

TURBINE PLANT RECOMMENDED OVERHAUL INSPECTION WORKS

EQUIPMENT	OVERHAUL/INSPECTION	CATEGORY OF OVERHAUL		REMARKS	
		MAJOR	MINOR		
1. Steam turbine	1. Turbine casings	1)Disassembly of HP & LP outer casings	○		
		2)Disassembly of HP inner casing	○		
		3)Deformation check, etc.	○		
Main turbine	2. Turbine rotors	1)Overhaul of HP & LP turbine rotors	○		
		2)Inspection of blades	○		
		3)Inspection of clearance (Rotor setting)	○		
		4)Investigation of status of deterioration, etc.	○		
Main turbine	3. Blade rings	1)Check of the condition of each part	○		
		1)Check of the condition of each part	○		
		1)Deterioration check	○		
		6. Bearings	1)Inspection of thrust bearing	○	
			2)Inspection of journal bearing	○	
7. Turning gear device	1)Visual inspection	○			
	2)Overhaul inspection	○			
8. Insulation	1)Thickness and layer	○			
	1. Main stop valves	1)Disassembly of each portion	○		
2)Overhaul of servomotor		○			
Main Steam Valves	2. Governing valves	1)Disassembly of each portion	○		
		2)Overhaul of servomotor	○		
Main Steam Valves	3. Reheat stop valves	1)Disassembly of each portion	○		
		2)Overhaul of servomotor	○		
	4. Interceptor valves	1)Disassembly of each portion	○		
		2)Overhaul of servomotor	○		
Control oil system	1. Governor control block including load limiter, main governor, etc.	1)Overhaul	○		
		2)Cleaning and retouching	○		
Control oil system	2. Main stop valve controller	○			
		○			

RECOMMENDED OVERHAUL INSPECTION WORKS

EQUIPMENT		OVERHAUL/INSPECTION	CATEGORY OF OVERHAUL		REMARKS
			MAJOR	MINOR	
	3. Protective device		○	○	
	4. EH converters for MSV and GV		○		
	5. Multiple orifice block		○	○	
	6. HP oil relief valve		○		
	7. Main oil pump and governor impeller		○		
	8. Air pilot valve		○	○	
	1. Oil reservoir	1) Inspection of inner parts 2) Overhaul of accessories	○	○	
	2. Oil cooler	1) Cleaning of inner pipes 2) Overhaul of tube bundle	○	○	
Turbine auxiliaries	3. Oil conditioner	1) Cleaning and inspection	○	○	
	1. Condenser	1) Cleaning of tubes 2) Water leakage check 3) Inspection of water chamber	○	○	○
	2. Air ejectors	1) Cleaning of tubes 2) Inspection of nozzle	○	○	
2. Heat exchangers	3. Gland steam condenser	1) Cleaning of tubes and water chamber 2) Inspection of rotor and fans	○	○	
	4. Feed water heaters	1) Cleaning of tubes 2) Inspection of water chamber	○	○	
	5. Deaerator and storage tank	1) Inspection and cleaning	○	○	
	1. Control valves	1) Inspection and adjustment	○	○	○
	2. Instrument system	1) Inspection and adjustment	○	○	
3. Instruments	3. Turbomaster				

**RECOMMENDED OVERHAUL INSPECTION WORKS**

EQUIPMENT	OVERHAUL/INSPECTION	CATEGORY OF OVERHAUL		REMARKS
		MAJOR	MINOR	
4. Piping	1. Feed water piping	<input type="checkbox"/>	<input type="checkbox"/>	
	2. Main steam piping	<input type="checkbox"/>	<input type="checkbox"/>	
1. Boiler feed water pumps	1) Appearance check of paint and lining	<input type="checkbox"/>	<input type="checkbox"/>	
	2) Deformation check of piping	<input type="checkbox"/>	<input type="checkbox"/>	
	3) Deformation check of piping	<input type="checkbox"/>	<input type="checkbox"/>	
2. Hydraulic coupling for BFP	1) Inspection of inner parts	<input type="checkbox"/>	<input type="checkbox"/>	
	2) Check of alignment and coupling	<input type="checkbox"/>	<input type="checkbox"/>	
	3) Overhaul of oil cooler and oil pump	<input type="checkbox"/>	<input type="checkbox"/>	
3. Boiler feed booster pump	1) Analysis of sample oil	<input type="checkbox"/>	<input type="checkbox"/>	○
	2) Inspection of inner parts	<input type="checkbox"/>	<input type="checkbox"/>	
	3) Alignment check	<input type="checkbox"/>	<input type="checkbox"/>	
5. Feed water system	1) Inspection of inner parts	<input type="checkbox"/>	<input type="checkbox"/>	
	2) Check of alignment and coupling	<input type="checkbox"/>	<input type="checkbox"/>	
4. Condensate pumps	1) Inspection of inner parts	<input type="checkbox"/>	<input type="checkbox"/>	
	2) Check of alignment and coupling	<input type="checkbox"/>	<input type="checkbox"/>	
5. Water fill-up pump	1) Overhaul and inspection	<input type="checkbox"/>		
6. Heater drain pump	1) Overhaul and inspection	<input type="checkbox"/>		
7. Water treatment plant				
8. Chemical injection equipment				
1. Circulating water pumps	1) Inspection of inner parts and casing	<input type="checkbox"/>	<input type="checkbox"/>	
	2) Check of alignment and coupling	<input type="checkbox"/>	<input type="checkbox"/>	
2. Screen wash pump				
3. Ferrous sulphate injection system	1) Overhaul and inspection of injection pump	<input type="checkbox"/>		
6. Circulating water system	4. Hypochlorite injection system	<input type="checkbox"/>		
	5. Ball cleaning system	<input type="checkbox"/>		
	1) Overhaul and inspection of ball re-circulation pump	<input type="checkbox"/>		

**RECOMMENDED OVERHAUL INSPECTION WORKS**

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		MAJOR	MINOR	SIMPLE	
7. Closed circuit cooling water system	1. Cooling water pumps	1) Inspection of inner parts 2) Check of alignment and coupling	<input type="radio"/>		
	2. Cooling water coolers	3) Cleaning of tubes 4) Water leakage check 5) Inspection of water chamber	<input type="radio"/>	<input type="radio"/>	
	3. Seal oil cooler				
	4. Generator H <sub>2</sub> coolers				
	5. Exciter air cooler				
8. Air system	1. Instrument air compressor				
	2. Service air compressor				
9. Unit Auxiliary	1. Traveling screens				
	2. Bar screens				
	3. Overhead crane				

Note: (1) N/A means "not applicable". Out of scope of MHI Takaago.

(2) The items which are not shown on the above table are out of scope of overhaul inspection works.

**BOILER PALNT RECOMMENDED OVERHAUL INSPECTION WORKS**

EQUIPMENT		OVERHAUL / INSPECTION	CATEGORY OF OVERHAUL			REMARKS
			MAJOR	MINOR	SIMPLE	
1. Boiler pressure part	1. Steam drum	1) Open manhole and visually inspect for indications of corrosion, deposits on the internal surfaces and examine for tightness and integrity of the drum internals.	<input type="radio"/>			
		a) Disassembling drum internals.		<input type="radio"/>		Dye penetrant and/or magnetic particle technique shall be used in major overhaul and further investigation on suspective part.
		b) Without disassembling drum internals.		<input type="radio"/>		
		2) Remove dust and sludge from drum inside.	<input type="radio"/>			
		3) Check damage on glass of water level gauge.		<input type="radio"/>		
4) Inspect visually for any indication of corrosion, crack or damage on U-bolt.	<input type="radio"/>					
		5) Replace the manhole gaskets.	<input type="radio"/>			
2. Furnace wall		1) Set scaffold inside the furnace and check scale deposit on fireside of tube, crack on weld, corrosion, deformation swelling of tube for;				
		a) Burner zone and bottom b) Total furnace	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Inspect the critical area

BOILER PLANT

EQUIPMENT	OVERHAUL / INSPECTION	CATEGORY OF OVERHAUL			REMARKS
		MAJOR	MINOR	SIMPLE	
2. (continued)	<p>2) Check integrity of castable refractories.</p> <p>a) Burner part, furnace bottom</p> <p>b) Total furnace</p> <p>3) Sample water wall tube for analysis. Location shall be recommended by the boiler manufacturer. Analysis shall be made by their Laboratory.</p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p>See note*</p>	<p>*Note : Annual sampling and analysis will be useful for diagnostics on operating conditions such as cycle water chemistry, condenser leak etc.</p>
3. Superheater and Reheater	<p>1) Inspect visually external surface of tubes, spacer metals and supports for erosion or wastage. Corrosion, crack in weld, deform or swell for;</p> <p>a) The part easily accessible from manhole opening.</p> <p>b) Pre-selected area in the most vulnerable areas.</p> <p>c) Complete area with setting scaffolding.</p> <p>2) Inspect visually for any indication of erosion/drain attack due to soot blowing.</p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p>	<p>Dye penetrant and/or magnetic particle technique shall be used in major overhaul and further investigation on suspect part.</p>

BOILER PLANT

EQUIPMENT	OVERHAUL / INSPECTION	CATEGORY OF OVERHAUL			REMARKS
		MAJOR	MINOR	SIMPLE	
3. (continued)	<p>3) Measurement of tube dimension</p> <p>a) Outer diameter</p> <p>b) Wall thickness</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4. Economizer	<p>1) Inspect visually external surface of tubes and supports for erosion, corrosion, crack in weld, deform for;</p> <p>a) The part easily accessible form manhole opening.</p> <p>b) Suspected areas:</p> <p>c) Complete area</p> <p>2) Measurement of tube dimension</p> <p>a) Outer diameter.</p> <p>b) Wall thickness</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Headers	<p>1) Inspect visually for indication of corrosion and abnormal deposits by cutting the</p>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	If furnace bottom header is found to be much

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		MAJOR	MINOR	SIMPLE	
	inspection cap.				contaminated, other headers shall be subject to investigation.
5. (continued)	2) Inspect visually outside the headers for crack in weld, corrosion.	<input type="radio"/>		(Uninsulated header only)	Dye penetrant and/or magnetic particle technique shall be used for major overhaul and further investigation on susceptible part.
6. Connecting pipe	1) Inspect visually the exterior of welding joint for crack on selected area. 2) Same as above but with Dye penetrant and/or magnetic particle technique.	<input type="radio"/>	<input type="radio"/>		
7. De-superheater	1) External : Inspect visually on seal weld of support and positioning screws for cracks. 2) Internal : Disassemble the de-superheater spray nozzle for erosion, cracks and inspection the liner for erosion or deformation.	<input type="radio"/>	<input type="radio"/>		Dye penetrant and/or magnetic particle technique shall be used as necessary.





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		MAJOR	MINOR	SIMPLE		
II. Burner	1. Burner register nozzle	1) Check extent of damage on nozzle	<input type="radio"/>	<input type="radio"/>		
	2. Wind box	1) Check on crack	<input type="radio"/>			
	3. Wind box damper	1) Adjustment of damper for proper indication and smooth operation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
		2) Check on damage and deformation of blade.	<input type="radio"/>			
4. Oil atomizer	1) Check and confirm that the distance between atomizer tip and diffuser is as provided in the Instruction Manual. 2) Check extent of damage on diffuser. 3) Measurement of atomizer gun length and hydraulic pressure test if necessary. 4) Check the integrity of contacting surface		<input type="radio"/>			
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

BOILER PLANT

EQUIPMENT	OVERHAUL / INSPECTION	CATEGORY OF OVERHAUL			REMARKS
		MAJOR	MINOR	SIMPLE	
	condition on stationary and removable unions.  Visual	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4. (continued)	5) Check the integrity of shoulder bolt and threaded hole on stationary union.  Visual  6) Check the integrity of gasket surface.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Burner tilt mechanism	1) Check smooth operation through its range while the nozzles are being observed from inside the furnace.	<input type="radio"/>	<input type="radio"/>		
6. Oil gun retract cylinder	1) Check on proper function and integrity.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7. Pilot igniter	1) Check igniter horn for damage  2) Check integrity of igniter, spark plug, atomizer, flame detecting rod and clean up the same.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

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	8. Burner valve	1) Check and lapping on inner valve if necessary.	<input type="radio"/>	<input type="radio"/>		
III. Buckstay and casing	1. Buckstay	1) Check visually on bolts and leveler for damage.	<input type="radio"/>			
	2. Casing	1) Examine outer casing visually for evidence of leakage. If any evidence of leakage or questionable area is found remove outer casing and inspect surface of panel on crack, deformation, damage, etc. 2) Inspect the roof and header enclosures for any indication of crack, deterioration of insulation/refractories. 3) Inspect the casing, seals, support steel within the dead air space beneath the sloping furnace bottom.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
IV. Ducts and Dampers	1. Duct	1) Inspect visually exterior of ducts for any evidence of leakage, damage on insulation and lagging.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

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		MAJOR	MINOR	SIMPLE	
	<ul style="list-style-type: none"> <li>2) Inspect visually interior of ducts including expansion joint for any evidence of corrosion, erosion, crack, etc.</li> <li>3) Inspect visually crack on hanger/lug</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	<ul style="list-style-type: none"> <li>1) Confirm smooth operation for full span.</li> <li>2) Check the clearance of blade</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Visual inspection on bearing shall be made, if smooth operation is hindered.
V. Boiler Safety Valves and Power Control Valve	<ul style="list-style-type: none"> <li>1) Safety valve setting</li> <li>2) Disassemble and check for crack, erosion, deformation, damage on various parts. Lapping disc and seat</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
VI. Boiler Auxiliaries	<ul style="list-style-type: none"> <li>1) EDF, GRF,</li> <li>2) Confirm integrity of fastening bolt</li> <li>3) Check clearance between the inlet cone and wheel shroud.</li> </ul>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	Annual replacement of lubricant is recommended.

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		MAJOR	MINOR	SIMPLE	
	4) Inspect bearing for any indication of damage	<input type="radio"/>	<input type="radio"/>		
2. Air heater	1) Weight measurement for pre-selected cold end elements in two sectors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. (continued)	2) Inspect visually, heating elements for ash deposit and any indication of drain attack by soot blowing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Inspect visually for any indication of corrosion, crack, damage on soot blowing lance and water washing lance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4) Inspect visually for any indication of damage crack, abrasion on seal plate, bearing, rotor, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5) Measure clearance on seal plates,	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	6) Inspect visually any indication of abnormality on gear box and air motor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	8) Inspect visually any indication of gas leak.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Steam air heater	1) Inspect visually element tube for any	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

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	indication of corrosion, wear and leakage.				
4. Miscellaneous fans	Inspect on casing and impeller for any indication of oil/grease leakage, damage on shaft seal, corrosion, abrasion, crack, etc.	<input type="radio"/>			
5. Fuel oil pump	1) Alignment check	<input type="radio"/>	<input type="radio"/>		
	2) Inspect casing and impeller visually for any indication of wear, corrosion, erosion, crack.	<input type="radio"/>	<input type="radio"/>		
	3) Inspect visually integrity of packing, seal and bearing.	<input type="radio"/>	<input type="radio"/>		
6. Fuel oil heater	1) Inspect all flange for any indication of leak and deterioration on gasket.	<input type="radio"/>			
	2) Heating element tube shall be withdrawn and inspect visually for indication of corrosion, erosion and wear on tubes and tube plate.	<input type="radio"/>			
	3) hydraulic test	<input type="radio"/>			

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	4) Overhaul on relief valves	<input type="radio"/>			
7. Fuel oil strainer	1) Inspect strainer mesh for any indication of damage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8. Soot blower	1) Check effectiveness of cleaning and any tube erosion from soot blowing operation during the internal furnace inspection. 2) Investigate nozzle, lance, seal head valve and spring therein, bearing chain, gland packing, seal packing for any indication of erosion, corrosion, wear, crack, damage, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
VI. Control and Instrument	1) Burner management system 2) Check operation of voltage relay and power supply interlock as well as calibration on voltmeters of power supply unit. 3) Check cabinet for dust and dirt for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	



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		MAJOR	MINOR	SIMPLE	
	<p>cleaning.</p> <p>5) Performance check on solenoid valves, limit switch.</p> <p>6) Internal check on local junction box.</p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p>	
2. Control drive	<p>1) Check for proper operation for full stroke</p> <p>2) Inspect visually control drive including linkage pin for any indication of wear and abrasion.</p> <p>3) Confirm limit switch and contractor for proper settings.</p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p> <p><input type="radio"/></p>	
3. Control valves	<p>1) Performance check</p> <p>2) Inspect for any indication of erosion, wear and leakage.</p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p> <p><input type="radio"/></p>	<p><input type="radio"/></p>	
4. Control element	<p>1) Calibrate on pressure switch, temperature switch, vibration switch, transmitter and</p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	<p><input type="radio"/></p>	

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		MAJOR	MINOR	SIMPLE	
	controller.				
5. Boiler M.F.T. and Annunciator Check-out	It is advisable to conduct the Boiler M.F.T. and Annunciator Check-out after completion of overhaul of the control system.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
VII. OTHERS	1. Turbine bypass valve system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	- Turbine bypass valves				
	1) Disassemble and check for crack, erosion, deformation, damage on various parts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2) Functional check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	- Oil unit				
	1) Inspect oil pump	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2) Replace lub. oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Perform oil flushing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4) Inspect electrical & instrument parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

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	5) Functional check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. Emergency diesel generator	1) Clean filters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2) Replace lub. oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Inspect & clean the various parts	<input type="radio"/>	*	*	* Depending on operation time
	4) Replace the parts	<input type="radio"/>	*	*	
	5) Inspect & test the protection system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. (continued)	6) Perform functional check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Air compressor Air dryer	1) Clean air filters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	- Depending on operation time
	2) Replace lub. oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Inspect & clean the various parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4) Replace the parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5) Inspect & test the protection system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	6) Perform functional check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

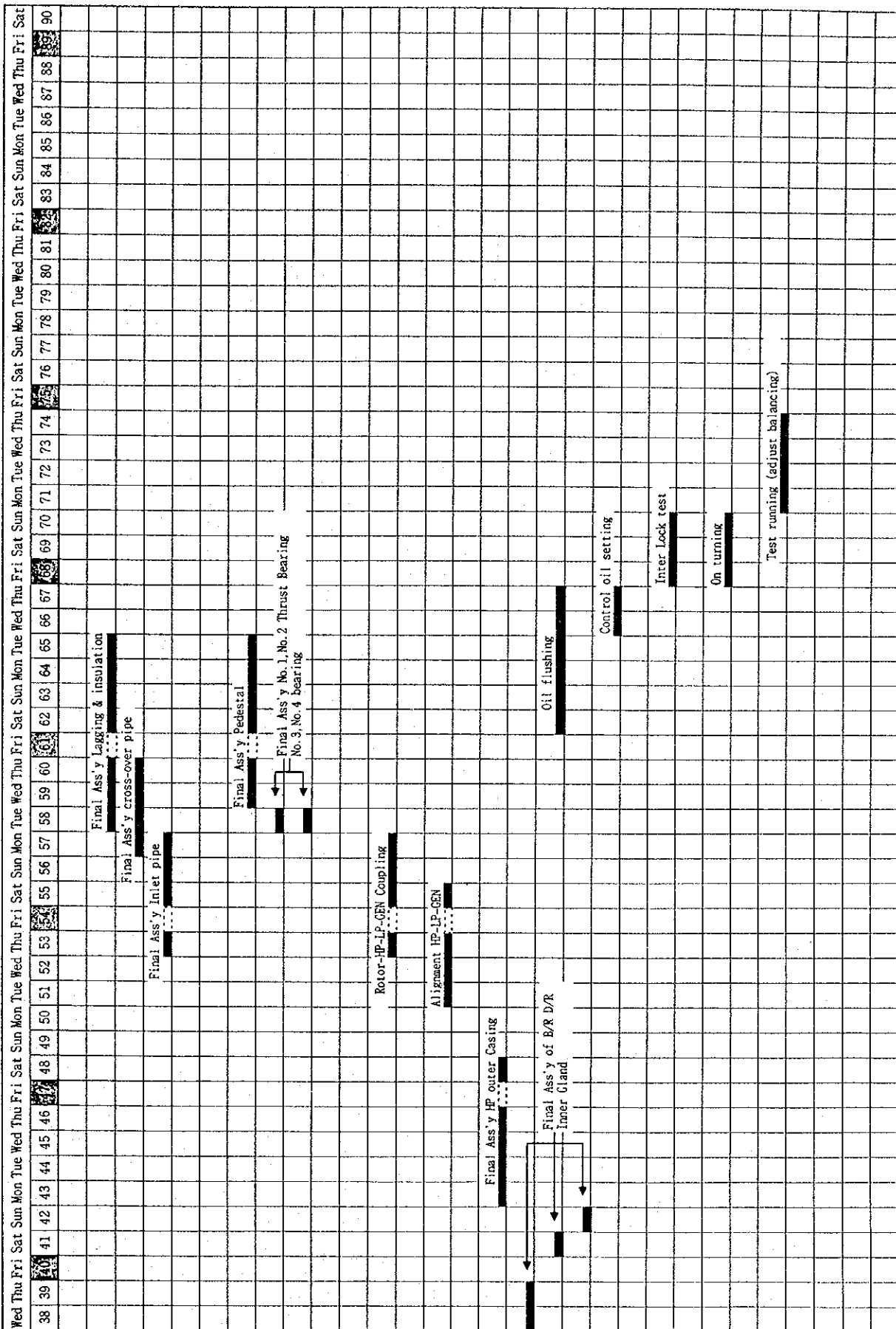
BOILER PLANT

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		MAJOR	MINOR	SIMPLE	
4. Fire fighting system	1) Inspect for crack, damage on whole system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2) Replace lub. oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Inspect electrical & instrument parts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4) Check protection & ANN system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5) Perform functional check	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	6) Perform spray test	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Plant water system	1) Inspect internal parts - No foreign material - No loosen bolt & nut - No broken strainer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	2) Make-up activated carbon, resin, etc.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	3) Replace lub. oil	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	4) Inspect bearing, mech. seal, etc. of pump & blower	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	5) Check control system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
	6) Perform operational check after overhaul	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Major Overhaul / Inspection Time Schedule of Unit #3 Turbin (1week lday Holiday Schedule)

Work Item	Mon							Tue							Wed							Thu							Fri							Sat							Sun							Mon							Tue							Wed						
	-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45																			
I. T/G Shut Down	Turning 1st Stage Temp. 150°C																																																																					
Main Turbine	Remove lagging & insulation																																																																					
HP/LP Cross over pipe	Dismantle cross-over pipes																																																																					
Main Stream Inlet pipe	Dismantle Inlet pipe Bolt & Nut																																																																					
	Preparing of Bolt Heater																																																																					
(1) HP/LP Turbine																																																																						
Dismantle No.1,2,3,4 Pedestal								Check of Brg Clearance							Pedestal Inside Cleaning																																																							
→ No.1,2 Brg & Thrust Brg								No.1, No.2 Thrust Bearing							Remove each instrument Parts (Rotor speed sensing pick up mounting etc.) (Rotor Position & Eccentricity)							Final Ass'y Bottom Bearing (No.1, No.2)																																																
→ No.3,4 Brg								No.3, No.4 Bearing														Final Ass'y Bottom Bearing (No.3, No.4)																																																
HP/LP/CEN Coupling Bolts								Dismantle HP/LP/CEN Coupling																																																														
Alignment HP/LP/CEN Rotor								Check Alignment (HP-LP-Gen)																																																														
(2) HP-Turbine																																																																						
HP-outer Glang								Gov. side							Dismantle outer Gland																																																							
HP-outer Casing								Gen. side							Dismantle HP-upper casing																																																							
HP-No.1B/R, No.2D/R, No.3D/R															Preparing of Bolt Heater																																																							
HP-No.1D/R, No.4B/R, No.3No.2B/R															Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring													
HP-Inner Gland								Gov. side														Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring													
HP-Rotor (Setting)								Gen. side														Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring							Dismantle upper Ring													
HP-Turbine Parts																						Cleaning of Rotor & Bearing & Bladering & Bolts Washers Caings etc. (Inspection-PT, UT, MT, DPI & Visual of All The Parts Recommendation)							HP-Rotor Setting							HP-Rotor Lifting Check Bottom Clearance							Final Ass'y Bottom Side ring																											

Work Item	Date						
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
I. T/G Shut Down	-5	-4	-3	-2	-1	0	1
Main Turbine	Turning 1st Stage Temp. 150°C						
HP/LP Cross over pipe	Remove lagging & insulation						
Main Steam Inlet pipe	Dismantle cross-over pipes						
(1) HP/LP Turbine	Dismantle Inlet pipe Bolt & Nut						
Dismantle No. 1, 2, 3, 4 Pedestal	Preparing of Bolt Heater						
No. 1, 2 Brg & Thrust Brg	Check of Brg Clearance						
No. 3, 4 Brg	No. 1, No. 2 Thrust Bearing No. 3, No. 4 Bearing						
HP/LP/GEN Coupling Bolts	Pedestal Inside Cleaning						
Alignment HP/LP/GEN Rotor	Remove each instrument Parts (Rotor speed sensing pick up mounting etc.) Rotor Position & Eccentricity						
(2) HP-Turbine	Dismantle HP/LP/GEN Coupling						
HP-outer Gland	Check Alignment (HP, LP, Gen)						
HP-outer Casing	Dismantle over Gland						
HP-No. 1E/R, No. 2D/R, No. 3D/R	Dismantle HP-upper casing						
HP-No. 1D/R, No. 4B/R, No. 3No. 2B/R	Dismantle upper Ring						
HP-Inner Gland	Dismantle upper Ring						
HP-Rotor (Setting)	Dismantle upper Ring						
HP-Turbine Parts	HP-Rotor Setting						
	Cleaning of Rotor & Bearing & Blading & Bolts Washers Casings etc. (Inspection: PT, UT, MT, DPI & Visual of All The Parts Recommendation)						
	Preparation of Final Ass'y						
	HP rotor Final Ass'y & setting						
	Final Ass'y Bottom Bearing (No. 1, No. 2)						
	Final Ass'y Bottom Bearing (No. 3, No. 4)						
	Final Ass'y Bottom Side Ring						







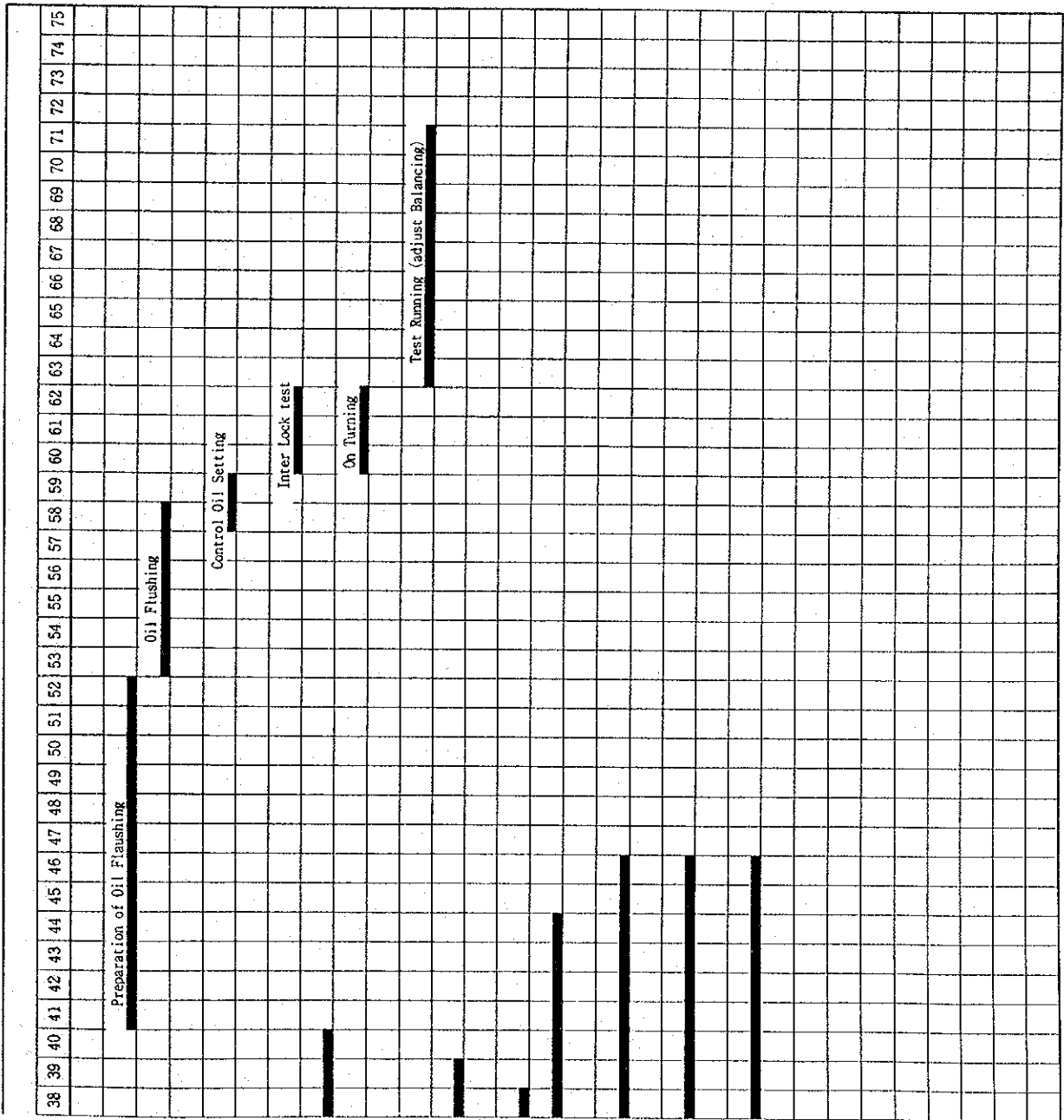




















SUPERVISOR SCHEDULE FOR UNIT NO.3

MO.	ITEM	DATE																								M/N																																																							
		-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
	KEY SCHEDULE	SHUT DOWN & COOL-DOWN																																																																															
	1. BOILER	Fan test Pre-boiler/Boiler clean-up Interlock test																																																																															
	1 Boiler General	Blowing																								3.47																																																							
	2 Safety valve																									0.60																																																							
	3 Auxiliary equipment																									0.73																																																							
	4 FD & CR fan																									0.60																																																							
	5 Air preheater																									1.47																																																							
	6 Turbine bypass valve system																									0.73																																																							
	7 AEC system																									1.33																																																							
	8 BMS system																									1.33																																																							
	9 Local instrument & others																									0.63																																																							
	10 Start-up																									0.63																																																							
	11 Emergency diesel generator																									0.60																																																							
	12 Air compressor & Air dryer																									0.90																																																							
	13 Fire fighting system																									0.50																																																							
	14 Plant water system																									0.77																																																							
	Boiler Total Manhours																									14.49																																																							

SUPERVISOR SCHEDULE FOR UNIT NO.3

NO. ITEM	DATE	Days																															W/X																																																
		-5	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73
		SHUT DOWN & COOL-DOWN																																																																															
		Turning 1st stage temp. 150 °C																																																																															
		Remove lagging & insulation																																																																															
		Dismantle cross-over pipes																																																																															
		Dismantle inlet pipe, belt & nut																																																																															
		Final Ass'y inlet pipe																																																																															
		Final Ass'y lagging & insulation																																																																															
		Final Ass'y cross-over pipe																																																																															
		Final Ass'y inlet pipe																																																																															
		Interlock test																																																																															
		Final test																																																																															
		Pre-shut-in/ Boiler cleaning																																																																															
		Centering Tu. Gen. & Exc																																																																															
		Lab oil flushing																																																																															
		Operation																																																																															
		Turning																																																																															
		Overhaul																																																																															
		Disassemble Tu. & Gen.																																																																															
		Turning																																																																															
		Generator assembly																																																																															
		Seal oil and gas control system																																																																															
		Exter. AVR																																																																															
		Transformer																																																																															
		Thunderbolt																																																																															
		TG Total Manmonths																																																																															
		UNITS TOTAL MANMONTHS																																																																															
		3.47																																																																															
		1.07																																																																															
		0.80																																																																															
		2.97																																																																															
		1.57																																																																															
		0.77																																																																															
		0.70																																																																															
		0.90																																																																															
		12.15																																																																															
		25.64																																																																															

Note: Turbine overhaul duration shall be 100days.

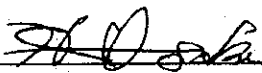


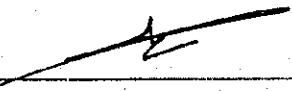
**Technical Note of Discussions**

**THE BASIC DESIGN STUDY  
OF  
THE PROJECT  
FOR  
REHABILITATION  
OF  
BANIAS POWER STATION  
(Units No.3 and No.4)  
(Explanation of the Draft Report)**

Referring to the Minutes of Discussions on the captioned Project, signed between Syrian and Japanese sides on March 1, 1999, both sides have, hereby, confirmed the list of parts and materials to be provided by the Japan's Grant Aid and their principal technical specifications as attached herewith, in case the Grant is extended. The list will be attached to the Final Basic Design Report, which is scheduled to be sent to Syrian side by the end of May, 1999.

Damascus, March 1, 1999

  
Mr. ISAKA Hiroshi  
Chief of Consultants,  
Basic Design Study  
Team,  
JICA

  
Mr. Akram KHALIFEH  
Director of  
Power Generation,  
PEEGT

メジャーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler &amp; Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
1	過熱器/SH	過熱器管/SH Tube	1ry SH Tube	φ 45x4.7t x5500	SA213-T12	30 pcs			770
2	過熱器/SH	過熱器管/SH Tube	2ry SH Tube	φ 45x6.1t x5500	SA213-T22	30 pcs			970
3	過熱器/SH	過熱器管/SH Tube	Final SH Tube	φ 45x4.9t x5500	SA213-T91	30 pcs			800
4	過熱器/SH	過熱器管サポート/Tube supprot	Fixed Spacer for 1ry SH	φ 45/ φ 45/ p48	SA217-WC6	30 pcs			50
5	過熱器/SH	過熱器管サポート/Tube supprot	Fixed Spacer for 2ry SH	ditto	ditto	30 pcs			
6	過熱器/SH	過熱器管サポート/Tube supprot	Fixed Spacer for Final SH	ditto	ditto	30 pcs			
7	再熱器/RH	再熱器管/RH Tube	1ry RH Tube	φ 48.6x3.5t x5500	SA213-T12	30 pcs			640
8	再熱器/RH	再熱器管/RH Tube	2ry RH Tube	φ 45x3.5t x5500	SA213-T91	30 pcs			590
9	再熱器/RH	再熱器管サポート/Tube supprot	Fixed Spacer for 1ry RH	φ 48.6/31.8/ p41.25	SA217-WC6	15 pcs			10
10	再熱器/RH	再熱器管サポート/Tube supprot	Fixed Spacer for 1ry RH	φ 48.6/31.8/ p45.5	SA217-WC6	15 pcs			10
11	再熱器/RH	再熱器管サポート/Tube supprot	Fixed Spacer for 2ry RH	φ 45/ φ 45/ p48	SA217-WC6	30 pcs			20
12	火炉/Water Wall	火炉壁管/Water Wall Tube	Furnace Wall Tube	φ 63.5x5.4t x5500	SA210-C	80 pcs			3400 +390
13	火炉/Water Wall	火炉壁管/Water Wall Tube	Fin for Furnace Wall	FB 6tx5500x19w	SA36	80 pcs			
19	通風設備 /Drafting	押込ファン/FDF	Bearing No. 41			4 pcs			
20	通風設備 /Drafting	押込ファン/FDF	Bearing Washer No. 43			4 pcs			
21	通風設備 /Drafting	押込ファン/FDF	Oil Gauge			4 pcs			
22	通風設備 /Drafting	押込ファン/FDF	Air Seal Packing No. 12			10 pcs			

メジャーオーバーホール用供給部品表(機械関係)  
 Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
25	通風設備 /Drafting	ガス再循環ファン/GRF	Bearing No. 41			4 pcs			
26	通風設備 /Drafting	ガス再循環ファン/GRF	Bearing Washer No. 43			4 pcs			
32	バーナ設備 /Burner	油バーナ/Oil Burner	Oil Gun Complete			1 sets			
33	バーナ設備 /Burner	油バーナ/Oil Burner	Spray Plate			48 pcs			
34	バーナ設備 /Burner	油バーナ/Oil Burner	Back Cross Plate			48 pcs			
35	バーナ設備 /Burner	油バーナ/Oil Burner	Gasket for Gun			4,800 pcs			
36	バーナ設備 /Burner	油バーナ/Oil Burner	Seal Tube			24 pcs		10	
37	バーナ設備 /Burner	油バーナ/Oil Burner	Dust Cover			24 pcs		23	
47	バーナ設備 /Burner	バーナ風箱/Burner Windbox	Swirler			24 pcs			
48	バーナ設備 /Burner	バーナ風箱/Burner Windbox	Oil Burner Nozzle			24 pcs		2	
49	バーナ設備 /Burner	バーナ風箱/Burner Windbox	Air Nozzle Auxiliaries			32 pcs			
50	バーナ設備 /Burner	バーナ風箱/Burner Windbox	Air Nozzle End			24 pcs			
53A	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Cold end shell plate & shell bar			2 sets			
53B		ユングストロム式空気予熱器 /Air Preheater	Diaphragm			2 sets			
53C		ユングストロム式空気予熱器 /Air Preheater	Grating			2 sets			
53D		ユングストロム式空気予熱器 /Air Preheater	Rotor tire			2 sets			
53E		ユングストロム式空気予熱器 /Air Preheater	Cold end post seal			2 sets			

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メジャーオーバーホール用供給部品表 (機械関係)  
 Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	図番 DWG. NO.	部品 番号 P.NO.	
53F		ユングストロム式空気予熱器 /Air Preheater	Basket cover					
53G		ユングストロム式空気予熱器 /Air Preheater	Hermeseal #500 & packing					
53H		ユングストロム式空気予熱器 /Air Preheater	Repair plate for cold end sector plate					
54	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Cold End Heating Element (Basket)			384 pcs		
55	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Intermediate Heating Element (Basket)			384 pcs		
57	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Fittings for Intermediate Heating Element			2 sets		
58	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Holding Strip (inner)			96 pcs	A182445000 A182446000	SP- MI-
59	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Holding Strip (interm.)			96 pcs	A182445000 A182446000	SP- MI-
60	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Holding Strip (outer)			96 pcs	A182445000 A182446000	SP- MI-
61	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Outer Sealing Tab			10 sets	A182445000 A182446000	SP- MI-
62	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Bolts, Nuts and Washeres for Radial Seal Plate			1440 sets	A182445000 A182446000	SP- MI-
63	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Carbon for Circum Seal Plate (hot side)	50x50x292.5		192 pcs	A182455000	SP- MI-
64	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Carbon for Circum Seal Plate (hot side)	50x50x286		96 pcs	ditto	ditto
65	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Carbon for Circum Seal Plate (cold side)	50x50x292.5		192 pcs	A182455000	SP- MI-
66	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Carbon for Circum Seal Plate (cold side)	50x50x286		96 pcs	ditto	ditto
67	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Carbon for Circum Seal Plate (bolt for hot side)			576 pcs	ditto	SP- MI-
68	空気予熱器 /Air heater	ユングストロム式空気予熱器 /Air Preheater	Radial Seal Plate (inner)			96 pcs	A182445000 A182446000	SP- MI-

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ボイラーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	
69	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Radial Seal Plate (interm)			96 pcs	A182445000 A182446000	SP- MI-
70	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Radial Seal Plate (outer)			96 pcs	A182445000 A182446000	SP- MI-
71	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Gland Packing for Air Seal (hot side)			2 sets		
72	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Gland Packing for Air Seal (cold side)			2 sets		
73	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Bearing for Speed Reducer			2 sets		
74	空気予热器 /Air Preheater	ユンクストローム式空気予热器 /Air Preheater	Oil Seal for Speed Reducer			2 sets		
75	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Head Valve			2 pcs	770-10197	1
76	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Lance Tube			4 pcs	770-10197	8
78	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Forced Pressure Air Valve			4 pcs	770-10197	3
79	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Valve Stem(771-43963)			12 pcs		
80	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Ring Packing(771-40445)			12 pcs		
81	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Valve Spring(S1113924)			4 pcs		
84	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Packing(771-42887)			24 pcs		
94	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Gland Packing(771-31709)			12 pcs		
98	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Gasket(S2546704)			12 pcs		
99	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Gasket(S2546704)			12 pcs		
100	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Gasket(771-42562A)			12 pcs		

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ボイラーオーバーホール用供給部品表 (機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
102	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Gasket(S1833204)			12 pcs			
103	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Spring(S1052704)			2 pcs			
105	スートブロワ /Soot Blower	ロングレトラクタブル /Long Retra-ctable S B	Packing(S1261204)			12 pcs			
106	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Rotary Blower			1 pcs	770-31965	1	
107	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Forced Pressure Air Valve			2 pcs	770-31965	4	
109	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Valve Stem(771-43963)			4 pcs			
110	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Ring Packing(771-40445)			4 pcs			
111	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Valve Spring(S1113924)			2 pcs			
112	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Gasket			4 pcs			
114	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Gland Packing(771-31712)			4 pcs			
115	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Cam Follower(S1884604)			4 pcs			
116	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Ball Bearing(6012ZZ)			4 pcs			
117	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Gasket(S1831704)			4 pcs			
118	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Ball Bearing(7270A0)			12 pcs			
119	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Ball Bearing(6005LLU)			4 pcs			
120	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Packing(771-42661)			4 pcs			
121	スートブロワ /Soot Blower	ロータリーストロー /Rotary SB	Oil Seal(VB20304.5)			4 pcs			

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メジャーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
122	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Ball Bearing(7204A)			4 pcs			
123	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Ball Bearing(6204LLU)			4 pcs			
124	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Gasket(S1104624)			4 pcs			
125	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Oil Window			4 pcs			
126	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Gasket(S1824714)			4 pcs			
127	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Gland Packing(771-31713)			4 pcs			
128	スートブロワ /Soot Blower	ロータリーストローパ/Rotary SB	Gasket(S1833204)			4 pcs			
129	スートブロワ /Soot Blower	AHスートロパ/AH Soot Blower	Swivel Joint			4 pcs	B6-01750	8	
130	スートブロワ /Soot Blower	AHスートロパ/AH Soot Blower	Nozzle			4 pcs	B6-01750	12	
131	スチームコン バータ/Steam Converter	スチームコンバータ/Steam Converter	Gasket			4 pcs	X62-80612	11	
137	スチームコン バータ/Steam Converter	スチームコンバータ/Steam Converter	Steam Trap			40 pcs	SN0880913	3-CS- TR04	
138	風煙道ダクト /Air & Gas Duct	煙道/Gas Duct	Gas Duct (from AH outlet to stack inlet)			1.5 sets			
139	風煙道ダクト /Air & Gas Duct	煙道/Gas Duct	Insulation and Lagging for Gas Duct			0.5 sets			
140	風煙道ダクト /Air & Gas Duct	煙道/Gas Duct	Expansion Joint for Gas Duct			2 sets	E23 320x6020x2210 E24 400x2210x2500 E25 400x2210x2500 E26 480x3700x3000 E27 480x4500x3000		
141	風煙道ダクト /Air & Gas	煙道/Gas Duct	Gland Packing T/#2305 D=60			80 pcs			

## マシヤオーバホール用供給部品表(機械関係)

## Parts List for Major Overhaul (Mechanical)

Equipment : Boiler &amp; Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	
142	風煙道ダクト /Air & Gas	煙道/Gas Duct	Gland Packing T/#2305 D=40			16 pcs		
143	風煙道ダクト /Air & Gas	煙道/Gas Duct	Gland Packing T/#2305 D=85			16 pcs		
159	風煙道ダクト /Air & Gas	計測座/ Instrument Insert	Flat Face Packing For JIS 5 <sup>K</sup> 65A T/#1100 3T			24 pcs		
160	風煙道ダクト /Air & Gas	計測座/ Instrument Insert	Flat Face Packing For JIS 5 <sup>K</sup> 100A T/#1100 3T			10 pcs		
161	ボイラ安全弁 /Boiler Safety	ドラム安全弁/Drum Safety Valve	Disc	2 pcs for 65A 1 pcs for 75A		3 pcs		
162	ボイラ安全弁 /Boiler Safety	ドラム安全弁/Drum Safety Valve	Stem	ditto		3 pcs		
168	ボイラ安全弁 /Boiler Safety	過熱器安全弁/SH Safety Valve	Disc			2 pcs		
169	ボイラ安全弁 /Boiler Safety	過熱器安全弁/SH Safety Valve	Stem			2 pcs		
175	ボイラ安全弁 /Boiler Safety	再熱器入口安全弁/RH Inlet Safety Valve	Disc	2 pcs for 125A 1 pcs for 150A		3 pcs		
176	ボイラ安全弁 /Boiler Safety	再熱器入口安全弁/RH Inlet Safety Valve	Stem	ditto		3 pcs		
182	ボイラ安全弁 /Boiler Safety	再熱器出口安全弁/RH outlet Safety Valve	Disc			2 pcs		
183	ボイラ安全弁 /Boiler Safety	再熱器出口安全弁/RH outlet Safety Valve	Stem			2 pcs		
189	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Main Disc			2 pcs		
190	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Pilot Disc			2 pcs		
191	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Stem			2 pcs		
192	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Spring			2 pcs		
193	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Pin			2 pcs		

メジャーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
194	ボイラ安全弁 /Boiler Safety	電磁式逃し弁/PCV	Gasket			2 pcs			
194 B	補助蒸気 安全弁/ Aux. Safety Valve	補助蒸気 安全弁/ Aux. Safety Valve	Disc (AS-SV-01) (AS-SV-02)			2 pcs			
194 C	補助蒸気 安全弁/ Aux. Safety Valve	補助蒸気 安全弁/ Aux. Safety Valve	Stem (AS-SV-01) (AS-SV-02)			2 pcs			
194 D	ドラム水面計 /Level Gauge	ドラム水面計 /Level Gauge	Glass Set			56 pcs			
194 E	ドラム水面計 /Level Gauge	ドラム水面計 /Level Gauge	Lamp			28 pcs			
198	燃料設備 /Fuel System	重油ポンプ/Fuel Oil Pump	Gasket, Packings		ditto	4 sets			
201	燃料設備 /Fuel System	軽油ポンプ/Gas Oil Pump	Gasket, Packings		ditto	2 sets			
205	燃料設備 /Fuel System	重油油移送ポンプ/Fuel Oil Transfer Pump	Gasket, Packings		ditto	2 sets			
207	燃料設備 /Fuel System	重油ストレーナ/Fuel Oil Strainer	O-ring, Packings		ditto	2 sets			
209	燃料設備 /Fuel System	軽油ストレーナ/Gas Oil Strainer	O-ring, Packings		ditto	2 sets			
212	燃料設備 /Fuel System	LPG受入ポンプ/LPG Unloading Pump	Gasket, Packings, side Plate, V-Belt, CAM, Blades		ditto	1 set			
216	燃料設備 /Fuel System	点火ポンプ/Ignitor Pump	Gasket, Packings, Seal Assy, Grease Seal, Coupling		ditto	2 sets			
217	燃料設備 /Fuel System	重油ヒータ/Fuel Oil Heater	Gasket, Packings		1 set for 1 heater	2 sets			
217 A	ガス化装置 /Gas	循環ポンプ/ Cir. Pump	Complete Set		SVE008/E/ 002336④	2 sets			
218	高圧一般弁 /High	アングル弁/Angle needle Valve	Disk and Stem		class 2500-II 2B(50A)	2 pcs			

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メジャーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
221	高圧一般弁 /High	仕切弁/Gate Valve	Disk	class 1500-II 8B(200A)		1 pcs			
222	高圧一般弁 /High	仕切弁/Gate Valve	Stem	ditto		1 pcs			
226	高圧一般弁 /High	仕切弁/Gate Valve	Disk	class 1500-II 10B(250A)		1 pcs			
227	高圧一般弁 /High	仕切弁/Gate Valve	Stem	ditto		1 pcs			
231	高圧一般弁 /High	仕切弁/Gate Valve	Disk	class 2500-II 10B(250A)		1 pcs			
232	高圧一般弁 /High	仕切弁/Gate Valve	Stem	ditto		1 pcs			
236	高圧一般弁 /High	仕切弁/Gate Valve	Disk	class 2500-II 14B(350A)		1 pcs			
237	高圧一般弁 /High	仕切弁/Gate Valve	Stem	ditto		1 pcs			
241	高圧一般弁 /High	仕切弁/Gate Valve	Disk	class 900 22B(550A)		1 pcs			
242	高圧一般弁 /High	仕切弁/Gate Valve	Stem	ditto		1 pcs			
251	高圧一般弁 /High	玉形弁Globe Valve	Disk	class 2000 8B(200A)		1 pcs			
252	高圧一般弁 /High	玉形弁Globe Valve	Stem	ditto		1 pcs			
256	高圧一般弁 /High	玉形弁Globe Valve	Disk	class 1500 8B(200A)		1 pcs			
257	高圧一般弁 /High	玉形弁Globe Valve	Stem	ditto		1 pcs			
261	高圧一般弁 /High	逆止弁/Check Valve	Disk	class 1500 10B(250A)		1 pcs			
265	高圧一般弁 /High	パッキン類/Packing & Gasket	Gasket and Gland Packing for High Pressure General			Installed Quantities			
265 A	HP ハイパス スプレイント	玉形弁/ Globe	Complete Set (SP-V-122)			2 sets			

メジャーオーバーホール用供給部品表(機械関係)

Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG. NO.	部品 番号 P.NO.	
265	過熱低減器 Desuperheater	Type VO-70	Packing, Gasket, Cap, Screw, Screw Lock			2 sets			
266	火炎検出器 冷却ファン	火炎検出器冷却ファン /Flame Detector Fan	Felt Packing for Casing			2 pcs			
267	火炎検出器 冷却ファン	火炎検出器冷却ファン /Flame Detector Fan	Filter for Suction Filter			2 pcs			
268	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Valve Stem (771-43963)			2 pcs			
269	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Ring Packing(771-40445)			2 pcs			
271	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket			2 pcs			
272	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Thrust Bearing (51105)			2 pcs			
273	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Ball Bearing			2 pcs			
274	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Oil Seal (SB355558)			2 pcs			
275	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1025604)			4 pcs			
276	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1027504)			2 pcs			
278	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1022504)			2 pcs			
279	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Ball Bearing			4 pcs			
280	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Oil Seal (SB406212)			2 pcs			
281	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1028003)			2 pcs			
282	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1146004)			2 pcs			
283	火炉ガス温度 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Oil Ring (G-70)			2 pcs			

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メジャーオーバーホール用供給部品表(機械関係)  
Parts List for Major Overhaul (Mechanical)

Equipment : Boiler & Aux.

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	図番 DWG. NO.	部品 番号 P.NO.	
284	火炉ガス温度計/Furnace 計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Ball Bearing (6208Z)			4 pcs		
285	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Ball Bearing (6205Z)			4 pcs		
286	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1058204)			2 pcs		
287	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S2546904)			2 pcs		
288	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Packing (S1252504)			2 pcs		
289	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Gasket (S1833204)			2 pcs		
292	火炉ガス温度計/Furnace	火炉ガス温度計/Furnace Temperature Probe	Packing (S1261204)			2 pcs		
298	薬品注入設備/Chemical	りん酸注入ポンプ /Phosphate Pump	Gasket			30 pcs		
300	薬品注入設備/Chemical	りん酸注入ポンプ /Phosphate Pump	Gland Packing			15 pcs		
303	薬品注入設備/Chemical	ヒドラジン注入ポンプ /Hydrazine Pump	Gasket			30 pcs		
305	薬品注入設備/Chemical	ヒドラジン注入ポンプ /Hydrazine Pump	Gland Packing			15 pcs		
308	薬品注入設備/Chemical	アンモニア注入ポンプ /Ammonia Pump	Gasket			30 pcs		
310	薬品注入設備/Chemical	アンモニア注入ポンプ /Ammonia Pump	Gland Packing			15 pcs		
311	試料採取装置/ Sampling	試料採取装置/ Sampling Rack	Cooler Gasket			20 pcs		
312	試料採取装置/ Sampling	試料採取装置/ Sampling Rack	Sight Flow Gasket			20 pcs		



メジャーオーバーホール用供給部品表(機械関係)  
Parts Lists for Major Overhaul (Mechanical)

Equipment: Common Facility

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (KG)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG NO.	
1	排水処理設備 /Waste Water	ユニット中和槽ピットブロ ワ/Unit Neu-tralizing	V-belt			1 pc		
10	排水処理設備 /Waste Water	最終中和槽ピットブロ ワ/Final Neu-tralizing	V-belt			1 pc		
22	排水処理設備 /Waste Water	ユニット中和槽ピットボン プ/Unit Neu-tralizing	Gland Packing			2 sets		
23	排水処理設備 /Waste Water	ユニット中和槽ピットボン プ/Unit Neu-tralizing	Oil Seal			2 sets		
25	排水処理設備 /Waste Water	ユニット中和槽ピットボン プ/Unit Neu-tralizing	Coupling Rubber			2 sets		
35	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Packing for Casing Gasket			2 sets		
36	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Packing for Discharge Pipe Gasket			2 sets		
37	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Packing for Shaft Enclosing Pipe Gasket			2 sets		
38	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Gland Packing			2 sets		
39	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Oil Seal			2 sets		
41	排水処理設備 /Waste Water	排水槽ピットポン プ/Waste Water Pit	Coupling Rubber			2 sets		
57	圧縮空気設備 /Compressed Air System	空気圧縮機/Air Compressor	Seal Box Ass'y			8 pcs	UM40125	4
58	圧縮空気設備 /Compressed Air System	空気圧縮機/Air Compressor	Suction Valve Ass'y	1st stage		6 pcs	UM40322	9
59	圧縮空気設備 /Compressed Air System	空気圧縮機/Air Compressor	Delivery Valve Ass'y	1st stage		4 pcs	UM40323	10
60	圧縮空気設備 /Compressed Air System	空気圧縮機/Air Compressor	Suction Valve Ass'y	2nd stage		3 pcs	UM40283	11

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## メジャーオーバーホール用供給部品表(機械関係)

## Parts Lists for Major Overhaul (Mechanical)

Equipment: Common Facility

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.		図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG NO.	
61	圧縮空気設備 /Compressed Air System	空気圧縮機/Air Compressor	Delivery Valve Ass'y	2nd stage		3 pcs	UM40284	12
66	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	V-Belt 5V-1800	1set for 1 compressor		4 sets		
67	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Piston Ring (1st stage)	ditto		3 sets	UM7212	58
68	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Piston Ring (2nd stage)	ditto		3 sets	UM8438	59
69	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Rider Ring (1st stage)	ditto		3 sets	UM3712	60
70	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Rider Ring (2nd stage)	ditto		3 sets	UM14071	61
75	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Side Cover Packing	Item 11		8 pcs		
76	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Side Cover Packing	Item 12		16 pcs		
77	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Oil Seal	Item 13		16 pcs		
79	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Valve Packing	Item 15		48 pcs		
80	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	O-Ring	Item 16		48 pcs		
83	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Cylinder Packing	Item 19		8 pcs		
84	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Front Head Packing	Item 20		4 pcs		
85	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Front Head Packing	Item 21		4 pcs		
86	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Flange Packing	Item 22		36 pcs		
87	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Flange Packing	Item 23		4 pcs		

メジャーオーバーホール用供給部品表(機械関係)  
 Parts Lists for Major Overhaul (Mechanical)  
 Equipment: Common Facility

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (Kg)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG NO.	部品 番号 P NO.	
88	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Flange Packing	Item 24		8 pcs			
89	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Flange Packing	Item 25		8 pcs			
90	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	O-Ring	Item 26		4 pcs			
91	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	O-Ring	Item 27		4 pcs			
92	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Gland Packing	Item 28		16 pcs			
93	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Gland Packing	Item 29		16 pcs			
94	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Garter Spring	Item 30		32 pcs			
95	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Gland Packing	Item 31		12 pcs			
96	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Gland Packing	Item 32		12 pcs			
97	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Garter Spring	Item 33		24 pcs			
98	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Holder Packing	Item 34		4 pcs			
99	圧縮空気設備 /Compressed Air	空気圧縮機/Air Compressor	Seal Cover Packing	Item 35		24 pcs			
100	圧縮空気設備 /Compressed Air	空気乾燥機/Air Dryer	Descicant (Silica GEL)	Type of Model PA-		500 kg	1389		
101	圧縮空気設備 /Compressed Air	空気乾燥機/Air Dryer	Strainer			4 pcs	P102610		
109	消火装置/ Fire Fighting	消火装置/ Fire Fighting	Seal Glass for Air Form Chamber			8 sets			
110	消火装置/ Fire Fighting	消火装置/ Fire Fighting	Sprinkle Head for Sprinkler Head			100 pcs			
111	消火装置/ Fire Fighting	消火装置/ Fire Fighting	Sprinkle Head for Sprinkler Head			35 pcs			

メジャーパーポーホール用供給部品表(機械関係)  
 Parts Lists for Major Overhaul (Mechanical) Equipment: Compon Facility

番号 NO.	設備名称 Equipment	装置名称 Device	部品名称 Parts Name	部品仕様 Parts Spec.			図面 Drawing		重量 Weight (KG)
				寸法 Dimension	材料 Material	供給数量 Quantity for 2 Units	図番 DWG NO.	部品 番号 P.NO.	
112	消火装置/ Fire Fighting	消火装置/ Fire Fighting	Handle for Hose Chabinet			3 pcs			
113	消火装置/ Fire Fighting	消火装置/ Fire Fighting	Power Portable Extin			20 pcs			
114	非常用ディーゼル発 電機/	非常用ディーゼル発 電機/	Set of Special Tools for 6000H Inspection and			1 set			
115	非常用ディーゼル発 電機/	非常用ディーゼル発 電機/	Material Set Price of Min.			1 set			

*[Handwritten signature]*