AS FITTED DWG

HULL NOS.	IMO SHIP IDENTIFICATION NO.
S467	IMO 9490909
S468	IMO 9490911
S569	IMO 9597745

이 준 수 사원
LEE JOON SOO
(TEL. 2997)

☐ FOR REFERENCE
☐ FOR WORKING
☐ FOR REVISION

(57 SHEETS WITH A COVER)

DEP'T NO. **C297**

SHIP NO. S467/8,S569

TEL NO. **2-0860**

BASIC DESIGN DEPARTMENT #3

SHIP TYPE **180,000 DWT CLASS BULK CARRIER**

SHIP NAME HYUNDAI VISION

APPROVED BY Y.H. Cha

CHECKED BY J.S. Kim

DRAWN BY H.S. Kim / 김 현 승

TITLE

PIPING SYSTEM DIAGRAM IN E/R

HYUNDAI SAMHO
HEAVY INDUSTRIES CO., LTD.

SCALE

DRAWING NO **3U-2400-103**

REV.NO. F

DATE **MAR. 19, 2010**

CONSOLIDATED NO. M-23

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	SHIP NO.	S467/8,S569

PLAN HISTORY

PAGE NO. 1

SHIP NO. S467/8,S569

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORIG.	2010. 3. 19		PREPARED FOR SHIP NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	△A	REFLECTED OWNER'S COMMENTS, CLASS(KR) COMMENTS, MAKER'S RECOMMENDATIONS AND DESIGN IMPROVEMENTS.	J.H.CHOI	H.S.KEE
0	'10.08.30		ISSUED FOR WORKING.	J.H.CHOI	H.S.KEE
100	'10.11.05	△100	REFLECTED OWNER'S COMMENTS, CLASS(KR) COMMENTS, MAKER'S RECOMMENDATIONS AND DESIGN IMPROVEMENTS.	J.H.CHOI	H.S.KEE
200	'11.03.18	△200	REFLECTED OWNER'S COMMENTS, CLASS(KR) COMMENTS, MAKER'S RECOMMENDATIONS AND DESIGN IMPROVEMENTS.	J.H.CHOI	H.S.KEE
F	'11.04.28		ISSUED FOR FINISHED PLAN.	J.H.CHOI	H.S.KEE

REV.	DESCRIPTION	SUBMITTED DATE	RECEIVED DATE
ORG	SHIPOWNER APPROVAL	MAR. 19, 2010	2010.05.07
ORG	KR CLASS APPROVAL	MAR. 19, 2010	2010.05.20

ABBREVIATION TABLE

(O.C) : SHIPOWNER'S COMMENT

(C.C) : CLASS COMMENT

(M.R) : MAKER'S RECOMMENDATION

(D.I) : DESIGN IMPROVEMENT

(B.S) : BUILDING SPECIFICATION

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CONN. NO.

PAGE

1. CLASSIFICATION

THE VESSEL INCLUDING ITS HULL, MACHINERY AND EQUIPMENT TO BE BUILT UNDER THE SURVEY OF THE CLASSIFICATION SOCITY OF KOREAN REGISTER OF SHIPPING AND TO BE CLASSED AND REGISTERED AS +KRS1, BULK CARRIER, (HOLD NOS. 2, 4, 6 AND 8 MAY BE EMPTY), (CSR), ESP, BC-A, GRAB(20), CHA, SeaTrust(HCM), +KRM1, UMA, LI, IWS, STCM, ENV(BWMP(S+F), IAFS, IOPP, ISPP, IGPP, IAPP).

2. RULES AND REGULATIONS

THE VESSEL TO BE REGISTERED IN A PORT OF PANAMA AND TO BE BULIT IN COMPLIANCE WITH THE FOLLOWING RULES AND REGULATIONS WHICH ARE RATIFIED ON THE DATE OF SIGNING THE CONTRACT AND COMING INTO FORCE BEFORE THE DELIVERY OF THE VESSEL AS PER "LR FUTURE IMO REGISTRATION" ISSUED ON JANUARY, 2007 EXCEPT FOLLOWING RULES.

- SOLAS CH.V REG.19-1 (NEW REG.) LRIT (LONG-RANGE IDENTIFICATION AND TRACKING)

THE PERFORMANCE STANDARDS AVAILABLE AT THE TIME OF CONTRACT OF EQUIPMENT OF NAVIGATION, COMMUNICATION, LIFESAVING AND FIRE FIGHTING AS REQUIRED BY THE SPECIFICATION SHALL BE APPLIED, IN PRINCIPLE. HOWEVER, NEW PERFORMANCE STANDARD ADOPTED BY THE MAKER BEFORE ON-BOARD CAN BE APPLIED SUBJECT TO MUTUAL AGREEMENT ON ADJUSTMENT OF COST AND DELIVERY OF THE VESSEL, IF NECESSARY. FOR THIS PURPOSE, THE BUILDER SHALL INFORM TO THE BUYER IF MAKER'S/VENDOR'S PERFORMANCE STANDARD IS CHANGED AT THE TIME OF FABRICATION OF MACHINERY/EQIPMENT.

- NATIONAL MARITIME REGULATION OF COUNTRY OF REGISTRY.
- INTERNATIONAL CONVENTION FOR THE SAFETY OF LIFE AT SEA, 1974 AND PROTOCOL 1978, AND AMENDMENTS. HOWEVER, THE APPLICATION OF ISPS TO BE LIMITED TO SHIP SECURITY ALERTS SYSTEM AND IMO NUMBER. PROVISIONS FOR MEANS OF ACCESS TO BE IN ACCORDANCE WITH IMO RES. MSC. 151(78) AND 158(78). COATING FOR WATER BALLAST TANKS TO BE IN ACCORDANCE WITH IMO RES. MSC. 215(82).
- INTERNATIONAL CONVENTION ON LOAD LINES, 1966 INCLUDING PROTOCOL 1988 AND AMENDMENTS.
- INTERNATIONAL CONVENTION ON TONNAGE MEASUREMENT OF SHIPS, 1969.
- INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 73/78 (ANNEX I, IV, V & VI) AND AMENDMENTS. (FOR REG. 14 OF ANNEX VI, HOWEVER, LOW SULPHUR HEAVY FUEL OIL TANK, SETTLING/SERVICE TANKS AND CYLINDER OIL STORAGE TANK TO BE PROVIDED RESPECTIVELY.) (MARPOL ANNEX I RG. 12A ON FUEL OIL TANK PROTECTION.)
- CONVENTION ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972 AND AMENDMENTS.
- INTERNATIONAL TELECOMMUNICATION UNION RADIO REGULATION, 1974, 1982 AND AMENDMENTS.
- INTERNATIONAL MARITIME PILOT'S ASSOCIATION REGARDING PILOT BOARDING ARRANGEMENT.
- U.S.C.G. RULES AND REGULATIONS FOR FOREIGN VESSELS OPERATING IN THE NAVIGABLE WATERS OF THE UNITED STATES.
- SUEZ CANAL NAVIGATION RULES INCLUDING TONNAGE MEASUREMENT.
- ILO CONVENTION 147 AND 147 PROTOCOL (EXCEPT SWIMMING POOL).
- ICS/OCIMF, GUIDE TO HELICOPTER/SHIP OPERATION, 3RD EDITION, 1989 (FOR LANDING MARK/DAYTIME OPERATION ONLY).
- CODE OF SAFETY PRACTICE FOR SOLID BULK CARGOES (BC CODE) WITH AMENDMENTS (FOR COAL ONLY).
- IMO RES. A868(20) ON BALLAST WATER MANAGEMENT, WITH STATEMENT OF COMPLIANCE AND BALLAST WATER MANAGEMENT PLAN APPROVED BY CLASS (BALLAST WATER MANAGEMENT PLAN TO BE REVIEWED BY THE BUYER BEFORE CLASS APPROVAL.).
- IMO RESOLUTION MSC.137(76) "STANDARD FOR SHIP MANOEUVRABILITY" EXECPT STOPPING ABILITY.
- IMO RESOLUTION A.601(15) "MANOEUVRING INFORMATION ON BOARD SHIPS".

ABOVE RULES AND REGULATIONS ARE APPLIED WITHOUT INSPECTION OR SURVEY BY THIRD PARTIES UNLESS CERTIFICATE IS REQUIRED BY SECTION 0.6 "CERTIFICATE" AND/OR OTHER SECTIONS.

PAGE 2 | SHIP NO. S467/8,S569

3. MAIN DIMENSION

- LENGTH, OVERALL	ABT. 292 M
- LENGTH, BETWEEN PERPENDICULARS	283.5 M
- BREADTH, MOULDED	45 M
- DEPTH MOULDED	24.7 M
- DESIGN DRAUGHT, MOULDED	16.5 M
- SCANTLING DRAUGHT, MOULDED	18.2 M
- FREEBOARD TYPE	TYPE B-60 OF INTERNATIONAL CONVENTION ON LOAD LINES, 1966 AND ASSIGNED FREEBOARD CORRESPONDING TO THE SCANTLING DRAUGHT.

- DECK HEIGHT AT CENTER LINE

UPPER DECK TO "A" DECK	3.7 M
"A" DECK TO "B" DECK	3.7 M
"B" DECK TO "C" DECK	3.2 M
"C" DECK TO "D" DECK	3.2 M
"D" DECK TO NAV. BRIDGE DECK	3.2 M
NAV. BRIDGE DECK TO COMPASS DECK	2.9 M
UPPER DECK TO FORECASTLE DECK	3.9 M AT AFT END AND 4.0 M AT F.P.

CAMBER

UPPER DECK	STRAIGHT, 1,000 MM HIGH
FORECASTLE DECK	NIL
NAVIGATION BRIDGE DECK	STRAIGHT, 100 MM HIGH
OTHER DECKS IN DECKHOUSE	NIL

- SHEER

UPPER DECK	DUE TO CAMBER ONLY
FORECASTLE DECK	STRAIGHT 100 MM AT F.P. (REFER TO DECK HEIGHT)

- AIR DRAUGHT: THE VESSEL TO BE DESIGNED TO SATISFY THE AIR DRAUGHT OF ABOUT 13.7 M FROM THE WATERLINE TO THE TOP OF HATCH COVER WITH FULL FLOODING OF NO.6 HOLD AND PARTIAL FLOODING OF NOS. 2, 4 AND 8 HOLD AT HARBOUR.

4. CAPACITY

CARGO CAPACITY (100% FULL) :

- CARGO HOLDS	ABT. 199,500 M3

TANK CAPACITY (100% FULL) :

- HEAVY FUEL OIL TANKS INCLUDING SETTLING, SERVICE TANKS & LOW SULPHUR HEAVY FUEL OIL TANKS	ABT. 5,100 M3
- LOW SULPHUR HEAVY FUEL OIL TANKS INCLUDING SETTLING, SERVICE TANKS	ABT. 1,000 M3
- DIESEL OIL TANKS INCLUDING SETTLING, SERVICE TANK AND LOW SULPHUR DIESEL OIL STORAGE TANK	ABT. 200 M3
- FRESH WATER TANKS	ABT. 400 M3
- WATER BALLAST TANKS INCLUDING PEAK TANKS AND NO.6 FLOODABLE HOLD	ABT. 75,500 M3

FUEL OIL TANK CALIBRATION TABLE TO BE ENDORSED BY THE CLASSIFICATION WITHOUT MEASUREMENT.

SHIP NO.	S467/8,S569	HDS NO.	8001	1/10

HYUNDAI

SYMBOL LIST IN PIPING DIAGRAM

DATE	'79	'88		
	11/22	8/18	/	/

1. SCOPE

THE STANDARD COVERS GRAPHICAL SYMBOLS FOR PIPING AND FITTINGS

THEREFORE TO BE USED IN SHIP'S PIPING DIAGRAM

2. CLASSIFICATION OF GRAPHICAL SYMBOLS

THE GRAPHICAL SYMBOLS SHALL BE CLASSIFIED AS GIVEN BELOW.

1) PIPES AND PIPE JOINTS
2) CONTROL AND REGULATION PARTS
3) VALVE AND COCKS
4) PIPE FITTINGS
5) CONTROL AND INSTRUMENTATION

APRD
CHKD
DRWN
RGTD

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	2/10

HYUNDAI

1. PIPES AND PIPE JOINTS

DATE	'79	'88		
	11/22	8/18	/	/

SYMBOL	NAME	REMARK
	NOT CONNECTED CROSSING PIPES	
	CONNECTED CROSSING PIPES	
	BRANCH PIPE	
	FLEXIBLE JOINT , FLEXIBLE PIPE JOINT	
	FLANGE JOINT	SYMBOL FOR MACH. CONN. FLANGE JOINT:
	REDUCER OR EXPANDER	EXAMPLE:
	SLEEVE TYPE EXPANSION JOINT	
	BELLOWS TYPE EXPANSION JOINT	
	EXPANSION BEND PIPE	
	BLANK FLANGE	
	SPECTACLE FLANGE	EXAMPLE: O C
	PENETRATING BULKHEAD AND DECK CROSSING	
	DRAIN PIPE LED TO DECK OR SCUPPER	TO BILGE WELL OR T/T : TO B.W. OR TO T/T
	INSULATED PIPE	
	STEAM TRACED & INSULATED PIPE	
	MAKER SUPPLY ITEM	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	3/10

HYUNDAI

2. CONTROL AND REGULATION PARTS

DATE	'79	'88		
	11/22	8/18	/	/

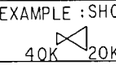
T	HAND OPERATED	
≋	SPRING	
▭—	WEIGHT	
—○	FLOAT	
⊤	PISTON	
⌒	DIAPHRAGM	
⌒	DIAPHRAGM WITH POSITIONER	
(M)	ELECTRIC MOTOR DRIVEN	
(S)	SOLENOID DRIVEN	
(A)	AIR MOTOR DRIVEN	
⊓	CYLINDER WITH POSITIONER	
T○	HAND OPERATED (LOCKED OPEN)	
T●	HAND OPERATED (LOCKED SHUT)	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	4/10

HYUNDAI

3. VALVE AND COCK

DATE	'79	'88		
	11/22	8/18	/	/

SYMBOL	NAME	REMARK
⋈	STOP VALVE (GLOBE)	
⋈	STOP VALVE (ANGLE)	
⋈	THREE WAY VALVE	
⋈	LIFT CHECK VALVE(GLOBE)	
⋈	LIFT CHECK VALVE(ANGLE)	
⋈	SCREW DOWN STOP CHECK VALVE(GLOBE)	
⋈	SCREW DOWN STOP CHECK VALVE(ANGLE)	
⋈	SWING CHECK VALVE	
⋈	PRESSURE REGULATING VALVE	EXAMPLE : SHOWES 40K - 20K 
⋈	SAFETY OR RELRIEF VALVE (GLOBE)	
⋈	SAFETY OR RELRIEF VALVE (ANGLE)	
⋈	SELF CLOSING VALVE (GLOVE)	
⋈	SELF CLOSING VALVE (ANGLE)	
⋈	REGULATING VALVE	
⋈	BUTTERFLY VALVE	
⋈	GATE VALVE	
⋈	BREATHER VALVE	
⋈	HOSE VALVE (GLOVE)	EXAMPLE : 
⋈	HOSE VALVE (ANGLE)	
⋈	FOOT VALVE	EXAMPLE : 
⋈	NEEDLE VALVE AND V-PORT VALVE (GLOBE)	
⋈	NEEDLE VALVE AND V-PORT VALVE (ANGLE)	
⋈	COCK	
⋈	THREE WAY COCK (L-PORT)	
⋈	THREE WAY COCK (T-PORT)	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	5/10

HYUNDAI

3. VALVE AND COCKS

DATE	'79	'88		
	11/22	8/18		

SYMBOL	NAME	REMARK
	LOCKED COCK	
	AUTO VENT VALVE	
	REMOTE OPERATED VALVE	
	EMERGENCY SHUT OFF VALVE (WIRE OPERATED)	
	EMERGENCY SHUT OFF VALVE (AIR OPERATED)	
	EMERGENCY SHUT OFF VALVE (HYDRAULIC OPERATED)	
A	AIR MOTOR VALVE	
M	ELECTRIC MOTOR VALVE	
	PISTON VALVE	
S	SOLENOID VALVE	
	DIAPHRAGM OPERATED VALVE	
	STORM VALVE(GLOBE)	
	STORM VALVE(ANGLE)	
	DIAPHRAGM OPERATED VALVE(3-WAY CONTROL)	
	DIAPHRAGM OPERATED VALVE WITH POISITIONER (3-WAY CONTROL)	
	CYLINDER OPERATED VALVE WITH POSITIONER (3-WAY CONTROL ROTARY PLUG TYPE)	
W	WAX EXPANSION TYPE CONTROL VALVE	
	SELF CONTAINED TYPE CONTROL VALVE	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	6/10

HYUNDAI

4. PIPE FITTINGS

DATE	'79	'88		
	11/22	8/18		

SYMBOL	NAME	REMARK
	ROSE BOX	
	MUD BOX	
	SIMPLEX WATER STRAINER	
	SIMPLEX OIL STRAINER	
	DUPLEX OIL STRAINER	
	SEPARATOR	EXAMPLE :
	DRAIN TRAP (DISC IMPULSE TYPE)	
	Y-TYPE STRAINER	
	HOPPER (WITHOUT COVER)	
	HOPPER (WITH COVER)	
	SOUNDING HEAD WITH SCREWED CAP	
	SOUNDING HEAD WITH SELF CLOSING VALVE(WITH TEST COCK)	
	ORIFICE	
	HOSE COUPLING	EXAMPLE :
	HAND PUMP	
	EJECTOR, EDUCTOR INJECTOR	
	SEA CHEST	
	DRAIN SILENCER	
	HULL DISTANCE PIECE (SHIPSIDE NOZZLE)	
	BILGE HAT	
	SIGHT GLASS	
	FUSIBLE PLUG	
	BOSS	
	BOSS AND PLUG	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	7/10

HYUNDAI

4. PIPE FITTINGS

DATE	,79	,88		
	11/12	8/18		

SYMBOL	NAME	REMARK
	SIMPLEX AUTO-BACK FLUSHING FILTER	
	DUPLEX AUTO-BACK FLUSHING FILTER	
	AIR VENT HEAD	
	GOOSE NECK TYPE AIR PIPE HEAD(WITH WIRE NET)	
	FLOAT TYPE AIR PIPE HEAD(WITH INSECT SCREEN)	
	FLOAT TYPE AIR PIPE HEAD(WITH FLAME PROOF SCREEN)	
	OIL TRAY, COAMING	
	BELLMOUTH	
	SCUPPER	
H.B	HOSE BOX	
U	ULLAGE STAND WITH COVER	
	INTERNATIONAL SHORE CONNECTION	
A	AIR HORN	
S	STEAM HORN	
E	ELECTRIC HORN	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	8/10

HYUNDAI

5. CONTROL AND INSTRUMENTATION

DATE	'79	'88		
	11/22	8/8		

SYMBOL	NAME	REMARK
	HYDRAULIC OIL LINE	
	CONTROL AIR LINE	
	CAPILLARY TUBE	
	ELECTRIC WIRING	
	LOCAL INDICATOR	
	REMOTE INDICATOR	
	SEAL POT	
	LOOP SEAL	
	WITHOUT VALVE OR COCK	FOR LEVEL GAUGE
	VALVE OR COCK FOR WATER GLASS LEVEL GAUGE	FOR LEVEL GAUGE
	SELF CLOSING VALVE FOR OIL GLASS LEVEL GAUGE	FOR LEVEL GAUGE
	WATER GLASS LEVEL GAUGE	FOR LEVEL GAUGE
	FLAT GLASS LEVEL GAUGE (WITH SELF CLOSING V/V)	FOR LEVEL GAUGE
	FLOAT TYPE LEVEL GAUGE	FOR LEVEL GAUGE

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	9/10

HYUNDAI

5. CONTROL AND INSTRUMENTATION

DATE	'79	'88		
	11/22	8/16		

SIGN	NAME	SIGN	NAME
MC	MAIN CONTROL CONSOLE	VAH	VISCOSITY ALARM HIGH
GP	GRAPHIC PANEL	VAL	VISCOSITY ALARM LOW
PI	PRESSURE INDICATOR	TI	TEMPERATURE INDICATOR
PX	PRESSURE TRANSMITTER	TX	TEMPERATURE TRANSMITTER
PC	PRESSURE CONTROLLER	TC	TEMPERATURE CONTROLLER
PS	PRESSURE SWITCH	TS	TEMPERATURE SWITCH
PAH	PRESSURE ALARM HIGH	TAH	TEMPERATURE ALARM HIGH
PAL	PRESSURE ALARM LOW	TAL	TEMPERATURE ALARM LOW
PR	PRESSURE RECORDER	TR	TEMPERATURE RECORDER
DPI	DIFFERENTIAL PRESSURE INDICTOR	LI	LEVEL INDICATOR
DPX	DIFFERENTIAL PRESSURE TRANS.	LX	LEVEL TRANSMITTER
DPS	DIFFERENTIAL PRESSURE SWITCH	LC	LEVEL CONTROLLER
VI	VACUUM INDICATOR	LAH	LEVEL ALARM (HIGH)
VX	VACUUM TRANSMITTER	LAL	LEVEL ALARM (LOW)
VA	VACUUM ALARM	LR	LEVEL RECORDER
CI	COMPOUND INDICATOR	LS	LEVEL SWITCH
RI	REVOLUTION INDICATOR	VR	VISCOSITY INDICATOR
RCO	REVOLUTION COUNTER	VC	VISCOSITY CONTROLLER
RX	REVOLUTION TRANSMITTER	X	TRANSMITTER
RC	REVOLUTION CONTROLLER	FLG	FLOAT TYPE LEVEL GAUGE
LCG	LOCAL CONTENT GAUGE	WD	WATER DETECTOR

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SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8001	10/10

HYUNDAI

5. CONTROL AND INSTRUMENTATION

DATE	'79	'88		
	11/22	8/18		

SIGN	NAME	SIGN	NAME
FI	FLOW INDICATOR	MS	MICRO SWITCH
FCO	FLOW COUNTER	TM	TORQUE METER
FX	FLOW TRANSMITTER	HY	HYDRAZINE DETECTOR OR METER
FC	FLOW CONTROLLER	PH	PH DETECTOR OR METER
FS	FLOW SWITCH	μv	"μv" DETECTOR OR METER
FA	FLOW ALARM	SM	SMOKE INDICATOR
SX	SALINITY TRANSMITTER	O2	O2 METER
SI	SALINITY INDICATOR	CO2	CO2 METER
SA	SALINITY ALARM	H2O	HYDROMETER
TAHLI	TEMPERATURE ALARM HIGH/ LOW INDICATION	M	MOTOR
PAHLI	PRESSURE ALARM HIGH/ LOW INDICATION	BL	BALLAST CONTROL CONSOLE
SMX	SMOKE DETECTOR	BC	BRIDGE CONTROL CONSOLE
MT	WATER TRANSDUCER		

BLANK

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8101	1/5

HYUNDAI

CARBON AND STAINLESS STEEL PIPE STANDARD

DATE	'82	'88	'93	
	5/31	3/7	9/10	/

1. SCOPE

THIS STANDARD PROVIDES FOR CARBON AND STAINLESS STEEL PIPE.

2. MATERIAL

2.1 SPP : CARBON STEEL PIPES FOR ORDINARY PIPING
COMPARABLE TO JIS SGP(KS D3507)

2.2 STPG370 (=STPG38) : CARBON STEEL PIPE FOR PRESSURE SERVICE.
MIN. TENSILE STRENGTH 370 N/MM² (38KGf/MM²):(JIS G3454)

2.3 ERWS370 (=ERWS 38) : ELECTRIC RESISTANCE WELDED SPECIAL CARBON STEEL PIPE
EQUIVALENT TO STPG370 N/MM²(38KGf/MM²) MATERIAL.

2.4 STPY400 (=STPY41) : ARC WELDED CARBON STEEL PIPE.
MIN. TENSILE STRENGTH SS400 N/MM²(41KGf/MM²):(JIS G3457)

2.5 STS 370 (=STS38) : CARBON STEEL PIPES FOR HIGH PRESSURE SERVICE
MIN. TENSILE STRENGTH 370 N/MM²(38KGf/MM²):(JIS G3455)

2.6 SUS TP : STAINLESS STEEL PIPE (JIS G3459)

2.7 SUS TPY : ARC WELDED LARGE DIAMETER STAINLESS STEEL PIPE (JIS G3468)

2.8 SUS ERW : ELECTRIC RESISTANCE WELDED SPECIAL STAINLESS STEEL PIPE
EQUIVALENT TO SUS TP MATERIAL.

3. DIMENSION & WEIGHTS

THE OUTSIDE DIAMETER, THE WALL THICKNESS AND THE WEIGHT OF THE PIPE SHALL BE AS SPECIFIED IN ATTACHED TABLE.

APRD
CHKD
DRWN
RGTD

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8101	2/5

HYUNDAI

CARBON STEEL PIPE STANDARD

DATE	'82	'86	'93	
	5/31	5/12	9/10	/

NOM. DIA.		OUT. DIA.	PIPE WALL THICKNESS (MM)									
			SPP		7.9 MM		SCH. 40		9.5 MM			
(A)	(B)	(d)	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M
10	3/8	17.3	2.35	0.87			2.3	0.85				
15	1/2	21.7	2.65	1.25			2.8	1.31				
(20)	3/4	27.2	2.65	1.60			2.9	1.74				
25	1	34.0	3.25	2.46			3.4	2.57				
(32)	1 1/4	42.7	3.25	3.16			3.6	3.47				
40	1 1/2	48.6	3.25	3.63			3.7	4.10				
50	2	60.5	3.65	5.12			3.9	5.44				
65	2 1/2	76.3	4.00	6.34			5.2	9.12				
80	3	89.1	4.05	8.49			5.5	11.3				
100	4	114.3	4.50	12.2			6.0	16.0				
125	5	139.8	4.85	16.1			6.6	21.7				
150	6	165.2	4.85	19.2			7.1	27.2				
200	8	216.3	5.85	30.4			8.2	42.1				
250	10	267.4	6.4	41.2			9.3	59.2				
300	12	318.5	7.0	53.8					9.5	72.3		
350	14	355.6	7.6	65.2					9.5	81.0		
400	16	406.4	7.9	77.6					9.5	93.0		
450	18	457.2	7.9	87.5					9.5	105		
500	20	508.0	7.9	97.4					9.5	117		
550	22	558.8	7.9	107					9.5	129		
600	24	609.6	7.9	117					9.5	141		
650	26	660.4			7.9	129					9.5	153
700	28	711.2			7.9	137					9.5	164
750	30	762.0			7.9	147					9.5	176
800	32	812.8			7.9	157					9.5	188
850	34	863.6			7.9	167					9.5	200
900	36	914.4			7.9	177					9.5	212
1000	40	1016.0			7.9	196					9.5	236

FOR SCH. 40 PIPING SYSTEM

MAT'L					
SPP	○	-	-	-	-
STPG370 (=STPG38)	-	-	○	-	-
ERWS370 (=ERW38)	-	-	-	○	-
STPY400 (=STPY41)	-	○	-	-	○

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SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8101	3/5

HYUNDAI

CARBON STEEL PIPE STANDARD

DATE	'82	'86	'93	
	5/31	5/12	9/10	/

NOM. DIA.		OUT DIA.	PIPE WALL THICKNESS (MM)								REMARK
			SCH. 80		12.7 MM				SCH. 160	16.0 MM	
(A)	(B)	(d)	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	
10	3/8	17.3	3.2	1.11					-	-			
15	1/2	21.7	3.7	1.64					4.7	1.97			
(20)	3/4	27.2	3.9	2.24					5.5	2.94			
25	1	34.0	4.5	3.27					6.4	4.36			
(32)	1 1/4	42.7	4.9	4.57					6.4	5.73			
40	1 1/2	48.6	5.1	5.47					7.1	7.27			
50	2	60.5	5.5	7.46					8.7	11.1			
65	2 1/2	76.3	7.0	12.0					9.5	15.6			
80	3	89.1	7.6	15.3					11.1	21.4			
100	4	114.3	8.6	22.4					13.5	33.6			
125	5	139.8	9.5	30.5					15.9	48.6			
150	6	165.2	11.0	41.8					-	-	16.0	58.9	
200	8	216.3	12.7	63.8					-	-	16.0	79.0	
250	10	267.4	-	-	12.7	79.8			-	-	16.0	99.2	
300	12	318.5	-	-	12.7	95.8			-	-	16.0	119	
350	14	355.6	-	-	12.7	107			-	-	16.0	134	
400	16	406.4	-	-	12.7	123			-	-	16.0	154	
450	18	457.2	-	-	12.7	139			-	-	16.0	174	
500	20	508.0	-	-	12.7	155			-	-	16.0	194	
550	22	558.8	-	-	12.7	171			-	-	16.0	214	
600	24	609.6	-	-	12.7	187			-	-	16.0	234	
650	26	660.4	-	-	-	-	12.7	213	-	-	-	-	
700	28	711.2	-	-	-	-	12.7	219	-	-	-	-	
750	30	762.0	-	-	-	-	12.7	235	-	-	-	-	
800	32	812.8	-	-	-	-	12.7	251	-	-	-	-	
850	34	863.6	-	-	-	-	12.7	266	-	-	-	-	
900	36	914.4	-	-	-	-	12.7	282	-	-	-	-	
1000	40	1016.0	-	-	-	-	12.7	314	-	-	-	-	

FOR SCH. 80 PIPING SYSTEM

FOR SCH.160 PIPING SYSTEM

MAT'L						
STPG370 (=STPG38)	○					
ERWS370 (=ERWS38)	-	○	-	-	○	
STPY400 (=STPY41)	-	-	○	-	-	
STS370 (=STS38)	-	-	-	○	-	

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8101	4/5

HYUNDAI

STAINLESS STEEL PIPE STANDARD

DATE	'82	'86	'93	
	5/31	5/12	9/10	/

NOM. DIA.		OUT DIA.	PIPE WALL THICKNESS (MM)											
			SCH. 10S				SCH. 20S				SCH. 40		9.5 MM	
(A)	(B)	(d)	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M
6	1/8	10.5	1.2	0.28			1.5	0.33			1.7	0.37	FOR SCH.40 PIPING SYSTEM	
8	1/4	13.8	1.65	0.49			2.0	0.58			2.2	0.63		
10	3/8	17.3	1.65	0.64			2.0	0.76			2.3	0.85		
15	1/2	21.7	2.1	1.02			2.5	1.18			2.8	1.31		
(20)	3/4	27.2	2.1	1.30			2.5	1.52			2.9	1.74		
25	1	34.0	2.8	2.15			3.0	2.29			3.4	2.57		
(32)	1 1/4	42.7	2.8	2.76			3.0	2.94			3.6	3.47		
40	1 1/2	48.6	2.8	3.16			3.0	3.37			3.7	4.10		
50	2	60.5	2.8	3.96			3.5	4.92			3.9	5.44		
65	2 1/2	76.3	3.0	5.42			3.5	6.28			5.2	9.12		
80	3	89.1	3.0	6.37			4.0	8.39			5.5	11.3		
100	4	114.3	3.0	8.23			4.0	10.9			6.0	16.0		
125	5	139.8	3.4	11.4			5.0	16.6			6.6	21.7		
150	6	165.2	3.4	13.6			5.0	19.8			7.1	27.7		
200	8	216.3	4.0	20.9			6.5	33.6			8.2	42.1		
250	10	267.4	4.0	26.0			6.5	41.8			9.3	59.2		
300	12	318.5	4.5	34.8			6.5	50.0			-	-	9.5	73.1
350	14	355.6	-	-	5.0	43.7	-	-	8.0	69.3	-	-	9.5	81.9
400	16	406.4	-	-	5.0	50.0	-	-	8.0	79.4	-	-	9.5	93.9
450	18	457.2	-	-	5.0	56.3	-	-	8.0	89.5	-	-	9.5	105.9
500	20	508.0	-	-	5.5	68.8	-	-	9.5	118.0	-	-	9.5	118.0

MAT'L							
	SUS TP	○	-	○	-	○	-
	SUS TPY	-	○	-	○	-	-
	SUS ERW	-	-	-	-	-	○

A4 (210X297) 알마지

P: 10

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8101	5/5

HYUNDAI

STAINLESS STEEL PIPE STANDARD

DATE	'82	'86	'93	
	5/31	5/12	9/10	/

NOM. DIA.		OUT DIA.	PIPE WALL THICKNESS (MM)								REMARK
			SCH. 80		12.7 MM		SCH. 160		16.0 MM		
(A)	(B)	(d)	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M	
6	1/8	10.5	2.4	0.48	FOR SCH. 80 PIPING SYSTEM		-	-	FOR SCH. 160 PIPING SYSTEM		
8	1/4	13.8	3.0	0.80			-	-			
10	3/8	17.3	3.2	1.11			-	-			
15	1/2	21.7	3.7	1.64			4.7	1.97			
(20)	3/4	27.2	3.9	2.24			5.5	2.94			
25	1	34.0	4.5	3.27			6.4	4.36			
(32)	1 1/4	42.7	4.9	4.57			6.4	5.73			
40	1 1/2	48.6	5.1	5.47			7.1	7.27			
50	2	60.5	5.5	7.46			8.7	11.1			
65	2 1/2	76.3	7.0	12.0			9.5	15.6			
80	3	89.1	7.6	15.3			11.1	21.7			
100	4	114.3	8.6	22.4			13.5	33.6			
125	5	139.8	9.5	30.5			15.9	48.6			
150	6	165.2	11.0	41.8			-	-	16.0	59.5	
200	8	216.3	12.7	63.8			-	-	16.0	79.8	
250	10	267.4	-	-	12.7	80.6	-	-	16.0	100	
300	12	318.5	-	-	12.7	96.7	-	-	16.0	121	
350	14	355.6	-	-	12.7	108	-	-	16.0	135	
400	16	406.4	-	-	12.7	125	-	-	16.0	155	
450	18	457.2	-	-	12.7	141	-	-	16.0	176	
500	20	508.0	-	-	12.7	157	-	-	16.0	196	

MAT'L						
	SUS TP	○	-	○	-	
	SUS TPY	-	-	-	-	
	SUS ERW	-	○	-	○	

HSFB-C300-402-2

A3 (420X297) 알마지

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8102	1/2

HYUNDAI

COPPER PIPE STANDARD

DATE	'79	'82	'88	'93
	11/2	5/31	12/9	9/10

1. SCOPE

THIS STANDARD PROVIDES FOR COPPER PIPE.

2. MATERIAL

1) THE MATERIAL IS IN ACCORDANCE WITH JIS H 3300(C1220T)

3. DIMENSION & WEIGHTS

THE OUTSIDE DIAMETER, THE WALL THICKNESS AND THE WEIGHT OF THE PIPE SHALL BE AS SPECIFIED IN ATTACHED TABLE.

APRD
CHKD
DRWN
RGTD

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8102	2/2

HYUNDAI

COPPER PIPE STANDARD

DATE	'79	'93		
	11/2	9/10	/	/

NOM. DIA.	OUT DIA.	PIPE WALL THK. (MM)							
		10KGf/CM^2		40KGf/CM^2		70KGf/CM^2		140KGf/CM^2	
(A)	(Ø)	THK.	KG/M	THK.	KG/M	THK.	KG/M	THK.	KG/M
4	6	1.2	0.06	1.4	0.18	1.6	0.19	2.0	0.22
5	8	1.2	0.23	1.4	0.25	1.8	0.31	2.5	0.38
6	10	1.2	0.29	1.6	0.37	2.0	0.44	3.0	0.58
8	12	1.2	0.37	1.8	0.51	2.3	0.62	3.5	0.83
10	15	1.4	0.53	1.8	0.66	2.5	0.87	4.0	1.20
15	20	1.6	0.82	2.2	1.09	3.0	1.42	5.0	2.09
20	25	1.6	1.04	2.5	1.57	3.5	2.10	6.0	3.18
25	30	1.6	1.27	3.0	2.26	4.0	2.90	7.0	4.50
32	35	1.6	1.49	3.0	2.68	5.0	4.61	8.0	6.03
40	45	2.0	2.40	3.5	4.06	6.0	6.54	10.0	9.78
50	55	2.0	2.96	4.5	6.35	7.0	9.39	11.0	13.5
65	70	2.0	3.80	5.0	9.08	8.0	13.9	14.0	21.9
80	85	2.5	5.76	6.0	13.3	10.0	21.0	17.0	32.3
100	110	3.0	8.97	8.0	22.8	12.0	32.9	21.0	52.3
125	140	3.5	11.4	9.0	33.0	15.0	52.4	26.0	82.9
150	160	3.5	15.3	11.0	45.8	17.0	68.0	30.0	109.0

PIPE O/D (Ø)	MATERIAL
15Ø & BELOW	C1220T-O, C1220T-1/2H
20Ø & ABOVE	C1220T-1/2H

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8103	1/2

HYUNDAI

AL-BRASS & CU-NICKEL PIPE STANDARD

DATE	'82	'93		
	7/16	9/10		

1. SCOPE

THIS STANDARD PROVIDES FOR AL-BRASS & CU-NICKEL PIPE STANDARD.

2. MATERIAL

THE MATERIAL IS IN ACCORDANCE WITH JIS H 3300

AL-Bs : C6870T C6871T, C6872T.

CU-NI : C7060T)

3. DIMENSION & WEIGHTS

THE OUTSIDE DIAMETER, THE WALL THICKNESS AND THE WEIGHT OF THE PIPE SHALL BE AS SPECIFIED IN ATTACHED TABLE.

APRD
CHKD
DRWN
RGTD

SCALE	NONE	SHIP NO.	S467/8,S569	HDS NO.	8103	2/2

HYUNDAI

AL-BRASS & CU-NICKEL PIPE STANDARD

DATE	'82	'93		
	7/16	9/10		

NOM. DIA. (A)	OUT. DIA. (d)	PIPE WALL THK. (MM)											
		10KGf/CM²			40KGf/CM²			70KGf/CM²			140KGf/CM²		
		THK.	W'T (KG/M)		THK.	W'T (KG/M)		THK.	W'T (KG/M)		THK.	W'T (KG/M)	
			AL-BS	CU-NI		AL-BS	CU-NI		AL-BS	CU-NI		AL-BS	CU-NI
4	6	1.0	0.13	0.14	1.2	0.15	0.16	1.2	0.15	0.16	1.5	0.18	0.19
5	8	1.0	0.19	0.20	1.2	0.22	0.23	1.4	0.24	0.26	1.8	0.30	0.31
6	10	1.0	0.24	0.25	1.2	0.28	0.30	1.6	0.37	0.38	2.0	0.42	0.45
8	12	1.2	0.34	0.31	1.5	0.42	0.44	1.6	0.44	0.47	2.2	0.57	0.60
10	15	1.2	0.44	0.39	1.5	0.53	0.57	1.8	0.63	0.66	2.5	0.83	0.87
15	20	1.2	0.50	0.53	1.5	0.73	0.78	2.0	0.95	1.01	3.0	1.35	1.43
20	25	1.5	0.98	1.05	1.8	1.10	1.17	2.2	1.32	1.40	3.5	1.99	2.10
25	30	1.5	1.12	1.20	1.8	1.34	1.42	2.5	1.81	1.92	4.0	2.74	2.91
32	38	1.5	1.43	1.53	2.2	2.08	2.20	3.0	2.77	2.94	5.0	4.35	4.61
40	44.5	1.5	1.70	1.81	2.5	2.77	2.94	3.5	3.79	4.01	6.0	6.10	6.46
50	57.0	1.6	2.18	2.33	2.8	4.01	4.24	4.0	5.60	5.93	7.0	9.24	9.79
65	76.1	2.0	3.88	4.15	-	-	-	-	-	-	-	-	-
80	88.9	2.5	5.66	6.05	-	-	-	-	-	-	-	-	-
100	108.0	2.5	6.91	7.39	-	-	-	-	-	-	-	-	-
125	133.0	2.5	8.55	9.14	-	-	-	-	-	-	-	-	-
150	159.0	2.5	10.2	10.9	-	-	-	-	-	-	-	-	-
200	219.0	3.0	17.0	18.1	-	-	-	-	-	-	-	-	-
250	267.0	3.0	20.7	22.1	-	-	-	-	-	-	-	-	-
300	323.9	4.0	33.5	35.8	-	-	-	-	-	-	-	-	-
350	368.0	4.0	38.1	40.7	-	-	-	-	-	-	-	-	-
400	419.0	4.0	43.5	46.8	-	-	-	-	-	-	-	-	-
450	457.2	4.0	47.5	50.7	-	-	-	-	-	-	-	-	-
500	508.0	4.5	59.3	63.4	-	-	-	-	-	-	-	-	-
550	558.0	4.5	65.3	69.8	-	-	-	-	-	-	-	-	-
600	619.0	4.87	78.3	83.7	-	-	-	-	-	-	-	-	-

MAT'L		
	AL-Bs	C6870T, C6871T, C6872T,
	CU-NI	C7060T,

△	BILGE, BALLAST, FIRE AND WASH DECK SYSTEM PLAN HISTORY	SHIP NO. S467/8, S569 - B -		

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	CHANGED PIPE TREATMENT METHOD FOR "BA","BL" AND "BF" ACCORDING TO BUILDING SPEC. (D.I)	J.H.CHOI	H.S.KEE
		02	CHANGED SLUDGE P/P OUTLET V/V (B-33V) TYPE FROM SNGV TO SNAV. (O.C)		
		03	DELETED INCIN.W.O.TK DRAIN LINE TO B.H.TK. (FD-295-40A) (O.C)		
		04	CHANGED BALLAST STRIPPING EDUCTOR DISCH.LINE FROM 150A TO 200A. (M.R)		
		05	ADDED D/G JACKET COOL'G W. DRN LINE TO CLEAN BILGE TK. (M.R)		
		06	ADDED F.W. SUPPLY LINE (10Ø) TO SLUDGE PUMP. (M.R)		
		07	ADDED ROOT VALVES AT PI FOR BALLAST STRIPPING EDUCTOR SUCT. AND DISCH. (D.I)		
		08	REVISED THE BILGE LINE FOR NO.9 HOLD BILGE WELL ACCORDING TO ACTUAL ARRANGEMENT. (D.I)		
		09	CHANGED M/E T/C & A/C DRN CONNECT POSITION ACCORDING TO ACTUAL ARRANGEMENT. (D.I)		
		10	ADDED CHECK VALVE (B-42V) AT OILY BILGE RECIRC. LINE. (D.I)		
		11	CHANGED COOL'G F.W.EXP.TK DRN CONNECT POSITION ACORDING TO ACTUAL ARRANGEMENT. (D.I)		
		12	INCREASED M/E A/C & J.C.W.DRN LINE SIZE FROM 40A TO 50A. (D.I)		
		13	ADDED CHECK VALVE (B-89V) AT FEED FILTER TK DRN LINE TO CLEAN BILGE TANK. (D.I)		
		14	CHANGED GENERAL SERVICE PIPE NO. FROM "BB-43" AND "BB-44" TO "BA-30","BA-31","BJ-49" AND "SC-92". (D.I)		
		15	ADDED FIRE & WASH DECK LINE (40A) TO PAINT STORE. (D.I)		
		16	ADDED M/E A/C CHEM. DRN LINE ACCORDING TO ACTUAL ARRANGEMENT. (D.I)		
		17	ADDED LEVEL SWITCH AT DUCT KEEL BILGE ACCORDING TO HULL PIPING DIAGRAM. (D.I)		
		18	ADDED S.W. LINE (SB-28-50A) FOR OILY BILGE PUMP. (D.I)		
		19	ADDED LEVEL SWITCH FOR OILY BILGE PUMP START/STOP AT AFT BILGE WELL. (D.I)		
		20	ADDED SOOT COLLECTING TK DRN LINE CONNECTION TO BALLAST STRIPPING EDUCTOR INLET. (O.C)		
		21	DELETED G/E EXH.PIPE DRN LINE ACC.TO MAKER RECOMMENDATION. (M.R)		
100	'10.11.05	01	ADDED SWING CHECK V/V AT SOOT COLLECTING TK DRN LINE. (C.C)	J.H.CHOI	H.S.KEE
200	'11.03.18	01	ADDED GREY WATER COLLECTING SYSTEM. (O.C)	J.H.CHOI	H.S.KEE

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
BILGE LINE	3	-	250 TO 50	STPG370-E SCH.40	-	-	ALUMI-NIZED △A 01	BA 01-31 51-52	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
GENERAL SERVICE LINE	3	32	250 TO 50	STPG370-E SCH.40	-	-	GAL	BB 41-45	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
							PE	BJ 47-49							
FIRE & WASH DECK LINE	9	32	125 TO 50	STPG370-E SCH.40	-	-	GAL	BC 53-63	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	FC	BC	
BALLAST LINE	3	32	600 TO 300	ERWS370 (9.5T)	-	-	ALUMI-NIZED	BE 74-87	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
						△A 01	PE	BL 88-89							
			250 TO 125	STPG370-E SCH.40			ALUMI-NIZED	BF 91-98							
DRAIN LINE	-	-	65 TO 50	KS-SPP	-	-	GAL	BD 101-108	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
GAUGE LINE	-	-	8Ø 6Ø	COPPER C1220T-O	-	-	-	BI	BITE UNION	-	-	-	BC	BC	
SLUDGE TRANSFER LINE	3.5	60	65 TO 50	STPG370-E SCH.40	-	-	INS & TRAC	BH 112-119	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	

NOTE

1. BILGE MAIN

$$DM \geq 1.68\sqrt{L(B+D)} + 25 = 1.68\sqrt{283.5(45+24.7)} + 25 = 261.2 \text{ MM}$$

* 250A (I/D : 248.8 MM)

2. BILGE BRANCH

$$DB \geq 2.15\sqrt{L(B+D)} + 25 = 2.15\sqrt{26.4(45+24.7)} + 25 = 117.2 \text{ MM}$$

* 125A (I/D : 126.6 MM)

L : LENGTH, B. P. 283.5 M
B : BREATH (MOULDED) 45 M
D : DEPTH (MOULDED) 24.7 M
C : LENGTH OF E/R 26.4 M

3. SHIPSIDE VALVES ARE TO BE OF CAST STEEL(N/D 50A AND ABOVE) OR BRONZE(N/D 40A AND BELOW).
4. BILGE SUCTION TO HAVE STRAIGHT TAILED SUCTION PIPE.
5. EMERGENCY BILGE SUCTION VALVE(B-6V) NAMEPLATE TO BE MARKED "FOR EMERGENCY USE ONLY".
6. PUMP GAUGE BOARD TO BE FITTED AT A POSITION SUITABLE FOR READING AT A LOCAL OPERATION POSITION.
7. ⊗ MEANS CORROSION FLANGE(SS400).
8. FOR PUMPS LOCATED UNDER FLOOR, THE PRESSURE GAUGE SHALL BE ARRANGED ABOVE THE FLOOR LEVEL.
9. REQUIRED SLUDGE TANK CAPACITY (18.2 M^3) ≤ ACTUAL SLUDGE TANK CAPACITY (40 M^3) : MARPOL 04 AMEND I, REG.12
   SLUDGE TANK 10
   OILY BILGE 30
10. "P.E" MEANS "POLYETHYLENE" COATING.

OILY BILGE SEPARATOR (5 M³/H)

15PPM BILGE SEPARATOR

EMULSION TREATMENT UNIT

ELECTRIC HEATER

FOR SAMPLING

ISG

BILGE SHORE CONNECTION

TO INCIN. W.O SETT. TK

BALLAST STRIPPING EDUCTOR (150 M³/H)

FR SOOT COLL. TANK DRN

FROM CONTROL AIR SERVICE LINE

BITE 8Ø

PACKAGE UNIT (SUNBO)

FROM L.O. TRANS P/P

OILY BILGE PUMP (5 M³/H X 3 KDP)

SLUDGE PUMP (5 M³/H X 3.5 KDP)

PACKAGE UNIT (BOWON)

FR F.W. HYD. UNIT

E/R W.B.T (P) (946.17 M³)

E/R W.B.T (S) (953.96 M³)

TO FIRE & WASH DECK MAIN

HIGH SEA CHEST (P)

FWD BILGE WELL(P)

DIRECT BILGE SUCT

BILGE,FIRE & G/S P/P (400/180 M³/H X 30/90 MTH)

HOLD BILGE MAIN

W.B. STRIPPING MAIN (P)

W.B. STRIPPING MAIN (S)

BALLAST MAIN(P)

BALLAST MAIN(S)

DUCT KEEL

FWD BILGE WELL (S)

BALLAST P/P (2500 M³/H X 30 MTH)

NO.1 COOLING S.W. PUMP (460 M³/H X 20 MTH)

LOW SEA CHEST (S)

STEERING GEAR ROOM

F.W TK

EMCY FIRE P/P SPACE

A.P. TK

C.W.T

AFT BILGE WELL

BILGE HOLDING TK (57.2 M³)

OILY BILGE TK (33.1 M³)

CLEAN BILGE TK (132.95 M³)

MAIN L.O SUMP TK

COFFERDAM

M/E RECESS

DELETE

DELETE

4	PRESSURE GAUGE	4-PI-1 - 5
3	STRAINER	IS-2S
2	MUD(ROSE) BOX	IM-4M (IR-5R)
1	VALVE(ORIFICE)	1V-99V (B-ORI-1)
NO.	ITEM	NO.

SHIP NO. S467 ~~/8, S569~~ - B -

BILGE,BALLAST,FIRE & WASH DECK SYSTEM

(BULK) A3(420X297)

20110421-D033000-01준수-2997 /20110421-기장설계팀-완성도용

CENTRAL COOLING S.W. SYSTEM PLAN HISTORY

SHIP NO.S467/8,S569

- S -

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	MODIFIED MGPS ANODE INSTALLATION POSITION FROM SEA CHEST TO S.W. STRAINER AS PER MUTUAL AGREEMENT. (D.I)	J.H.CHOI	H.S.KEE
		02	INCREASED MAIN COOLING S.W. LINE SIZE FROM 300A TO 350A. (D.I)		
		03	INCREASED F.W.GEN.S.W.DISCH.LINE SIZE FROM 100A TO 125A. (D.I)		
		04	ADDED STOP VALVE(S-18V) AT RUDDER PINTLE S.W.LUBRICATION LINE AND CHANGED LINE CONNECTION ACCORDING TO ACTUAL ARRANGEMENT. (D.I)		
		05	ADDED PRESS.TRANSMITTER(4-PX-9) WITH STOP VALVE(S-17V) AT MAIN COOL'G S.W. PUMP DISCH. LINE. (D.I)		
		06	MODIFIED SEWAGE COLLECTING TK S.W. LINE SIZE FROM 40A TO 80A AND ADDED S.W.SERVICE LINE(SB-28-50A) FOR OILY BILGE PUMP. (D.I)		
		07	MODIFIED TEMP.TRANSMITTER POSITION FROM MAIN COOL'G S.W.P/P DISCH. TO MAIN COOL'G S.W. P/P SUCT. (D.I)		
		08	CHANGED MAIN COOLING S.W.PUMP TOTAL HEAD FROM 20MTH TO 23MTH. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

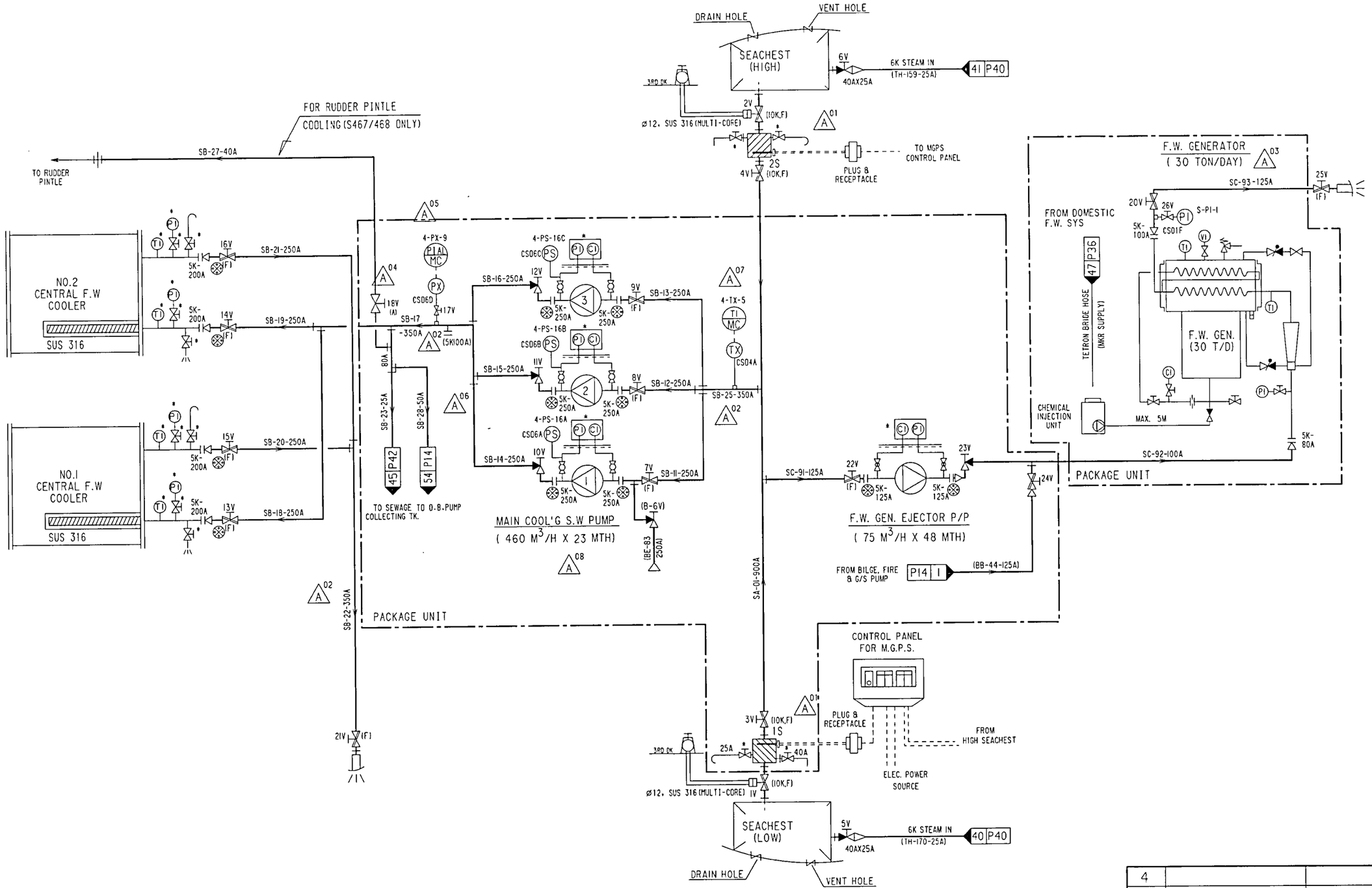
SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
MAIN COOLING S.W. LINE	-	-	900 TO 650	STPY400 (9.5T)	-	-	PE	SA 01	FLANGE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			600 TO 50	KS-SPP				SB 11-27							
			40 TO 25										BC		
AUX. COOLING S.W. LINE	-	-	600 TO 50	KS-SPP	-	-	PE	SC 91-93	FLANGE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 25										BC		
			15	STPG370-E SCH.40			GAL	SE							
DRAIN LINE	-	-	40 TO 15	KS-SPP	-	-	GAL	SD	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	

NOTE

1. SHIPSIDE VALVES ARE TO BE OF CAST STEEL OR BRONZE.
2. ⊗ MEANS CORROSION FLANGE(SS400).
3. PE : POLYETHYLENE COATING INSIDE.
4. SHORT FLANGED ELBOW OR BENDING PIECES TO BE INSTALLED BETWEEN COOLERS AND STOP VALVES WHERE CONSIDERED NECESSARY FOR EASY MAINTENANCE.
5. ONE(I) SET OF SACRIFICIAL FLANGE FOR EACH SIZE SHALL BE PROVIDED AS SPARE.
6. THE SACRIFICIAL FLANGE SHALL BE PROVIDED AT EACH SUCTION SIDE OF THE SEAWATER HANDLING PUMP IN ENGINE ROOM TO AVOID GALVANIC CORROSION OF THE PUMP'S IMPELLER AND CASING.

CENTRAL COOLING S.W SYSTEM

(BULK) A3 (420X297)



NO.	ITEM	NO.
4		
3	PRESSURE GAUGE	S-PI-1
2	STRAINER	IS-2S
1	VALVE	1V-26V

SHIP NO. S467/8.S569 | - S -

CENTRAL COOLING S.W SYSTEM

(BULK) A3(420X297)

MAIN CENTRAL COOLING F.W SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

- W -

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	ADDED 5K-150A BUTTERFLY VALVE(W-19V, 20V) AT M/E COOL'G F.W. INLET & OUTLET LINE. (O.C)	J.H.CHOI	H.S.KEE
		02	REFLECTED HEIGHT OF THE COOL'G F.W. EXP.TK ACCORDING TO M/E MAKER'S RECOMMENDATION. (O.C)		
		03	INCREASED CENTRAL COOL'G F.W. SUCT.AND DISCH. LINE SIZE FROM 200A TO 250A. (D.I)		
		04	INCREASED CENTRAL F.W.COOLER INLET AND OUTLET LINE SIZE FROM 200A TO 250A. (D.I)		
		05	INCREASED M/E A/C & J.C.W.DRN LINE SIZE FROM 40A TO 50A. (D.I)		
		06	ADDED "DX" CONNECTION AT MAIN ENGINE AIR COOLER DRN LINE AND CHANGED M/E AIR COOLER CHEM.CLEAN TK DRN CONNECTION. (M.R)		
		07	ADDED THE C.F.W. LINE OF MGO COOLER FOR MGO BURNING. (O.C)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
M/E F.W. COOLING LINE	3.0	80	125 TO 80	KS-SPP	-	-	INS.	WA 01-02	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
		-	400 TO 50	KS-SPP	-	-	-	WB 06-43	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
			50	STPG370-E SCH.80	-	-	-	WE 61	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
M/E AIR COOLER CHEMICAL CLEANING LINE	3.0	70	40 TO 15	KS-SPP	-	-	-	WC 71-75	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
DRAIN LINE	-	-	65 TO 50	KS-SPP	-	-	GAL	WD 81-90	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		

NOTE

1. SHORT FLANGED ELBOW OR BENDING PIECES TO BE INSTALLED BETWEEN THE COOLERS AND STOP VALVES WHERE CONSIDERED NECESSARY FOR EASY MAINTENANCE.

CENTRAL COOLING F.W SYSTEM (1/2)

(BULK) A3 (420X297)

PACKAGE UNIT (SHINWOO)
INSPECTION COVER
COOL'G F.W. EXP. TK
(SPEC. :1.5 M3)
(ACTUAL:1.9 M3)
46V
(DA-30-25A)
FROM F.W. HYD. UNIT
26 P36
WD-87-40A
47V (25A)
4-LS-6
LAL MC
LS
(W-160V)
16V
50V
WD-86 -40A
W-CR1-2
MIN.5M FROM M/E JKT.C.W. OUTLET CONN.
WB-16-80A
A 02
B
P20 44
(WB-149-25A)
FROM G/E J.F.W AIR VENT
P34 50
(AC-59-25A)
FROM 8K COMP.AIR
AP
10K-15A
PI
T/C
WB-18-65A
6 P14
TO CLEAN BILGE TK
AUTO VENTING UNIT
5K-125A
20V
WA-01-150A
6-PI-2
PI
CS01G
9V
OIL DETECTOR
HIGHEST POINT
8Ø
10V
SET. 80°C
7K AIR
TC
A 01
AH 5K-32A
F.O DRAIN PIPE J.F.W TRACING
ED 5K-15A
TI
WB-19-15A
19V
(W-131V)
C
(WB-170-80A)
2 P20
FROM G/E JACKET C.W. OUTLET
F.W GENERATOR
(30 TON/DAY)
M/E JACKET F.W. PREHEATER
D
WB-37-200A
I-PX-3
PIAL MC
PX
PS
FOR M/E JKT COOL'G F.W.P/P CHANGE OVER
I-TX-10A-10F
TIAH MC
TX
MAIN ENGINE
(HYUNDAI B&W 6S70MC-C7)
I-TX-6
5K-200A
P
AK
5K-25A
AIR COOLER
A/C & T/C DRAIN
A 06
I-PX-5
WD-82-40A
5K-32A
AS
AM
5K-50A
DY
5K-25A
AL
5K-50A
WB-38-200A
WC-72-25A
27V
25A
(DA-13-25A)
31 P36
FROM F.W. HYD. UNIT
26V
15A
22V
24V
WC-73-40A
WC-74-40A
WC-75-50A
23V
M/E AIR COOLER CHEM. CLEANING P/P
(2 M3/H X 30 MTH)
M/E AIR COOLER CHEM. CLEAN TK
(SPEC. :0.6 M3)
(ACTUAL:0.84M3)
WC-71-40A
21V
25V
WD-84 -40A
WD-90-25A
WE-61-50A
WD-83-40A
WD-81-40A
48V
49V
WD-88 -50A
WB-14-150A
WB-13-50A
8V
WB-12-50A
WB-11-150A
4V
WB-10 -150A
3V
5K- 150A
2V
IV
WB-08 -150A
WB-19 -15A
17V
WB-09-150A
WB-16-80A
LAL MC
4-LS-15
DEAERATING CHAMBER
18V
WB-15-50A
WA-01-150A
WB-39-150A
WB-17-150A
WB-07-150A
WB-18-65A
14V
7K AIR
44V
(A)
WB-40-150A
M/E JACKET COOL'G F.W. P/P
(155 M3/H X 30 MTH)
PACKAGE UNIT (BOWON)
A 05
60 P14
3 P14
4 P14
51 P14
TO BILGE HOLDING TK
TO CLEAN BILGE TK
WB-38-200A
TO CENTRAL C.F.W SYSTEM(II)
P20 5
WB-41-300A
WB-37-200A
WB-36-300A
MIN.5 DIA
7K AIR
SET. 36°C
NO.2 CENTRAL F.W COOLER
NO.1 CENTRAL F.W COOLER
5K-200A
(F) 40V
(F) 38V
(F) 39V
(F) 37V
A 04
WB-32-250A
WB-30-250A
WB-31-250A
WB-29-250A
WB-33 -300A
41V
WB-43 -40A
A 07
WB-34-300A
42V
52V (A)
5K-50A
M.G.O. COOLER
WB-28-300A
A 03
5K-50A
51V (A)
WB-27-250A
WB-26-250A
WB-25-250A
36V
35V
34V
4-PS-2C
CS07D
4-PS-2B
CS07C
4-PS-2A
CS07B
5K-250A
(F) 33V
(F) 32V
(F) 31V
(5K-150A)
CENTRAL COOL. F.W. P/P
(360 M3/H X 25 MTH)
WB-24-250A
WB-23-250A
WB-22 -250A
A 03
FR DUMP COND. COOLER OUTLET
P20 22
WB-131 -125A
43V
WB-21-350A
(WB-157-200A)
P20 7
FROM CENTRAL C.F.W SYSTEM(III)

NO.	ITEM	NO.
4		
3		
2	PRESSURE GAUGE	6-PI-2
1	VALVE	IV-50V

SHIP NO. S467/8,S569 - W -

CENTRAL COOLING F.W. SYSTEM (1/2)

(BULK) A3(420X297)

20110421-D033000-0|준수-2997 /20110421-기장설계부-완성도용

△ AUX. CENTRAL COOLING F.W. SYSTEM PLAN HISTORY

SHIP NO.S467/8.S569

- W -

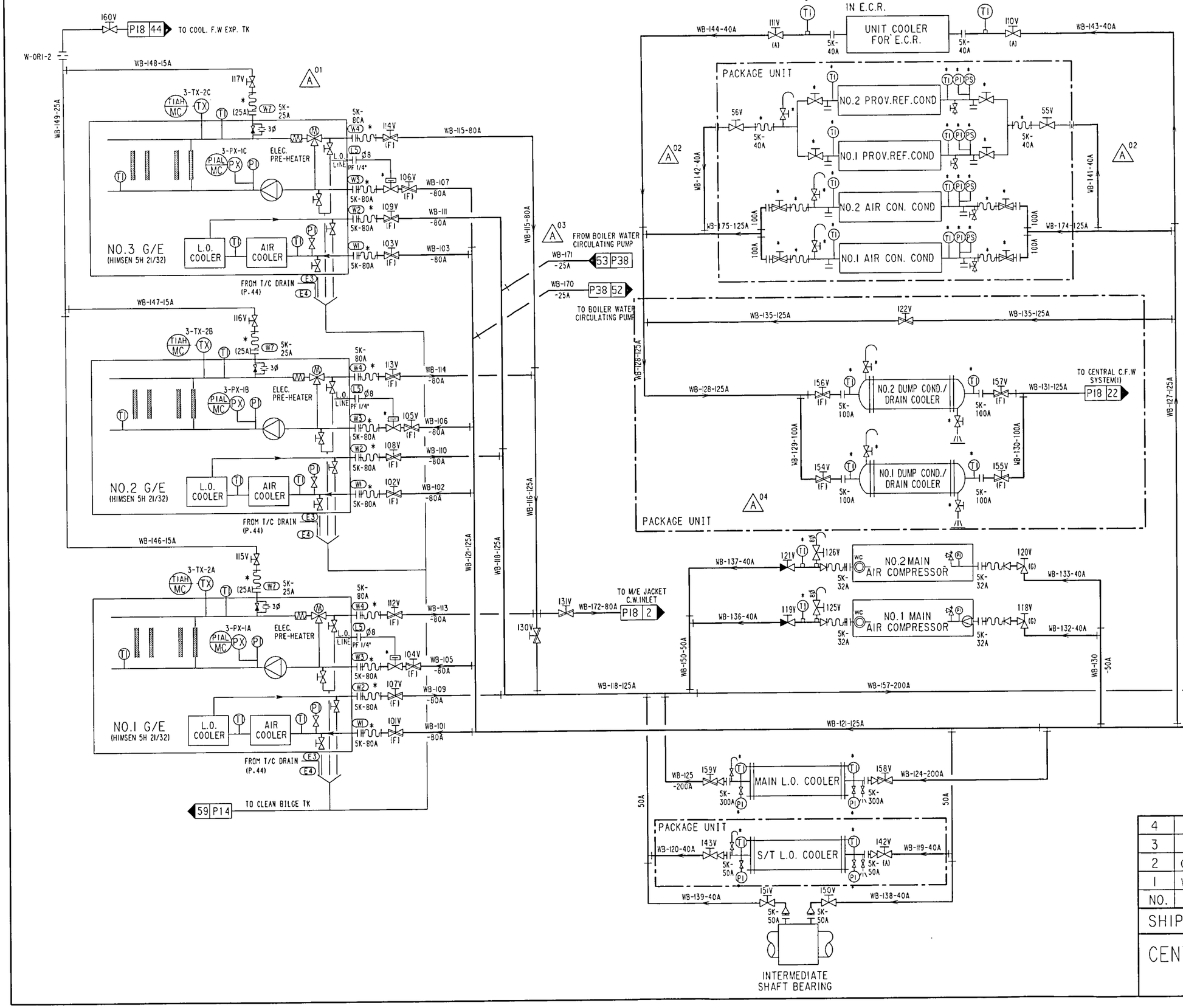
REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	ADDED G/E COOL'G F.W. DRN LINE TO CLEAN BILGE TANK. (M.R)	J.H.CHOI	H.S.KEE
		02	CHANGED PROV.REF.COND. COOL'G F.W. INLET & OUTLET LINE SIZE FROM 50A TO 40A. (M.R)		
		03	CHANGED BOILER WATER CIRCULATING PUMP COOL'G F.W. INLET & OUTLET LINE FROM 40A TO 25A. (M.R)		
		04	CHANGED NO.1 & NO.2 MAIN AIR COMPRESSOR POSITION EACH OTHER AND ADDED THERMOMETER AT MAIN AIR COMP. F.W.OUT LINE. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/2 CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
AUX. F.W. COOLING LINE	3.0	-	250 TO 50	KS-SPP	-	-	-	WB 101-175	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		

CENTRAL COOLING F.W. SYSTEM (2/2)

(BULK) A3(420X297)



NO.	ITEM	NO.
4		
3		
2	ORIFICE	W-ORI-2
1	VALVE	101V-160V

SHIP NO. S467/8,S569 - W -

CENTRAL COOLING F.W. SYSTEM (2/2)

(BULK) A3(420X297)

△ L.O TRANSFER AND PURIFYING SYSTEM PLAN HISTORY

SHIP NO.S467/8,S569

- L -

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	ADDED G/E L.O.SETT.TK AND ITS CONCERNED LINES FOR FILLING, SERVICE, & PURIFYING. (D.C)	J.H.CHOI	H.S.KEE
		02	CHANGED L.O.STOR.TK OUTLET VALVE(L-3V,17V) TYPE FROM GLBV TO SNGV. (D.C)		
		03	CHANGED MAIN L.O.PURI.OUTLET V/V(L-53V,54V) FROM GLBV TO SNGV. (D.C)		
		04	ADDED MAIN L.O.PURI.OPERATING WATER DRAIN LINE(50A) TO SLUDGE TANK. (M.R)		
		05	INCREASED L.O.SETT.& STOR.TK DRAIN VALVE(L-71V,72V,73V,84V,85V 86V) SIZE FROM 15A TO 25A. (D.I)		
		06	SEPARATED MAIN L.O.SETT.TK RTN LINE FROM FILLING LINE. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

PAGE 21 5/

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
L.O FILLING & TRANSFER LINE	3.3	-	100 TO 50	KS-SPP	-	-	-	LA 01-30	FLANGE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
PURIFYING LINE	3.3	90	40 TO 15	STPG370-S SCH.40	5	*	INS	LB 31-34	FLANGE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	CLASS II
		-	40 TO 15	KS-SPP			-	LC 41-60		SLIP-ON JIS 5K		JIS 5K FLANGED			
DRAIN LINE	-	-	100 TO 50	KS-SPP	-	-	-	LD 71-85	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
GAUGE LINE	-	-	8Ø	COPPER C1220T-O	-	-	-	LE	BITE UNION	-	-	-	BC	BC	

NOTE

1. L.O PURIFYING LINE MARKED WITH ------ TO BE INSULATED ACCORDING TO BUILDING SPECIFICATION
2. PIPE AND FITTINGS TO BE ARRANGED WELL CLEAR OF M/E, G/E, BOILER EXH. GAS PIPES AND ELECTRICAL APPLIANCES.
3. SAVEALL TRAYS WITH DRAIN CONNECTION TO BE PROVIDED AROUND OIL TANKS, PUMPS, FILTERS, HEATERS & PURIFIERS.
4. ALL HIGH POINT IN PIPE WORK WHERE AIR IS LIKELY TO COLLECT TO BE PROVIDED WITH AIR VENT.
5. ALL LOW PIONT IN PIPE WORK TO BE PROVIDED WITH A MEANS OF DRAINAGE.
6. (*) THE SHIP TEST TO BE CARRIED OUT IN ACCORDANCE WITH CLASS RULE REQUIREMENT.

L.O TRANSFER & PURIFYING SYSTEM

(BULK) A3(420X297)

(P) (S) UPPER DECK

65A LA-03-65A LA-30-65A LA-29-50A

80A LA-01-80A LA-02-80A LC-56-40A

G/E L.O SETT. TK (6.27 M³) G/E L.O STOR. TK (6.27 M³)

MAIN L.O STOR. TK (39.28 M³) MAIN L.O SETT. TK (33.02 M³)

LA-28-40A LA-06-65A LD-72-25A LA-14-40A

LC-53-40A LC-48-40A LC-45-40A LC-56-40A

TO BILGE SHORE CONN. OR INCIN. W.O. TK

LA-12-50A LA-13-50A P14 8

LA-05-65A LD-71-25A

LO TRANS P/P (6 M³/H X 3 KG/CM²)

MAIN L.O PURI. SUPPLY P/P (2.6 M³/H X 3 KG/CM²)

PACKAGE UNIT (BOWON)

PACKAGE UNIT (SUNBO)

NO.2 MAIN L.O. PURI. HTR.

NO.1 MAIN L.O. PURI. HTR.

LB-33-40A LB-31-40A LC-49-25A LC-46-25A LC-55-40A

LB-34-25A LB-32-25A LA-26-25A LA-27-25A LC-47 LC-50 LC-51-40A LC-52-40A

NO.2 MAIN L.O. PURIFIER (2,600 L/H)

NO.1 MAIN L.O. PURIFIER (2,600 L/H)

RUBBER HOSE 150Ø 25A 120

LD-87-50A LD-86-50A

FOR INTERLOCKING OF PURI. STARTING

LD-85 -100A LD-84 -100A

SLUDGE TK (14.17 M³)

MIN. LEVEL (SLUDGE P/P SUC.)

3-DPS-3C 3-PX-2C 3-TX-IC

G/E NO.3 L.O. SUMP TK L.O COOLER

LA-17-25A LA-20 -25A LA-14-40A LD-75-25A

3-DPS-3B 3-PX-2B 3-TX-IB

G/E NO.2 L.O. SUMP TK L.O COOLER

LA-16 -25A LA-19 -25A LA-11-40A LD-74-25A

3-DPS-3A 3-PX-2A 3-TX-1A

G/E NO.1 L.O. SUMP TK L.O COOLER

LA-15 -25A LA-18 -25A LD-76-25A

LA-11-40A LA-10-50A LA-09-50A LA-10-50A LA-07-25A LA-08-25A LD-77-40A LD-78 -25A LD-79-40A LC-52-40A

S/T L.O SUMP TK (1 M³)

MAIN L.O SUMP TK (34.62 M³)

9 P14 TO O.B. TK

4		
3	PRESSURE GAUGE	6-PI-3,4
2	STRAINER	IS-3S
1	VALVE	IV-91V
NO.	ITEM	NO.

SHIP NO. S467/8,S569 | - L -

L.O TRANSFER & PURIFYING SYSTEM

(BULK) A3(420X297)

20110421-D033000-01준수-2997 /20110421-기장설계부-완성도용

L.O SERVICE SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

- L -

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	REVISED THE STERN TUBE L.O.SYSTEM TOTALLY. (M.R)	J.H.CHOI	H.S.KEE
		02	REFLECTED HEIGHT OF CYL.OIL MEASURING TANK ACCORDING TO M/E MAKER'S RECOMMENDATION. (M.R)		
		03	INCREASED CYL.OIL TK DRAIN VALVE(L-111V,117V,119V,143V,144V, 145V) SIZE FROM 15A TO 25A. (D.I)		
		04	ADDED 5K-40A CONNECTION WITH BLANK FLANGE FOR FLUSHING. (D.I)		
100	'10.11.05	01	CHANGED S/T L.O.RTN LINE SIGHT GLASS HEIGHT DIFFERENTLY. (O.C)	J.H.CHOI	H.S.KEE
200	'11.03.18	01	CHANGED S/T SEAL PIPING SYSTEM ACC.TO MAKER RECOMMENDATION. (M.R)	J.H.CHOI	H.S.KEE

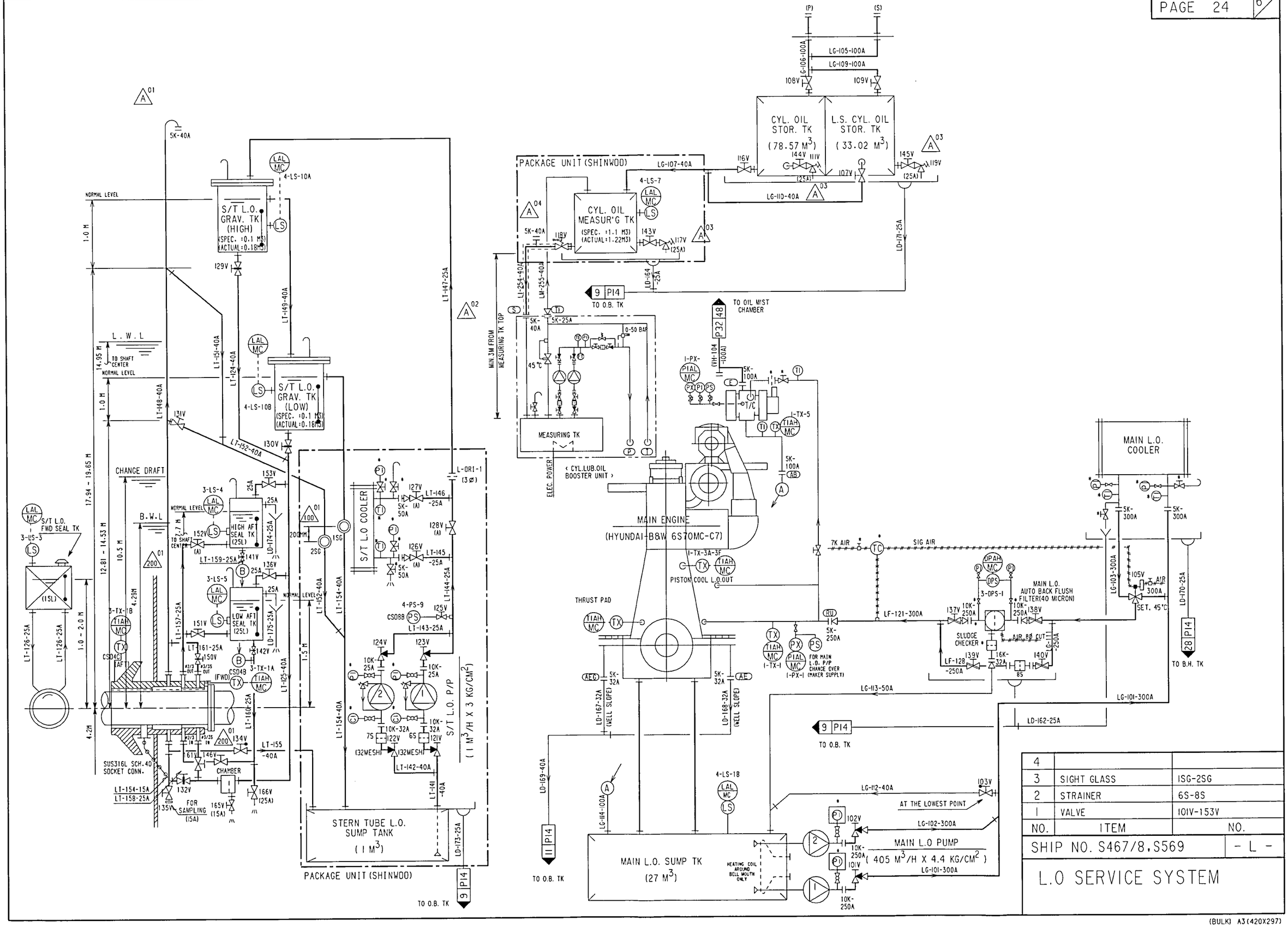
SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
MAIN L.O SERVICE LINE	4.3	-	250 TO 50	KS-SPP	-	-	-	LF 121, 128	FLANGE	F-TYPE SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
			250 TO 50					LG 101-114		SLIP-ON JIS 5K			FC		
			40 TO 15										BC		
S/T L.O LINE	3.3	-	100 TO 50	STPG370-S SCH.40	-	-	-	LT 141-161 124-127	FLANGE	F-TYPE SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
M/E CYL. OIL SERVICE LINE	-	-	40 TO 25	KS-SPP	-	-	INS & TRAC	LI 254	FLANGE	F-TYPE SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
							-	LM 255-256							
	50	45	25	STPG370-S SCH.80	75	-	-	LO 250	FLANGE	F-TYPE SLIP-ON JIS 280K	SF440	JIS 40K FLANGED	SF	SUS	CLASS I
DRAIN LINE	-	-	100 TO 50	KS-SPP	-	-	-	LD 162-175	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
GAUGE LINE	-	-	8Ø	COPPER C1220T-O	-	-	-	LE	BITE UNION	-	-	-	BC	BC	

NOTE

1. PIPES AND FITTINGS TO BE ARRANGED WELL CLEAR OF M/E, G/E, BOILER EXH. GAS PIPE AND ELECTRIC APPLIANCES.
2. SAVEALL TRAYS WITH DRAIN CONNECTION TO BE PROVIDED AROUND OIL TANKS, PUMPS, FILTERS, HEATERS & PURIFIERS.
3. AT THE HIGHEST POINT IN PIPE LINE WHERE AIR IS LIKELY TO COLLECT, AIR VENT TO BE APPLIED.
4. GAUGE BOARD FOR PUMPS WHICH LOCATED UNDER THE FLOOR GRATING TO BE FITTED AT THE SUITABLE POSITION.
5. SIGHT GLASS (L-ISG,2SG) TO BE ARRANGED CONSPICUOUS POSITION FROM MAIN PASSAGE WAY.

L.O SERVICE SYSTEM



NO.	ITEM	NO.
4		
3	SIGHT GLASS	ISG-2SG
2	STRAINER	6S-8S
1	VALVE	101V-153V

SHIP NO. S467/8,S569 | - L -

L.O SERVICE SYSTEM

(BULK) A3(420X297)

20110421-D033000-01준수-2997 /20110421-기장설계부-완성도용

F.O TRANSFER AND PURIFYING SYSTEM PLAN HISTORY

SHIP NO.S467/8,S569

-F-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	INCREASED F.O.PURIFYING LINE FROM 50A TO 65A AND D.O.PURIFYING LINE FROM 40A TO 50A. (D.I)	J.H.CHOI	H.S.KEE
		02	INCREASED H.F.O.PURI.SUP.P/P DISCH.TO PURIFIER LINE AND F.O.RTN LINE SIZE FROM 40A TO 50A. (D.I)		
		03	CHANGED H.F.O.PURI.DRN LINE SIZE FROM 125A TO 100A. (M.R)		
		04	ADDED H.F.O.PURI.OPERATING WATER DRN LINE(50A) TO SLUDGE TK. (M.R)		
		05	INCREASED H.F.O./L.S.H.F.O.SERV TK OVFL LINE FROM 50A TO 65A. (D.I)		
		06	CHANGED TANK NAME FROM "L.S.MDO STOR.TK" TO "MGO STOR.TK" AND SEPARATED OIL FILLING LINE FOR MGO OPEARTING. (O.C)		
		07	CHANGED TANK NAME FROM "MDO SETT.TK" TO "MGO SERV.TK" AND ADDED FILLING, SERV. & OVFL LINE FOR MGO OPERATING. (O.C)		
		08	ADDED HFO.MDO AND MGO TK VENT DRN LINE TO OVFL TK. (D.I)		
		09	ADDED STOP VALVE(F-18V) AT HFO TRANS.P/P RTN TO HFO BUNK.TK LINE. (D.I)		
		10	SEPARATED H.F.O./L.S.H.F.O.SETT.TK PURIFYING RTN LINE FROM H.F.O.FILLING LINE. (D.I)		
		11	MODIFIED MDO SERV.TK OVFL LINE CONNECTION FROM MDO STOR.TK TO FO OVFL TK.		
		12	ADDED MGO SERV.TK EMPTY LINE TO FO OVFL TK. (D.I)		
		13	DELETED NO.2 H.F.O.PURIFIER BY-PASS VALVE. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
F.O FILLING & TRANSFER LINE	3.3	50	200 TO 50	STPG370-E SCH.40	-	*	INS & TRAC	FA 01-08	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
D.O FILLING & TRANSFER LINE	3.3	-	200 TO 50	STPG370-E SCH.40	-	*	-	FB 21-26	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
F.O PURIFYING LINE	3.3	98	80 TO 50	STPG370-S SCH.40	4.95	*	INS & TRAC	FC 31-52	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	SC	SUS	CLASS II
			40 TO 15									JIS 16K FLANGED	BC	BC	
D.O PURIFYING LINE	3.3	-	40 TO 15	STPG370-E SCH.40	-	*	-	FE 66-68	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
DRAIN LINE	-	-	125 TO 50	KS-SPP	-	-	-	FD 71-81	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
OVERFLOW LINE	-	-	150 TO 100	KS-SPP	-	-	-	FG 86-88	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
			80 TO 50	STPG370-E SCH.40				FH 91-95							
GAUGE LINE	-	-	10Ø	COPPER C1220T-O	-	-	-	-	BITE UNION	-	-	-	BC	BC	

NOTE

1. FUEL OIL PIPING TO BE ARRANGED SUFFICIENTLY FAR AWAY FROM ELECTRICAL INSTRUMENT, IN PRINCIPAL.
2. DRIP TRAYS OR SAVE-ALLS TO BE PROVIDED AT ALL TANKS, OIL PUMPS STRAINER & ETC, WHERE THERE IS A POSSIBLITY OF LEAKAGE DRAINAGE TO THE OILY BILGE.
3. PIPES MARKED WITH (=====) TO BE TRACED BY STEAM AND INSULATED.
4. EMERGENCY SHUT OFF VALVES TO BE OPERATED FROM OUTSIDE OF E/R.
5. POCKETS IN PIPING TO BE ELIMINATED AS FAR AS POSSIBLE, IF UNAVOIDABLE AIR VENT OR SCREWED DRAIN PLUG TO BE FITTED.
6. FOR PUMPS LOCATED UNDER FLOOR, THE PRESSURE GAUGE SHALL BE ARRANGED ABOVE FLOOR LEVEL WHEN THE PUMP IS LOCATED UNDER FLOOR GRATING.
7. (*) THE SHIP TEST TO BE CARRIED OUT IN ACCORDANCE WITH CALSS RULE REQUIREMENT.

F.O TRANSFER & PURIFYING SYSTEM

FB-24-50A
FB-26-25A P30 13 TO INCIN. M.D.O TK
FA-07-125A
FC-44-50A
FC-37-50A
FE-67-50A
FE-66-50A
FE-68-40A
FE-40-50A
FC-35-50A
FC-39-50A
FC-42-50A
FC-41 -50A
FC-52-50A
FC-34-50A
FC-36 -50A
FC-51 -50A
FC-46-25A
FC-45-25A
FC-39 -50A
FC-31 -65A
FC-32 -65A
FC-33-65A
FC-48-65A
FC-88-150A
FD-74-40A
FD-73-40A
FD-71 -40A
FD-79 -50A
FD-81-50A
FD-80-50A
FD-78-100A
FD-77-100A
FD-75-15A
FD-76-40A
FD-293 -50A
FG-66-150A (OVERFLOW)
FG-87-150A
FA-08-125A
FA-03 -150A
FA-06-50A
FA-05-50A
FA-02 -150A
FA-04-80A
FA-01-150A
FA-02-150A
FB-23-50A
FZ-194-32A
FZ-192-40A
FZ-191-40A
FZ-190-40A
(FL-101-65A)
(FR-25 -40A)
(F-252V)
(F-190V)
(F-161V)
(F-101V)
(FI-102 -65A)
(BH-112 -65A)
FH-93-65A
FH-92-65A
FH-94-65A
FH-91-65A
FH-95-65A

FOR DETAIL SEE HULL PIPING DIAGRAM

M.D.O FILLING
H.F.O. FILLING

M.D.O SERV. TK (55.33M³)
M.G.O SERV. TK (44.26M³)
L.S.H.F.O. SETT. TK (54.82M³)
L.S.H.F.O. SERV. TK (54.82M³)
H.F.O. SERV. TK (130.8M³)
H.F.O. SETT. TK (98.1M³)
M.D.O STOR. TANK (251.81M³)
M.G.O STOR. TANK (182.42M³)
NO.2 H.F.O. BUNKER TANK (PORT) (1209.8M³)
NO.1 L.S.H.F.O. BUNKER TANK (PORT)
NO.2 H.F.O. BUNKER TANK (STBD) (1876.8M³)
NO.1 H.F.O. BUNKER TANK (STBD)

4-LS-17 FOR MDO TRANS. P/P STOP
4-LS-20 FOR MDO TRANS. P/P STOP
4-LS-14B FOR HFO TRANS. P/P START/STOP
4-LS-14D FOR HFO TRANS. P/P START/STOP
4-LS-14A FOR HFO TRANS. P/P START/STOP
4-LS-14C FOR HFO TRANS. P/P START/STOP
4-LS-19

4-TX-3B 4-TX-3 4-TX-4B 4-TX-2 4-TX-6D 4-TX-6C 4-TX-6B 4-TX-6A
CS04D CS04E CS04F CS04C CS04J CS04H CS04K CS04I

65Ø HOLE

FR MDO TK VENT DRN P32 55
FR MGO TK VENT DRN P32 58
FR MDO SERV TK
FR HFO TK VENT DRN P32 56
TO M/E
TO BLR
TO O.B. TK P14 9
TO SLUDGE P/P P14 12
TO INCIN. M.D.O TK OVFL P30 21

NO.2 H.F.O PURI. HEATER
NO.1 H.F.O PURI. HEATER
TO COAM'G
FOR T.C.V

NO.2 H.F.O PURIFIER (4,200L/H)
NO.1 H.F.O PURIFIER (4,200L/H)
RUBBER HOSE 150Ø 120 25A
FOR INTERLOCKING OF PURI. STARTING MS

H.F.O PURI. SUP. P/P (4.2 M³/H X 3 KG/CM²)

M.D.O TRANS. PUMP (6 M³/H X 3 KG/CM²)
H.F.O TRANS. PUMP (41 M³/H X 3 KG/CM²)
PACKAGE UNIT (BOWON)
DRAIN PLUG

PURIFIER WORK BENCH
PACKAGE UNIT (SUNBO)

SLUDGE TK (14.17 M³)
MIN. LEVEL (SLUDGE P/P SUC.)
MAX. 1M

F.O OVERFLOW TK (37.3 M³)

UMBRELLA SEALING FO RTN
FROM M/E, G/E FO AUTO FILTERS
FROM G/E FO LEAKAGE

4		
3	SIGHT GLASS	ISG-2SG
2	STRAINER	IS-4S
1	VALVE	IV-97V
NO.	ITEM	NO.

SHIP NO. S467/8, S569 -F-

F.O TRANSFER & PURIFYING SYSTEM

(BULK) A3 (420X297)

20110421-D033000-이준수-2997 /20110421-기장설계부-완성도용

M/E AND G/E F.O. SERVICE SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

-F-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	CHANGED M/E F.O.CIRC.P/P DISCH.LINE FLANGE PRESS. RATING FROM 10K TO 16K. (D.I)	J.H.CHOI	H.S.KEE
		02	CHANGED M/E AUTO FILTER OUT TO M/E LINE FLANGE VALVE FROM 10K TO 20K. (D.I)		
		03	CHANGED G/E MDO OUTLET V/V(F-180V,181V,182V) TYPE FROM ANGV TO SNAV. (O.C)		
		04	INCREASED G/E MDO RTN LINE(FD-156) SIZE FROM 25A TO 40A. (M.R)		
		05	ADDED G/E MGO SUPPLY P/P(1.6M3/H X 6 KG/CM2) FOR MGO SUPPLY TO G/E. (O.C)		
		06	INCREASED G/E M.D.O.SERV.LINE SIZE FROM 25A TO 40A. (D.I)		
		07	ADDED G/E M.G.O.RTN LINE TO M.G.O.SERV.TK. (D.I)		
		08	ADDED M.G.O.COOLER AND M.G.O.SERV.LINE TO G/E & BOILER. (O.C)		
		09	CHANGED M/E F.O.SUPPLY P/P BY-PASS LINE SIZE FROM 25A TO 40A. (D.I)		
		10	ADDED "NOTE" FOR F.O.RETURN PIPE INLET CONNECTION. (D.I)		
		11	MODIFIED D/G DRAIN LINE ACC.TO MAKER RECOMMENDATION. (M.R)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/2 CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
H.F.O SUPPLY PUMP SUCTION LINE (M/E,G/E,BOILER)	-	80	80 TO 50	STPG370-S SCH.40	4	*	INS & TRAC	FI 101-106	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	SC	SUS	CLASS II
M/E F.O SUPPLY P/P DISCH & RETURN LINE	4.4	135	80 TO 50	STPG370-S SCH.40	6.6	*	INS & TRAC	FJ 107-113 118	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	SC	SUS	CLASS II
			40 TO 25									JIS 16K FLANGED	BC	BC	
M/E .F.O. CIRC. P/P DISCH.	11	150	80 TO 50	STPG370-S SCH.40	21	*	INS & TRAC	FK 114-117 119-120	FLANGE	SLIP-ON JIS 16K A01	SF440	JIS 20K FLANGED	SC	SUS	CLASS II
			40 TO 25									JIS 16K FLANGED	BC	BC	
G/E F.O SUP. P/P DISCH. LINE & RETURN LINE	4.4	135	40 TO 25	STPG370-S SCH.40	6.6	*	INS & TRAC	FL 121-127	FLANGE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	CLASS II
G/E F.O BOOST P/P DISCH. & RTN. LINE	11	150	40 TO 25	STPG370-S SCH.40	21	*	INS & TRAC	FM 131-138	FLANGE	SLIP-ON JIS 16K	SF440	JIS 16K FLANGED A02	BC	BC	CLASS II
M/E AUTO FILTER OUT TO M/E	11	150	80 TO 50	STPG370-S SCH.40	21	*	INS & TRAC	FF 139	FLANGE	F-TYPE SLIP-ON JIS 16K	SF440	JIS 20K FLANGED	SC	SUS	CLASS II
G/E AUTO FILTER OUT TO G/E	11	150	40 TO 25		21			FN 142-145				JIS 16K FLANGED	BC	BC	
G/E D.O SERV. LINE	-	-	65 TO 50	STPG370-E SCH.40	-	*	-	FO 150-160	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 25										BC		
	8.8	-	40 TO 25	STPG370-S SCH.40	13.2	*	-	FP 161-170	FLANGE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	CLASS II
DRAIN LINE & AIR VENT LINE	-	-	65 TO 50	KS SPP	-	-	-	FD 171-186	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 25				INS & TRAC	FZ 187-194					BC		

NOTES

1. EMERGENCY SHUT-OFF VALVES TO BE OPERATED OUTSIDE OF ENGINE ROOM.
2. FUIL OIL PIPING TO BE KEPT AS FAR AWAY AS POSSIBLE FROM ELECTRICAL APPLIANCES, IF IT IS UNAVODABLE SUITABLE PROTECTION TO BE PROVIDED.
3. ======== MEANS INSULATION PIPING WITH STEAM TRACING.
4. (*) THE SHIP TEST TO BE CARRIED OUT IN ACCORDANCE WITH CLASS RULE REQUIREMENT.

M/E & G/E F.O SERVICE SYSTEM

(BULK) A3 (420X297)

PACKAGE UNIT (SUNBO)

G/E M.G.O. SUPPLY P/P (1.6 M3/H X 6 KG/CM2)

G/E M.D.O. FLUSH'G P/P (1.2 M3/H X 6 KG/CM2)

G/E F.O BOOST. P/P (1.6 M3/H X 6 KG/CM2)

G/E F.O. SUPPLY P/P (0.8 M3/H X 4 KG/CM2)

G/E F.O. RTN PIPE

N/D 150A

HFD SERV TK HIGH LEVEL

COMP. AIR

TO F.O OVFL TK

M.G.O. SERV. TANK (44.26M3)

M.D.O. SERV. TANK (55.33M3)

H.F.O. SERV. TANK (130.8 M3)

L.S. H.F.O. SERV. TANK (54.82 M3)

THIS CONNECTION TO BE LOCATED HIGHER THAN M/E F.O. OUT LET CONN.

F.O. RETURN PIPE

M.G.O. COOLER

TO PURIFIER

TO BOILER

M/E F.O. SUPPLY P/P (4.6 M3/HR X 4 KG/CM2)

M/E F.O. CIRC. P/P (8.3 M3/HR X 6 KG/CM2)

NO.2 G/E F.O. HEATER

NO.1 G/E F.O. HEATER

VISCORATOR (ELEC.TYPE)

BY-PASS FILTER

G/E F.O AUTO BACK -FLUSHING FILTER (NOM. 10 MIC.)

NO.3 G/E

NO.2 G/E

NO.1 G/E

F.O. LEAK ALARM TK

TO O.B. TK

MAIN ENGINE (HYUNDAI B&W 6S70MC-C7)

FOR M/E F.O.CIRC. P/P CHANGE OVER

F.O RTN FROM UMBRELLA SEALING

F.O COLLECT'G CHAMBER

6K STEAM IN

193V NORMALLY OPEN. TO BE CLOSED IN CASE OF FIRE IN S/C AIR BOX.

SCAV. AIR BOX DRAIN TK (SPEC. :0.4 M3) (ACTUAL:0.72M3)

TO F.O. OVFL TK

M/E F.O AUTO BACK -FLUSHING FILTER (NOM. 10 MIC.)

NO.	ITEM	NO.
4		
3		
2	STRAINER	IIS-14S
1	VALVE	101V-194V

SHIP NO. S467/8,S569 -F-

M/E & G/E F.O. SERVICE SYSTEM

(BULK) A3(420X297)

20110421-D033000-01주수-2997/20110421-기장설계부-완성도영

△ BOILER AND INCINERATOR F.O. SERVICE SYS PLAN HISTORY

SHIP NO. S467/8, S569

-F-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	CHANGED INCIN.W.O.DRN SCUPPER CONNECTION FROM B.H.TK TO O.B.TK AND ADDED SWING CHECK VALVE(F-310V). (O.C)	J.H.CHOI	H.S.KEE
		02	REFLECTED THE BOILER F.O.SYSTEM ACC.TO MAKER'S RECOMMENDATION. (M.R)		
		03	REFLECTED THE DETAIL OF BOILER F.O.RETURN PIPE. (D.I)		
		04	ADDED MGO SERV.TK AND MGO COOLER FOR MGO OPERATING. (O.C)		
		05	ADDED LEVEL SWITCH AT INCIN.W.O.SETT.TK FOR SLUDGE P/P STOP. (M.R)		
		06	CHANGED INCIN.MDO TK OUTLET V/V(F-293V) TYPE FROM GLBV TO QUICK CLOSING VALVE. (D.I)		
		07	ADDED LINE AND VALVE(F-309V) AT INCIN.W.O.SERV.TK OUTLET. (D.I)		
		08	SEPARATED INCIN.W.O. MILL PUMP RETURN LINE FROM INCIN.W.O. RETURN LINE. (D.I)		
		09	CHANGED INCIN.M.D.O.TO MILL P/P LINE CONN. POSITION FROM PUMP DISCH. TO PUMP SUCT. (D.I)		
100	'10.11.05	01	CHANGED INCIN.W.O.RTN V/V TYPE FROM SNGV TO GLBV. (D.I)	J.H.CHOI	H.S.KEE
		02	CHANGED POSITION OF SIGHT GLASS FOR INCIN.M.D.O.TK OVFL FROM NEAR M.D.O.TRANS.P/P TO NEAR M.D.O.TRANS.P/P STOP BUTTON. (D.I)		
200	'11.03.18	01	ADDED LEVEL SWITCH(HIGH) AT INCIN.M.D.O.TK FOR S468/569 ONLY. (O.C)	J.H.CHOI	H.S.KEE
		02	ADDED TEMP.SWITCH ACC.TO MAKER RECOMMENDATION. (M.R)		

SPECIFICATION FOR PIPING SYSTEM

PAGE 29 9

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
BOILER F.O P/P DISCH. LINE	4	80	40 TO 15	STPG370-S SCH.40	6	*	INS & TRAC	FR 251-256	FLANGE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	CLASS II
INCIN. W.O LINE	-	-	40 TO 15	STPG370-S SCH.40	-	*	INS & TRAC	FS 281-284	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
M.D.O LINE	-	-	40 TO 15	STPG370-S SCH.40	-	*	-	FT 286-289	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
DRAIN LINE & OVERFLOW LINE	-	-	65 TO 50	KS-SPP	-	-	-	FD 290-300	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		

NOTES

1. EMERGENCY SHUT-OFF VALVES TO BE OPERATED OUTSIDE OF ENGINE ROOM.
2. FUEL OIL PIPING TO BE KEPT AS FAR AWAY AS POSSIBLE FROM ELECTRICAL APPLIANCES, IF IT IS UNAVOIDABLE SUITABLE PROTECTION TO BE PROVIDED.
3. ======== MEANS INSULATION PIPING WITH STEAM TRACING.
4. (*) THE SHIP TEST TO BE CARRIED OUT IN ACCORDANCE WITH CLASS RULE REQUIREMENT.

NOTE
THE DISTANCE BETWEEN ITEM 7.0 & 8.0 & 11.0 TO BE MAX. 0.5M AT ITEM 20.0.

M.G.O. SERV. TK (44.26M³)
M.D.O SERV. TK (55.33M³)
H.F.O SERV. TK (130.8 M³)
L.S. H.F.O SERV. TK (54.82 M³)
M.G.O. COOLER
AUX. BOILER (2,000 KG/H)
INCIN. M.D.O TK (SPEC. :0.4 M3) (ACTUAL:0.7 M3)
INCIN. W.O SETT. TK (SPEC. :1.5 M3) (ACTUAL:1.66M3)
INCIN. W.O SERV. TK (SPEC. :1.0 M3) (ACTUAL:1.18M3)
INCINERATOR (840,000 KG/H)
MILL PUMP (26 M3/H X 0.4 BAR)
SET.4 BAR
FOR SLUDGE PUMP STOP
NEAR M.D.O TRANS. PUMP STOP PUSH BUTTON
ONLY S468/569
MIN.500MM FR INC.BOTTOM
BELOW 1500 MORE THAN LOW L.S.
BLR F.O. RTN PIPE
OVFL LEVEL
MIN.1000MM
TO G/E
TO M/E
TO F.O. OVFL TK
TO O.B. TK
FROM SLUDGE P/P
FROM M.D.O TRANS. P/P
FROM OIL MIST MANIFOLD
PACKAGE UNIT (SHINWOO)
PACKAGE UNIT (SUNBO)
BOILER F.O PUMP UNIT

NO.	ITEM	NO.
4		
3		
2	SIGHT GLASS	3SG-4SG
1	VALVE	251V-263V, 290V-306V

SHIP NO. S467/8,S569 -F-

BOILER & INCINERATOR F.O. SERVICE SYSTEM

(BULK) A3(420X297)

20110421-D033000-이준수-2997/20110421-기장설계부-완성도용

AIR VENT AND SOUNDING SYSTEM PLAN HISTORY

SHIP NO. S467/8,S569

-V-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	MODIFIED OIL MIST CHAMBER VENT PIPE SIZE ACC.TO SHIPOWNER COMMENT. (O.C)	J.H.CHOI	H.S.KEE
		02	LED THE COMMOM AIR VENT DRAIN LINE TO F.O.OVFL TK INSTEAD OF TANK COAMING. (C.C)		
		03	ADDED VENT PIPE & SOUNDING PIPE AT E/R W.B.TK ACC. TO HULL PIPING DIAGRAM. (D.I)		
		04	ADDED G/E L.O.SETT.TK AND ITS VENT LINE. (O.C)		
		05	ADDED HEATING COIL AT MAIN L.O.SETT.TK AND DELETED HEATING COIL AT MAIN L.O.STOR.TK, M.D.O.SERV.TK & M.G.O.SERV.TK. (D.I)		
		06	INCREASED DUCT KEEL VENT PIPE FROM 400A TO 600A. (D.I)		
		07	INCREASED M.D.O. & M.G.O.SERV.TK LX PIPE LINE SIZE FROM 20A TO 25A. (D.I)		
		08	INCREASED CYL.OIL STOR.TK AIR VENT PIPE FROM 100A TO 125A AND G/E L.O.STOR.TK AIR VENT PIPE FROM 65A TO 80A. (D.I)		
		09	LED THE MAIN L.O.SETT.TK AIR VENT DRAIN LINE TO SLUDGE TK INSTEAD OF TANK COAMING. (D.I)		
		10	INCREASED SCAV.AIR BOX DRN TK AIR VENT LINE SIZE FROM 25A TO 50A AND INCREASED ORIFICE SIZE FROM 8ø TO 10ø. (O.C)		
		11	ADDED LEVEL TRANSMITTER FOR E/R W.B.TK (P&S). (B.S)		
		12	ADDED AIR VENT LINE FOR CLEAN BILGE TANK AND INCREASED VENT LINE SIZE FROM 50A TO 65A & 80A. (D.I)		
		13	INCREASED M.L.O.SUMP TK COMMON VENT LINE FROM 125A TO 150A. (D.I)		
		14	MADE TWO VENT PIPES FOR COFFERDAM TO ONE COMMON PIPE. (D.I)		
		15	REFLECTED THE DETAIL OF AFT DRAFT GAUGE. (M.R)		
		16	ADDED THE DETAIL OF ECHO SOUNDER SYSTEM. (M.R)		
		17	MODIFIED M/E CRANKCASE VENT PIPE OUT CONN. (D.I)		
		18	MODIFIED SCAV.AIR BOX DRAIN TK HEATING COIL TO STM BLOWING. (D.I)		
		19	MODIFIED F.O.OVFL TK LEVEL SWITCH TO LEVEL TRANSMITTER. (D.I)		
		20	ADDED DRAIN LINES WITH STOP VALVE FOR VOID SPACE (P&S) UNDER F.W. TK ACC.TO HULL PIPING DIAGRAM. (D.I)		
		21	CHANGED VENT'G SYSTEM FOR MDO/MGO SERV.TK AS PER SOLAS REQ'T. (D.I)		
		22	REFLECTED THE DETAIL OF INCIN.W.O.TK EXH.FAN. (M.R) AND ADDED PIPE CODE "VP". (D.I)		
		23	ADDED LEVEL HIGH ALARM AT MDO/MGO SERV.TK LEVEL TRANSMITTER. (D.I)		
		24	ADDED 300MM SHORT END PIECE (SUS304) AT D/B TK SOUNDING PIPE. (O.C)		
		25	ADDED STOP VALVES (V-10V~19V) FOR AIR PURGE TYPE LEVEL TRANSMITTER. (D.I)		
		26	REFLECTED GLASS LEVEL GAUGE FOR DEAD ZONE MEASURING AT E/R W.B.TK. (D.I)		
100	'10.11.05	01	CHANGED TANK LEVEL INDICATING SYS. FROM AIR PURGE TYPE TO ELEC. PRESS.TYPE. (O.C)	J.H.CHOI	H.S.KEE
200	'11.03.18	01	ADDED STOP V/V FOR INCIN.EXH.GAS FAN DRN LINE. (O.C)	J.H.CHOI	H.S.KEE

SPECIFICATION FOR PIPING SYSTEM

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SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
AIR VENT & SOUNDING PIPE FOR HULL STRUCTURED TANK (OIL TANK)	-	-	300 TO 100	KS-SPP		-	-	VA 01-10	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
								VL 181-187							
			80 TO 65	STPG370-E SCH.40				VB 31-44							
								VM 191-192							
			50 TO 40	STPG370-E SCH.80				VC 51							
								VN 201-206							
AIR VENT & SOUNDING PIPE FOR HULL STRUCTURED TANK (EXCEPT OIL TANK)	-	-	400 TO 100	KS-SPP	-	-	GAL	VE 66-67	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
			80 TO 65	STPG370-E SCH.40				VF 69-80							
			50 TO 40	STPG370-E SCH.80				VG 81-88							
AIR VENT & SOUNDING PIPE FOR INDEPENDENT TANK	-	-	300 TO 25	KS-SPP	-	-	-	VH 91-112	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
								VO 211-220							
			300 TO 25				GAL	VI 131-134							
			80 TO 50				INS	VP 121-122							
DRAIN LINE	-	-	50 TO 15	KS-SPP	-	-	-	VD 141-145	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
E/R TANK LEVEL GAUGE SYSTEM	-	-	25	STPG370-E SCH.40	-	-	-	VJ 151-164	FLANGE	-	-	-	-	-	
DRAFT GAUGE SYSTEM	-	-	20 TO 15	SUS 304 SCH.20S	-	-	-	VK 171-173	SLEEVE	SLIP-ON JIS 5K	SUS 304	-	-	-	
CABLE PIPE FOR ECHO SOUNDER	-	-	65	STPG370-S SCH.80	-	-	GAL	ES 91	FLANGE OR SLEEVE	SLIP-ON JIS 10K	SS400	-	-	-	

AIR VENT & SOUNDING SYSTEM

(BULK) A3(420X297)

20110421-D033000-01준수-2997/20110421-기장설계부-완성도용

4		
3	ORIFICE	V-ORI-1
2	SOUNDING HEAD	IH-2IH
1	VALVE	IV-6V
NO.	ITEM	NO.

SHIP NO. S467/~~S569~~ -V-

AIR VENT & SOUNDING SYSTEM

(BULK) A3(420X297)

20110421-D033000-이푸수-2997 /20110421-기장

-기장설계부 -완성도용

COMPRESSED AIR SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

-A-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	MODIFIED AIR COMP. & AIR RSVR DRAIN MANIFOLD ACC.TO YARD'S PRACTICE.(D.I)	J.H.CHOI	H.S.KEE
		02	REFLECTED SEPARATOR DRN LINE ACC.TO MAKER'S RECOMMENDATION.(M.R)		
		03	ADDED DRAIN LINE WITH STOP V/V AT LOWEST POINT OF AUX.AIR RESERVOIR SAFETY V/V OUTLET.(D.I)		
		04	INCREASED SAFETY V/V OUTLET LINE SIZE ACCORDING TO CHANGE OF SAFETY V/V SIZE.(D.I)		
		05	INCREASED SERVICE AIR LINE TO ACCOMMODATION FROM 15A TO 40A.(D.I)		
		06	INCREASED SERVICE AIR LINE TO S/G ROOM FROM 15A TO 25A.(D.I)		
		07	ADDED FIRE ALARM HORN FOR 3RD DECK.(D.I)		
		08	ADDED COAMING WITH SCUPPER DRAIN FOR CONTROL AIR DRYER.(D.I)		
		09	CHANGED LOCATION FOR SERV.AIR TO 'PURI.ROOM' INSTEAD OF '3RD DK'.(D.I)		
		10	MODIFIED SERVICE AIR LINE TO FLOOR(P) CONNECT FROM AC-45-40A TO AC-41-25A ACC.TO ACTUAL ARRANGEMENT.(D.I)		
		11	MODIFIED SERVICE AIR LINE TO CO2 ROOM CONNECT FROM E/R INSIDE TO ACCOMMODATION.(D.I)		
		12	ADDED SERVICE AIR LINE ACC.TO ACTUAL ARRANGEMENT.(D.I)		
		13	MODIFIED CONTROL AIR MANIFOLD ACC.TO ACTUAL ARRANGEMENT.(D.I)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
30 KG/CM² COMPRESSED AIR SYSTEM	33	-	150 TO 100	STPG370-S SCH.40	49.5	*	-	AA 01-02	FLANGE	SLIP-ON JIS 30K	SF440	JIS 30K FLANGED	SC	SUS	CLASS II
			80 TO 32					AB 06-18							
			25 TO 15										SF		
			8Ø	COPPER C1220-T	-	-	-	AK	BITE UNION	-	-	-	BC	BC	
8 KG/CM² COMPRESSED AIR SYSTEM	8.8	-	80 TO 50	STPG370-E SCH.40	13.2	*	-	AC 31-64	FLANGE OR SLEEVE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	FC	BC	
			40 TO 15									JIS 16K FLANGED	BC		
7 KG/CM² COMPRESSED AIR SYSTEM	7.7	-	80 TO 50	STPG370-E SCH.40	11.5	*	-	AE 60-70	FLANGE OR SLEEVE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	FC	BC	
			40 TO 15									JIS 16K FLANGED	BC		
			8Ø	COPPER C1220-T	-	-	-	AF	BITE UNION	-	-	-			
SAFETY V/V DISCH. & DRAIN LINE	-	-	100 TO 50	STPG370-E SCH.40	-	-	-	AD 81-99	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15									JIS 5K FLANGED	BC		

NOTE

1. ALL SAFETY VALVES ARE TO BE SITUATED AT VISIBLE POSITION
2. ALL AIR RELIEF AND DRAINS TO BE LED TO SAFE POSITION
3. (*) THE SHIP TEST TO BE CARRIED OUT IN ACCORDANCE WITH CLASS RULE REQUIREMENT.

COMPRESSED AIR SYSTEM

(BULK) A3 (420X297)

TO SAFE POSITION OUTSIDE E/R IN CASING
AD-84-65A
PACKAGE UNIT (BOWON)
AD-83-25A
AD-98-25A
AD-82-40A
AUX. AIR RESERV. (0.25 M^3 X 30KG/CM^2G)
DRAIN LINE WITH STOP V/V
8Ø CUT
AB-17 -25A
AB-18-40A
NO.2 MAIN AIR RESERVOIR (8 M^3)
AD-86-15A
AB-11-40A
AB-12-40A
AA-02-150A
AD-81-40A
AA-01-150A
AB-10-50A
AB-09-65A
NO.1 MAIN AIR RESERVOIR (8 M^3)
AD-85-15A
AB-16-40A
AB-08-65A
DRAIN SEPARATOR
AD-95 -15A
AB-12-40A
AA-02-150A
AT THE LOWEST POINT
AD-91-15A
AD-92-15A
TO EM'CY D/G M.D.O PUMP
42 P28
AC-58-15A
3-PS-IC
NO.3 G/E
AB-15-40A
3-PS-IB
NO.2 G/E
AB-14-40A
3-PS-IA
NO.1 G/E
AB-13-40A
LOWEST POINT
I-PX-8
STARTING AIR
I-TX-4A-4F
SCAV. AIR MANIFOLD
MAIN ENGINE (HYUNDAI-B&W 6S70MC-C7)
I-PS-5
I-PX-4
CONTROL AIR 20Ø
I-PS-1
EXH.VALVE SPRING AIR
SAFETY AIR 16Ø
30K/7K PRV
AC-93 -25A
TO AIR WHISTLE
AC-32-25A
AC-33-15A
TO AIR BOTTLE FOR EM'CY SHUT-OFF VALVES
P44 24
6-PI-5
30K-8K P.R.V.
40AX25A
22V A-ORI-1
25AX50A
6-PI-6
30K-7K P.R.V.
34V A-ORI-2
AE-65 -50A
AC-42-50A
AC-31-50A
AC-36-40A
AC-45-40A
AC-46-40A TO ACCOMMODATION
AC-47-15A TO WORKSHOP
AC-48-40A TO DECK SERVICE
AC-50-15A TO 2ND DECK (P)
AC-51-15A TO PURIFIER ROOM
AC-54-15A TO EM'CY D/G ROOM
(TO CO2 ROOM)
AC-57-25A
AC-59-25A
TO SOOT BALLAST M/E T/C CLEANING
P18 50
FIRE ALARM HORN (2ND DECK)
FIRE ALARM HORN (3RD DECK)
FIRE ALARM HORN (FLOOR)
O/D 10Ø
AC-38-15A TO 2ND DECK (S)
AC-39-15A TO CASING
AC-57-15A TO MACH'Y SPACE PURGE AIR LINE
AC-40-25A TO S/G ROOM
AC-41-25A
AC-43-15A TO FLOOR (S)
AC-44-15A TO 3RD DECK(S) (NEAR G/E)
P30 25
EM'CY FIRE PUMP SPACE SEA CHEST
AC-52-15A
50V TO FLOOR (P)
AC-39-15A TO FUEL V/V TEST DEVICE
AC-59-15A TO 3RD DK FWD
AC-60-15A TO NEAR ECONOMIZER
AC-61-15A TO NO.1 FAN ROOM
AC-62-15A TO NO.2 FAN ROOM
AC-63-15A TO F.W.HYD.UNIT
AC-64-15A
AE-61-40A
AE-62 -40A
CONTROL AIR DRYER (60 M^3/H.F.A)
NEAR SCUPPER
AE-63-40A
OPERATING CABINET FOR G/E F.O. INLET ISOLATING V/V
AC-69 -15A
8ØCOPPER
(F-187V)
(F-186V)
(F-185V)
MAIN AIR COMPRESSOR (275 M^3/H FAD X 30 KG/CM^2)
NO.2
NO.1
10Ø CUT
AD-87-25A
AD-88-25A
AIR RESERVOIR DRAIN MANIFOLD
COMP.AIR DRAIN MANIFOLD
AD-99-80A
P14 29
TO O.B. TK
TO AUX.AIR RESER.DRN
PI1/2 PF1/2
AB-07-50A
AB-06-50A
AE-70-40A
AE-66-40A
AE-67-40A
AE-68-40A
AE-69-40A
CC30A M/E L.O. DISCH. FILTER 8Ø CUT
CC09A M/E L.O. TEMP. CONT. V/V 8Ø CUT
CC03A M/E JACKET F.W. TEMP. CONT. V/V 8Ø CUT
CC08A CENT. F.W. TEMP. CONTROL V/V 8Ø CUT
CC19A EXCESS STM DUMP V/V 8Ø CUT
SPARE 10Ø CUT
SPARE 8Ø CUT
SPARE 8Ø CUT
CC28A/29A 8Ø CUT TO H.F.O. PURIFIER UNIT
CC27A 8Ø CUT TO L.O. PURIFIER UNIT
SPARE 10Ø CUT
DILY BILGE SEPARATOR 8Ø CUT
TO G/E F.O. SUPPLY UNIT 8Ø CUT
SPARE 8Ø CUT
SPARE 10Ø CUT
CC01A 8Ø CUT
CC17A 8Ø CUT BLR FEED W.CONT. V/V
SPARE 10Ø CUT
SPARE 8Ø CUT
SPARE 8Ø CUT
SPARE 8Ø CUT
8Ø CUT TO M/E F.O. SUPPLY UNIT
PACKAGE UNIT
PACKAGE UNIT
PACKAGE UNIT

NO.	ITEM	NO.
4		
3	ORIFICE	A-ORI-1,2
2	PRESS. GAUGE	6-PI-5,6
1	VALVE	IV-153V

SHIP NO. S467/8,S569 -A-

COMPRESSED AIR SYSTEM

(BULK) A3(420X297)

△ DOMESTIC F.W. AND SANITARY WATER SYSTEM PLAN HISTORY

SHIP NO.S467/8,S569

- D -

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.03.30	01	REFLECTED THE DETAIL OF LOCAL FIRE FIGHTING SYSTEM AND INCREASED F.W.LINE FOR G/E FROM 15A TO 25A.(M.R)	J.H.CHOI	H.S.KEE
		02	ADDED LEVEL SWITH FOR F.W.IK(S) SUPPLIED BY L.F.F.S.MAKER.(M.R)		
		03	MODIFIED LOCAL FIRE FIGHTING SYSTEM F.W.SUPPLY LINE CONNECT FROM E/R INSIDE TO S/G ROOM.(D.I)		
		04	CHANGED DESIGN PRESS. AND ADDED SHIP TEST FOR LOCAL FIRE FIGHTING SYSTEM.(D.I)		
		05	MODIFIED WASH'G TUB & WASH BASIN COLD WATER CONNECTION ACC.TO ACTUAL ARRANGEMENT.(D.I)		
100	'10.11.05	01	ADDED FRESH WATER LINE TO BOSUN STORE(40A) ACC. TO SHIPOWNER COMMENT.(O.C)	J.H.CHOI	H.S.KEE

SPECIFICATION FOR PIPING SYSTEM

PAGE 35 12

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
F.W SERV. LINE	4.5	-	50	KS-SPP	-	-	GAL	DA 10-30	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
DISTILLED, SANITAR & DRINKING WATER SERV. LINE	4.5	-	45Ø TO 20Ø	COPPER C1220T-1/2H	-	-	-	DB 31-34 41-46	FLANGE	SOLID BRAZING	YBSC2	JIS 5K FLANGED	BC	BC	
							INS	DJ 35-40							
			10Ø	COPPER C1220T-0				DF 81-84	BITE TYPE UNION	-	-	SCREWED OR UNION			
							INS	DK 85-86							
HOT W. SERV. LINE	5.0	70	45Ø TO 20Ø	COPPER C1220T-1/2H	-	-	INS	DC 51-53	FLANGE	SOLID BRAZING	YBSC2	JIS 5K FLANGED	BC	BC	
			10Ø	COPPER C1220T-0				DG 56-57	BITE TYPE UNION	-	-	SCREWED OR UNION			
DRAIN LINE	-	-	40 TO 15	KS-SPP	-	-	GAL	DD 61-65	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	BC	BC	
PURI. OPERATING WATER LINE	4.5	-	45Ø TO 20Ø	COPPER C1220T-1/2H	-	-	-	DE 71-75	FLANGE	SOLID BRAZING	YBSC2	JIS 5K FLANGED	BC	BC	
FIXED LOCAL FIRE FIGHT'G SYSTEM	9.6 △A 04	-	40 TO 15	STPG370-E SCH.40	-	△A 04 SEE NOTE 2	GAL	DH 91-96	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	MKR STD	MKR STD	
	-		40 TO 25					DI 100		SLIP-ON JIS 5K		JIS 5K FLANGED			

NOTE.

1. MARK (------) PIPES TO BE INSULATED. △A 04
2. 14.4 KG/CM2 HYD.TEST AND 5~7 KG/CM2 AIR BLOWING TO BE CARRIED OUT.

DOMESTIC F.W. & SANITARY WATER SYSTEM

(BULK) A3 (420X297)

NOTE
1. F.W. TK(S) SHALL BE ARRANGED TAKING INTO CONSIDERATION OF MIN.20 MINUTES TO ENSURE THAT PUMPABLE WATER LEVEL TO BE MAINTAINED.

FIXED LOCAL FIRE FIGHTING SYSTEM

MAKER SUPPLY UNIT (INSTALLED IN S/G ROOM)
WATER MIST PUMP (200 L/MIN X 96 MTH)
PUMP DRAIN
INSTALLED IN S/G ROOM
40A
8K AIR SERV. 15A
AIR SUPPLY 15A
DA-15-50A
P38 30
TO FEED FILTER TK
S/G RM
E/R
DH-91-40A M/E AREA (13EA)
DH-92-25A NO.3 G/E AREA (4EA)
DH-93-25A NO.1&2 G/E AREA (8EA)
DH-94-15A BOILER AREA (1EA)
DH-95-15A INCIN. AREA (1EA)
DH-96-15A H.F.O. PURI. AREA (2EA)
16K-50A / 16K-25A

TO GALLERY
DK-81-6A (10/D 10Ø)
DJ-40-40A (10/D 45Ø)
DRINKING WATER FOUNTAIN NEAR E.C.R.
DK-85-6A (10/D 10Ø)
DD-64 -40A
SINK IN ECR
25A
DG-58-6A

TO ACCOMODATION UPP. DECK
HOT W. SUPPLY
DG-57-6A (10/D 10Ø)
DF-84-6A (10/D 10Ø)
WASH'G TUB(SUS)
IN WORKSHOP
DG-56-6A (10/D 10Ø)
DF-83-6A (10/D 10Ø)
WASH BASIN
E/R TOILET
DC-52-40A (10/D 45Ø)
DC-53-40A (10/D 45Ø)
SANITARY WATER SUPPLY

TO ACCOMODATION (P) (S) UPP. DECK
TO DECK SERVICE
TO BOSUN STORE
DA-29-15A 15A
50V
40A
DA-15-15A TO SEWAGE TREATMENT PLANT P42 63 (S569 ONLY)
DA-30-25A TO F.W. EXP. TK P18 26
DA-28-15A 2ND DECK SERV. 48V
DA-17-15A WORKSHOP 39V (A)
DA-27-15A 3RD DECK SERV. 47V
DA-25-15A PURIFIER ROOM 45V

F.W. TK(P)
D-CLG-2
CONTENT LEVEL GAUGE
CSO3H
2V
4V DB-34-40A (10/D 45Ø)
32V
6V
DD-62-40A
DD-61-40A
40A
DB-31-25A (10/D 30Ø)

S/T COOLING W. TK
7V
76V
DD-65 -40A
10 P14
TO CLEAN BILGE TK

PACKAGE UNIT (BOWON)
ON:3.5K OFF:4.5K
8K AIR FLEXIBLE HOSE
DB-33-40A (10/D 45Ø) 14V
DB-43-40A (10/D 45Ø) 12V
F.W. HYD. TANK (2.0 M³)
SET. 5K
16V
DB-45-40A (10/D 45Ø)
DJ-37-40A (10/D 45Ø)
75V
DA-12-50A
25A
DE-71-40A

STERILIZER (1,000 L/H)
DJ-36 -40A 20V
DJ-35 -40A 19V
21V
MINERALIZER (1.000 L/H)
SET. 5K
DJ-39-40A (10/D 45Ø)

CALORIFIER (300L)
22V
10A
SET. 5.0K
DC-51-40A
15A
HOT W. CIRC. P/P
(2 M³/H X 5 MTH)
26V
28V
SHORT PIECE (100MM)
DB-44-40A (10/D 45Ø)
24V
37V
DB-46-40A (10/D 45Ø)
DA-24-50A
DA-12-50A

DA-22-25A EXH. GAS ECONOMIZER W. WASHING 44V
DA-21-25A TO BOILER WATER WASHING 43V
DA-19-15A 68V TO BOILER DOSING UNIT
DA-20-15A TO BOILER SAMPLING COOLER 42V P38 27
DA-16-15A G/E T/C CLEANING 46V G/E T/C CLEANING 20M
DA-13-25A TO M/E A/C CHEM. CLEAN'G TK P18 31
DA-14-15A FLOOR SERV. 38V
DA-10-25A TO O.B. SEP. P14 32

F.W PUMP
(5 M³/H X 45 MTH)

PACKAGE UNIT
74V
DE-75-15A 65V
DE-74-15A 64V
DE-73-15A 63V
DE-72-15A 62V
10K 15A
SEAL'G WATER
CLOS'G BOWL
OPEN'G BOWL
OPEN'G WATER (TOTAL DISCHARGE)
OPEN'G WATER (PARTIAL DISCHARGE)
NO.2 MAIN L.O. PURIFIER
NO.1 MAIN L.O. PURIFIER
NO.2 H.F.O. PURIFIER
NO.1 H.F.O. PURIFIER

F.W. TK(S)
LAL LS 5K-65A
D-CLG-1
CONTENT LEVEL GAUGE
CSO3G
50MM 400MM
5V DB-32-25A (10/D 30Ø)
1V DB-33-40A (10/D 45Ø)
3V
(40A)
DB-31-25A (10/D 30Ø)
5K-25A

PACKAGE UNIT
F.W GENERATOR (30 TON/DAY)
SALINO -METER
P16 47
TO CHEM INJECTION UNIT

NO.	ITEM	NO.
4		
3		
2	LEVEL GAUGE	D-CLG-1,2
1	VALVE	IV-76V

SHIP NO. S467/8,S569 - D -

DOMESTIC F.W. & SANITARY WATER SYSTEM

(BULK) A3 (420X297)

BOILER FEED WATER SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

-T-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	INCREASED SALINOMETER IN/OUT LINE SIZE FROM 40A TO 50A. (D.C)	J.H.CHOI	H.S.KEE
		02	ADDED CHECK VALVE TO EXHAUST GAS ECONOMIZER BLOW DOWN LINE. (D.C & D.I)		
		03	CHANGED CHEMICAL INJECTION POINT AFTER FEED W.CONTROL V/V. (M.R)		
		04	REFLECTED DOUBLE VALVE AT BOILER BLOW DOWN V/V ACCORDING TO BUILDING SPECIFICATION. (B.S)		
		05	INCREASED BOILER W.CIRC.P/P OUTLET LINE SIZE FROM 40A TO 50A. (D.I)		
		06	ADDED BOILER W.CIRC.P/P WATER DRAIN LINE(40A). (M.R)		
		07	REFLECTED HEIGHT OF BOILER W.CIRC.P/P ACCORDING TO MAKER'S RECOMMENDATION. (M.R)		
		08	CHANGED BOILER W.CIRC.P/P COOLING WATER LINE SIZE FROM 40A TO 25A. (D.I)		
		09	CHANGED BOILER W.CIRC.LINE PRESS.RATING FOR FLANGE & V/V. (D.I)		
		10	INCREASED AUX.BOILER SAFETY LINE SIZE FROM 80A TO 100A. (D.I)		
		11	INCREASED EXH.GAS ECONO. SAFETY LINE SIZE FROM 65A TO 80A. (D.I)		
		12	RELOCATED STEAM DUMP VALVE SENSOR TO STEAM DUMP LINE. (D.I)		
		13	ADDED STEAM DRAIN LINE AT 6K STEAM SERVICE LINE. (D.I)		
		14	ADDED MANUAL FILLING LINE TO FEED FILTER TANK. (D.I)		
		15	CHANGED STEAM DUMP VALVE & LINE FROM 65A TO 40A. (D.I)		
		16	CHANGED BOILER FEED WATER PUMP TOTAL HEAD FROM 100MTH TO 110MTH. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
BOILER FEED W. PUMP SUCT. LINE	-	60	100 TO 50	STPG370-E SCH.40	-	-	INS	TA 01-10	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
BOILER FEED W. PUMP DISCH. LINE	10	60	40 TO 15	STPG370-S SCH.40	15	-	INS	TB 11-16	FLANGE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	
BOILER W. CIRC. LINE	11	169.6	80 TO 50	STPG370-S SCH.40	16.5	-	INS	TC 21-26	FLANGE	SLIP-ON JIS 16K △A 09	SF400	JIS 20K FLANGED	SC	SUS	CLASS II
			40 TO 15									JIS 16K FLANGED	BC	BC	
BOILER BLOW-OFF DISCH. LINE	8	169.6	40 TO 15	STPG370-S SCH.80	12	-	INS	TE 31-37	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	BC	BC	CLASS II
6K STEAM SERVICE LINE	8	169.6	100 TO 50	STPG370-S SCH.40	12	-	INS	TH 101-105	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	SC	SUS	CLASS II
			40 TO 15									JIS 16K FLANGED	BC	BC	
CONDENSATE LINE	-	-	65 TO 50	KS-SPP	-	-	INS	TI 227-228	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
SAFETY & DRAIN LINE	-	-	200 TO 50	KS-SPP	-	-	INS	TD 48-58	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	SEE NOTE 1
			40 TO 15				INS & GAL	TF 41-46					BC		

NOTE

1. STEAM SAFETY VALVE DISCHARGE TO BE TERMINATED TO ATMOSPHERE, OPEN DRAIN PIPE TO BE INSULATED WITH GLASS CLOTH (0.5T) ONLY WHERE IT IS NECESSARY FOR PERSONAL PROTECTION.

BOILER FEED WATER SYSTEM

(BULK) A3 (420X297)

TO ATMOSPHERE
TF-46-150A
SAFETY MANIFOLD (350A)
TF-44-80A
TF-43-80A
TD-56-40A
TF-42-100A
TF-41-100A
TO NEAR COAM'G
EXH. GAS ECONOMIZER (1200 KG/H X 6 KG/CM2)
AUXILIARY BOILER (2000 KG/H X 6 KG/CM2)
TO 6K STEAM SERVICE
TH-101-100A
P40 34
LOWEST POINT
TC-26-125A
TD-48-40A
TC-25-50A
T-ORI-1
4-DPS-1
CSO10D
TE-31-40A
TE-32-40A
TE-33-40A
TE-37-40A
TD-47-40A
TE-34-40A
TB-13-40A
TO BILGE HOLDING TK
TC-24-50A
TC-23-80A
TC-21-80A
TC-25-50A
TC-22-80A
TO DECK SCUPPER
FROM 6K STM DRN RTN
35 P40
TH-102-80A
TH-103-125A
TH-104-100A
TH-105-100A
TI-226-50A
TI-227-50A
ECONOMIZER STEAM DUMPING V/V(SET.7K)
T-ORI-2 (32Ø)
NO.1 DUMP COND. /DRAIN COOLER
NO.2 DUMP COND. /DRAIN COOLER
TD-49-50A
TD-51-50A
TD-57-40A
TD-58-40A
BOILER WATER CIRC. P/P (9.6 M3/H X 40 MTH)
MIX-10M FROM FEED FILTER TK
(WB-171-25A)
TO CENTRAL COOLING F.W. SYSTEM (2/2)
(WB-170-25A)
FROM CENTRAL COOLING F.W. SYSTEM (2/2)
TB-12-40A
TB-11-40A
PA HOSE
BLR WATER SAMPL,G CLR
NEAR THE BOILER
WASHING TUB
(DA-20-15A) F.W IN
P36 27
(DA-19-15A)
(D-68V)
P20 52
P20 53
TA-08-15A
TA-07-15A
TA-02-50A
TA-01-50A
4-PS-28B CSD10B
4-PS-28A CSD10A
FROM F.W TANK
P36 30
(DA-15-50A)
TO CLEAN BILGE TK
33 P14
TD-52-40A
TD-53-40A
TD-54-25A
TD-55-40A
TD-51-40A
INSPECTION TK
FEED FILTER TANK
(SPEC. :2.0 M3)
(ACTUAL:3.03M3)
6-TI-21
4-LS-13
PACKAGE UNIT (SHINWOO)
BOILER FEED W. P/P (3.5 M3/H X 110 MTH)

NO.	ITEM	NO.
4		
3	ORIFICE	T-ORI-1,2
2	TEMP. GAUGE	6-TI-21
1	VALVE	IV-66V

SHIP NO. S467/8,S569 -T-

BOILER FEED WATER SYSTEM

(BULK) A3(420X297)

△ 6K STEAM SERVICE AND DRAIN SYSTEM PLAN HISTORY

SHIP NO.S467/8,S569

-T-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	ADDED G/E L.O.SETT.TK AND LINES FOR 6K STEAM SERVICE. (O.C)	J.H.CHOI	H.S.KEE
		02	ADDED 6K STEAM SERVICE CONNECTION NEAR LOW/HIGH SEA CHEST. (D.I)		
		03	ADDED 6K STEAM SERVICE CONNECTION TO 2ND DK(S). (D.I)		
		04	INCREASED M/E F.O.HEATER STEAM INLET LINE SIZE FROM 40A TO 50A. (D.I)		
		05	ADDED "NOTE" FOR THERMO BULB INSTALLATION. (D.I)		
		06	ADDED STEAM DRAIN LINE AT 6K STEAM SERVICE TO ACCOM. LINE. (D.I)		
		07	DELETED THERMOMETER FOR NO.1 H.F.O. BUNKS TK WHICH LOCATED AT CARGO SIDE. (D.I)		
		08	CHANGED H.F.O.PURI.HEATER CONTROL VALVE TYPE FROM DIRECT ACTING TYPE TO PNEUMATIC TYPE ACC.TO .BUILDING SPEC. (D.I)		
		09	CHANGED PURI.HEATER INLET V/V & LINE SIZE FROM 40A TO 25A. (D.I)		
		10	INCREASED 6K STEAM SERVICE TO ACCOMMODATION LINE FROM 40A TO TO 50A. (D.I)		
		11	ADDED ISOLATING V/V(T-150V,151V,152V) FOR EASY MAINTENANCE OF STEAM LINE. (O.C)		
100	'10.11.05	01	ADDED ISOLATING V/V(T-260V,261V) FOR EASY MAINTENANCE OF STEAM DRAIN LINE. (O.C)	J.H.CHOI	H.S.KEE
		02	CHANGED M/E SCAV.AIR BOX DRN TK STM INLET V/V TYPE FROM ANGV TO SNAV. (D.I)		

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
6K STEAM SERVICE LINE	8	169.6	100 TO 50	STPG370-S SCH.40	12	-	INS	TH 106-137 151-173	FLANGE	SLIP-ON JIS 10K	SS400	JIS 10K FLANGED	SC	SUS	CLASS II
			40 TO 15									JIS 16K FLANGED	BC	BC	
CONDENSATE LINE	-	-	65 TO 50	KS-SPP	-	-	INS	TI 180-223	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15										BC		
HEATING COIL IN E/R	8	169.6	40 TO 25	STPG370-S SCH.80	-	12	-	TY	SLEEVE	-	-	-	-	-	CLASS II
HEATING COIL IN O.B. TK & B.H. TK	8	169.6	40 TO 25	SUS316L SCH.40	-	12	-	TZ	SLEEVE	-	-	-	-	-	CLASS II

NOTE

1. THERMOSENSOR FOR TEMP.CONT.V/V IS TO BE INSTALLED AT ANGLE MORE THAN 30 DEGREE FROM THE HORIZONTAL POSITION.

△A 05

6K STEAM SERVICE & DRAIN SYSTEM

TO/FROM ACCOMMODATION (AIR COND. ROOM)

UPPER DECK

TH-106-50A

TI-181-25A

TH-108-25A

PACKAGE UNIT

TH-109-25A

TH-108-25A

109V (15A) NEAR INCIN.

105V (15A) 6-TI-4 INCIN. W.O. SERV. TK

107V (A) (15A) 6-TI-5 INCIN. W.O. SETT. TK

17T 18T

106V 108V

TI-182-15A TI-183-15A

TH-111-25A

TH-137-25A

202V (15A) 6-TI-19 G/E L.O. SETT. TK

110V (15A) 6-TI-6 MAIN L.O. SETT. TK

112V (15A) TO 2ND DK (P)

26T 19T

203V 111V

TI-180-15A TI-184-15A

PACKAGE UNIT

113V 10K-25A 115V

TH-112-25A

114V CALORIFIER

10K-15A 116V (C)

TI-185-15A

TH-107-25A

TH-165-50A TH-166-50A

183V 184V (15A) NO.1 L.S. H.F.O BUNK TK(P)

28T 29T 185V 186V 25A

TI-220-25A

TH-162-50A TH-163-50A

169V 170V (15A) NO.1 H.F.O BUNK TK(S)

22T 23T 171V 172V 25A

TI-214-25A

PACKAGE UNIT

221V 222V 223V 224V 225V 226V 227V 228V 229V 230V 231V

10Ø CUT

INCIN. W.O LINE STEAM TRACING

M/E F.O SERV. LINE STEAM TRACING

M/E F.O DISCH. FILTER DRAIN LINE STEAM TRACING

G/E F.O SERV. LINE STEAM TRACING

G/E F.O DISCH. FILTER DRAIN LINE STEAM TRACING

BOILER F.O SERV. LINE STEAM TRACING

F.O PURIFYING LINE STEAM TRACING

H.F.O TRANSFER LINE STEAM TRACING

M/E CYL-OIL LINE STEAM TRACING

SLUDGE PIPE STEAM TRACING

SPARE

37T 38T 39T 40T 41T 42T 43T 44T 45T 47T 48T

TH-106-50A

TI-199-40A

TH-108-25A

TH-111-25A

TH-107-25A

TH-121-80A

TH-135-40A

P38 34 (TH-101-100A) 101V

FROM / TO BOILER FEED W. SYSTEM 35 P38 TI-226-50A

250V 104V

TH-121-80A

PACKAGE UNIT

135V TH-126-50A TH-125-50A

128V 16K-25A 137V

243V

TH-127-50A

131V 10K-50A 129V (A) 10K-50A

NO.2 M/E F.O HEATER NO.1 M/E F.O HEATER

5T 4T

132V 130V

TI-194-25A

10Ø CUT M/E F.O SERV. LINE STEAM TRACING

133V 173V 22Ø 22Ø 22Ø 22Ø

6T 49T 134V 193V

M/E F.O AUTO FILTER

TI-195-15A

TI-196-25A

PACKAGE UNIT

147V TH-130-25A TH-129-40A

140V 16K-25A 149V

244V

TH-131-25A

143V 10K-25A 141V (A) 10K-25A

NO.2 G/E F.O HEATER NO.1 G/E F.O HEATER

9T 8T

144V 142V

TI-202-15A

10Ø CUT G/E F.O SERV. LINE STEAM TRACING

145V 174V 22Ø 22Ø 22Ø 22Ø

10T 52T 146V 194V

G/E F.O AUTO FILTER

TI-203-15A

TI-196-25A

PACKAGE UNIT

TH-134-25A TH-130-40A TH-136-25A

154V 151V 160V 163V 157V

155V SET. 90°C 152V SET. 90°C TC 161V SET. 98°C TC 158V SET. 98°C

10K-25A 10K-40A

NO.2 MAIN L.O PURI. HEATER NO.1 MAIN L.O PURI. HEATER F.O OUTLET NO.2 H.F.O PURI. HEATER F.O PURIFYING LINE STEAM TRACING F.O OUTLET NO.1 H.F.O PURI. HEATER

13T 12T 15T-36T 14T

156V 153V 162V 159V

TI-205-25A TI-207-15A

TI-206-25A TI-208-15A

TI-199-40A

TH-151-50A

TI-199-40A

TH-119-25A TH-120-25A TH-122-25A TH-123-25A TH-124-25A

127V 121V 164V 211V 240V (A) 234V

(15A) TO 3RD DK (P) TO 2ND DK (S)

117V 123V 166V 213V

119V 122V 165V 212V

SET. 60°C SET. 80°C SET. 80°C SET. 60°C

118V 122V 165V 212V (15A)

6-TI-15 L.S. H.F.O SETT. TK 6-TI-16 L.S. H.F.O SERV. TK 6-TI-1 H.F.O. SERV. TK 6-TI-2 H.F.O. SETT. TK 6-TI-3 SLUDGE TK

20T 21T 1T 2T 3T

120V 124V 167V 214V 126V (C)

TI-189-15A TI-190-15A TI-191-15A TI-192-15A TI-193-15A

CS02C

125V (15A)

TH-124-25A

TH-125-50A

TH-128-15A

TH-129-40A

TH-132-15A

TH-135-40A

TH-136-25A

TH-138-40A

TH-171-50A

TH-170-25A

TH-157-50A

TH-155-40A

TH-160 -25A TH-161 -15A

181V 182V 138V

10K-25A 10Ø UNION

43 P28

M/E FIRE EXTINGUISHING IN SCAVENGE AIR SPACE

M/E SCAV. AIR BOX DRAIN LINE CLEANING

12Ø COPPER M/E F.O LINE STM TRAC'G

46T 150V 15A

10Ø UNION

TH-152-25A TH-174-25A TH-153-25A TH-154-25A

199V (A) (15A) TO FLOOR AFT CENTER

175V 178V 177V (A) 179V

(15A) 6-TI-7 OILY BILGE TK CS02D 6-TI-18 BILGE HOLDING TK CS02E 6-TI-8 SCAV. AIR BOX DRAIN TK 6-TI-9 MAIN L.O SUMP TK CS02A (AROUND SUCTION BELL MOUTH OF MAIN L.O P'P)

24T 25T 27T

176V 242V 180V

TI-216-15A TI-213-15A TI-218-15A

TH-164-25A TH-172-50A TH-173-50A

NEAR HIGH SEA CHEST 236V (15A)

TH-159-25A

PACKAGE UNIT

191V 232V (A) 233V (A)

6-TI-12 F.O OVERFLOW TK CS02B 6-TI-17 NO.2 H.F.O BUNK TK(P)

32T 51T 50T

192V 234V (A) 235V (A)

TI-223-15A TI-227-25A TI-228-25A

41 P16

TO HIGH SEA CHEST

TH-167-50A TH-168-50A

201V (15A) TO 3RD DK (S)

187V 188V

6-TI-11 NO.2 H.F.O BUNK TK(S)

30T 31T

189V 190V

TI-221-25A TI-222-25A

PACKAGE UNIT

TH-169-25A

195V

6-TI-13 AIR CLR CHEM. CLEANING TK

33T

196V

TI-224-15A

40 P16

TO LOW SEA CHEST

NEAR LOW SEA CHEST 238V (15A)

PACKAGE UNIT

197V 10K-50A M/E J.F.W PREHEATER 16T 198V 10K-25A

TI-225-40A

NO.	ITEM	NO.
4		
3	TEMP. GAUGE	6-TI-1 -- 18
2	STEAM TRAP	IT-52T
1	VALVE	IOIV-244V

SHIP NO. S467/8, S569 -T-

6K STEAM SERVICE & DRAIN SYSTEM

A3(420X297)

△ SOIL DRAINAGE AND DECK SCUPPER SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

-P-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	REFLECTED FAN ROOM DRAIN SYSTEM. (D.I)	J.H.CHOI	H.S.KEE
		02	REFLECTED THE DETAIL OF VACUUM TOILET SYSTEM. (M.R)		
		03	CHANGED THE POSITION OF HOSPITAL SOIL DRAIN LINE. (D.I)		
		04	INCREASED WEATHER DECK SCUPPER LINE SIZE FROM 125A TO 150A. (D.I)		
		05	CHANGED S.W.SERVICE TO SEWAGE COLLECT TANK LINE SIZE FRON 40A TO 25A. (D.I)		
		06	CHANGED SOIL (P&S) DRAIN LINE SIZE FROM 65A TO 50A. (D.I)		
		07	ADDED DRAIN LINE TO SEWAGE COLLECT TANK AT REF.CHAMBER, GALLEY & GRAY WATER. (P&S) (D.C)		
100	'10.11.05	01	ADDED SPOOL PIECE AT SEWAGE COLLECT TANK DRAIN LINE (C.C)	J.H.CHOI	H.S.KEE
200	'11.03.18	01	ADDED GREY WATER COLELCTING SYSTEM. (D.C)	J.H.CHOI	H.S.KEE

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
SOIL DRAINAGE & WASTE WATER LINE	-	-	150 TO 100	KS-SPP	-	-	GAL	PA 01-09	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			80 TO 65	STPG370-E SCH.40				PB 11-16							
			50	STPG370-E SCH.80				PC 21-39					FC		
			40 TO 15										BC		
DECK SCUPPER LINES IN E/R	-	-	40 TO 15	KS-SPP	-	-	GAL	PD 41-55	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
WEATHER DECK SCUPPER LINES	-	-	150 TO 100	STPG370-E SCH.80	-	-	GAL	PE 61-62	BUTT WELD OR SLEEVE	-	-	-	-	-	
AIR VENT & OVERFLOW LINES	-	-	100 TO 50	KS-SPP	-	-	GAL	PF 72-77	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 25										BC		

NOTE

1. THE STORM VALVE (65A AND ABOVE) BODY INSIDE AT SEA OVERBOARD DISCHANGE TO BE RUBBER LINING.

SOIL DRAINAGE & DECK SCUPPER SYSTEM

SWEAT WASTE SCUPPER WATER(P) DRAIN
(P) (S)
BG-52 BG-51
SOIL(P) TO FUNNEL SOIL(S) HOSPITAL (SOIL) (WASTE WATER)
SWEAT SCUPPER DRAIN
WASTE WATER(S)
GALLEY DRAIN
PROVISION REFRIG. CHAMBER
NOTE: TO BE INSULATED BY CANVAS MATERIAL AT THE HORIZONTAL PIPING ONLY UNDER UPPER DECK.

PB-15-65A (TYPICAL) PC-29-50A (TYPICAL) PC-28-25A (TYPICAL)
PC-24-50A
PB-14-50A (TYPICAL)
PB-13-50A (TYPICAL)
PC-27-25A (TYPICAL)
PB-12-65A (TYPICAL)
PC-26-50A (TYPICAL)
PC-38-50A
SOIL DRAIN PIPE LENGTH: MIN.5M FROM HOSPITAL
PF-72-25A
PC-37-50A
PC-36-50A
PC-25-50A
PC-23-50A
PC-21-50A
PC-22-50A
PC-33-50A

26V 25V 5V 3V 4V 6V
28V 27V 30V 29V 32V 31V
E/R PUBLIC TOILET
WASH BASIN
PD-43-50A
49 P14
TO B.H TK

PA-09-100A PB-16-80A PA-08-100A PA-07-100A PA-06-100A PA-05-100A PA-04-100A PB-11-80A
MIN. 0.0IL
F.L.W.L.
B.W.L.
(10K) 8V (BC) (10K) 7V (BC)
9V (BC) (10K) 10V (BC) (10K) 14V (BC)

PF-73-65A
500MM
DN50 DN50
FLOAT TYPE LEVEL GAUGE
P42 62 TO CLEAN BILGE TK
SEWAGE COLLECT TANK
(SPEC. :5.0 M3)
(ACTUAL:6.11M3)
HIGHER THAN VACUUMARATOR INLET CONNECTION
MIN.200
OVERFLOW
15A
PLUG
PF-74-65A
(V1) 50A (V2) 50A (V3) 80A (V4) 50A (V5) 50A (V6) 50A (V7) 50A
PI CI
11V
PF-76-50A
SPOOL PIECE
12V
PACKAGE UNIT (SHINWOO)
PF-74-65A TO BILGE HOLD TK (SB-23-25A) FROM MAIN COOL'G S/W PUMP
36 P14
P16 145

LOUVER (P&S)
E/R FAN (2 SETS)
FAN ROOM BOTTOM
ATMOSPHERE
UPPER DECK
PD-55-40A (P&S)
HULL DUCT
TO UPPER SCUPPER

(P) (S)
PD-41 50A PD-42 50A
V/V TO BE CLOSED DURING HEAVY RAIN
50A 100A PD-43 100A
25A 500A
41V 42V 40A
DETAIL OF FUNNEL TOP DRAIN TK
VD-145 -40A
23 P32
TO O.B. TANK (OIL MIST CHAMBER DRN)
PD-44-40A (IF NO. 8 AFT.)

UPPER DECK
PD-45-40A PD-46-40A PD-47-40A PD-48-40A PD-49-40A PD-50-40A PD-51-40A PD-52-40A
PE-61 150A PE-62 -150A
MAX.400MM
TO BILGE WELL TO BILGE WELL

A01 A02 A03 A04 A05 A06 A07

NO.	ITEM	NO.
4		
3		
2		
1	VALVE	IV-18V

SHIP NO. S467/~~S569~~ -P-

SOIL DRAINAGE & DECK SCUPPER SYSTEM

(BULK) A3(420X297)

20110421-D033000-이준수-2997 /20110421-기장설계부-완성도면

△ MISCELLANEOUS SYSTEM PLAN HISTORY

SHIP NO. S467/8, S569

-M-

REV. NO.	DATE	MARK	DESCRIPTION	CHECKED BY	APPROVED BY
ORG.	2010.3.19	-	ORIGINALLY PREPARED FOR HULL NO. S467/468	J.S. KIM	Y.H. CHA
A	'10.08.30	01	INCREASED M/E EXH.GAS PIPE LINE SIZE FROM 1400A TO 1450A. (M.R)	J.H.CHOI	H.S.KEE
		02	INCREASED INCIN. EXH.GAS PIPE LINE SIZE FROM 500A TO 550A. (M.R)		
		03	INCREASED BOILER EXH.GAS PIPE LINE SIZE FROM 350A TO 400A. (M.R)		
		04	REFLECTED THE DETAIL OF SEAL POT DRAWING. (D.I)		
		05	REFLECTED CO2 SYSTEM ACCORDING TO MAKER DRAWING. (M.R)		
		06	REFLECTED VALVE REMOTE CONTROL SYSTEM ACC. TO MAKER DRAWING. (M.R)		
		07	ADDED G/E L.O.SETT.TK EM'CY SHUT-OFF VALVE LINE. (O.C)		
		08	ADDED THE IMO NOX MEASUREMENT FLANGE FOR M/E & D/G. (D.I)		
		09	ADDED TEMP.TRANMITTER AND TEMP.INDICATOR AT BOILER EXH.GAS LINE. (MAKER SUPPLY) (M.R)		
		10	ADDED COAMING AT SOOT COLLECTING TK. (D.I)		
		11	ADDED SOOT COLLECTING TK DRN LINE CONNECTION TO BALLAST STRIPPING EDUCTOR INLET (O.C) AND ADDED PIPE CODE "XF". (D.I)		
		12	CHANGED INTERNAL STRUCTURE FOR SOOT COLLECTING TANK. (D.I)		
		13	INCREASED AIR VENT FOR AIR COND.PLANT AND PROV.REF.PLANT ASSEMBLY LINE SIZE FROM 15A TO 25A. (D.I)		
		14	DELETED G/E T/C DRAIN LNE ACC.TO MAKER RECOMMENDATION. (M.R)		
		15	ADDED TEMP.TRANSMITTER AT E.G.E. EXH.GAS OUTLET LINE. (D.I)		
100	'10.11.05	01	ADDED GATE VALVE AT SOOT COLLECT'G TK OVFL LINE. (D.I)	J.H.CHOI	H.S.KEE

SPECIFICATION FOR PIPING SYSTEM

SERVICE	FLUID CON. PRESS (KG/CM²)	FLUID CON. TEMP. (° C)	PIPE NOM. DIA. (A)	PIPE MAT'L SPEC.	PIPE TEST PRESS. SHOP	PIPE TEST PRESS. SHIP	PIPE TREAT-MENT	PIPE NO.	PIPE CONNEC. TYPE	PIPE CONNEC. FLANGE ST'D	PIPE CONNEC. FLANGE MAT'L	VALVE CONNEC. TYPE	VALVE MAT'L BODY	VALVE MAT'L DISC	REMARK
R-404A LINE FOR AIR COND./ PROV. REF. COND. PLNAT	-	-	85Ø TO 20Ø	COPPER C1220T-1/2H	-	-	INS	MA 01-23	SOCKET BRAZING	-	-	-	-	-	
			45Ø TO 20Ø				-	MB							
			15Ø TO 10Ø	COPPER C1220T-0			INS	MC							
			15Ø TO 10Ø				-	MD							
	-	-	25 TO 15	STPG370-E SCH.40	-	-	GAL	ME 26-29	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	-	-	-	
EXHAUST GAS LINE	-	-	1400 TO 650	SS400 (6.0T)	-	-	INS	XA 31-32	BUTT-WELDED OR SLEEVE OR FLANGE	JISF7805 (F-TYPE)	SS400	-	-	-	SEE NOTE 1
			600 TO 300	KS-SPP				XB 36-40							
			100 TO 50	STPG370-E SCH.40	-	-	GAL	XD 51-62	FLANGE OR SLEEVE	SLIP-ON JIS 5K	SS400	JIS 5K FLANGED	FC	BC	
			40 TO 15	△A 11									BC		
			100	STPG370-E SCH.80			PE	XF 63					FC		
HYD. VALVE REMOTE CONTROL LINES	135	-	40 TO 15	STPG370-S SCH.80	203	-	-	HA 81	WELD SOCKET OR UNION	F-TYPE JIS 280K SQ FLAN.	SF440	-	-	-	CLASS I
	10	-	40 TO 15	STPG370-S SCH.40	15 △A 06	-	-	HB 82	FLANGE OR SLEEVE	F-TYPE SLIP-ON JIS 10K	SS400	-	-	-	CLASS II △A 06
CO2 SYSTEM	-	-	125 TO 25	STPG370-E SCH.40	-	7.0 (AIR BLOW'G)	GAL	CA	FLANGE OR SLEEVE	SLIP-ON JIS 10K	SS400	-	-	-	
COMP. AIR LINE FOR EM'CY SHUT -OFF VALVES	8.8	-	15 TO 6	STPG370-E SCH.40	-	12	GAL	AG 101-103	FLANGE OR SLEEVE	SLIP-ON JIS 10K	SS400	JIS 16K FLANGED	BC	BC	
			8Ø	COPPER C1220T-0	-	-	-	AH	BITE UNION	-	-	-	BC	BC	
OXYGEN LINE	8	-	15 TO 6	STPG370-S SCH.40	-	12	-	AI 111	SOCKET WELD'G	-	-	-	-	-	
ACETYLENE LINE	0.8	-	15 TO 6	STPG370-S SCH.40	-	10	-	AJ 112	SOCKET WELD'G	-	-	-	-	-	

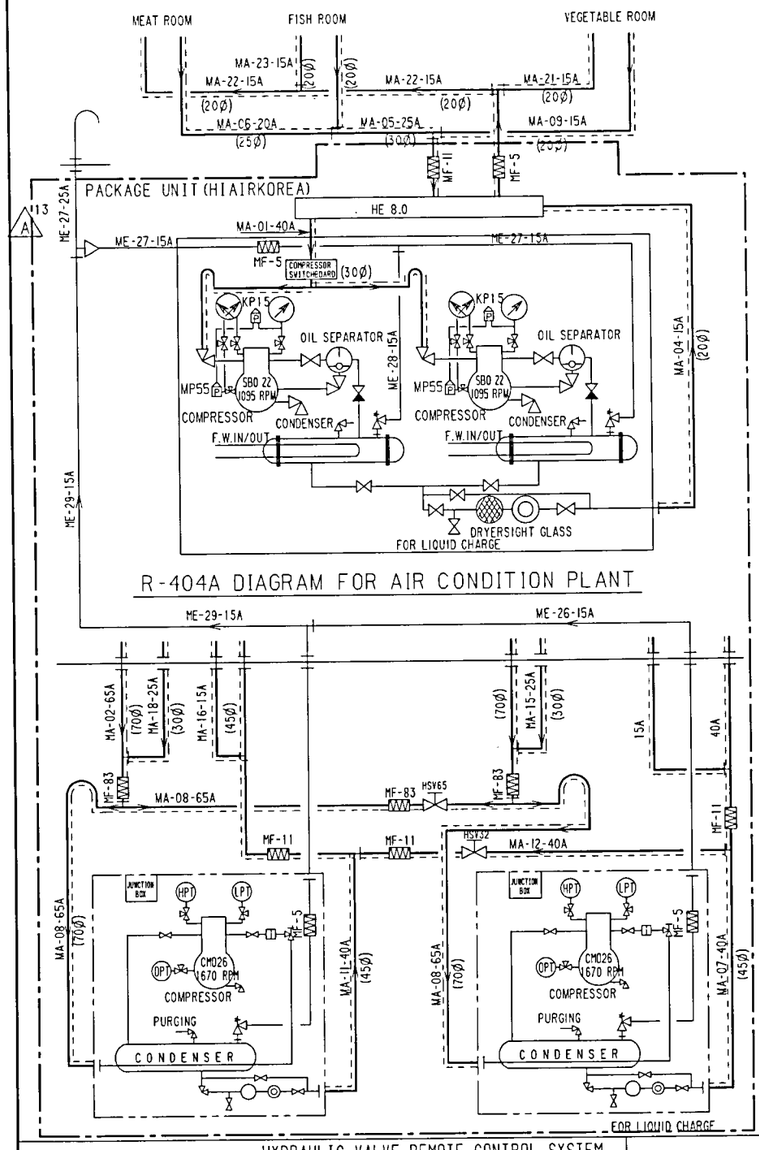
NOTE

1. THE MATERIAL OF M/E EXHAUST GAS UPTAKE FOR EXPOSED WEATHER PART TO BE OF SMA (ATMOSPHERIC CORROSION RESISTANCE) STEEL OR EQUIVALENT.

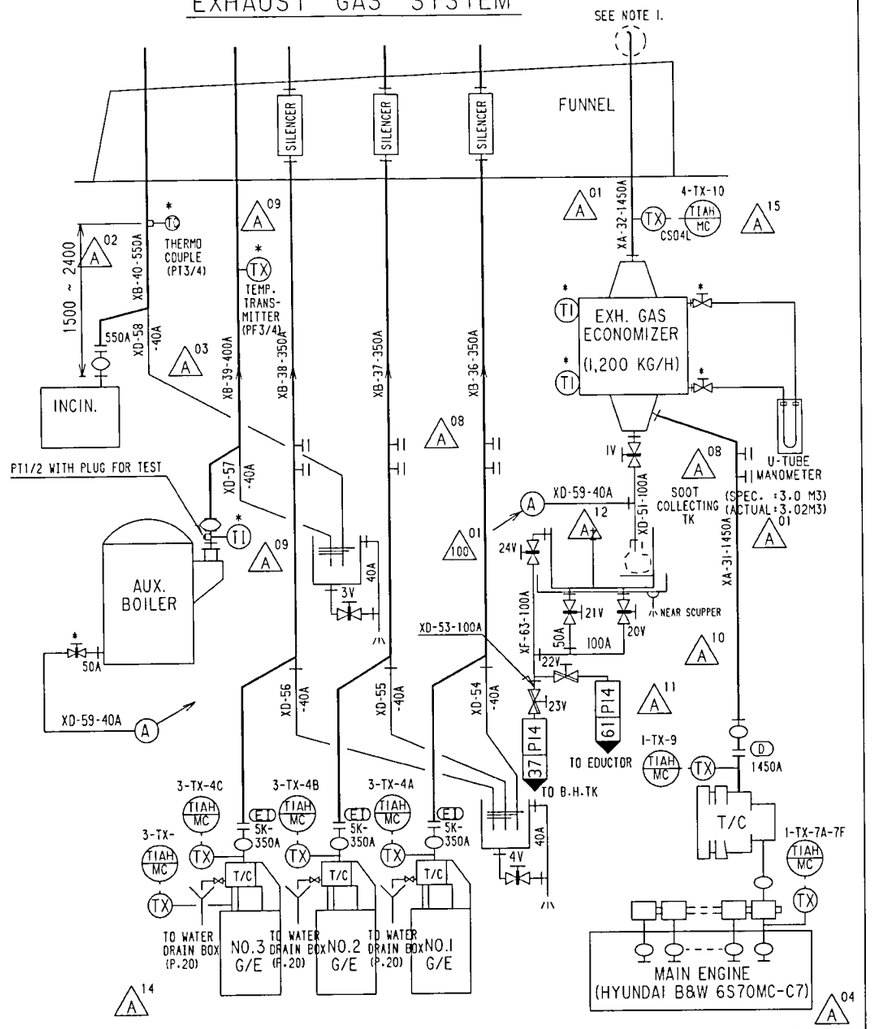
MISCELLANEOUS SYSTEM

(BULK) A3 (420X297)

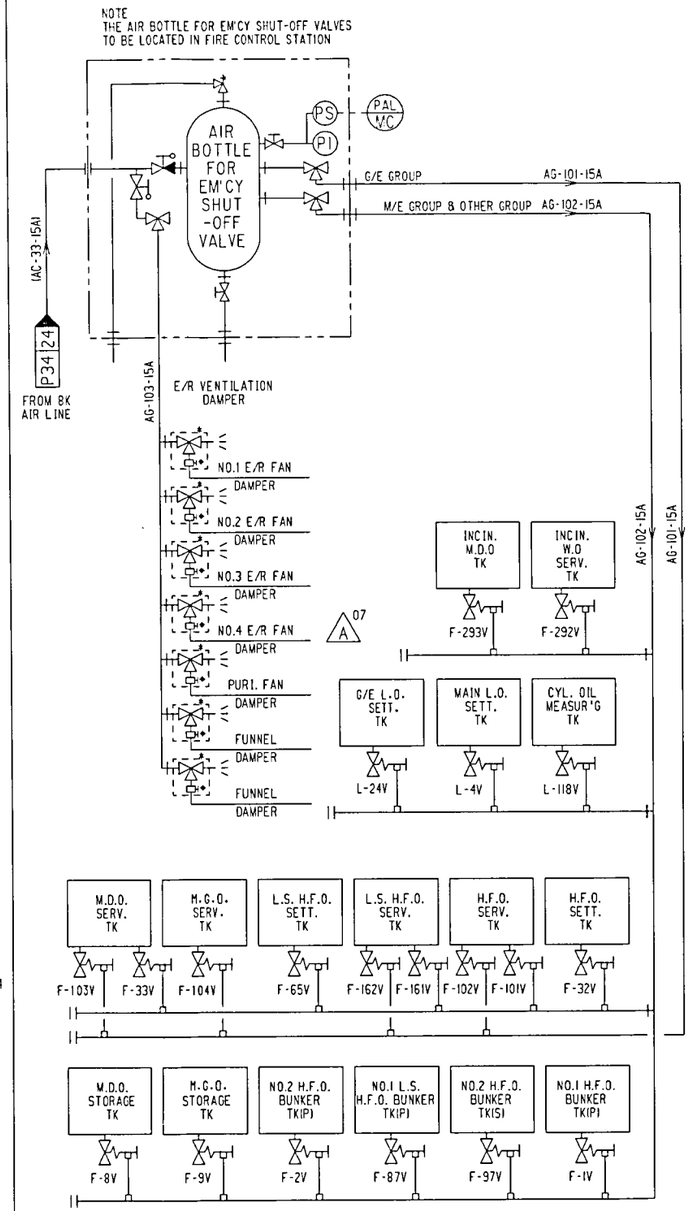
R-404A DIAGRAM FOR PROV. REF. CONDENSER



EXHAUST GAS SYSTEM

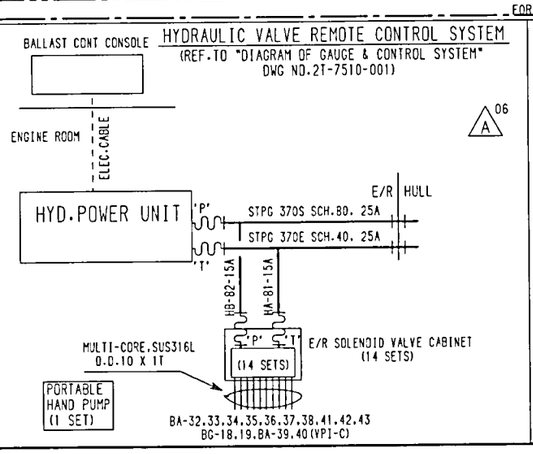


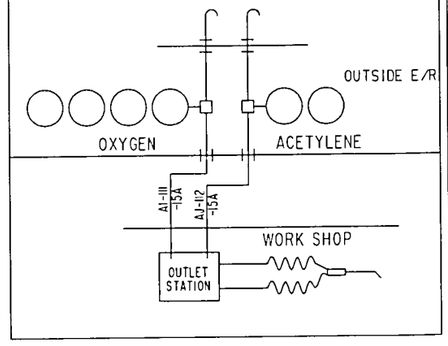
NOTE
THE AIR BOTTLE FOR EM'CY SHUT-OFF VALVES TO BE LOCATED IN FIRE CONTROL STATION



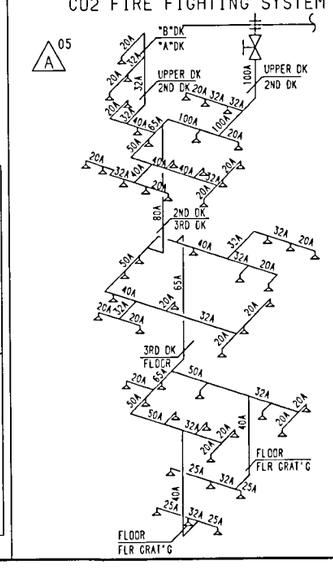
HYDRAULIC VALVE REMOTE CONTROL SYSTEM

(REF.TO "DIAGRAM OF GAUGE & CONTROL SYSTEM" DWG NO.2T-7510-001)

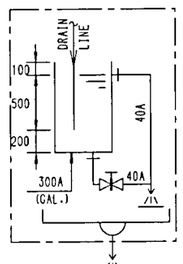


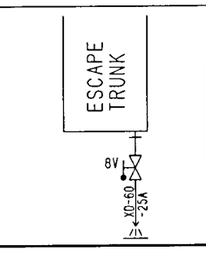


CO2 FIRE FIGHTING SYSTEM

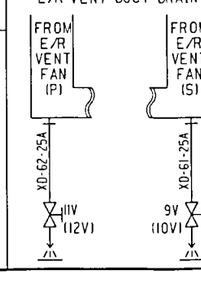


DETAIL FOR SEAL POT





E/R VENT DUCT DRAIN



NO.	ITEM	NO.
4		
3		
2		
1	VALVE	IV-12V

SHIP NO. S467/8,S569 -M-

MISCELLANEOUS SYSTEM

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E/R MACHINERY PARTICULAR

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1. Scope

This standard provides for E/R machinery particular format.

2. Content

**** This machinery particular to be completed when maker's data is available.***

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
1	MAIN ENGINE	HYUNDAI-MAN B&W 6S70MC-C7 (SINGLE ACTING, TWO(2) STROKE, CROSSHEAD, TURBOCHARGED, REVERSIBLE, MARINE DIESEL ENGINE)	1	1. NO.OF CYLINDER : SIX (6) 2. CYLINDER BORE x STROKE : 700 x 2,800 mm M.C.R / N.C.R ·OUTPUT (kW) 18,660 / 15,861 ·REVOLUTION (rpm) 91 / 86.2 ·MEAN EFF. PRESSURE (bar) 19 / 17.1 ·MEAN PISTON SPEED (m/sec) 8.5 / - 3. ROTATION : CLOCKWISE VIEWED FROM FLYWHEEL SIDE 4. STARTING METHOD : COMPRESSED AIR (30 kg/cm^2) 5. EXH. GAS Q'TY x TEMP. : 152,900 kg/h x 231 ℃ (AT NCR UNDER ISO) 6. COOLING METHOD - FRESH WATER : CYL. JACKET, SCAV. AIR COOLER - SEA WATER : - - LUB. OIL : PISTON 7. TURBO-CHARGER : HYUNDAI-MHI MET TYPE x 1 set 8. F.O. CONSUMP.: 165.5 g/kW·h + 5 % at NCR (USING M.D.O. OF 42,700 kJ/kg IN L.C.V. at SHOP TEST UNDER ISO REF. CONDITION.) 9. F.O. GRADE : H.F.O. 700 cSt at 50 ℃ 10. L.O. CONSUMPTION : - SYS. OIL : 0.15 g/kWh 11. DIMENSION (L x W x H) : 10,400 x 8,600 x 12,800 mm	555,000	HHI-EMD	TEL) 82 52 202 7261 FAX) 82 52 202 7425	1, CHEONHA-DONG, DONG-GU, ULSAN, KOREA
2	STEERING GEAR	2-RAM 4-CYL.	1	1. TYPE : ELECTRO-HYDRAULIC, TWO RAM-FOUR CYLINDER 2. MAX. WORKING TORQUE at 35 ° : 288 ton·m 3. WORKING PRESSURE : 240 kg/cm^2	19,100	FLUTEK LTD.	TEL) 82 55 286 5551 FAX) 82 55 286 5557	192-11, SINCHON-DONG, CHANGWON, GYEONGNAM, KOREA

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
3	PROPELLER	KEYLESS, FPP	1	1. DIA x NO. OF BLADE : 8,200 mm x 4 EA 2. MEAN PITCH : 5942.63 mm 3. MATERIAL : NI-AL-BRONZE	41,333	HHI-EMD	TEL) 82 52 202 7261 FAX) 82 52 202 7425	1, CHEONHA-DONG, DONG-GU, ULSAN, KOREA
	PROPELLER SHAFT	HHI/STD	1	1. DIA x LENGTH : Φ 655 mm x 8,811 mm 2. MATERIAL : FORGED STEEL	22,566			
	INTERMEDIATE SHAFT	HHI/STD	1	1. DIA x LENGTH : Φ 550 mm x 7,900 mm 2. MATERIAL : FORGED STEEL	16,114			
	STERN TUBE SEAL	LIP TYPE	1	AFT / FWD MODEL: 4BL / STERNGUARD MARK II MATERAIL LINER: HIGH Ni-Cr STEEL / F-ALLOY MATERAIL RING: VITON / VITON NO. OF SEAL RING: FOUR(4) / TWO(2)	AFT : 502 FWD : 376	WARTSILA JAPAN LTD.	TEL) 81 76 451 1012 FAX) 81 76 451 3161	14-37, 7-CHOME, MUKAISHINJO-MACHI, TOYAMA, JAPAN
	INTERMEDIATE SHAFT BEARING	SELF LUB., F.W. COOLED TYPE	1	1. MODEL SIZE : # 590 2. DIMENSION(I.D. X LENGTH) : Φ 555.7 mm x 762 mm	1,720			
	AFT STERN TUBE BUSH	OIL LUBRICATING	1	1. INDIA : Φ 656 mm 2. OUTDIA : Φ 776 mm 3. LENGTH : 1,350 mm 4. MATERIAL : CAST IRON WITH WHITE METAL LINING	1,402			
	FWD STERN TUBE BUSH	OIL LUBRICATING	1	1. INDIA : Φ 658 mm 2. OUTDIA : Φ 776 mm 3. LENGTH : 530 mm 4. MATERIAL : CAST IRON WITH WHITE METAL LINING	542			
	PROPELLER SHAFT NUT	HYD. NUT	1	1. OUTDIA : Φ 920 mm 2. LENGTH : 275 mm	922			
4	AUXILIARY BOILER	AUTOMATIC, FORCED DRAFT, H.F.O. BURNING, MARINE BOILER	1	1. EVAPORATION : 2,000 kg/h 2. DESIGN PRESSURE : 8 kg/cm^{2}G 3. WORKING PRESSURE : 6 kg/cm^{2}G 4. FEED WATER TEMPERATURE : 60 ℃ 5. HEATING SURFACE : 28.11 m^2 6. BURNER TYPE : PRESS.JET MODEL : RP-140M FUEL OIL : H.F.O. 700 cSt at 50 ℃ F.O.CONSUMPTION : 151 kg/h 7. F.O. PUMP QUANTITY : TWO(2) CAPACITY : 0.5 m3/h x 6 kg/cm2 MOTOR : 0.44 kW x 1,656 rpm 8. WATER VOLUME : 4.2 m^3 at AVERAGE WATER LEVEL 9. DIMENSION (DIA. x H) : Φ 1,800 x 4,260 mm	9,200	KANGRIM	TEL) 82 55 269 7700 FAX) 82 55 269 7795	40, WOUNGNAM-DONG, CHANGWON CITY, KOREA

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
5	EXHAUST GAS ECONOMIZER	FORCED CIRCULATING, SMOKE TUBE TYPE	1	ITEM / UNIT / CONDITION (ISO / SUMMER / WINTER) GAS FLOW x TEMP. at NCR — kg/h x ℃ — 152,900 x 226.0 / 143,600 x 264.0 / 162,400 x 211.0 DRAFT LOSS at MCR — mmAq — Max. 120 mmAq 1. EVAPORATION : ABT. 1,200 kg/h 2. DESIGN CONDITION : AT NCR UNDER ISO REFERENCE CONDITION 3. SOOT BLOWER : MANUAL TYPE 4. DESIGN PRESSURE : 11.0 kg/cm ^{2}G 5. WORKING PRESSURE : 6.0 kg/cm ^{2}G 6. FEED WATER TEMPERATURE : 60 ℃ 7. HEATING SURFACE : 223 m ^{2} 8. WATER VOLUME : 5 m ^{3} at EVERAGE WATER LEVEL 9. DIMENSION (DIA. x H) : Φ 2,600 x 1,800 mm	11,900	KANGRIM	TEL) 82 55 269 7700 FAX) 82 55 269 7795	40, WOUNGNAM-DONG, CHANGWON CITY, KOREA
6	D/G ENGINE	HYUNDAI - HIMSEN 5H21/32 (FOUR STROKE, TRUNK PISTON IN-LINE TYPE)	3	1. NO. OF CYLINDER : FIVE (5) 2. CYLINDER BORE x STROKE : 210 x 320 mm 3. OUTPUT : ABT. 800 kW 4. REVOLUTION : 720 rpm 5. ROTATION : CLOCKWISE VIEWED FROM FLYWHEEL SIDE 6. F.O. GRADE : H.F.O. 700 cSt at 50 ℃ 7. F.O.CONSUMPTION : 186 g/KW·h + 5% at MCR USING M.D.O of 42,700 kJ/kg in L.C.V. 8. STARTING METHOD : AIR MOTOR STARTING 9. DIMENSION (L x W x H) : 5,451 x 2,070 x 3,084 mm (INCLUDING GENERATOR)	54,600	HHI-EMD	TEL) 82 52 202 7261 FAX) 82 52 202 7425	1, CHEONHA-DONG, DONG-GU, ULSAN, KOREA
	GENERATOR	MARINE DESIGN IP 23 ENCLOSURE BRUSHLESS	3	1. OUTPUT : 750 kW 2. VOLTAGE : AC 450 V 3. FREQUENCY : 60 Hz 4. NO. OF PHASE : 8 5. POWER FACTOR : 0.8 (LAGGING) 6. REVOLUTION : 720 rpm 7. INSULATION : CLASS "F" 8. ENCLOSED : IP 23	15,300	HHI-EES	TEL) 82 52 202 6613 FAX) 82 52 202 6995	1, CHEONHA-DONG, DONG-GU, ULSAN, KOREA

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS			WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
7	CENTRIFUGAL PUMP			CAPACITY m^3/h x mTH	BORE SUCT x DISCH	MOTOR kW x rpm	TOTAL			
	NO.1 MAIN COOLING S.W.	M.D.V.C.	1	460 x 23 (SELF-PRIMING)	250 x 250	45 x 1,800	817	SHINKO IND., LTD	TEL) 81-82-508-1000 FAX) 81-82-508-1020	5-7-21, OHZU, MINAMI-KU, HIROSHIMA, JAPAN
	NO.2 & 3 MAIN COOLING S.W.	M.D.V.C.	2	460 x 23	250 x 250	45 x 1,800	1,494			
	CENTRAL COOLING F.W.	M.D.V.C.	3	360 x 25	250 x 250	37 x 1,800	2,061			
	F.W. GENERATOR EJECTOR	M.D.V.C.	1	75 x 48	125 x 125	30 x 1,800	433			
	M/E JACKET COOLING F.W.	M.D.V.C.	2	155 x 30	150 x 150	22 x 1,800	722			
	M/E AIR COOLER CHEMICAL CLEANING	M.D.H.C.	1	2 x 30	40 x 40	1.5 x 3,600	56			
	HOT WATER CIRCULATING	M.D.H.C.	1	2 x 5	40 x 40	0.4 x 1,800	46			
	BOILER FEED WATER	M.D.H.C.	2	3.5 x 110	50 x 50	7.5 x 3,600	474			
	BOILER WATER CIRCULATING	M.D.H.C.	2	9.6 x 40	50 x 40	5.5 x 3,600	474			
	BILGE, FIRE & G/S	M.D.V.C.	2	400/180 x 30/90 (SELF-PRIMING)	250 x 250	132 x 1,800	3,420			
	BALLAST	M.D.V.C.	2	2,500 x 30	450 x 450	280 x 1,200	7,000			
	MAIN L.O.	M.D.C. DEEP WELL	2	405 x 4.4 Kg/cm2	- x 250	110 x 1,800	3,660			

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS			WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
8	GEAR PUMP			CAPACITY m^3/h x kDP	BORE SUCT x DISCH	MOTOR kW x rpm	TOTAL			
	S/T L.O	M.D.H.R.	2	1 x 3	32 x 25	0.75 x 1,200	104	TAIKO KIKAI	TEL) 81 820 52 3113 FAX) 81 820 53 1001	209-1, SHIMOTABUSE, TABUSE-CHO, KUMAGE-GUN, YAMAGUCHI-PREF. 742-1598, JAPAN
	L.O. TRANSFER	M.D.H.R.	1	6 x 3	65 x 50	2.2 x 1,200	84			
	MAIN L.O. PURIFIER SUPPLY	M.D.H.R.	2	2.6 x 3	50 x 40	1.5 x 1,200	136			
	M/E F.O. CIRCULATING	M.D.H.R.	2	8.3 x 10 (SUCT.+4)	80 x 65	5.5 x 1,200	308			
	M/E F.O. SUPPLY	M.D.H.R.	2	4.6 x 4	65 x 50	2.2 x 1,200	168			
	G/E F.O. BOOSTER	M.D.H.S.	2	1.6 x 10 (SUCT.+4)	40 x 32	1.5 x 1,800	110			
	G/E F.O. SUPPLY	M.D.H.S.	2	0.8 x 4	40 x 32	0.75 x 1,800	106			
	G/E M.G.O. SUPPLY	M.D.H.S.	2	1.6 x 6	50 x 40	2.2 x 1,800	77			
	H.F.O. TRANSFER	M.D.H.R.	1	41 x 3	150 x 125	18.5 x 1,200	399			
	M.D.O. TRANSFER	M.D.H.S.	1	6 x 3	80 x 65	3.7 x 1,800	113			
	H.F.O. PURIFIER SUPPLY	M.D.H.R.	2	4.2 x 3	65 x 50	1.5 x 1,200	158			
	SLUDGE	M.D. MONO	1	5 x 3.5	65 x 65	2.2 x 1,200	184			
	G/E M.D.O. FLUSHING	M.D.H.R.	1	1.2 x 6	25 x 25	0.42 x 1,500	86	HHI-EMD	TEL) 82 52 202 7261 FAX) 82 52 202 7425	1, CHEONHA-DONG, DONG-GU, ULSAN, KOREA
	OILY BILGE	M.D. PISTON	1	5 x 3	50 x 40	1.5 x 1,200	334	SHINKO IND., LTD	TEL) 81-82-508-1000 FAX) 81-82-508-1020	5-7-21, OHZU, MINAMI-KU, HIROSHIMA, JAPAN

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
9	MAIN AIR COMPRESSOR	M.D. RECIPROCAT'G F.W. COOLED	2	1. CAPACITY : 275 m^3/h F.A.D. x 30 kg/cm^2 2. MOTOR : 53.7 kW x 1,200 rpm	2,980	JONGHAP PNEUTEC CO., LTD	TEL) 82 51 974 4800 FAX) 82 51 831 3772	1589-1, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
10	MAIN AIR RESERVOIR	CYLINDRICAL	2	1. VOLUME x PRESSURE : 8 m^3 x 30 kg/cm^2 2. DIMENSION (H x DIA.) : 3,887 x Φ 1,842	9,992	KANGRIM	TEL) 82 55 269 7700 FAX) 82 55 269 7795	40, WOUNGNAM-DONG, CHANGWON CITY, KOREA
	AUXILIARY AIR RESERVOIR	CYLINDRICAL	1	1. VOLUME x PRESSURE : 0.25 m^3 x 30 kg/cm^2 2. DIMENSION (H x DIA.) : 1,696 x Φ 516	193			
11	H.F.O.PURIFIER	AUTOMATIC, SELF-CLEANING, TOTAL & PARTIAL DISCH.	2	1. CAPACITY : 4,300 l/h 2. OIL VISCOSITY : 700 cSt at 50 ℃(MAX. S.G. 1.01 at 15 ℃) 3. BOWL REVOLUTION : 7,800 rpm 4. MOTOR (OUTPUT x SPEED) : 11.0 kW x 1,775 rpm 5. AUTO.CONTROL DEVICE : CONTROL PANEL	1,340	SAMGONG	TEL) 82 51 200 3040~1 FAX) 82 51 200 3046~7	1464-2, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
	MAIN L.O. PURIFIER	AUTOMATIC, SELF-CLEANING, TOTAL DISCHARGE	2	1. CAPACITY : 2,600 l/h 2. OIL VISCOSITY : DETERGENT OIL of SAE #30 at 40 ℃ 3. BOWL REVOLUTION : 10,000 rpm 4. MOTOR (OUTPUT x SPEED) : 7.5 kW x 1,770 rpm 5. AUTO.CONTROL DEVICE : CONTROL PANEL	810			

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
12	CENTRAL F.W. COOLER	TITANIUM PLATE (EACH 50% HEAT CAPACITY)	2	1. F.W. FLOW : 360 m^3/h 2. F.W. IN/OUTLET TEMPERATURE : 53.6 / 36 ℃ 3. S.W. FLOW : 460 m^3/h 4. S.W. IN/OUTLET TEMPERATURE : 32 / 46.2 ℃ 5. HEAT DISSIPATION : ABT. 6,300,000 kcal/h 6. SURFACE AREA : 180.8 m^2	4,924	TRANTER	TEL) 46 8 442 49 70 FAX) 46 8 442 49 80	MARIA SKOLGATA 79B, SE-118 53 STOCKHOLM, SWEDEN
	MAIN L.O. COOLER	SUS PLATE	1	1. L.O. FLOW : 405 m^3/h 2. L.O. IN/OUTLET TEMPERATURE : 53 / 45 ℃ 3. F.W. FLOW : 201 m^3/h 4. F.W. IN/OUTLET TEMPERATURE : 36 / 42.6 ℃ 5. HEAT DISSIPATION : ABT. 1,315,800 kcal/h 6. SURFACE AREA : 299.4 m^2	3,705			
	STERN TUBE L.O. COOLER	SUS PLATE	1	1. L.O. FLOW : 1.0 m^3/h 2. L.O. IN/OUTLET TEMPERATURE : 50 / 45 ℃ 3. F.W. FLOW : 5.0 m^3/h 4. F.W. IN/OUTLET TEMPERATURE : 36 / 36.4 ℃ 5. HEAT DISSIPATION : ABT. 2,000 kcal/h 6. SURFACE AREA : 0.72 m^2	116			
	M.G.O. COOLER	SUS PLATE	1	1. M.G.O. FLOW : 2.3 m^3/h 2. M.G.O. IN/OUTLET TEMPERATURE : 50 / 39 ℃ 3. F.W. FLOW : 5.8 m^3/h 4. F.W. IN/OUTLET TEMPERATURE : 36 / 37.8 ℃ 5. HEAT DISSIPATION : ABT. 10,140 kcal/h 6. SURFACE AREA : 1.62 m^2	120			

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
13	DUMP CONDENSER/ DRAIN COOLER	SHELL & TUBE (EACH 60% HEAT CAPACITY)	2	1. STEAM FLOW : COVERING FULL DUMP STEAM FROM EXH. GAS ECONO. UNDER TROPICAL CONDITION EXCEPT THE STEAM CONS. FO THE RELEVANT MACH. OPERATED ESS. AT SEA 3. F.W. IN/OUTLET TEMPERATURE : 49.4 / 59.36 ℃ 4. HEAT DISSIPATION : ABT. 498,600 kcal/h 5. SURFACE AREA : 9.5 m^2	1,300	DONGHWA ENTEC	TEL) 82 51 970 1070 FAX) 82 51 970 1031	1575-6, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
	M/E JACKET F.W. PREHEATER	SHELL & TUBE	1	1. STEAM FLOW : 489.7 kg/h 2. STEAM IN/OUTLET TEMPERATURE : 6k SAT. STEAM/SAT. WATER 3. F.W. FLOW : 15.5 m^3/h 4. F.W. IN/OUTLET TEMPERATURE : 50 / 65.6 ℃ 5. HEAT DISSIPATION : ABT. 240,720 kcal/h 6. SURFACE AREA : 1.5 m^2	370			
14	M/E F.O. HEATER	SHELL & TUBE	2	1. F.O. FLOW RATE : 8.3 m^3/h 2. F.O. IN/OUTLET TEMPERATURE : 100 / 150 ℃ 3. HEATING SURFACE : 15.49 m^2	846	DONGHWA ENTEC	TEL) 82 51 970 1070 FAX) 82 51 970 1031	1575-6, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
	G/E F.O. HEATER	SHELL & TUBE	2	1. F.O. FLOW RATE : 1.6 m^3/h 2. F.O. IN/OUTLET TEMPERATURE : 100 / 150 ℃ 3. HEATING SURFACE : 5.71 m^2	452			
	H.F.O. PURIFIER HEATER	SHELL & TUBE	2	1. F.O. FLOW RATE : 4.3 m^3/h 2. F.O. IN/OUTLET TEMPERATURE : 55 / 98 ℃ 3. HEATING SURFACE : 2.09 m^2	272			
	MAIN L.O. PURIFIER HEATER	SHELL & TUBE	2	1. L.O. FLOW RATE : 2.6 m^3/h 2. L.O. IN/OUTLET TEMPERATURE : 45 / 95 ℃ 3. HEATING SURFACE : 1.86 m^2	258			
15	F.W.GENERATOR	M/E JACKET WATER HEATING, TUBULAR TYPE	1	1. CAPACITY : 30 ton/day 2. MAX.SALINITY : 10.0 ppm 3. EJECTOR PUMP NO. OF SET : ONE(1) CAPACITY : 75 m^3/h x 48 mTH MOTOR : 30 kW x 1,800 rpm 4. DISTILLATE PUMP NO. OF SET : ONE(1) CAPACITY : 2.5 m^3/h x 30 mTH MOTOR : 1.5 kW x 3,450 rpm 5. DIMENSION (L x W x H) : 1,425 x 1,820 x 1,980 mm	1,140	SASAKURA	TEL) 81 6 6473 2134 FAX) 81 6 6473 5540	7-32, TAKEJIMA 4-CHOME, NISHIYODOGAWA-KU, OSAKA, JAPAN

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
21	E/R VENT FAN	M.D. AXIAL FLOW, REVERSIBLE	2	1. CAPACITY : 1,200 m^3/min x 38 mmAq 2. MOTOR : 18.5 kW x 1,165 rpm	2,624	DAEYANG ELEC.CO.,LTD.	TEL) 82 51 831 6760 FAX) 82 51 832 1177	1612-2, SONGJEONG-DONG, GANGSEO GU, BUSAN, KOREA
		M.D. AXIAL FLOW, NON REVERSIBLE	2	1. CAPACITY : 1,200 m^3/min x 38 mmAq 2. MOTOR : 18.5 kW x 1,165 rpm	3,784			
	PURIFIER ROOM EXHAUST FAN	M.D. AXIAL FLOW NON REVERSIBLE	1	1. CAPACITY : 210 m^3/min x 30 mmAq 2. MOTOR : 2.2 kW x 1,720 rpm	490			
	WELDING SPACE EXH. FAN	M.D. AXIAL FLOW NON REVERSIBLE WALL MOUNTING	1	1. CAPACITY : 15 m3/min x 10 mmAq 2. MOTOR : 0.4 kW x 1,710 rpm	100			
	E/R TOILET FAN	M.D. AXIAL FLOW NON REVERSIBLE WALL MOUNTING	1	1. CAPACITY : 3 m3/min x 15 mmAq 2. MOTOR : 0.09 kW x 1,750 rpm	40			
	INCINERATOR WASTE OIL SETT./SERV. TANK EXH. FAN	M.D. CENTRIFUGAL TYPE	1	1. CAPACITY : 5 m3/min x 40 mmAq 2. MOTOR : 0.4 kW x 1,710 rpm	82			
22	OILY BILGE SEPARATOR	GRAVITY AND FILTERING	1	1. CAPACITY : 5 m^3/h	1,500	GEORIM ENGINEERING	TEL) 82 51 831 2929 FAX) 82 51 831 2933	1591-10, SONGJEONG-DONG, GANGSEO GU, BUSAN, KOREA
23	M.G.P.S	IONIZING ELECTRODES	1	1. S.W. FLOW : 1,400 m^3/h 2. LIFE TIME : Five(5) years (2.5 years for working + 2.5 years for spare)	517.6	K.C.LTD.	TEL) 82 51 831 7720 FAX) 82 51 831 7726	1589-6, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
24	INCINERATOR	SLUDGE OIL & SOLID WASTE BURNING (IMO APPROVED TYPE)	1	1. CAPACITY : ABT. 850,000 kcal/h 2. PRIMARY& SECONDARY BURNER - MODEL : DH 160 E2 - F.O.CONSUMPTION : (PRI.) 17 l/h, (SEC.) 41.6 l/h - MOTOR : 0.125 kW X 2P 3. W.O.DOSING PUMP - TYPE : SELF-PRIMING POSITIVE DISPLACEMENT - CAPACITY : Max.233 l/h at 243 rpm - MOTOR : 0.45 kW X 4P 4. PRIMARY BLOWER - VOLUME/MAX. BACK PRESS. : 6,600 m^3/h X 715 mmAq - MOTOR : 22 kW X 2P 5. MILL PUMP - CAPACITY : 26 m^3/h - MOTOR : 3.7 kW X 2P	6,100	HYUNDAI MARINE MACHINERY CO., LTD.	TEL) 82 32 583 0671 FAX) 82 32 583 0674	602-15, GAJWA-DONG, SEO-GU, INCHEON, KOREA
25	CONTROL AIR DRYER	REFRIGIFILTER	1	1. CAPACITY : 60 m^3/h, F.A.	100	KYUNGNAM DRYER CO., LTD.	TEL) 82 31 963 0080 FAX) 82 31 962 0180	306-1, NAEYU-DONG, DEOGYANG-GU, GOYANG-SI, KYONGGI-DO, KOREA

DATA BOOKLETS (MACHINERY PARTICULARS & MAKER'S ADDRESS) FOR S467/8,S569

SER NO.	NAME OF EQUIPMENT	MODEL & TYPE	Q'TY /SHIP	PARTICULARS	WEIGHT (Kg/SHIP)	MAKER	TELEPHONE/FAX	ADDRESS
26	OVERHEAD CRANE	M.D.	1	1. CAPACITY : S.W.L. 6.3 ton 2. SPAN LENGTH : 7.65 m 3. SPEED HOISTING : 3.0 / 0.4 m/min TRAVERSING : 6.0 m/min TRAVELLING : 3.0 m/min	4,000	ORIENTAL PRECISION & ENGINEERING CO.LTD	TEL) 82 51 979 0888 FAX) 82 51 831 3308	1614-1, SONGJEONG-DONG, GANGSEO-GU, BUSAN, KOREA
27	M/E F.O. VISCOSITY CONTROL UNIT	ELECTRIC	1	1. FLOW RATE : 8.3 m^3/h		VAF INSTRUMENTS	TEL) 31 78 618 3100 FAX) 31 78 617 7068	AMSTELWIJCKWEG 21, 3316 BB DORDRECHT, P.O. BOX 40, 3300 AA DORDRECHT, THE NETHERLANDS
	G/E F.O. VISCOSITY CONTROL UNIT	ELECTRIC	1	1. FLOW RATE : 1.6 m^3/h				
28	M/E F.O. FLOWMETER	POSITIVE DISPLACEMENT	1	1. FLOW RATE : 4,600 l/h 2. KINEMATIC VISCOSITY : 700 cSt at 50 ℃	23	VAF INSTRUMENTS	TEL) 31 78 618 3100 FAX) 31 78 617 7068	AMSTELWIJCKWEG 21, 3316 BB DORDRECHT, P.O. BOX 40, 3300 AA DORDRECHT, THE NETHERLANDS
	G/E H.F.O. FLOWMETER	POSITIVE DISPLACEMENT	1	1. FLOW RATE : 800 l/h 2. KINEMATIC VISCOSITY : 700 cSt at 50 ℃	15.8			
29	UNIT COOLER	PACKAGE TYPE (R-404A)	1	1. CAPACITY : 15,000 kcal/h 2. ELECTRIC HEATING : 12,900 kcal/h	285	CENTURY COPPORATION	TEL) 82 41 420 8010 FAX) 82 41 420 8018	1, DONGSAN-RI, TANGJUNG-MYUN, ASAN CITY, CHUNGNAM, KOREA
30	M/E F.O. DISCHARGE FILTER	AUTO. BACKFLUSHING WITH MANUAL BY-PASS FILTER	1	1. FLOW RATE : 8.3 m^3/h 2. MESH SIZE : NOM. 10 micron	155	BOLL + KIRCH	TEL) 49 22 73 562 293 FAX) 49 22 73 562 176	SINDORF, SIEMENSTRABE 10-14 D-50170 KERPEN, GERMANY
	G/E F.O. DISCHARGE FILTER	AUTO. BACKFLUSHING WITH MANUAL BY-PASS FILTER	1	1. FLOW RATE : 1.6 m^3/h 2. MESH SIZE : NOM. 10 micron	140			
	M/E L.O. DISCHARGE FILTER	AUTO. BACKFLUSHING	1	1. FLOW RATE : 405 m^3/h 2. MESH SIZE : ABS. 40 micron	1,165			