

EXHIBIT C-3 MANUFACTURER'S DATA SHEETS

To achieve the Owner's requirement of a Facility with an output of 12 MW and to achieve the ability to operate at a 17% overload capacity for extended periods of time, the generating components will be designed and tested to a higher rating.

C3.4 not used

C3.5 not used

C3.6 GENERATOR

Electrical Output:

a) Guaranteed	12,000	MW + 17%
b) max. expected overload	15,111	MW
Above sea level	1000	M

Rated voltage	11	kV
Range of voltage regulation	-10.0 / 10.0	%

Rated power factor	0.9	
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Rated frequency	50	Hz
Rated speed	428.6	1/min
Runaway-speed	880	1/min
Moment of inertia (WR ²)	65	tm ²

Permissible unbalanced load (negative sequence current system) of rated current	max. 8	%
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Insulation Class

Stator winding	F	
Rotor winding	F	

Temperature Rise

At rated voltage 11 kV, rated frequency and continuous rating of with cooling air-inlet temperature of max. (Cooling water max. 30°C)	15,925 40	MVA °C
Stator winding (ETD method)	max. 85	K
Rotor winding (resistance method)	max. 90	K

Temperature Rise (max. expected overload)

At rated voltage 11 kV, rated frequency and continuous rating of with cooling air-inlet temperature of max. (Cooling water max. 30°C)	16,790 40	MVA °C
Stator winding (ETD method)	max. 105	K
Rotor winding (resistance method)	max. 110	K

Efficiencies

Referring to a winding temperature of 75 °C and a continuous rating of 15.925 MVA.

Included: - losses of excitation equipment.
- generator portion of thrust bearing losses.

	Generator mode	
	0.9	1.0
at power factor		
and 100% load	97.62%	97.94%
75% load	97.38%	97.73%
50% load	96.69%	97.10%
25% load (approximately)	94.90%	94.91%

The efficiencies are guaranteed with $(100-\eta)/10$ to 1. (except the values for 25% load).

Summation of Losses

at continuous rating of 15.925 MVA and p.f.: 0.9

	Gen.	Mode
Core loss + windage losses	157.3	kW
generator portion of bearings	33	kW
stator-IR losses + stray-load losses	109.8	kW
rotor-IR losses + excitation circuit losses	49.1	kW
total losses	349.2	kW

Copper losses are referred to a winding temperature of 75°C.

The losses will be guaranteed with 10% tol. (except the exciter losses).

Reactance

Direct-axis synchronous reactance unsaturated	Xd	195.4	%
Quadrature-axis synchronous reactance unsaturated	Xq	67.6	%
Transient reactance unsaturated	Xd'	24.8	%
saturated		22.8	%
Direct-axis subtransient reactance unsaturated	Xd''	20.46	%
saturated		17.8	%

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Quadrature-axis subtransient reactance unsaturated	$X_{q''}$	19.12	%
Negative phase-sequence reactance	X_2	19.8	%
Zero phase-sequence reactance	X_0	9.4	%

Time Constants

direct-axis transient open circuit time constant T_{do}'		5.17	s
direct-axis transient short circuit time constant T_d'		1.071	s
armature winding short circuit time constant T_a		0.119	s
direct-axis subtransient short circuit time constant $T_{d''}$		0.02	s

Further Electrical Data

Short circuit ratio referred to the no-load characteristic	0.9	-fold
3-phase sustained short circuit current with excitation for continuous rating of 15.925 MVA p.f. 0.9	1.73	-fold
Instantaneous short circuit current peak voltage at rated operation	14.3	-fold
Rise of voltage after removal of full load (without AVR) p.f. 0.9	33	%
The generator will be capable to supply at zero power factor over excited and 11kV continuously without exceeding the specified rotor temperature rise	11.15	MVar
The generator will be capable to supply at zero power factor under excited and 11kV continuously with a residual positive excitation of appr. 10% of no-load excitation	13.3	MVar
Telephone harmonic factor acc. IEC 34-1;	1.5	%

Excitation (see Exciter data sheet for details)

Static excitation without exciter
connected to the alternator slip rings

Generator mode 15.925 MVA

exciter voltage	53	V
exciter current	1008	A
power factor = 1.0		
exciter current	839	A
no-load excitation: exciter current	567	A

Design Details

Number of external winding ends of stator	6
stator winding connection	star - 7 - fold
number of stator sections	2
nominal stress in the rotor at run-away speed max. 67% of the yield strength of material	

Weights

Total net weight of the generator ready for service	87.5	t
weight of stator	32.0	t
weight of rotor	46.0	t
heaviest part for erection (valid for the rotor incl. lifting device)	50.0	t
heaviest part for transport (valid for the stator)	46.0	t

Dimensions

Stator frame diameter	4800	mm
frame length	1600	mm
max. transport dimensions (LxWxH)	5000x3000x1800	mm

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