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			Unit;	Scale;	D, KOREA	GEOJE SHIPYARD, KOREA	ନ୍ଲ
Rev. No.;	70	00	Builder's Document No.; MB10100	Builder's Do	ND. CO., LTD.	SAMSUNG HEAVY IND. CO., LTD.	SAMS
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			:		Choi (T 5579)		Prenared by
00 %	GINE R	M OF EN	PIPING DIAGRAM OF ENGINE ROOM	PIPINO	. Kim	. <u>Y.S.</u>	Approved by
			Title;	Document Title;			
				Ship Name;	1/65	1962/63/64/65	Hull No.,
Class.; LR	Ω	de Oil Tanker	ре; 157,000DWT Crude Oil Tanker	Ship Type;	n Design 1	artment; Outfitting System Design 1	Department; Outfitti
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IMO No	Hull No	a cover	(53) sheets with a cover		apore	Registration; Singapore	Xeg
9594822	1962	 			Y.	Dialiking device, Er	ן ב
9594834	1963		no seachest		CM), L1, FLMC, WIS, SHIPKIENT SCM, WS (NO Seagnest	bing derice) I	H CM
9594846	1964		ipKight (ACS(E	SK, EST, Sh	Me chanker to	UAI, Double H	
9594858	1965				Clossification; LR	Classification; LR	Class
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		nodation)	Hull and Accomodation)	ngine Room	Piping Practice (Engine Room,		
				Hull Part	Piping Diagram of Hull Part	MB60100 F	
				ingement	Engine Room Arrangement	MB00110 E	
		о	Document Title			Document No.	8
					Documents	≭ List of Reference Documents	*
	77						
Y. S. Kim	Was was	The B. Chor	recommendation and	-	design improvement	to May 2011	(
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Y. S. Kim	Y. S. Park	H. B. Choi	with Buyer's	accordance	Revised in comment.	03 Dec. 2010	Þ
Y. S. Kim	Y. S. Park	H. B. Choi		oval	Issued for approval	15 Oct. 2010	ı
Approved	Checked by	Prepared by	ue	Reason for Issue	R	Date	Rev.
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SAMSUNG Heavy Industries			FOR ENGINE ROOM FOR ENGINE ROOM)	HULL NO.	DRAWING NO.	PAGE
REVISION HIST LL NO.: 1962/63/64/65 V. NO. REVISED BY A AUTHORITY REQUEST OWNER'S REQUEST C CLASSIFICATION REQUEST D DETAIL ARRANGEMENT AT YAI E EQUIPMENT MAKER'S RECOMMENDATION T. NO. REV. NO. A B-1 The following 4th step arrangements. "Changin level for main engine.	REV. NO. REVISORY (1/1) REV. NO. REVISOR SERVISOR SERVISOR SERVISOR SERVISOR MISTAKE DESIGN MISTAKE DESIGN IMPROVEM DESCRIPTION Was included in Dead Ship starting gone(1) set of main air receiver to protect tarting." inpresentation:	SED BY FION BY YARD CTION AT YARD AENT PAGE 3/8		HULL NO. 1962/63/64/65	MB101.01	1 / 8



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Piping general and specification

(1) General note for L.R.S.

Lloyd Register of Shipping,

#100A1, Double Hull Oil Tanker. CSR, ESP, ShipRight(ACS(B), CM), LI, #LMC, UMS, ShipRight SCM, IWS(no seachest blanking device), EP

1) Material

- a. The carbon contents of SS400 is to be less than 0.23%.
- b. The elongation of ductile graphite cast iron is not to be less than 12%. also, FCD390 as equivalent material can be used.
- c. All flexible hoses, butterfly valves and level gauges on oil tanks are to be of classification society's approved type (or to be provided with certificate) for the intended service.
- d. All glasses on level gauges fitted to oil tanks are to be of flat and heat resistant type.
- e. The sight glass fitted to oil line is to be of fire / heat resistance material.
- f. The material of orifice plate to be SUS316 for sea water and SUS304 for other system.

2) Test

-) Test a. Burst pressure of the hose is not to be less than four times the relief valve setting of the system. In addition, non-metallic hoses for oil service are to be fire-resistant and reinforced with wire braid or other suitable material in accordance with the rules.
- b. Pipes, valves and fittings for class I & II piping systems, ship side and the collision bulkhead are to be manufactured and tested in accordance with the appropriate requirements of classification society.
- 2)-1. At Shop
 - Test of pipe spools which is classified I(1) and II(2) at shop can apply 100% of NDE instead of Hydraulic test under agreement and/or approval as follows.
 - aa) Classified I(1) pipe spools shall apply 100% of R.T & M.T or P.T which depends on raw material as it is in accordance with rule and regulations.
 - bb) Classified II(2) pipe spools shall apply 10% of R.T and 100% of M.T or P.T other than R.T to avoid duplication of NDE.
- 2)-2. At Onboard

All class I(1) and II(2) pipes and their integral fittings are to be tested by hydraulic pressure to the surveyor's satisfaction in accordance with rule and regulation.

3) Fittings

- a. Class approved type short sounding pipes for oil tanks in E/R to be installed.
- b. The coupling of hose valves for compressed air system, fresh water service system and steam service system is to be of JIS type thread, (M42)
- c. Sounding pipes for all tanks are to be fitted in a small diameter self closing test cock in accordance with the rule.

4) Operation

a. Emergency shut-off valves are to be operated from outside the machinery space as well as at local position. These are to be closed by spring return force by using of compressed air from the air bottle located outside E/R.

The capacity of the air bottle for em'cy shut off valves is to be sufficient to cycle all connected loads without recharging i.e. min. 2 times.

- b. Detail of dead ship start arrangement is as follows in accordance with the rules.
 - << When black out/dead ship condition >>
- 1st: The emergency generator engine to be started by primary starting of automatic battery device (3 starts at one charging) and secondary starting of manual mechanical device in accordance with rule request. The fuel oil service tank for em'cy G/E are to be provided with min.18 hours running continuously in connection with the rule.
- 2nd: No.1 Main air compressor with emergency power source, the lub. oil priming pump and also, the diesel oil supply pump for generator engine to be started. It can be operated automatically or manually by select switch.
- 3rd: The auxiliary generator engine to be started.

(4th: Charging one(1) set of main air receiver to proper pressure level for main engine starting.)

- c. F.O pumps and L.O service pumps are to be capable of being stopped from outside the machinery space.
- d. Valves with remote control are to be arranged for local manual operation as per 5,13,2.3.2.
- e. Further consideration will be given to the position of remote control stands for UMS operation of sea inlet and overboard discharge valves, when flooding calculations are submitted Main sea inlet and overboard discharge valves are to be fitted with local controls as per 5,13,2.5.7 and UMS controls as per 6,1,4.6.2 The flooding time to be applied minimum 20 minutes.

5) Installation

- a. Thermometers and other temperature sensing devices registering through pressure boundaries are to be provided with instrument wells
- b. Pressure sensing devices are to be provided with valve arrangements to allow for instrument isolation and removal without impairing the pressurized system's integrity.
- c. Air vent pipes led to exposed deck are to be of substantial thickness for penetration.
- d. Ship side valves and pipe connections fitted between the shell and the valves are to be in accordance with 5,13,2,5 of the rules.
- e. The relief valves fitted on the oil side of heaters are to be adjusted to operate as per 5.14,4,10.1

6) General

- a. The unit of pressure gauge: SI unit (Pa, kPa, MPa)
 - b. The positions of pipe branches and pipe sizes shown in this diagram may be changed to other suitable ones according to machinery and detail piping arrangement.
 - c. Details of machinery and concerned diagram may be changed according to manufacture's recommendation.
 - d. Motors below the level of the floor plates are to be water proof(IP44) in accordance with rule requirements.
 - e. The ventilation dampers and exhaust air louver are to be closed by spring return force and fail of supplied compressed air at fire control station in accordance with rule requirements.

SAMSU	NG	
	HEAVY INDUSTRIES	

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(2) PIPE TABLE

1) STEEL PIPE

015	CL TIFE																		
		T	Τ	Pipe wall thickness (mm)															
Non	n Out	SPP	7.9	Sch.	Т	9.5		10.		12.7			16.0		Τ	T	1	T	Ι
dia	ďia	SF F	mm		1	mm		Sch.		mm			mm		Sch.	Sch.	Sch.	Sch.	Sch.
			1.	40		*2		80		*3		1	•4		40	80	100	120	160
10	17,3	2,35	-	2.3	-	1 -	T -	3.2	 -	T -	T -	١.	T -	٠.	2.3	3.2	 .	 	-
15	21.7	2.65	 -	2.8	† -	١.	-	3.7	1 -	١.	١.	+	+	 -	2.8	3,7	 	╅-	4.7
20	27.2	2,65	╁-	2,9	-	┼-		3.9	١.	 -		-	١.	١.	2,9	3.9	 -	1	5.5
25	34.2	3.25	١.	3.4	-	+-	١.	4.5	+-	+-	+-	+	 	 -	3.4	4.5	 	l	6,4
32	42,7	3,25	-	3,6	-	1-	 -	4.9	١.	 	┿.	1 -	+-	1 -	3,6	4,9		H.	6,4
40	48.6	3.25	-	3.7	-	١.	-	5.1	-	-	-	-	 -	H	3.7	5.1	H	۱÷	7.1
50	60,5	3,65	 -	3.9	-	<u>-</u>	-	5.5	-	 	 	┪╧	 -	 	3.9	5.5		+	8.7
65	76.3	3.65	-	5.2	<u> </u>	-		7.0		-	 -	1 -	 	 - -	5.2	7.0	<u> </u>	 - -	9.5
80	89.1	4.05	-	5.5	1 -	 -	+-	7.6	·	1	 - -	+ -	-	_	5.5	7.6	<u> - </u>	<u> </u>	•
100	114.3	4.50	- -	6.0	÷	÷	H	8,6	<u> </u>	 	H÷	+	<u> </u>	 -			Ŀ	-:- -	11.1
125	139.8	4.85	-	6,6	÷	-	-	9.5		-	-	-	<u> </u>		6.0	8.6	Ŀ	11.1	13.5
150	165.2	4.85	i.	7.1	÷	H	Ŀ	_		<u> </u>	⊢	-	1.50	<u> </u>	6.6	9.5	<u> </u>	12.7	15.9
200		_	-		_	_	-	11.0		<u> </u>	<u> </u>	ļ -	16,0	ļ	7.1	11,0	<u> </u>	14.3	18.2
	-216.3	5.85	17°1	8.2	2500g	1777.	3.5	12.7.	1395	300	7.75	J • ::	16.0	31E .	8.2	-12.7	15.1	18,2	23.0
250	C. C	6.4	863	9.3	AN	100	N.	200	12.7	12.7	135	- 13	16.0	38	9.37	15:1	18.2	21.4	28,6
300		7.0		-89. -39.	9.5	9.5	*	1148	12.7	12:7.	1	1 - 1	16.0	<i>(4π</i>)	10.3	17.4	21.4	25.4	33.3
350	355.6	.: P.9	Silv.		9.5	9.5	1	400	12.7	1257	350	16.0	0.61;	20.47	1,1,1,	19.0	23,8	27.8	35.7
400		7.9	160.	0.0	9.5	9.5	-	3.3	12.7	12,7	c) 🗟	16.0	16.0	2 12	12.7	-2154	26.2	30.9	40.5
450	***457.2	7.9	************	43/2	9.5	3. (- 147		12,7	- **	25.0	16.0	<u> </u>		- ~	15.644		-	-
500	508,0	7.9	-	·	9.5	-	-	-	12.7	٠.	٠.	16.0	-		Ŀ		-	-	•
550	558.8	7.9			9.5	-	•		12,7	-	١.	16.0	-		-	٠	٠	<u>_</u>	- '
600	609.6	7.9	200		9,5₹	$C \sim C$	327	J77290	12.7	57	1997	16.0	SAM	, -		١٠,	٠	-	-
650	660.4	١.	14.		198		9.5	游生		4.4-	12.7	• 6	20	₹6.0	-		-	•	-
700	711.2	- 1	į.	17		9 9.00	9.5		•	¥-	12.7	-	STATE .	16.0	•	•	-	-	•
750	762.0	- 🔐	J.	į,	Ø.		9.5	G.	-	•	12.7	- 1	1	16.0	-	•	-	-	-
800	812.8	38.0 36.6	\$ \$	$\vec{r} \cdot \vec{z}$	Ľ.	V.C	9.5	***	-4	-	12.7	: *	iii -	16.0	-	•		-	-
850	863.6	-	٠	-	- "		9.5		-	-	12.7	-	· -	16.0	-	-	-	- 1	-
900	914.4	-	•	-	•	-	9.5	•	-	·	12.7		•	16.0	-		-	-	-
950	965.2		•	-		-	9.5		•	-	12.7	-	·	16.0	-	-		•	-
1000	1016.0	-	•	-	-	-	9.5	•	-	-	12,7	-	•	16.0	•		-		-
1050	1066,8	-	-	- 1	-	-	9.5	-		•	12.7	•	•	16.0	-	-		-	-
1100	1117.6	1-1		-	-	$\overline{}$	9.5			- <u>-</u> -	12,7	-		16.0	-		-		-
1150	1168,4	1-1	-	T			9.5	-			12,7			16.0	-	$\overline{}$	_		-
1200	1219,2	- 1	-	- 1		_	9.5	$\overline{}$			12.7	-	-	16,0		-	_	-	-
SPI	PERW	0							-									-	
T-	ERW			ᇹ	0			0	0			0						-	
	•5 ERW		\neg					-	Ť		_								
STPG	350~600		J	I				i	I			0				İ			
370	SMLS	\vdash		0		0		7	_	0			0						_
	*5 SMLS	\vdash	\dashv		-	~	-	~		-~	-	-						-+	
	150~300				1	1			1				0				1	. 1	
STPY	SAW		~	-		\dashv	0	\dashv		-+	0		-	0				\dashv	
400	*5 SAW	 	-~	\dashv		\dashv	<u>~</u>				~			- -				\dashv	
700	650~1200		ł					ŀ						0					
CEDT	370 SMLS	┞╼╾┼				<u> </u>								 -∤				<u>_</u>	_
STS	SMLS	$\vdash \vdash$	\dashv	\rightarrow	-				!		!			∤	<u> </u>	0	0	0	0
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370	*5 SMLS		I	- [- 1	Ī	I	- 1	Ī		- 1	- 1		- 1		ľ	- 1	Į.	0
CTT	25~125					\dashv					\rightarrow			[
31 PA	22 SMLS	ᄔ													0	0	0	0	0

Note *1 For SPP piping System

- *2 For SCH 40 Piping System
- *3 For SCH 80 Piping System
- *4 For SCH 160 Piping System

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٠.	- 1	2) (L-BR	ላ ሮሮ	DIDE
١.	١.	4,5	יוט יונ	7700	TILL
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<u> </u>			Unitinaa
Normand diameter	Outride diameter	Pipe walk thickness	Weight
(mm)	(men)	<u> </u>	0 (2)
G	120	10	0.41
15	200	1.0	0.51
A 25 E E	250	12	0.76
25	300)	1.5	1.14
32	38.0	1.5	1.85
	445	30	2.27
	570	20	294
• 62	761	20	3.89
E	889	25	5.66
100	1080	25	6.93
125	1330	25	8.72
120	1590	7.5	10.20
200	2190	30	17.0
250	2670	30	20.70
333	3239	40[34.20
35)	368 0	4.0	38.91
400	419D	4.0	44,37

3) Cu-Ni (90/10) PIPE

No	mal	αo	10 E	kaz *1	14 E	iar*2	16 E	lar =3	20 E	ar*3
irck	Ю	(net)	(min)	(kg/m)	T (nm)	₩ (kg/m)	T (mm)	(lqt/m)	T (rum)	(Ng/m)
Seam Weld	ed or Seam	61								
1.6		10.0		026		0,26	10	0.26		026
14	•	12.0	10	031	1.0	0.31	1 12	0.31	1D	D3L
36	10	15,0] ""	0.42		UA2		0.79		0.79
1/2	- 15	20.0		023		0.53	7.0	1.01	20	101
34		25.0		059		0.59		1.30		130
1	75	30.0	15	120	15	1 20		1.93		193
114	32	39.0	15	154				5.50		250
1 10	Ð	44.5	20	1.81		1.91	23	2.95		195
2	អ	57.0		234		234		3.80	25	383
210	65	76.1		1	20	416		517	} }	5.17
3	80	BB.9		4.98	2.5	607		607		607
-4-1	300	1080		7.41	- Z-J	7.Al		8.85		2AS
5	125	1330	25 936	םכ	10.95	30	1093	30	10.93	
_ 6	120	1.970		10.99	- 35	13.74		1314	35	1529
- 8	_200	2171	30	19.21	35	21.19	40	24.17	4.5	27,12
ID	250	267.0		22.24	40	29.55	45	3116	55	4039
Seam West	4									

0.635 77.415 88.96(1) 109.85 118.80 126.76 133.99

90

10.0

ПD

210.15

120

135

2013) 311.14

170

390.06

€77.EQ

430° 34573° 3580 6° 3590 6° 3590 6° 3590 7° 3590 7° 3590 7° 3590 7° 3590 7° 3590 8° 35 80 2 191.37 2 203.57

4) COPPER PIPE

12 15

				Unitinam
	Outside diameter		wall thickne	# (mm)
(mm)	(mm)	3.030°s	7.0 Mpt	14.0 Life
- .	ě	1.0	•	-
5 /	2	1.2	-	
6	l 10	1.2	2.0	3.0

25 25 30 1.3 4.0 35 2.0 2.0 45

2) N.D. 10 & below: C1220T - 0 (except 70K, 140K; C1220T - 1/2H) 7) N.D. 15 & nauve : C1220T - 1/2H

5) STAINLESS STEEL PIPE

	,	,											Unitionam	
Numinal	Outside													
diameter	diamiler	Sc	h.58	30	103	Sch.20S 3d		h.40	Sel	L20	Seh 160			
٨	(mm)	ZRW	SMILS	ZRW	SMIS	ERW	SMLS	ZRW	SMIS	ZRW.	SMLS	ZKW	5340.5	
6	10.5	-		$\overline{}$	12		1.5	$\overline{}$	1.7	-	2.4	_		
2	13.8				1.65		2.0		22		3.0			
10	17.3	•	۱.	LAS	1.65	2.0	2.0	23	23	- 1	3.2	l . i	-	
15	21.7	1.65	1.65	2.1	21	2.5	2.5	2.8	23	3.7	3.7		4,7	
20	27.2	1.63	1.65	2.1	2.1	25	25	2.9	29	3.9	3.9		3.3	
25	34.0	1.65	1,65	28	28	3.0	3.0	3.4	3.4	45	45		6.4	
32	43.7	1.63	1.65	28	28	3D	30	3.6	3.6	49	49	- 1	6.4	
40	48.6	1.65	1.65	28	28	3.0	30	3.7	3.7	5.1	51	- 1	7.1	
50	60.5	1.65		23	28	3.5	3.5	3.9	3.9	5.5	5.5		2.7	
రు	763	2.1		3.0	3.0	35	35	5.2	5.2	- 1	7.0	- 1	9.5	
80	29.1	2.1	-	3.0	30	40	4.0	55	5.5		7.6	.	11.1	
100	1143	2.1		3.0	3.0	4.0	40	6.0	6.0	-	- 1	٠. ا		
125	139.8	2.8		3.4	- 1	50		6.6	-	-	_	.		
150	1652	22		3.4		5.0		7,1	- 1	-	.	٠. ا	_	
200	216,3	28		4.0	- 1	65	.	\$2		-	_	- 1	-	
220	267.4	3.4	-	40		6.5	-	- 1				-		
300	318.5	4D		4.5		63			_ •		- 1	- 1		
SUS304 / 3	5US304L	٥	o	٥	0	٥	٥	0	٥	Q	0		0	
SUS316L/	SUS316L	0	О	0	0	0	a	0	0	0	_		٥	
								\neg						
Vada														

Material: JIS G3459 or equivalent

PIPING GENERAL FOR ENGINE ROOM (MB101.01)

*5 For Ship Side Distance Piping System

CONFIDENTIAL: Unauthorized use or disclosure of this material results in civil or criminal liabilities.



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(3) SYMBOL AND IDENTIFICATION
1) PIPING SYMBOL

IV.	SYMBOL	DESCRIPTION	DI	IV.	SYMBOL	DESCRIPTION
	-	NOT CONNECTED CROSSING PIPES		,	61	DECK PENETRATION (UP)
	+	CONNECTED CROSSING PIPES	S S		مر	DECK PENETRATION (DOWN)
		TEE PIPE	SAND PIPE BAN		ps	DECK PENETRATION (UP & DOWN)
ĺ	m	FLEXIBLE JOINT FLEXIBLE PIPE JOINT	PiPES	}	O (PLAN)	PIPE DOWNWARD
	− }	FLANGED JOINT				
	-0-	SLEEVE JOINT			Т	HAND-OPERATED
		REDUCER CONCENTRIC		1		REMOTE CONTROL
		SCREWED JOINT		A		SPRING:
ູ	1000	WELDED JOINT				WEIGHT
E JOIN	<u></u>	SLEEVE TYPE EXPANSION JOINT	E E		۲۵	FLOAT
PIPES AND PIPE JOINS	#	DRESSERTYPE EXPANSION JOINTS	N S		7	PISTON HYDRAULC: 丁*
PIPES	\rightarrow	BELEOWS TYPE EXPANSION JOINT	CONTROL AND REGIDLATION PARTS		<u>۹</u>	DIAPHRAGM MEMBRANE
	덙	RUBBER COMPENSATOR	AND R	Ì	-	DIAPHRAGM WITH POSITIONER
	7	EXPANSION PIPE JOINT	NTROL		Θ	ELECTRIC MOTOR DRIVEN
Ì		BLANK(BLIND) FLANGE	8		ø.	AIR MOTOR DRIVEN
	TH	SPOOL PIECE			φ	SOLENOID DRIVEN
	-₁)	CAP NUT		ſ	Θ	WAX DRIVEN
Į,	OPEN) (CLOSE)	SPECTACLE FLANGÉ	İ			DECK STAND FOR REACH ROD
Γ		PENETRATING WATERTIGHT BULKHEAD & DECK CROSSING		Ī	亞	DECK STAND FOR MANUAL HYDRAULIC OPERATED
[-	+-	PENETRATING NON-WATERTIGHT BULKHEAD & DECK CROSSING		ſ		EDUCTOR
	 	TO BILGE				
	-×	FIXED BAND (ANCHOR POINT)				
				Ī		
				ľ		· · · · · · · · · · · · · · · · · · ·

DIV.	SYMBOL		DESCRIPTION	$\ $	DIV.	SYMBOL		DESCRIPTION	
1	丞	GLOBE	CTOD VALVE	Ħ		∑t	GLOBE	STORM VALVE	
	₹	ANGLE	STOP VALVE			~	ANGLE	WITHOUT HANDLE (ARROWHEAD MAY BE OMITTED)	
	拯		3-WAY VALVE			Å	GLOBE	•	
	⊵≰	GLOBE	LIFT CHECK VALVE			لأ	ANGLE	NEEDLE VALVE	
. [₫	ANGLE	(ARROWHEAD MAY BE OMITTED)			Ě	GLOBE		
. ! [丞	GLOBE	SCREW DOWN			Å	ANGLE	RELIEF VALVE	
	<u> </u>	ANGLE	STOP CHECK VALVE (ARROWHEAD MAY BE OMITTED)			M	соск		
.:	Ď ∕	SV (ARR	VING CHECK VALVE	100		网	S WAY	COCK (L.PORT)	
S.	\bowtie	PRE	SSURE REDUCING VALVE	30000	8	風	\$555 F	COCK (T PORT)	
VALVES AND COCKS	Å	SPRING L	OADED CHECK VALVE (FLAP)		VALVES AND COCKS	- ф-	Sime.	п соск	
VES A	⋈	FLAP (ARRO)	SWING CHECK VALVE		WES /	** \Z ij	BALL V	ALVE	
.₹	Ճ	GLOBE	SAFETY VALVE		W. S.	图	(t)	BALL VALVE (L-PORT)	
	Ā	ANGLE	(ARROWHEAD MAY BE OMITTED)			函 學函	YAWE	BALL VALVE (T-PORT)	
. , i	৷≴	GLOBE	SELF CLOSING VALVE			₽₹O	BALLF	LOAT VALVE	
	톡	ANGLE	(ARROWHEAD MAY BE OMITTED)			XXX	MANIFO	OLD VALVE (STOP)	
;	丞	RE	GULATING VALVE			NAME OF	MANIFO	DLD VALVE (CHECK)	
,	丞	BUTTE	RFLY VALVE (WAFER)	l		Á	REMOT	E OPERATED VALVE	
	M	BUTTE! (FLANG	RFLY VALVE ED OR LUGGED)		ĺ	遠		ENCY SHU OFF VALVE TE OPERATED)	
	×	G	ATE VALVE			<u></u>	AIR MC	AIR MOTOR VALVE	
	•	BREATHER VALVE				®	ELECTRIC MOTOR VALVE		
	⊠	GLOBE	HOSE VALVE			图	PISTO	VALVE	
7 [∑ ni	ANGLE	THE TOTAL			%	SOLEN	OID VALVE	
	∑ î		FOOT VALVE WHEAD MAY 8E ON/ITTED)			兔	DIAPH	RAGM OPERATED VALVE	
						<u> </u>	EMERG	SENCY OPEN VALVE	



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						· · · · · · · · · · · · · · · · · · ·		_	
DIV.	SYMBOL	DESCRIPTION		DIV.	SYMBOL	DESCRIPTION	• '		
ļ	<u></u>	WAX DRIVEN 3-WAY VAL	.ve			ROSE BOX	, 1		
	힏	STRAIGHT	BALL FLOAT CHECK VALVE			MUD BOX			
g	만	ANGLE					SIMPLEX STRAINER	;	
DO2 a	₩	BACKFLOW PREVENTE	ER		— 	DUPLEX STRAINER			
VALVES AND COCKS	42	3-WAY SOIL BRANCH V	'ALVE			SEPARATOR	1.2		
\ \ \	Ø	FLOW REGULATING V	ALVE			DRAIN TRAP(DISC)			
ĺ					-	DRAIN TRAP(BALL FLOAT)	. :		
	á h	<u> </u>	43		\$ 7 4	Y TYPE STRAINER			
	700		- 17 Ta			HOPPER	- T		
١	X	FLANGED END		PIPE FITTINGS	7	HOPPER WITH COVER			
COCKS	ℴ	SCREWED END	C. Nicolanda	25 E E E	<u> </u>	AIR VENT PIPE			
VALVES AND COCKS	₩.	WELDING END	in in the second	7 - 3	(ELEVATION)	SOUNDING HEAD WITH CAP (DECK STAND TYPE)			
VALVI					PELEVATION)	SOUNDING HEAD WITH SELF-CLO	SING		
					(PLAN)	SCUPPER	<i>j.</i> .		
	0	LOCKED CLOSED			Υ	SCUPPER WITH WATER SEAL			
	0	LOCKED OPEND (1 1		\diamondsuit	AIR FILTER / REGULATOR		****	
	*	MAKER'S SUPPLY ITEM	(₫)		 : 	ORIFICE			
	LC	LOCKED CLOSED			ט	HOSE COUPLING	- :		
	LO	LOCKED OPEND			-000	DRAIN SILENCER			
	NO	NORMAL OPEND			₫	EXHAUST GAS SILENCER			
	NC	NORMAL CLOSED			≠	HULL DISTANCE PIECE			
						BILGE HAT			
	,				Ф	SIGHT GLASS			
					0	OBSERVATION GLASS			

טוט,	SYMBOL	DESCRIPTION	OIV.	SYMBOL	DESCRIPTION
	⊖	FLOWMETER			OFF CONNECTION
•	.(4)	FUSIBLE PLUG			OFF PAGE CONNECTION
	~	THERMOMETER POCKET		8	TRANSMITTER
	þ	BOSS		Image: Control of the control of the	SEAL POT
	þ	BOSS & PLUG		d	LOOP SEAL
<u>ي</u> [(iii)	ROSE PLATE		Î	GLASS LEVEL
PIPE FITTINGS	Ħ	CHANGE PIECE, CHANGE OVER PIECE			GAUGE O WITHOUT VALVE
PIPE	சி∰	GOOSE NECK TYPE AIR PIPE HEAD WITHOUT WIRE NET)			MINVALVE MATH SELF. FLAT GLASS OIL LEVEL GAUGE
	ď	BONNET TYPE AIR PIPE HEAD &	Total		OIL LEVEL GAUGEC
	®J‱	GOOSE NECK TYPE AIR PIPE HEAD (WITH WIRE NET)	Z		
	×	BONNET TYPE AIR PIPE HEAD (WITH WIRE NET)	IMENTATION	∦ ",	FLOAT TYPE LEVEL GAUGE
	ш	OIL TRAY COAMING	Z TRUME		
		BELLMOUTH	CONTROL AND INSTRU		MANOMETER
			TROL A	#	NAMED GLOAT TYPE I SHELL CALLOR
	ů, O	SELF POWERED CONTENT DIAL TYPE LEVEL GAUGE	S	l ÷	INNER FLOAT TYPE LEVEL GAUGE
	4	AIR PURGE TYPE REMOTE LEVEL GAUGE		I	
NOIT					OUTER FLOAT TYPE LEVEL GAUGE
CONTROL AND INSTRUMENTATION				НВ	HOSE BOX
NSTR				Ħ	HOSE REEL
OF AND				#H	FOAM 80X
CONTR				8	HORN (PHONE)
				Q	ACUMMULATOR
				P	VACUUM BREAKER



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2) Instrumentation symbol

Ist letter

D DENSITY (OIL)

DΡ PRESSURE DIFFERENTIAL DT DEVIATION TEMPERATURE

FLOW LEVEL

PRESSURE SALINITY TEMPERATURE

VISCOSITY Х GENERAL FAILURE Z LIMIT (OR POSITION)

2nd: letter

Ä С CONTROL INDICATION SWITCH

TRANSMITTER RECORDING

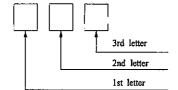
RECORDING SHUT DOWN SLOW DOWN INDICATION AND ALARM SH SL

lA

C. 3rd and 4th letter

Η HIGH LOW

D. Example



REMOTE LOCAL

REMOTE LEVEL ALARM HIGH

LOCAL PRESSURE GAUGE ΡI WITH ROOT VALVE

LOCAL THERMOMETER WITH TERMOWELL

3) Application of local instrument tubing

(1) Guidance

All the instruments(in E/R) furnished by yard are to be installed as per the following table.

i i				HEAVY FUEL OIL	REMARK
	NO.	ITEM	GENERAL (1)	& SLUDGE (2)	(IN PIPING DIAGRAM)
	1	PRESSURE GAUGE	P) MENUATURE VALVE BOSS MENUATURE VALVE A BOSS	GLYCELINE PI GB (L: TO BE MINIMUM)	(P)
	2	PRESSURE SWITCH/ TRANSMITTER	PS) PT) PS TEST COCK	GL: TO BE MINIMUM)	(F) (F)
	3	EXTERNAL SENSING TYPE PRESSURE CONTROL VALVE		(L: TO BE MINIMUM)	
	**************************************	"PI" "PS" ENSTALLED AT THE SAME TIME		TO BE INSTALLED AT THE SAME LEVEL AS FAR AS PRACTICABLE	PS PI

- 1) All gauges installed in sludge and H.F.O. systems shall be furnished with oil interface to prevent direct contact of fluid with gauge internals.
- 2) Glycerine bottle shall not be applied to the gauges which are directly mounted on pump bed with gauge board

SAMSU.	NB
	HEAVY INDUSTRIES

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4) PIPE TREATMENT SYMBOL

NO	MARK	DESCRIPTION	REMARK
1	A	ACID PICKLING + PHOSPHATE	
2	AA	ACID PICKLING + ANTI RUST OIL	
3	AG	ACID PICKLING + GALVANIZING	
4	AL	ALUMA COATING	
5	AP	ACID PICKLING + PAINTING	
6	BP	BLASTING + PAINTING	
7	GF	GLASS FLAKE COATING	
8	NO	NO TREATMENT	
9	NP	NEOPRENE COATING	
10	PE	POLYETHYLENE LINING	
11	PPT	ACID PICKLING + ANTI RUST OIL (LOW MELTING POINT)	Ι.
12	RL	RUBBER LINING	
1327752	Fig. TE:	TAR EPOXY COATING	

5) MATERIAL SYMBOI

USE	MATERIAL SYMBOL	REFERENCE NO. OF ЛS OR KS	DESCRIPTION
ļ	CDD	D 2607	CARBON STEEL PIPES FOR ORDINARY SERVICE CARBON STEEL PIPES FOR PRESSURE SERVICE CARBON STEEL PIPES FOR
	CCDEA 125330	D 3507	CARBON SIEEL PIPES FOR
İ	CTDC STO	5 35-2 (G3H32) 35 7	ORDINARTISERVICE
	31FG-370 (2-5)	890 J434 Ap 8	¿ CARBON STEEL PIPES FOR PRESSURE SERVICE
	STPT_370		CARBON'STEEL PIPES FOR HIGH TEMPERATURE SERVICE
	STPY 400	€G 3457	ARC WELDED CARBON STEEL PIPES
	STPA22	G 3458	ALLOY STEEL PIPE(Cr-Mo STEEL PIPE)
PIPES	SUS304 TP/ SUS316 TP	G 3459	STAINLESS STEEL PIPES
	Chn/n/m)	······································	FIBRE GLASS RE-INFORCED PIPE
	GRP(RTR)		(RE-INFORCED THERMOSETTING RESIN)
	C 1201 T		<u></u>
İ	C 1220 T	H 3300	COPPER AND COPPPER ALLOY-SEAMLESS
	C 1221 T		PIPES AND TUBES (COPPER PIPE)
	C 6871 T	H 3300	PIPES AND TUBES (AL-BRASS PIPE)
	Cu - Ni		COPPER - NICKEL PIPE
	BC	H 5111	BRONZE CASTING
` [BS	71 2050	COPPER AND COPPER ALLOY-RODS
	ь	H 3250	AND BARS (NAVAL BRASS)
Ī	FC	G 5501	GREY IRON CASTING
	FCD	G 5502	SPHEROIDAL GRAPHITE IRON CASTING
	SC	G 5101	CARBON STEEL CASTING
PIPING	SF440	G 3201	CARBON STEEL FORGING FOR GENERAL USE
COMPONENTS	SS400	G 3101	ROLLED STEEL FOR GENERAL STRUCTURE
(FLANGE,	S 25C		CARDON COURT FOR MACHINE
FITTING)	S 35C	G 4501	CARBON STEEL FOR MACHINE STRUCTURE USE
	S 45C		SIKUCIUKE USE
ľ	SNB 7	G 4107	ALLOY STEEL BOLTING MATERIAL
L		Q 4107	FOR HIGH TEMPERATURE SERVICE
	SCS	G 5121	STAINLESS STEEL CASTING
		G 4303	STAINLESS STEEL BAR/
	SUS	G 4304	SHEET AND PLATE
		G 4305	OLDER AND TEATE

6) IDENTIFICATION OF PIPING

① IDENTIFICATION OF PIPING

MARK	SYSTEM	MARK	SYSTEM	MARK	SYSTEM
AC	CONTROL AIR PIPING	CG	FUEL GAS PIPING	CN	NITROGEN SERVICE PIPING
AH	ACETYLENE PIPING	GE	EXHAUST GAS PIPING	ST	STEAM SERVICE PIPING
. AR	GENERAL SERV. AIR PIPING	HG	HYDRAULIC OIL PIPING	VA	AIR VENT PIPING
AS	STARTING AIR PIPING	OD	DIESEL OIL PIPING	VS	SOUNDING PIPING
BA	BLLLAST WATER PIPING	OF	FUEL OIL PIPING	WC	COLD WATER PIPING
BC	GREY WATER PIPING	OL	LUB. OIL PIPING	WF	COOL, FRESH WATER PIPING
BD	SCUPPER PIPING	ox	OXYGEN PIPING	WG	GEN, SERV. WATER PIPING
BS	SANITARY DISCHARGE PIPING	RF	AIR CON. & REFRIG. PIPING	WH	HOT F.W. SERVICE PIPING
BG	BILGE WATER PIPING	SB	BOILER FEED WATER PIPING	WP	POTABLE WATER PIPING
FC	CO , PIPING	\$D	CONDENSATE WATER PIPING	ws	COOLING SEA WATER PIPING
FD	FIRE, DECK WASH PIPING	SE	EXHAUST STEAM PIPING	FA	FORCED DRAFT AIR PIPING
DS	DESUPERHEATED STM	SS	SUPERHEATED STEAM PIPING	BV	BOILER MAKER'S SUPPLY

② NUMBERING OF PIPE LINE

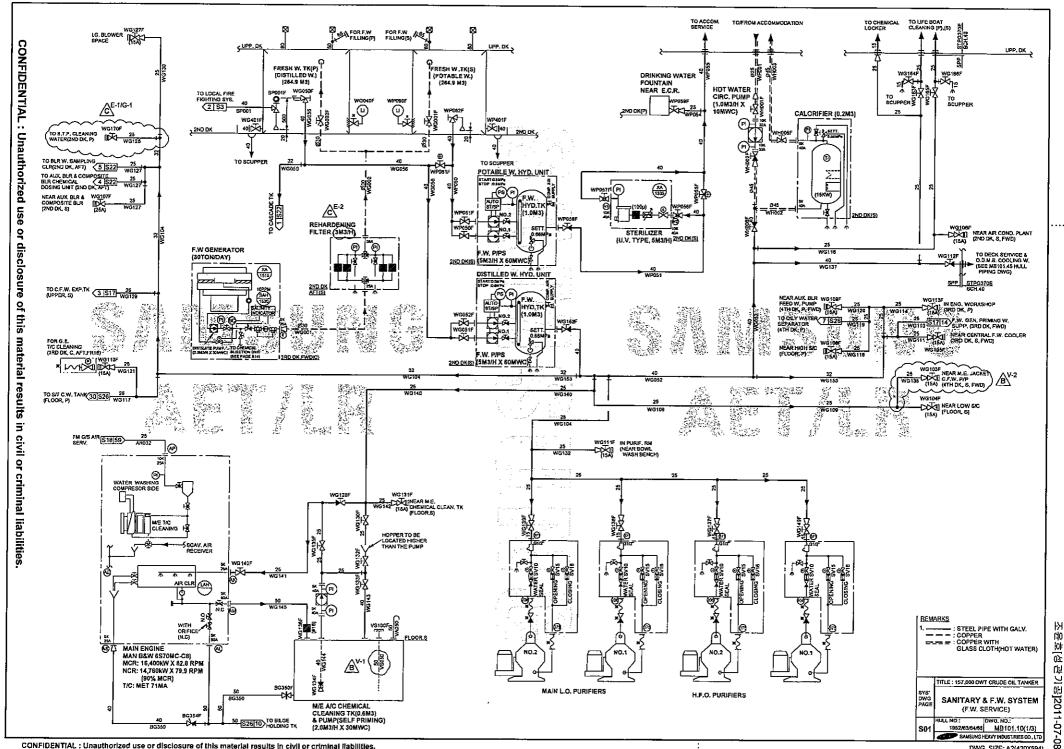
<u>80</u>		<u>A5</u>	<u>001</u>	detroit.	10 m	
1		Ĺ	£		PE NO. STEM M	(A TOTA
. L	- 1				OM. DIA	

IDENTIFICATION MARK OF VALVE & FITTING
 VIV & FITTING NO.
 SYSTEM MARK

7) ABBREVIATION & DEFINITION

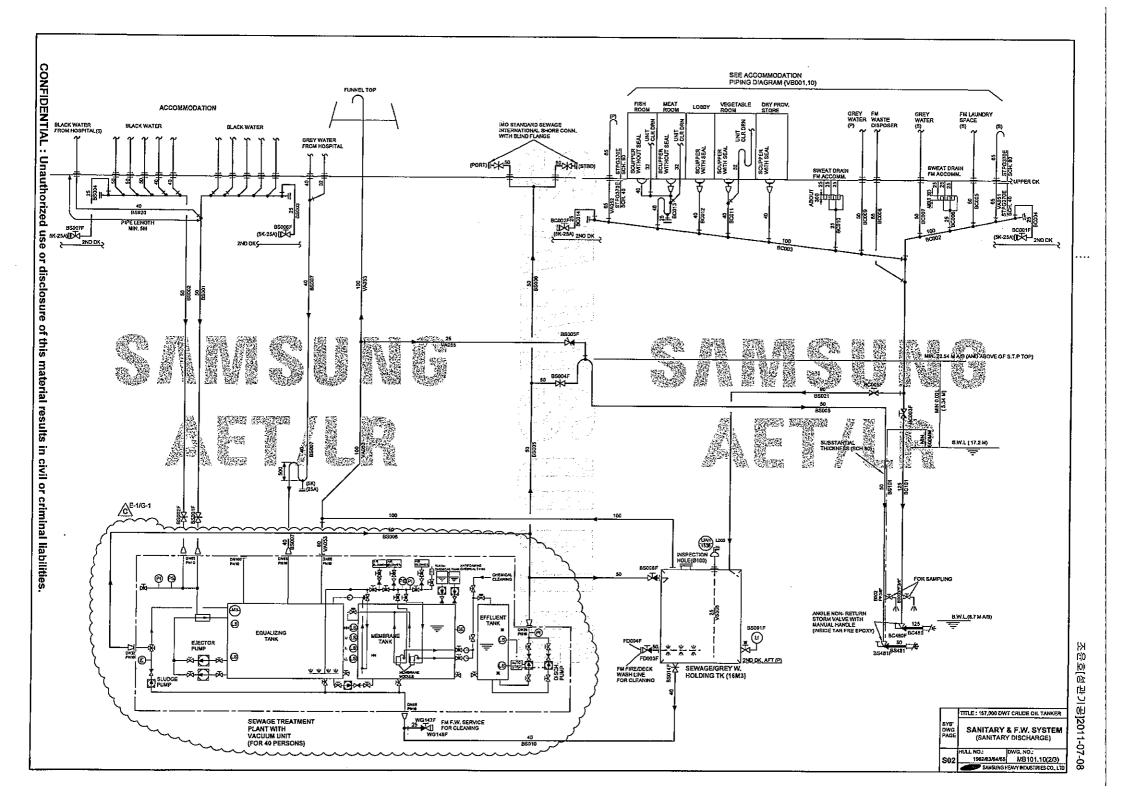
		, e ² , k	85 ST 9	S	3.8		
ABBREV AITION	DEFINITION	ABBREV- JATION	DEFINITION	ABBREV- IATION	DEFINITION	ABBREV- IATION	DEFINITION
	DEFINITION ABOVE BASE LINE ACCOMMODATION AUXILIARY ENGENE AFT PEAK TANK AUTOMATIC BALLAST WATER LINE COFFERDAM CENTRIFUGAL CHANGE-OVER CIRCULATING COOLER COMPRESSOR COMPRESSOR CONNECTION COOLING CONTROLLABLE PITCH PROPELLER CONTROLLABLE PITCH PROPELLER CENTISTOKES DOUBLE BOTTOM TANK DETAIL DIAMETER DISCHARGE	DK, D.O. DRN DMCR DWG ESCR EL. CY EM CY ENG ER.W. EXH. EXP N FPD FPT F.F.T F.W. FWD GALV.	DEFINITION DECK MARINE DIESEL OIL DEAN DERATED MAXIMUM CONTINUOUS RATING DRAWING ENGINE SUB CONTROL ROOM ELECTRIC EMERGENCY EMERGENCY ENGINE ROOM ELECTRIC RESISTANCE EXPANSION FROM FUEL OIL FROM FUEL OIL FORE FORE PEAK TANK FRESH WATER FORWARD GALYANIZING	GEN. GS. H.F.O. H/T HTR HYD. INCIN. K LO L/T L.W.L M/E MCR MIN. NCR NO.	GENERATOR GENERAL SERICE HEAVY FUEL OIL FOR MARINE USE HEAVY FUEL OIL FOR MARINE USE HIGH TEMPERATURE HEATER HYDROPHORE OR HYDRAULIC INCINERATOR KGGC.G (IKGCM = 0.981 BAR) MARINE LUBRICATION OIL LOW TEMPERATURE LOAD WATER LINE MAIN PROPULSION ENGINE MAXIMUM CONTINUOUS RATING MINIMUM NORMAL CONTINUOUS RATING NUMBER	IATION NOM. OBS. P PP PP PP PP PV RW SEPTR SEPT. ST SY ST-BY STR SUC. SYS. T/C TEMP. THK. T.S.W.T	NOMINAL OBSERVATION FORT FUMP PURIFIER ROOM QUANTITY ROCK WOOL SEPARATOR SERVICE SETILING STERN TUBE STARBOARD STAND-BY STEERING SUCTION SYSTEM TURBO CHARGER TEMPERATURE THICKNESS TANK TOP SIDE WING TANK TYPICAL
		G.C G/E	GLASS CLOTH GENERATOR ENGINE	į		SMLS	SEAMLESS

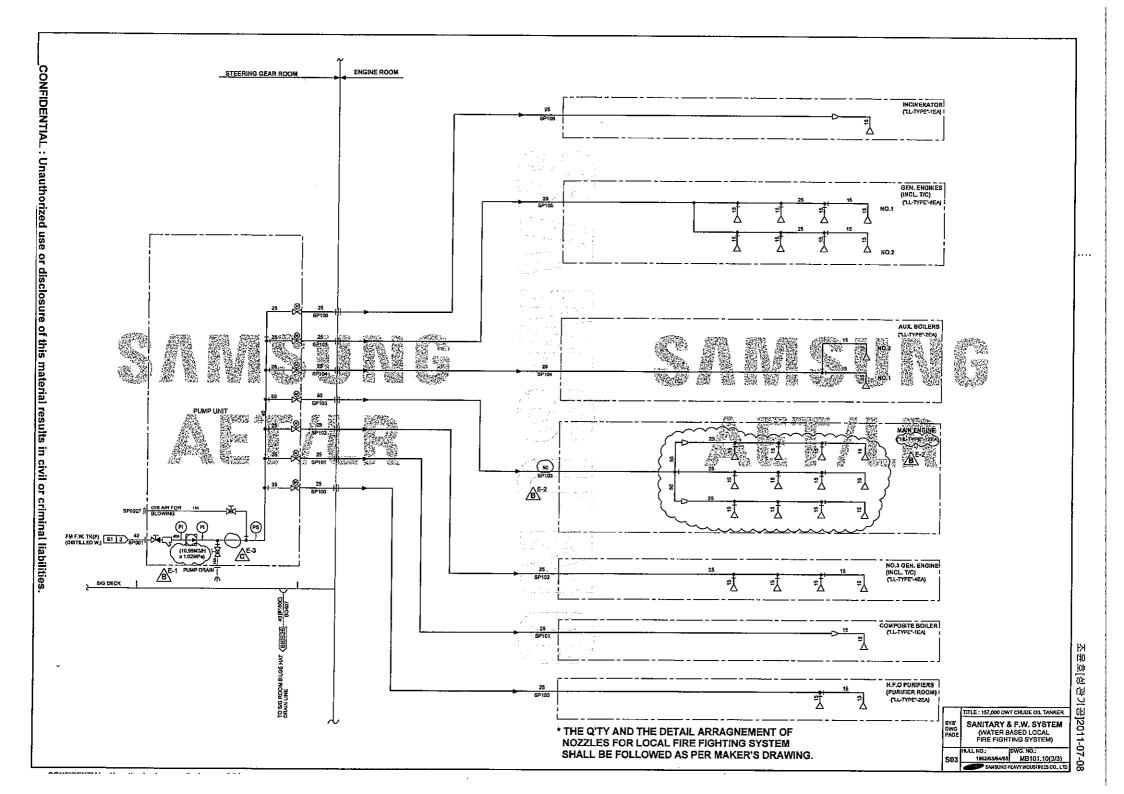
SAMSUNG				<u> </u>	,				(DES	IGN CON				ON OF F	FICATION PIPE, PIPE	IOINT &	VALVES	5)						HULL NO. 1962/63/64/65	DWG N MB101		YSTEM DWO PS(1)	. PAGE	
				SIGN ESS.		HYD.	. TEST		PIPE SPEC	IFICATIO	N		SI	PIPE JO				VALV	E SPECIE	IACTIO	N			R	EVISION H	HISTORY			
	PIPE, VALVE	Тепр. [೮]		iPa)	(LR)	Mj M	IPa]			:	TREA	AT. ★2				ON ¥3			N	IATERL	LL.	Rev. No.		REVISED BY		Rev. No.	REVISED		
System	FITTING NO.	Work, Ter	Work	MAX	CLASS(LR)	SHOP	ON- BOARD	N.D [A]	MATERIAL	тніск	IN.	оит.	TYPE *1	RATE (JIS)	MATE -RIAL	INSULATION	N.D [A]	RATE (JIS)	вову	STEM	DISC & SEAT	A B C D E	-OWNER -CLASSI -DETAIL	ORITY REQUEST R REQUEST FICATION REQUEST ARRANGEMENT AT MENT MAKER'S RECO		BY YAR G -OTHER AT YAR M -DESIGN	DESIGN SEC	TION	
VSTEM DWG. PAGE: S01 - S02:	SANITARY	ND P	W: SYST	EM (F.)	W. SER	VICE;	SANTTÀ	RY DISC	HARGE)		446.3	110				255141		TITLE TITLE				ALT:	Rev.		DESCRI	Prion #5.		6YS	
ISTILLED WATER (FROM F.W. EN. TO TANK)	WG001-049		0.3	0.33	111		Work. Cond.	≥15	COPPER (C1220T)	Pipe Table	МО	МО	F/S/U +5	- 5K	YBSC2/ BRASS	-	≥15	5K	ВС	BS	ВС	В	E-1	- Design press of Fixed (pump discharge) wa		d local fire fightir	ıg system	PS(1), S0	
W. SERVICE (DISTILLED WATER)	WG050-099	-	0.3	0.33	181	-	Work, Cond.	≥15	SPP	Pipe Table	AG	AG	F/S '★5	.5K.	SS400	-	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		E-2 V-1	- The total nozzle Q'ty i 9ca and relevant pipe	of Main Eng line size wo	as changed.		S03	
RINKING WATER	WP050-099	-	0.6	0.66	(11	-	Work. Cond.	≥15	SPP	Pipe Table	AG	AG	F/S ★5	5K	\$\$400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		V-1 V-2	 The sounding pipe size increased to SOA from F.W. Service line for 	140A.		iing tank was	S01 S01	
ENERAL FRESH WATER	WG100-299		0.6	0.66	III	·	Work. Cond.	≥15	SPP	Pipe Table	AG	AG	F/S	5K	SS400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC	С	E-1 /G-1	- The maker of Sewage from "JETS" and rele	Treatment P	Plant was changed	to "EAVC"	\$01,502	
OT WATER	WH001-099	70	0.6	0.66	111	-	Work. Cond.	≥15	COPPER (C1220T)	Pipe Table	Ю	МО	F/S/U ★5	5K	YBSC2/ BRASS	R.W /G.C	≥15	5K	вс	BS	вс		E-2		• •		rom 2m3/h,	SOI	
REY & BLACK WATER DRAIN	BC001-049 BS001-049		-	-	III	•	Work. Cond.	≥15	STPG370-E	Sch 40	AG	AG	F/S ★5	5K	SS400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		E-3						
REY & BLACK WATER JBSTANTIAL THICKNESS PIECE	BC100-199 BS100-199	-	-	-	111	-	Work. Cond.	≥15	STPG370-E	Sch 80	AG	AG	ř	5K	5S400	-	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC								
IIP SIDE LINE FOR GREY & .ACK WATER OVERBOARD	BC480-499 BS480-499		III - Wark. Cond. ≤125 STS370-S Sch 160 TE AP F. 10K SF440 - ★6																										
R VENT & OVERFLOW XCEPT OIL TANK INSIDE)	VA001-099	-		•	=		Work. Cond.	≥100 65, 80 ≤50	SPP STPG370-E	Pipe Table Sch 40	AG	AG	F/S ★5	5K	SS400	-		-	-		-		į						
OUNDING XCEPT OIL TANK INSIDE)	VS001-099	•			ш	-	Work. Cond.	≥100 65,80	STPG370-E SPP STPG370-E	Sch 80 Pipe Table Sch 40	AG	AG	F/S ★5	5K	S\$400	•		-	-										
STEM DWG PAGE SOLE	SANITARYA	NO F.	v svet	EN AV	TERT	ASED	ľöčáť	≤SO FIRE FI	STPG370-E GHTING SYST	Sch 80	institu		120	egrice :		क विभक्तात	nistal sad	nie i e i	<u> </u>	* St 10 17 4 1	1646								
XED WATER BASED CAL FIRE FIGHTING	SP001-049	-	and an elite is	and the second	व्यव्यवस्था () ()		Work.	≥15	STPG370-E	Sch 40	AG	AG	F/S	5K	SS400	esain (+a S∓ -	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC	,							
'STEM (PUMP SUCTION) XED WATER BASED CAL FIRE FIGHTING	SP100-149	-	1.02	1.32	111		Work. Cond.	≥15	STPG370-E	Sch 40	AG	AG	F/S ★5 ··	16K	SF440	-	≥50 ≤40	5K 5K 5K	FC BC	BS BS	BC BC								
"STEM (PUMP DISCHARGE) REMARKS: *1: TYPE OF PIPE JOINTS ① F: FLANGE ② S: SLEEVE ③B ② LE: L-TYPE SLIP ON FLANGE (*2: REFER TO PIPING GENERAL 1 *3: INSULATION ① R.W: ROCK WOOL ② G.C: G *4: NDE CAN BE APPLIED INSTEA SPECIFICATION 1-(1)-2 FOR "T. *5: THE PIPE JOINT PACH SYSTEI IN PIPE JOINT TYPE COLUMN *7: AT BLOCK STAGE, EACH CON FOR CLEANING CHECK, AFTE WHOLE SYSTEM SHALL BE B	① SF: SQUARE I -(3)-4), FOR "PIP LASS CLOTH ① LD OF HYDRAUI EST". EM WILL BE DEC . CERNED PIPE SER THIS CLEANI	FLANG. PE TREA C.S : F LIC TES CIDEDA SHALL ING, NO	E ATMENT PRE-FOR TUNDI SELECT BE CAR DZZLE S	INION (SYMBO RMED CA ER AGRE ED ACCO RIED OL HALL BI	DL". ALCIUM EEMEN ORDIN UT COM	M SILIC. T AND/ G TO A MPRESS	ATE © (OR APPI CTUAL I	G.C.F.: G ROVAL, PIPING A BLOWN	LASS CLOTH C DETAIL METHO RRANGEMENT WITHOUT NOZ	OVERED V OD IS MEN FROM ON	WITH A TIONE JE OF T	LUMIN D ON P THE TY DER CI	IIUM FO IPING G PES MEI .ASS INS	IL(0.3T) ENERAL NTIONEI IPECTIO	AND.	O GENI - ≥ 50 - ≤ 40 O BUT - BOD STEA COO - BOD	STEM: DISC & BODY DISC & TERFLY Y: CAST M: SUS3: MAIN CO LER IN/C Y: CAST	LEVE: SC(RUS) 16 SEAT: BC, S'SEAT: SEAT: VALVE: STEEL 16L, DISOOL, S.VOUTLET' TRON,	JBBER LI IL OR BS, SUS316L TEM: BS	OR BC PSIDE V. (), (6L, SEA CENT. F.	ALVE T:NBR W								
																					ŀ			PIPING DESIG	N SPECIFI	CATION (PS1)	(1/1)	<u> </u>	



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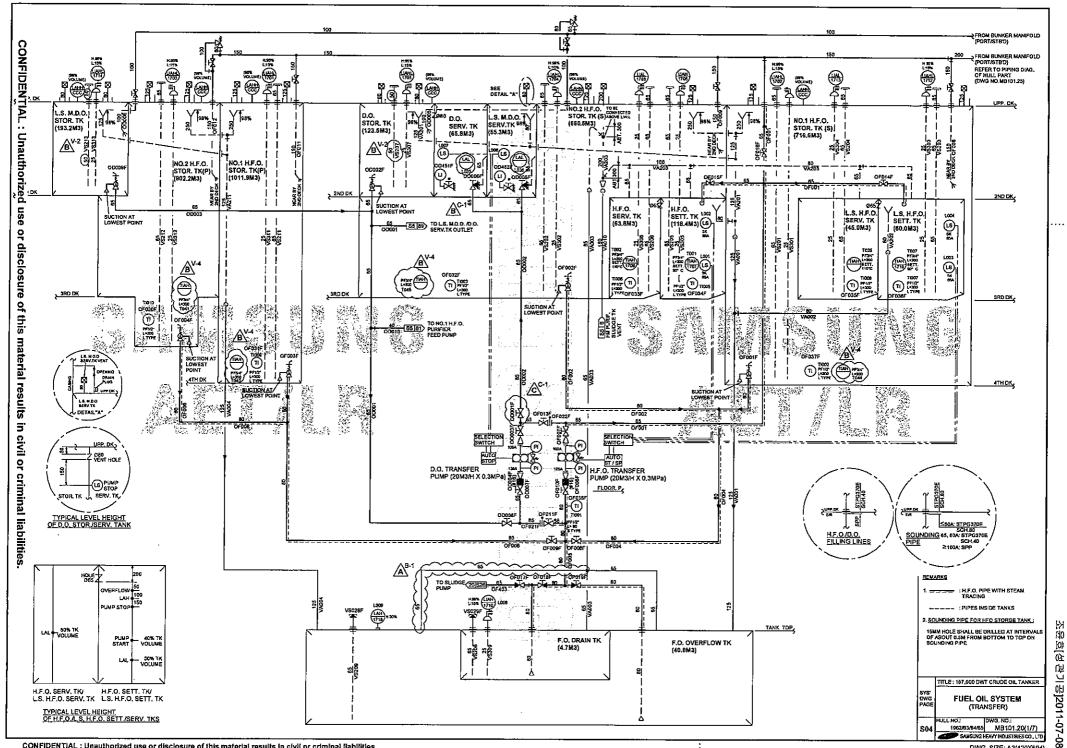


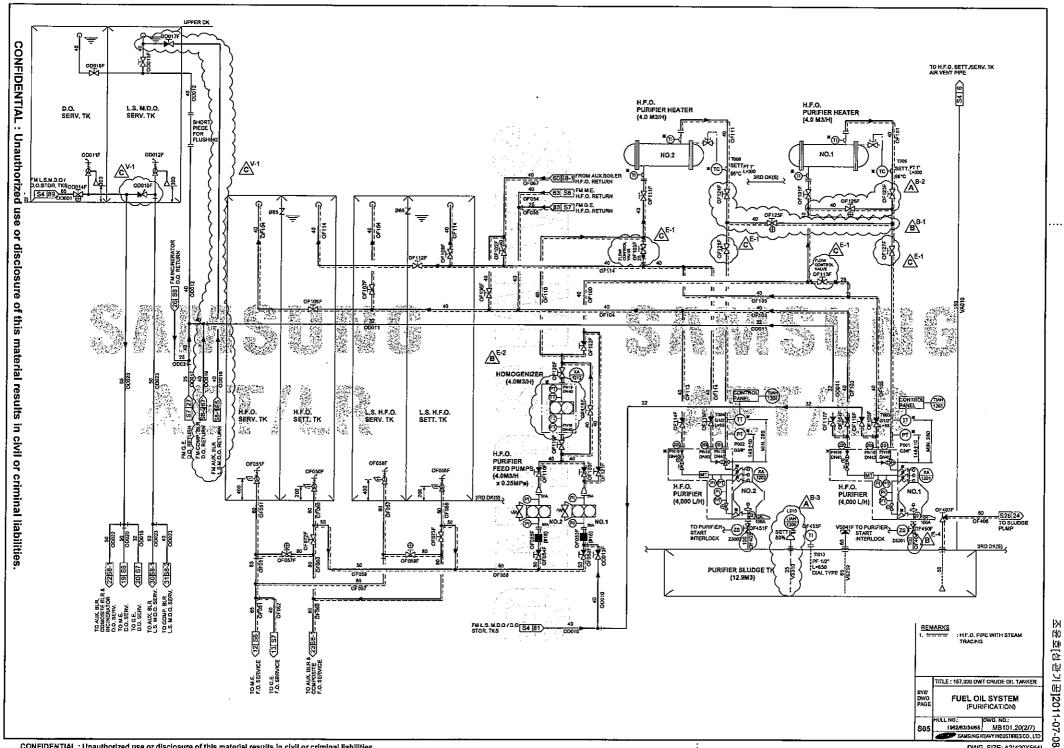


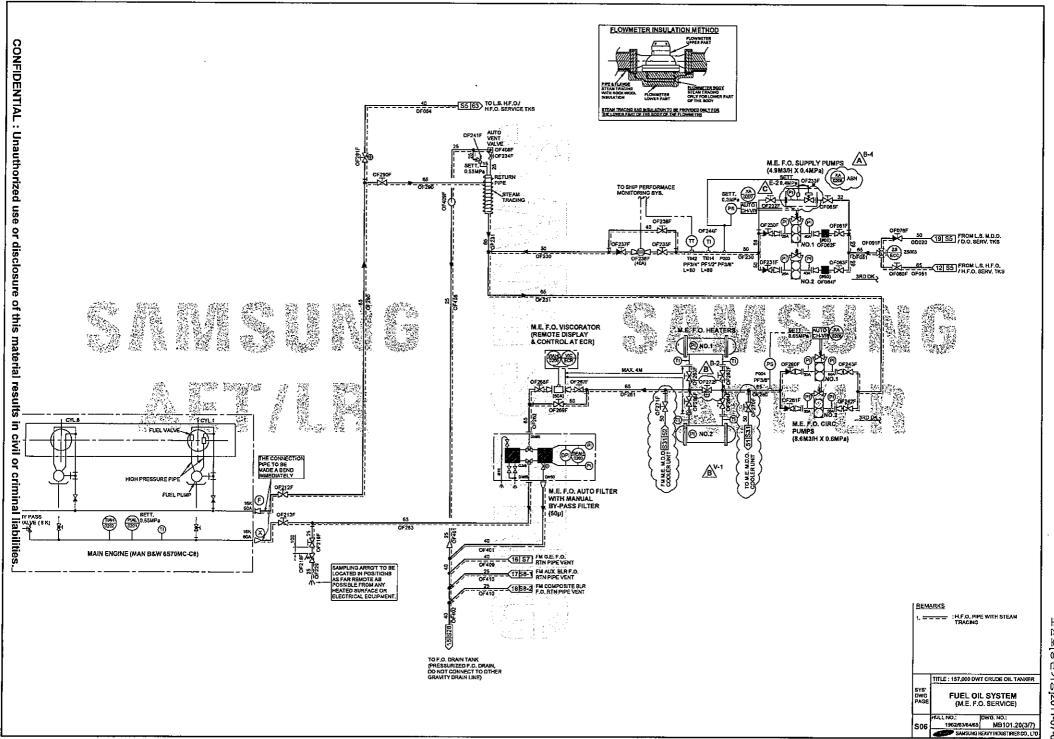
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SAMSUNG				Γ					ΦE	SIGN CO					FICATION PIPE, PIPE	JOINT &	VALVE	(S)			-			HULL NO. DWG NO. SYSTEM DWG 1962/63/64/65 MB101.20 PS(2) (1/2						
				SIGN	Τ	нуі). TEST	ŀ	PIPE SPEC					PIPE JO	DINT		1		E SPEC	FIACTI	ON			REVISION HISTORY	.)					
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SYSTEM	PIPE, VALVE & FITTING NO.	Work Temp.		MAX		SHOP	ON. BOARD	N.D (A)	MATERIAL	тніск	IN.	оит.	ТҮРЕ ★1	(ЛS)	RIAL	INSULATION	N.D [A]	RATE (JIS)	BODY	STEM	DISC & SEAT	A B C D E	-OWNI -CLAS: -DETA	IORITY REQUEST ER REQUEST STICATION REQUEST IL ARRANGEMENT AT YARD MENT MAKERS RECOMMEND. TOESIGN MISTAKE U-DESIGN MISTAKE U	ECTION					
SYSTEM DWG PAGE ; 504 - 509	FUEL OIL'S	ÝSTEN				(1) 3 6 5 (1) 3 6 5			al annight bid			7.2			7		\$11.44 \$11.44					VIII VIII	Reva NO	DESCRIPTION LEGISLATION	SYS"					
TRANSFER/FILLING & PUMP SUCTION & RETURN (CLASS III)	OF001-049	≤60	0.3	0.45		0.68 *4	0.68	≥15	SPP	Pipe Table	A	AP	F/S ★5	5K	SS400	R.W /G.C	≥50 ≤40 ≥50 (B/F V/V)	5K 5K 5K	FC BC FC	BS BS SUS -304	BC BC Disc; AL-BC Seat:	A	B-1 B-2 B-3 B-4	B-1 - Air vent pipe for F.O. overflow tank was added. B-2 - By-pass line with valve was provided with No.1 HFO Purifier Heater for MDO operation. B-3 - Instrument for Purifier sludge tank was changed to LIAH from LAH.						
	OD001-049	≤60	0.3	0.45	п	0,68 *4	0.68/	E-1 ≥15	SPP	Pipe Table	A	AP	F/S	5K	SS400	-	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC	В	B-1	was provided. The cross connection line with valve between No.1 H.F.O. purifier heater outlet line and No.2 H.F.O. purifier heater	S05					
PUMP SUCTION & RETURN (CLASS II)	OF050-099	> 60	0.25	0.35	l n	0.53	0.53	≥15	STPG370-S	Sch 40	Α	AP,	F	5K	SS400	R.W /G.C	≥50 ≤40	10K 5K	SC BC	SUS	SCS BC		B-2 B-3	outlet line was provided. - By-pass line with valve for M.E. F.O heater was provided. - By-pass line with valve for G.E. F.O. heater was provided.	S06					
H.F.O. PURIFIER FEED PUMP DISCHARGE	OF100-149	MAX. 98	0.25	0.35	l II	0.53	0.53	≥is	STPG370-S	Sch 40	A	AP	F	- 5K	SS400	R.W /G.C	≥50 ≤40	10K 5K	SC BC	SUS	SCS BC		B-4	- By-pass line with valve for Aux. Boiler F.O. heater was provided.	S07 S08-1					
G.E. F.O. SUPPLY P/P TO G.E. F.O. CIRC. P/P	OF150-179	MAX. 90	0.4	0.5	п	0,75	0.75	≥15	STPG370-S	Sch 40	Α	AP	F	IOK	SS400	R.W /G.C	≥50 ≤40	10K 16K	SC BC	SUS	SCS BC		C-1 D-1	Low level alarm(LAL) for D.O. Serv. tank and L.S.M.D.O. Serv. tank was provided. The installation location of Homogenizer was moved.	S04 S09					
G.E. F.O. CIRC. P/P TO G.E. F.O. OUT ISOL/G V/V	OF180-219	MAX. 150	0.8	1.4	11	2.1 *4	2.1	≥80 ≤65	STPG370-S	Sch 40	АА	АР	LF F	16K	SF440	R.W /G.C	≥50 ≤40	20K 16K	SC BC	SUS BS	SCS BC		E-1	to incinerator outside from inside. - Following piping design specification was changed as below. - Transfer/filling & pump suction & return (classIII).	PS(2)					
G.E. F.O. RETURN FM G.E. F.O. OUT ISOL'G V/V TO RETURN PIPE	OF220-229	MAX. 150	0.4	0.55	п	0.83 *4	0.83	≥15	STPG370-S	Sch 40	A	AP	F	10K	\$\$400	R.W /G.C	≥50 ≤40	10K 16K	SC BC	SUS BS	SCS BC			Pump saction & return (classII). - H.F.O. purifier feed pump discharge. - G.E. F.O. supply u/p to G.E. F.O. Circ. u/p. - G.E. F.O. return from G.E. F.O. ut isolating v/v						
M.E F.O. SUPPLY P/P TO M.E. F.O CIRC, P/P	OF230-259	MAX. 90	0.4	0.5	П	0.75 *4	0.75	≥15	STPG370-S	Sch 40	A	AP	F	lok	SS400	R.W /G.C	≥50 ≤40	10K 16K	SC BC	SUS BS	SCS BC			to return pipe. M.E. F.O. snuply p/p to M.E. F.O. Circ, p/p. M.E. F.O. Circ, p/p to M.E. F.O. out isolating v/y.						
M.E. F.O. CIRC. P/P TO M.E. F.O. OUT ISOL'G V/V	OF260-289	MAX. 150	1,0	1.45	l II	2.2 *4	2.2	≥80 ≤65	STPG370-S	Sch 40	AA	AP	LF F	16K	SF440	R.W /G.C	≥50 ≤40	20K	SC BC	SUS BS	SCS BC			M.E. F.O. Circ. pp to M.E. F.O. out isolating v/v M.E. F.O. return from M.E. F.O. out isolating v/v to return pipe.						
M.E. F.O. RETURN FM M.E. F.O. OUT ISOL'G V/V TO RETURN PIPE	OF290-299	MAX, 150	0.4	0.55	п	0,83 ★4	0,83	≥15	STPG370-S	Sch 40	A	AP	F	10K	\$\$400	R.W /G.C	≥50 ≤40	10K 16K	SC BC	SUS BS	SCS BC			- G.E. D.O. pump for G.E. D.O. service Composite boiler F.O. boost pump to composite boiler F.O. outlet isolating valve.						
G.E. D.O. PUMP FOR G.E. D.O. SERVICE	OD150-199		0.7	0.8	u	1.2 *4	1.2	≥80 ≤65	STPG370-S	Sch 40	AA	AP	LF F	IOK	SS400	-	≥\$0 ≤40	10K 16K	SC BC	SUS B\$	SCS BC		E-2 E-3	Internal drawing of homogenizer was changed. Internal drawing of Composite boiler F.O. booster pumps was changed because the supply scope of Composite boiler.	S05, S09 S08-2					
AUX. BOILER F.O. BOOST PUMP TO AUX. BOILER F.O. OUTLET ISOLATING VALVE	OF300-339	MAX. 145	2.5	2.85	I	4.28 ★4	4.28	≥15	STPG370-S	Sch 40	Α	АР	F	30K	SF440	R.W /G.C	≥32 ≤25	30K 30K	SC SF	SUS SUS	SCS SCS		E-4	F.O. booster pumps was changed to "Composite boiler- AALBORG" from "Displacement pump-IMO". The pipie line size of No.1/2 H.F.O. Purifier sludge discharge was changed to 100A from 125A.	505					
COMPOSITE BOILER F.O BOOST PUMP TO COMPOSITE BOILER F.O OUTLET ISOLATING VALVE	OF340-349	MAX. 90	3.3	3.6	، (5.4 *4	5.4	≥15	STPG370-S	Sch 40	A	ΑP	F	30K	SF440	R.W /G.C	≤32 ≤25	30K 30K	SC SF	SUS SUS	SCS SCS		E-5 E-6 E-7 E-8	Sampling valve was provided. Internal drawing of Composite boiler was changed. Internal drawing of Incinerator was changed. Position of C.E. M.D.O. cooler was moved to G.E. inlet	S08-2 S08-2 S09 S07					
BOILER D.O. IGNITION PUMP DISCHARGE	OD300-339	•	0.7	0.77	11	1.16 ★4	1.16	≤10	SUS304	105			U		SUS304		≥50 ≤40	10K 16K	SC BC	SUS	SCS BC		V-1	-from-outlet: - The pipe line of * To M.E. M.D.O. cooler unit* was moved	S06					
AUX. BOILER L.S. M.D.O. SUPPLY PUMP TO AUX. BOILER	OD200-209	•	2.5	2.85	I	4.28 ★4	4.28	≥15	STPG370-S	Sch 40	A	AP	ř.	30K	SF440	·	≤32 ≤25	30K 30K	SC SF	SUS SUS	SCS SCS		V-2	between M.E. F.O. Circ. pumps and M.E. F.O. heaters. - The sounding pipe size of following tanks was changed to SOA from 40A.	\$04,509					
INCINERATOR D.O. P/P TO INCIN, D.O. SUPPLY	OD360-369	_	0.3	0.33	111	-	0.5	≥15	SPP	Pipe Table	A	ΑP	F	5K	SS400		≥50 ≤40	10K 5K	SC BC	SUS BS	SCS BÇ			- L.S. M.D.O. STOR. tank. - D.O. STOR. tank.						
NCINERATOR WASTE OIL SERVICE	OF360-369	MAX. 90	0.2	0.3	II	0.45 *4	0.45	≥15	STPG370-S	Sch 40	A	ΑP	. F	5K	SS400	R.W /G.C	≥50 ≤40	10K 5K	SC BC	SUS BS	SCS BC			- EM'CY G.E. D.O, tank.						
EM'CY G.E. D.O. SERVICE	OD340-359	-	-		ш	-	0.41	≥15	SPP	Pipe Table	A	AP	F	5K	SS400	-	≥50 <40	5K 5K	FC BC	BS BS	BC BC			PIPING DESIGN SPECIFICATION (PS2) (1/2) (FUEL OIL SYSTEM) (MB101.20) (S04-S09)						

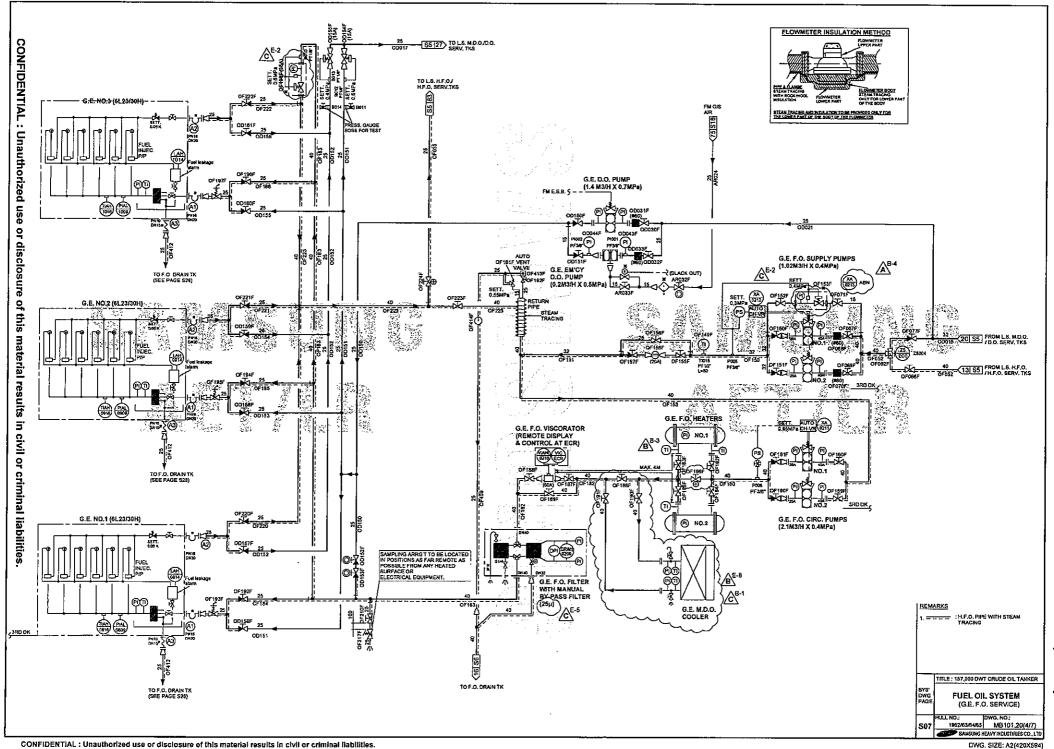
SAMSUNG									(DES	SIGN CON					FICATION PIPE, PIPE	M TAIOL	VALVE	(S)			-			HULL NO. 1962/63/64/65		G NO.	SYSTEM DY PS(2)		
				SIGN		нуг	, TEST		PIPE SPEC			,		PIPE JO	INT		1	· · · · ·	E SPEC	IFIACTI	ON		!		EVISION H		P3(2)	42)	
		2		ESS. [Pa]	2	I .	/IPa]		<u> </u>		TRE	AT. ★2	 	T		*		T	ĺ	MATER	IAL	Rev.		REVISED BY	,	Rev.	REVISE	D BY	
SYSTEM	PIPE, VALVE & FITTING NO.	Work Temp.	}	MAX		SHOP	ON. BOARD	N.D [A]	MATERIAL	тніск	IN.	OUT.		(JIS)	MATE -RIAL	INSULATION	N.D [A]	RATE (JIS)	вору	STEM	DISC & SEAT	A B C D E	-OWNER F -CLASSFIC -DETAIL	LITY REQUEST REQUEST CATION REQUES ARRANGEMENT ENT MAKER'S RE	AT YARD	F G	DETAIL CALCU 3Y YARD OTHER DESIGN AT YARD DESIGN MISTA DESIGN IMPRO	I SECTION KE	
SYSTEM DWG PAGE 2 S04 2 S09	FUEL OILS	YSTEM				透過	57.52									110221		1 12 14 14	i de dia			ALT NO	Rev :		DESCR	IETION !		TALL I SY	
F.O. & SLUDGE DRAIN LINE	OF400-479		-	<u>.</u>	111	-	Work. Cond.	≥15	SPP	Pipe Table	A	ΑР	F/S ★ 5	5K .	SS400	R.W /G.C *7	≥50 ≤40 ≥50 (B/F V/V)	SK SK SK	FC BC FC	BS BS SUS304	BC BC Disc: AL-BC Seat: NBR	В	V-3 - V-4 - V-5 - B-1 - 1	The pipe thickness through other fuel TIAH for H.F.O st Position of Aux. I to Aux. Boiler M.I Position of G.E. M. heater,	for vent, sor tank was ide torage tanks Boiler M.D.O D.O. supply	unding and entified. was provid O. supply fl pumps suc	overflow passing led. lowmeter was mo tion side.	PS() S0- ved S08	
D.O. DRAIN LINE	OD400-479	-	-		10	-	Work. Cond.	≥15	SPP	Pipe Table	А	АР	F/S * 5	5K	SS400		≥50 ≤40 ≥50 (B/F V/V)	5K 5K 5K	FC BC FC	BS BS SUS304	BC BC Disc: AL-BC Seat: NBR		C-1 - 1 E-1 - 1 E-2 - 5 E-3 - 0 f E-5 - 1	Isolating valve on provided. Valve's supply scope of pro Capacity of Aux. b to 6.8m3/h from 11 Capacity of incinent from 800,000kcal/h Filter mesh size of	pe was chang essure contro oiler M.D.O 1,7m3/h, ator was cha	ged to build of valve wa supply pur anged to 85	der from maker. is changed, mps was changed 0,000kcal/h	50- 506,5 508- 508- 509- 509-	
AIR VENT & OVERFLOW (EXCEPT OIL TANK INSIDE)	VA001-099	-		•	ш	•	Work. Cond.	≥100 65, 80 ≤50	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	AG	AG	F/S * 5	5K	SS400	•	•	-	-	-			V-1 -1	from 10µ.					
AIR VENT & OVERFLOW (PASSING THROUGH OTHER FUEL OIL TANK)	VA200-219			}	111		Work. Cond.	≥250 ≤200 ≤50	STPG370-E STPG370-E STPG370-E	Sch 40 Sch 80 Sch 160	٨	АА	F/S ★ 5	5K	\$\$400	N ^{V-3}	•		•	-	-			(\-	-,			
AIR VENT & OVERFLOW (OIL TANK INSIDE)	VA220-249	-		٠	וננ	•	Work, Cond.	≥100 65,80 ≤\$0	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	A	**	F/S ★ 5	5K	SS400		٠			-	-								
SOUNDING (EXCEPT OIL TANK INSIDE)	VS001-099	•		•	ш		Work. Cond.	≥100 65,80 ≤50	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	AG	AG	F/S + 5	5K	SS400	^v·3			•		-								
SOUNDING (PASSING THROUGH OTHER FUEL OIL TANK)	VS200-219				in		Work. Cond.	≥250 ≤200 ≲50	STPG370-E STPG370-E STPG370-E	Sch 40 Sch 80 Sch 160	A	٨	F/S ★ 5	5K	SS400	B			-		-								
SOUNDING (OIL TANK INSIDE)	VS220-249	•	•	•	nı		Work. Cond.	≥100 65,80 ≤50	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	A	۸۸	r/s ★'s	5K	SS400	•	-	-	-	-	-								
AIR PURGE LINE FOR REMOTE LEVEL GAUGE (OIL TANK) ** REMARKS:	VS300-349	-	-	-	J[J		Work. Cond.	≤50 ≥15	STPG370-E	Sch 80	A	AA	F/S ★ 5	5K	SS400	- 6. ★6:Sl	112 SAIR	- DE VAI	- VE	-	-								
** KEMARKS: (** KEMARKS: (**) F: FLANGE (**) S: SLEEVE (**) (**) LF: L-TYPE SLIP ON FLANGE (**) X: REFER TO PIPING GENERAL 3. **3: INSULATION (**) R.W.: ROCK WOOL (**) G.C.: (**) 4. **4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR " 5. **5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUM 7. **7: ONLY HORIZONTAL INSTAL	: ③ SF: SQUARE 1-(3)-4), FOR "PH GLASS CLOTH © AD OF HYDRAU TEST". TEM WILL BE DE N.	FLANG PE TRE D C.S : I LIC TE: CIDED/	E ATMEN PRE-FOR ST UND: SELECT	T SYME UMED C ER AGR ED ACC	OL". ALCIU EEMET	M SILI IT ANI IG TO	CATE (4) D/OR API ACTUAL	G,C.F.:) PROVAL PIPING	GLASS CLOTH (, DETAIL METH	COVERED IOD IS ME	WITH NTION	ALUMI ED ON	NIUM F PIPING	OIL(0.3T) GENERAI	L AND	⊕ GENE - ≥ 50 - ≤ 40 Ø BUTTI - BODY STEM © THE 12 COOL	RAL V.: BODY STEM; DISC &: BODY DISC & ERFLY I: SUS3 MAIN C.	ALVE : SC(RU SUS316 : SEAT : : BC, S : SEAT : VALVE F STEEL 16L, DIS OOL, S.	IBBER L L OR BS SUS316 TEM : B BC I FOR SI (FLANC C : SUS W P/P TO	LOR BC S, HIPSIDE V BE), 316L, SE D CENT, 1	/ALVE								
DENTIAL : Unauthorized use or	disclosure of t	this ma	aterial r	esults	in civi	l or cr	iminal li	iabilitie	s. 											316L, SE/	AT:NBR			PIPING DESIGN (FUEL OIL SY					

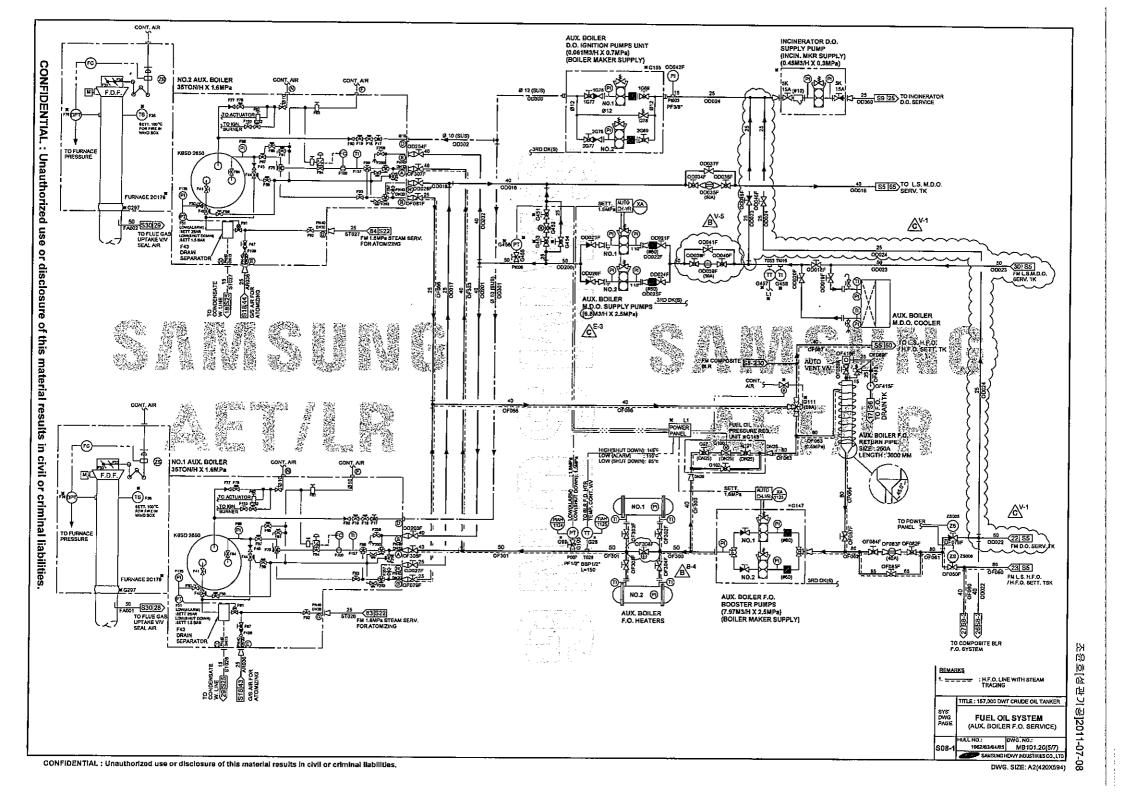




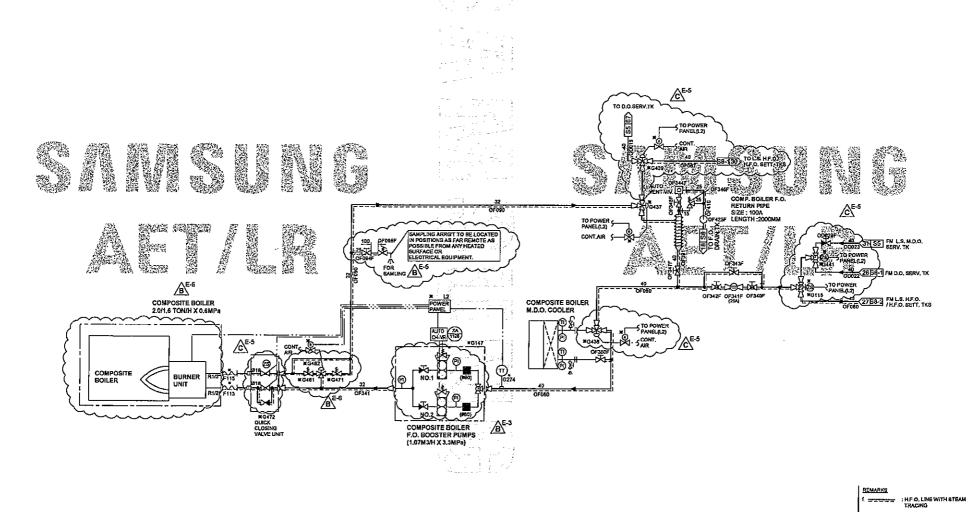


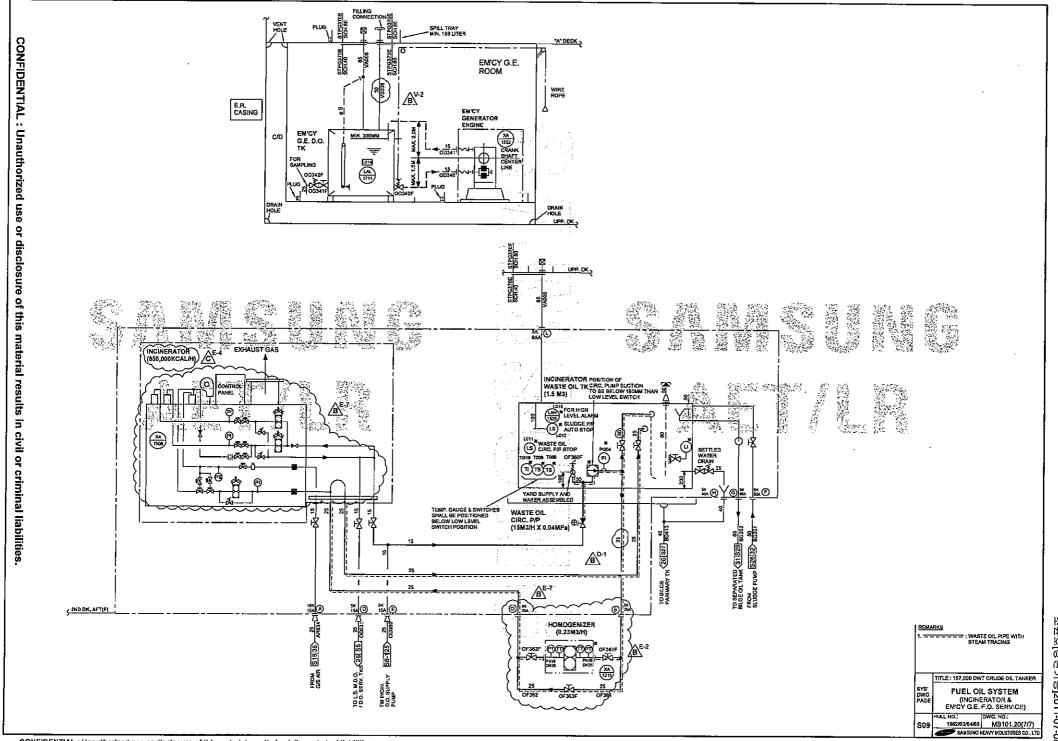
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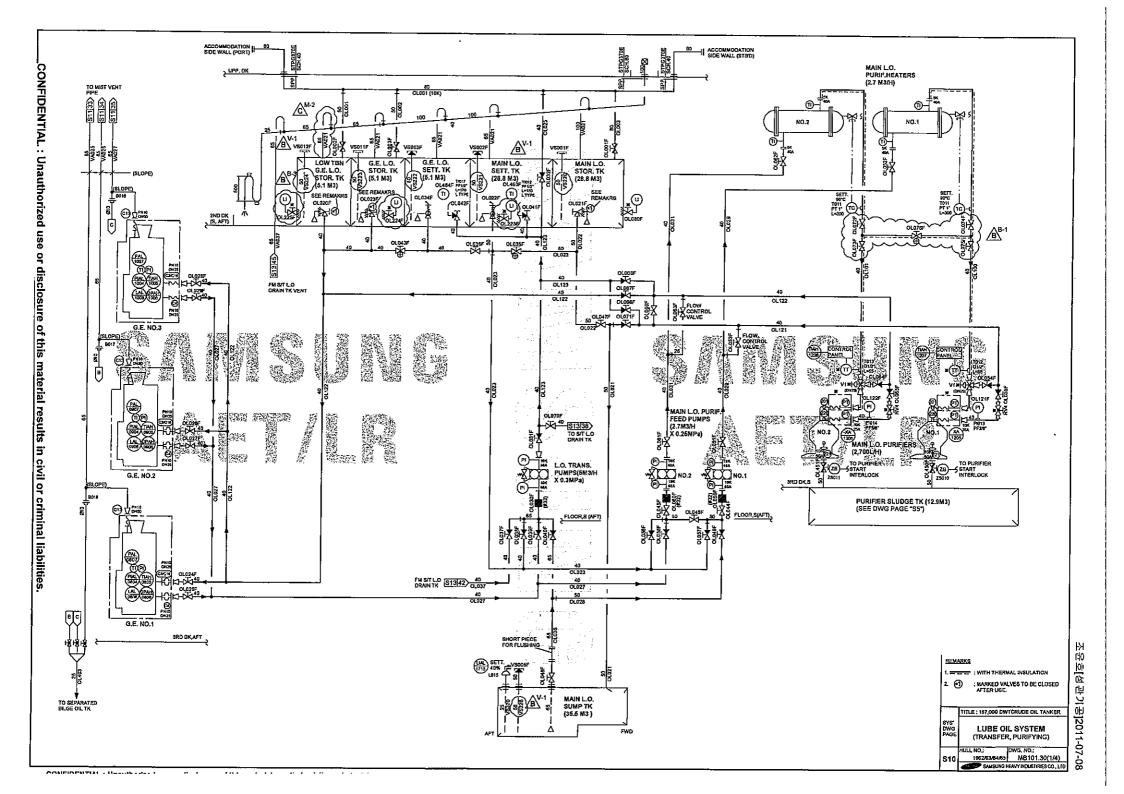


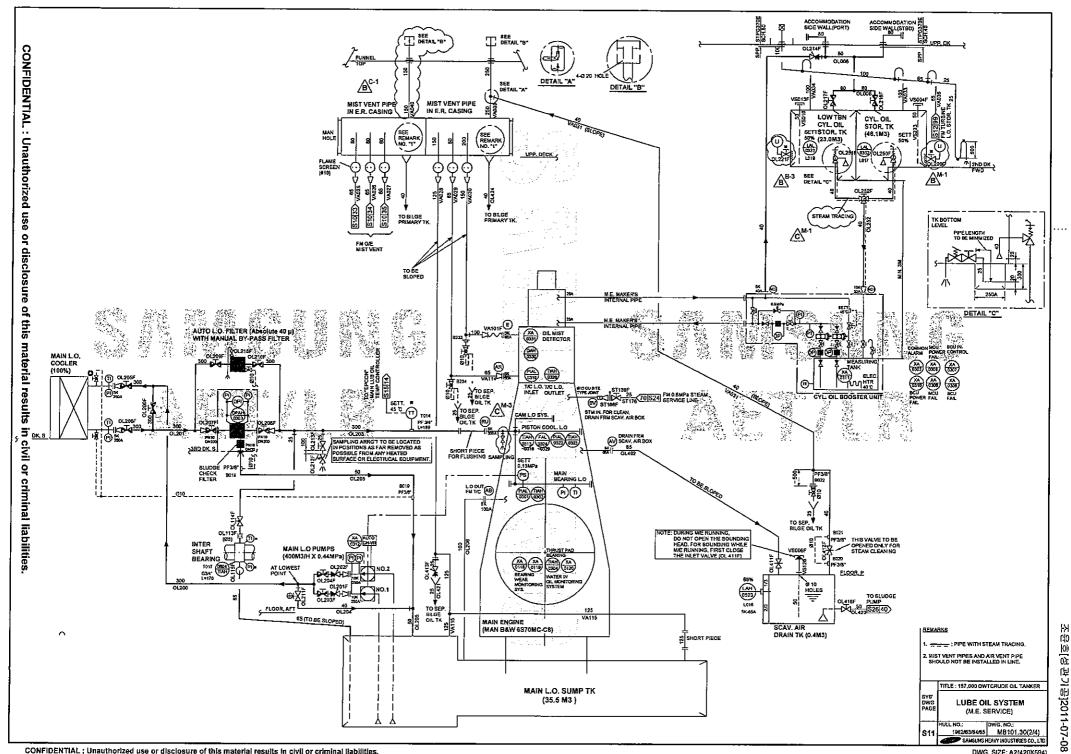
FUEL OIL SYSTEM (COMPOSITE F.O. SERVICE)

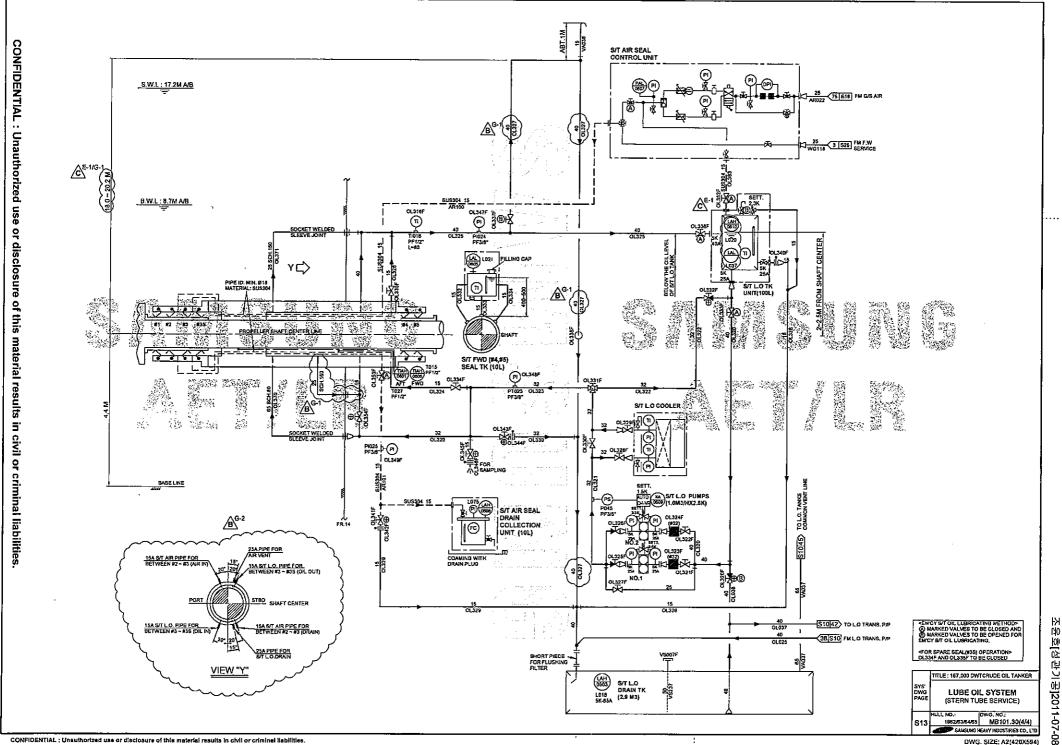




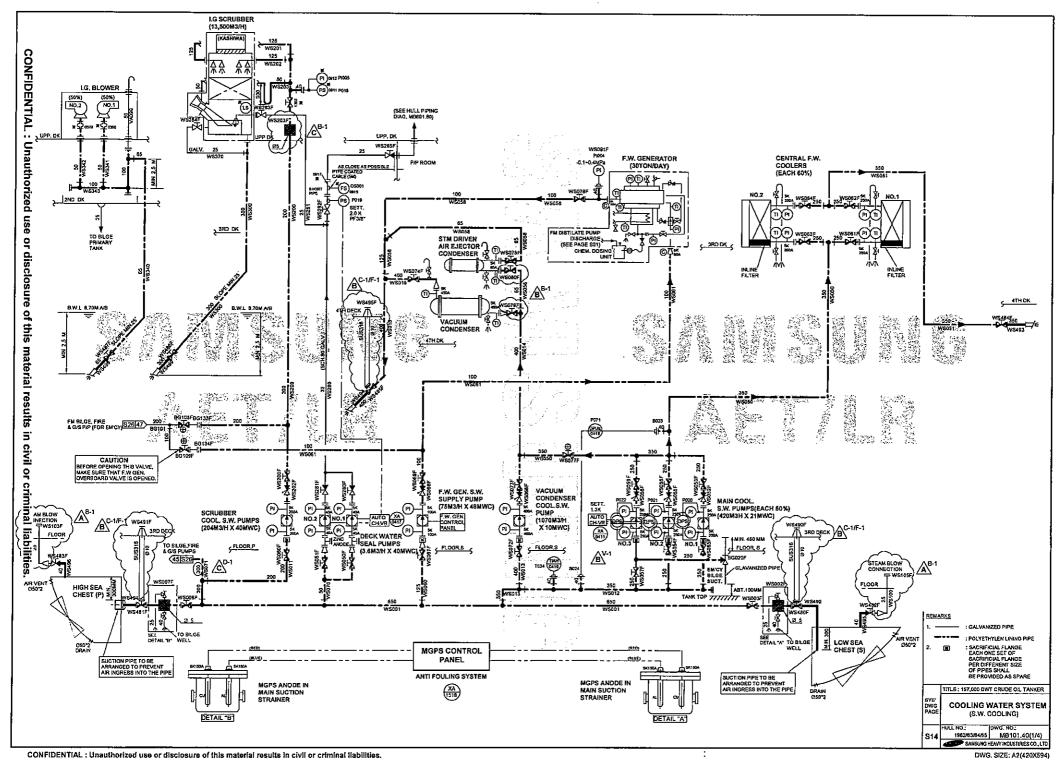
SUMSING	-		,		REPUIS DESIGN CONDITION PROPER PIPE JOINT & VALVES FUEL NO. DWG NO. SYSTEM DWG, PAGE																							
<u> </u>				SIGN ESS.		HYI). TEST		PIPE SPEC	CIFICATIO	ON							VALV	E SPEC	IFIACTI	ON			REVISION HISTORY				
T T SYSTEM	PIPE, VALVE	اي. (<u>ر</u>		IPa)	LR)	"	MPa]				TRE	AT. ★2				on *3				MATER	IAL				Υ			
	& FITTING NO.	Work Temp.	Work	MAX	0			[A]		:			★ 1	(318)	-RIAL		[A]	(JIS)	BODY	Ì		B C D	-OWNER -CLASSF -DETAIL	REPURST REQUEST G OTHER DESIGN SEG ARRANGEMENT AT YARD AT YARD DESIGN MISTAKE	CTION			
SYSTEM DWG:PAGE:SID: S13.	LUBEOIL	SYSTE		Hi														TTO IN	e deservations in particular et promisis s			ALT. NO.	i Rev. No 1	-Description - V	SY.			
(.O. FILLING LINE(65A,80A)	OL001~009		0.30	0.35	-		Work.			Pipe				. 1	14. s = 1		65,80 65,80 (B/F	10K	FC	BS	BC Disc; Al-BC	В	B-1 B-2	- The cross connection line with valve between No.1 L.O. purifier heater outlet line and No.2 L.O. purifier heater outlet line was provided. - The isolating valve was provided. - Following L.O. tanks were provided with Self powered content dial type level gauge.	\$10 \$12 \$10			
L.O. FILLING(≤50), TRANSFER & PURIF, HEATER INLET	O1.020~099	-	0.30	0.35	III			≥15	SPP		A	AP	F	5K	SS400	-								- Main L.O. settling tank. S12 - Low TBN cyl. oil storaget tank, - G.E. L.O. storage tank.				
L.O. LINE BETWEEN HEATER AND PURIFIER	OL100-119	MAX. 95	0.25	0.3	п	1	Work.	≥15	STPG370-S		A	AP	F	5K	SS400		≥50	10K	SC	SUS	scs		i	- G.E. L.O. storage tank. - Low TBN G.E. L.O. storage tank. - Turbine L.O. storage tank.				
L.O. PURIFIER OUTLET	Ol.120-149	MAX. 95	0.25	0.3	II	0.45	Work	≥15	STPG370-S	Seb 40	A	AP	F	5K	SS400	-	≥50	IOK	SC	SUS	scs		i	- Low TBN G.E. L.O. storage tank Turbine L.O. storage tank1 - M.E. mist vent vent pipe and G.E. mist vent vent pipe were provided separately. S11				
		93				*4	Conu.				ļ				12.48		≥50	5K	FC	BS	BC			- Stern tube section (View"Y") was changed as per				
Y.E. L.O. SERVICE	OL200-239	45	0.45	0.50	in				SPP		ррт	ΔP	LI.	5K	SSAM	_	· .	• •	77				M-1	- Self powered content dial type level gauge was provided	\$11			
	01200237	"		9.20	1	-	,Cond.	≤65	5.1	Table	'''	Λ.	F		- 33740	//\	(B/F	SK	٠.	SUS304	Al-BC		`	- The sounding pipe size of following tanks was changed to 50A from 40A.	\$10			
M CYL, OIL STOR, TK			٠.				Work,	≥80		Pipe			LF		5., . 1		ļ		-	BS				- Low TBN G.E. L.O. storage tank,				
TO CYL OIL BOOSTER UNIT	OL250-269	<u> </u>		-	 	-	Cond.	≤65		Table		-	F	1 7	-		<u>≤</u> 40		BC	BS	BC			- G.E. L.O. settling tank,				
TERN TUBE L.O. SERVICE	OL320-369	•	0.25	0.30		-	Cond.	≤65		Table	PPT	AP		5K	SS400	-								- Main I.O. storage tank.				
S/T C.F.W TANK INSIDE)	OL370-379	<u> </u>	<u> </u>	·•	III	·	Cond.		-		PPT	AP		7	<u>. ·/</u>	-	-	-	-			С	E-1		SI3			
STERN TUBE AIR SEAL	AR100-119		-	-	tri	-	Cond.	.≥15	SUS304-S		МО	МО	±5	5K	SUS304	_				<u> </u>			E-2/G-1	- The emergency line height range for S/T L.O system was change to 18.0 ~ 20.2 from 14.3 ~ 16.5 as per maker's recommendation.	d \$13			
2.O.P.TURBINE L.O. SERVICE	Ol.380-399	-			ш		Work. Cond.	≥15	SPP	Pipe Table	PPT	ΑP	F	5K	SS490	٠	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		M-1	- M.E. Cyliner oil service line(from cylinder oil storage tank	PS(3)			
O. DRAIN LINE	OL400-479			•	111	-	Work. Cond.	≥15	SPP	Pipe Table	A	AP	F/S ★5	. 5K	SS400	-	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC			to cylinder oil boosting unit inlet was provided with steam tracing and insulation.	S11			
. AIR VENT, OVERFLOW SOUNDING EXECPT OIL TANK INSIDE)	- VA001-099 - VS001-099	-	-	,	ш	•	Work. Cond.	≥100 65,80 ≤50	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	AG	AG	F/S ★5	5K	SS400		-		-	-	-		M-2 M-3	 Air vent pipe for Low TBN G.E. L.O. STOR. tank was provided. Sampling valve was provided by maker. 	\$11			
AIR VENT, OVERFLOW SOUNDING OIL TANK INSIDE)	- VA220-249 - VS220-249	•	•	•	111	•	Work. Cond.	≥100 65,80 ≤50	SPP STPG370-E STPG370-E	Pipe Table Sch 40 Sch 80	A	АА	F/S ★5	5K	5S400	-		-	•									
VIR PURGE LINE FOR REMOTE (LEVEL GAUGE (OIL TANK)	VS300-349	-	-		III	-	Work. Cond.	≤50	STPG370-E	Sch 80	A	AA	F/S +5	5K	SS400	•				-	-							
 REMARKS: 1. ★1: TYPE OF PIPE JOINTS ① P. FLANGE ② S: SLEEVE ③ ② NF: NECK WELD FLANGE ② 2. ★2: REFER TO PIPING GENERAL 3. ★3: INSULATION ① R.W: ROCK WOOL ② G.C: 4. ★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR * 5. ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUM 	DLF: L-TYPE SLI 1-(3)-4), FOR "P. GLASS CLOTII FAD OF HYDRAU TEST". TEM WILL BE DE	IP ON F IPE TRE ③ C.S : ULIC TE	LANGE (ATMEN PRE-FO ST UND	(9) SF: SP TT SYMI RMED (DER AGF	QUARE BOL". CALCIU REEME	FLAN IM SILI NT AN	GE CATE @ D/OR AP) G.C.F.: PROVAL	GLASS CLOTH	COVERED IOD IS ME	WITH MOITM	ALUMI ED ON I	PIPING (ENERAL	L AND	- ≤40 : ② BUTT - BODY STEM ③ THE N COOL	RAL VAL BODY: STEM: S DISC & S BODY: DISC & S ERFLY V C: CAST I: SUS316 MAIN CO	LVE SC(RUE SUS316L SEAT: S BC, ST SEAT: E VALVE I STEEL(SI, DISC OL, S.W UTLET V	BBER LIN OR BS, SUS316L OEM: BS, BC FOR SHIP FLANGE C: SUS31	PSIDE VA), 6L, SEAT CENT. F.	LVE : NBR							



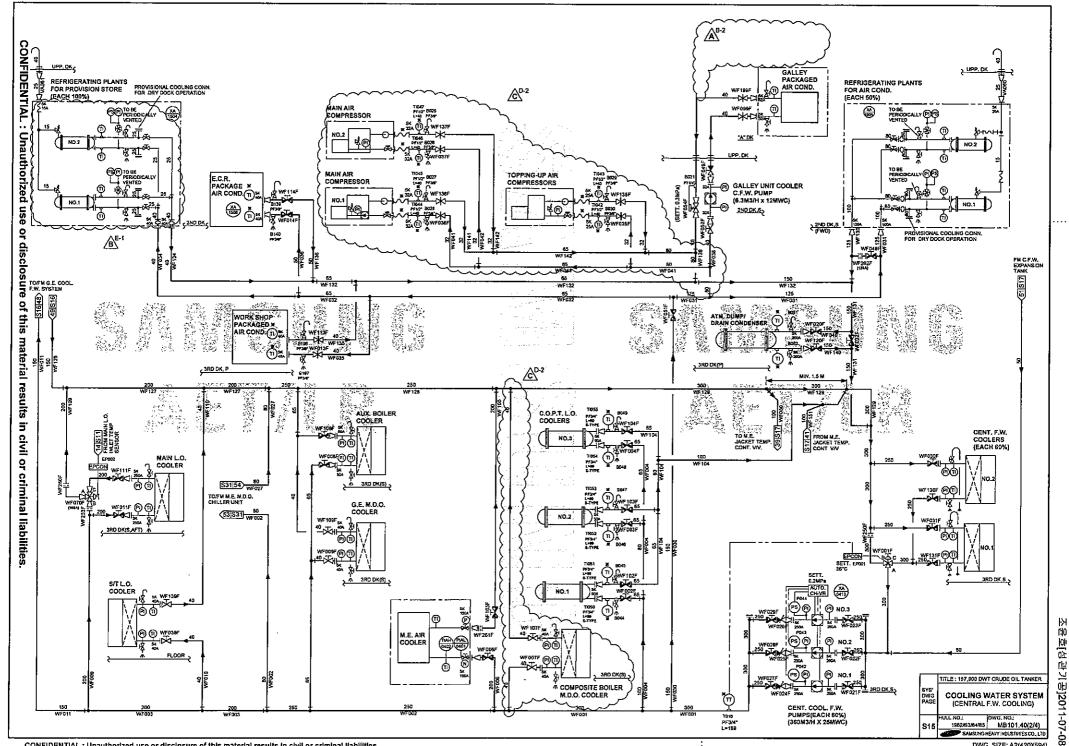


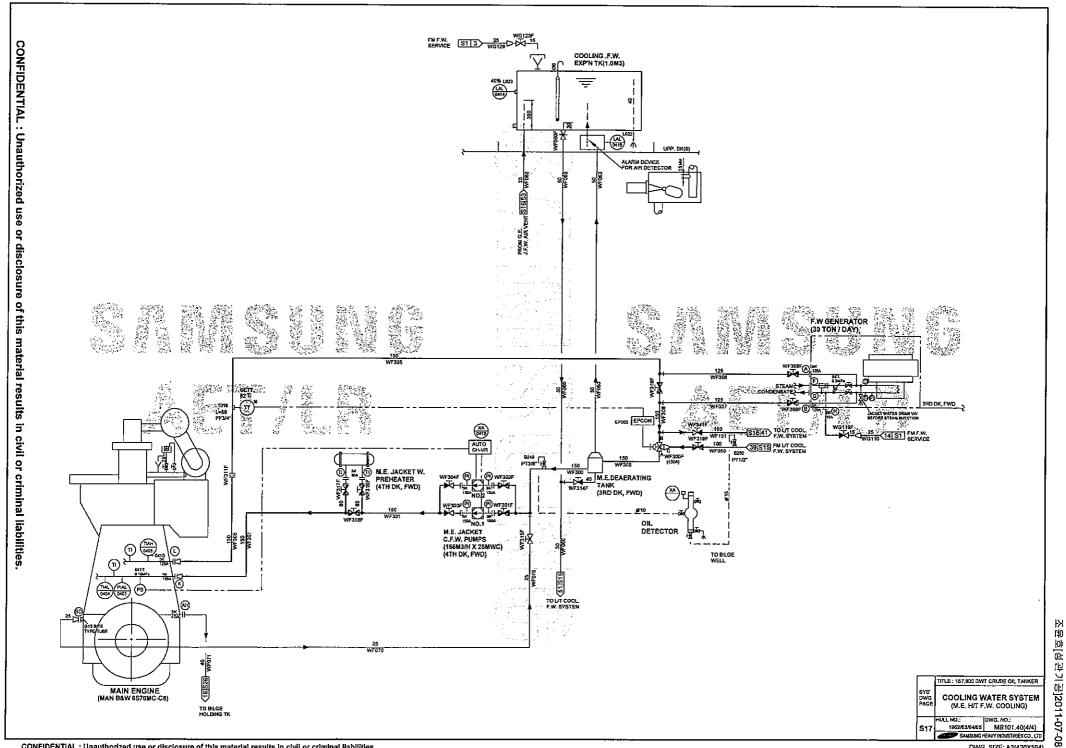


SUMSUNG		·			-,			·r	(DES	IGN CONI			LICATI	ON OF	FICATION PIPE, PIPI		& VAL	/IES)						HULL NO. 1962/63/64/65	DWG NO. MB101.40	SYSTEM DWG PS(4)	PAGE
i				SIGN RESS.). TEST		PIPE SPEC	IFICATIO	N .			PIPE JO				VALV	Æ SPECII	TACTION	N			REV	ISION HISTO	RY	
	PIPE, VALVE	ap. [C]	[5	IPa]	ASS(LR)	ļ (i	MPa]	<u> </u>			TREA	T. ★2				× NO			,	MATERIA	AL.	Rev. No.		REVISED BY	Re N	o. REVISED I	ìΥ
SYSTEM	& FITTING NO.	Work, Temp.		MAX	ं हि	SHOP	ON- BOARD	N.D [A]	MATERIAL	тніск		OUT.	*1	RATE (JIS)	-RIAL	INSULATION	N.D [A]	RATE (JIS)	BODY	STEM	DISC & SEAT	A B C D	-OWNE -CLASS -DETAL	ORITY REQUEST ER REQUEST SFICATION REQUEST IL ARRANGEMENT AT PMENT MAKER'S RECO		BY YARD OTHER DESIGN SEAT YARD DESIGN MISTAKE	CTION
SYSTEM DWG. PAGE : \$14-\$17.	COOLING	WATE	R SYSTI	EM.		TO:				714 IS	A 180						de la la la la la la la la la la la la la	11年1日 11年1日 11日日 11日日 11日日 11日日 11日日 11	4.7-464-41. S-1-2-74-1 G-144-18-1		15081K	ALT. NO.4	Rev.	A CONTRACTOR OF THE PARTY OF TH	DESCRIPTION		S)
MAIN CROSS-OVER & SEA WATER	WS001-099	32	0.53	0.64	1		Work.	≥650	STPY400	9.5t	PE	ВР	F/S	. "			≥125		FC (RUBBER LINING)	BS	BC BC	A	B-1 B-2	- Steam blow connection - Wheel house unit cool	n for sea chest(F ler was changed	S) was provided.	S S
COOLING & SERVICE	11/0100 148		0.53	0,04	1 "	•	Cond.	≤600	SPP	Pipe Table	PE	BP	* 5	5K	SS400	★ 7	≤100	5K.	BC	BS	вс	В	B-1	from water cooled type		r and Air jector condenser	. s
.G. SCRUBBER P/P	WS100-149 WS200-249	32	0.53	0.64	111	-	Work.	≤40	STPG370-E	Sch 80 Pipe	AG	AG		(4)	722.4		1			İ			C-1/	S.W. inlet was provide	ed.	hipside valve was applied	
DISCHARGE DECK W. SEAL P/P			 	·		Ŀ	Cond. Work.	≥50	SPP	Table	PE	BP	F	5K	SS400	★ 7	≥50	5K	FC	SUS304	Disc:		F-1 E-1	as per " Flooding calca - The internal drawing of	ulation for E/R s	hipside valves"	SI
DISCHARGE	WS280-299 WS300-369	32 32	0.53	0.64	111	<u> </u>	Cond. Work.	≤40 ≥300	STPG370-E STPG370-E	Sch 80 9.5t	AG PE	AG BP	F	5K 5K	SS400 SS400	★ 7	(B/F V/V) (★6)				Seat: NBR		V-1	was changed The DPS(Differential) with each main cool, 5	Pressure Switch	was provided	SI
OVERBOARD FROM LG. SCUBBER & BLOWER	WS370-399	32	<u>-</u>		111		Cond. Work.	≤250 ≤50	STPG370-E STPG370-E	Sch 40 Sch 40	AG	AG	F	5K	SS400	* 7	,,					С	B-1 D-1	- The strainer on LG. So	crubber S.W. suc	tion pipe was provided	s
			 _	-	-		Cond.	≤600	STPG370-E	16.0t		AU		, JA	55400					<u>L</u>	<u> </u>		D-2	from 200A Following C.P.W. pipe		mp was increased to 300A	SI SI
SHIP SIDE FOR SEA WATER LINE	WS480~499	-	•	•	III	_	-	≤300 ≤125	STPG370-S STS370-S	16.0t Sch 160	TE	AP	F.	IOK	SF440	-			★6		1			arrangement Compoiste boiler M.	D.O. Cooler.	on as per serious	SI
				i		ļ. 		·							. 1		≥50 ≤40		FC BC		BC BC .			Main Air compressor Topping-up air comp Oil cooler for AFT p	pressor,	indlasses winches	
CENTRAL COOLING F.W.	WF001-299	36	0.46	0.56	111	-	Work. Cond.	≥15	STPG370-E	Sch 40	A	ΑP	F	5K	SS400		≥50 (B/F V/V)	5K	FC	SUS304	Disc: AJ-BC Seat: NBR			in S/G room.			
			<u> </u>										•	2			≥50 ≤40		FC BC		BC BC						
ACKET COOLING F.W. M.E. & G.E.)	WF300-399	82	0.46	0.56	ш	-	Work. Cond.	≥15	STPG370-E	Sch 40	A	АР	F .	5K	S\$400	_	≥50 (B/F V/V)	sk .	FC	SUS304	Disc: Al-BC Seat: EPDM						
				ļ	 			≥100	SPP	Pipe Table				A-12 1 1													
AIR VENT, OVERFLOW SOUNDING EXCEPT OIL TANK INSIDE)	- VA001-099 - VS001-099	-	-	-	nt		Work, Cond.	65, 80	STPG370-E	Sch 40	ΛG	AG	F/S · ★5	5K	SS400	-		-	-	-	-						
MOEFT OIC TANK INSIDE)					l			≤50	STPG370-E	Sch 80																	
► REMARKS: . ★1: TYPE OF PIPE JOINTS ① F: FLANGE ② S: SLEEVE ③ B ② NF: NECK WELD FLANGE ⑧ I 2. ★2: REFER TO PIPING GENERAL I . ★3: INSULATION ① R.W: ROCK WOOL ② G.C: G . ★4: NDE CAN BE APPLIED INSTEA SPECIFICATION 1-(1)-2 FOR "T I. ★5: THE PIPE JOINT EACH SYSTE IN PIPE JOINT TYPE COLUMN . ★7: SEA WATER PIPE LINE RUNN	LF: L-TYPE SLII I-(3)-4), FOR "P: ILASS CLOTH (AD OF HYDRAU 'EST". EM WILL BE DE I.	P ON FI IPE TRI ③ C.S : JLIC TI ECIDED	LANGE (EATMEN PRE-FO EST UND VSELEC	© SF: S NT SYM DRMED DER AG TED AC	QUARI IBOL". CALCII REEME	FLAN	GE CATE (I D/OR AP ACTUAL	D G.C.F.: PROVAL L PIPING	GLASS CLOTH C , DETAIL METHO ARRANGEMENT	OVERED V OD IS MEN	WITH A TIONE VE OF T	LUMIN D ON F	IIUM FO IPING (PES ME	DIL(0.3T) GENERA	L AND	② BUT - BOU STE COO - BOU - B	STEM: DISC & DISC & DISC & TERFLY DY: CAS: M: SUS3 MAIN CO DLER IN/C DY: CAST	ALVE: SC(RU SUS316 SEAT:: BC, S' SEAT: VALVE F STEEL 16L, DIS OOL. S.A DUTLET F IRON,	BBER LINGL OR BS, SUS316L GTEM: BS, BC FOR SHIP (FLANGE C: SUS31 W P/P TO GO VALVES	OR BC SIDE VAI), 6L, SEAT CENT. F.V	.VE : NBR						
																								PIPING DESIGNS (COOLING WATER S			



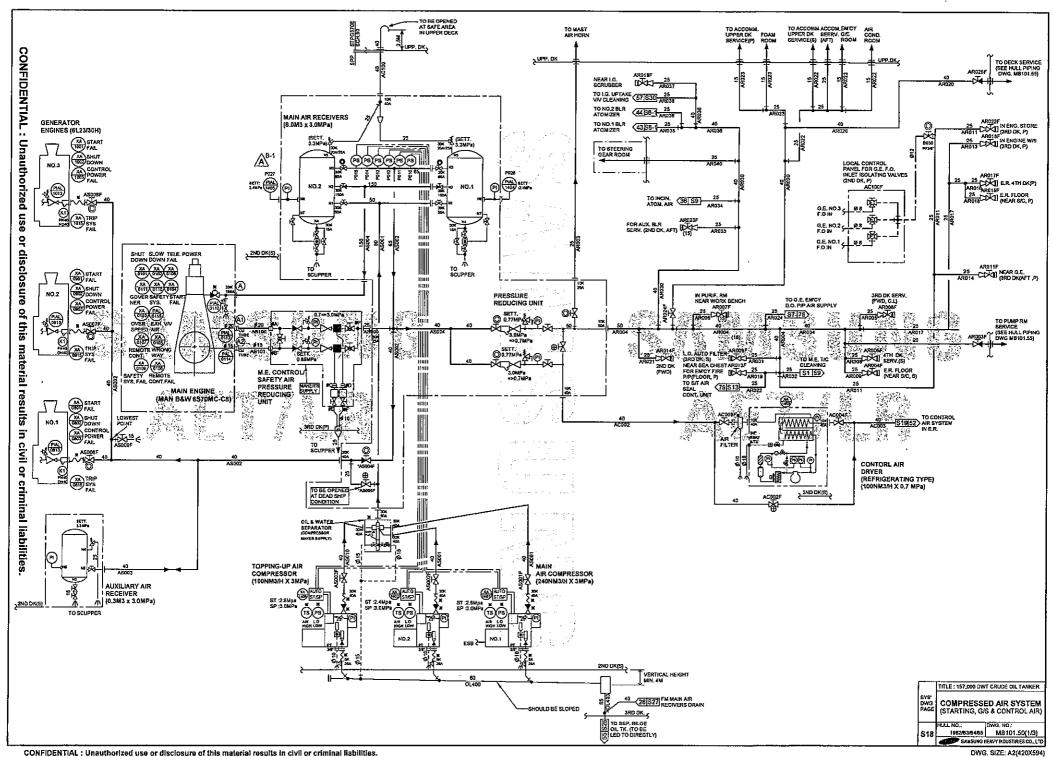
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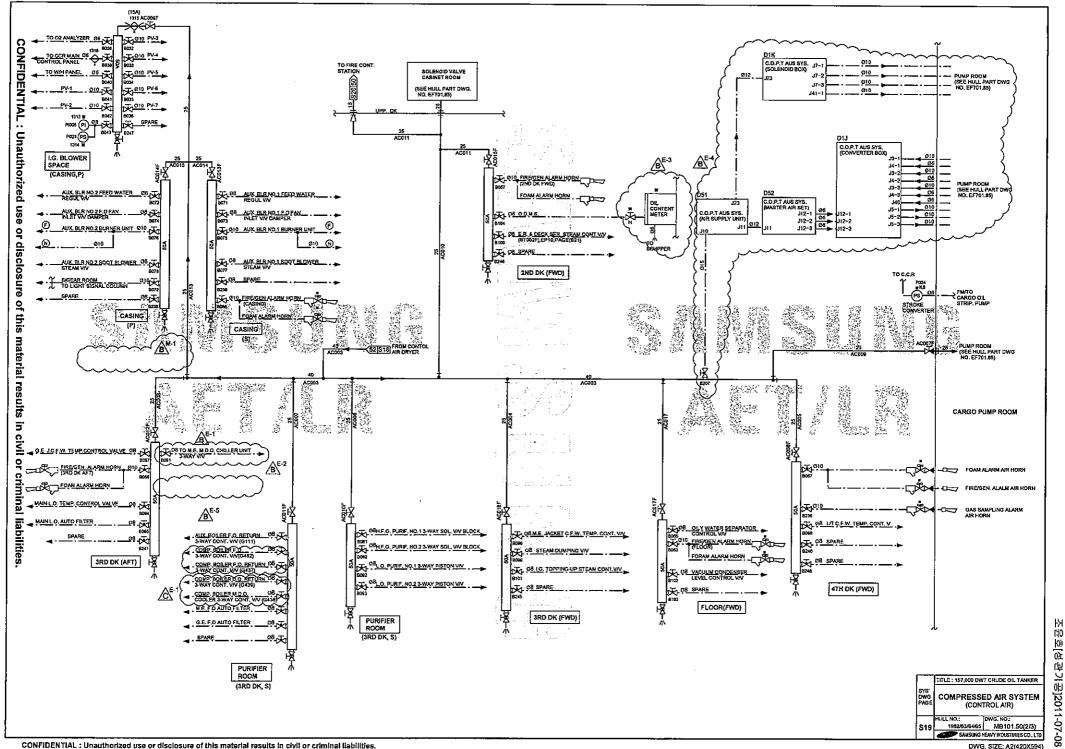


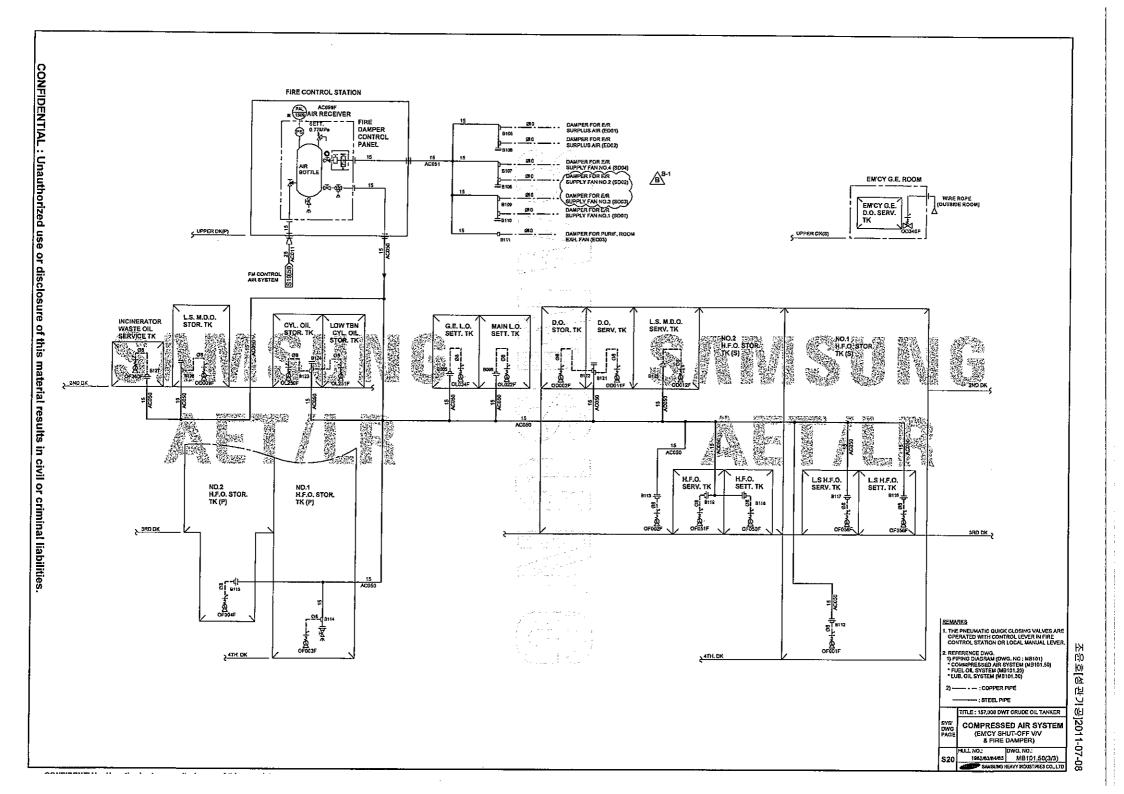


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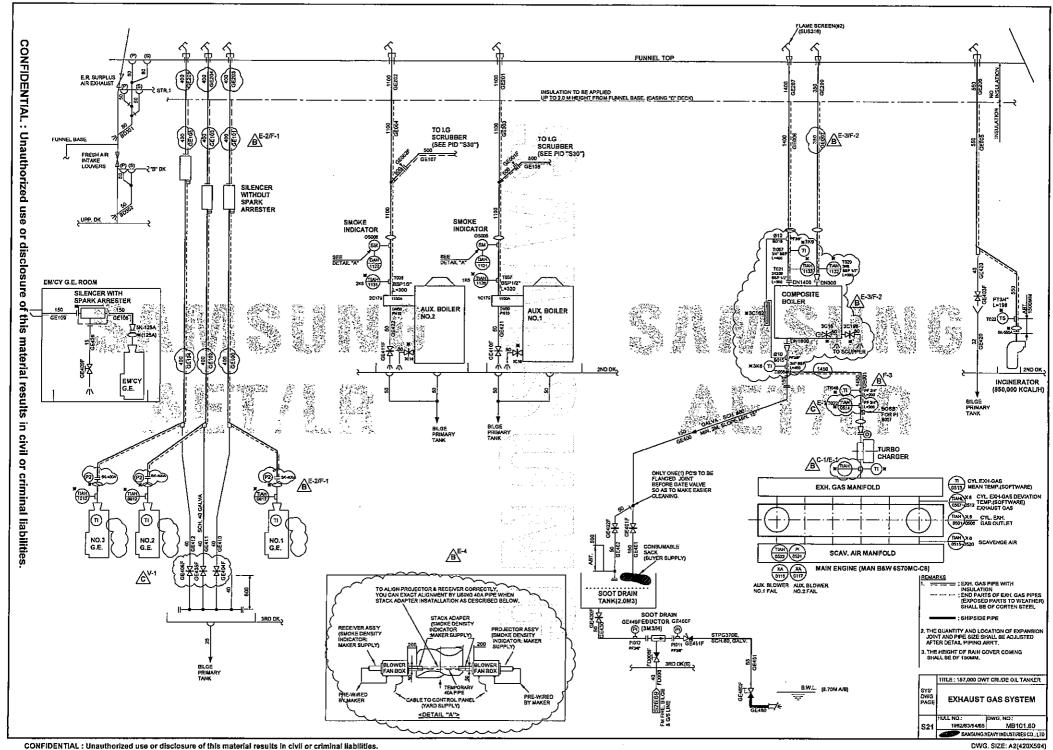
PIPE, VALVE SPECIFICATION PRESS. [MP4] PIPE, VALVE SPECIFICATION SPECIF	SAMSUNG									(DE	SICN CO					FICATION		. 1/4 1 1/1	EC)						HULL NO.	DWG NO.	SYSTEM DWG.
SYSTEM FIFE, VALVE		T	Γ	DE:	J	T !							JO, AL]	PIPE JO	INT	TOTAL 9	VALV			Y . CTTO				1962/63/64/65	MB101.50	PS(5)
SYSTEM **REF_VALVE*** **REF_VALVE** **REF_VALVE*			_	PR	ESS.					THEST	CIFICATI	1		1	ECIFICA	TION	, e		VALVE				Day	,			
## 17 YAND 19 19 19 19 19 19 19 1		PIPE, VALVE		L _{IM}	Iraj T	- 6						TREA	AT. ★2			ĺ				M	IATERI.	\L		<u> </u>	REVISED BY		REVISED B
## 17 YAND 19 19 19 19 19 19 19 1	SYSTEM	&	Tem]		ASS(_	N.D					TYPE	RATE	MATE	ATK	ND	RATE		•		A				
CONTROLAGASTY AIR A501-099 3 0 3 0 1		FILLING NO.	Vork	Work	MAX	5	ğ.	ARE	[A]	MATERIAL	THICK	IN.	OUT.	ابدا			Sur			λQQ	EM	C &				6 4	THER DESIGN SEC
### ASSISTANCE ASSISTA			*				- Si	0 8				""					=			ĕ	ST	SIG	D	-DETAI	IL ARRANGEMENT AT	(AKD 1 r	
AND AND AND AND AND AND AND AND AND AND	4.150mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm 1.100mm		A F LAKE		SEFRICE	1045	2-h-G-h-b	energerent	2 4 5 m (2.4	and the same of the	×16 6 5 2 5	** 14.5	Srzioukiej	des in the case			paarga, l rings sirk.	ing Projects		en la bridge	I I I I I I I I		E	-EQUIP		V L	
AND AND AND AND AND AND AND AND AND AND	STEM DWG PAGE 1. 518 - S20	COMPRESS	EDAIF	USXSTI	Mali	200			121.16											*1014			ALTA NO:	Rey NO		DESCRIPTIONS	
AND AND AND AND AND AND AND AND AND AND																		≥32	30K	SC	sus	C6782	A	B-I	- Valve type(N2) for Main		
E. CONTROLARETY AIR AS10-109	OMPa STARTING AIR	AS001-099	. '	3.0	3.30	11			≥15	STPG370-S	Sch 40	A	AP	F	30K	SF440	_								1		
ASSOCIATION OF THE PRINCIPLE ACCOUNTS OF THE PRINCIPLE OF THE DISTORY OF THE PRINCIPLE OF THE DISTORY OF SCHEEF WHILE PRINCIPLE OF THE DISTORY OF SCHEEF AND A APPROXIMATION OF SCHEEF INTERIOR OF SCHEEF AND A APPROXIMATION OF SCHEEF INTERIOR OF SCHEEF AND A APPROXIMATION OF SCHEEF INTERIOR OF SCHEEF AND A APPROXIMATION OF SCHEEF INTERIOR OF SCHEEF AND A APPROXIMATION OF SCHEEF INTERIOR OF AUTHER TO BE CARBED OUT WITHIN TROOPS INSTEAD OF WATER TO PREVENT PERSONAL WATER FROM CAUSING AMAILER FOR COUNTY AND AND AND AND AND AND AND AND AND AND	ERVICE			'		1	×*	Сола.	ľ	i		``			-917	- !		≤25	40K	SF	SUS	SCS	В	B-1	- The following damper n - E/R supply fan No.3(S	umber was changed D03)→E/R supply	fan No.2(SD02)
ASIGNARY AND ASSESSED AS A CONTROL OF THE REPORT AND A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF A CONTROL OF THE TYPE SHOWN FAMOR OF THE		 		 	 	┝┯┤	1.16																	E-1	- E/R supply fan No.2(S - Control air line for M.E.	D02)→E/R supply: M.D.O. chiller unit	fan No.3(SD03) was provided
N. AR. SERVICE A800 L-099 - 0.7 0.77 III 1.16 Work 2.15 STRG379E Sch. 40 A AP F 18K SS440 - \$2.90 10K FC 88 BC SS 10C SS SS SS SS SS SS SS	A.E. CONTROL/SAFETY AIR ERVICE	AS100-109	-	0.7	0.77	111	★4		≥15			NO	NO		· tok			.	.	-	-	-		E-2	- Control air line for G.Es	was deleted.	
N. AR SERVICE A 8001-099 - 0.7 0.77 III Mail Occup. 215 STRC370-E Sch.40 A. AP F IEK SS440 - \$0.0 IEK EC BS BC C C C C C C C C		<u> </u>				$\vdash \vdash$										210100					<u> </u>				- Control air line for A.U.		
NTROLAR AC001-699 0.7 0.77 0. *** Cost	EN. AIR SERVICE	AR001-099	-	0.7	0.77	111			≥15	STPG370-E	Sch 40	A	ΑР	F	10K	SS440	-						ĺ		- Control air line for Com	osite Boiler 3-way	control were provided
NTROLAR AC001-699 0.7 0.7 11 14 0.000 15 15 15 0.000 15 15 15 0.000 15 15 15 0.000 15 15 15 0.000 15 15 0.000 15 15 0.0000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.000 15 0.00000 15 0.00000 15 0.00000 15 0.00000 15 0.00000 15 0.00000 15				 	 '				$\vdash \vdash$									240	IVE						1		
NTROLAR AC001-699 B.7 G.7 G.7 G.7 G.7 G.7 G.7 G.7	NTROL AIR		أيتيا	0.7	0.77		* 4		≥15	STPG370-E	Sch 40	A	AP	F	10K	SS400	-						C		were provided		
REMARKS: **H. TYPEO FIPE IONTS D. F. LANGE @ S. SLEFEV GB- BUTT WILDING @ U. BHE LINION. @ SWF- SOCKET WILD FLANGE @ SIW: SOCKET WILD FLANGE & SIW: SOCKET WILD FLANGE & SIW			1 5 <u>4</u>	<u> </u>	14: N.			\$6.5	\$0. 7 70. 1	3,43	15,"							-70						育.			41 % 41 *
REMARKS: AC 100-149 . III . 215 SPP Table A AP #5 5K SS400 . THE ALVER O'R. S. SERVE CB: BUTT WELDING BUT BUTON (I) SWF-SOCKET WILD FLANGE (III) SWF-SOCKET WILD	NIROLAIR			0.7		m ,	* 4					МО	ю	υ	10K			T.			ğ		Ş	100		法裁判 第	turkij Brit
MEMARKS: ACTION 149	165 856 - 59	(A) 1/2 (A)	- 10	· · · ·	in the first		. ★ 7.	· ·	3,6	(012201)	014040					DAA65		i,	25.3.4	ं	, , , , , , , , , , , , , , , , , , ,	j. 1967.	:40	167	R Selve F		ુવું હૈ
REMARKS: #1:TYPEG PIPE IONTS OF FLANGE ØS: SLEEVE GB: BUTT WELDING ØU: BITE UNION ØSWF-SOCKET WELD FLANGE ØSIW: SOCKET JOINT WELD ON PN NECK WELD FLANGE ØSIS-DOY; SCRIBBER LINED OR BG STEM: SUSSIGLOR BS, SINULATION OF AW: ROCK WOOL ØG: GLASS CLOTH ØC: FRE-FORMED CALCIUM SILICATE ØG.C.F.: GLASS CLOTH COVERED WITH ALLIMINIUM FOIL(#37) ***NECK CAN BE APPLIED INSTEAD OF HYDRAULIC TEST UNDES A GREEKBERT ANDOR APPROVAL, DETAIL METHOD IS MENTIONED ON PIPHOS GENERAL AND SPECIFICATION 1(1); P. FOR THESIS. ***S: THE PIPE IONE FRACH SYSTEM WILL BE DECIDEDSELECTED ACCORDING TO ACTUAL PIPHOS ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE IONE TYPE COLUMN. ***A: THEY ROUTH FRACH SYSTEM WILL BE DECIDEDSELECTED ACCORDING TO ACTUAL PIPHOS ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE IONE TYPE COLUMN. ***A: THEY COUNTS. MALFUNCTIONING OF SOME SENSORS ACCORDING TO "LR" ACCEPTANCE. ***ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF SOME SENSORS ACCORDING TO "LR" ACCEPTANCE. ***ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING ONE OF THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONTROL AIR LINE TO THE CONT		AC100-149	!	.	-	ш	. [≥IS	SPP		Α	AP		5K	. SS400		.	_	.		_ '					
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M2. KEREK TO PIPING GENERAL 1-(3)-4, DRC *PIPE TREATMENT SYMGOL." DEC. 4. SEAT. SUSJALO BOX C. GLASS CLOTH © C.S. FRE-FORMED CALCIUM SILICATE @ G.C.F.: GLASS CLOTH COVERED WITH ALLUMINIUM FOIL (0.3T) R. W. BOCK NO BE APPLIED INSTEAD OF HYDRAULIC TEST UNDER AGREEMENT AND/OR APPROVAL, DETAIL METHOD IS MENTIONED ON PIPING GENERAL AND SPECIFICATION 1-(1).2 FOR *TEST*. S. THE PIPE INDIT TAPE COLUMN. ** 7: HYDRAULIC TEST OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING MALFUNCTIONING OF SOME SENSORS ACCORDING TO *LR* ACCEPTANCE. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR R. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR R. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. S	★1:TYPE OF PIPE JOINTS				÷.				****					,	73												
M2. KEREK TO PIPING GENERAL 1-(3)-4, DRC *PIPE TREATMENT SYMGOL." DEC. 4. SEAT. SUSJALO BOX C. GLASS CLOTH © C.S. FRE-FORMED CALCIUM SILICATE @ G.C.F.: GLASS CLOTH COVERED WITH ALLUMINIUM FOIL (0.3T) R. W. BOCK NO BE APPLIED INSTEAD OF HYDRAULIC TEST UNDER AGREEMENT AND/OR APPROVAL, DETAIL METHOD IS MENTIONED ON PIPING GENERAL AND SPECIFICATION 1-(1).2 FOR *TEST*. S. THE PIPE INDIT TAPE COLUMN. ** 7: HYDRAULIC TEST OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH INTROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING MALFUNCTIONING OF SOME SENSORS ACCORDING TO *LR* ACCEPTANCE. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT. SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO R. BC. ** OBDY: BC. STEM: S. DISC. & SEAT: SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR R. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR R. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALOR SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. SUSJALO, SEAT. S	(I) F: FLANGE (2) S; SLEEVE (3) (I) NF: NECK WELD FLANGE (8)	B: BUTT WELDIN	NG ØJU ZON FL	J: BITE ! ANGE (DNION ((5) SWF:	SOCK	ET WELL		GE @SJW:S	OCKET I	OINT V	VELD	3								BC	;				
**S. FROCK WOOL	★2 : REFER TO PIPING GENERAL	1-(3)-4), FOR *PI	PE TRE	ATMEN	Т ЅҮМВ				- 7						Çe ve	,		DISC &	SEAT: S	US316L)	OR BC		:				
*** ME CAN BE APPLIED INSTEAD OF HYDRAULIC TEST UNDER AGREEMENT AND/OR APPROVAL, DETAIL METHOD IS MENTIONED ON PIPING GENERAL AND SPECUICATION (-(1)-2 FOR "TEST". **5 : THE IPIE JOINT EACH SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE JOINT FACT STEEL(PLANCE), **5 : THE IPIE JOINT FACT SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE JOINT FACT STEEL(PLANCE), **5 : THE PIPE JOINT FACT SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE JOINT FACT SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED **5 : THE PIPE JOINT FACT SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED STEM : SUS316L, DISC : SUS316L, SEAT : NBR (**O'THE MAIN COOL. S. W /P TO CENT. F. W COOLER NOUTIET VALVES -BODY : CAST IREON, STEM : SUS316L, DISC : SUS316L, SEAT : NBR (**O'THE MAIN COOL. S. W /P TO CENT. F. W COOLER NOUTIET VALVES -BODY : CAST IREON, STEM : SUS316L, DISC : SUS316L, SEAT : NBR (**THE MAIN COOL. S. W /P TO CENT. F. W COOLER NOUTIET VALVES -BODY : CAST IREON, STEM : SUS316L, DISC : SUS316L, SEAT : NBR (**THE MAIN COOL. S. W /P TO CENT. F. W COOLER NOUTIET VALVES -BODY : CAST IREON, STEM : SUS316L, DISC : SUS3	#3:INSULATION	GLASS CLOTH (3 C.S : I	PRE-FOF	RMED C	ALCIUN	a silic	ATE 40	G.C.F.: 0	GLASS CLOTI	- COVERE	D WIT	H ALUÑ	MINIUM I	FOII (0 31	n											
**S:THE PIPE JOINT EACH SYSTEM WILL BE DECIDED/SELECTED ACCORDING TO ACTUAL PIPING ARRANGEMENT FROM ONE OF THE TYPES MENTIONED IN PIPE JOINT TYPE COLUMN. **T: HYDRAULIC TEST OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH NITROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING MALFUNCTIONING OF SOME SENSORS ACCORDING TO "LR" ACCEPTANCE. **STEM: SUSJIGL, DISC: SUSJIGL, SEX: NBR (THE MAIN COOL S.W. PIPE COLUMN. **THYDRAULIC TEST OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH NITROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING COOLER INJURIES TO CENT. F.W. COOLER INJURIES TO CENT. F.W. SUSJIGL, DISC: SUSJIGL	⊕ R.W : ROCK WOOL @ G.C : 6										TIOD IC M	(ENTIO	NEDO	L DIDING						OR SHIP		ALVE					
IN PIPE JOINT TYPE COLUMN. * 7: HYDRAULC TEST OF THE CONTROL AIR LINE TO BE CARRIED OUT WITH NITROGEN INSTEAD OF WATER TO PREVENT RESIDUAL WATER FROM CAUSING MALFUNCTIONING OF SOME SENSORS ACCORDING TO "LR" ACCEPTANCE. STEM: SUS316L, DISC: SUS316L, SEAT: NBR STEM: SUS316L, DISC: SUS316L, SEAT: NBR	★4: NDE CAN BE APPLIED INSTE	AD OF HYDRAU	LICTE	ST UNDI	ER AGR.	EEMEN	T AND	OR APP	KUYAL,	DETAIL ME	מ בו עטחו	111,4110	.120 01	A LILIMO	GENERA	AL AND											
MALFUNCTIONING OF SOME SENSORS ACCORDING TO "LR" ACCEPTANCE. -BODY: CAST IRON, STEM: SUS316L, DISC: SUS316L, SEAT: NBR	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "I	AD OF HYDRAU TEST*.				EEMEN	T AND							100	100	AL AND	- BODY	: CAST				r: NBR					
	 *4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 *5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI 	AD OF HYDRAU (EST*. EM WILL BE DEC N.	CIDED/S	SELECT	TED ACC	EEMEN CORDING	T AND	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND	- BODY STEM (3) THE N	: CAST : SUS31 (AIN CC	.6L, DISC XXL. S.W	SUS31	6L, SEA CENT. F.						
	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "I ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEC N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
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PIPING DESIGN SDECIFICATION (PSS) (III)	*4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 *5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI *7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SDECIFICATION (DES. 1/1/1)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SDECIFICATION (DES. 1111)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SPECIFICATION (PSG), (III)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "I ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SPECIFICATION (DESIGN)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SDECIFICATION (DES. 1/1/1)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "1 ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
PIPING DESIGN SPECIFICATION (DSS) (1/1)	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "I ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					
I PIPING DIVINITION DOES THAT	★4: NDE CAN BE APPLIED INSTE SPECIFICATION 1-(1)-2 FOR "I ★5: THE PIPE JOINT EACH SYST IN PIPE JOINT TYPE COLUMI ★7: HYDRAULIC TEST OF THE C	AD OF HYDRAU: FEST*. EM WILL BE DEO N. CONTROL AIR LII	CIDED/S	SELECT BE CARI	TED ACC	EEMEN CORDING UT WITH	T AND/ G TO A I NITRO	CTUALI	PIPING A	ARRANGEME	ENT FROM	ONEC	OF THE	TYPES M	IENTION	AL AND ED AUSING	- BODY STEM (3) THE N COOL - BODY	' : CAST : SUS31 (AIN CO ER IN/O ' : CAST	6L, DISC OOL. S.W OUTLET V IRON,	P/PTO C	6L, SEA CENT, F.	w					



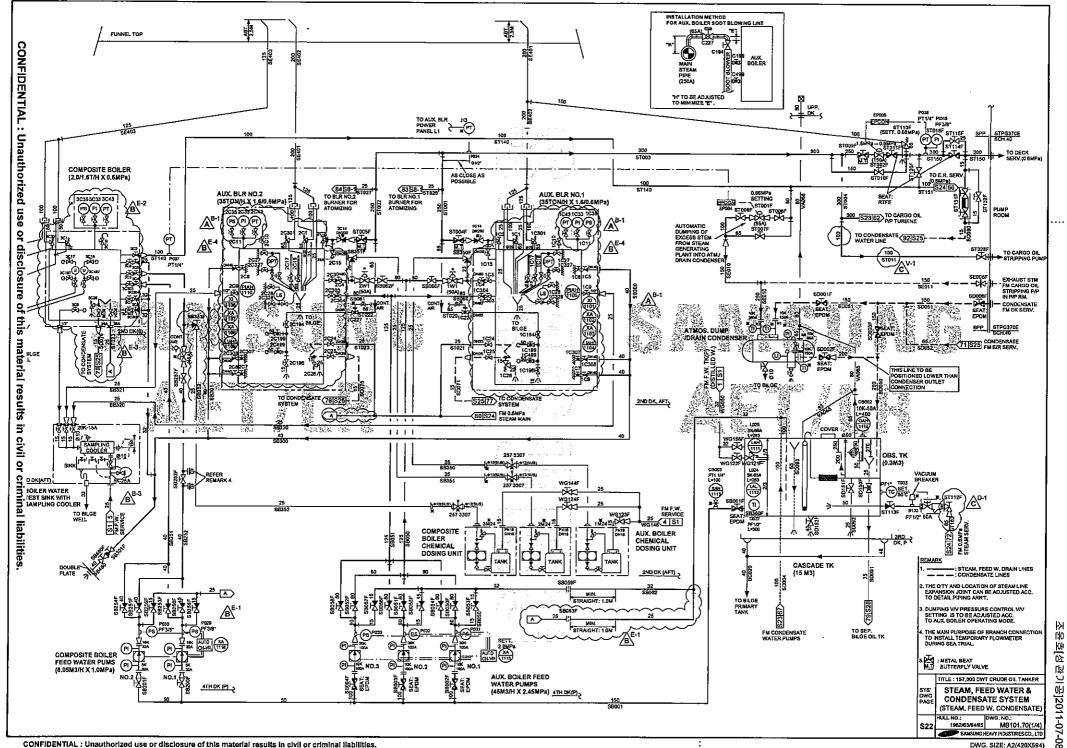


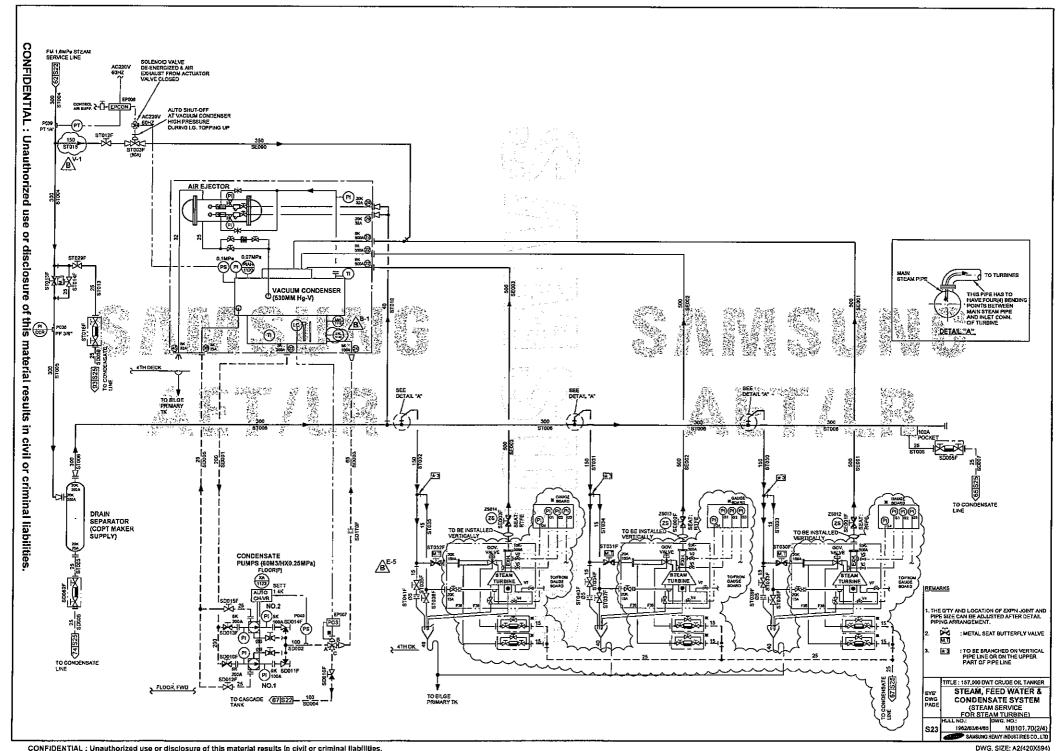


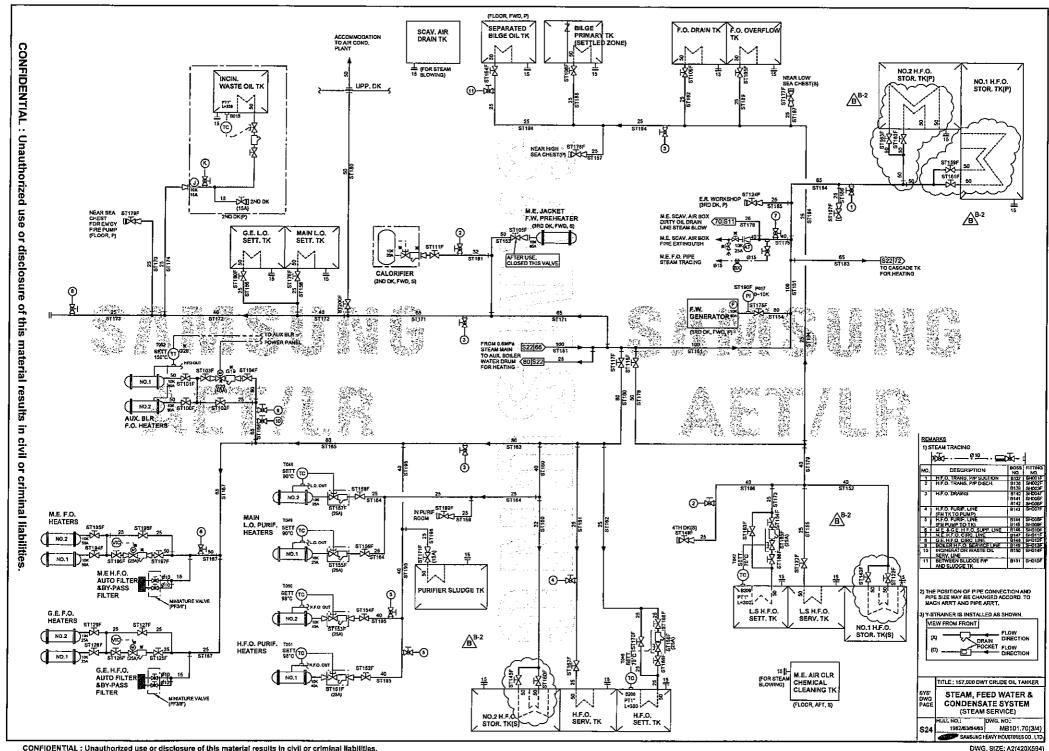
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		ŀ			Ι.	Τ		т —				ON, A	PPLICA	PIPE JO	PIPE, PIP	E JOINT &	VALVE					-		1962/63/64/65 MB101.60 PS(6) REVISION HISTORY				S(6)		
				SIGN RESS.). TEST	-	PIPE SPEC	JFICATI	J NO		SI	ECIFIC.	ATION	_		VALV.	E SPECIF	TACTIO	N	ļ			R	REVISION	HISTOR	RY		
System	PIPE, VALVE &	Temp. [C]	[5	(IPa)	CLASS(LR)		MPaj				TRE	AT. ★ 2	<u>:</u>			on *3			M	(ATERIA	L	Rev. No.	ļ	RE	VISED BY	<i>t</i>	Re No	o. REV	SED BY	
SISIEM	FITTING NO.		Work	Work MAX		SHOP	ON. BOARD	N.D [A]	MATERIAL	тніск	IN.	out	TYPE	RATE (JIS)	MATE -RIAL	INSULATION	N.D [A]	RATE (JIS)	BODY	STEM	DISC & SEAT	A B C D E	-AUTHOR -OWNER -CLASSFI -DETAIL -EQUIPM	REQUES CATION : ARRANG	T REQUEST SEMENT A			BY YARD OTHER DESIGNAT YARD ODESIGN MIST	IN SECT	NOF
SYSTEMED WIG PAGE SIL	S EXHAUST O	AS SY	Пем			e ve	i ja ja						16.63									ALT:	TROV.			i i di				
	GE001-099	MAX, 400		F 441 441	tit		Work. Cond.	≥550	STEEL PLATE WELDED	61	NO	NO	F/S/B ★5	SHI's pratice	SS400	R.W / Galv. Steel Sheet	-	-	- -	-		В	C-1/E-1 E-2/F-1 E-3/F-2	- The then Main E - Exhaust and int - Smoke	mometer i ngine mak pipe size e emal draw uptake pipe	for exhaus ter, of G.Es wi ring of G.E e size of C	at gas T/C in as increase Es was char Composite b	niet was provided i d to 400A from 35 nged. boiler was increase	rom DA	S21 S21 S21
EXHAUST GAS PIPE	GE100-199	MAX. 400		-	III	-	Work. Cond.	≤500	SPP	Pipe Tuble	МО	NO	F/S/B ★5	SHI's pratice	\$S400	R.W / Galv. Steel Sheet	-	-	_	-	•	С	E-4 F-3 E-1	was cha - Detail d - Exhaust - Temp. s	inged. rawing for pipe size of sensor for i	r Smoke in of M.E wa M.E. turbo	icator was is increased	ng of Composite be revised. I to 1450A from 14 ut was provided fro	00A.	S21 S21
EXHAUST GAS PIPE ON FUNNEL TOP EXPOSED TO THE WEATHER	GE200-249	MAX. 400		-	m	-	Work. Cond.	≥300	Corten Steel	6t	МО	NO	F/S/B	SHI's pratice	SS400		-	-	•	-	-		V-1	loose s	upply by n ating valve	naker. es on G.E.	. exhaust ga	as pipe drain line w		S2
XHAUST GAS PIPE DRAIN	GE400-429			- 1,	ʻ Iİİ	-	Work.	≥15	STPG370-E	Sch 40	AG	AG	F/S	5K	SS400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		Š.							ĺ
OOT DRAIN TK DRAIN EDUCTOR SUC.)	GE430-449)		10	- 0	Work.	≥15	STPG370-E	Sch 80	AG	AG	F/S *5	5K	SS400	•	≥50	SK.	FC (Tar Epoxy)	BS	вс	The same	360							
OOT DRAIN TK DRAIN AFTER EDUCTOR)	OE450-459	• (,	12	- 	111		Work, Cond,	≥15 :\}.	STPG370-E	Sch 80	AG	AG	F/S ★5	16K	55400	•	≥50	16K	FC (Tar Epoxy)	BS	вс					٧.,٠	J			
HIP SIDE LINE FOR SOOT EDUCTOR OVED	GE480-499				Ш			≤125	STS370S	Sch 160	TE	ΑP	F	tox	SF440				★ 6		14				1 (1) 4 (1)		1 N#5			ĺ
EXPOSED DK SCUPPER ABOVE UPP, DECK)	BD300-399				ш		Work. Cond.	≥15	STPG370-E	Sch 40	AG	AG	F/S ★5	, SK.	SS400	-	-		• .		- 2	<i>.</i>	A							
CONO, SOOT BLOWER EALING AIR SUPPLY	FA001-049	-	•	•	III	-	Work. Cond.	≥15	STPG370-E	Sch 40	AG	AG	F/S +5	5K	S\$400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC						,			
P. *1: TYPE OF PIPE JOINTS OF: FLANGE ②S: SLEET OF: NECK WELD FLAN 2. *2: REFER TO PIPING GEN. 3. *3: INSULATION OR.W: ROCK WOOL 3. *4: NDE CAN BE APPLIED I GENERAL AND SPECIF 5. *5: THE PIPE JOINT EACH MENTIONED IN PIPE IX	SOOT BLOWER G AIR SUPPLY FA001-049 III Work Cond. >15 STPG370-E Sch 40 AG AG F/S \$5K \$5K000 - \$50 SK FC 40 SK BC ARKS: TYPE OF PIPE JOINTS FF. FLANGE ② I.F: L-TYPE SLIP ON FLANGE ③ SF: SQUARE FLANGE REFER TO PIPING GENERAL 1-(3)-4), FOR "PIPE TREATMENT SYMBOL". STEM: SUPPLY STPG370-E Sch 40 AG AG F/S \$5K \$5K \$5K \$5K000 - \$50 SK FC G AIR SUPPLY G GENERAL VALVE - >50: BODY: SCRUBBER LINED STEM: SUS316L OR BS, DISC & SEAT: SUS316L OR BS, DISC & SEAT: SUS316L OR BS,															R BC SIDE VAL 1, SEAT: ENT. F.W	VE NBR													
																					İ	<u>-</u>	PIPING DESIGN SPECIFICATION (PS6) (1/1) (EXHUAST GAS SYSTEM) (MB101.60) (S21)							

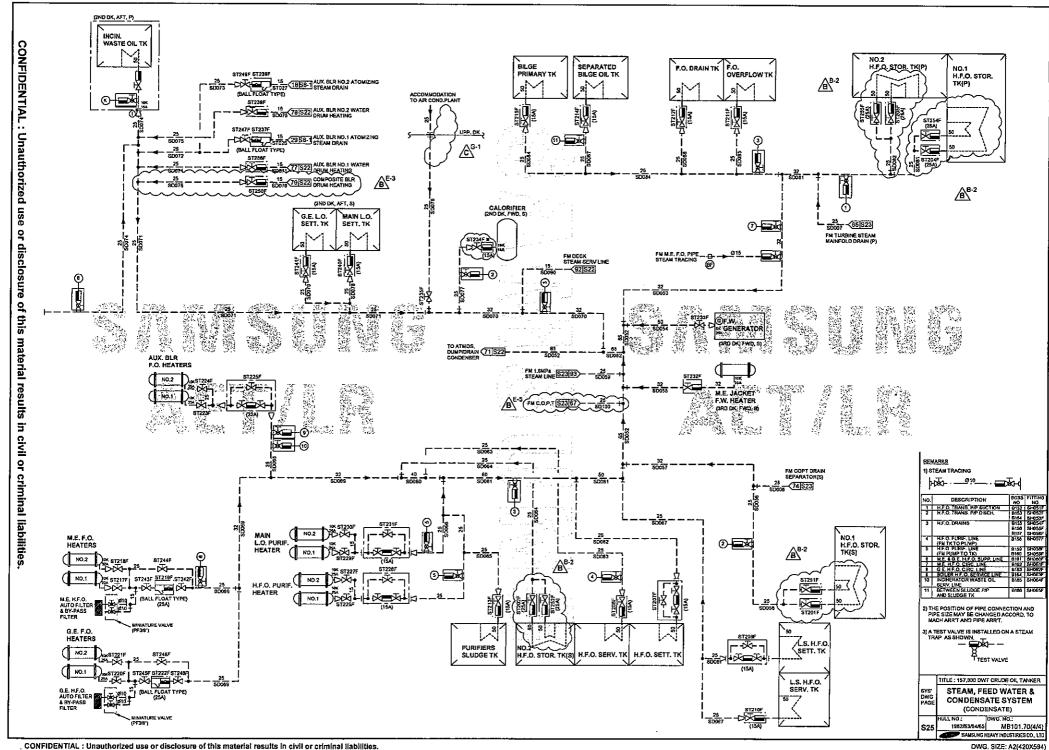


SAMSUNG				PIPING DESIGN SPECIFICATION (DESIGN CONDITION, APPLICATION OF PIPE, PIPE JOINT & VALVES)																	HULL NO. DWG NO. SYSTEM DWG. 1962/63/64/65 MB101.70 PS(7)	PAGE			
Ž			DES			нуг	. TEST		PIPE SPECI	FICATIO	NC		s	PIPE JO				VALV	Æ SPECI	FIACTIO	ON			REVISION HISTORY	
<u>n</u>	PIPE, VALVE	<u>5</u>	PRI [M		<u> </u>		(Pa)				TRE	AT. ★ 2				* z				MATER	AL	Rev. No.		REVISED BY REVISED E	SY.
System	& FITTING NO.	Work. Ten	Work	MAX	CLASS(LR)	SHOP	ON- BOARD	N.D [A]	MATERIAL	тніск	IN.		ТҮРЕ ★1	RATE (JIS)	-RIAL	INSULATION	N.D [A]	RATE (JIS)	BODY	STEM	DISC & SEAT	A B C D E	-OWNE -CLASS -DETAI	ORITY REQUEST SER REQUEST SFICATION REQUEST IL ARRANGEMENT AT YARD PMENT MAKER'S RECOMMEND. M -DESIGN MISTAKE V -DESIGN IMPROVEM	CTION
YSTEM DWG. PAGE S2Z - S25	STEAM, FEI	D WAT	ER & Co	ONDEN	SATE S	YSTE	ec:691			1				April 1	Hading I					i i i i i i i i i i i i i i i i i i i		ALT.	Rev NO	E 1377 FOR DESCRIPTION	SYS
6MPa STEAM JP TO STEAM TRAP)	ST001-099	MAX. 209	1.6	1.8	I	2.7 ★4	Work. Cond.	≥300	STPG370-S	9.51	A	AP	F	20K	SF440	R.W	≥32	20K	SC	SUS	SCS	A	B-I	- Seprate isolating valves for instruments PT, PI and PS	S22
6MPa STEAM JP TO STEAM TRAP)	ST100-299	MAX. 168	0.6	0.66	an a	0.99	Work. Cond.	≤250 ≥15	STPG370-E SPP	Sch 40 Pipe Table	A	AP	F	10K	SS400	/G.C R.W /G.C	≤25 ≥50 ≤40	20K 10K 16K	SF SC BC	SUS SUS BS	SCS SCS BC		B-2	(maker' supply) was provided. - Pipe line of the bottom and top surface blow down for Aux, boile No.1 was changed as like Aux, boiler No.2.	r \$22
EATING COIL	SH001-099	MAX. 168	0.6	0.66	111	-	0.99	50A	STPG370-S BARE TUBE or CYLINDRICAL TYPE HEATER	Sch 80	Α	АА	s				-	-	-			В	B-1 B-2 B-3	The low level alarm was provided. Two(2) sets of heating for No. 1/2 H.F.O. storage tanks were provided. F.W. service connection was provided.	S23 S24/S25 S22
TEAM TRACING	SH001-099	MAX. 168	0.6	0.66	11(Work.	φ10	COPPER (C1220T)	Pipe Table	NO	NO	U		YBSC2/ BRASS		-	-	•	•			E-1 E-2	The return line to cascade tank from composite boiler feed water pumps was provied. Internal drawing and relevant pipe line of Composite boiler.	
UX. BOILER & COMPOSITE OILER SED W. PUMP SUCTION	SB001-049	80		-	ш	-	Work. Cond.	≥15	SPP	30K Pipe Table	Α	AP	F	5K	SS490	G.C *7	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		E-3 E-4	was changed. - Steam service line and condensate line for Composite boiler were provided. - Interanl drawing for Aux. boiler was changed.	\$22/\$25 \$22
UX. BOILER FEED W. JMP DISCHARGE	SB050-099	80	2.4	2,64	11	3.96 ★4	Work. Cond.	≥15	STPG370-S	Sch 40	А	AP	F	20K	SF440	G.C ★7	≥32 ≤25	20K 20K	SC SF	SUS	SCS SCS		E-5 V-1	 Internal draiwing and relevant pipe line for C.O.P.T was changed and condensater line for C.O.P.T was provided with steam trap. I.G. topping up pipe line size was increase to 150A from 80A. 	\$23/25 \$23
OMPOSITE BOILER FEED W. JMP DISCHARGE	SB250-299	80	1.2	1.32	п	1.98	Work. Cond.	≥15	STS370-S	Sch 40	A	АР	F	. 20K	SF440	G.C	≥32 ≤25	20K 20K	SC SF	SUS SUS	SCS	С	D-1	- The drain line was deleted as per actual arrangement.	S22
OILER BLOW OFF & EED W. SAMPLING	SB300-349	MAX. 209	1.6	1.8	п	2.7 *4	Work, Cond.	≥15	STPG370-S	Sch 40	A	ΑÞ	F.	20K	SF440	G.C ★7	≥32 ≤25	20K 20K	SC SF	SUS SUS	SCS SCS		G-1 V-1	Condensate water line for accommodation to air condition plant was modified. Steam supply line to cargo oil stripping pump was increased.	S25 S22
OILER CHEMICAL 'ATER TO BOILER 'ED WATER	SB350-399	50	2.5	2.75	11	4.13 *4	Work. Cond.	≥15	\$TPG370-S	Sch 40	A	AP	F	20K	SF440		≤25	20K	SF	sus	SCS			to 100A from 80A.	1
HIP SIDE FOR BLOW OWN LINE	SB480-499	•	•	•	ш	-	•	≲125	STS370-S	Sch 160	TE	ΑP	F	20K	SF440	-		•	★ 6						
FEAM TURBINE CHAUST STEAM	SE001-099	MAX. 70	530 mmHgV	-	11f	-	Work. Cond.	≥15	SPP	Pipe Table	Λ	ΑP	Fr	5K	SS400	G.C ★7	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC				
AFETY VALVE OUTLET	\$E400-479	•	•	•	III	•	Work, Cond.	≥15	SPP	Pipe Table	Α	ΑP	F/S ★5	10K	SS400	G.C ★7		-	•	-					
ONDENSATE WATER ROM STEAM TRAP	SD001-199	MAX. 133	0.1	0.2	ш	-	Work. Cond.	≥15	SPP	Pipe Table	A	AP	F/S ★5	5K	SS400	G.C ★7	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC				
'.IR VENT, OVERFLOW OUNDING	- VA001-099			,			Work.	≥100	SPP	Pipe Table	AG	AG	F/S	5K	SS400		_								
XCEPT OIL TANK INSIDE)	- VS001-099			-			Cond.	65,80 ≤50	STPG370-E STPG370-E	Sch 40 Sch 80	710	1.0	★5								_				
© LF: L-TYPE SLIP ON FLANGE: 2. ★2: REFER TO PIPNIN GENERAL I 3. ★3: INSULATION ① R.W: ROCK WOOL ② G.C: G 4. ★4: NDE CAN BE APPLIED INSTEA SPECIFICATION 1-{1}-2 FOR "T 5. ★5: THE PIPE JOINT TACH SYSTE IN PIPE JOINT TYPE COLUMN	ARKS: TYPE OF PIPE JOINTS F. FLANGE ②S: SLEEVE ③B: BUTT WELDING ④ U: BITE UNION ⑤ SWF: SOCKET WELD FLANGE ⑥ SJW: SOCKET JOINT WELD ⑦ NF: NECK WELD FLANGE 1F: L-TYPE SLIP ON FLANGE ⑤ SF: SQUARE FLANGE REFER TO PIPING GENERAL 1-(3)-4), FOR "PIPE TREATMENT SYMBOL". 6. ★6: SHIP'S SIDE VALVE ① GENERAL VALVE - ≥50: BODY: SC(RUBBER LINED) OR BC, STEM: SUS316L OR BS, DISC & SEAT: SUS316L OR BC														LLVE I: NBR W										
																						(5	TEAM,	PIPING DESIGN SPECIFICATION (PS7) (1/1) FEED WATER & CONDENSATE SYSTEM) (MB101.70) (S22	:-S25)



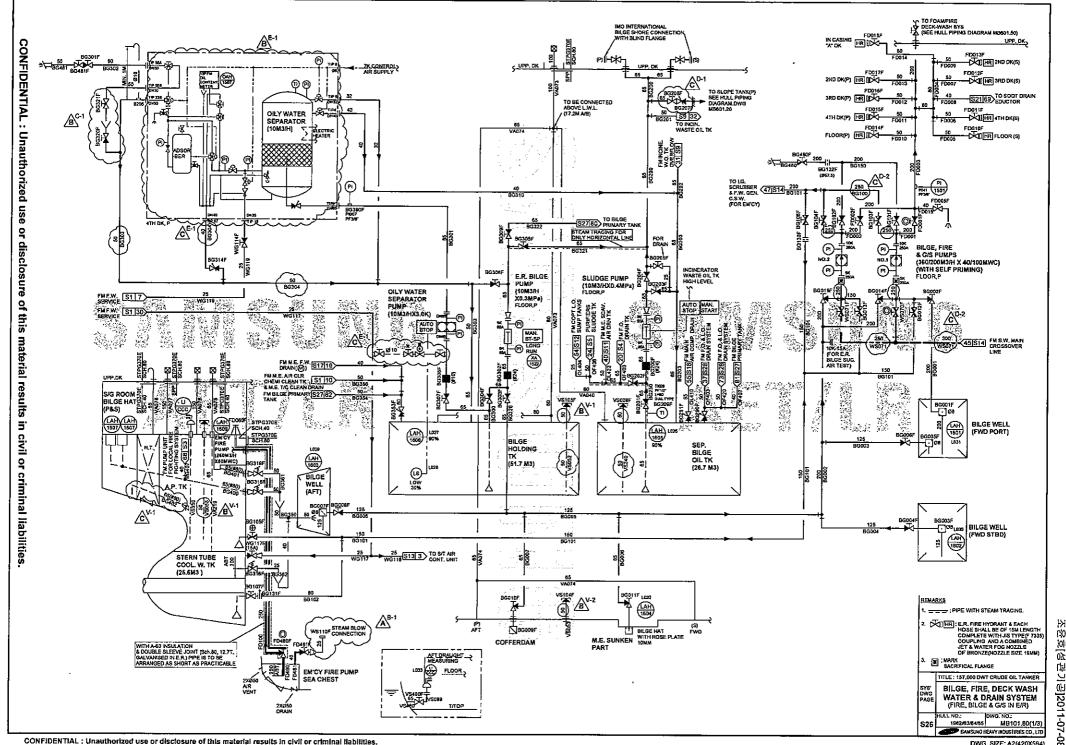






SAMSUNG									(DE	SIGN CON					ICATION IPE, PIPE J	OINT &	VALVE	S)						HULL NO. DWG NO. SYSTEM DWG. PAGE 1962/63/64/65 MB101.80 PS(8) (1/2)						
<u>-</u> .				SIGN		11321	D. TEST		PIPE SPEC					PIPE JO	INT		T		VE SPECIFIC	ATION				REVISION HISTORY						
System	PIPE, VALVE	p (c		PRESS. [MPa]			MPa]				TRE	\T. ★2	3.			£ ×			МА	TERIAL	,	Rev. No.		REVISED BY Rev. No. REVISED B	Υ					
	& FITTING NO.	Work. Temp.	Work	Work MAX		SHOP	ON- BOARD	N.D [A]	MATERIAL	тпіск	IN.	OUT.	TYPE	RATE (JIS)	MATE -RIAL	INSULATIO	N.D [A]	RATE (JIS)	-1	STRM	DISC & SEAT	A B C D E	-OWNE -CLASS -DETAIL	AUTHORITY REQUEST OWNER REQUEST CLASSFICATION REQUEST DETAIL ARRANGEMENT AT YARD EQUIPMENT MAKER'S RECOMMEND. F -DETAIL CALCUL BY YARD -OTHER DESIGN S AT YARD -DESIGN MISTAKI V -DESIGN IMPROVI						
SYSTEM DWG. PAGE 7 S26 S28	WATER	& DRA	IN SY	TEM		This properties	THE RES		13.74	ii n	描字				131				ALT. NO	Rev.	DESCRIPTION STATE OF THE PROPERTY OF THE PROPE	SYS								
BILGE, FIRE & G/S PUMP DISCHARGE TO FIRE MAIN LINE	FD001-099	32	1.0	1,44	111		2.16	≥15	STPG370-E	Sch 40	AG	AG	F	16K	SF440	* 7	≥50	16K	FC (RUBBER LINED)	BS	BC	A	B-1 B-2	- Steam blow connection for Embry fire pump sea chest was provided. - Water drain connection was provided for M.B.L.O SETT. TK. ST.						
EMERGENCY FIRE PUMP SUCTION	FD100-109	32	-		ш	-	0.4	≥15	STPG370-E	Sch 80	AG	AG	DS	5K	SS400	* 7	≥50 ≤40	10K 16K	SC BC	SUS	SCS	В	C-1	The hopper and valve were provided on Oily water separator recircualtion line.	S26					
BILGE, FIRE & G/S P/P SUCTION FROM BILGE	BG001-099	-	-	-	ш		0.4	≥!5	STPG370-E	Sch 40	AG	ΑG	F	5K	SS400	* 7	≥50	5K	FC (TAR FREE EPOXY)	BS	BC		D-1 D-2 E-1	Internal towerflow connection was changed due to narrow of tank inside. Drain line for sunken part of Purifier room was provided. Maker drawing for Oily Water Separator was changed.	\$27 \$27 \$26					
BILGE FIRE & G/S PUMP DISCHARGE TO BILGE OVERBOARD & A.P. TANK	BG100-199	-	0.4	0.45	ш	-	0.68	≥15	\$TPG370-E	Sch 40	AG	AG	F	10K	SS400	* 7	≥50 (★ 5)	10K	FC (TAR FREE EPOXY)	BŞ	BĊ		E-2 E-3	and the relevant pipe line size was changed Drain scuppers for G.Es were provided Following G.E. drain line was identified L.O. drain (D8)	\$27 \$28					
SLUDGE PUMP SUCTION & DISCHARGE	BG200-249	-	0.40	0.45	ш	-	Work. Cond.	≥15	STPG370-E	Sch 40	A	AP	_F	5K	\$\$400	-	≥50 ≤40	5K 5K	FC BC	B\$ B\$	BC BC			Crank case drain(D7) Oil vapour discharger drain(D3)						
SLUDGE PUMP SUCTION WITH INSULATION.	BG250-299	50.0	-	-	ш		Work.	≥15	STPG370-E	Sch 40	٨	ΑP	F	5X	SS400	R.W /G.C	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		V-1	The sounding pipe size of following tanks was increased to 50A from 40A. SEP, bilge oil tank.	526					
BILGE PUMP SUCTION/DISCHARGE & BILGE DRAIN	BG300-399	•	0.3	0.35	111		0.53	≥15	STPG370-E	Sch 40	AG	AG	 	5K	SS400		≥50 ≤40	5K 5K	FC (TAR FREE EPOXY) BC	BS BS	BC		V-2	Bitge holding tank A.P. tank The sounding pipe size of cofferdam was changed to 50A from 40A.	\$26					
	·			<u> </u>		-	Work,	≥65	STPG370-E	Sch 80			,				.340	-				С	D-1 D-2	- The valve type was change to stop valve and swing check valve instead of screw down stop check valve.	S26					
BILGE DRAIN IN A.P. TK	BG400-409	-		·	III		Cond.	≤50	STPG370-E	Sch 160	AG	AG	SJW		*****	•	•	•	•	-	-		E-1	The relevant pipe line of Bilge, fire &G/S pumps suction/discharge was modified as per actaul arrangement. Following item of Oily Water Separater was changed as below.	S26 S26					
WATER DRAINS, COAMING DRAINS & DECK SCUPPER	BD001-299	-	-	•	ш		Work. Cond.	≥15	SPP	Pipe Table	AG	AG	F/S ★5	.5K	\$\$400	•	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC			Dry running protection of oily water separater pump was provided. Common drain pipe size was changed to DN40 from DN50.						
EXPOSED DK SCUPPER (ABOVE UPP. DECK)	BD300-399			-	ш		Work. Cond.	≥15	STPG370-E	Sch 40	AG	AG	F/S ★5	5K	\$\$400	•	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		G-t	Pipe specification of Air purge line for remote level gauge (A.P. tank) was changed as below.	PS(8)					
EXPOSED DK SCUPPER BELOW UPP. DECK)	BD400-479	-	-		m	1	Work. Cond.	≥15	STPG370-E	Sch 80	AG	AG	F	5K	SS400		≥50 ≤40	5K 5K	FC BC	BS BS	BC BC			- Pîpe material: STPG370E→SUS316L, - Pîpe treatment: AG→NO. - Pîpe joint meaterial: SS400→SUS316						
F.O. DRAIN LINE	OF400-479	٠	-		ш	,	Work. Cond.	≥15	SPP	Pipe Table	A	ΑÞ	F/S ★5	5K	SS400	R.W /G.C ★ 8	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC		V-1	- Drain line for A.P. tank was provided.	\$26					
D.O. DRAIN LINE	OD400-479	•	•		ш	-	Work. Cond.	≥]5	SPP	Pipe Table	A	ΑP	F/S****	5K	\$\$400	-	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC	i								
O. DRAIN LINE	OL400-479	-	-	•	m		Work. Cond.	≥15	SPP	Pipe Table	A	AP	F/S: +5	5K	SS400	•	≥50 ≤40	5K 5K	FC BC	BS BS	BC BC									
AIR VENT, OVERFLOW								≥100	SPP	Pipe Table																				
SOUNDING EXECPT OIL TANK INSIDE)	- VA001-099 - VS001-099	•	٠		m	•	Work. Cond.	65, 80	STPG370-E	Sch 40	AG	AG	F/S *5	5K	S\$400	-	-	-	-	-	-									
								≤50	STPG370-E	Sch 80 Pipe			'		: 		ļ													
AIR VENT, OVERFLOW SOUNDING DIL TANK INSIDE) G11	- VA220-249 - V\$220-249	-			Œ1		Wark. Cond.	≥100 65, 80	SPP STPG370-E	Table Sch 40	A	AA,	F/S +±5	5K	SS400	.					-									
(B B) (B/GE I INE FOR DELIVE	~					_	Uforti	≤50	STPG370-E	Sch 80		<u> </u>	E/0																	
IR PURGE LINE FOR REMOTE EVEL GAUGE (A.P., TANK)	VS350-359	-		-	III	-	Work Cond.	≥15	SUS316L	Sch 80	МО	МО	F/S ★5	5K	SUS316	-	•	•	-	-	-									
HIP SIDE LINE FOR BILGE OVED	BG480-499		-]	n	-		≤300	STPG370-S	16.0t	TE	ΑP	F	10K	SF440	•	*6						(D75 C-	PIPING DESIGN SPECIFICATION (PS8) (1/2)						
HIP SIDE LINE FOR AFTER DRAFT	VS480-499				ш	-	-	≤125	STS370-S	Sch 160	TE	AP	F	10K	SF440	-			* 6				(BILGE, FIRE, DECK WASH WATER & DRAIN SYSTEM) (S26~S28)							

SAMSUNG					PIPING DESIGN SPECIFICATION (DESIGN CONDITION, APPLICATION OF PIPE, PIPE,										DINT & Y	VALVE:	sı							HULL NO. 1962/63/64/6	_	DWG NO.		YSTEM DWO		\Box		
			DES	IGN					PIPE SPEC				\Box	PLPE	JOIN	T				VE CD	ECIFIACT	108						ON HISTO		P3(8) (2	2)	\dashv
			PRI (M.			HYD, TI [MPa							+	SPECIF	CAT	NOT			172	1551				Rev.					tev.			_
		=	[,77.								IREA	.T. ★2	-				*3			<u> </u>	MATE	RIAL		No.	<u> </u>	REVISED	<u>өү</u>		No.	REVISED	BY	_
SYSTEM	PIPE, VALVE & FITTING NO.	Work, Temp. [C]	Work	MAX	CLASS(DNV)		BOARI	N.D [A]	MATE -RIAL	тніск	IN.	оит.	*)	MATE -RIAL	INSULATION	[A]	RATE (JIS)			STEM	DISC & SEAT		-OWNE -CLASS -DETAL AT YAF -EQUIP RECOM	MENT MAKER'S IMENDATION	EST NT		G -OTHE AT YA M -DESIG V -DESIG	R DESIGN SI RD IN MISTAKE IN IMPROVE	ECTION MENT	
SYSTEM DWG PAGE 1 826 - S28	BILGE FIRE	DECK	WASHV	ATER 8	DRAI	NSYSTE	ur i	#				TIB	144	All provides		er and all the later of the lat	ro per il		### 10 P T # P R P T BY E T B E	9 15 10		1		ALT.	Riv.		組費	ESCRIPT	ON F		ii is)	\$
REMARKS:		2718:3231	APPLICANA	ar.a kie gay	SA THEORIES	-122-23	en en e	の自動の主要を	ode direktorike programa	Series estre (este de	(Almina	4 541-354	(WEG.)	THE PURE T. T.	100	51051.44	6. ★6;S	HIP'S SI	DE VAI	LVE	******	*###	***********	19-5/11	A NO.R	461 MEST 121	make the	<u>ाच्ये स्थात</u>	A love in the stability	e de altraire de Labor	AAU (PA)	314
1. * 1: TYPE OF PIPE JOINTS ① F: FLANGE ② S: SLEEVE ③B: 1 ③ LF: 1-TYPE SLIP ON FLANGE ③ 2. * 2: REFER TO PIPING GENERAL 1-(3. * 3: INSULATION ① R.W: ROCK WOOL ② G.C: GL/ 4. * 4: NDE CAN BE APPLIED INSTEAD SPECIFICATION 1-(1)-2 FOR "TE 5. * 5: THE PIPE JOINT TYPE COLUMN, 7. * 7: SEA WATER PIPE LINE RUNNIN 8. * 8: ONLY HORIZONTAL INSTALLE	SF: SQUARE FLA 3)-4), FOR "PIPE" ASS CLOTH @C. 0 OF HYDRAULIC SST". 1 WILL BE DECID IG ABOVE THE E ED DRAIN PIPES	NGE () IREATA S: PRE- TEST U DED/SEL LECTRI- TO BE S	DS: DOU MENT SYN FORMED INDER AN ECTED A C EQUIPN TEAM TR	BLE SLE MBOL*. CALCIU GREEME CCORDII MENT SH	EVE M SILK NT ANI NG TO .	CATE (0) C D/OR APPI ACTUAL I AVE A SW	G.C.F.; G ROVAL, PIPING A EAT PR	JLASS C , DETAI ARRAN	CLOTH COVERI IL METHOD IS I	ED WITH A MENTION MONE OF	LUMIN ED ON I	IUM FO PIPING (PES M	OIL(0. GENI	.3T) ERAL AN	- (* 1 -		- \$40 ② BUT: - BOD: STEN ③ THE: COO! - BOD:	: BODY STEM : DISC & : BODY DISC & IERFLY Y : CAS MAIN C LER IN/4 Y : CAS	SC(R SUS31 SEAT SEAT SEAT VALV TSTEE SIGL, DI COOL, S OUTLE TIRON	6L OR : SUS3 STEM : BC E FOR L(FLA ISC : S I.W PA T VAL I,	16L OR BO : BS, : SHIPSIDE :NGE), US316L, SI • TO CENT	VALV EAT:1	⁄E √BR		-					4.		
 CALCULATION SHEET FOR SLUDGE (MARPOL 73/78ANNEX I REG. 17 (1) (٠.								-												
1) SLUDGE TANK CAPACITY FORMULA: YI = KI×C×D (mt) where: KI = 0.015 (Heavy face) oil C = Daily face) vicel oil consumption h = Running hour per B = F.O. consumption in h = Running hour per C = Feel oil specific gr D = Precise data of maximum (18,500 miles / 15,9 km Note: Incinentor will be provided. (i.e., 50% volume applied of c so, VI = (0.015 × 65.1 × 48.5 Therefore, the sludge tanks and volume NO. TANK 1 PURIFIER SLUDGE TANKS 2 WASTE OIL TANKS FOR INCIL 3 SEPARATED BILGE OIL TANK SUM. 10. SIZE OF MAIN BILGE LINE AND BR. 1) SIZE OF ER. BRANCH BILGE LINE D = 2.15√(RB+D) + 25 = 2.15√(AB(49+23.3) + PROPOSED 125A (LD 126.6 mm)	on = ((a>b×1.03)() an N.C.R. (4.760b) an N.C.R. (4.760b) an N.C.R. (4.760b) and (4.	o ⁶ ×g)×h] W)) tays follows.	VOLUM 14.5 1.5 II 26.4 II 42.4 III ORDING 2) SIZE C	IE m' i' i' i' i' i' i' i' i' i' i' i' i' i'	AIN BU	sc.5, 5.1/5.2 LGE LINE \(\overline{2} \times D_b\) \(\overline{2} \times 116\) (4 199.9 mm)		of LRS R	2) PUMP CAL PUMP CAI IN ACCOR For your ref	PACITY W DANCE W ference, the	HICH	10 m'(I)	3 SPE	dition is as	ON.	:	nection (I tank (P)	ik and														
11. CAPACITY OF MAIN BILGE PUMP (a $Q = 5.75 \times d_{\pi}^{2} / 10^{3}$	ACCORDING TO	Pt.5 Ch.1	13 Sec.6, 6	.3 of LRS	RULES	S)							٠.	1 7																		
$=5.75 \times 164^{2}/10^{3}$																																
= 154.7 PROPOSED 360 MYH X 2 SETS																									(B)LGE	PIPING DESI					(28)	٦

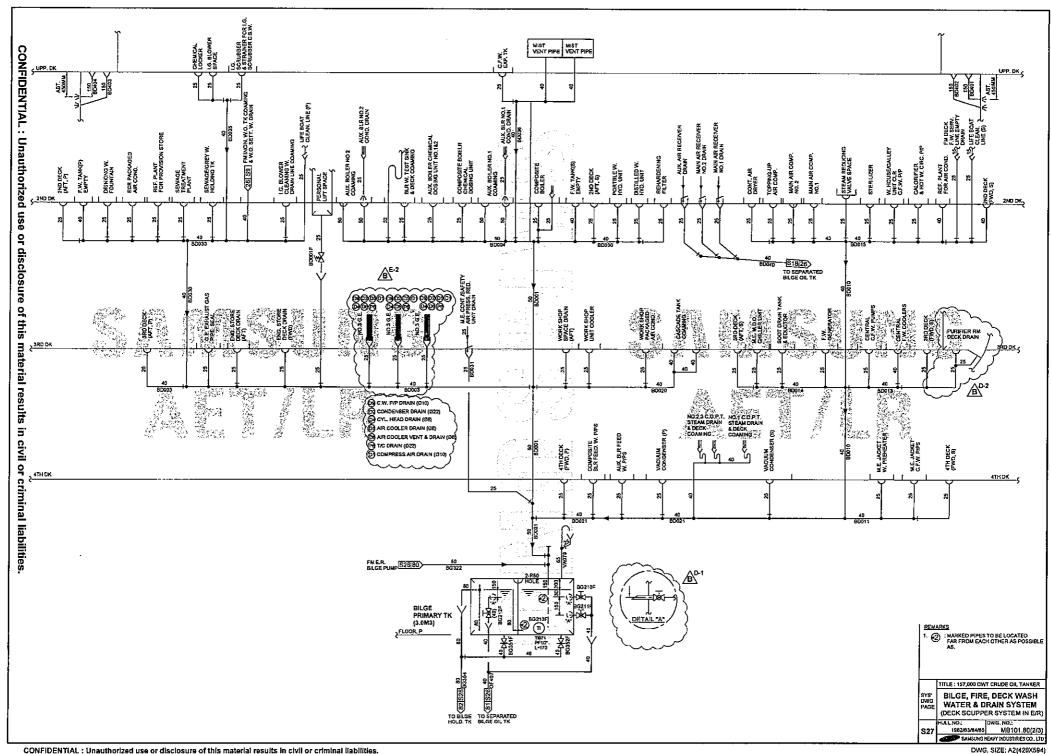


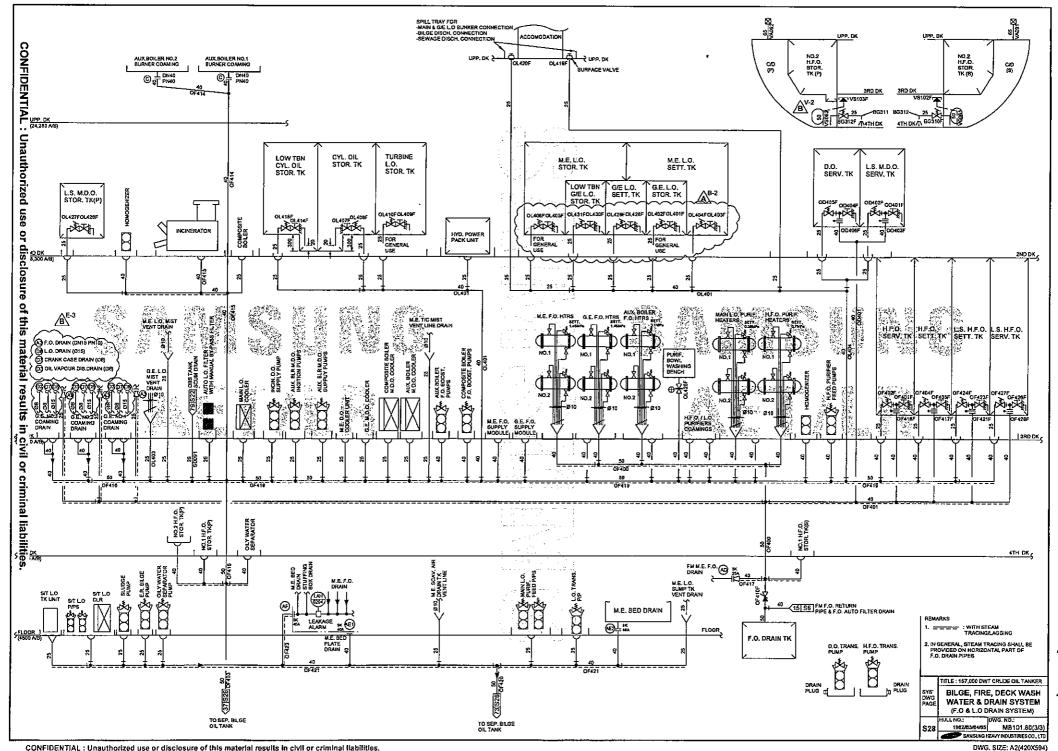
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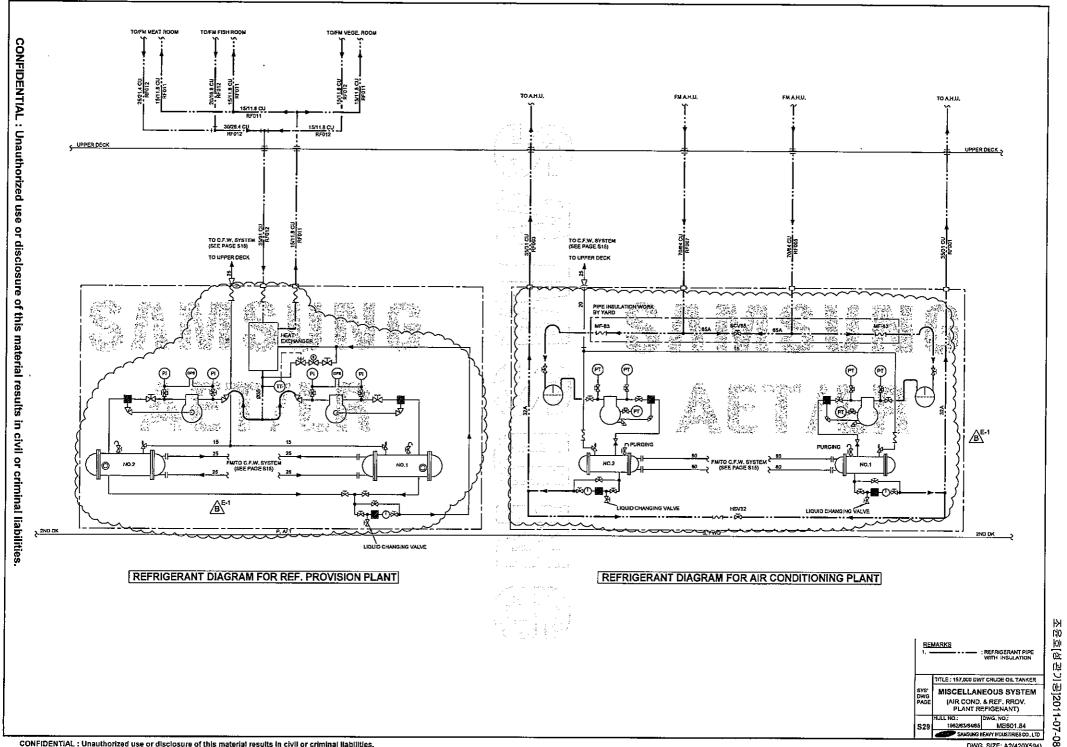
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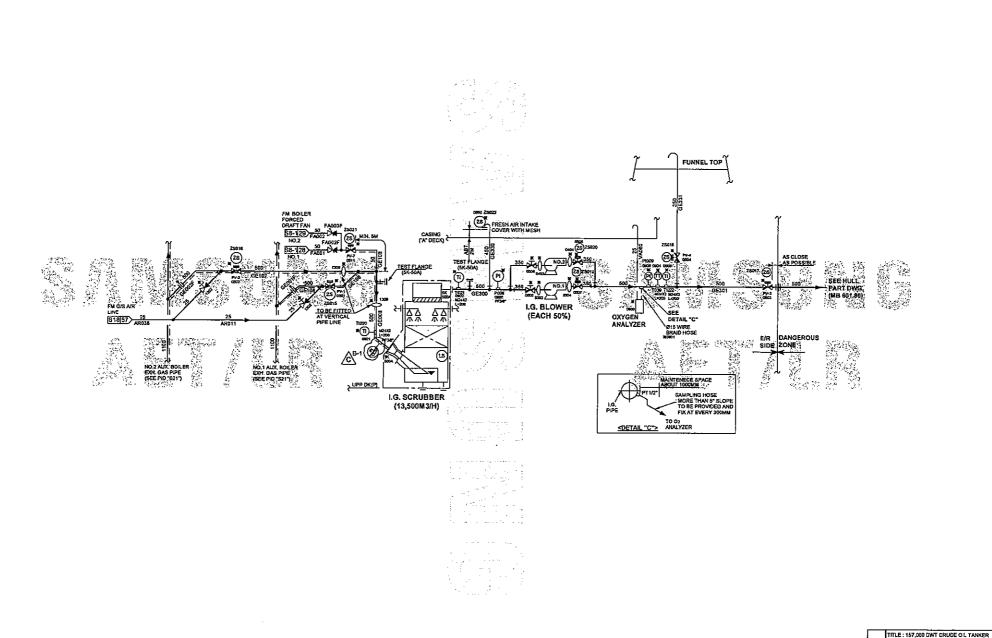
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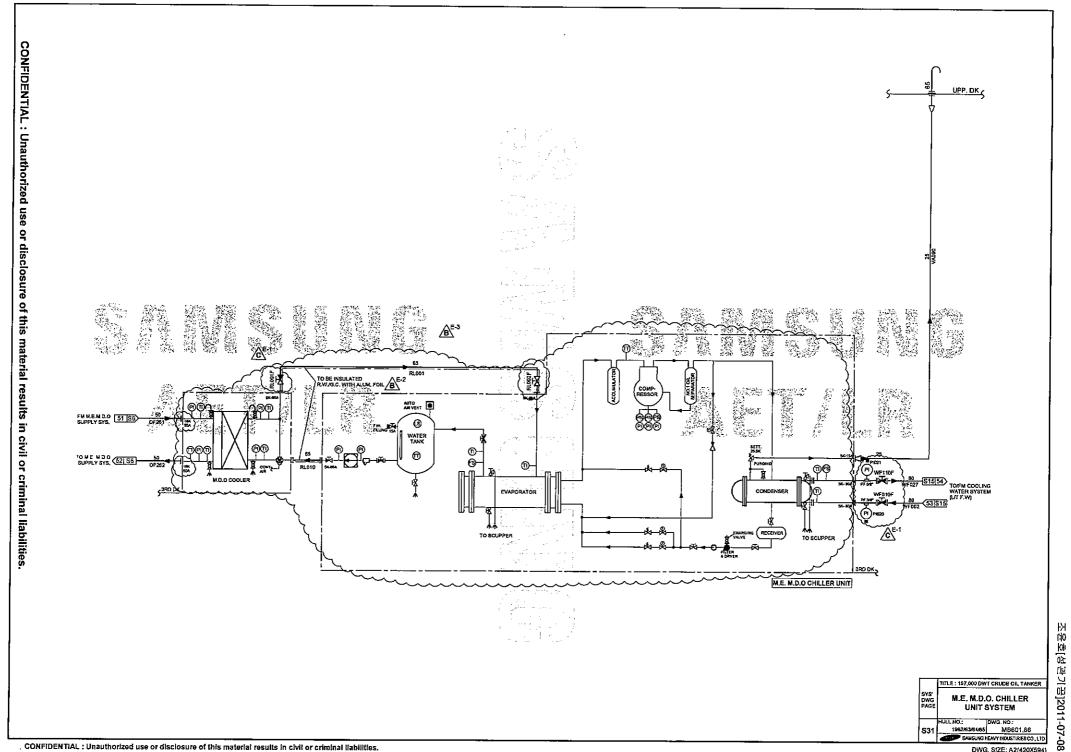


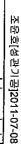


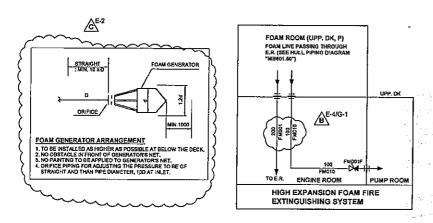


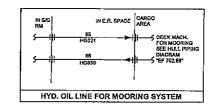


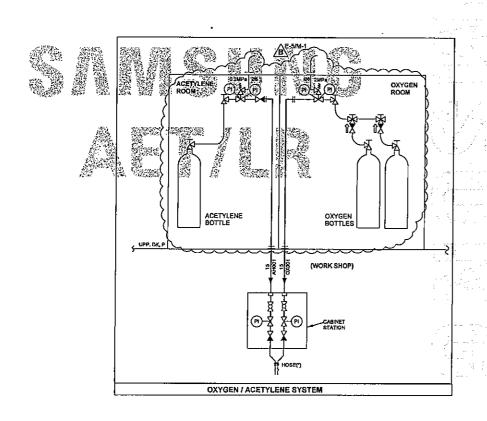
MISCELLANEOUS SYSTEM (INERT GAS SYSTEM)

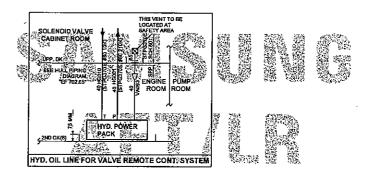












TITLE: 157,000 DWT CRUDE OIL TANKER

WISCELLANEOUS SYSTEM

(OXIAC, HYD. OIL

& FOAM FIRE FIGHTING)

GE (OX/AC, HYD, OIL
& FOAM FIRE FIGHTING)
HULL NO.: DWG, NO.:
192,83,84,85 MBG01,87
SAMSUNG HEAVY NOUSTRIES CO., LTD
