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RISK INSPECTION REPORT

SUBJECT : KIPVU 1 DIESEL POWER PLANT, MOMBASA

CLIENT / INSURED : KENYA ELECTRICITY GENERATING COMPANY / KENYA POWER & LIGHTING COMPANY

DATE OF VISIT : THURSDAY, MARCH 23, 2000 & FRIDAY, APRIL 7, 2000

CONTACT : FRANK KONUCHE, STATION ENGINEER, KIPVU POWER STATION

PREPARED BY : A. M. WANJOHI, DEPUTY GENERAL MANAGER, KABAGE & MWIRIGI INSURANCE BROKERS



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Ref	ITEM / ISSUE	DETAILS / DESCRIPTION	RISK IMPROVEMENT RECOMMENDATIONS / COMMENTS
1	Purpose of Inspection	a) New power plant. Recently erected and commissioned. Insured against fire and related perils in September, 1999. b) Inspection intended to address risk management and insurance issues.	
2	Commissioning / Testing / Handover	a) The commissioning process is in stages and commenced in October, 1999. b) Testing / commissioning is now substantially complete. However, contractors' / manufacturers' two engineers remain on site monitoring efficiency levels. c) Station handover was done in October, 1999. d) A defects liability period runs for 12 months upto October, 2000.	1) Fire and Perils insurance effected. 2) Attendant loss of profits insurance to be effected. 3) Machinery breakdown insurance is necessary. However, it should be scaled down to risks not covered by the defects liability contract, until October, 2000. 4) Attendant loss of profits insurance following machinery breakdown should be arranged.



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3	Property Values / Insurance Considerations	Item No.	Description	Sum Insured Kshs	1) These values are based on the original specification. 2) They did not include Duty and VAT. 3) They are based on Japanese yen which exchanged at JY 55 for Kshs. 100-. 4) Now the exchange rate is JY 70 for Kshs. 100. 5) Thus the values are underinsured and inadequate. 6) New Values should be determined.
		1	Building and Civil Works – Excluding Site Clearance, Roads, Foot Paths and Fencing Structures	576,838,000	
		2	6 No. Mitsubishi MAN 428 RPM / 12.5 KW Diesel Engines (9 Cylinder) & Accessories	1,425,893,275	
		3	Engine Controls and Instrumentation – Including Air Intake and Lubricating System, Water Cooling, Air Starting, Engine Fuel and Engine Exhaust Systems	595,822,913	
		4	a) 6 No. 14.4 MVA ABB AC Generators b) 3 No. 30 MVA 11 KV / 132 KV Generator Transformers c) Station Transformers	319,808,119	
		5	6 No. Exhaust Heat Recovery Boilers and Associated Components and Equipment	85,950,700	
		6	132 KV / 11 KV Switchgear, Protection and Metering Systems, Overhead Line Diversion, Earthing Transformers and Resistors, and Attendant Equipment	214,306,124	
		7	Control Room Desk Panels, Distribution Control Panel, Generator Control Panel, LV Switch and Motor Control Boards and Furniture	109,108,704	
		8	Cabling and Earthing Systems	72,348,240	
		9	Fuel Storage, Treatment and Transfer Plant	37,808,872	
		10	All Other Equipment – Including Telephone / Scada System, Battery Chargers, Ventilation and Air conditioning Equipment, Fire Protection and Fighting Equipment and Other Building Services	122,955,028	
		11	Power Station Cranes	23,932,040	
		12	Spare Parts and Various Tools and Equipment	150,813,584	
		TOTAL			



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4	Location Exposures	a) Sea side location, next to Kenya Ports Authority, Mombasa. b) Adjacent to old steam and gas turbine plants c) Construction work for Kipevu 2 set to commence on one side. d) Stone perimeter wall. Small section chain link bordering the old plant	
5	Natural Hazards Exposure	a) Earthquake / Mild b) Tidal waves / Mild c) Flood, windstorm / Medium d) Bush fire / Mild e) Climatic conditions – Average 30 °C / Humid.	1) Bush clearing should be prioritised particularly on the side of the gas turbine plant.
6	Human Element Exposure	a) Smoking / Not allowed but observed taking place openly in the generator control panel room. b) Law and Order / Good c) Cleanliness & house-keeping / Above Average d) Control attitude of management / Good e) Compliance with previous recommendations for risk management / New Plant	1) No smoking rule should be enforced within the plant building. 2) In the control room, no smoking sign should be fixed.
7	Fire Fighting Systems	a) Safety Engineer / Yes. Mr. Obiero b) Fire boss (Chief) / None. Some employees trained in Fire Fighting. c) Professional full time fire men / None d) Sets of individual protective equipment / None Observed. •Hats •Clothing •Breathing apparatus - oxygen e) Drills - regular / irregular (refresher instructions) / None f) Fire fighting vehicles, trucks / None. Not necessary. g) Supervision of contractors / Yes. Work Permits. No Hot Work Permits.	1) A formal fire fighting team should be constituted and documented. It should be trained. 2) About five sets of fire fighting hats and clothing should be acquired. Two breathing apparatus could also be acquired. 3) Hot work permit system should be instituted.



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8	Fire Protection	a) Ring Main & Hydrants / Yes. Size - To be Advised. a) How is the Ring Main pressurised / Jockey Pump. Automatic b) Sprinkler System / Yes. Engines only. c) Fire Pumps / 2 No. Automatic. Pressure Drop. Electric & Diesel. d) Location Schedule or map of all fire fighting systems / To be Advised e) Are fire drills conducted? How regularly / None Yet. f) Water supply to hydrants and hose reels - is it independent / Yes g) Fire Alarm - Automatic / Manual, or Audio / Visual. / Yes. Control Panel in Control Room. Smoke and flame sensors. Break glass manual override system. h) Fire Water Storage / 2 No. 150 M3 Tanks.	a) At least two fire drills should be conducted per year.
7	Security	a) Watchmen daytime / at night / Yes b) Security Co. or own employees / Subcontracted Service c) Armed security / No d) 24 hrs accessibility to an outside telephone line / Yes e) Internal radio communications / Yes. Walkie Talkies f) Panic buttons / No. g) Controlled patrol (checkpoints) / No. h) Television supervision system / No i) External lightning - flood lights / Yes j) Perimeter fence / Yes. Stone. Small Section - Chain Link	a) It was understood that the current security subcontractor would be changed. On this basis, consideration should be given to using a company with panic button facilities.
8	Construction Protection	a) Spacing between building, / Adequate b) Identification of complex / 3 c) Installed fire walls & fire doors / Yes d) Accessibility of fire brigade / Good. e) Diking of tanks containing combustible and flammable liquids / Yes f) Restriction to unauthorised entry / Yes. But Control Room unrestricted.	a) The control room should be designated a restricted entry area and a sign to this effect put on the two doors.
9	Inspections	These have been conducted at 1500 hours and 3000 hours. The 6000 hour inspection is scheduled for May, 2000.	a) Confirmation that this inspection has been conducted successfully.