## MOUDA SUPER THERMAL POWER PROJECT STAGE-II (2x660MW)

SL. NO.	ATTRIBUTES	UNIT	VALUE
CYCLE PA	RAMETERS:		
1.	MAIN STEAM PRESSURE	Kg/cm2(a)	247
2.	MAIN STEAM TEMPERATURE	Deg.C	565
3.	REHEAT STEAM TEMPERATURE	Deg.C	593
4.	NO. OF REHEATS		01
5.	DESIGN BACK PRESSURE	mmHg (a)	77
6.	FINAL FEED WATER TEMPERATURE	Deg.C	290
7.	GURANTEED HEAT RATE AT TMCR	Kcal/KWH	1834.5
8.	GURANTEED HEAT RATE AT TMCR 105% OF	Kcal/KWH	1832.9
	TMCR		
9.	GURANTEED VACUUM	mmHg (a)	77
10.	COLD START UP PARAMETERS	ata/Deg.C/	100/390/390
	(MS Pr. /MS Temp. /HRH Temp.)	Deg.C	
11.	TOTAL COLD START UP TIME	min	555
MAIN TU		_	
1.	MAKE		SIEMENS, GERMANY
2.	COMBINED HP-IP		NO
3.	DOUBLE LP TURBINE		NO
4.	NO. OF TURBINE CYLINDERS		03
5.	NO. OF CASING IN HPT		02
6.	NO. OF CASING IN HP-IP		NA
7.	NO. OF CASING IN IPT		02
8.	NO. OF CASING IN LPT		02
9.	TYPE OF TURBINE INSULATION		SPRAY AS WELL AS ROCK WOOL
			PADS/BLANKET
10.	ACOUSTIC ENCLOSURE PROVIDED OR NOT		YES
11.	LPT EXHAUST DOWNWARD /AXIAL		DOWNWARD
12.	NO. OF EXTRACTION		8
13.	TYPE OF HPT (SINGLE/DOUBLE FLOW)		SINGLE
14.	TYPE OF IPT (SINGLE/DOUBLE FLOW)		DOUBLE
15.	TYPE OF LPT (SINGLE/DOUBLE FLOW)		DOUBLE
16.	COMPOUNDING (TANDEM/CROSS)		TANDEM
17.	BEARING SPAN (HP/HIP/IP/LP)	mm	4865/-/6075/8000
18.	ROTOR DESIGN (WELDED/ONE PIECE		HP- ONE PIECE FORGED
	FORGED)		IP- ONE PIECE FORGED
			LP- ONE PIECE FORGED
19.	BLADE FIXING TYPE:		FIRTREE
	a) HPT		
	b) IPT		
	c) LPT		CDDING DACKED LABOURITH THE
20.	TYPE OF GLAND SEALS		SPRING BACKED LABYRINTH TYPE
21.	HPT MODULE NO.		HP70-V4
22.	HIP MODULE NO.		NA Isa ya
23.	IPT MODULE NO.		160-V2
24.	LPT MODULE NO.		
25.	NO. AND TYPE OF TURBINE BEARING		01 NO. TILTING PAD TYPE THRUST
			BEARING
	NO OF UP TURBUSE SUASES		07 NOS JOURNAL BEARING
26.	NO. OF HP TURBINE BLADES		18 (ALL REACTION TYPE)
27.	NO. OF HIP TURBINE BLADES		NA
28.	NO. OF IP TURBINE BLADES		15x2 (ALL REACTION TYPE)
29.	NO. OF LP TURBINE BLADES		7x2x2 (ALL REACTION TYPE)

30.	LPT LAST STAGE BLADE TYPE		FREE STANDING
31.	LPT LAST TWO STAGE BLADE DETAILS:	1	LAST STAGE LAST BUT ONE STAGE
31.	a) BLADE HEIGHT	mm	1021.4 644.75
	b) ROOT DIAMETER	mm	1630 1660
	c) PITCH DIAMTER	mm	2538.8 2244
	d) TIP DIAMETER	mm	3458.4 2178.4
32.	RADIAL CLEARANCE OF EACH BEARING	mm	1# 0.35, 2# 0.54, 3#0.68, 4#0.75,
02.			5#0.75 (VERTICAL)
			1# 0.40, 2# 0.61, 3#0.46, 4#0.51,
			5#0.50 (HORIZONTAL)
33.	TYPE OF BARRING GEAR		HYDRAULIC
	(HYDRAULIC/MOTORISED)		
34.	BARRING SPEED	rpm	60
35.	CRITICAL SPEED	rpm	HPT-1602
		"	IPT-1962
			LPTA-1620
			LPTB-1572
			GEN-750
36.	STEAM ADMISSION FULL OR PARTIAL ARC		FULL ARC
	TYPE		
37.	NO. OF MSV		02
38.	NO. OF MCV		02
39.	NO. OF OLV		01
40.	NO. OF IPSV		02
41.	NO. OF ICV		02
42.	HP CASING TYPE (BARREL TYPE OR		BARREL TYPE
	HORIZONTALLY SPLIT)		
43.	HIP CASING TYPE (BARREL TYPE OR		NA
	HORIZONTALLY SPLIT)		
44.	IP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		
45.	LP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		
46.	LP TURBINE BURSTING DIAPHRAGM		
	a) Number		01 per CASING
	b) Diameter	mm	800
	c) Material		1.4301+TEFLON+1.4301
	d) Bursting Set Pressure	Kg/cm2(a)	1.4
47.	WHETHER LPT LAST STAGE BLADE VIBRATION		NO
	MONITORING SYSTEM PROVIDED.		
TURBINE	LUBE OIL SYSTEM	1	T
1.	MAIN OIL PUMP (MOTOR/SHAFT DRIVEN)		MOTOR DRIVEN
2.	NO. OF MOP & CAPACITY		2x100% & 59 lps
3.	MOP DIS. PR. AND SPEED		6.2 bar (g) & 3000rpm
4.	NO. OF AOP		NA
5.	NO. OF EOP & CAPACITY		1x100% & 59 lps
6.	EOP DIS. PR. AND SPEED		2.6 bar (g) & 3000rpm
7.	NO. OF JOP(AC/DC)		1x100% AC & 1x100% DC
8.	JOP (BOTH DC &AC) CAPACITY, DIS. PR. AND		3.07 lps, 175 bar (g), 1470rpm (AC)
	SPEED		& 1750rpm (DC)
9.	TYPE OF LUBE OIL		ISO VG 46
10.	TYPE OF COOLER		SHELL & TUBE TYPE
11.	LUBE OIL TANK CAPACITY	Lit	32000/45000
	(NORMAL/MAXIMUM)		
12.	NORMAL TANK LEVEL	mm	510 from Top of Tank

13.	TANK LEVEL HI/LO	mm	470/550 From Top of Tank
14.	TYPE OF PURIFIER PROVIDED		CENTRIFUGE TYPE
15.	NORMAL LUBE OIL TEMPERATURE	Deg.C	50
GOVERN	ING SYSTEM & CONTROL OIL SYSTEM		
1.	TYPE OF GOVERNING		D-EHC TYPE THROTTLE
			GOVERNING (HP GOV.)
2.	GOVERNING OIL PRESSURE	Kg/cm2(g)	160
3.	MAKE		SIEMENS, GERMANY
4.	DEAD BAND OF THE GOVERNOR		0.06%
5.	RANGE OF REGULATION		5% (ADJUSTABLE BETWEEN 3% -
			8%)
6.	TYPE OF GOVERNING OIL		TRIXYLENYL PHOSPHATE ESTER
7.	CONTROL OIL TANK CAPACITY (NORMAL)	lit	1000
8.	DIFFERENT TANK LEVELS (NORMAL/HI/LO)	mm	150/80/265 from Tank Top
9.	NO. OF OIL PUMP AND TYPE		2x100% AXIAL PISTON TYPE
10.	PUMP CAPACITY, DIS. PR. & SPEED		62 l/min,160 bar (g) & 1500rpm
11.	CONTROL OIL PURIFIER DETAILS		MAKE: Amberlist A21 Molecular
			Sieve A1/8
			TYPE: REGENERATING UNIT
12.	PURIFIER PUMP DETAILS		NO. – 2x100%
			CAPACITY - 0.021-0.024 m3/h
6. 7. 8. 9. 10.	TYPE OF GOVERNING OIL  CONTROL OIL TANK CAPACITY (NORMAL)  DIFFERENT TANK LEVELS (NORMAL/HI/LO)  NO. OF OIL PUMP AND TYPE  PUMP CAPACITY, DIS. PR. & SPEED  CONTROL OIL PURIFIER DETAILS		8%) TRIXYLENYL PHOSPHATE ESTER 1000 150/80/265 from Tank Top 2x100% AXIAL PISTON TYPE 62 I/min,160 bar (g) & 1500rpm MAKE: Amberlist A21 Molecular Sieve A1/8 TYPE: REGENERATING UNIT NO. – 2x100%

## MEJA THERMAL POWER PROJECT (2x660MW)

SL. NO.	ATTRIBUTES	UNIT	VALUE
CYCLE PA	RAMETERS:		
1.	MAIN STEAM PRESSURE	Kg/cm2(a)	247
2.	MAIN STEAM TEMPERATURE	Deg.C	565
3.	REHEAT STEAM TEMPERATURE	Deg.C	593
4.	NO. OF REHEATS		01
5.	DESIGN BACK PRESSURE	mmHg (a)	77
6.	FINAL FEED WATER TEMPERATURE	Deg.C	290
7.	GURANTEED HEAT RATE AT TMCR	Kcal/KWH	1842
8.	GURANTEED HEAT RATE AT TMCR 105% OF TMCR	Kcal/KWH	1839
9.	GURANTEED VACUUM	mmHg (a)	77
10.	COLD START UP PARAMETERS	ata/Deg.C/	96.1/380/380
	(MS Pr. /MS Temp. /HRH Temp.)	Deg.C	
11.	TOTAL COLD START UP TIME	min	140
MAIN TU	RBINE		
1.	MAKE		TOSHIBA CORPORATION, JAPAN
2.	COMBINED HP-IP		NO
3.	DOUBLE LP TURBINE		NO
4.	NO. OF TURBINE CYLINDERS		03
5.	NO. OF CASING IN HPT		02
6.	NO. OF CASING IN HP-IP		NA
7.	NO. OF CASING IN IPT		02
8.	NO. OF CASING IN LPT		02
9.	TYPE OF TURBINE INSULATION		CERAMIC FIBRE AND MINERAL
			WOOL PADS/BLANKET
10.	ACOUSTIC ENCLOSURE PROVIDED OR NOT		YES
11.	LPT EXHAUST DOWNWARD /AXIAL		DOWNWARD
12.	NO. OF EXTRACTION		8
13.	TYPE OF HPT (SINGLE/DOUBLE FLOW)		SINGLE
14.	TYPE OF IPT (SINGLE/DOUBLE FLOW)		SINGLE
15.	TYPE OF LPT (SINGLE/DOUBLE FLOW)		DOUBLE
16.	COMPOUNDING (TANDEM/CROSS)		TANDEM
17.	BEARING SPAN (HP/HIP/IP/LP)	mm	5580/-/5450/7500
18.	ROTOR DESIGN (WELDED/ONE PIECE		HP- ONE PIECE FORGED
10.	FORGED)		IP- ONE PIECE FORGED
			LP- ONE PIECE FORGED
19.	BLADE FIXING TYPE:		FIRTREE
	a) HPT		
	b) IPT		
	c) LPT		
20.	TYPE OF GLAND SEALS	1	SPRING BACKED LABYRINTH TYPE
21.	HPT MODULE NO.		-
22.	HIP MODULE NO.		NA
23.	IPT MODULE NO.		-
24.	LPT MODULE NO.		TCDF-48
25.	NO. AND TYPE OF TURBINE BEARING		01 NO. TILTING PAD TYPE THRUST
۷.	1.3.7.10 THE OF TORDINE BEARING		BEARING
			08 NOS JOURNAL BEARING
26.	NO. OF HP TURBINE BLADES		19 (ALL REACTION TYPE)
27.	NO. OF HIP TURBINE BLADES		NA
27.	NO. OF HIP TURBINE BLADES  NO. OF IP TURBINE BLADES		11 (1 IMPULSE AND 10 REACTION
۷٥.	NO. OF IF TORDINE BLADES		TYPE)

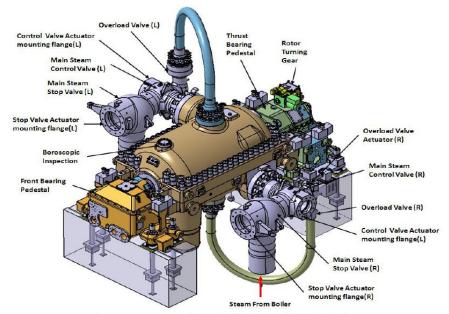
29.	NO. OF LP TURBINE BLADES		7x2 (ALL REACTION TYPE)
30.	LPT LAST STAGE BLADE TYPE		SHROUDED (WITH SNUBBER)
31.	LPT LAST TWO STAGE BLADE DETAILS:		LAST STAGE LAST BUT ONE STAGE
51.	a) BLADE HEIGHT	mm	1219.2 637.03
	b) ROOT DIAMETER	mm	1879.6 1956.72
	c) PITCH DIAMTER	mm	3098.8 2587.75
	d) TIP DIAMETER	mm	4318 3224.78
32.	RADIAL CLEARANCE OF EACH BEARING	mm	BRG.DIA.x1.3/1000
33.	TYPE OF BARRING GEAR	111111	MOTORISED
33.	(HYDRAULIC/MOTORISED)		WOTOKISED
34.	BARRING SPEED	rpm	4
35.	CRITICAL SPEED	rpm	HPT-2010
33.	CHITCH EST EES		IPT-1940
			LPT-1260
36.	STEAM ADMISSION FULL OR PARTIAL ARC		FULL ARC
30.	TYPE		1 02271110
37.	NO. OF MSV AND TYPE		04 & POPET TYPE
38.	NO. OF MCV AND TYPE		04 & VENTURI TYPE
39.	NO. OF IPSV AND TYPE		02 & POPET TYPE
40.	NO. OF ICV AND TYPE		02 & VENTURI TYPE
41.	HP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		THORIZOTTI ALET OF ELL
42.	HIP CASING TYPE (BARREL TYPE OR		NA
72.	HORIZONTALLY SPLIT)		
43.	IP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
٦3.	HORIZONTALLY SPLIT)		TIONIZON TALET STEET
44.	LP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		THORIZOTTI ALET OF ELL
45.	LP TURBINE BURSTING DIAPHRAGM		
	a) Number		04
	b) Diameter	mm	1007
	c) Material		COPPER
	d) Reliving Capacity	t/h	340
	e) Bursting Set Pressure	Kg/cm2(a)	1.38
46.	WHETHER LPT LAST STAGE BLADE VIBRATION		NO
	MONITORING SYSTEM PROVIDED.		
TURBINE	LUBE OIL SYSTEM		
1.	MAIN OIL PUMP (MOTOR/SHAFT DRIVEN)		MOTOR DRIVEN
2.	NO. OF MOP & CAPACITY		2x100% & 4640 l/min
3.	MOP DIS. PR. AND SPEED		7.75 Kg/cm2 (g) & 3000rpm
4.	NO. OF AOP		NA
5.	NO. OF EOP & CAPACITY		1x100% & 3789 l/min
6.	EOP DIS. PR. AND SPEED		2.97 Kg/cm2 (g) & 1750rpm
7.	LUBE OIL PRESSURE (AT TURBINE C/L)	Kg/cm2(a)	1.8
8.	NO. OF JOP(AC/DC)		1x100% AC & 1x100% DC
9.	JOP (BOTH DC &AC) CAPACITY, DIS. PR. AND		22.8 l/min, 246Kg/cm2 (g),
	SPEED		1500rpm (AC) & 1750rpm (DC)
10.	TYPE OF LUBE OIL		ISO VG 32
11.	TYPE OF COOLER		PHE TYPE
12.	LUBE OIL TANK CAPACITY	Lit	40000/64000
	(NORMAL/MAXIMUM)		
13.	NORMAL TANK LEVEL	mm	920 from Top of Tank
14.	TANK LEVEL HI/LO	mm	820/1020 From Top of Tank
15.	TYPE OF PURIFIER PROVIDED		COALESCER TYPE
16.	NORMAL LUBE OIL TEMPERATURE	Deg.C	43-49
10.	MONIVIAL LODE OIL TEIVIFEINATURE	Deg.C	T-J-T-J

GOVERN	GOVERNING SYSTEM & CONTROL OIL SYSTEM			
1.	TYPE OF GOVERNING		D-EHC TYPE THROTTLE	
			GOVERNING (HP GOV.)	
2.	GOVERNING OIL PRESSURE	Kg/cm2(g)	167	
3.	MAKE		TOSHIBA CORPORATION, JAPAN	
4.	DEAD BAND OF THE GOVERNOR		0%	
5.	RANGE OF REGULATION		5% (ADJUSTABLE BETWEEN 3% -	
			8%)	
6.	TYPE OF GOVERNING OIL		QUINTOLUBRIC 888-46	
7.	CONTROL OIL TANK CAPACITY	lit	1000/2000	
	(NORMA/MAXIMUM)			
8.	DIFFERENT TANK LEVELS (NORMAL/HI/LO)	mm	500/600/400/ from Tank Bottom	
9.	NO. OF OIL PUMP AND TYPE		2x100% AXIAL PISTON TYPE	
10.	PUMP CAPACITY, DIS. PR. & SPEED		160 l/min,169 Kg/cm2(g) &	
			970rpm	
11.	CONTROL OIL PURIFIER DETAILS		MAKE: PALL (HOUSING) & PARKER	
			(ELEMENT)	
			TYPE: COALESCER TYPE	
12.	PURIFIER PUMP DETAILS		NO. – 2x100%	
			TYPE –Gear Type	
			CAPACITY – 45 l/min	
			DIS. PR5.1 Kg/cm2 (g)	

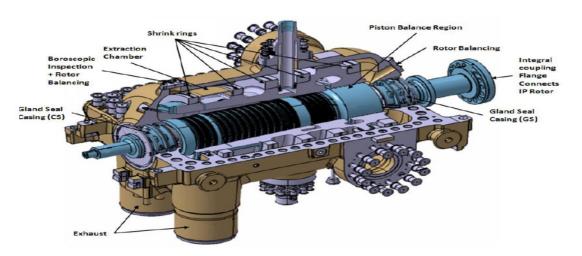
## NPGCL NABINAGAR SUPER THERMAL POWER PROJECT STAGE-I (3x660MW)

SL. NO.	ATTRIBUTES	UNIT	VALUE
CYCLE PA	RAMETERS:	-	
1.	MAIN STEAM PRESSURE	Kg/cm2(a)	247
2.	MAIN STEAM TEMPERATURE	Deg.C	565
3.	REHEAT STEAM TEMPERATURE	Deg.C	593
4.	NO. OF REHEATS		01
5.	DESIGN BACK PRESSURE	mmHg (a)	77
6.	FINAL FEED WATER TEMPERATURE	Deg.C	290
7.	GURANTEED HEAT RATE AT TMCR	Kcal/KWH	1832
8.	GURANTEED HEAT RATE AT TMCR 105% OF	Kcal/KWH	1832
	TMCR		
9.	GURANTEED VACUUM	mmHg (a)	77
10.	COLD START UP PARAMETERS	ata/Deg.C/	102/390/390
	(MS Pr. /MS Temp. /HRH Temp.)	Deg.C	, ,
11.	TOTAL COLD START UP TIME	min	260
MAIN TU			
1.	MAKE		ALSTOM
2.	COMBINED HP-IP		NO
3.	DOUBLE LP TURBINE		NO
	NO. OF TURBINE CYLINDERS		03
<del>4.</del> 5.	NO. OF CASING IN HPT		02
6.	NO. OF CASING IN HP-IP		NA
7.	NO. OF CASING IN FIP-IP		02
			02
8.	NO. OF CASING IN LPT		*-
9.	TYPE OF TURBINE INSULATION		CERAMIC FIBRE PADS/BLANKET AND MINERAL WOOL SPRAY
10.	ACOUSTIC ENCLOSURE PROVIDED OR NOT		YES
11.	LPT EXHAUST DOWNWARD /AXIAL		DOWNWARD
12.	NO. OF EXTRACTION		8
13.	TYPE OF HPT (SINGLE/DOUBLE FLOW)		SINGLE
14.	TYPE OF IPT (SINGLE/DOUBLE FLOW)		DOUBLE
15.	TYPE OF LPT (SINGLE/DOUBLE FLOW)		DOUBLE
16.	COMPOUNDING (TANDEM/CROSS)		TANDEM
17.	BEARING SPAN (HP/HIP/IP/LP)	mm	4677/-/6516/7102
18.	ROTOR DESIGN (WELDED/ONE PIECE FORGED)		HP-TWO FORGED PIECES WELDED TOGETHER
	, ,		IP- TWO FORGED PIECES WELDED
			TOGETHER
			LP- TWO FORGED PIECES WELDED TOGETHER
10	DIADE FIVING TYPE.		FIRTREE
19.	BLADE FIXING TYPE:  a) HPT		FININEE
	b) IPT		
	c) LPT		
20	TYPE OF GLAND SEALS	1	SDDING DACKED I ADVOINTLE TYPE
20. 21.			SPRING BACKED LABYRINTH TYPE HD4
	HPT MODULE NO.		
22.	HIP MODULE NO.		NA NADA
23.	IPT MODULE NO.	+	MD4
24.	LPT MODULE NO.		ND41
25.	NO. AND TYPE OF TURBINE BEARING		01 NO. TILTING PAD TYPE THRUST
			BEARING
3.0	NO OF UD TURBING DIARGO	+	06 NOS JOURNAL BEARING
26.	NO. OF HP TURBINE BLADES		20 (ALL REACTION TYPE)
27.	NO. OF HIP TURBINE BLADES		NA
28.	NO. OF IP TURBINE BLADES		20x2 (ALL REACTION TYPE)
29.	NO. OF LP TURBINE BLADES		5x2 ((ALL REACTION TYPE)

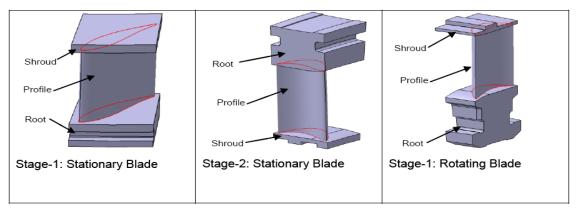
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30.	LPT LAST STAGE BLADE TYPE		SHROUDED (WITH SNUBBER)
31.	LPT LAST TWO STAGE BLADE DETAILS:		LAST STAGE LAST BUT ONE STAGE
	a) BLADE HEIGHT	mm	1051 608
	b) ROOT DIAMETER	mm	1705 1842
	c) PITCH DIAMTER	mm	2756 2450
	d) TIP DIAMETER	mm	3806 3056
32.	RADIAL CLEARANCE OF EACH BEARING	mm	0.25 TO 1.484
33.	TYPE OF BARRING GEAR		MOTORISED
	(HYDRAULIC/MOTORISED)		
34.	BARRING SPEED	rpm	16
35.	CRITICAL SPEED	rpm	HPT-2405
			IPT-1700
			LPT-1573
36.	STEAM ADMISSION FULL OR PARTIAL ARC		FULL ARC
	TYPE		
37.	NO. OF MSV		02
38.	NO. OF MCV		02
39.	NO. OF OLV		02
40.	NO. OF IPSV		02
41.	NO. OF ICV		02
42.	HP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		
43.	HIP CASING TYPE (BARREL TYPE OR		NA
13.	HORIZONTALLY SPLIT)		
44.	IP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
1-7-	HORIZONTALLY SPLIT)		TIGHTZGIVI/KEET SI EIT
45.	LP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
٦٥.	HORIZONTALLY SPLIT)		HOMEON FALLET STEET
46.	LP TURBINE BURSTING DIAPHRAGM		
40.	a) Number		01
	b) Diameter	mm	DN600
	c) Material	'''''	PTFE embedded between Inconel
	cy waterial		600 alloy
	d) Reliving Capacity	Kg/s	31
	e) Bursting Set Pressure	Kg/cm2(a)	1.5
47.	WHETHER LPT LAST STAGE BLADE VIBRATION	116/ 01112(0)	NO
77.	MONITORING SYSTEM PROVIDED.		140
TURRINE	LUBE OIL SYSTEM		<u> </u>
1.	MAIN OIL PUMP (MOTOR/SHAFT DRIVEN)		SHAFT DRIVEN
2.	AOP OIL PUMP (MOTOR/SHAFT DRIVEN)		MOTOR DRIVEN
3.	NO. OF MOP & CAPACITY		2x100% & 200m3/h
4.	MOP DIS. PR. AND SPEED		54.1m & 2970rpm
5.			1x100% & 66.6m3/h
6.	NO. OF EOP & CAPACITY  EOP DIS. PR. AND SPEED		1.3bar(g) & 1500rpm
	NO. OF JOP(AC/DC)		1.30ar(g) & 1500rpm 1x100% AC & 1x100% DC
7.	, , ,		
8.	JOP (BOTH DC &AC) CAPACITY, DIS. PR. AND SPEED		60 l/min, 260Kg/cm2 (g), 1500rpm
			ISO VG 46
9.	TYPE OF LUBE OIL		ISO VG 46
10.	TYPE OF LUBE OIL TYPE OF COOLER		ISO VG 46 PHE TYPE
10. GOVERN	TYPE OF LUBE OIL TYPE OF COOLER ING SYSTEM & CONTROL OIL SYSTEM		PHE TYPE
10.	TYPE OF LUBE OIL TYPE OF COOLER		PHE TYPE  D-EHC TYPE THROTTLE
10. GOVERN 1.	TYPE OF LUBE OIL TYPE OF COOLER ING SYSTEM & CONTROL OIL SYSTEM TYPE OF GOVERNING	l hard = )	D-EHC TYPE THROTTLE GOVERNING
10. GOVERN 1. 2.	TYPE OF LUBE OIL  TYPE OF COOLER ING SYSTEM & CONTROL OIL SYSTEM  TYPE OF GOVERNING  GOVERNING OIL PRESSURE	bar(g)	D-EHC TYPE THROTTLE GOVERNING 42
10. GOVERN 1. 2. 3.	TYPE OF LUBE OIL  TYPE OF COOLER ING SYSTEM & CONTROL OIL SYSTEM  TYPE OF GOVERNING  GOVERNING OIL PRESSURE  MAKE	bar(g)	D-EHC TYPE THROTTLE GOVERNING 42 ALSPA
10. GOVERN 1. 2.	TYPE OF LUBE OIL  TYPE OF COOLER ING SYSTEM & CONTROL OIL SYSTEM  TYPE OF GOVERNING  GOVERNING OIL PRESSURE	bar(g)	D-EHC TYPE THROTTLE GOVERNING 42



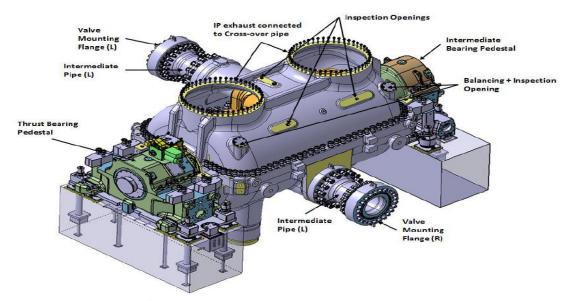
Typical HP turbine arrangement



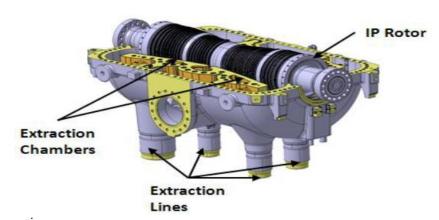
Typical section of HP Turbine



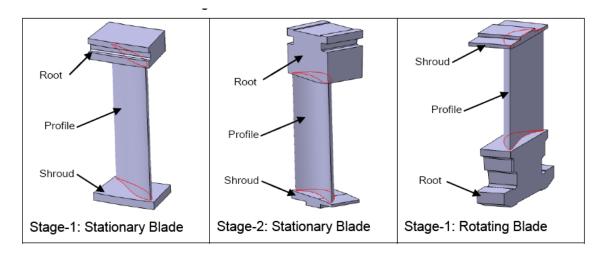
**HP Turbine stationary and rotating blades** 



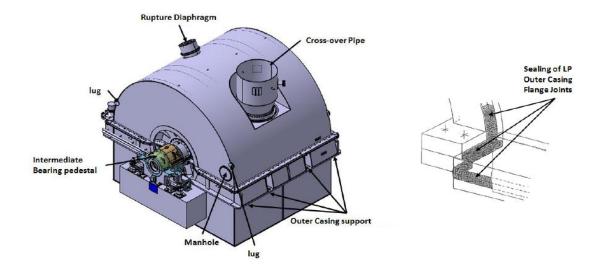
Typical IP turbine assembly



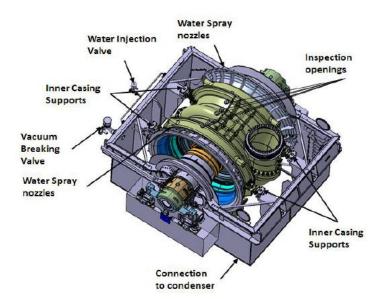
Typical IP turbine extraction lines



IP turbine blades



Typical LP turbine assembly



Typical LP turbine assembly (Outer Casing UH removed)



Typical LP last stage blades



Typical LP front stage blades

## KHARGONE SUPER THERMAL POWER PROJECT (2x660MW)

SL. NO.	ATTRIBUTES	UNIT	VALUE
CYCLE PA	RAMETERS:		
1.	MAIN STEAM PRESSURE	Kg/cm2(a)	270
2.	MAIN STEAM TEMPERATURE	Deg.C	660
3.	REHEAT STEAM TEMPERATURE	Deg.C	660
4.	NO. OF REHEATS		01
5.	DESIGN BACK PRESSURE	mmHg (a)	Avg.77
6.	FINAL FEED WATER TEMPERATURE	Deg.C	290
7.	GURANTEED HEAT RATE AT TMCR	Kcal/KWH	1780.8
8.	GURANTEED HEAT RATE AT TMCR 105% OF	Kcal/KWH	1776.1
	TMCR		
9.	GURANTEED VACUUM	mmHg (a)	59.25
10.	COLD START UP PARAMETERS	ata/Deg.C/	108/380/380
	(MS Pr. /MS Temp. /HRH Temp.)	Deg.C	
11.	TOTAL COLD START UP TIME	min	420
MAIN TU			
1.	MAKE		LMTG, HAZIRA
2.	COMBINED HP-IP		NO
3.	DOUBLE LP TURBINE		YES
4.	NO. OF TURBINE CYLINDERS		4
5.	NO. OF CASING IN HPT		02
6.	NO. OF CASING IN HP-IP		NA
7.	NO. OF CASING IN IPT		02
8.	NO. OF CASING IN LPT		02
9.	TYPE OF TURBINE INSULATION		CERAMIC PADS/BLANKET AND
			MINERAL WOOL
10.	ACOUSTIC ENCLOSURE PROVIDED OR NOT		YES
11.	LPT EXHAUST DOWNWARD /AXIAL		DOWNWARD
12.	NO. OF EXTRACTION		9
13.	TYPE OF HPT (SINGLE/DOUBLE FLOW)		SINGLE
14.	TYPE OF IPT (SINGLE/DOUBLE FLOW)		SINGLE
15.	TYPE OF LPT (SINGLE/DOUBLE FLOW)		DOUBLE
16.	COMPOUNDING (TANDEM/CROSS)		TANDEM
17.	BEARING SPAN (HP/HIP/IP/LP)	mm	5300/-/6250/8060/8060
18.	ROTOR DESIGN (WELDED/ONE PIECE		HP- ONE PIECE FORGED
	FORGED)		IP- TWO FORGED PIECES WELDED
			TOGETHER
	DI ADE ENVINO TVDE		LP- ONE PIECE FORGED
19.	BLADE FIXING TYPE:		FIRTREE
	a) HPT		
	b) IPT		
20	c) LPT		CDDING DACKED LADVOINTIL TYPE
20.	TYPE OF GLAND SEALS		SPRING BACKED LABYRINTH TYPE
21.	HPT MODULE NO.		- NA
22.	HIP MODULE NO.		NA
23.	IPT MODULE NO.		- TC4E40 E
24.	LPT MODULE NO.	+	TC4F40.5
25.	NO. AND TYPE OF TURBINE BEARING		01 NO. TILTING PAD TYPE THRUST
			BEARING
20	NO OF HE THEREING BLADES		08 NOS JOURNAL BEARING
26.	NO. OF HIP TURBINE BLADES		16 (ALL REACTION TYPE)
27.	NO. OF HIP TURBINE BLADES		NA 12 (ALL REACTION TYPE)
28.	NO. OF IP TURBINE BLADES		12 (ALL REACTION TYPE)

20	NO OF LETTINDING DIADES	1	7:2:2 (ALL DEACTION TYPE)
29.	NO. OF LP TURBINE BLADES		7x2x2 (ALL REACTION TYPE)
30.	LPT LAST STAGE BLADE TYPE		SHROUDED (WITH SNUBBER)  LAST STAGE  LAST BUT ONE STAGE
31.	LPT LAST TWO STAGE BLADE DETAILS:		1029 648
	a) BLADE HEIGHT	mm	1458 1680
	b) ROOT DIAMETER	mm	114.9 130.6
	c) PITCH	mm	3516 2976
22	d) TIP DIAMETER	mm	
32.	TYPE OF BARRING GEAR		MOTORISED
33.	(HYDRAULIC/MOTORISED) BARRING SPEED	rnm	3
34.	CRITICAL SPEED	rpm rpm	HPT-2115
34.	CRITICAL SPEED	i piii	IPT-2008
			LPTA-1060
			LPTB-1064
			GEN-709
35.	STEAM ADMISSION FULL OR PARTIAL ARC		FULL ARC
33.	TYPE		I OLL AILC
36.	NO. OF MSV		02
37.	NO. OF MCV		02
38.	NO. OF OLV		02
39.	NO. OF IPSV	1	02
40.	NO. OF ICV		02
41.	HP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
71.	HORIZONTALLY SPLIT)		HOMEONTALLT STEIT
42.	HIP CASING TYPE (BARREL TYPE OR		NA
42.	HORIZONTALLY SPLIT)		
43.	IP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
43.	HORIZONTALLY SPLIT)		TIOMEON THE STEIN
44.	LP CASING TYPE (BARREL TYPE OR		HORIZONTALLY SPLIT
	HORIZONTALLY SPLIT)		
45.	LP TURBINE BURSTING DIAPHRAGM		
	a) Number		04 per CASING
	b) Diameter	mm	990
	c) Material		LEAD
	d) Reliving Capacity	m3/s	61.1
	e) Bursting Set Pressure	Kg/cm2(a)	1.3
46.	WHETHER LPT LAST STAGE BLADE VIBRATION		NO
	MONITORING SYSTEM PROVIDED.		
TURBINE	LUBE OIL SYSTEM		
1.	MAIN OIL PUMP (MOTOR/SHAFT DRIVEN)		MOTOR DRIVEN
2.	NO. OF MOP & CAPACITY		2x100% & 5400 l/min
3.	MOP DIS. PR. AND SPEED		3.6 Kg/cm2 (g) & 1500rpm
4.	NO. OF AOP		NA
5.	NO. OF EOP & CAPACITY		1x100% & 5000 l/min
6.	EOP DIS. PR. AND SPEED		3.6 Kg/cm2 (g) & 1500rpm
7.	NO. OF JOP(AC/DC)		1x100% AC & 1x100% DC
8.	JOP (BOTH DC &AC) CAPACITY, DIS. PR. AND		120 l/min, 160Kg/cm2 (g),
	SPEED		1000rpm (AC) & 1000rpm (DC)
9.	TYPE OF LUBE OIL		ISO VG 32XL
10.	TYPE OF COOLER		PHE TYPE
11.	LUBE OIL TANK CAPACITY	Lit	40500/43813
	(NORMAL/MAXIMUM)		
12.	NORMAL TANK LEVEL	mm	1833 from Bottom of Tank
13.	TANK LEVEL HI/LO	mm	1983/1673 From Bottom of Tank
14.	TYPE OF PURIFIER PROVIDED		COALESCER TYPE

15.	NORMAL LUBE OIL TEMPERATURE	Deg.C	Less than 50		
GOVERN	GOVERNING SYSTEM & CONTROL OIL SYSTEM				
1.	TYPE OF GOVERNING		D-EHC TYPE THROTTLE		
			GOVERNING (HP GOV.)		
2.	GOVERNING OIL PRESSURE	Kg/cm2(g)	140		
3.	MAKE		MHPS, JAPAN		
4.	DEAD BAND OF THE GOVERNOR		0%		
5.	RANGE OF REGULATION		4%		
6.	TYPE OF GOVERNING OIL		FRF (FYRQUELL)		
7.	CONTROL OIL TANK CAPACITY (NORMAL)	lit	1300		
8.	DIFFERENT TANK LEVELS (NORMAL/HI/LO)	mm	484/170/798 from Tank Top		
9.	NO. OF OIL PUMP AND TYPE		2x100% AXIAL PISTON TYPE		
10.	PUMP CAPACITY, DIS. PR. & SPEED		133 l/min,140 Kg/cm2(g) &		
			1000rpm		
11.	CONTROL OIL PURIFIER DETAILS		Fuller's Earth Type		
12.	PURIFIER PUMP DETAILS		NO. – 2x100%		
			TYPE –Screw Type		
			CAPACITY – 48 l/min		
			DIS. PR5.1 Kg/cm2 (g)		
			SPEED:1000rpm		