

PIPING MATERIAL SPECIFICATION

(B015-6-44-0005)

Client : HPCL

Project : VRMP

Location : VIZAG

Job No. : B015

D	18/05/2017	REVISED & ISSUED FOR BIDS	KPR	AKB	MI
C	05/05/2017	ISSUED FOR BIDS	KPR	AKB	MI
B	26/04/2017	REVISED & ISSUED FOR BIDS	KPR	AKB	MI
A	09/03/2017	ISSUED FOR BIDS	KPR	AKB	MI
Rev. No	Date	Purpose	Prepared by	Checked by	Approved by

Abbreviations:

AARH : ARITHMETIC AVERAGE ROUGHNESS HEIGHT

ANSI : AMERICAN NATIONAL STANDARDS INSTITUTE

API : AMERICAN PETROLEUM INSTITUTE

ASME : AMERICAN SOCIETY OF MECHANICAL ENGINEERS

ASTM : AMERICAN SOCIETY FOR TESTING & MATERIALS

AWWA: AMERICAN WATER WORKS ASSOCIATION

BE : BEVEL END

BHN : BRINNEL HARDNESS NUMBER

BS : BRITISH STANDARD

BW : BUTT WELD

E.FS.W : ELECTRIC FUSION WELD

E.R.W : ELECTRIC RESISTANCE WELD

FF : FLAT FACE

FLGD : FLANGED

HIC : HYDROGEN INDUCED CRACKING

IBR : INDIAN BOILER REGULATIONS

IS : INDIAN STANDARD

M : MATCHING (SCHEDULE/THICKNESS)

MP : MAGNETIC PARTICLE

MSS : MANUFACTURERS STANDARDIZATION SOCIETY

NACE : NATIONAL ASSOCIATION OF CORROSION ENGINEERS

NDT : NON DESTRUCTIVE TESTING

PBE : PLAIN BOTH END

PE : PLAIN END

PMS : PIPING MATERIAL SPECIFICATION

PWHT : POST WELD HEAT TREATMENT

RF : RAISED FACE

SS : STAINLESS STEEL

SW : SOCKET WELD

WN WELD NECK

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
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PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Reqt.	Basic Material	Service	Remarks
1	A11A	150	3		CARBON STEEL	MILD SOUR FLARE (NON NACE) - REFER NOTE 34.	
2	A1A	150	1.5		CARBON STEEL	NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A AND A10A; IN OFFSITES ONLY BEYOND A10A;	
3	A1K	150	0		SS 304	PURE NON CORROSIVE OR MILD CORROSIVE HYDROCARBONS FLAMMABLE/NON FLAMMABLE & NON LETHAL HYDROCARBONS, LUBE OIL (AFTER FILTERS), CHEMICALS ETC.	
4	A2A	150	1.5	IBR SERVICE	CARBON STEEL	STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR)	
5	A32A	150	1.5		CARBON STEEL	NONIBR STEAM TRACING (BEYOND STEAM SUPPLY MANIFOLD ISOLATION VALVES),NONIBR TRACER CONDENSATE	
6	A33Y	150	0		CARBON STEEL	SEA WATER (FIRE WATER-A/G & U/G)	
7	A3A	150	1.5		CARBON STEEL	NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2" & ABOVE), PLANT AIR, INERT GAS, CARBON DI OXIDE (DRY), NITROGEN, CONDENSATE & BOILER FEED SUCTION (NON IBR). THIS CLASS DOES NOT COVER UNDERGROUND PIPING AND THE FIRE WATER SERVICE. FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 7.0 KG/CM2G RESPECTIVELY.	
8	A3K	150	0		SS 304	DEMINERALISED WATER (OUTSIDE DM PLANT BATTERY LIMITS), POLISHED WATER, POLISHED CONDENSATE - CATEGORY 'D' , INSTRUMENT AIR UP TO 4".	
9	A93A	150	1.5		CARBON STEEL	UG & AG OWS, CBD AND UG CRWS.	

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PIPING MATERIAL SPECIFICATION INDEX

Sl. No	Piping Class	Rating	C.A	Spl. Reqt.	Basic Material	Service	Remarks
10	B1A	300	1.5		CARBON STEEL	NON CORROSIVE PROCESS - FLAMMABLE / NON FLAMMABLE, NON LETHAL - HYDROCARBONS, AROMATICS, AMMONIA, SWEET GAS, FLUSHING OIL AND OTHER UTILITIES -MP CONDENSATE, INSTRUMENT AIR, PLANT AIR, NITROGEN, AMMONIA GAS ETC. ABOVE CLASS 'A1A'.	
11	B2A	300	1.5	IBR SERVICE	CARBON STEEL	STEAM, BOILER FEED WATER & CONDENSATE - ALL IBR	
12	D2A	600	1.5	IBR SERVICE	CARBON STEEL	STEAM (IBR), BOILER FEED WATER (IBR)	
13	J2A	150	0		CS (Galv.)	POTABLE WATER (ABOVE GROUND ONLY), FIRE WATER-SPRINKLER SYSTEM AFTER ORIFICE	
14	J3A	150	0		CS (Galv.)	INSTRUMENT AIR (FOR ABOVE 4" IN UNITS AND FOR ALL SIZES IN OFFSITES)	
15	J91A	150	0		CS (Galv.)	HIGH PRESSURE WATER SPRAY SYSTEM (A/G)	

Notes : 1. For PMS General notes refer Annexure-I of this document

2. For PMS Extracts refer Annexure-II of this document

Package : IPMCS

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Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A11A Sheet 1 of 6

PIPE CLASS : **A11A**
RATING : 150
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 3 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73

SERVICE

MILD SOUR FLARE (NON NACE) - REFER NOTE 34.

NOTES

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS, REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS, REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL, PLUG & BUTTERFLY VALVES, REFER GENERAL NOTES.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 34 MAXIMUM HARDNESS IN WELD JOINTS SHALL BE LIMITED TO 200 BHN.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 173 THICKNESS CALCULATED BASED ON 80% OF CLASS CONDITION.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL'STD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A11A Sheet 2 of 6

[illegible]

CODE	DESCRIPTION				
F	SADDLE FUSED JT	T	TEES	J	THREADOLETS
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A11A Sheet 3 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	26	STD	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	
PIP	PIPE	30	30	STD	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	32
PIP	PIPE	32	44	XS	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	
PIP	PIPE	46	46	XS	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	32
PIP	PIPE	48	48	XS	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	52	52	12.7	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	56	56	12.7	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	60	60	14.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	64	64	14.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	68	68	16.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	72	72	16.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	76	76	16.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	80	80	18.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
PIP	PIPE	84	84	18.0	B-36.10	A672GR.B60 CL.12 (200 BHN MAX)	BE, E.FS.W	PI2H613Z0	173
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	36	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	

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A11A

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A11A Sheet 4 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Flange Group									
FLB	FLNG.BLIND	26	36		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	36		EIL'STD	ASTM A 516 GR.70	150, FF/125AARH	FCE6321Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB90	ELBOW.90	50	84	M	MNF'STD	ASTM A 234 GR.WPB-W	BW, 1.5D	WAN754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
ELB45	ELBOW.45	50	84	M	MNF'STD	ASTM A 234 GR.WPB-W	BW, 1.5D	WBN754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TEQ	T.EQUAL	50	84	M	MNF'STD	ASTM A 234 GR.WPB-W	BW	WEN754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	

Package : IPMCS

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A11A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A11A Sheet 5 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
TRED	T.RED	50	84	M, M	MNF'STD	ASTM A 234 GR.WPB-W	BW	WRN754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDC	REDUC.CONC	50	84	M, M	MNF'STD	ASTM A 234 GR.WPB-W	BW	WUN754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
REDE	REDUC.ECC	50	84	M, M	MNF'STD	ASTM A 234 GR.WPB-W	BW	WVN754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	50	84	M	MNF'STD	ASTM A 234 GR.WPB	BW	WFN684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	92

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A11A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301	54301ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55301	55301ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	36		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
GAS	GASKET	26	36		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
Trap/Strainer Group									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1A Sheet 1 of 6

PIPE CLASS : **A1A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73

SERVICE

NON CORROSIVE/ FLAMMABLE / NON FLAMMABLE/ NON LETHAL -PROCESS & HYDROCARBONS; LUBE OIL BEFORE FILTER; AMMONIA, STEAM & CONDENSATE (NON IBR); UTILITIES- INST AIR(BEYOND A3A), PLANT AIR, NITROGEN, CARBONDIOXIDE; WATER - BEYOND A3A AND A10A; IN OFFSITES ONLY BEYOND A10A;

NOTES

- 5 FOR PERMANENT "T" TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 36 THIS IS A PRESSURE BALANCED PLUG VALVES WHICH SHALL BE USED ONLY IF SPECIFIED IN P&ID.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1A Sheet 2 of 6

[illegible]

CODE	DESCRIPTION				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A1A Sheet 3 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	36	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	40	48	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLG/300	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FLB/300	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	48		EIL'STD	ASTM A 516 GR.70	150, FF/125AARH	FCE6321Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	

Package : IPMCS

Report No. : 50

A1A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1A Sheet 4 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1A Sheet 5 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	92
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
CHV	VLV.CHECK	26	28		API-594	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 53925	53925ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301	54301ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55301	55301ZZZ0	
PLV/I	VLV.PLUG	.5	36		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55315	55315ZZZ0	36
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56301	56301ZZZ0	
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56315	56315ZZZ0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Bolt Group									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.20- ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
GAS	GASKET	26	48		B-16.20- ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
GAS/30 0	GASKET	.5	24		B-16.20- ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK66274Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S: SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1K Sheet 1 of 5

PIPE CLASS : **A1K**
RATING : 150
BASE MATERIAL : SS 304
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371
PRESS	19.33	19.33	16.17	14.41	13.35	11.95	9.84	8.78	7.73

SERVICE

PURE NON CORROSIVE OR MILD CORROSIVE HYDROCARBONS
FLAMMABLE/NON FLAMMABLE & NON LETHAL HYDROCARBONS, LUBE OIL (AFTER FILTERS), CHEMICALS ETC.

NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1K Sheet 2 of 5

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
H	H. COUPLING
P	PIPE TO PIPE
R	REINFORCED
S	SOCKOLETS
T	TEES
W	WELDOLETS
I	INSTRUMENT TEE
X	Refer Notes
J	THREADOLET
L	SWEEPOLET

Package : IPMCS

Report No. : 50

A1K

Template No. 5-0000-0001-T2 Rev.

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1K Sheet 3 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	3	8	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	10	24	10S	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
Flange Group									
FLG	FLNG.WN	.5	1.5	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FWC4127Z0	
FLG	FLNG.LJ	2	24		B-16.5	ASTM A 105	150, STK/MAX1000AARH	FLC012EZ0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FBC4127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FGK4121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FCK4121Z0	
Fitting Group									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB90	ELBOW.90	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WAG894Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
ELB45	ELBOW.45	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WBG894Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TEQ	T.EQUAL	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WEG894ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	

Package : IPMCS

Report No. : 50

A1K

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1K Sheet 4 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
TRED	T.RED	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WRG894ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WUG874ZZ0	
REDC	REDUC.CONC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WUG894ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WVG874ZZ0	
REDE	REDUC.ECC	10	24	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WVG894ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	2	24	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
STB	STUB.END	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 125AARH	WSG8741Z0	
STB	STUB.END	10	24	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 125AARH	WSG8941Z0	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51345	51345ZZZ0	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52345	52345ZZZ0	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A1K Sheet 5 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
						STELLITED			
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53345	53345ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 351 GR.CF8 / ASTM A 182 GR.F304,TRIM-SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54345	54345ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 182 GR.F304 / ASTM A 351 GR.CF8,TRIM-PLUG-SS304/SS316	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 55345	55345ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	24		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
Trap/Strainer Group									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A240TP304;INT:S S304	CONETYPE, 150,FF/125AARH	ST14131Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	2	8	M	EIL'STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	
PSR	STRNR.PERM	10	24	M	EIL'STD	B:A403GR.WP304-WX;INT:SS304	BW, T-TYPE	SP15444Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A2A Sheet 1 of 6

PIPE CLASS : **A2A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	204	260	280	300
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	11.19	10.44

SERVICE

STEAM (IBR), BOILER FEED WATER (IBR) & CONDENSATE (IBR)

NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A2A Sheet 2 of 6

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
-------------	--------------------

F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Package : IPMCS

Report No. : 50

A2A

Template No. 5-0000-0001-T2 Rev.

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A2A Sheet 3 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	16	36	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	
PIP	PIPE	38	48	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
Flange Group									
FLG	FLNG.WN	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z1	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z1	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z1	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z1	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z1	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z1	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z1	
FEF	SPCR&BLND	26	48		EIL'STD	ASTM A 516 GR.70	150, FF/125AARH	FCE6321Z1	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z1	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z1	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	
ELB90	ELBOW.90	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z1	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z1	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A2A Sheet 4 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	
ELB45	ELBOW.45	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z1	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z1	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z1	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z1	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ1	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ1	
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z1	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z1	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z1	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z1	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z1	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z1	

Signature Not Verified

Digitally signed by RITU AMB
Date: 2017.08.31 16:59:22 IST
Location: eProcure

Package : IPMCS

Report No. : 50

Template No. 5-0000-0001-T2 Rev.

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A2A Sheet 5 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z1	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z1	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51002	51002ZZZ1	
GAV	VLV.GATE	2	36		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51302	51302ZZZ1	92
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52002	52002ZZZ1	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52302	52302ZZZ1	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53002	53002ZZZ1	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53302	53302ZZZ1	
BLV	VLV.BALL	.5	1.5		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-PEEK	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54302	54302ZZZ1	
G3V	VLV.PISTON	.5	1		MNF'STD	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	SW, 300, 3000, B-16.11, SHT NO.- 64402	64402ZZZ1	
Bolt Group									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
GAS	GASKET	26	48		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 150,RF/125AARH	TR3065531	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z1	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A2A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Trap/Strainer Group									
PSR	STRNR.PERM	.5	1.5		MNFSTD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D511	
PSR	STRNR.PERM	2	24		MNFSTD	B:A216GR.WCB;IN T:SS304	FLGD, Y-TYPE, 150,RF/125AARH	SP3805531	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A32A Sheet 1 of 4

PIPE CLASS : **A32A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	204	260	280
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	11.19

SERVICE

NONIBR STEAM TRACING (BEYOND STEAM SUPPLY MANIFOLD ISOLATION VALVES),NONIBR TRACER CONDENSATE

NOTES

- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0"	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DF3	
	ON LINES >=2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, VF3	
	ON LINES >=2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN.	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN.	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A32A Sheet 2 of 4

84.00								84.00
80.00								80.00
76.00								76.00
72.00								72.00
70.00								70.00
68.00								68.00
66.00								66.00
64.00								64.00
62.00								62.00
60.00								60.00
58.00								58.00
56.00								56.00
54.00								54.00
52.00								52.00
50.00								50.00
48.00								48.00
46.00								46.00
44.00								44.00
42.00								42.00
40.00								40.00
38.00								38.00
36.00								36.00
34.00								34.00
32.00								32.00
30.00								30.00
28.00								28.00
26.00								26.00
24.00								24.00
22.00								22.00
20.00								20.00
18.00								18.00
16.00								16.00
14.00								14.00
12.00								12.00
10.00								10.00
8.00								8.00
6.00								6.00
5.00								5.00
4.00								4.00
3.50								3.50
3.00							T	3.00
2.50								2.50
2.00					T		P	2.00
1.50				T	T		H	1.50
1.25								1.25
1.00		T		T	H		H	1.00
0.75	T	T		T	H		H	0.75
0.50	T	T		T	H		H	0.50
.50								
.75								
1.00								
1.25								
1.50								
2.00								
2.50								
3.00								

RUN PIPE (SIZE IN INCHES)

CODE	DESCRIPTION				
F	SADDLE FUSED JT	T	TEES	J	THREDOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Package : IPMCS

Report No. : 50

A32A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A32A Sheet 3 of 4

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
NIP	NIPPLE	.5	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG	FLNG.WN	2	3	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLB	FLNG.BLIND	.5	3		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FEF	FLNG.FIG.8	.5	3		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
Fitting Group									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	3	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	3	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	3	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	3	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
REDC	REDUC.CONC	2	3	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDE	REDUC.ECC	2	3	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	3	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	

Package : IPMCS

Report No. : 50

A32A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A32A Sheet 4 of 4

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
BLV	VLV.BALL	.5	3		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-PEEK	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54322	54322ZZZ0	
G3V	VLV.PISTON	.5	1		MNF'STD	BODY-ASTM A 216 GR.WCB,TRIM-13% CR,STEEL	SW, 300, 3000, B-16.11, SHT NO.- 64422	64422ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	3		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	3		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, BPTHRMST, 150,RF/125AARH	TR3065730	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 1 of 7

PIPE CLASS : **A33Y**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	50	65
PRESS	18.9	18.9	18.9	18.9

SERVICE

SEA WATER (FIRE WATER-A/G & U/G)

NOTES

- 23 REFER 'STANDARD SPECIFICATION FOR CEMENT LINED PIPING (6-44-0074)' FOR DETAILS.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 38 CORROSION ALLOWANCE SHALL BE 3.00 MM FOR SIZES UPTO 2" AND NIL FOR SIZES 3" & ABOVE.
- 80 ALL PIPING COMPONENTS EXCEPT VALVES AND STRAINERS FOR SIZES 3" & ABOVE SHALL BE CEMENT LINED AT SITE.
- 81 VALVES AND Y-TYPE STRAINERS FOR SIZES 3" & ABOVE SHALL BE INTERNALLY LINED WITH GLASS FLAKE REINFORCED EPOXY AS PER SPECIFICATION B016-000-79-41-PLS-03.
- 82 ALL BLIND FLANGES, FIG.8 FLANGES AND SPACER & BLINDS SHALL BE LINED WITH GLASS FLAKE REINFORCED EPOXY FOR THE WETTED PORTION AS PER SPECIFICATION B016-000-79-41-PLS-03.
- 88 AS PER TAC REQUIREMENTS, 10% OF THE BUTT WELD JOINTS SHALL BE RADIOGRAPHED. HOWEVER, 50% OF THESE BUTT WELD JOINTS SHALL BE FIELD WELD JOINTS.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 193 FOR EXTERNAL COATING OF BURRIED PIPING AND FITTINGS REFER JOB SEPC. B016-000-79-41-PLS-04.

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 2 of 7

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED	
PIPE JOINTS	0.5" TO 1.5"	SW COUPLING	
	2" TO 2.5"	BUTT WELDED	
	3" & ABOVE	FLANGED	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DF3	
	2.0" TO 2.5"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
	ON LINES >= 3.0"	AS PER P&ID; REFER EIL STD. 6-44-0074 & 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	2.0" TO 2.5"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, V4	
	ON LINES >= 3.0"	AS PER P&ID; REFER EIL STD. 6-44-0074 & 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED, REFER EIL STD 6-44-0074 & 7-44-0353	
PRESS.CONN	0.75"	FLANGED WITH VALVE TO SPEC. REFER EIL STD 6-44-0074 & 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 3 of 7

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 4 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2.5	2.5	STD	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	3	6	STD	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	8	12	8.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
PIP	PIPE	14	24	10.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
PIP	PIPE	26	30	12.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
PIP	PIPE	32	38	12.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
PIP	PIPE	40	46	12.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
PIP	PIPE	48	48	14.0	IS-3589	IS-3589 GR.410	PE, SAW	PI7E376Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, FF/125AARH	FSC0121Z0	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, FF/125AARH	FWB0121Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105	150, FF/125AARH	FNC0121Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, FF/125AARH	FBC0121Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 285 GR.C	150, FF/125AARH	FBB5321Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	48		EIL'STD	ASTM A 285 GR.C	150, FF/125AARH	FCE5321Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 5 of 7

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	2.5	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	3	6	STD	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	2.5	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	3	6	STD	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	2.5	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	3	6	STD	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	2.5	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	3	6	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	2.5	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	3	6	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	2.5	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 6 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
REDE	REDUC.ECC	3	6	STD, STD	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	2.5	M, M	BS-3799	ASTM A 105	TBE	WNH02EZZ0	
SWGE	SWAGE.ECC	.5	2.5	M, M	BS-3799	ASTM A 105	TBE	WPH02EZZ0	
CAP	CAP	.5	.75		B-16.11	ASTM A 105	SCRF, 6000	WF60283Z0	
CAP	CAP	1	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	2	2.5	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	3	6	STD	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WFG754ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM-IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 51080	51080ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 51384	51384ZZZ0	
GLV	VLV.GLOBE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM-IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 52080	52080ZZZ0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A33Y Sheet 7 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 52384	52384ZZZ0	
CHV	VLV.CHECK	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 53080	53080ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 53384	53384ZZZ0	
CHV	VLV.CHECK	26	48		API-594	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.47 B, FF/125AARH, SHT NO.- 53382	53382ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 56931	56931ZZZ0	
BFV	VLV.BTRFLY	26	36		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-BRONZE	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56382	56382ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7(GALV), NUT:A194 2H(GALV)		BS40513Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GKBAX22Z0	
GAS	GASKET	26	48		B-16.21-ANSI B16.47B	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GKAAX22Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	3	24		MNF*STD	B:A216GR.WCB(G ALV);INT:BRONZE	FLGD, Y-TYPE, 150,FF/125AARH	SP3905510	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 1 of 7

PIPE CLASS : **A3A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	50	65	100	150	186
PRESS	10.55	10.55	10.55	10.55	10.55	10.55	10.55

SERVICE

NON CORROSIVE UTILITIES (ABOVE GROUND) CATEGORY "D" FLUID - COOLING WATER, INSTRUMENT AIR(2" & ABOVE), PLANT AIR, INERT GAS, CARBON DI OXIDE (DRY), NITROGEN, CONDENSATE & BOILER FEED SUCTION (NON IBR). THIS CLASS DOES NOT COVER UNDERGROUND PIPING AND THE FIRE WATER SERVICE. FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 7.0 KG/CM2G RESPECTIVELY.

NOTES

- 6 FOR FABRICATED REDUCERS,REFER EIL/STD 7-44-0485 & 7-44-0487. FOR MITRES, REFER EIL/STD 7-44-0033.
- 31 USE BUTTERFLY VALVES INSTEAD OF GATE VALVES FROM 10" ONWARDS IN WATER SERVICE AND UPTO 70 DEG C. DESIGN PRESSURE FOR BUTTERFLY VALVES IS LIMITED UPTO 10 BAR.
- 64 AWWA C207 CL.D FLANGES SHALL BE OF HUB TYPE.
- 65 FORGINGS ARE ACCEPTABLE IN LIEU OF PLATE MATERIAL FOR BLIND FLANGES AND SPACER & BLINDS.
- 76 FOR PERMANENT BW STRAINERS,REFER EIL/STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL/STD 7-44-0300.
- 77 FOR SIZES > 24", SPACER & BLIND SHALL BE DESIGNED BY THE MANUFACTURER AS PER ASME B31.3.
- 86 BUTTERFLY VALVES FOR THE SPEC ARE PN10 RATED WITH A MAXIMUM PRESSURE OF 10.2 KG/CM2G.
- 97 USE 5-PIECE 90 DEG. MITRE FOR SIZES FROM 16" TO 44", 6-PIECE 90 DEG. MITRE FOR SIZES 48" TO 68" & 7-PIECE MITRE FOR SIZES 72" TO 80". 45 DEG. MITRE SHALL REQUIRE ONE PIECE LESS.
- 98 FOR SIZES ABOVE 30", TEMPERATURE AND PRESSURE RATINGS SHALL BE 70 DEG.C & 7.0 KG/CM2G RESPECTIVELY.
- 99 BLIND FLANGES AND SPACER & BLINDS SPECIFIED TO MANUFACTURER'S STANDARD SHALL BE DESIGNED FOR 70 DEG.C AND 7.0 KG/CM2G TO SUIT 150#, FF, 125AARH, AWWA C207 CL.D FLANGES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING 3000 LBS.	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL/STD 7-44-350, DF3	
	ON LINES >= 2.0"	0.75" OR AS PER P&ID. REFER EIL STD. 7-44-351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-350, VC1	
	ON LINES >= 2.0"	0.75" OR AS PER P&ID. REFER EIL STD 7-44-351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-353	
PRESS.CONN	0.75"	SW, SH HVY NIPPLE WITH GATE VALVE TO SPEC AS PER EIL STD 7-44-354	

Package : IPMCS

Report No. : 50

A3A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 2 of 7

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 3 of 7

			84.00
			80.00
			76.00
		R	72.00
	R	R	70.00
R	R	R	68.00
R	R	R	66.00
R	R	R	64.00
R	R	R	62.00
R	R	R	60.00
R	R	R	58.00
R	R	R	56.00
R	R	R	54.00
R	R	R	52.00
R	R	R	50.00
R	R	R	48.00
R	R	R	46.00
R	R	R	44.00
R	R	R	42.00
R	R	R	40.00
R	R	R	38.00
R	R	R	36.00
R	R	R	34.00
R	R	R	32.00
R	R	R	30.00
R	R	R	28.00
R	R	R	26.00
R	R	R	24.00
			22.00
R	R	R	20.00
R	R	R	18.00
R	R	R	16.00
R	R	R	14.00
R	R	R	12.00
R	R	R	10.00
R	R	R	8.00
R	R	R	6.00
			5.00
R	R	R	4.00
			3.50
R	R	R	3.00
			2.50
R	R	R	2.00
H	H	H	1.50
			1.25
H	H	H	1.00
H	H	H	0.75
H	H	H	0.50
68.00			
70.00			
72.00			

BRANCH PIPE (SIZE IN INCHES)

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 4 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	6	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	8	14	6.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	16	18	8.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	20	24	10.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	26	48	12.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	50	60	14.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	64	72	16.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
PIP	PIPE	76	80	18.0	IS-3589	IS-3589 GR.330	BE, SAW	PI7D916Z0	
NIP	NIPPLE	.5	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	150, RF/125AARH	FSC0127Z0	
FLG	FLNG.SO	2	24		B-16.5	ASTM A 105	150, RF/125AARH	FNC0127Z0	
FLG	FLNG.SO	26	80		AWWA-C207 CL.D	ASTM A 105	150, FF/125AARH	FN40121Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		AWWA-C207 CL.D	ASTM A 285 GR.C	150, FF/125AARH	FB45321Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	80		MNF'STD	ASTM A 285 GR.C	150, FF/125AARH	FCG5321Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 5 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
MIT90	MITRE.90	16	80	M	EIL'STD	IS-3589 GR.330	BW, 1.5D	WDKF141Z0	
MIT45	MITRE.45	16	80	M	EIL'STD	IS-3589 GR.330	BW, 1.5D	WGKF141Z0	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	8	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	8	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDC	REDUC.CONC	16	80	M, M	EIL'STD	IS-3589 GR.330	BW	WUKF14ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
REDE	REDUC.ECC	16	80	M, M	EIL'STD	IS-3589 GR.330	BW	WVKF14ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	

Package : IPMCS

Report No. : 50

A3A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 6 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	.75		B-16.11	ASTM A 105	SCRF, 6000	WF60283Z0	
CAP	CAP	1	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	2	6	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CAP	CAP	8	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
UNN	UNION	.5	.75		BS-3799	ASTM A 105	SW, 6000	WQH02D3Z0	
UNN	UNION	1	1.5		BS-3799	ASTM A 105	SW, 3000	WQH02D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51321	51321ZZZ0	
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52321	52321ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	

Package : IPMCS

Report No. : 50

A3A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3A Sheet 7 of 7

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53321	53321ZZZ0	
CHV	VLV.CHECK	26	48		API-594	BODY-ASTM A 105 / A 216GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 53316	53316ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54321	54321ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56321	56321ZZZ0	
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, AWWAC207, FF/125AARH, SHT NO.- 56316	56316ZZZ0	
Bolt Group									
BOS	BOLT.STUD	18	80		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
BOM	BOLT.M/C	.5	16		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
GAS	GASKET	26	80		AWWA-C207 CL.D	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GK2AX22Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, THRMNMC, 150,RF/125AARH	TR3065530	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A285GR.C;INT:S S304	CONETYPE, 150,FF/125AARH	ST14431Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	6	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	8	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3K Sheet 1 of 5

PIPE CLASS : **A3K**
 RATING : 150
 BASE MATERIAL : SS 304
 CORROSION ALLOWANCE : 0 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	186
PRESS	10.55	10.55	10.55	10.55	10.55

SERVICE

DEMINERALISED WATER (OUTSIDE DM PLANT BATTERY LIMITS), POLISHED WATER, POLISHED CONDENSATE - CATEGORY 'D', INSTRUMENT AIR UP TO 4".

NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DC3	
	ON LINES >= 2.0"	AS PER P&ID. OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VC1	
	ON LINES >= 2.0"	AS PER P&ID. OR 0.75". REFER EIL STD 7-44-0351, V1	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3K Sheet 2 of 5

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A3K Sheet 3 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	80S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	1	1.5	40S	B-36.19	ASTM A 312 TP304	PE, SEAMLESS	PI33577Z0	
PIP	PIPE	2	2	40S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	3	8	10S	B-36.19	ASTM A 312 TP304	BE, SEAMLESS	PI33517Z0	
PIP	PIPE	10	14	10S	B-36.19	ASTM A 358 TP304 CL.1	BE, E.FS.W	PI35513Z0	
NIP	NIPPLE	.5	.75	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
NIP	NIPPLE	1	1.5	M	B-36.19	ASTM A 312 TP304	PBE, SEAMLESS	PN33567Z0	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FSC4127Z0	
FLG	FLNG.LJ	2	14		B-16.5	ASTM A 105	150, STK/MAX1000AARH	FLC012EZ0	
FLB	FLNG.BLIND	.5	14		B-16.5	ASTM A 182 GR.F304	150, RF/125AARH	FBC4127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FGK4121Z0	
FEF	SPCR&BLND	10	14		ASME-B16.48	ASTM A 182 GR.F304	150, FF/125AARH	FCK4121Z0	
Fitting Group									
ELB90	ELBOW.90	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WA642D2Z0	
ELB90	ELBOW.90	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WAG874Z10	
ELB90	ELBOW.90	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WAG894Z10	
ELB45	ELBOW.45	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WB642D2Z0	
ELB45	ELBOW.45	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 1.5D	WBG874Z10	
ELB45	ELBOW.45	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 1.5D	WBG894Z10	
TEQ	T.EQUAL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WE642D2Z0	
TEQ	T.EQUAL	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WEG874ZZ0	
TEQ	T.EQUAL	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WEG894ZZ0	
TRED	T.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WR642D2Z0	

Package : IPMCS

Report No. : 50

A3K

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A3K Sheet 4 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
TRED	T.RED	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WRG874ZZ0	
TRED	T.RED	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WRG894ZZ0	
REDC	REDUC.CONC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WUG874ZZ0	
REDC	REDUC.CONC	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WUG894ZZ0	
REDE	REDUC.ECC	2	8	M, M	B-16.9	ASTM A 403 GR.WP304-S	BW	WVG874ZZ0	
REDE	REDUC.ECC	10	14	M, M	B-16.9	ASTM A 403 GR.WP304-WX	BW	WVG894ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WNH426ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 182 GR.F304	PBE	WPH426ZZ0	
CAP	CAP	.5	1.5		B-16.11	ASTM A 182 GR.F304	SCRF, 3000	WF64282Z0	
CAP	CAP	2	14	M	B-16.9	ASTM A 403 GR.WP304-S	BW	WFG874ZZ0	
CPLF	CPLNG.FULL	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WJ642D2Z0	
CPLH	CPLNG.HALF	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WK642D2Z0	
CPLL	CPLNG.LH	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WL642D2Z0	
CPLR	CPLNG.RED	.5	1.5		B-16.11	ASTM A 182 GR.F304	SW, 3000	WM642D2Z0	
STB	STUB.END	2	8	M	B-16.9	ASTM A 403 GR.WP304-S	BW, 125AARH	WSG8741Z0	
STB	STUB.END	10	14	M	B-16.9	ASTM A 403 GR.WP304-WX	BW, 125AARH	WSG8941Z0	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SW, 800, 3000, B-16.11, SHT NO.- 51045	51045ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51345	51345ZZZ0	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS304	SW, 800, 3000, B-16.11, SHT NO.- 52045	52045ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52345	52345ZZZ0	

Package : IPMCS

Report No. : 50

A3K

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A3K Sheet 5 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53045	53045ZZZ0	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 351 GR.CF8,TRIM-SS 304	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53345	53345ZZZ0	
BFV	VLV.BTRFLY	3	14		BS EN 593	BODY-ASTM A 351 GR CF8,TRIM-SS 304	WAFL, 150, B-16.5, SHT NO.- 56351	56351ZZZ0	
Bolt Group									
BOM	BOLT.M/C	.5	14		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
Gasket Group									
GAS	GASKET	.5	14		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	RING, 150, 2 MM	GKBAX52Z0	
Trap/Strainer Group									
TSR	STRNR.TEMP	1.5	14		EIL'STD	B:A240TP304;INT:S S304	CONETYPE, 150,FF/125AARH	ST14131Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A182GR.F304;IN T:SS304	SW, Y-TYPE, 800	SP307D510	
PSR	STRNR.PERM	2	8	M	EIL'STD	B:A403GR.WP304-S;INT:SS304	BW, T-TYPE	SP15344Z0	
PSR	STRNR.PERM	10	14	M	EIL'STD	B:A403GR.WP304-WX;INT:SS304	BW, T-TYPE	SP15444Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A93A Sheet 1 of 6

PIPE CLASS : **A93A**
 RATING : 150
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371
PRESS	20.03	20.03	18.28	16.17	14.06	11.95	9.84	8.78	7.73

SERVICE

UG & AG OWS, CBD AND UG CRWS.

NOTES

- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 92 GATE VALVES OF SIZE 26" AND ABOVE SHALL BE IN ACCORDANCE WITH B-16.34/ BS-1414 AND FLANGE ENDS SHALL BE IN ACCORDANCE WITH ASME B16.47 SERIES B.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 104 FOR PERMANENT AND TEMPORARY T-TYPE BW STRAINERS REFER EIL STD 7-44-0303 AND 7-44-0304
- 108 FOR UNDERGROUND PIPING, PIPE WALL THICKNESS ARE CALCULATED BASED ON SOIL PARAMETERS AND BURIAL DEPTH UP TO 3000 MM.
- 110 MINIMUM SOIL COVER FOR U/G PIPING SHALL BE 600MM FOR 0.5"-32", 800MM FOR 36"-42" & 1000MM FOR 44"-48".
- 191 SUITABILITY OF PIPE THICKNESS FOR U/G SERVICE HAVE BEEN VERIFIED FOR DESIGN PRESSURE OF 3.5 KG/CM2G AND TEMPERATURE OF 371 DEG. C.
- 193 FOR EXTERNAL COATING OF BURRRIED PIPING AND FITTINGS REFER JOB SEPC. B016-000-79-41-PLS-04.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL'STD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353(NOTE 124	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Package : IPMCS

Report No. : 50

A93A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A93A Sheet 2 of 6

[illegible]

CODE	DESCRIPTION				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : A93A Sheet 3 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	24	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	26	36	STD	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	38	48	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.WN	.5	24	M	B-16.5	ASTM A 105	150, RF/125AARH	FWC0127Z0	
FLG	FLNG.WN	26	48	M	B-16.47-B	ASTM A 105	150, RF/125AARH	FWB0127Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	150, RF/125AARH	FBC0127Z0	
FLB	FLNG.BLIND	26	48		B-16.47-B	ASTM A 105	150, RF/125AARH	FBB0127Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	150, FF/125AARH	FGK0121Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	150, FF/125AARH	FCK0121Z0	
FEF	SPCR&BLND	26	48		EIL'STD	ASTM A 516 GR.70	150, FF/125AARH	FCE6321Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A93A Sheet 4 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	48	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	48	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	.5	.75		B-16.11	ASTM A 105	SCRF, 6000	WF60283Z0	
CAP	CAP	1	1.5		B-16.11	ASTM A 105	SCRF, 3000	WF60282Z0	
CAP	CAP	2	48	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A93A Sheet 5 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dimn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	42		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-HARDFACED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 51301	51301ZZZ0	
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13% CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	16		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-HARDFACED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 52301	52301ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS 1868	BODY-ASTM A 216 GR.WCB,TRIM-13%CR.STEEL, SEATS-HARDFACED	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 53301	53301ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 150, B-16.5, RF/125AARH, SHT NO.- 54301	54301ZZZ0	
BFV	VLV.BTRFLY	3	24		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	WAF, 150, B-16.5, WAF/125AARH, SHT NO.- 56301	56301ZZZ0	
BFV	VLV.BTRFLY	26	48		BS EN 593	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 150, B-16.47 B, RF/125AARH, SHT NO.- 56315	56315ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	48		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	

Package : IPMCS

Report No. : 50

A93A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : A93A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Gasket Group									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 150	GK65072Z0	
GAS	GASKET	26	48		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 150	GK56272Z0	
Trap/Strainer Group									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 150,FF/125AARH	ST16831Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	104
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	104

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : B1A Sheet 1 of 6

PIPE CLASS : **B1A**
RATING : 300
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371	399	427
PRESS	52.02	52.02	47.8	46.05	44.64	42.53	40.07	38.66	37.26	35.5	28.82

SERVICE

NON CORROSIVE PROCESS - FLAMMABLE / NON FLAMMABLE, NON LETHAL - HYDROCARBONS, AROMATICS, AMMONIA, SWEET GAS, FLUSHING OIL AND OTHER UTILITIES -MP CONDENSATE, INSTRUMENT AIR, PLANT AIR, NITROGEN, AMMONIA GAS ETC. ABOVE CLASS 'A1A'.

NOTES

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 7 FOR RESTRICTION ON USE OF BALL,PLUG & BUTTERFLY VALVES,REFER GENERAL NOTES.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 173 THICKNESS CALCULATED BASED ON 80% OF CLASS CONDITION.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B1A Sheet 2 of 6

[illegible]**RUN PIPE (SIZE IN INCHES)**

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Package : IPMCS

Report No. : 50

B1A

Template No. 5-0000-0001-T2 Rev.

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B1A Sheet 3 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z0	
PIP	PIPE	16	18	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	
PIP	PIPE	20	20	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	32
PIP	PIPE	24	24	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	173
PIP	PIPE	26	26	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	32,173
PIP	PIPE	28	28	S30	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	173
PIP	PIPE	30	30	S30	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z0	173
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z0	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z0	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z0	
FLG	FLNG.WN	26	28	M	B-16.47-B	ASTM A 105	300, RF/125AARH	FWB0147Z0	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z0	
FLB	FLNG.BLIND	26	28		B-16.47-B	ASTM A 105	300, RF/125AARH	FBB0147Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	300, FF/125AARH	FGK0141Z0	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	300, FF/125AARH	FCK0141Z0	
FEF	SPCR&BLND	26	28		EIL'STD	ASTM A 516 GR.70	300, FF/125AARH	FCE6341Z0	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z0	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B1A Sheet 4 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z10	
ELB90	ELBOW.90	16	28	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z10	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z0	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z0	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z10	
ELB45	ELBOW.45	16	28	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z10	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z0	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z0	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ0	
TEQ	T.EQUAL	16	28	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ0	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z0	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z0	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ0	
TRED	T.RED	16	28	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ0	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ0	
REDC	REDUC.CONC	16	28	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ0	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ0	
REDE	REDUC.ECC	16	28	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ0	
CAP	CAP	2	28	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ0	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z0	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B1A Sheet 5 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z0	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z0	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z0	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z0	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z0	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z0	
Valves Group									
GAV	VLV.GATE	.25	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51001	51001ZZZ0	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51401	51401ZZZ0	
GLV	VLV.GLOBE	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52001	52001ZZZ0	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52401	52401ZZZ0	
CHV	VLV.CHECK	.25	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53001	53001ZZZ0	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53401	53401ZZZ0	
BLV	VLV.BALL	.5	16		BS EN ISO 17292	BODY-ASTM A 105 / A 216GR.WCB,TRIM-BODY SEAT-RPTFE	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 54401	54401ZZZ0	
PLV	VLV.PLUG	.5	24		BS-5353	BODY-ASTM A 105 / A 216GR.WCB,TRIM-PLUG-HARDENED	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 55401	55401ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	28		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	24		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 300	GK65074Z0	

Package : IPMCS

Report No. : 50

B1A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B1A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Gasket Group									
GAS	GASKET	26	28		B-16.20-ANSI B16.47B	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 300	GK56274Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S: SS304	FLGD, THRMDNMC, 300,RF/125AARH	TR30655B0	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 300,FF/125AARH	ST16839Z0	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D510	
PSR	STRNR.PERM	2	14	M	EIL'STD	B:A234GR.WPB;IN T:SS304	BW, T-TYPE	SP13344Z0	
PSR	STRNR.PERM	16	24	M	EIL'STD	B:A234GR.WPBW;I NT:SS304	BW, T-TYPE	SP13644Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 1 of 6

PIPE CLASS : **B2A**
RATING : 300
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	204	260	316	343	371	399	427
PRESS	52.02	52.02	47.8	46.05	44.64	42.53	40.07	38.66	37.26	35.5	28.82

SERVICE

STEAM, BOILER FEED WATER & CONDENSATE - ALL IBR

NOTES

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 173 THICKNESS CALCULATED BASED ON 80% OF CLASS CONDITION.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EILSTD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 2 of 6

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 3 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	3	14	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	16	18	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	
PIP	PIPE	20	20	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	32
PIP	PIPE	24	24	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	173
PIP	PIPE	26	26	XS	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	32,173
PIP	PIPE	28	30	S30	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	173
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	300, RF/125AARH	FSC0147Z1	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	300, RF/125AARH	FWC0147Z1	
FLG	FLNG.WN	26	30	M	B-16.47-B	ASTM A 105	300, RF/125AARH	FWB0147Z1	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	300, RF/125AARH	FBC0147Z1	
FLB	FLNG.BLIND	26	30		B-16.47-B	ASTM A 105	300, RF/125AARH	FBB0147Z1	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	300, FF/125AARH	FGK0141Z1	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	300, FF/125AARH	FCK0141Z1	
FEF	SPCR&BLND	26	30		EIL'STD	ASTM A 516 GR.70	300, FF/125AARH	FCE6341Z1	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z1	
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z1	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	

Package : IPMCS

Report No. : 50

B2A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 4 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z1	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z1	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	
ELB45	ELBOW.45	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z1	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z1	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z1	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z1	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ1	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ1	
CAP	CAP	2	30	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z1	
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z1	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z1	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 5 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z1	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z1	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z1	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z1	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z1	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51002	51002ZZZ1	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 51402	51402ZZZ1	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52002	52002ZZZ1	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 52402	52402ZZZ1	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53002	53002ZZZ1	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-13% CR STEEL	FLGD, 300, B-16.5, RF/125AARH, SHT NO.- 53402	53402ZZZ1	
G3V	VLV.PISTON	.5	1		MNF'STD	BODY-ASTM A 216 GR.WCB,TRIM-13% CR.STEEL	SW, 300, 3000, B-16.11, SHT NO.- 64402	64402ZZZ1	
Bolt Group									
BOS	BOLT.STUD	.5	30		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	30		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 300	GK65074Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 300,RF/125AARH	TR30655B1	
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 300,FF/125AARH	ST16839Z1	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D511	

Package : IPMCS

Report No. : 50

B2A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : B2A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Trap/Strainer Group									
PSR	STRNR.PERM	2	24		MNF'STD	B:A216GR.WCB;IN T:SS304	FLGD, Y-TYPE, 300,RF/125AARH	SP38055B1	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : D2A Sheet 1 of 6

PIPE CLASS : **D2A**
RATING : 600
BASE MATERIAL : CARBON STEEL
CORROSION ALLOWANCE : 1.5 MM
SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	204	260	316	343	371	399	427
PRESS	104.05	104.05	95.6	92.09	88.92	84.71	79.79	77.33	74.52	71.35	58

SERVICE

STEAM (IBR), BOILER FEED WATER (IBR)

NOTES

- 1 NDT REQUIREMENTS AS PER EIL STANDARD 6-44-0016.
- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
- 5 FOR PERMANENT 'T' TYPE BW STRAINERS,REFER EIL'STD 7-44-0303 & 7-44-0304; AND FOR TEMPORARY STRAINERS,REFER EIL'STD 7-44-0300; FOR SPACER AND BLIND REFER EIL'STD 7-44-0162.
- 8 ALL PIPES,FITTINGS,VALVES,FLANGES,TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES,FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER,FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCHEDULE. REFER GENERAL NOTES TO PMS.
- 173 THICKNESS CALCULATED BASED ON 80% OF CLASS CONDITION.
- 306 PIPE WALL THICKNESS IS CALCULATED BASED ON ACTUAL LINE DESIGN CONDITION [400 DEG. C & 40 KG/ CM2 G] SUBJECT TO MINIMUM OF 20 MM THICKNESS.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	1.5" & BELOW	SW COUPLING	
	2.0" & ABOVE	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL'STD 7-44-0350, DF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D4	
VENTS	ON LINES <= 1.5"	REFER EIL STD. 7-44-0350, VF3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V4	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SW NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : D2A Sheet 2 of 6

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
T	TEES
J	THREADOLET
H	H. COUPLING
W	WELDOLETS
P	PIPE TO PIPE
I	INSTRUMENT TEE
R	REINFORCED
X	Refer Notes
S	SOCKOLETS
L	SWEEPOLET

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : D2A Sheet 3 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B	PE, SEAMLESS	PI21977Z1	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	3	3	STD	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	32
PIP	PIPE	4	8	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	10	12	XS	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	173
PIP	PIPE	14	14	S60	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	173
PIP	PIPE	16	18	S60	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	173
PIP	PIPE	20	20	20.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	306
PIP	PIPE	24	24	20.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	306
PIP	PIPE	26	30	20.0	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	306
NIP	NIPPLE	.5	.75	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
NIP	NIPPLE	1	1.5	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
Flange Group									
FLG	FLNG.SW	.5	1.5	M	B-16.5	ASTM A 105	600, RF/125AARH	FSC0167Z1	
FLG	FLNG.WN	2	24	M	B-16.5	ASTM A 105	600, RF/125AARH	FWC0167Z1	
FLG	FLNG.WN	26	30	M	B-16.47-B	ASTM A 105	600, RF/125AARH	FWB0167Z1	
FLB	FLNG.BLIND	.5	24		B-16.5	ASTM A 105	600, RF/125AARH	FBC0167Z1	
FLB	FLNG.BLIND	26	30		B-16.47-B	ASTM A 105	600, RF/125AARH	FBB0167Z1	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105	600, FF/125AARH	FGK0161Z1	
FEF	SPCR&BLND	10	24		ASME-B16.48	ASTM A 105	600, FF/125AARH	FCK0161Z1	
FEF	SPCR&BLND	26	30		EIL/STD	ASTM A 516 GR.70	600, FF/125AARH	FCE6361Z1	
Fitting Group									
ELB90	ELBOW.90	.5	.75		B-16.11	ASTM A 105	SW, 6000	WA602D3Z1	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : D2A Sheet 4 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
ELB90	ELBOW.90	1	1.5		B-16.11	ASTM A 105	SW, 3000	WA602D2Z1	
ELB90	ELBOW.90	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	
ELB90	ELBOW.90	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	.5	.75		B-16.11	ASTM A 105	SW, 6000	WB602D3Z1	
ELB45	ELBOW.45	1	1.5		B-16.11	ASTM A 105	SW, 3000	WB602D2Z1	
ELB45	ELBOW.45	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	
ELB45	ELBOW.45	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WE602D3Z1	
TEQ	T.EQUAL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WE602D2Z1	
TEQ	T.EQUAL	2	14	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16	30	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WR602D3Z1	
TRED	T.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WR602D2Z1	
TRED	T.RED	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	2	14	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16	30	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WNH026ZZ1	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105	PBE	WPH026ZZ1	
CAP	CAP	2	30	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	
CPLF	CPLNG.FULL	.5	.75		B-16.11	ASTM A 105	SW, 6000	WJ602D3Z1	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : D2A Sheet 5 of 6

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLF	CPLNG.FULL	1	1.5		B-16.11	ASTM A 105	SW, 3000	WJ602D2Z1	
CPLH	CPLNG.HALF	.5	.75		B-16.11	ASTM A 105	SW, 6000	WK602D3Z1	
CPLH	CPLNG.HALF	1	1.5		B-16.11	ASTM A 105	SW, 3000	WK602D2Z1	
CPLL	CPLNG.LH	.5	.75		B-16.11	ASTM A 105	SW, 6000	WL602D3Z1	
CPLL	CPLNG.LH	1	1.5		B-16.11	ASTM A 105	SW, 3000	WL602D2Z1	
CPLR	CPLNG.RED	.5	.75		B-16.11	ASTM A 105	SW, 6000	WM602D3Z1	
CPLR	CPLNG.RED	1	1.5		B-16.11	ASTM A 105	SW, 3000	WM602D2Z1	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	SW, 800, 3000, B-16.11, SHT NO.- 51002	51002ZZZ1	
GAV	VLV.GATE	2	24		API 600/ ISO 10434	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13%CR STEEL	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 51502	51502ZZZ1	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR,STEEL	SW, 800, 3000, B-16.11, SHT NO.- 52002	52002ZZZ1	
GLV	VLV.GLOBE	2	12		BS-1873	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED,STEM-13%CR,STEEL	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 52502	52502ZZZ1	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	SW, 800, 3000, B-16.11, SHT NO.- 53002	53002ZZZ1	
CHV	VLV.CHECK	2	24		BS-1868	BODY-ASTM A 216 GR.WCB,TRIM-STELLITED	FLGD, 600, B-16.5, RF/125AARH, SHT NO.- 53502	53502ZZZ1	
Bolt Group									
BOS	BOLT.STUD	.5	30		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	.5	30		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL	SPIRAL, 600	GK65076Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	.5	1.5		MNF'STD	B:A105;T:13%CR;S:SS304	FLGD, THRMDNMC, 600,RF/125AARH	TR30655E1	

Package : IPMCS

Report No. : 50

D2A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : D2A Sheet 6 of 6

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Trap/Strainer Group									
TSR	STRNR.TEMP	1.5	24		EIL'STD	B:A516GR.70;INT:S S304	CONETYPE, 600,FF/125AARH	ST1683IZ1	
PSR	STRNR.PERM	.5	1.5		MNF'STD	B:A105;INT:SS304	SW, Y-TYPE, 800	SP303D511	
PSR	STRNR.PERM	2	24		MNF'STD	B:A216GR.WCB;IN T:SS304	FLGD, Y-TYPE, 600,RF/125AARH	SP38055E1	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : J2A Sheet 1 of 4

PIPE CLASS : **J2A**
RATING : 150
BASE MATERIAL : CS (Galv.)
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	65
PRESS	10.55	10.55	10.55

SERVICE

POTABLE WATER (ABOVE GROUND ONLY),
FIRE WATER-SPRINKLER SYSTEM AFTER ORIFICE

NOTES

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
46 FOR BRANCH CONNECTION "X", USE EQUAL TEE/REDUCING TEE WITH NIPPLE AND REDUCING COUPLING/REDUCER FOR BW TEES.
101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	1.5" & BELOW	UNIONS (SCRF) TO BE KEPT MINIMUM	
	2" & ABOVE	FLANGED (SCREWED) TO BE KEPT MINIMUM	
PIPE JOINTS	4" & BELOW	SCREWED COUPLING	
	6" & ABOVE	BUTT WELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD 7-440350, VC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J2A Sheet 2 of 4

[illegible]

RUN PIPE (SIZE IN INCHES)

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
H	H. COUPLING
P	PIPE TO PIPE
R	REINFORCED
S	SOCKOLETS
T	TEES
W	WELDOLETS
I	INSTRUMENT TEE
X	Refer Notes
J	THREADOLET
L	SWEEPOLET

Package : IPMCS

Report No. : 50

Template No. 5-0000-0001-T2 Rev.

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J2A

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : J2A Sheet 3 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	3	4	STD	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	6	6	STD	B-36.10	ASTM A 106 GR.B(GALV)	BE, SEAMLESS	PI22217Z0	
Flange Group									
FLG	FLNG.SCRD	.5	4		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FTC0721Z0	
FLG	FLNG.SO	6	6		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FNC0721Z0	
FLB	FLNG.BLIND	.5	6		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FBC0721Z0	
FEF	FLNG.FIG.8	.5	6		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FGK0721Z0	
Fitting Group									
ELB90	ELBOW.90	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WA60882Z0	
ELB90	ELBOW.90	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WAG714Z10	
ELB45	ELBOW.45	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WB60882Z0	
ELB45	ELBOW.45	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WBG714Z10	
TEQ	T.EQUAL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WE60882Z0	
TEQ	T.EQUAL	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WEG714ZZ0	
TRED	T.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WR60882Z0	
TRED	T.RED	6	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WRG714ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WNH08EZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WPH08EZZ0	
CAP	CAP	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WF60882Z0	
CAP	CAP	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WFG714ZZ0	
CPLF	CPLNG.FULL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WJ60882Z0	

Package : IPMCS

Report No. : 50

J2A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J2A Sheet 4 of 4

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLH	CPLNG.HALF	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WK60882Z0	
CPLL	CPLNG.LH	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WL60882Z0	
CPLR	CPLNG.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WM60882Z0	
UNN	UNION	.5	4		B-16.11	ASTM A 106 GR.B(GALV)	SCRF, NA	WQ6R98ZZ0	
Valves Group									
GAV	VLV.GATE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM-IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 51080	51080ZZZ0	
GAV	VLV.GATE	2	6		IS:14846	BODY-IS 210 GR.FG 200,TRIM-IS 320 ALLOY HT2	FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 51380	51380ZZZ0	
GLV	VLV.GLOBE	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM-IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 52080	52080ZZZ0	
CHV	VLV.CHECK	.5	1.5		IS:778 CL.2	BODY-IS 318 GR.LTB2 (LEADED TIN BRONZE),TRIM- IS 320 ALLOY HT2	SCRF, CL.2, 3000, B-1.20.1, SHT NO.- 53080	53080ZZZ0	
CHV	VLV.CHECK	2	6		IS:5312 (PT-1)	BODY-IS 210 GR.FG 200,TRIM-IS 320 ALLOY HT2	FLGD, PN1.6, B-16.1, FF/125AARH, SHT NO.- 53380	53380ZZZ0	
Bolt Group									
BOM	BOLT.M/C	.5	6		B-18.2	BOLT:A307 GR.B(GALV), NUT:A563 GR.B(GALV)		BM41519Z0	
Gasket Group									
GAS	GASKET	.5	6		B-16.21-ANSI B16.5	BUTYL RUBBER	FULLFACE, 150, 2 MM	GKB0422Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J3A Sheet 1 of 5

PIPE CLASS : **J3A**
RATING : 150
BASE MATERIAL : CS (Galv.)
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	65
PRESS	10.55	10.55

SERVICE

INSTRUMENT AIR (FOR ABOVE 4" IN UNITS AND FOR ALL SIZES IN OFFSITES)

NOTES

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 21 NO FIELD HYDROSTATIC TESTING IS PERMITTED IN INSTRUMENT AIR SERVICE.
- 46 FOR BRANCH CONNECTION "X", USE EQUAL TEE/REDUCING TEE WITH NIPPLE AND REDUCING COUPLING/REDUCER FOR BW TEES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	4"& BELOW	UNIONS (SCRF)	
	6"& ABOVE	FLANGED TO BE KEPT MINIMUM	
PIPE JOINTS	4"& BELOW	SCREWED COUPLING	
	6"& ABOVE	BUTT WELDED	
DRAINS	ON LINES <=1.5"	REFER EIL STD 7-44-0350, DC3	
	ON LINES >=2.0"	ÄS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, D3.	
VENTS	ON LINES <=1.5"	REFER EIL STD 7-44-0350, VC3	
	ON LINES >=2.0"	ÄS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3.	
TEMP. CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS. CONN	0.75"	SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354.	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J3A Sheet 2 of 5

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
H	H. COUPLING
P	PIPE TO PIPE
R	REINFORCED
S	SOCKOLETS
T	TEES
W	WELDOLETS
I	INSTRUMENT TEE
X	Refer Notes
J	THREADOLET
L	SWEEPOLET

Package : IPMCS

Report No. : 50

Template No. 5-0000-0001-T2 Rev.

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J3A

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location VIZAG	Pipe Class : J3A Sheet 3 of 5

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	1	1.5	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	2	2	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	2.5	4	STD	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	6	6	STD	B-36.10	ASTM A 106 GR.B(GALV)	BE, SEAMLESS	PI22217Z0	
PIP	PIPE	8	14	6.0	IS-3589	IS-3589 GR.330 (GALV)	BE, SAW	PI7E216Z0	
NIP	NIPPLE	.5	1.5	M	B-36.10	ASTM A 106 GR.B(GALV)	TBE, SEAMLESS	PN222E7Z0	
Flange Group									
FLG	FLNG.SCRD	.5	4		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FTC0721Z0	
FLG	FLNG.SO	6	14		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FNC0721Z0	
FLB	FLNG.BLIND	.5	14		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FBC0721Z0	
FEF	FLNG.FIG.8	.5	8		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FGK0721Z0	
FEF	SPCR&BLND	10	14		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FCK0721Z0	
Fitting Group									
ELB90	ELBOW.90	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WA60882Z0	
ELB90	ELBOW.90	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WAG714Z10	
ELB90	ELBOW.90	8	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WAG764Z10	
ELB45	ELBOW.45	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WB60882Z0	
ELB45	ELBOW.45	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW, 1.5D	WBG714Z10	
ELB45	ELBOW.45	8	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WBG764Z10	
TEQ	T.EQUAL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WE60882Z0	
TEQ	T.EQUAL	6	6	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WEG714ZZ0	
TEQ	T.EQUAL	8	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WEG764ZZ0	
TRED	T.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WR60882Z0	

Package : IPMCS

Report No. : 50

J3A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J3A Sheet 4 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
TRED	T.RED	6	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WRG714ZZ0	
TRED	T.RED	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WRG764ZZ0	
REDC	REDUC.CONC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WUG714ZZ0	
REDC	REDUC.CONC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WUG764ZZ0	
REDE	REDUC.ECC	2	6	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WVG714ZZ0	
REDE	REDUC.ECC	8	14	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WVG764ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WNH08EZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WPH08EZZ0	
CAP	CAP	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WF60882Z0	
CAP	CAP	6	14	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WFG714ZZ0	
CPLF	CPLNG.FULL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WJ60882Z0	
CPLH	CPLNG.HALF	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WK60882Z0	
CPLL	CPLNG.LH	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WL60882Z0	
CPLR	CPLNG.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WM60882Z0	
UNN	UNION	.5	4		BS-3799	ASTM A 105(GALV)	SCRF, 3000	WQH0882Z0	
Valves Group									
GAV	VLV.GATE	.5	1.5		API 602/ ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SCRF, 800, 3000, B-1.20.1, SHT NO.- 51914	51914ZZZ0	
GAV	VLV.GATE	2	14		API 600/ ISO 10434	BODY-ASTM A 351 GR CF8,TRIM-SS 304	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 51924	51924ZZZ0	
GLV	VLV.GLOBE	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-STELLITED,STEM-SS 304	SCRF, 800, 3000, B-1.20.1, SHT NO.- 52914	52914ZZZ0	
GLV	VLV.GLOBE	2	14		BS-1873	BODY-ASTM A 351 GR CF8,TRIM-SS 304	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 52924	52924ZZZ0	
CHV	VLV.CHECK	.5	1.5		BS EN ISO 15761	BODY-ASTM A 182 GR.F304,TRIM-	SCRF, 800, 3000, B-1.20.1, SHT NO.- 53914	53914ZZZ0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J3A Sheet 5 of 5

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Valves Group									
						STELLITED			
CHV	VLV.CHECK	2	14		BS-1868	BODY-ASTM A 351 GR CF8,TRIM-SS 304	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 53924	53924ZZZ0	
Bolt Group									
BOM	BOLT.M/C	.5	14		B-18.2	BOLT:A307 GR.B, NUT:A563 GR.B		BM41418Z0	
Gasket Group									
GAS	GASKET	.5	14		B-16.21-ANSI B16.5	NONASBESTOS BS7531 GR X	FULLFACE, 150, 2 MM	GKBAX22Z0	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J91A Sheet 1 of 4

PIPE CLASS : **J91A**
RATING : 150
BASE MATERIAL : CS (Galv.)
CORROSION ALLOWANCE : 0 MM
SPECIAL REQUIREMENT :

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	5	38	65
PRESS	14	14	14

SERVICE

HIGH PRESSURE WATER SPRAY SYSTEM (A/G)

NOTES

- 19 THREADED JOINTS SHALL BE MADE WITH 1" WIDTH PTFE JOINING TAPE.
- 20 SURFACES WHERE GALVANISING HAS BEEN BURNT OFF SHALL BE WIRE BRUSHED AND COLD GALVANISED WITH ZINC COATING COMPOUND.
- 46 FOR BRANCH CONNECTION "X", USE EQUAL TEE/REDUCING TEE WITH NIPPLE AND REDUCING COUPLING/REDUCER FOR BW TEES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	1.5" & BELOW	UNIONS (SCRF) TO BE KEPT MINIMUM	
	2" & ABOVE	FLANGED (SCREWED) TO BE KEPT MINIMUM	
PIPE JOINTS	UPTO 4 "	SCREWED COUPLING	
	6" & ABOVE	BUTT WELDED	
DRAINS	ON LINES <= 1.5"	REFER EIL STD 7-44-0350, DC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD. 7-44-0351, D3	
VENTS	ON LINES <= 1.5"	REFER EIL STD 7-440350, VC3	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". REFER EIL STD 7-44-0351, V3	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	SCRD NIPPLE WITH VALVE TO SPEC AS PER EIL STD 7-44-0354	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J91A Sheet 2 of 4

[illegible]

RUN PIPE (SIZE IN INCHES)

<u>CODE</u>	<u>DESCRIPTION</u>				
F	SADDLE FUSED JT	T	TEES	J	THREADOLET
H	H. COUPLING	W	WELDOLETS		
P	PIPE TO PIPE	I	INSTRUMENT TEE		
R	REINFORCED	X	Refer Notes		
S	SOCKOLETS	L	SWEEPOLET		

Package : IPMCS

Report No. : 50

J91A

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Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J91A Sheet 3 of 4

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	.5	.75	S160	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	1	2	XS	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	3	4	STD	B-36.10	ASTM A 106 GR.B(GALV)	SCRM, SEAMLESS	PI22297Z0	
PIP	PIPE	6	14	STD	B-36.10	ASTM A 106 GR.B(GALV)	BE, SEAMLESS	PI22217Z0	
Flange Group									
FLG	FLNG.SCRD	.5	4		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FTC0721Z0	
FLG	FLNG.SO	6	14		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FNC0721Z0	
FLB	FLNG.BLIND	.5	14		B-16.5	ASTM A 105(GALV.)	150, FF/125AARH	FBC0721Z0	
FEF	FLNG.FIG.8	.5	14		ASME-B16.48	ASTM A 105(GALV.)	150, FF/125AARH	FGK0721Z0	
Fitting Group									
ELB90	ELBOW.90	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WA60882Z0	
ELB90	ELBOW.90	6	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WAG764Z10	
ELB45	ELBOW.45	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WB60882Z0	
ELB45	ELBOW.45	6	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW, 1.5D	WBG764Z10	
TEQ	T.EQUAL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WE60882Z0	
TEQ	T.EQUAL	4	14	M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WEG764ZZ0	
TRED	T.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WR60882Z0	
TRED	T.RED	4	14	M, M	B-16.9	ASTM A 234 GR.WPB-W(GALV)	BW	WRG764ZZ0	
REDC	REDUC.CONC	6	14	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WUG714ZZ0	
REDE	REDUC.ECC	6	14	M, M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WVG714ZZ0	
SWGC	SWAGE.CONC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WNH08EZZ0	
SWGE	SWAGE.ECC	.5	3	M, M	BS-3799	ASTM A 105(GALV)	TBE	WPH08EZZ0	
CAP	CAP	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WF60882Z0	
CAP	CAP	6	14	M	B-16.9	ASTM A 234 GR.WPB(GALV)	BW	WFG714ZZ0	

Package : IPMCS

Report No. : 50

J91A

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location VIZAG	Pipe Class : J91A Sheet 4 of 4

Note :(The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Fitting Group									
CPLF	CPLNG.FULL	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WJ60882Z0	
CPLH	CPLNG.HALF	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WK60882Z0	
CPLL	CPLNG.LH	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WL60882Z0	
CPLR	CPLNG.RED	.5	4		B-16.11	ASTM A 105(GALV)	SCRF, 3000	WM60882Z0	
UNN	UNION	.5	4		B-16.11	ASTM A 234 GR.WPB(GALV)	SCRF, NA	WQ6718ZZ0	
Valves Group									
GAV	VLV.GATE	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 51090	51090ZZZ0	
GAV	VLV.GATE	2	14		MSS-SP128	BODY-ASTM A 395,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 51390	51390ZZZ0	
GLV	VLV.GLOBE	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 52090	52090ZZZ0	
CHV	VLV.CHECK	.5	1.5		MSS-SP80	BODY-ASTM B62 UNS C83600,TRIM-BRONZE	SCRF, 150, 3000, B-1.20.1, SHT NO.- 53090	53090ZZZ0	
CHV	VLV.CHECK	2	14		MSS-SP136	BODY-ASTM A 395,TRIM-BRONZE	FLGD, 150, B-16.5, FF/125AARH, SHT NO.- 53390	53390ZZZ0	
Bolt Group									
BOS	BOLT.STUD	.5	14		B-18.2	BOLT:A193 GR.B7(GALV), NUT:A194 2H(GALV)		BS40513Z0	
Gasket Group									
GAS	GASKET	.5	14		B-16.21-ANSI B16.5	BUTYL RUBBER	FULLFACE, 150, 2 MM	GKB0422Z0	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F22G Sheet 1 of 4

PIPE CLASS : **F22G**
 RATING : 1500
 BASE MATERIAL : 9CR-1MO-V
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	-29	38	93	149	204	260	316	343	371	399	427	454	482	510
PRESS	263.65	263.65	263.65	255.91	248.18	233.77	212.67	206.7	199.67	187.01	178.57	171.19	157.83	135.69
	538													
	127.95													

SERVICE

VVHP STEAM

NOTES

- 8 ALL PIPES, FITTINGS, VALVES, FLANGES, TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 13 USE NORMALIZED AND TEMPERED MATERIAL ONLY.
- 14 RADIOGRAPHY SHALL BE PERFORMED AFTER HEAT TREATMENT.
- 30 ALL PRESSURE CONTAINING COMPONENTS (REGARDLESS OF SIZE, THK.) SHALL BE PWHT AS PER ASME B 31.3.
- 32 CORROSION ALLOWANCE HAS BEEN ADJUSTED TO SELECT OPTIMUM SCH. REFER GENERAL NOTES TO PMS.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.
- 386 PIPE WALL THICKNESS IS CALCULATED BASED ON ACTUAL LINE DESIGN CONDITION [525 DEG. C & 116 KG/ CM2 G] FOR THE SIZES 6" TO 16".

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	ALL	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	AS PER P&ID OR 0.75". TEE, NIPPLE, DOUBLE VLV (AS PER P&ID OR LINE ISOLATION VLV), BLD FLG ASSBLY.	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". WELDOLET, NIPPLE, DOUBLE VLV (AS PER P&ID OR LINE ISOLATION VLV), BLD FLG ASSEMBLY	
VENTS	ON LINES <= 1.5"	AS PER P&ID OR 0.75". TEE, NIPPLE, DOUBLE VLV (AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". WELDOLET, NIPPLE, DOUBL VLV (AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
TEMP.CONN	2.0"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	TEE/WELDOLET & NIPPLE WITH DOUBLE VALVES (AS PER P&ID OR SIMILAR TO LINE ISOLATION VALVES)	

F22G

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location : VIZAG	Pipe Class :F22G Sheet 2 of 4

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
H	H. COUPLING
P	PIPE TO PIPE
R	REINFORCED
S	SOCKOLETS
T	TEES
W	WELDOLETS
I	INSTRUMENT TEE
X	Refer Notes
L	SWEEPOLET
J	THREADOLET

F22G

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F22G Sheet 3 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	0.50	0.75	S160	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	
PIP	PIPE	1.00	1.00	XS	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	
PIP	PIPE	1.50	1.50	XS	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	32
PIP	PIPE	2.00	3.00	S160	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	
PIP	PIPE	4.00	4.00	S120	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	
PIP	PIPE	6.00	8.00	XS	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	386
PIP	PIPE	10.00	16.00	S80	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	386
PIP	PIPE	18.00	24.00	CALC	B-36.10	ASTM A 335 GR.P91	BE, SEAMLESS	PI2K517Z1	
NIP	NIPPLE	0.50	1.50	M	B-36.10	ASTM A 335 GR.P91	PBE, SEAMLESS	PN2K567Z1	
Flange Group									
FLG	FLNG.WN	0.50	24.00	M	B-16.5	ASTM A 182 GR.F91	1500, RF/125AARH	FWCB787Z1	
FLB	FLNG.BLIND	0.50	24.00		B-16.5	ASTM A 182 GR.F91	1500, RF/125AARH	FBCB787Z1	
FEF	FLNG.FIG.8	0.50	4.00		ASME-B16.48	ASTM A 182 GR.F91	1500, RF/125AARH	FGKB787Z1	
FEF	SPCR&BLND	6.00	24.00		ASME-B16.48	ASTM A 182 GR.F91	1500, RF/125AARH	FCKB787Z1	
Fitting Group									
ELB90	ELBOW.90	0.50	24.00	M	B-16.9	ASTM A234GR.WP91	BW, 1.5D	WAGQ34Z11	
ELB45	ELBOW.45	0.50	24.00	M	B-16.9	ASTM A234GR.WP91	BW, 1.5D	WBGQ34Z11	
TEQ	T.EQUAL	0.50	24.00	M	B-16.9	ASTM A234GR.WP91	BW	WEGQ34ZZ1	
TRED	T.RED	0.50	24.00	M, M	B-16.9	ASTM A234GR.WP91	BW	WRGQ34ZZ1	
REDC	REDUC.CONC	0.50	24.00	M, M	B-16.9	ASTM A234GR.WP91	BW	WUGQ34ZZ1	
REDE	REDUC.ECC	0.50	24.00	M, M	B-16.9	ASTM A234GR.WP91	BW	WVGQ34ZZ1	
CAP	CAP	0.50	24.00	M	B-16.9	ASTM A234GR.WP91	BW	WFGQ34ZZ1	

F22G

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F22G Sheet 4 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
O'let Group									
WLT	WELDOLET	0.50	24.00	M, M	MSS-SP97	ASTM A 182 GR.F91	BW	YWSQ24ZZ1	
Valves Group									
GAV	VLV.GATE	0.50	1.50		BS EN ISO 15761	BODY-ASTM A182 GR.F91,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 511GA	511GAZZZ1	
GAV	VLV.GATE	2.00	16.00		ANSI-B-16.34	BODY-ASTM A217 GR.C12A,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 517GA	517GAZZZ1	
GLV	VLV.GLOBE	0.50	1.50		BS EN ISO 15761	BODY-ASTM A182 GR.F91,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 521GA	521GAZZZ1	
GLV	VLV.GLOBE	2.00	16.00		ANSI-B-16.34	BODY-ASTM A217 GR.C12A,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 527GA	527GAZZZ1	
CHV	VLV.CHECK	0.50	1.50		BS EN ISO 15761	BODY-ASTM A182 GR.F91,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 531GA	531GAZZZ1	
CHV	VLV.CHECK	2.00	12.00		ANSI-B-16.34	BODY-ASTM A217 GR.C12A,TRIM-STELLITED,STEM-13% CR.STEEL	BW, 1500, B-16.25, SHT NO.- 537GA	537GAZZZ1	
Bolt Group									
BOS	BOLT.STUD	0.50	24.00		B-18.2	BOLT:A193 GR.B16, NUT:A194 GR.4		BS40107Z0	
Gasket Group									
GAS	GASKET	0.50	24.00		B-16.20-ANSI B16.5	SPWND SS316+THERMICU LITE835+HR	SPIRAL, 1500	GK6AQ78Z0	
Trap/Strainer Group									
TRP	TRAP.STEAM	0.50	1.50		MNF'STD	B:A182GR.F91;INT:SS304	FLGD, BIMETLIC, 1500,RF/125AARH	TR3F55161	
PSR	STRNR.PERM	0.50	24.00	M	MNF'STD	B:A182GR.F91;INT:SS304	BW, Y-TYPE	SP3F545Z1	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F2A Sheet 1 of 4

PIPE CLASS : **F2A**
 RATING : 1500
 BASE MATERIAL : CARBON STEEL
 CORROSION ALLOWANCE : 1.5 MM
 SPECIAL REQUIREMENT : IBR SERVICE

TEMPERATURE (Deg. C) AND PRESSURE (Kg/Sq. cm g) RATINGS

TEMP	0	38	93	149	204	260	316	343	371	399	427
PRESS	260.49	260.49	238.66	229.88	222.85	211.95	199.65	192.97	186.64	178.21	144.46

SERVICE

STEAM AND BOILER FEED WATER (IBR)

NOTES

- 3 USE PIPE OF CLASS 22 INSTEAD OF CLASS 12 IF PIPE THICKNESS EXCEEDS 20.00 MM.
- 8 ALL PIPES, FITTINGS, VALVES, FLANGES, TRAPS AND STRAINERS SHALL BE TESTED AND TEST CERTIFICATE IN FORM III A FOR PIPE AND FORM III C FOR OTHERS SHALL BE REQD. DULY COUNTERSIGNED BY IBR AUTHORITY OR ITS APPROVED REPRESENTATIVE.
- 9 CARBON CONTENT SHALL NOT EXCEED 0.25% FOR ALL PIPES, FITTINGS FLANGES ETC. THAT MAY REQUIRE WELDING. MOREOVER, FOR FLANGES THE SULPHUR AND PHOSPHOROUS SHALL ALSO BE LIMITED TO 0.05% EACH.
- 90 INST. CONNECTIONS LIKE ORIFICE TAPS ETC SHALL BE PROVIDED WITH DOUBLE ISOLATION VALVES.
- 101 NDT REQUIREMENTS AS PER EIL STANDARD B016-6-44-0016.

SPECIAL NOTES

ITEM	SIZE	DESCRIPTION	A.CODE
MAINTAINENCE JOINTS	ALL	FLANGED, TO BE KEPT MINIMUM	
PIPE JOINTS	ALL	BUTTWELDED	
DRAINS	ON LINES <= 1.5"	AS PER P&ID OR 0.75". TEE, NIPPLE, SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". WELDOLET, NIPPLE, SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASMBLY	
VENTS	ON LINES <= 1.5"	AS PER P&ID OR 0.75". TEE, NIPPLE, SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASSEMBLY	
	ON LINES >= 2.0"	AS PER P&ID OR 0.75". WELDOLET, NIPPLE, SINGLE VLV(AS PER P&ID OR LINE ISOLATION VLV), BLIND FLG ASMBLY	
TEMP.CONN	1.5"	FLANGED. REFER EIL STD 7-44-0353	
PRESS.CONN	0.75"	TEE/WELDOLET & NIPPLE WITH DOUBLE VALVES (AS PER P&ID OR SIMILAR TO LINE ISOLATION VALVES)	

Client :HPCL	Dept./Sect. : 16/43
Project :VRMP	
Location : VIZAG	Pipe Class :F2A Sheet 2 of 4

[illegible]

<u>CODE</u>	<u>DESCRIPTION</u>
F	SADDLE FUSED JT
H	H. COUPLING
P	PIPE TO PIPE
R	REINFORCED
S	SOCKOLETS
T	TEES
W	WELDOLETS
I	INSTRUMENT TEE
X	Refer Notes
L	SWEEPOLET
J	THREADOLET

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F2A Sheet 3 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
Pipe Group									
PIP	PIPE	0.50	4.00	S160	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	6.00	14.00	CALC	B-36.10	ASTM A 106 GR.B	BE, SEAMLESS	PI21917Z1	
PIP	PIPE	16.00	24.00	CALC	B-36.10	ASTM A 672 GR.B60 CL.12	BE, E.FS.W	PI2A813Z1	3
NIP	NIPPLE	0.50	1.50	M	B-36.10	ASTM A 106 GR.B	PBE, SEAMLESS	PN21967Z1	
Flange Group									
FLG	FLNG.WN	0.50	24.00	M	B-16.5	ASTM A 105	1500, RF/125AARH	FWC0187Z1	
FLB	FLNG.BLIND	0.50	24.00		B-16.5	ASTM A 105	1500, RF/125AARH	FBC0187Z1	
FEF	FLNG.FIG.8	0.50	4.00		B-16.5	ASTM A 105	1500, RF/125AARH	FGC0187Z1	
FEF	SPCR&BLND	6.00	24.00		B-16.5	ASTM A 105	1500, RF/125AARH	FCC0187Z1	
Fitting Group									
ELB90	ELBOW.90	0.50	14.00	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WAG684Z11	
ELB90	ELBOW.90	16.00	24.00	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WAG754Z11	
ELB45	ELBOW.45	0.50	14.00	M	B-16.9	ASTM A 234 GR.WPB	BW, 1.5D	WBG684Z11	
ELB45	ELBOW.45	16.00	24.00	M	B-16.9	ASTM A 234 GR.WPB-W	BW, 1.5D	WBG754Z11	
TEQ	T.EQUAL	0.50	14.00	M	B-16.9	ASTM A 234 GR.WPB	BW	WEG684ZZ1	
TEQ	T.EQUAL	16.00	24.00	M	B-16.9	ASTM A 234 GR.WPB-W	BW	WEG754ZZ1	
TRED	T.RED	0.50	14.00	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WRG684ZZ1	
TRED	T.RED	16.00	24.00	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WRG754ZZ1	
REDC	REDUC.CONC	0.50	14.00	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WUG684ZZ1	
REDC	REDUC.CONC	16.00	24.00	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WUG754ZZ1	
REDE	REDUC.ECC	0.50	14.00	M, M	B-16.9	ASTM A 234 GR.WPB	BW	WVG684ZZ1	
REDE	REDUC.ECC	16.00	24.00	M, M	B-16.9	ASTM A 234 GR.WPB-W	BW	WVG754ZZ1	
CAP	CAP	0.50	24.00	M	B-16.9	ASTM A 234 GR.WPB	BW	WFG684ZZ1	

Client : HPCL	Dept./Sect. : 16/43
Project : VRMP	
Location : VIZAG	Pipe Class : F2A Sheet 4 of 4

Note : (The shaded portion of PMS body shows Field Fabricated Items)

Input Id.	Item Type	Lower Size (Inch)	Upper Size (Inch)	Sch/ Thk (mm)	Dmn. STD	Material	Description	Commodity Code	Note No
O'let Group									
WLT	WELDOLET	0.50	20.00	M, M	MSS-SP97	ASTM A 105	BW	YWS024ZZ1	
Valves Group									
GAV	VLV.GATE	0.50	1.50		API 602/ ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR STEEL	BW, 1500, B-16.25, SHT NO.- 51102	51102ZZZ1	
GAV	VLV.GATE	2.00	4.00		ANSI-B-16.34	BODY-ASTM A 105 / A 216GR.WCB,TRIM-STELLITED,STEM-13%CR STEEL	BW, 1500, B-16.25, SHT NO.- 51702	51702ZZZ1	
GLV	VLV.GLOBE	0.50	1.50		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED,STEM-13%CR.STEEL	BW, 1500, B-16.25, SHT NO.- 52102	52102ZZZ1	
GLV	VLV.GLOBE	2.00	4.00		ANSI-B-16.34	BODY-ASTM A 105 / A 216GR.WCB,TRIM-STELLITED,STEM-13%CR.STEEL	BW, 1500, B-16.25, SHT NO.- 52702	52702ZZZ1	
CHV	VLV.CHECK	0.50	1.50		BS EN ISO 15761	BODY-ASTM A 105,TRIM-STELLITED	BW, 1500, B-16.25, SHT NO.- 53102	53102ZZZ1	
CHV	VLV.CHECK	2.00	4.00		ANSI-B-16.34	BODY-ASTM A 105 / A 216GR.WCB,TRIM-STELLITED	BW, 1500, B-16.25, SHT NO.- 53702	53702ZZZ1	
Bolt Group									
BOS	BOLT.STUD	0.50	24.00		B-18.2	BOLT:A193 GR.B7, NUT:A194 GR.2H		BS40404Z0	
Gasket Group									
GAS	GASKET	0.50	24.00		B-16.20-ANSI B16.5	SP.WND SS316+GRAFIL+ I RING	SPIRAL, 1500	GK66278Z0	
Trap/Strainer Group									
PSR	STRNR.PERM	0.50	1.50	M	MNF'STD	B:A105;INT:SS304	BW, Y-TYPE	SP30345Z1	
PSR	STRNR.PERM	2.00	24.00	M	MNF'STD	B:A216GR.WCB;IN T:SS304	BW, Y-TYPE	SP38045Z1	

ANNEXURE – I (TO PMS)

JOB PIPING MATERIAL SPECIFICATION GENERAL NOTES

CLIENT - HPCL

PROJECT - VRMP

LOCATION - VIZAG

JOB NO. - B015

B	18/05/2017	ISSUED AS JOB STANDARD	KPR	AKB	MI	
A	08/03/2017	ISSUED AS JOB STANDARD	KPR	AKB	MI	
Rev. No	Date	Purpose	Prepared by	Checked by	Approved by	

Abbreviations:

PMS : Piping Material Specification

CONTENTS

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1.0 SCOPE

- 1.1 This specification (PMS) covers the various piping classes for Process and utility Piping.
- 1.2 Deviations from this specification may be necessary to conform to specific job requirements.

2.0 REFERRED CODES & STANDARDS

- 2.1 All Piping shall be designed in accordance with the Process Piping Code, ASME B31.3. A particular edition (indicated in Design Basis), once selected shall be followed throughout the job.
- 2.2 Editions and addenda (if any) of referred Codes and Standards shall be as per the Job Engineering Design Basis (Piping).
- 2.3 For the sake of brevity, the initials of the society to which the codes are referred to may be omitted in the specification. For example; B16.5 is a code referring to ASME; A106 is a standard referring to ASTM.

3.0 MATERIAL SPECIFICATIONS

- 3.1 Individual piping Class has been generally designed to cover a set of services operating within pressure-temp. combination as per ASME B16.5 / B16.34 or part of it.
- 3.2 The PMS shall be strictly adhered to in the design, requisitioning, purchasing, fabrication and testing of the piping system. However, deviations of material may occur due to design conditions and/or availability. All substitutions must be duly approved.
- 3.3 Unless mentioned otherwise, pipe thicknesses in the specs are for above ground piping.

4.0 CLASS DESIGNATION CODE

The class designation shall consist of not more than three components made up of a letter, number & letter; e.g.B1A.

- 4.1 The first letter indicates pressure rating.

A	150 Class	D	600 Class	G	2500 Class
B	300 Class	E	900 Class	J	125/150 Class
C	400 Class	F	1500 Class	K	UNCLASSIFIED

- 4.2 The middle number indicates difference in the specifications within the same rating and material as enlisted in the Table attached.
- 4.3 The third letter indicates type of material.

A	Carbon
B	Carbon Moly.
C	1.0 % Cr., 0.5 % Moly.
D	1.25 % Cr., 0.5 % Moly.
E	2.25 % Cr., 1.0 % Moly.

F	5.0 % Cr., 0.5 % Moly.
G	9.0 % Cr., 1.0 % Moly.
H	3.5 % Ni.
I	
J	Nickel / Titanium
K	Stainless steel type 304, 304H, 304L.
L	Aluminium
M	Stabilised stainless steel type 316, 316H, 321, 347.
N	316L
P	Monel / Alloy 20
Q	Hastalloy / Inconel / Incoloy
R	Lead
S	PVC & FRP, PP / FRP, PVDF / FRP
T	Cast Iron / Silicon Iron
U	
V	Duplex Stainless Steel
W	Cupro-Nickel
Y	Lined steel (Rubber Lined, Teflon Lined etc).
Z	HDPE / PDVF / Teflon / PVC

5.0 PIPES

- 5.1 Pipe dimension shall be in accordance with ASME B36.10, IS:1239 & IS:3589 for wrought steel and wrought iron pipe; to B36.10 / B36.19 for stainless steel pipe and respective ASTM Standard for non-ferrous and non-metallic pipes.
- 5.2 Pipe made by acid-bessemer process shall not be acceptable, steel pipe shall be made by open hearth, electric furnace or basic Oxygen process.
- 5.3 All pipe threads shall conform to ASME B1.20.1 except where otherwise noted.
- 5.4 Pipe thicknesses not covered in different classes of this specification shall be calculated to meet specific job requirement based on actual max. design condition to economise on thickness. However, in such cases the thickness shall be calculated at not less than 80% of class rating unless defined otherwise in the Job Engineering Design Basis (Piping).
- 5.5 Maximum of 10% of Corrosion Allowance may be adjusted to optimize on pipe schedule. However, if CA is suffixed by 'minimum', this downward adjustment shall not be used.
- 5.6 Non-standard pipe sizes 1¼", 2½", 3½", 5" and 22" shall not be treated as a part of this specification unless these sizes are separately called out.

6.0 FLANGES

- 6.1 Flanges shall be in accordance with the following codes, except where otherwise noted:

Upto 24" (150# -1500#)	ASME B16.5
Upto 12" , 2500#	ASME B16.5
Above 24"	ASME B16.47 SERIES 'B' / AWWA / EIL' STD.

Flanges to ASME B16.47 SERIES 'A' or any other standard (e.g. DIN, GOST, JIS etc.) may be specified to mate with equipment or valve flanges with the corresponding bolting.

6.2 Finish of steel flange faces shall be as follows:

Stock Finish	:	1000 μ in AARH max.
Serrated Finish / 125 AARH /	:	Serrations with 125-250 μ in AARH
Smooth finish		
63 AARH	:	32 TO 63 μ in AARH

6.3 Brinell hardness for RTJ groove shall be atleast 20 BHN more than that of corresponding gasket as specified.

6.4 Fig.8 FI and SPCR & BLN shall be as per B16.48 upto 24" (150-1500#) & upto 12" for 2500#. For other sizes, refer EIL Std 7-44-0162.

7.0 FITTINGS

7.1 Forged steel SW and threaded fittings shall be in accordance with ASME B16.11, unless otherwise specified. For items not covered under B16.11, reference may be made to BS 3799 or appropriate MSS-SP-Std.

7.2 BW Fittings shall be in accordance with ASME B16.9, unless otherwise specified.

7.3 Dimensions of steel BW fittings for sizes not covered in ASME B16.9 shall conform to MSS-SP-48.

7.4 Usage of unions shall be restricted to utilities only.

8.0 BENDS, MITRES AND REDUCERS FABRICATED FROM PIPE

8.1 Mitres and Reducers fabricated from Pipe may be used if specified in particular Piping Class. 90 degree mitre shall be minimum 4-piece construction upto 24" and minimum 5-piece construction for 26" & above. 45 degree mitre shall be minimum 3-piece construction. Mitres require higher thickness than corresponding Pipe / Elbow to hold the same pressure (Refer ASME B31.3).

9.0 GASKETS

9.1 Non-metallic gaskets shall conform to B16.21 (corresponding to B16.5) upto 24", and B16.21 (corresponding to B16.47B) beyond 24", unless otherwise specified.

9.2 Spiral wound gaskets (SP.WND or SPWD) and Ring Joint gaskets shall conform to B16.20.

10.0 BOLTING

10.1 All bolts shall conform to B18.2.1, nuts to be B18.2.2. Reference shall also be made to B16.5 for studs.

10.2 Threads shall be to coarse Thread Series, B1.1, having Class 2A allowances for bolts and studs, and Class 2B tolerance for nuts.

10.3 Nuts for Bolts and Studs shall be the American Standard Hexagon Heavy Series.

11.0 THREADS

- 11.1 Threads for threaded Pipes, Fittings, Flanges and Valves shall be in accordance with B1.20.1 taper threads, unless otherwise specified.
- 11.2 Up to 204 deg. C, threaded joints shall be made with 1" width PTFE joining tape.
- 11.3 Above 204 deg.C, threaded joints shall be seal welded with a full strength fillet weld.
- 11.4 All threaded joints irrespective of pressure and temperature on lines carrying toxic fluid shall be seal welded with a full strength fillet weld.

12.0 VALVES

- 12.1 Face to Face / End to End dimension of valves shall conform to B16.10 to the extent covered. For valves not covered in B16.10, reference shall be made to BS 2080 and / or the manufacturer's drawings.
- 12.2 Flange / weld ends of the valve shall be as per the corresponding Flange / Fitting ends of the piping class, unless otherwise specified.
- 12.3 Pressure-temperature rating for flanged and butt welding end valves shall be as per ASME B16.34 except for ball, plug & butterfly valves. For these valves refer TABLE FOR PRESSURE-TEMP RATING FOR BALL, PLUG AND BUTTERFLY VALVES. Wall thickness of valve body at different locations should not be less than as calculated as per B16.34.
- 12.4 Unless called-out specifically, valves shall be as per the following Standards:

Valve	Size	Rating	Des. Std.	Testing Std.
Gate	1/2"- 1-1/2"	800 / 1500	API-602	API-598
Globe / Check	-do-	800 / 1500	BS-5352	BS-6755 Pt-I
Gate	2"-24"	150 / 300 / 600	API-600	API-598
Gate	26"-42"	150 / 300	BS-1414	BS-6755 Pt-I
Globe	2"-8"	150 / 300 / 600	BS-1873	-do-
Check	2"-24"	-do-	BS-1868	-do-
Gate/ Globe/Check		900 / 1500 / 2500	B-16.34 (Refer 12.6 also)	API 598 / BS-6755 Pt.I
Ball	1/2"-16"	150 / 300 / 600	BS-5351 / API 6D	BS – 6755 Pt. I / API- 598
		900 / 1500	API 6D	API-598
Plug	1/2"-12"	All	API-599 / BS 5353	API-598 / BS 6755 Pt.I
Btrfly	3" & above	All	API-609 / BS 5155 / AWWA C504	API-598 / BS-6755 Pt-I / AWWA
Diaphragm	ALL	-	BS-5156	BS-6755 Pt-I
Bronze			RELEVANT IS STD.	RELEVANT IS STD.
Cast Iron			RELEVANT IS STD.	RELEVANT IS STD.

- 12.5 If not covered in 12.3, the valve shall be as per B16.34 / relevant MSS-SP Standard.
- 12.6 For details of the valves specifications, refer specifications B015-6-44-0006. Features not covered by B015-6-44-0006 and the relevant code shall be to the manufacturer's standard.
- 12.7 Unless otherwise specifically called for, up to 600# rating, 2" and larger size steel Gate, Globe & Check valves in Hydrocarbon and utility service shall have bolted bonnets. Pressure-seal bonnets or covers shall be used for Classes 900# and above to minimize bonnet leakage. However, valves with Pr-seal Bonnet shall have wall thickness & stem diameter as per API-600, (if required). Welded bonnets or screwed & seal welded bonnets are acceptable for sizes lower than 2" for Classes 900# & above.
- 13.0 For Non-Destructive Testing (NDT) specification, refer Job' STD B016-6-44-0016.
- 14.0 For Welding specifications, refer Job specs. 'Welding Specification for fabrication of piping (B016-000-06-41-WSP-01)' & 'Welding charts for piping classes (B016-000-06-41-WSC-01)'.
- 15.0 For 'Caustic Soda service graph' refer sheet 16 of 16.

TABLE FOR MIDDLE NUMBER

Middle Number	Carbon Steel A	AlloySteel B, C, D, E, F, G, H	SS304 / SS304H / SS304L K	SS 316 / 316H / 321 / 321H / 347 M
1	CA=1.5	CA=1.5	CA=NIL (SS304)	CA=NIL (SS316)
2	CA=1.5 (IBR)	CA=1.5 (IBR)	CA=NIL (SS304-CRYO)	CA=NIL (SS321-CRYO)
3	CA=1.5 (CAT'D)	CA=6.0	CA=NIL (CAT 'D' SS304)	CA=1.5 (SS321)
4	CA=1.5 (LTCS)	CA=3.0	CA=1.5 (SS304H)	CA=NIL (SS321)
5	CA=1.5 (Hydrogen)	CA=1.5 (Hydrogen)>230°C	CA=3.0 (SS304H)	CA=NIL (SS316H) – H ₂
6	CA=4.5	CA=4.5	CA=1.5 (SS304L)	CA=NIL (SS316H)
7	CA=1.5 (Vacuum)		CA=NIL (SS304L-Vacuum)	CA=NIL (SS347)
8	CA=1.5 (Conc.Sulphuric Acid)		CA=1.5 (SS304L-CRYO)	CA=1.5 (SS347)
9	CA=3.0		CA=1.5 (SS304)	CA=1.5 (SS316)
10	CA=1.5 (Offsites)			
11	CA=3.0 (Hardness controlled)		CA=NIL (SS304L)	
12			CA=NIL (SS304-IBR)	
13	CA=6.0			
14				
15	CA=3.0 (Liquid Sulphur)		CA=1.5 (SS304 H ₂ & CO ₂)	CA=1.5 (SS321H - H ₂)
16	CA=4.5 (NACE)	CA=4.5 (NACE)	CA=1.5 (SS304L - NACE)	CA=1.5 (SS321 - NACE)
17	CA=3.0 (dry Chlorine)			
18	CA=1.5 (Oxygen)		CA=NIL (SS304L-Oxygen)	
19	CA=3.0 (Caustic / Amine, Stress relieved)			
20	CA=1.5 (Jacket for A15A)			
32	CA=1.5 (Tracing)		CA=NIL (Tracing)	
33	CA=1.5 (Fire Water)			

NOTE: USE MIDDLE NUMBERS 21 TO 30 & 91 TO 99 FOR PROJECT DEPENDENT CLASSES.

TABLE FOR MIDDLE NUMBER

Middle Number	SS316L N	NICKEL /TITANUM J	ALLUMINIUM L	MONEL / ALLOY 20 P
1	CA=NIL	CA=NIL (NICKEL)		CA=NIL (MONEL)
2	CA=1.5 (CRYO)	CA=1.5 (NICKEL)		CA=1.5 (MONEL)
3		CA=NIL (TITANUM)		CA=NIL (ALLOY 20)
4		CA=1.5 (TITANUM)		CA=1.5 (ALLOY 20)
5	CA=1.5 H ₂			
6	CA=NIL (Vacuum)			
7				
8				
9				
10				
11			CA=NIL	
12				
13				
14				
15				
16	CA=1.5(NACE)			
17				
18				CA=NIL (MONEL) OXYGEN
19				
20				
32				
33				

NOTE: USE MIDDLE NUMBERS 21 TO 30 & 91 TO 99 FOR PROJECT DEPENDENT CLASSES.

TABLE FOR MIDDLE NUMBER

Middle Number	Hastelloy / Inconel / Incoloy Q	PVC / FRP S	LINED STEEL Y	HDPE / PVDF / TEFLON Z
1	CA=NIL (INCONEL 600)	CA=NIL (PVC)	CA = NIL (TEF LINED)	CA=NIL (HDPE) H ₂ SO ₄
2		CA=1.5 (PVC / FRP)		
3	CA = NIL (INCOLOY 800)	CA=NIL (FRP)	CA = NIL (RUBBER LINED - SOFT)	
4	CA = 1.5 (INCOLOY 800)		CA = NIL (RUBBER LINED – SEMI HARD) 30% HCL	CA = NIL (HDPE) 30% HCL
5			CA = 3.0 (<= 2") & NIL (>= 3") (CEMENT LINED) CAT 'D' SEA WATER	CA = NIL (HDPE) 50% HF
6	CA = 1.5 (INCOLOY 800H)			
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
32				
33			CA = 3.0 (<= 2") & NIL (>= 3") (CEMENT LINED) FIRE WATER (SEA)	

NOTE: USE MIDDLE NUMBERS 21 TO 30 & 91 TO 99 FOR PROJECT DEPENDENT CLASSES.

TABLE FOR PRESSURE TEMPERATURE RATING FOR BALL, PLUG & BUTTERFLY VALVES

ITEM	PRESSURE RATING (PIPING CLASS)	SIZE RANGE (NB INCHES)	PRESSURE IN kg / cm ²									
			TEMPERATURE IN °C									
			-29 TO 38	50	65	100	120	150	175	200	>200	
BALL (Soft Seated)	150# (AS PER PMS)	Upto 16"	19.99	19.58	19.2	17.93	17.2	16.12	15.22	7.03	DO NOT USE	
	300# (AS PER PMS)		52.00	51.02	49.8	41.85	37.3	27.4	19.15	7.03		
	600# (AS PER PMS)		104.1	98.46	91.4	64.61	49.3	38.6	29.68	17.6		
PLUG (Soft Seated)	150# (AS PER PMS)	Upto 8"	19.33	19.3	18.63	17.6	16.89	15.82	14.93	14.06		
	300# (AS PER PMS)		52.02	50.35	48.26	43.4	40.0	37.4	35.23	28.1		
PLUG (Lubricated)	150# (AS PER PMS)	Upto 12"	19.99	19.58	19.12	18.05	17.28	16.12	15.15	14.28		
	300# (AS PER PMS)		52.0	51.1	49.96	47.3	46.82	46.1	45.5	44.6		
	600# (AS PER PMS)		104.1	102.2	99.95	94.7	93.74	92.3	91.1	89.4		
Butterfly (Soft Seat)	150# (J5A, A3A, A33A, A5Y, A33Y)	Upto 48"	10.55	10.55	10.55	DON'T USE						
	150#		19.99	19.58	19.2	17.93	17.20	16.12	15.22	7.03		

NOTE: IF THE CLASS PRESSURE / TEMPERATURE IS LOWER THAN THIS TABLE, CLASS PRESSURE / TEMPERATURE TO BE FOLLOWED.

INSTRUCTIONS TO PROCESS USER

1. Piping Material Specification (Extracts) are meant only for the Process Engineers. Process Engineers require some specific standard information of each Piping Class for their use. The Extract attempts to condense the STD PMS by extracting the relevant portions required by the Process Engineers. The extent of the relevant extract required has been discussed with Process and has their concurrence. If the Process Department after a period of use require any further data, the same can be added to this extract.
2. For all EIL jobs only the EIL STD PMS shall be used unless otherwise the Process Licensor imposes his specification.
3. The following method of working is suggested for Process department:
 - a) Piping department is issuing to Process Dept one legible copy of the standard PMS and its extracts. It is requested that each Process Engineer may please be provided with a copy of the extract for their regular use.
 - b) For every job, the Process Engineer shall use this extract of the PMS, however the full PMS can be referred to as and when required.
 - c) During the course of preparation of Process Package, if any new Class (not covered in STD PMS) is required the Process Engineer shall contact the Lead Piping Engineer. The Lead Piping Engineer will get the new piping class designation from the Piping Department Standardisation Cell and convey to Lead Process Engineer.
 - d) Process Engineer shall ensure the following during Process Package:
 - i) Correct Piping Class based on the service he selected.
 - ii) Design pressure / design temperature of various lines are within the range of the selected Piping Class.
 - iii) Only the type of valves restricted to size ranges indicated are used.
 - iv) Special care for using soft seated valves (Ball, Plug & Butterfly) in view of reduced Press / Temp capability.
4. At the end of the Process Package the Lead process Engineer is requested to hand over a copy of the extract to the Lead Piping Engineer clearly marking up the following:
 - a) List of all Piping Classes used in the Process Package.
 - b) Any extra sizes of any Piping Classes as required, Any extra type of valve with size range as required.
 - c) For the new Piping Classes, details of piping material class, ANSI rating, size range, corrosion allowance, service, various types of valves with size range and basic pipe material shall be marked up in the blank Piping Material Class format available with the extracts.
 - d) Even if there is no change required in the STD PMS, Process should send back one copy of the Extracts identifying the Classes.

After receiving the marked up extracts, Piping shall make necessary revisions / updations and issue job PMS.

INSTRUCTIONS TO PIPING ENGINEERS FOR PREPARATION OF JOB SPECIFICATIONS

1. The process department is provided with STD PMS along with its extracts. The extracts include instructions to process users and outlines the procedure to be followed by process engineers while using STD PMS for various jobs. Piping engineers are also requested to follow the procedure outlined in the instructions to process department.
2. After getting the marked up copies of extracts of STD PMS for the job from Lead Process Engineer the Lead Piping Engineer shall issue JOB PMS as per Procedure for Preparation of Job Piping Material Specification (Doc. No. 5-1643-2001)
3. Revisions in the STD PMS for making the JOB PMS to be carried by Piping Department is strictly restricted to the following:
 - a) Additions / changes desired by Licensor / Process Lead Engineer.
 - b) Changes desired by the Client.

Attempts should be made to minimize revisions asked by Client / Licensor. If any such revision in any piping class becomes unavoidable, the changes are permitted only in respective job specification but the class designation should not be changed and the changes are to be considered special for the particular project.
4. The piping lead engineer should thoroughly go through the general notes of std PMS before making the job specification and in case any new class designation is required to be made the lead piping engineer should contact piping standardisation group. Development of PMS for new classes should be done in consultation with Piping Standardisation Group / SMMS.

CAUSTIC SODA SERVICE GRAPH

