

Lampiran 1

Technical Specification

Freshwater generator type:	JWP-26-C100
Customer :	Samsung Heavy Industries Co., Ltd.

Technical data

Freshwater generator size	Capacity [m3/24h]:	25	NE/NK:	82/82
Jacket water temperature	Inlet [°C]:	82	Outlet [°C]	69.5
Jacket water flow/pressure drop	Flow [m3/h]:	51.7	Pressure drop [bar]:	0.3
Heat consumption from jacket water	[Mcal/h] :	647	or [kW]:	752
Seawater temperature	Inlet [°C]:	32	Outlet [°C]	41.3
Seawater flow/pressure drop	Flow[m3/h]:	62	Pressure drop [bar]:	0.5

Basic data

	(X)	(X)	(X)	Other (Not standard)
Main power	3x380V/50 Hz	3x440/60 Hz	<input checked="" type="checkbox"/> 3x460V/60 Hz	
Control voltage	100 V	110-115 V	220-230 V	<input checked="" type="checkbox"/>
Flange connection	DIN	ANSI	JIS	<input checked="" type="checkbox"/>
Painting colour				
Spare part box	RAL 7032	Munsell 7,5 BG 7/2	<input checked="" type="checkbox"/> Munsell 2,5 G 7/2	
Control panel	RAL 7032	<input checked="" type="checkbox"/> Munsell 7,5 BG 7/2	Munsell 2,5 G 7/2	
Fresh water motor	RAL 7032	Munsell 7,5 BG 7/2	<input checked="" type="checkbox"/> Munsell 2,5 G 7/2	
Classification society	Workshop certificate			

Scope of supply

1 Set(s)/Ship

Basic equipment :		
Structure incl. freshwater pump, standard spares, standard packing and plates:		1
Additional equipment necessary for operation :		
Distillate pump :		1
Electric motor for distillate pump :		1
Feed water treatment :		1
Ejector pump		1
Electric motor for ejector pump		1
Optional equipment / design :		
Control panel option A :		1
Control panel build-on unit at right side		1
Remote start/stop		1
Feed water treatment build-on unit at left side		1
Water clock by-pass :		1
Return pipe to brine :		1
Steel box for spare part kit:		1
Other - Not standard:		
Item	3 Thermometer with thermowell as loose supply	1
Item	The name plate for all instrument to be fitted	1
Item	The root valves for pressure gauges to be provided	1
Item	Contactora(for 1K4) & thermal relay(for 1F4) for ejector pump	1
Comments:		
	Cable tray to be provided	
	The name plate for Remote start/stop to be provided	
	Warning plate not to operate the spring loaded valve to be provided	

Technical Specification filled in by:	Technical Specification review at Desalt
Name: NZG	Reviewed by:
Date: 03/02/2007	Date:

Lampiran 2

Alfa Laval Marine & Power



9.2 Production Information

9.2.2 Freshwater Generator JW(S)P-26-C80(B)/C100

Edition 99-01

9.2.2.2-5 Technical data, JW(S)P-26-C100

Power consumption

freshwater pump:	NE/NK	60 Hz
	82/82-90/90:	0.75 kW

Pressure

	bar(g)	lbs/in ²
Max. jacket water pressure:	4.0	58
Max. back pressure to freshwater tank:	1.6	23
Max. seawater pressure to inlet condenser:	4.0	58
Min. seawater pressure to ejector:	3.0	43
Max. back pressure at ejector outlet:	0.6	8.7

Temperature

Seawater temperature: 0-32°C	Jacket water temperature: 55-95°C
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Flow

Seawater flow: 49-70 m ³ /h	Jacket water flow: 25-72 m ³ /h
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Materials

Separator:	Red brass
Front cover:	Stainless steel
Bed frame:	Steel (hot dip galvanized)
Pipe for brine discharge:	Red brass
Evaporator/condenser plates:	Titanium
Demister:	Stainless steel
Pipe for seawater:	CuNi 90/10
Pipe for fresh water:	CuNi 90/10
Combined brine/air ejector housing:	Red brass
Combined brine/air ejector nozzle:	Stainless steel
Flange for evaporator/condenser:	SG-iron (hot dip galvanized)

Shipping data

Freshwater generator, complete with ejector pump, electrical panel, dosing unit and standard spares.

Weight:	net: 930 kg, gross: 1050 kg
Dimensions:	l x w x h: 2200 x 1300 x 1620 mm
Volume:	4.6 m ³

9.2.2.2-5 Technical data, JW(S)P-26-C100

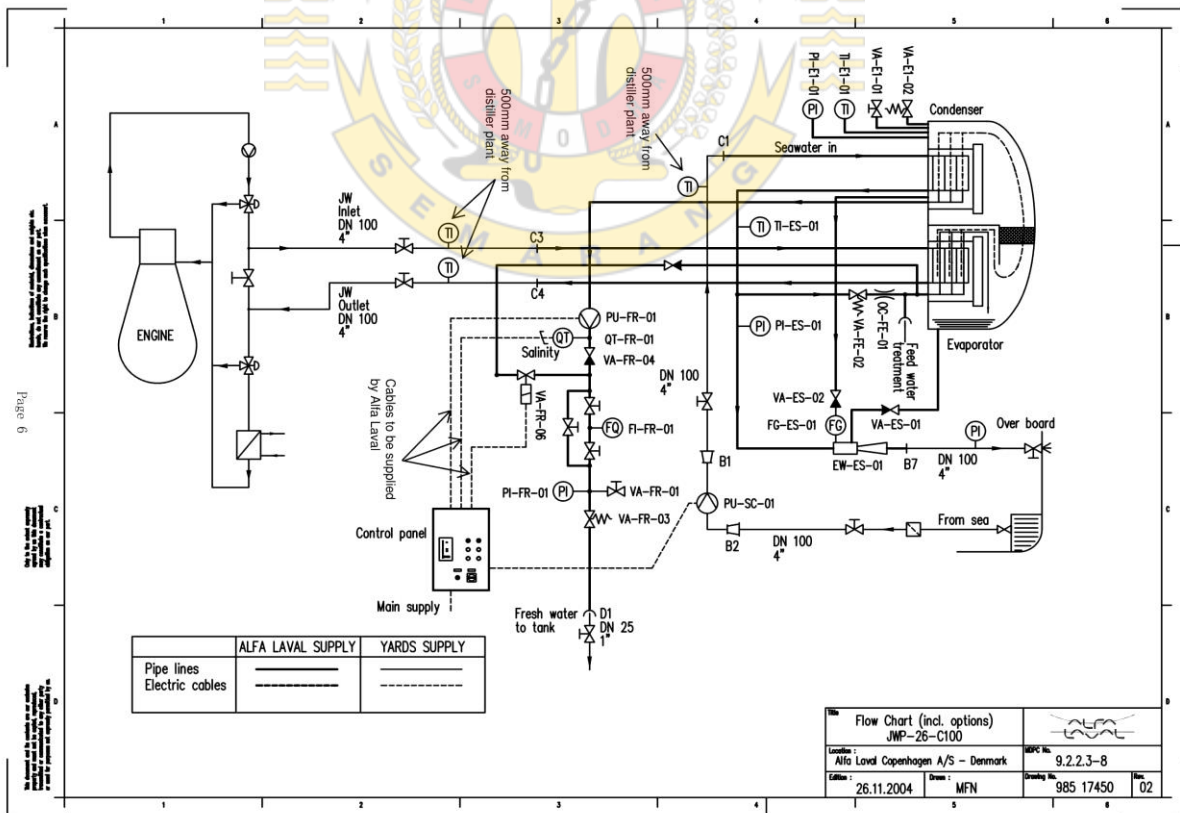
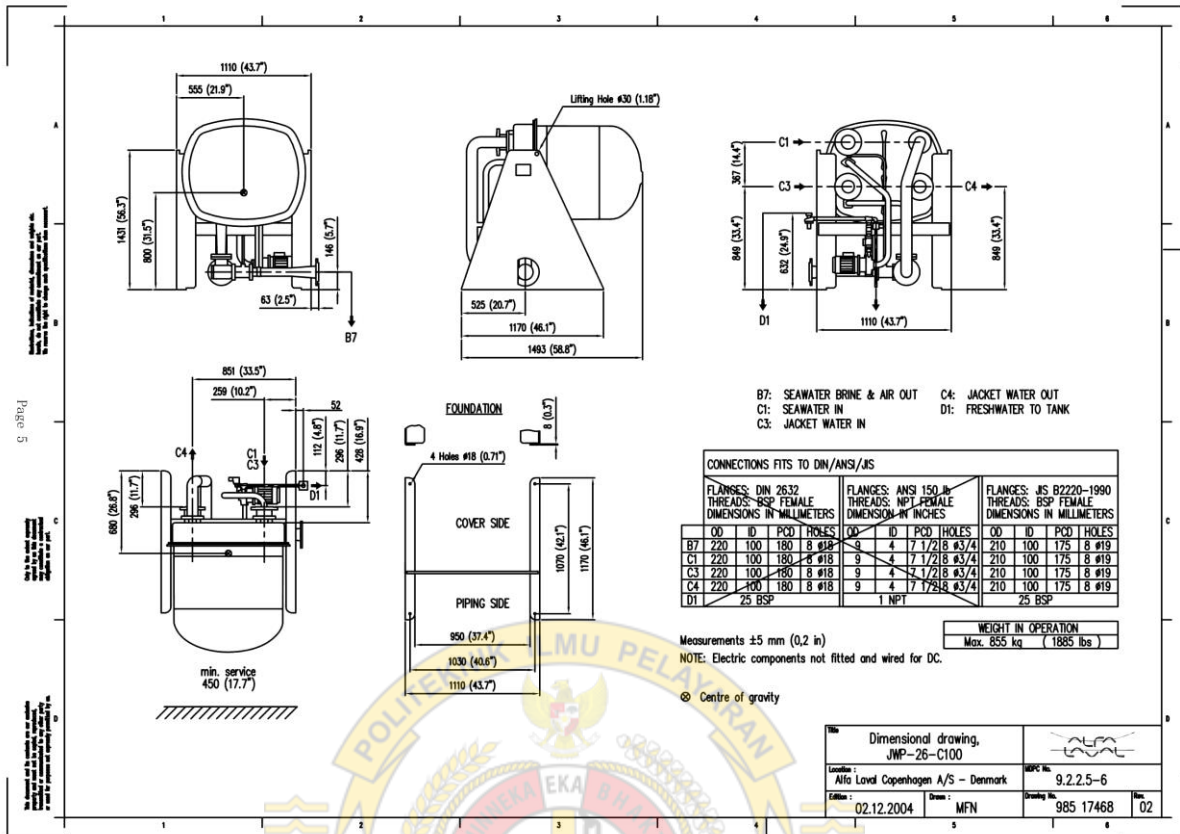
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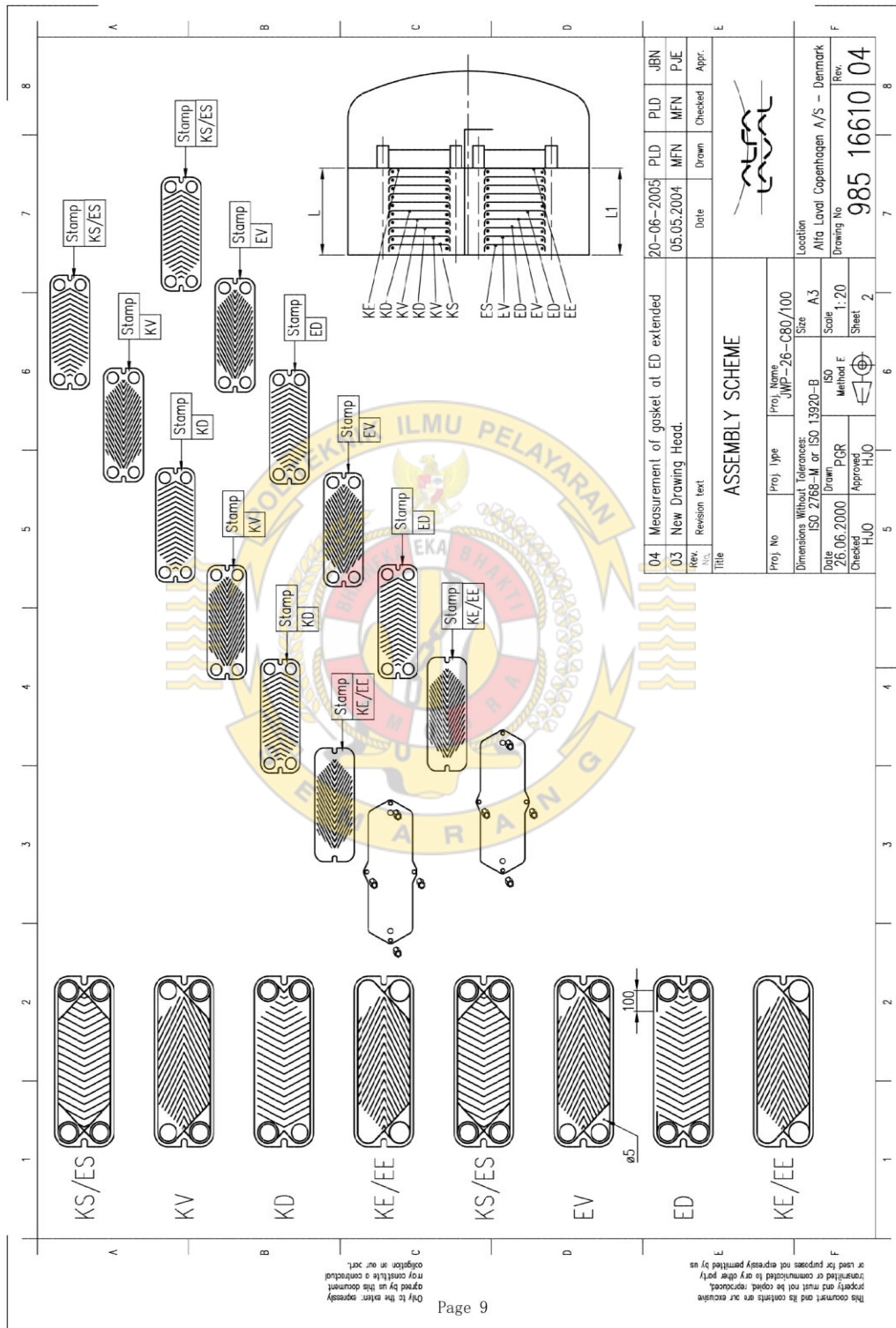
Lampiran 2. Spesifikasi menurut buku manual *fresh water generator* - 2

Lampiran 3



Lampiran 3. Final drawing of Fresh Water Generator

Lampiran 4



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04 Measurement of gasket at ED extended	Date	Date	Date	Date	Date	Date	Date	Date
03 New Drawing Head.	Revision text	20-06-2005	05.05.2004	MFN	MFN	MFN	MFN	JBN
ASSEMBLY SCHEME								
Proj. No.	Proj. Name	Proj. Type	Proj. Size	Location	Location			
26.06.2000	JWP-26-C80/100	ISO 2768-M or ISO 13920-B	A3	Alfa Laval Copenhagen A/S - Denmark	Alfa Laval Copenhagen A/S - Denmark			
Checked	Approved	H2O	H2O	PGR	ISO Method E	Scale	Drawing No.	Rev.
H2O	H2O	H2O	H2O	Method E	1:20	985 16610	04	04

Lampiran 4. Fresh Water Generator plate

Lampiran 5

Maintenance

1.0.0 Why you need to perform regular maintenance duties

Regular maintenance of the plant will improve performance and availability.

The maintenance schedule on the following pages will tell you how often service should be performed on the main components.

As the actual operating conditions of the plant are of major influence on the life time, the overhaul dates are not obligatory but only recommended intervals.

When the plant has been in operation for a longer period of time and experience has been established as to the actual performance, it will be possible to adapt the maintenance schedule.

For service on minor components please refer to component instructions.

1.1.0 Overhaul Intervals

Component	Operating Hours	Action
Evaporator section	As required	Clean in inhibited acid bath
Condenser action	As required	Clean with pure freshwater and brush
Separator vessel with anodes	2000 h	See separator instructions
Combined ejector/cooling water pump with motor	8000 h	Measure seal ring and impeller. Examine mechanical shaft seal, cooling water pipe passage. Megger-test electric motor. Clean pump thoroughly before reassembly.
Freshwater extraction pump with motor	8000 h	See above
Combined air/brine ejector	8000 h	Measure nozzles and diffuser and compare to measurements in technical specification. Max. wear 20% on diffuser cylindrical bore.

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Maintenance

Component	Operating Hours	Action
MV-valves	4000 h	Disassembly and inspect for damage
Demister	8000 h	Clean in inhibited acid bath
Manometers	8000 h	Adjust with control manometer
Salinometer	See "Maintenance of salinometer type DS-20"	See "Maintenance of salinometer type DS-20"

1.2.0 Maintenance of Separator Vessel

The front cover and the pressure plates for the heat exchanger sections (evaporator and condenser) are made of stainless steel with a special chemical treatment. This treatment will reestablish normal surface oxidation after work-up at the factory. The preparation is a natural protection of the stainless steel.

CAUTION

To preserve this natural protection DO NOT scrape or scratch the inside surface of the front cover.

Whenever the separator vessel is opened,

- check that the anodes are functioning.

If the anodes are not functioning and/or scarified, replace them.

NOTE

If the unit is stopped for a longer period than 14 days.

- Open front covers and clean unit inside with freshwater.
- Let the unit dry out completely, before closing covers.

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Trouble-Shooting

1.0.0 Test Sheet

Before taking any action, please fill in a test sheet to find possible causes of malfunctions.

Test sheets can be found in the back of this binder.

1.1.0 Trouble Shooting Table

Problem	Cause	Action
Drop in production.	Partially blocked feed water orifice and/or sludge deposits on hot water side.	Dismantle evaporator section, and clean evaporator and orifice.
	Sludge on the heat exchanger plates on the sea water side.	Dismantle condenser section, and clean.
	Inlet channel in evaporator/condenser plate stack blocked, e.g. with rust scales, gasket fragments etc.	Dismantle evaporator/condenser section, and clean.
	Too low ejector pump pressure.	See instructions for "Low Sea Cooling water/Ejector pump flow / pressure", below.
	Leakages	Carry out a pressure test at max. 150 kPa (1.5 kp/cm ²) (21.8 PSI).a
	Foreign bodies in ejector nozzles.	Inspect nozzles, and clean. Replace nozzles, if damaged.
	Too high back pressure on ejector outlet side. Max 60 kPa (0.6 kp/cm ²) (8.7 PSI).	Check overboard pipe and valves for blocking / functionality.
	Non-return valve in air extraction pipe defect.	Replace non-return valve.
	Hot water temperature too high.	Reduce to specified temperature.
Defective water clock.	Examine water clock. Let the produced water flow through water clock into a 10 l pail, and check production with a stop watch.	

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Trouble-Shooting

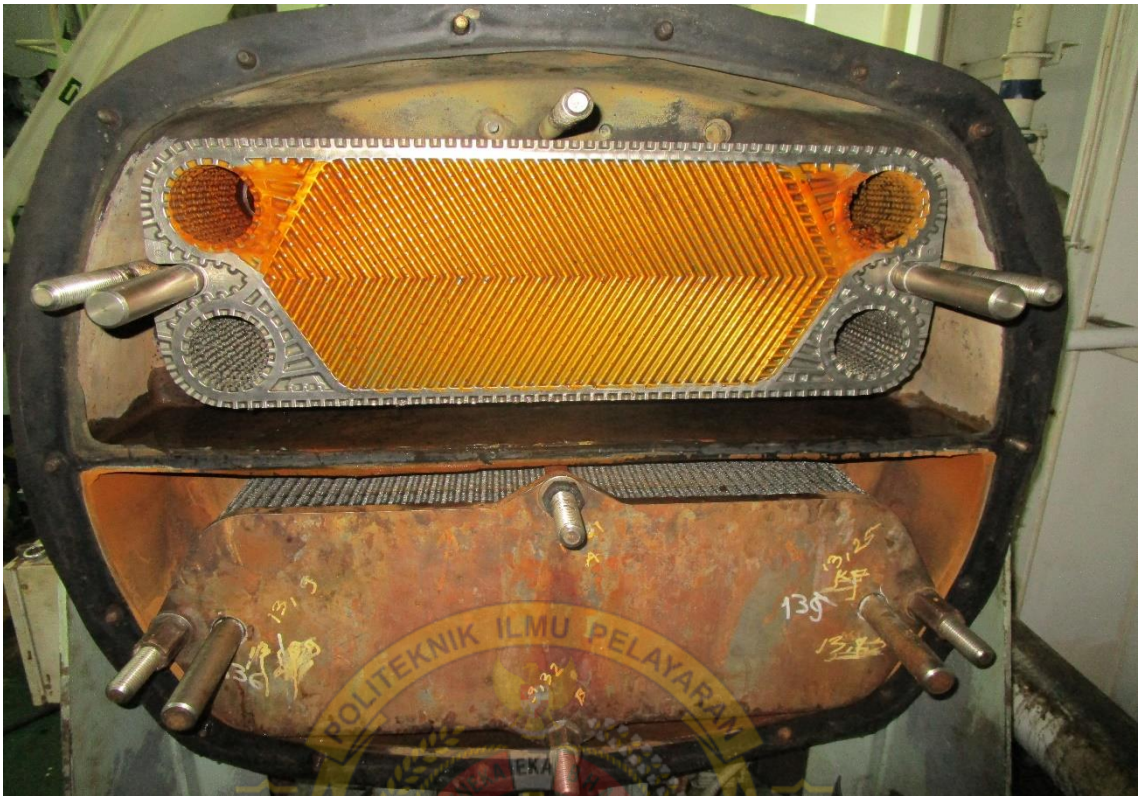
Problem	Cause	Action
Low Sea Cooling water/Ejector pump flow / pressure. Minimum pressure 300 kPa (3.0 kp/cm ²) (43.5 PSI). At inlet side of ejector.	Too low ejector pump pressure.	Clean, or replace pressure gauge.
	Suction strainer blocked.	Clean suction strainer.
	Valves on suction or pressure pipe defect.	Examine and overhaul defective valves.
	Leakage from suction pipe to pump.	Repair.
	Impeller / seal ring defective.	Check pump maximum clearance See "Maintenance of Ejector Pump"
	Clocked up condenser plate stack.	Dismantle condenser plate stack and clean.
	Pump rotating in wrong direction.	Interchange phases.
Sight glass overflow. Normal back pressure for freshwater pump is 120 - 160 kPa (1.2 - 1.6 kp/cm ²) (17.4 - 23.2 PSI). Except for JWP-16-C40 generator type, where the max. back pressure is 80 kPa (0.8 kp/cm ²) (11.6 PSI).	Suction pipe leakage.	Check suction pipe especially unions and connections. Repair.
	Mechanical seal in freshwater pump defect.	Replace mechanical seal.
	Impeller / seal ring in freshwater extraction pipe defect.	Check pump maximum clearance See "Maintenance of Freshwater Pump"
	Pump rotating in wrong direction.	Interchange phases.
	Valves to freshwater tank closed.	Check all valves.
	Inlet filter for water clock blocked.	Clean filter.
Salinity too high (more than 2.0 ppm).	Demister not fitted correctly.	Check that demister is fitted against baffle and front cover.
	Front cover gasket defect or not fitted correctly.	Replace front cover gasket.
	Insufficient brine extraction.	See separate instructions for insufficient brine extraction, below.
	Electrode unit defective or dirty.	Examine electrode unit for cracks. Check that it is fitted correctly. Clean, if necessary.

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Trouble-Shooting

Problem	Cause	Action
	Leakage in condenser section.	Open distiller and pressure test condenser. Max. 600 kPa (6.0 kp/cm ²) (87 PSI). If there is a defective plate, remove together with adjacent plate assemble plate stack according to new plate number with reduced assembly measurements. Check plate gaskets and replace, if necessary.
Insufficient brine extraction - brine level in sight glass higher than 20 mm.	Ejector pump pressure too low.	See special instructions for "Low Sea Cooling water/Ejector pump flow / pressure", above.
	Foreign bodies in ejector nozzles.	Check nozzles, and clean. Replace damaged nozzles.
	Too high back pressure downstream of ejector.	Examine overboard pipe and valves.
	Wrong dimension of feedwater orifice.	Examine orifice dimension - check technical specification.
	Non-return valve in brine suction pipe of ejector defect.	Examine valve and repair, or replace.
Frequent refill of freshwater expansion tank due to loss of hot water.	Leakage in evaporator section.	Open distiller and pressure test condenser. Max. 600 kPa (6.0 kp/cm ²) (87 PSI). If there is a defective plate, remove together with adjacent plates assemble plate stack according to new plate number with reduced assembly measurements. Check plate gaskets and replace, if necessary.
Abnormal amperage consumption of ejector pump motor.	Ejector nozzles defective.	Replace nozzles.
	Wrong dimension of feedwater inlet orifice.	Check dimensions on spare parts list, See List of spare part drawings", and replace if necessary.
	Bearings in motor defective.	Examine with stetoscope, and replace bearings, if defective.
	Contactors defective.	Examine and replace contactor set, if defective.
	Breaking of phases.	Max. 5% difference in amperage between phases.

Lampiran 10

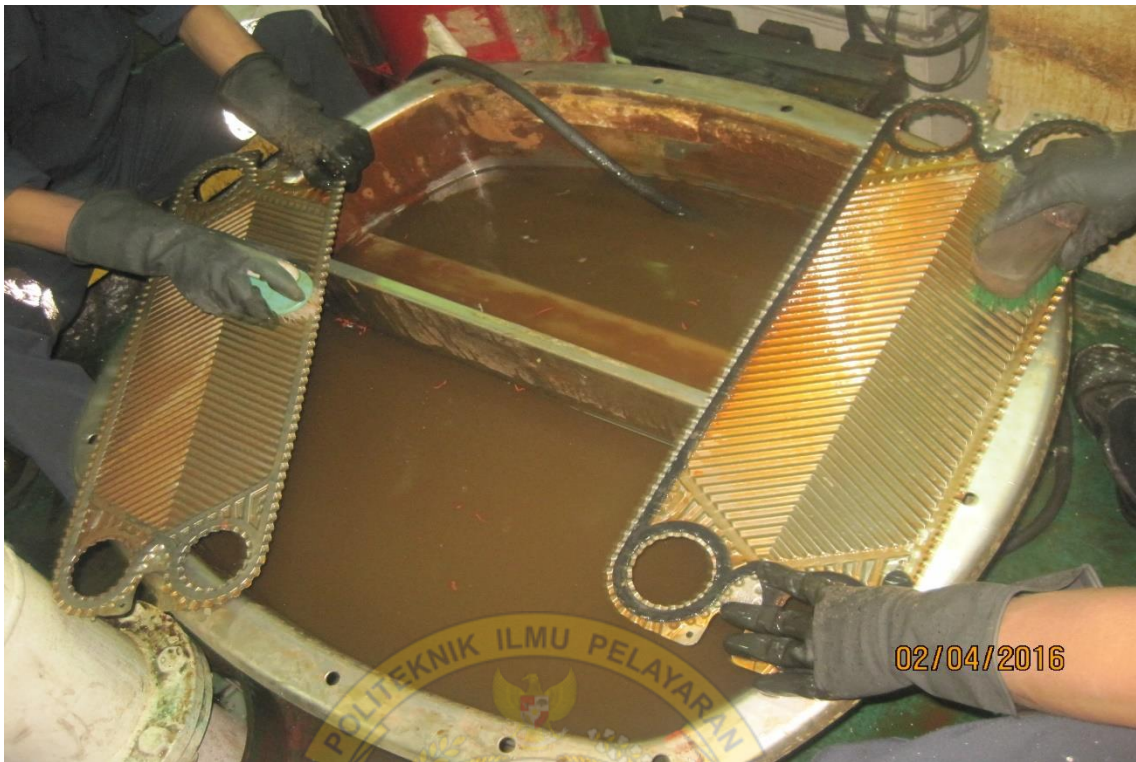


Pembongkaran Fresh Water Generator



Melepas plat Fresh Water Generator

Lampiran 11



Perawatan menggunakan *Chemical*

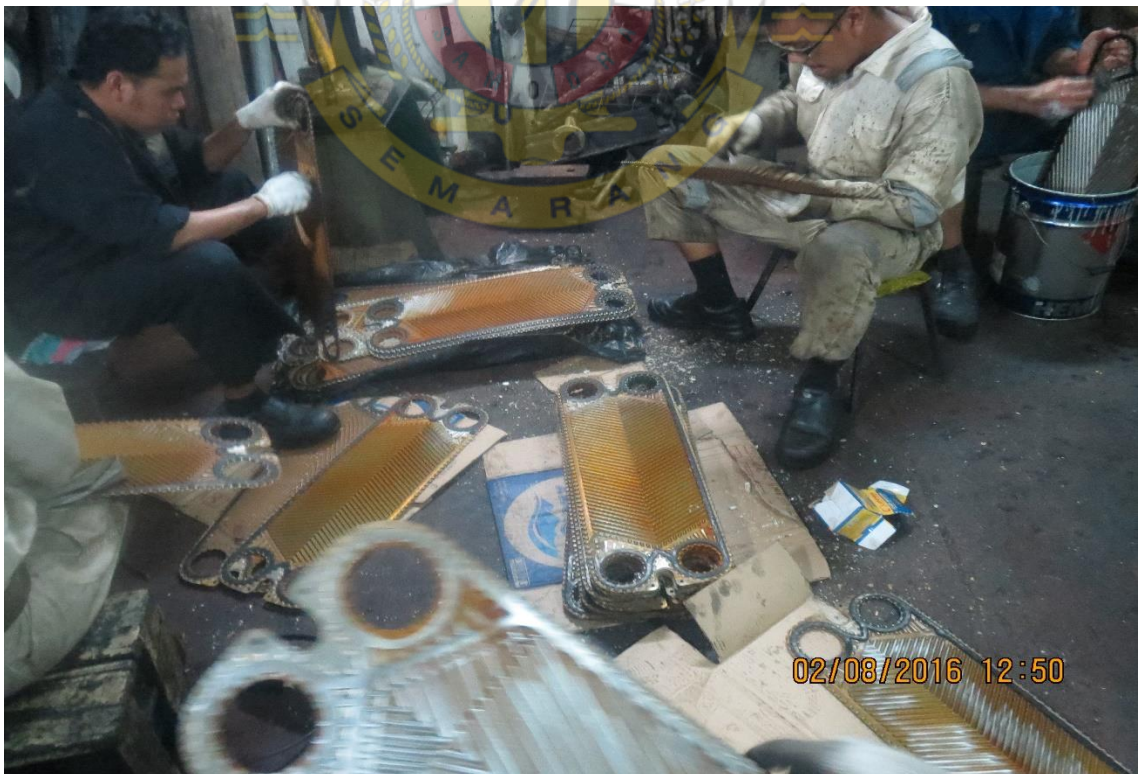


Kerak yang tetap menumpuk

Lampiran 12



Perawatan menggunakan metode fisik - 1



Perawatan menggunakan metode fisik - 2

Lampiran 13



Lampiran 13 kondisi gasket seal yang rusak