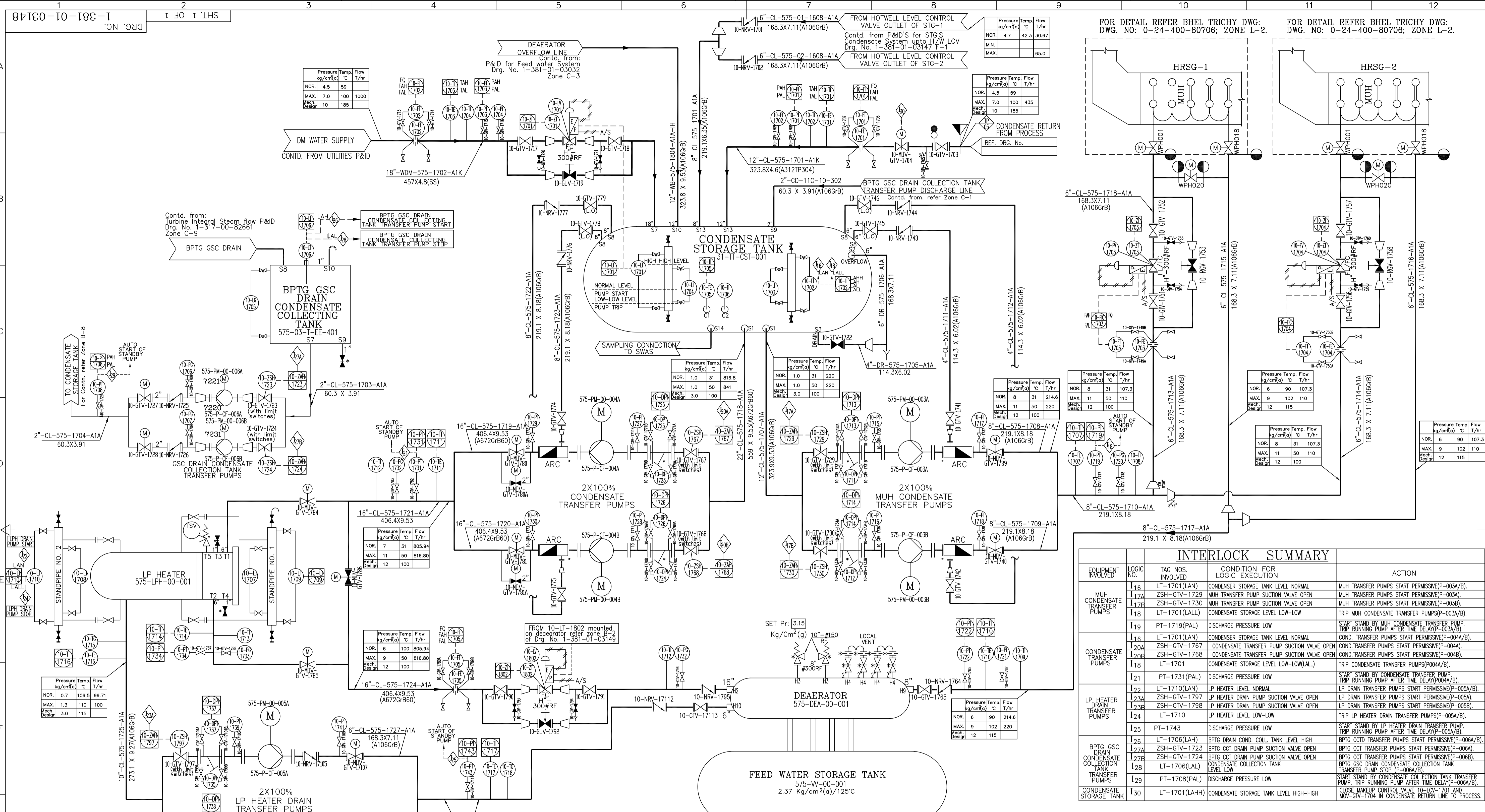
CUSTOMER: HPCL - MITTAL ENERGY LIMITED
CONSULTANT: ENGINEERS INDIA LTD
PROJECT: CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda
DEPT. PED: 450
SCALE: N.T.S.
TITLE: P & ID FOR HP STEAM SYSTEM







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INTERLOCK SUMMARY				
EQUIPMENT INVOLVED	LOGIC NO.	TAG NOS. INVOLVED	CONDITION FOR LOGIC EXECUTION	ACTION
MUH CONDENSATE TRANSFER PUMPS	16	LT-1701(LAN)	CONDENSATE STORAGE TANK LEVEL NORMAL	MUH TRANSFER PUMPS START PERMISSIVE(P-003A/B).
	17A	ZSH-GTV-1729	MUH TRANSFER PUMP SUCTION VALVE OPEN	MUH TRANSFER PUMPS START PERMISSIVE(P-003A).
	17B	ZSH-GTV-1730	MUH TRANSFER PUMP SUCTION VALVE OPEN	MUH TRANSFER PUMPS START PERMISSIVE(P-003B).
CONDENSATE TRANSFER PUMPS	18	LT-1701(LALL)	CONDENSATE STORAGE LEVEL LOW-LOW	TRIP MUH CONDENSATE TRANSFER PUMPS(P-003A/B).
	19	PT-1719(PAL)	DISCHARGE PRESSURE LOW	START STAND BY MUH CONDENSATE TRANSFER PUMP TRIP RUNNING PUMP AFTER TIME DELAY(P-003A/B).
	20A	LT-1701(LAN)	CONDENSATE STORAGE TANK LEVEL NORMAL	COND. TRANSFER PUMPS START PERMISSIVE(P-004A/B).
LP HEATER DRAIN TRANSFER PUMPS	20B	ZSH-GTV-1767	CONDENSATE TRANSFER PUMP SUCTION VALVE OPEN	CONDENSATE TRANSFER PUMPS START PERMISSIVE(P-004A).
	20C	ZSH-GTV-1768	CONDENSATE TRANSFER PUMP SUCTION VALVE OPEN	CONDENSATE TRANSFER PUMPS START PERMISSIVE(P-004B).
	18	LT-1701	CONDENSATE STORAGE LEVEL LOW-LOW(LALL)	TRIP CONDENSATE TRANSFER PUMPS(P004A/B).
BPTG GSC DRAIN TRANSFER PUMPS	21	PT-1731(PAL)	DISCHARGE PRESSURE LOW	START STAND BY CONDENSATE TRANSFER PUMP TRIP RUNNING PUMP AFTER TIME DELAY(P004A/B).
	22	LT-1710(LAN)	LP HEATER LEVEL NORMAL	LP DRAIN TRANSFER PUMPS START PERMISSIVE(P-005A/B).
	23A	ZSH-GTV-1797	LP HEATER DRAIN PUMP SUCTION VALVE OPEN	LP DRAIN TRANSFER PUMPS START PERMISSIVE(P-005A).
CONDENSATE COLLECTION TANK TRANSFER PUMPS	23B	ZSH-GTV-1798	LP HEATER DRAIN PUMP SUCTION VALVE OPEN	LP DRAIN TRANSFER PUMPS START PERMISSIVE(P-005B).
	124	LT-1710	LP HEATER LEVEL LOW-LOW	TRIP LP HEATER DRAIN TRANSFER PUMPS(P-005A/B).
	25	PT-1743	DISCHARGE PRESSURE LOW	START STAND BY LP HEATER DRAIN TRANSFER PUMP TRIP RUNNING PUMP AFTER TIME DELAY(P-005A/B).
CONDENSATE STORAGE TANK	26	LT-1706(LAH)	BPTG DRAIN COND. COLL. TANK LEVEL HIGH	BPTG CCT TRANSFER PUMPS START PERMISSIVE(P-006A/B).
	27A	ZSH-GTV-1723	BPTG CCT DRAIN PUMP SUCTION VALVE OPEN	BPTG CCT TRANSFER PUMPS START PERMISSIVE(P-006A).
	27B	ZSH-GTV-1724	BPTG CCT DRAIN PUMP SUCTION VALVE OPEN	BPTG CCT TRANSFER PUMPS START PERMISSIVE(P-006B).
CONDENSATE STORAGE TANK	27C	ZSH-GTV-1725	BPTG GSC DRAIN CONDENSATE COLLECTION TANK SUCTION VALVE OPEN	BPTG GSC DRAIN CONDENSATE COLLECTION TANK TRANSFER PUMP START PERMISSIVE(P-006A/B).
	28	LT-1706(LAL)	CONDENSATE COLLECTION TANK LEVEL LOW	START STAND BY CONDENSATE COLLECTION TANK TRANSFER PUMP TRIP RUNNING PUMP AFTER TIME DELAY(P-006A/B).
	130	LT-1701(LAH)	CONDENSATE STORAGE TANK LEVEL HIGH-HIGH	CLOSE MAKEUP CONTROL VALVE TO LCV-1701 AND MOV-GTV-1704 IN CONDENSATE RETURN LINE TO PROCESS.

**SCOPE**

BHEL (H) GGSR

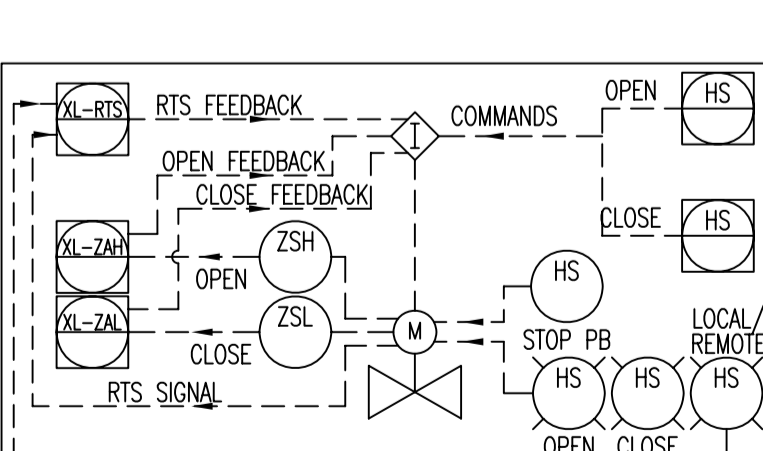
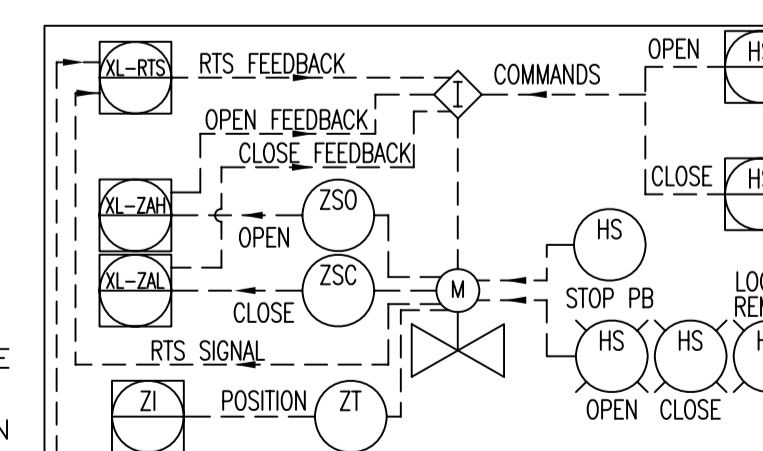
BHEL (H) BHEL-TRY (H) (HRS/G/UB)

Reference Drawings:	Drawing No.:
a) LEGEND FOR SCHEMES (EL DRAWING)	1191 Rev.00
b) TAG NUMERING PHILOSOPHY	PEMC-1834
c) P&ID FOR STG CONDENSATE SYSTEM UPTO HOTWELL LCV	1-381-01-03147
d) INTEGRAL STEAM & DRAIN SCHEME FOR 32 MW BPTG	1-317-00-82661
e) P&ID FOR FEED WATER SYSTEM FOR HRS/G, UB'S & EXPORT	1-381-01-03149
f) SCHEME FOR WATER & STEAM CIRCUIT(HRS/G)	0-24-400-80706

- NOTES:**
- UNTIL UNLESS SPECIFIED OTHERWISE, ALL THE DRAINS & VENTS SHALL BE OF 20NB(3/4").
  - LEGEND
    - INTERLOCKS & PROTECTIONS REALISED IN DCS.
    - DCS
  - DRAINS SHALL BE PROVIDED AT ALL LOWEST POINTS & VENTS SHALL BE PROVIDED AT ALL HIGHEST POINTS.
  - FOR INSTRUMENTATION ON DEAERATOR REFER FEED WATER FLOW P&ID SHEET 1 OF 3
  - VENTS SHALL BE DISCHARGED AT SAFE HEIGHT ABOVE ROOF AT A SAFE LOCATION.
  - END CONNECTIONS FOR TAP OFFS TO BE PROVIDED ON PIPING FOR INSTRUMENTS SHALL BE AS FOLLOWS:
    - i) ROOT VALVE ENDING WITH 3/4" SW FOR PRESSURE
    - ii) 1 1/2" FLANGED CONNECTION FOR TEMPERATURE

**TAG NO. INDEX**

EQUIPMENT TAG	TAGS USED	RANGE	SPARE TAGS
LINE NUMBERS	1729	--	--
VALVE TAG.	17115	--	--
INSTRUMENTATION TAG	1743	--	--
INTERLOCK TAG.	16-30	--	--



REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD
1			2			3			4			5			6		

CUSTOMER: **HPCL - MITTAL ENERGY LIMITED**

CONSULTANT: **ENGINEERS INDIA LTD**  
1, BHIKAJI CAMA PLACE, NEWDELHI - 110 006  
EIL JOB NO.: 6922

PROJECT: **CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda**

NAME	SIGN.	DATE	NO OF VAR.
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	DRN. DURGA SHARAN	06.08.08	
	CHD. M.S.S.N	06.08.08	-N.A.-
	APPD. P.SUDHIR BABU	06.08.08	

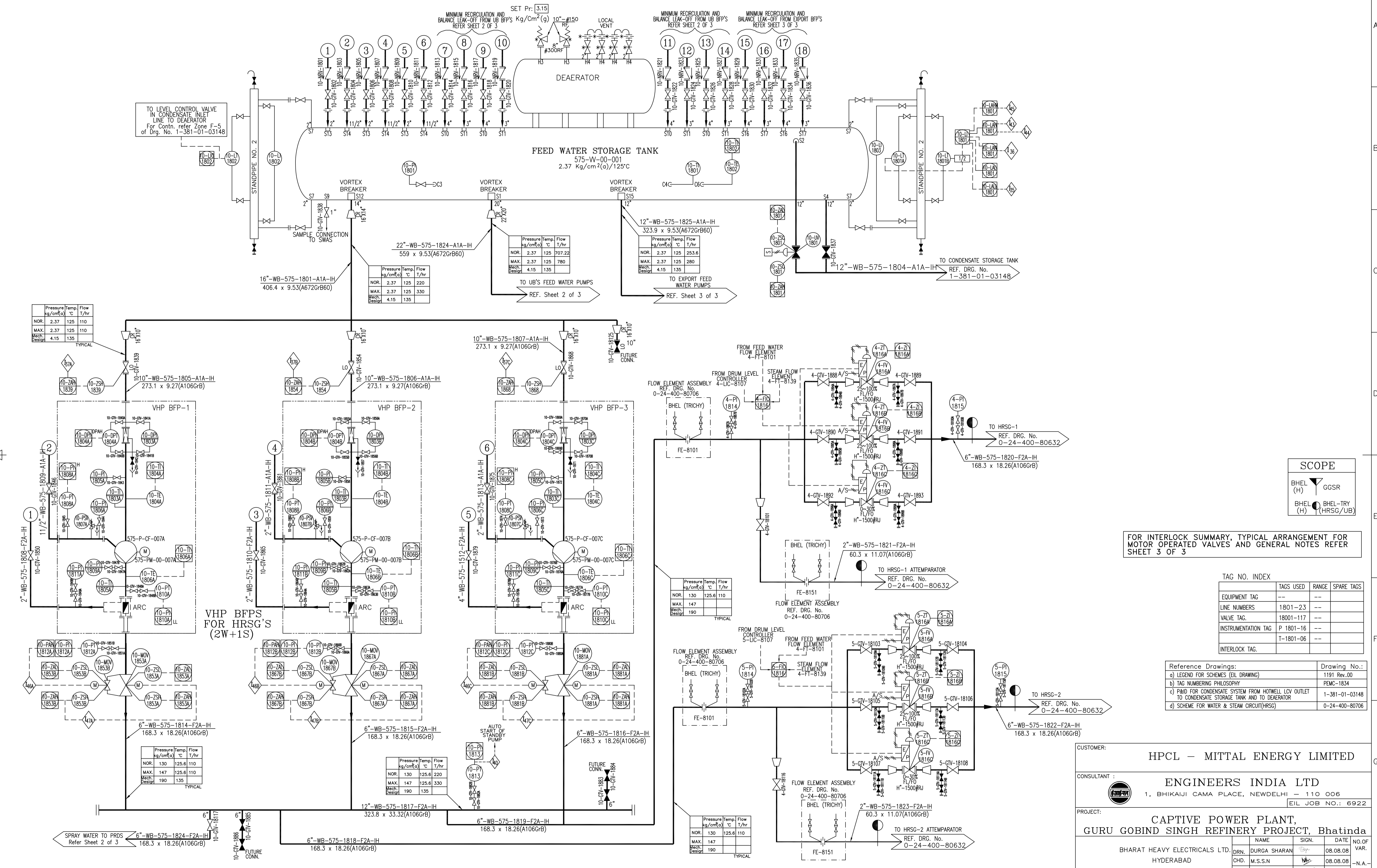
DEPT. PPE 451 UNTO. DMS. GR. 2/M/P SCALE N.T.S. WEIGHT (KG) REF. TO ASSY. ORG. NO. OF ITEMS

TITLE: **P&ID FOR CONDENSATE SYSTEM FROM HOTWELL LCV OUTLET TO CONDENSATE STORAGE TANK AND TO DEAERATOR**

DRG. NO. **1-381-01-03148** REV. **00**  
CUST. DRG. NO. **3148-575-1117**  
SHT. No. 1 NO. OF SHT. 1

DRG. NO. 1-381-01-03148

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Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	2.37	125	110
MAX.	2.37	125	110
Mech. Design	4.15	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	2.37	125	220
MAX.	2.37	125	330
Mech. Design	4.15	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	2.37	125	707.22
MAX.	2.37	125	780
Mech. Design	4.15	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	2.37	125	253.6
MAX.	2.37	125	280
Mech. Design	4.15	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	130	125.6	110
MAX.	147	125.6	110
Mech. Design	190	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	130	125.6	110
MAX.	147	125.6	110
Mech. Design	190	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	130	125.6	220
MAX.	147	125.6	330
Mech. Design	190	135	

Pressure kg/cm²(a)	Temp. °C	Flow T/hr	
NOR.	130	125.6	110
MAX.	147	125.6	110
Mech. Design	190	135	

**SCOPE**

BHEL (H)	GGSR
BHEL (H)	BHEL-TRY (HRSG/UB)

FOR INTERLOCK SUMMARY, TYPICAL ARRANGEMENT FOR MOTOR OPERATED VALVES AND GENERAL NOTES REFER SHEET 3 OF 3

**TAG NO. INDEX**

EQUIPMENT TAG	TAGS USED	RANGE	SPARE TAGS
LINE NUMBERS	1801-23	---	---
VALVE TAG.	18001-117	---	---
INSTRUMENTATION TAG	P 1801-16	---	---
INTERLOCK TAG.	T-1801-06	---	---

Reference Drawings:

a) LEGEND FOR SCHEMES (EIL DRAWING)	Drawing No.:
b) TAG NUMBERING PHILOSOPHY	1191 Rev.00
c) P&ID FOR CONDENSATE SYSTEM FROM HOTWELL LCV OUTLET TO CONDENSATE STORAGE TANK AND TO DEAERATOR	PMC-1834
d) SCHEME FOR WATER & STEAM CIRCUIT(HRSG)	1-381-01-03148
	0-24-400-80632

CUSTOMER: **HPCL - MITTAL ENERGY LIMITED**

CONSULTANT: **ENGINEERS INDIA LTD**  
1, BHIKAJI CAMA PLACE, NEWDELHI - 110 006  
EIL JOB NO.: 6922

PROJECT: **CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda**

NAME	SIGN.	DATE	NO. OF VAR.
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	DRN. DURGA SHARAN	08.08.08	
	CHD. M.S.S.N	08.08.08	-N.A.-
	APPD. P.SUDHIR BABU	08.08.08	

DEPT. PPE  
UNTO. DIMS. GR. 2/M/P  
SCALE N.T.S.  
WEIGHT (KG) REF. TO ASSY. DRG. -N.A.-  
ITEM NO. -N.A.-  
NO. OF ITEMS

TITLE: **P&ID FOR FEED WATER SYSTEM FOR HRSG'S, WATER AND EXPORT FEED WATER**

DRG. NO. **1-381-01-03148**  
CUST. DRG. NO. **3149-575-1118**  
SHT. No. 1 NO. OF SHT. 3

REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED															
		CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD			CHD/APPD															
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DRG. NO. 1-381-01-03149

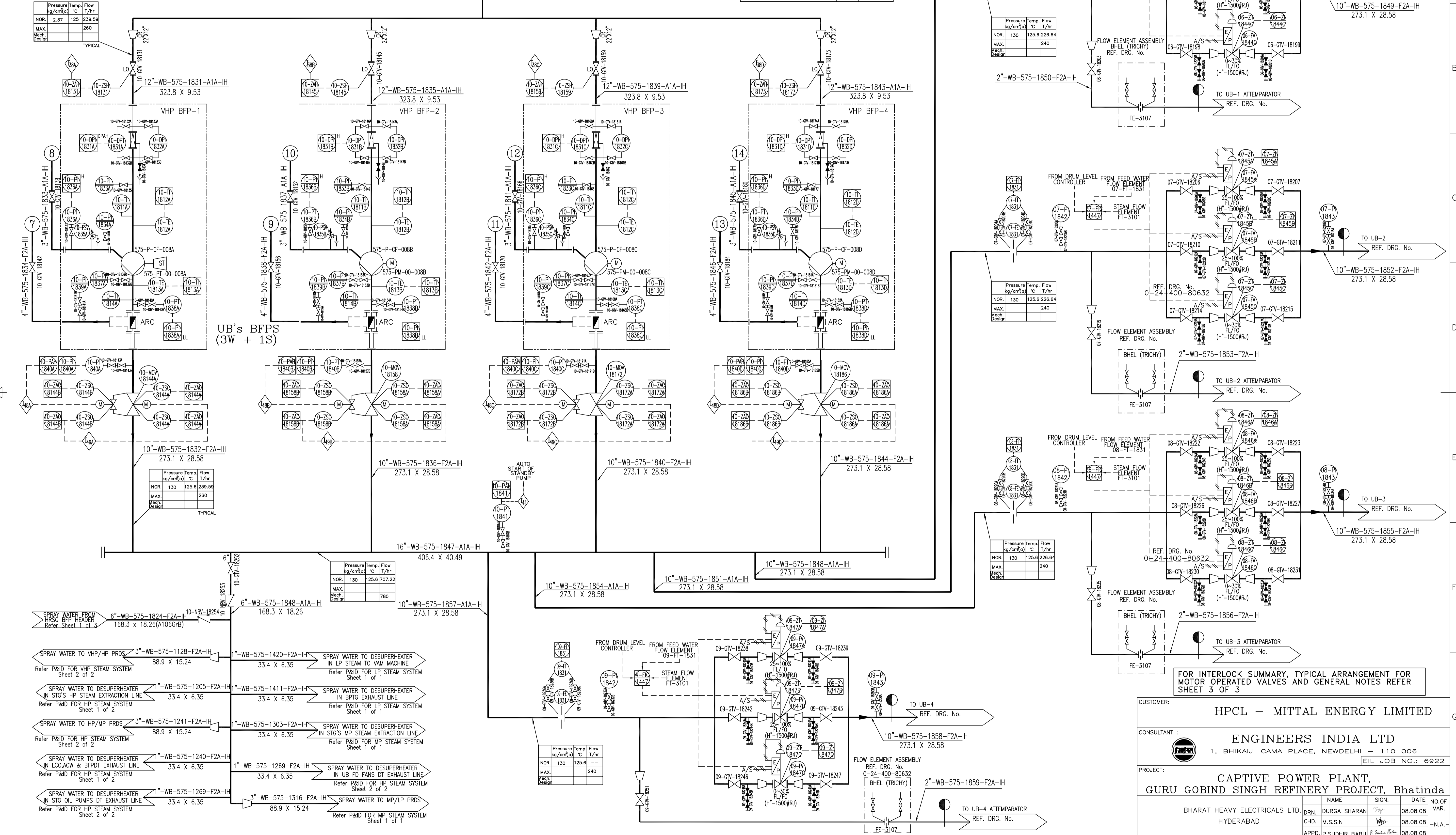
FROM DEAERATOR OUTLET  
REF. DRG. No. 1-381-01-03149  
Sheet 1 of 3

Pressure	Temp.	Flow
kg/cm <sup>2</sup> a	°C	T/hr
NOR. 2.37	125	239.59
MAX. Mech. Design		260

TAG NO. INDEX

EQUIPMENT TAG	TAGS USED	RANGE	SPARE TAGS
LINE NUMBERS	1831-59	--	--
VALVE TAG.	1831-254	--	--
INSTRUMENTATION TAG	P 1831-43	--	--
INTERLOCK TAG.	T-1811-14	--	--

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UB's BFPs (3W + 1S)

FOR INTERLOCK SUMMARY, TYPICAL ARRANGEMENT FOR MOTOR OPERATED VALVES AND GENERAL NOTES REFER SHEET 3 OF 3

- SPRAY WATER FROM HRSG BFP HEADER Refer Sheet 1 of 1
- SPRAY WATER TO VHP/HP PRDS Refer P&ID FOR VHP STEAM SYSTEM Sheet 2 of 2
- SPRAY WATER TO DESUPERHEATER IN LP STEAM TO VAM MACHINE Refer P&ID FOR LP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO DESUPERHEATER IN BPTG EXHAUST LINE Refer P&ID FOR LP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO HP/MP PRDS Refer P&ID FOR HP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO DESUPERHEATER IN LCOACW & BFPDT EXHAUST LINE Refer P&ID FOR HP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO DESUPERHEATER IN STG'S HP STEAM EXTRACTION LINE Refer P&ID FOR HP STEAM SYSTEM Sheet 2 of 2
- SPRAY WATER TO DESUPERHEATER IN STG'S MP STEAM EXTRACTION LINE Refer P&ID FOR MP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO DESUPERHEATER IN STG'S LP STEAM EXTRACTION LINE Refer P&ID FOR MP STEAM SYSTEM Sheet 1 of 1
- SPRAY WATER TO DESUPERHEATER IN STG OIL PUMPS DT EXHAUST LINE Refer P&ID FOR HP STEAM SYSTEM Sheet 2 of 2
- SPRAY WATER TO MP/LP PRDS Refer P&ID FOR MP STEAM SYSTEM Sheet 1 of 1

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

CUSTOMER: HPCL - MITTAL ENERGY LIMITED

CONSULTANT: ENGINEERS INDIA LTD  
1, BHIKAJI CAMA PLACE, NEWDELHI - 110 006  
EIL JOB NO.: 6922

PROJECT: CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda

NAME	SIGN.	DATE	NO. OF VAR.
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	DRN.	DURGA SHARAN	08.08.08
	CHD.	M.S.S.N	08.08.08
	APPD.	P.SUDHIR BABU	08.08.08

DEPT. PPE CODE 451

UNTOL. DIMS. GR. 2/M/P

SCALE N.T.S.

WEIGHT (KG) -N.A.-

REF. TO ASSY. DRG. -N.A.-

ITEM NO. OF ITEMS -N.A.-

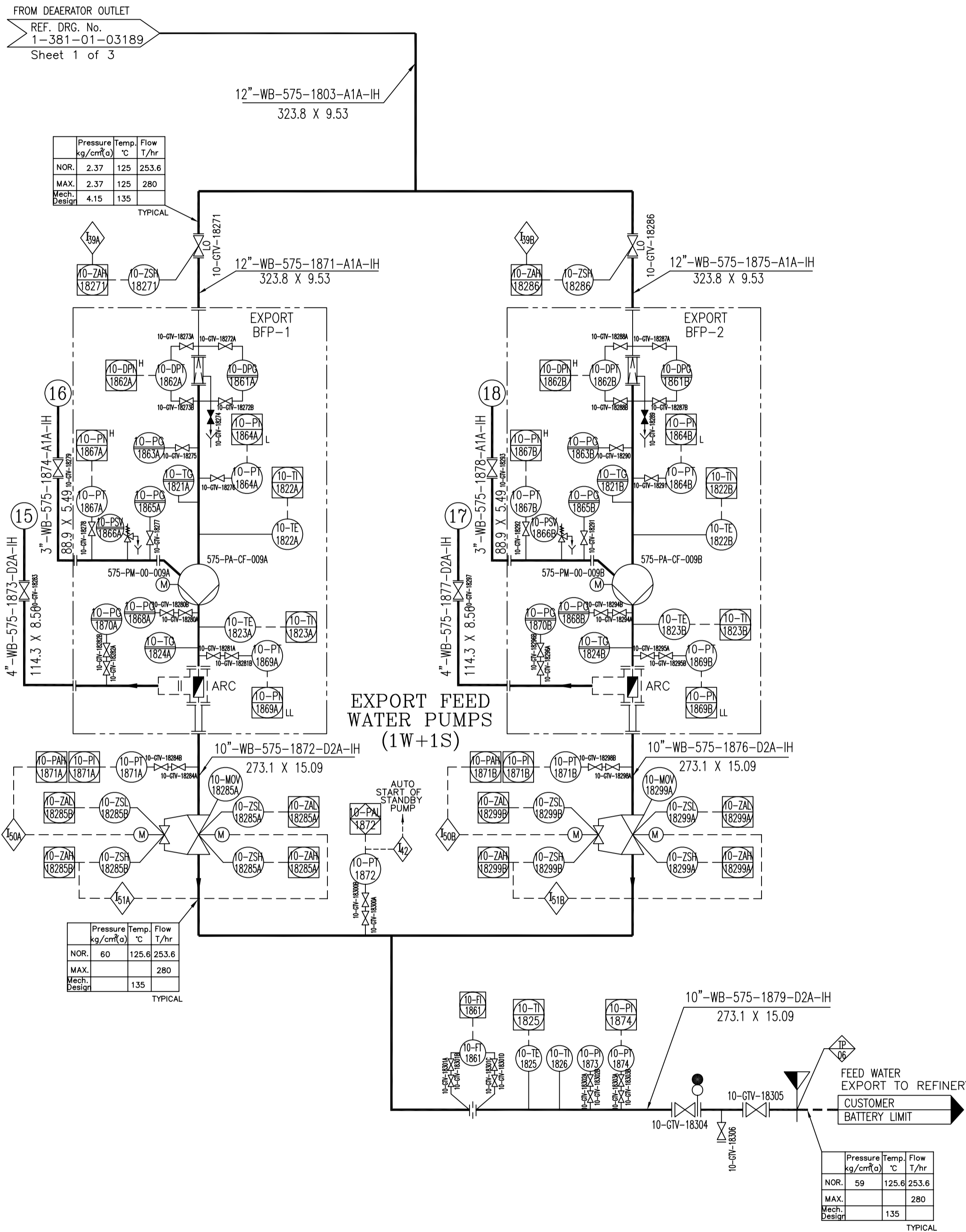
TITLE: P&ID FOR FEED WATER SYSTEM FOR HRSG'S, UB'S AND EXPORT FEED WATER

DRG. NO. 1-381-01-03149

CUST. DRG. NO. 3149-575-1118

SHT. No 2 NO. OF SHT. 3

DRG. NO. 1-381-01-03149



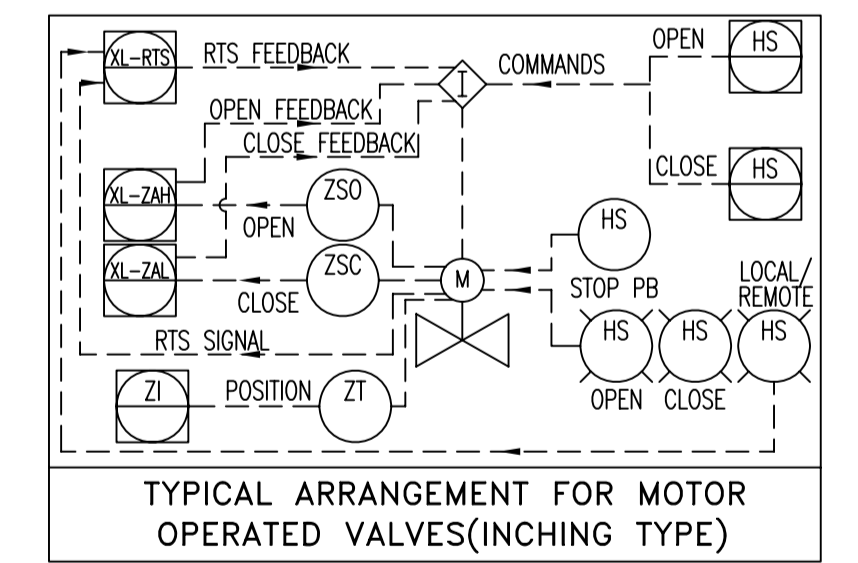
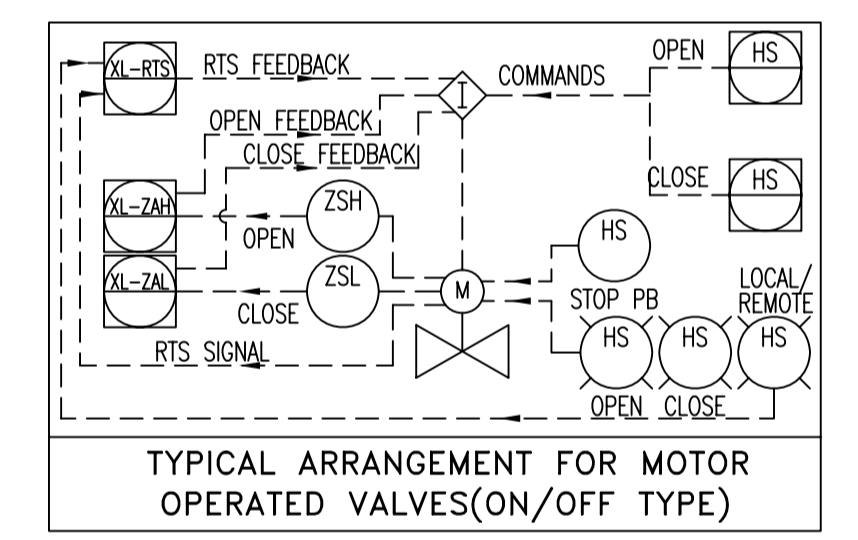
### INTERLOCK SUMMARY

EQUIPMENT INVOLVED	LOGIC NO.	TAG NOS. INVOLVED	CONDITION FOR LOGIC EXECUTION	ACTION
HRSG'S BOILER FEED	I35	10-LT-1801(LALL)	LEVEL LOW LOW	TRIP RUNNING HRSG BOILER FEED PUMPS, UB BOILER FEED PUMPS & EXPORT FEED WATER PUMP (575-P-CF-007A,B,C,008A,B,C,D,009A,B)
	I36	10-LT-1801(LAN)	FEED WATER STORAGE TANK LEVEL NORMAL	START PERMISSIVE FOR HRSG, UB & EXPORT FEED WATER PUMPS (575-P-CF-007A,B,C,008A,B,C,D,009A,B)
WATER PUMPS, UTILITY BOILER FEED WATER PUMPS & EXPORT FEED WATER PUMPS	I37A	10-ZAH-1839	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR HRSG BOILER FEED WATER PUMP (575-P-CF-007A)
	I37B	10-ZAH-1854	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR HRSG BOILER FEED WATER PUMP (575-P-CF-007B)
	I37C	10-ZAH-1868	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR HRSG BOILER FEED WATER PUMP (575-P-CF-007C)
	I38A	10-ZAH-18131	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR UB BOILER FEED WATER PUMP (575-P-CF-008A)
	I38B	10-ZAH-18145	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR UB BOILER FEED WATER PUMP (575-P-CF-008B)
	I38C	10-ZAH-18159	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR UB BOILER FEED WATER PUMP (575-P-CF-008C)
	I38D	10-ZAH-18173	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR UB BOILER FEED WATER PUMP (575-P-CF-008D)
	I39A	10-ZAH-18271	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR EXPORT FEED WATER PUMP (575-P-CF-009A)
	I39B	10-ZAH-18286	PUMP SUCTION VALVE LIMIT SWITCH OPEN	START PERMISSIVE FOR EXPORT FEED WATER PUMP (575-P-CF-009B)
	DEAERATOR FEED WATER STORAGE TANK	I43	10-LT-1801(LAH)	LEVEL 50MM ABOVE HIGH LEVEL
I44		10-LT-1801(LAH)	LEVEL 50MM BELOW HIGH LEVEL	CLOSE OVERFLOW VALVE 10-UV-1800
I45		10-LT-1801(LAH)	LEVEL HIGH HIGH	CLOSE DEAERATOR INLET STEAM VALVE 10-MOV-GTV-1441
HRSG BFP DISCHARGE LINE MOV'S	I46A	10-PT-1812A(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-1853B
	I47A	10-ZAH-1853B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-1853A
	I46B	10-PT-1812B(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-1867B
	I47B	10-ZAH-1867B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-1867A
	I46C	10-PT-1812C(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-1881B
	I47C	10-ZAH-1881B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-1881A
	UB BFP DISCHARGE LINE MOV'S	I48A	10-PT-1840A(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START
I49A		10-ZAH-18144B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18144A
I48B		10-PT-1840B(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-18158B
I49B		10-ZAH-18158B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18158A
I48C		10-PT-1840C(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-18172B
I49C		10-ZAH-18172B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18172A
I48D		10-PT-1840D(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-18186B
I49D		10-ZAH-18186B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18186A
EXPORT FEED PUMP DISCHARGE LINE MOV'S		I50A	10-PT-1871A(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START
	I51A	10-ZAH-18285B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18285A
	I50B	10-PT-1871B(PAH) OR ON PUMP START	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN BYPASS VALVE OF MAIN DISCHARGE VALVE 10-MOV-GTV-18299B
	I51B	10-ZAH-18299B	DISCHARGE PRESSURE HIGH OR ON PUMP START	OPEN MAIN DISCHARGE VALVE 10-MOV-GTV-18299A

- ### NOTES:-
- MIN. 15D UP STREAM AND 5D DOWN STREAM STRAIGHT LENGTH TO BE MAINTAINED FOR ALL FLOW ELEMENTS.
  - HIGH POINT VENTS AND LOW POINT DRAINS SHALL BE PROVIDED AT SUITABLE LOCATIONS AS PER PIPING LAYOUT THE VENT, DRAIN SHALL BE AS SHOWN TYPICALLY IN THIS P & ID.
  - ALL TEMPERATURE INSTRUMENTS ARE PROVIDED WITH THERMOWELL.
  - ALL DRAIN LINES SHALL BE 3/4" SIZE UNLESS OTHERWISE STATED.
  - ALL VALVES SHALL BE PROVIDED WITH INTEGRAL BYPASS VALVE IF THE SIZE IS 26" AND ABOVE FOR 150, 16" & ABOVE FOR 300 RATINGS, 6" & ABOVE FOR 600, 4" & ABOVE FOR 900 & 1500 RATINGS.
  - ALL FLOW NOZZLES AND FLOW ORIFICES ARE TO BE SUPPLIED DULY CALIBRATED FROM A REPUTED LABORATORY. CALIBRATION CERTIFICATE TO BE PRODUCED BEFORE INSTALLATION OF ALL EQUIPMENT
  - ALL PRESSURE INSTRUMENTS SHALL BE WITH PROCESS ISOLATION GATE VALVE AND AN INSTRUMENT ISOLATION VALVE, WITH PROVISION FOR VENT AND DRAIN.
  - ALL ON/OFF TYPE MOTORISED VALVES SHALL BE PROVIDED WITH OPEN & CLOSE LIMIT SWITCHES. ALL INCHING TYPE MOV'S SHALL BE PROVIDED WITH OPEN CLOSE LIMIT SWITCHES APART FROM POSITION TRANSMITTER.
  - INDICATES SAFETY SET PRESSURE IN kg/cm (A)
  - ALL SAFETY VALVES ARE FULL FLOW QUANTITY.
  - IF THE MAIN VALVE IS MOTOR OPERATED THEN THE BYPASS VALVE ALSO SHALL BE MOTOR OPERATED.
  - ALL MOTORISED VALVES SHALL BE PROVIDED WITH HAND WHEEL AND LOCK OPEN/CLOSED FACILITY.
  - ALL LIMIT SWITCHES SHALL BE PROXIMITY TYPE.
  - ALL VENTS SHALL BE LEFT AT SAFE HEIGHT AND SHALL NOT BE DIRECTED TOWARDS PATH WAY.
  - ALL FEED CONTROL STATIONS ARE TO BE LOCATED ON GROUND.
  - \* INDICATES SCOPE OF SUPPLY BY VENDOR.

#### TAG NO. INDEX

EQUIPMENT TAG	TAGS USED	RANGE	SPARE TAGS
LINE NUMBERS	1871-79	---	---
VALVE TAG.	18271-305	---	---
INSTRUMENTATION TAG	P 1861-74	---	---
INTERLOCK TAG.	35 - 51	---	---



#### SCOPE

BHEL (H) GGSR  
BHEL (H) BHEL-TRY (HRSG/UB)

Reference Drawings:	Drawing No.:
a) LEGEND FOR SCHEMES (EIL DRAWING)	1191 Rev.00
b) TAG NUMBERING PHILOSOPHY	PEMC-1834
c) P&ID FOR CONDENSATE SYSTEM FROM HOTWELL LCV OUTLET TO CONDENSATE STORAGE TANK AND TO DEAERATOR	1-381-01-03148
d) SCHEME FOR WATER & STEAM CIRCUIT(HRSG)	0-24-400-80706

CUSTOMER: **HPCL - MITTAL ENERGY LIMITED**

CONSULTANT: **ENGINEERS INDIA LTD**  
1, BHIKAJI CAMA PLACE, NEWDELHI - 110 006  
EIL JOB NO.: 6922

PROJECT: **CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda**

NAME	SIGN.	DATE	NO. OF VAR.
BHARAT HEAVY ELECTRICALS LTD. HYDERABAD	DRN. DURGA SHARAN	08.08.08	
	CHD. M.S.S.N	08.08.08	-N.A.-
	APPD. P.SUDHIR BABU	08.08.08	-N.A.-

DEPT. PPE CODE 451  
UNTO. DIMS. GR. 2/M/P  
SCALE N.T.S.  
WEIGHT (KG) -N.A.-  
REF. TO ASSY. ORG. -N.A.-  
ITEM NO. -N.A.-  
NO. OF ITEMS

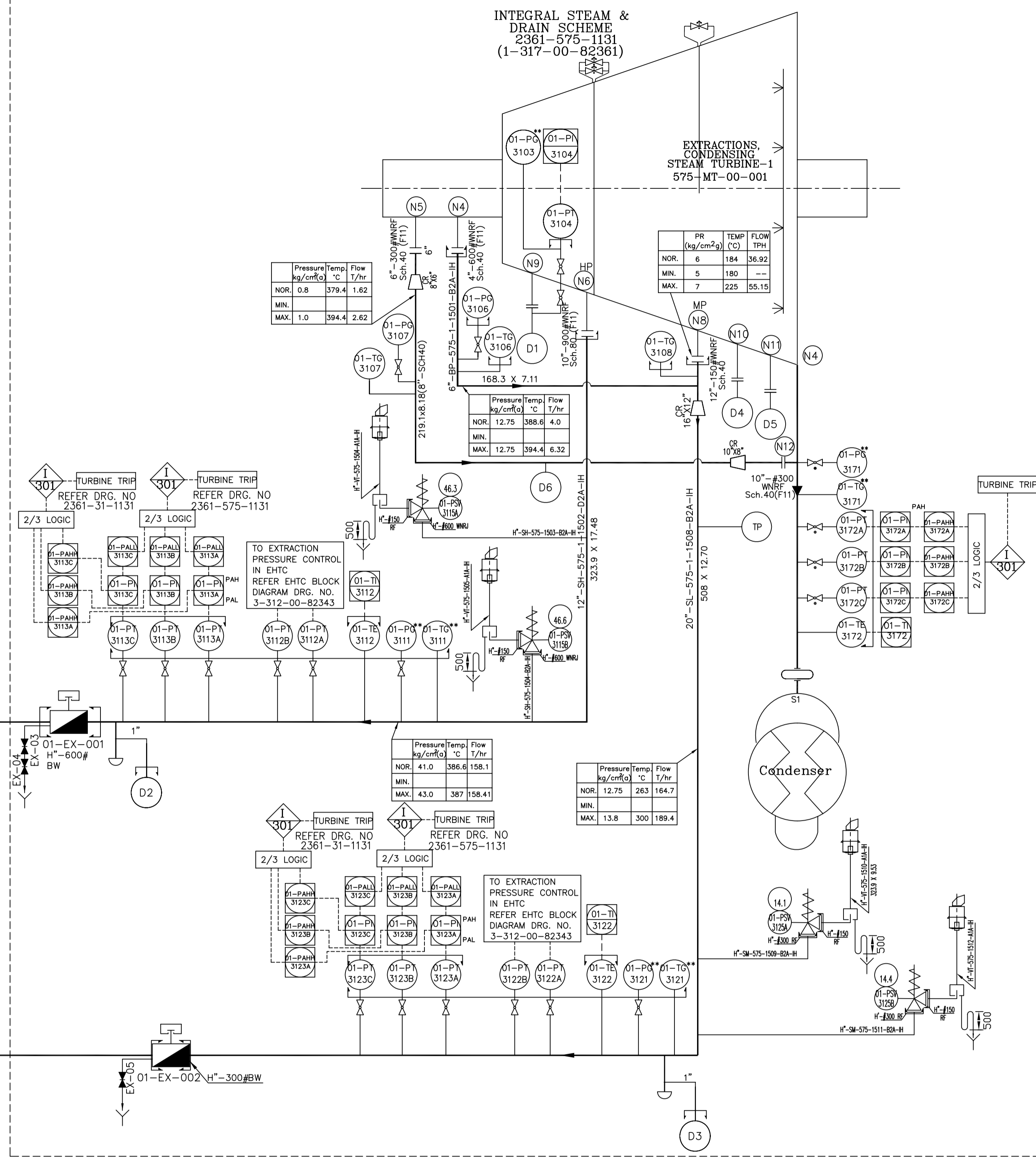
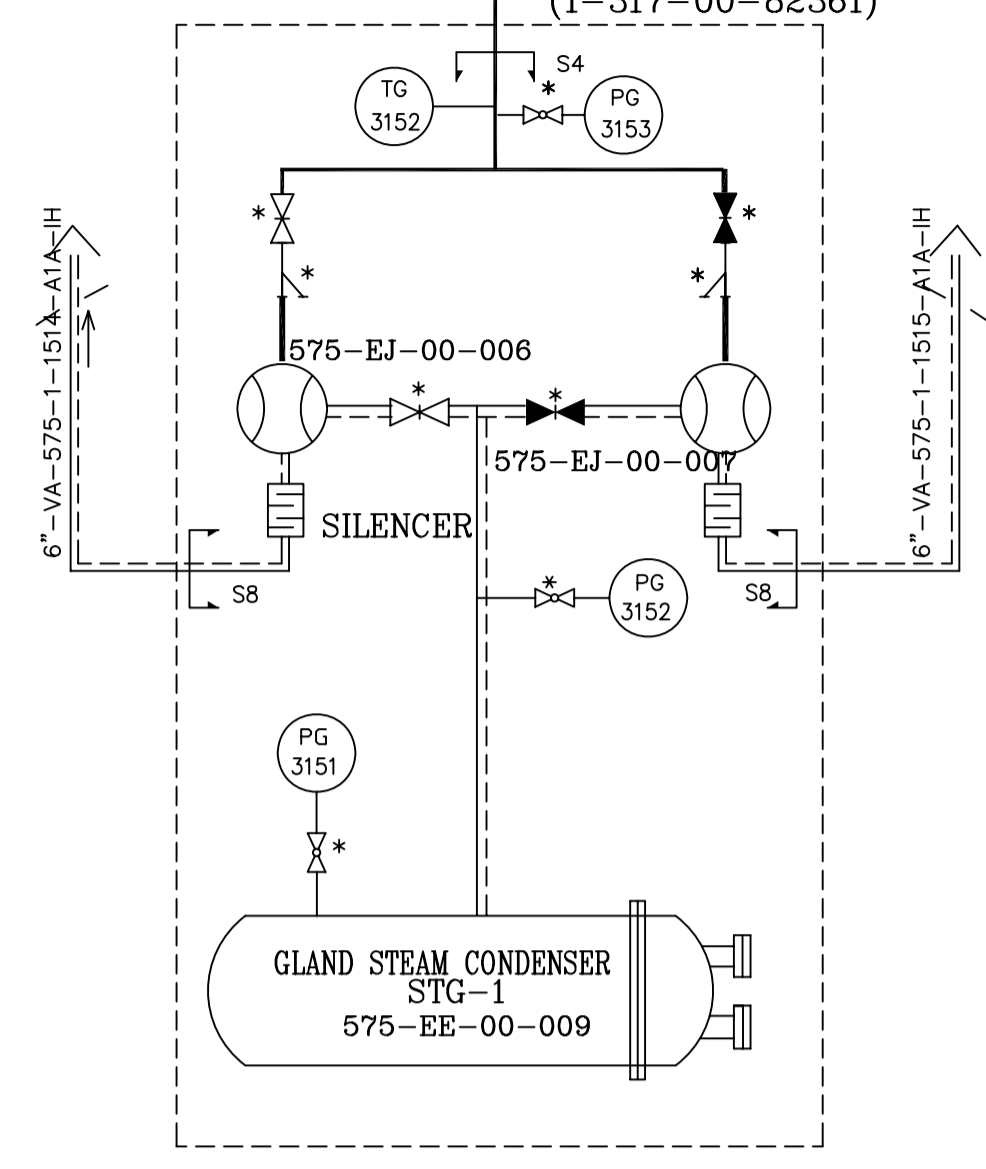
TITLE: **P&ID FOR FEED WATER SYSTEM FOR HRSG'S, UB'S AND EXPORT FEED WATER**  
CARD CODE  
DRG. NO. 1-381-01-03149  
CUST. DRG. NO. 3149-575-1118  
SHT. No 3 NO. OF SHT. 3

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REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED	REV.	DATE	ALTERED
ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD	ZONE		CHD/APPD
1			2			3			4			5			6			7		

991E0-10-18C-1  
DRG. NO. OF 1  
LHS

AUX. STEAM SUPPLY  
REF. DRG. NO. 3144-575-1112 SH 2 OF 2  
(1-38101-03144)  
11/2"-SM-31-1135-B2A-IH  
INTEGRAL STEAM & DRAIN SCHEME  
2361-575-1131  
(1-317-00-82361)



**HP&MP STEAMDRAIN DETAIL-A**

NOM LINE DIA 'D' INCH	NOM DRIP LEG DIA 'd' INCH	A mm	B mm	REF. NOTE
3/4"	3/4"	250	125	
1"	1"	250	125	
1 1/2"	1 1/2"	275	150	
2"	2"	275	180	
3"	3"	350	200	
4"	3"	350	230	
6"	3"	385	260	
8"	3"	410	285	
10"	4"	440	315	
12"	4"	460	335	
14"	4"	480	355	
16"	4"	500	375	
18"	6"	530	400	
20"	6"	550	425	
24"	6"	605	480	

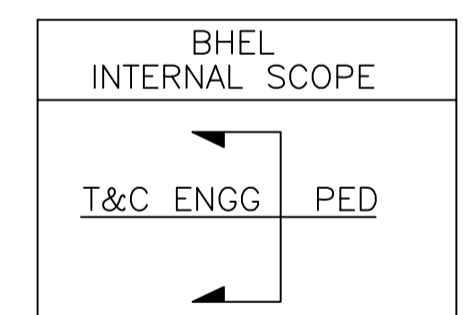
NOTE : DIMENSIONS A & B CAN BE REDUCED OR INCREASED CASE BY CASE FOR LAYOUT REASONS

- NOTES:-**
- MIN. 15D UP STREAM AND 5D DOWN STREAM STRAIGHT LENGTH TO BE MAINTAINED FOR ALL FLOW ELEMENTS.
  - HIGH POINT VENTS AND LOW POINT DRAINS SHALL BE PROVIDED AT SUITABLE LOCATIONS AS PER PIPING LAYOUT THE VENT, DRAIN SHALL BE AS SHOWN TYPICALLY IN THIS P & ID.
  - ALL TEMPERATURE INSTRUMENTS ARE PROVIDED WITH THERMOWELL.
  - ALL DRAIN LINES SHALL BE 3/4" SIZE UNLESS OTHERWISE STATED.
  - STEAM LINE LOW POINTS SHALL BE PROVIDED WITH DRIP POT AND FURTHER DETAILS AS INDICATED IN DETAIL-A
  - ALL VALVES SHALL BE PROVIDED WITH INTEGRAL BYPASS VALVE IF THE SIZE IS 26" AND ABOVE FOR 150, 16" & ABOVE FOR 300 RATINGS, 6" & ABOVE FOR 600, 4" & ABOVE FOR 900 & 1500 RATINGS.
  - ALL FLOW NOZZLES AND FLOW ORIFICES ARE TO BE SUPPLIED DULY CALIBRATED FROM A REPUTED LABORATORY. CALIBRATION CERTIFICATE TO BE PRODUCED BEFORE INSTALLATION OF ALL EQUIPMENT
  - TWO NO. ATM. FLASH VESSELS ARE CONSIDERED. FOR DETAIL P & ID FOR BLOW DOWN SYSTEM. DRG. No. 1-381-01-02621.
  - ALL PRESSURE INSTRUMENTS SHALL BE WITH PROCESS ISOLATION GATE VALVE AND AN INSTRUMENT ISOLATION VALVE, WITH PROVISION FOR VENT AND DRAIN.
  - ALL ON/OFF TYPE MOTORISED VALVES SHALL BE PROVIDED WITH OPEN & CLOSE LIMIT SWITCHES. ALL INCHING TYPE MOV'S SHALL BE PROVIDED WITH OPEN CLOSE LIMIT SWITCHES APART FROM POSITION TRANSMITTER.
  - INDICATES SAFETY SET PRESSURE IN kg/cm<sup>2</sup> (g)
  - ALL SAFETY VALVES ARE FULL FLOW QUANTITY.
  - THIS VALVE IS NOT REQUIRED IF STEAM TRAP ASSLY. IS INSTALLED WITHIN 3M FROM DRIPLEG.
  - MINIMUM STRAIGHT LINE TO BE MAINTAIN DOWN STREAM OF PRDS AS RECOMMENDED BY THE PRDS SUPPLIER. LOCATION OF TEMPERATURE ELEMENT SHALL ASLO BE LOCATED BEYOND THE RECOMMENDED STRAIGHT LENGTH.
  - DELETED.
  - TEMPERATURE ELEMENT SHALL BE KEPT AT DISTANCE INDICATED BY DE-SUPER HEATER VENDOR.
  - IF THE MAIN VALVE IS MOTOR OPERATED THEN THE BYPASS VALVE ALSO SHALL BE MOTOR OPERATED.
  - ALL MOTORISED VALVES SHALL BE PROVIDED WITH HAND WHEEL AND LOCK OPEN/CLOSED FACILITY.
  - ALL LIMIT SWITCHES SHALL BE PROXIMITY TYPE.
  - ALL VENTS SHALL BE LEFT AT SAFE HEIGHT AND SHALL NOT BE DIRECTED TOWARDS PATH WAY.
  - THIS SCHEME IS VALID FOR ONE TURBINE. THE SAME IS APPLICABLE FOR SECOND TURBINE ALSO.  
TAG NOS. INDICATED IN THE P&ID ARE FOR FIRST TURBINE.
  - TAG NO.'S FOR INSTRUMENTS, VALVES & EQUIPMENTS:  
FOR FIRST TURBINE TAG NOS. SHALL BE PREFIXED WITH '01'.  
FOR SECOND TURBINE TAG NOS. SHALL BE PREFIXED WITH '02'.
  - '\*\*' INDICATES INSTRUMENTS MOUNTED ON GUAGE BOARD.
  - '\*' INDICATES ITEMS SUPPLIED ALONGWITH EQUIPMENT.

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EXTRACTION TO HP HEADER  
REFER DRG. NO 3144-575-1112  
(1-38101-03144)  
12"-SH-575-1-1507-D2A-IH  
323.9 X 17.48

EXTRACTION TO MP HEADER  
REFER DRG. NO 3145-575-1113  
(1-38101-03145)  
20"-SM-575-1-1513-B2A-IH  
508 X 12.7

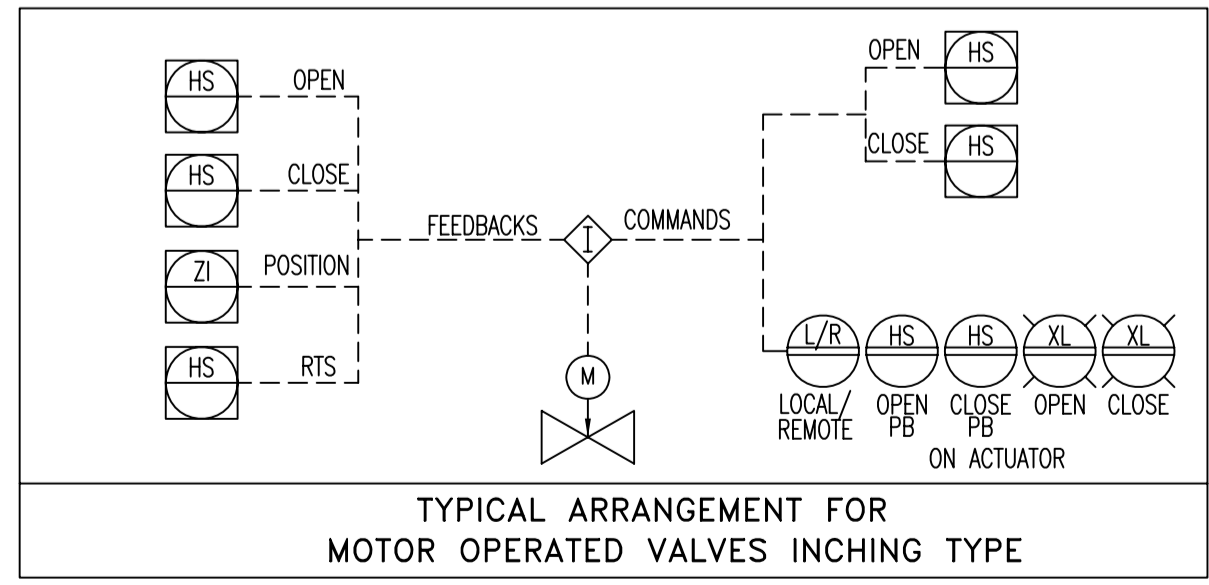
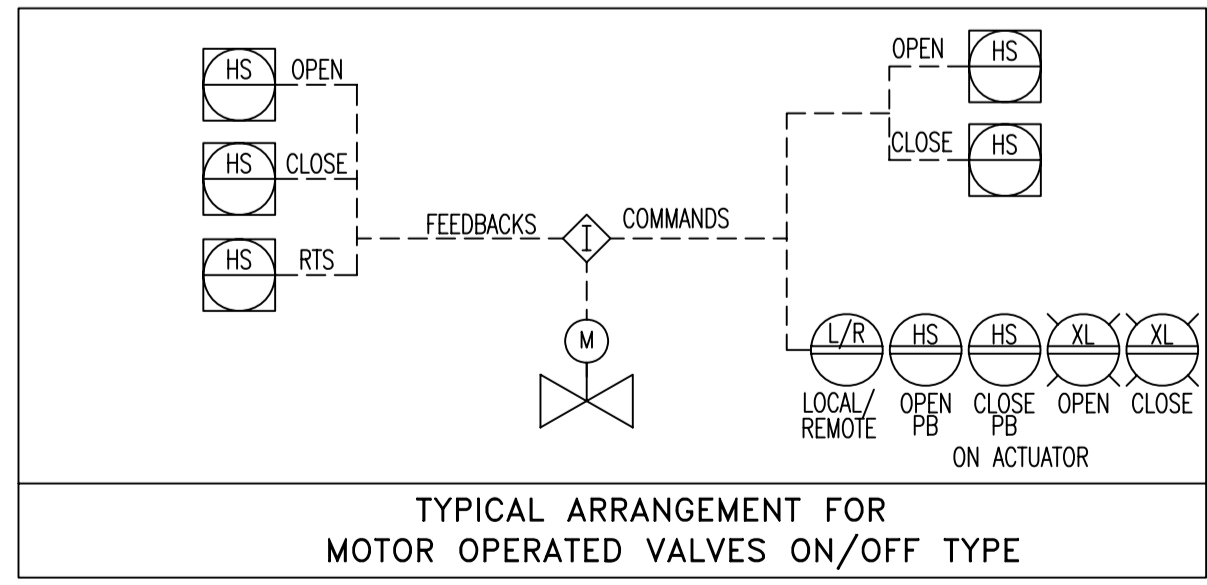


**TAG NO. INDEX**

TAGS USED	RANGE	SPARE TAGS
EQUIPMENT TAG	--	--
LINE NUMBERS	1515	--
VALVE TAG.	--	--
INSTRUMENTATION TAG	3125	--
INTERLOCK TAG.	--	--

**REF. DRG NO.**

NO.	DESCRIPTION	REV.	DATE	ALTERED CHD/APPD
1.	LEGEND (EIL DRAWING)	1191	Rev.00	
2.	NUMBERING PHILOSOPHY	PEMC-1834		
3.	INTEGRAL STEAM & DRAIN SCHEME	2361-575-1131		
4.	P&ID FOR VHP STEAM SYSTEM (2 Sheets)	3143-575-1111		
5.	P&ID FOR HP STEAM SYSTEM	3144-575-1112		
6.	P&ID FOR MP STEAM SYSTEM	3145-575-1113		



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

CUSTOMER: **HPCL - MITTAL ENERGY LIMITED**

CONSULTANT: **ENGINEERS INDIA LTD**  
1, BHIKAJI CAMA PLACE, NEWDELHI - 110 006  
EIL JOB NO.: 6922

PROJECT: **CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda**

NAME	SIGN.	DATE	NO. OF VAR.
DRN. D.S.B		21.07.08	
CHD. M.S.S.N		21.07.08	NA
APPD. P.S.B		21.07.08	

DEPT. PPE UNTO. DIMS. GR. 9/M/f SCALE NTS WEIGHT (KG) REF. TO ASSY. DRG. ITEM NO. NO. OF ITEMS

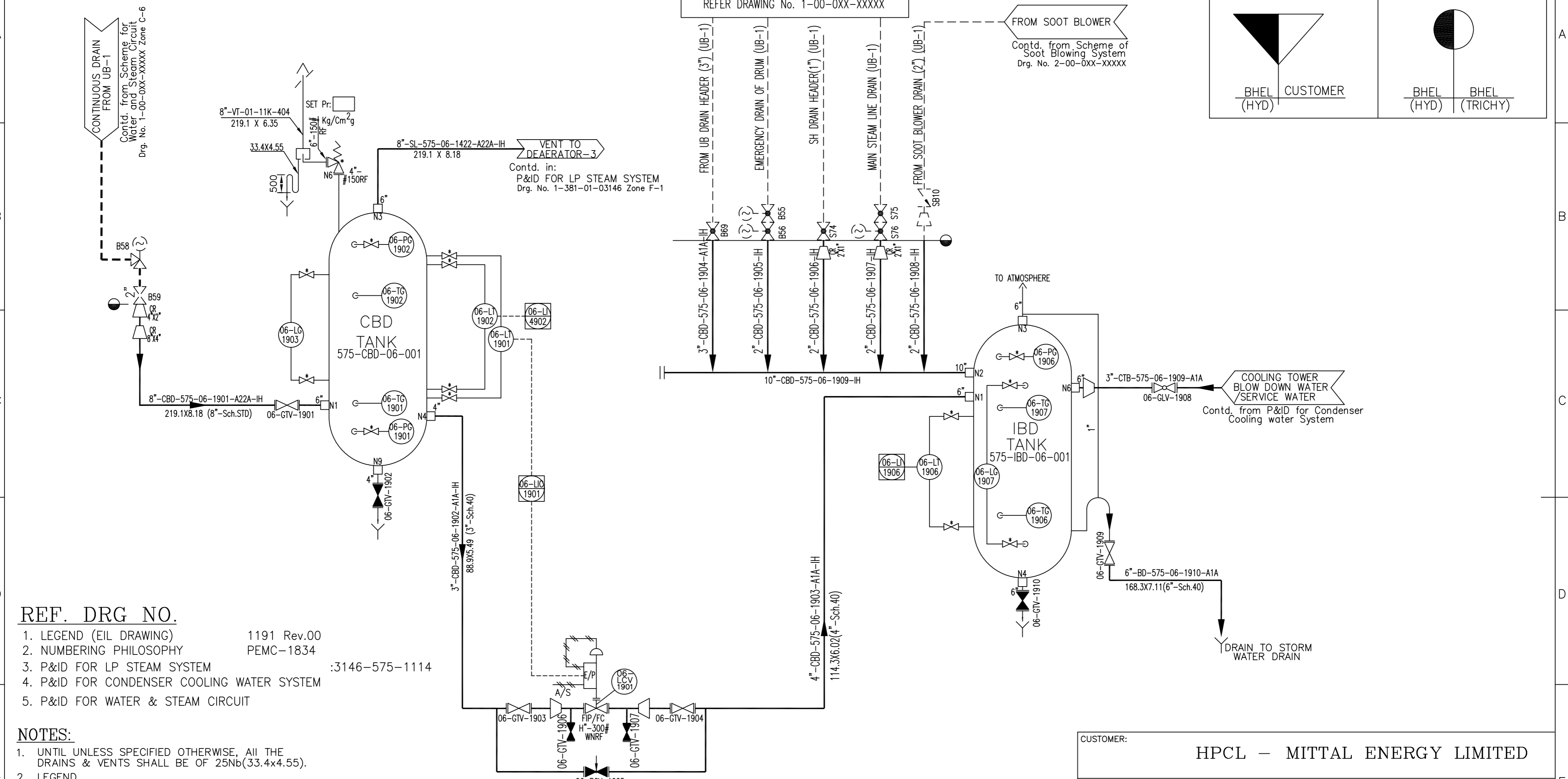
TITLE: **P&ID FOR STG EXTRACTION SYSTEM** CARD CODE: **1-38101-03156** REV. **00**  
DRG. NO. **1-38101-03156** CUST. DRG. NO. **3156-575-1115**  
SHT. NO. 1 NO. OF SHT. 1

DRG. NO. 2-381-01-00862

SHT. 1 OF 1

SCHEME OF WATER AND STEAM CIRCUIT WITH VALVES, FITTINGS AND INSTRUMENTATION REFER DRAWING No. 1-00-OXX-XXXX

SCOPE OF SUPPLY		SCOPE OF SUPPLY (within BHEL)	
	CUSTOMER		BHEL (TRICHY)



**REF. DRG NO.**

1. LEGEND (EIL DRAWING) 1191 Rev.00
2. NUMBERING PHILOSOPHY PEMC-1834
3. P&ID FOR LP STEAM SYSTEM :3146-575-1114
4. P&ID FOR CONDENSER COOLING WATER SYSTEM
5. P&ID FOR WATER & STEAM CIRCUIT

**NOTES:**

1. UNTIL UNLESS SPECIFIED OTHERWISE, ALL THE DRAINS & VENTS SHALL BE OF 25Nb(33.4x4.55).
2. LEGEND  
 INTERLOCKS & PROTECTIONS REALISED IN DCS.  
 DCS
3. THIS SCHEME IS VALID FOR ONE BOILER. THE SAME IS APPLICABLE FOR SECOND, THIRD AND FOURTH BOILER ALSO.
4. THE TAG NOS. FOR INSTRUMENTS AND VALVES ARE AS FOLLOWS:  
 FOR FIRST BOILER TAG NUMBERS SHALL BE PREFIXED WITH '06'.  
 FOR SECOND BOILER TAG NUMBERS SHALL BE PREFIXED WITH '07'.  
 FOR THIRD BOILER TAG NUMBERS SHALL BE PREFIXED WITH '08'.  
 FOR FOURTH BOILER TAG NUMBERS SHALL BE PREFIXED WITH '09'.
5. VENTS SHALL BE DISCHARGED AT SAFE HEIGHT ABOVE ROOF AT A SAFE LOCATION.

TAG. NOS. RANGE	
TERMINAL POINTS	VALVES & SPECIALITES
	1910 - 1910
INST-RANGE	
	LINES
	1901-1910

CUSTOMER: **HPCL - MITTAL ENERGY LIMITED**

CONSULTANT: **ENGINEERS INDIA LTD**  
 1, BHICAJI CAMA PLACE, NEWDELHI - 110 006  
 EIL JOB NO.: 6922

PROJECT: **CAPTIVE POWER PLANT, GURU GOBIND SINGH REFINERY PROJECT, Bhatinda**

	BHARAT HEAVY ELECTRICALS LTD. HYDERABAD		NAME	SIGN.	DATE	NO. OF VAR.
	DRN.	DURGA SHARAN			26.08.08	
	CHD.	M.S.S.N			26.08.08	-N.A-
APPD.	P.SUDHIR BABU			26.08.08		

DEPT. PED CODE 450	UNTOL. DIMS. GR. g/m/y	SCALE -N.A-	WEIGHT (KG) -N.A-	REF. TO ASSY. DRG. -N.A-	ITEM NO. -N.A-	NO. OF ITEMS -N.A-
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TITLE: **P&ID FOR BLOW DOWN SYSTEM**

DRG. NO. 2-381-01-00862  
 CUST. DRG. NO. 0862-575-1219  
 SHT. No 1, NO. OF SHT. 1

COMPUTER FILE NAME: 23810100862-S00-R00.DWG  
 REF. DRG. NO.: 23910000040  
 SIGN. AND DATE:  
 INVENTORY NO:

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