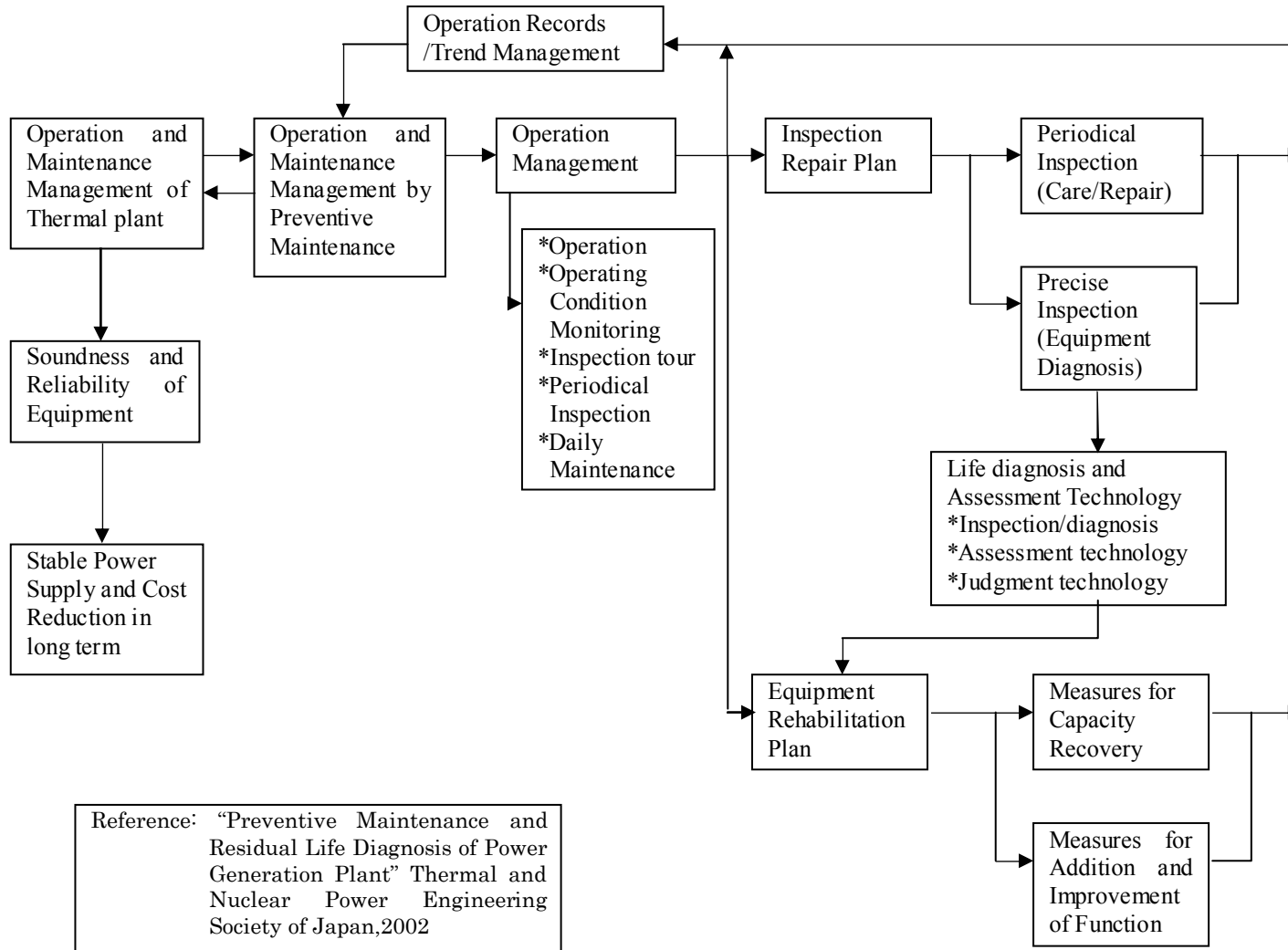


Appendix F : Items to be Considered for Selection of New Generating Plant

Appendix F.1 Operation and Maintenance Management Cycle for Thermal Plant



Appendix F.2 Power Plant Deterioration Diagnosis and Residual Life Assessment

Equipment Name	Component	Place	Phenomena of Deterioration	Diagnosis and Test Technology	Residual Life Assessment Technology
Boiler	Furnace	Pipe support welding portion, furnace wall piping	Thermal fatigue cracking	PT, MT,	SAM, MACM, others
			Corrosion fatigue,	UT	
			Erosive thickness reduction	VT, UT	
			High temperature corrosion thickness reduction	VT, UT, Scale analysis	
	Superheater, Reheater	Pipe support welding portion, Pipe peripheral welding portion	High temperature corrosion thickness reduction	VT, UT, Sampling check.	SAM, MACM, others
			Thermal fatigue cracking	PT, MT, Sampling check	
			Creep fatigue cracking	PT, UT, RT	
	Superheater, Reheater Piping Support	Pipe support, Pipe support welding portion	Creep, Thermal fatigue cracking	PT, MT	SAM, MACM, others OCM, CGDM, VARM
	Main & Reheat Steam Piping	Pipe support welding portion, Longitudinal /peripheral welding point	Thermal fatigue cracking	PT, MT,	MACM, HMM, others OCM, CGDM, VARM
			Creep	PT, MT, UT, RT	
Forced Draft Fan	Impeller, Bearing	Fatigue cracking	VT, PT, MT, UT	SAM	
		Wearing	VT, UT		
Turbine	High/Intermediate pressure Rotor	Outer surface, Center hole	Creep, Fatigue, Fragility	VT, PT, MT, UT	HMM, OCM MACM EPM EM
	High/Intermediate pressure Casing	Steam inlet portion,, Turbine nozzle coupling portion	Creep, Fatigue, Fragilization	VT, PT, MT,	HMM, OCM MACM EPM EM
	High/Intermediate pressure buckets	Buckets embedded area, shroud	Creep	VT, PT, MT, UT	HMM, OCM
	Main valve	Valve box, Valve stem, Welding point with piping	Creep, Fatigue, Fragility	VT, PT, MT, UT	HMM, OCM MACM EPM EM
Generator	Rotor	Center hole, Shaft, Wedge, End ring Coil	Low cycle fatigue cracking	UT, MT, VT	MACM HMM,
			Fatigue cracking	MT, UT, VT	MACM HMM,
			Creep, Fatigue cracking	PT, UT, VT Disassembling inspection	HMM, OCM
			Stress corrosion cracking	PT, UT, VT Disassembling inspection	
			Durum powder	VT, Disassembling inspection	
			Deterioration of insulation	Insulation resistance measurement	ICT
	Stator	Coil	Deterioration of insulation	VT, Insulation resistance measurement	OC, ICT

RT (Radiographic Examination) UT (Ultrasonic examination)

MT (Magnetic Particle testing) PT (Penetrating testing)

ET (Eddy Current testing) AET (Acoustic Emission test)

ST Strain measuring test VT Visual testing

SAM (Stress Analysis Method) MACM (Micro-analyzed Crack Method)

OCM (Organization Contrast Method) CGDM (Crystal Grain Deform Method)

VARM (Void Area Ratio Method) HMM (Hardness Measurement Method)

EPM (Electrical Polarization Method) EM (Etching Method)

ICT (Insulation Characteristics Test) OC (Operation Carrier)

Reference: "Preventive Maintenance and Residual Life Diagnosis of Power Generation Plant" Thermal and Nuclear Power Engineering Society of Japan, 2002

Appendix G : Power Network Diagram for the Power Flow Calculation

Appendix G Power Network Diagram for the Power Flow Calculation

- LEGEND**
- 400 kV Energized
 - 400 kV Damaged
 - 400 kV Under construction/Rebuild
 - 132 kV Energized
 - 132 kV Damaged
 - 132 kV Under construction/Rebuild

