

## **Turbo Generator Set**

- SOCIETE RATEAU, Type 7 190 CP 21 multi stage backpressure impulse steam turbine.
- MAAG, type G50S speed reduction gear.
- ALSTHOM, 18,5MW A.C. generator.

### **Backpressure Steam Turbine**

Type	: 7 190 CP 21
Series No	: 8 481
Nbr of stages	: 10
Nbr of nozzle arcs	: 4
Steam inlet orifice dia, mm	: 250
Extraction orifice dia, mm	: 200
Exhaust orifice dia, mm	: 600
HP bearing dia, mm	: 140
LP bearing dia, mm	: 160
Thrust bearing type	: Kingsbury 10 ½''
Turbine-to- gear coupling type	: MAAG Z 58
Gear-to-Generator coupling type	: MAAG Z 59

### **Speed reduction gear**

Type	: MAAG G 50 S
Input speed	: 6313 rpm
Output speed	: 3000 rpm

### **Generator**

Alsthon France 1969	
Type	: T174-165
No	: 409352
Voltage	: 6300V
Current	: 2120 A
Speed of Rotation	: 3000 r.p.m
KVA	: 23100
Cos(fi)	: 0,8
Frequency	: 50 Hz
Insu Cl.	: B
Protection	: Enclosed
Excitation	: V 106 A1200

### **Normal Operation**

Steam inlet pressure	: 57 ata
Steam inlet temperature	: 420 Deg. C
Extraction pressure	: 14 ata,
Extraction temperature	: 264 Deg. C
Exhaust (back) pressure	: 4.5 ata
Throttle steam flow	: 157.400 kg/h
Speed of rotation	: 6300 rpm
Capacity	: 18.500 kW

### **Maximum Conditions**

Capacity	: 20900 kW
Maximum continuous speed of rotation	: 6615 rpm
Lube Oil pressure	: 2.5 bars
Governing (filtered) oil pressure	: 10 bars
Actuating (Unfiltered) oil pressure	: 16 bars

### **Lube Oil Filter**

Make & type	: Rellumix 59C 465 single
Oil flow rate	: 1000 l/min
Pressure drops	: 0,7 bars
Filtering efficiency	: 20 microns
Oil grade	: 50C No.3 E mineral
Service pressure	: 5 bars

### **Governing & safety oil filter**

Make & type	: Rellumix D7C 400 twin
Oil flow rate	: 100 l/min
Pressure drops	: 0,35 bars
Filtering efficiency	: 20 microns
Oil grade	: 50C No.3 E mineral
Service pressure	: 12,5 bars

### **Oil pumps**

Main pump make & type	: Rateau IDF-22 + IMP-13-6
Lube Oil Pressure	: 5 bars
Lube oil flow	: 1100 l/min
Governing & safety oil pressure	: 12 bars
Governing and safety oil flow	: 100 l/min
Actuating oil pressure	: 17 bars
Actuating oil flow	: 200 l/min
Main pump motor power	: 60 HP
Main pump motor supply	: 500V, 50Hz, 3-phase
Main pump motor speed of rotation	: 3000 rpm
Aux. pump turbine steam inlet pressure	: 57 bars (abs)
Aux. pump turbine steam inlet temperature	: 425 deg. C
Aux. pump turbine exhaust pressure	: atmosphere
Aux. pump type	: DHV15 vertical

### **Vent condenser**

Type	: P4-2500-S 16m2
Vapour air flow	: 300kg/h of 26 Deg. C vapour 150kg/h of 60 Deg. C air
Non condensable gas outlet temperature	: 60 Deg. C
Cooling water flow	: 34600 l/h
Water inlet temperature	: 20 Deg. C
Water outlet temperature	: 26.5 Deg. C

### **Turning gear**

Turbine shaft turning speed	: 47 rpm
Motor power	: 10 HP
Motor supply	: 500V, 50Hz, 3-phase

## **POWER FUEL OIL-BOILERS**

Effective design pressure	: 67 atü
Steam pressure	: 57 atü
Steam temperature	: 425 Deg. C
Capacity	: 85 t/h (each)

**RECOVERY BOILER**

Effective design pressure	: 67 atü
Steam pressure	: 59 atü
Steam temperature	: 425 Deg. C
Capacity	: 68 t/h (each)

**FEED WATER PUMPS**

Capacity	: 150 t/h (each)
Total Pump number	: 3

(2 of 3 feed water pumps driven by electric motors and the other driven by steam turbine)