

EXHIBIT C-3 MANUFACTURER'S DATA SHEETS

TURBINE

sed that the existing embedded spiral casing cum speed ring and the draft tube be
s or with only minor adjustments. To achieve the Owner's requirement of a
th an output of 12 MW and to achieve the ability to operate at a 17% overload
or extended periods of time, the generating components will be designed and tested
rating.

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a)	Make	:	SULZER HYDRO
b)	Type	:	Vertical Francis
c)	Unit setting level (Guide vane center line to TWL)(M)	:	(-5.25)

Rated net head (M)	:	69.00
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Operating Data for design and testing

3.1	Discharge		
	a) Guaranteed (cum/sec)	:	23.67
	b) Optimum (Cum sec)	:	approx. 21.5
3.2	Output		
	a) Guaranteed (kW)	:	12564 + 17%
	b) max. expected overload(kW)	:	15500
	c) Optimum (KW)	:	approx. 12200
3.3	Efficiency		
	a) Guaranteed (%)	:	92.1
	b) Optimum (%)	:	93.3

Speed

a)	Design (RPM)	:	428.6
b)	Maximum runaway speed (RPM)	:	880

Maximum pressure rise (%)	:	35 of H_{max} stat.
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Runner

a)	Material	:	Stainless steel
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(Cr:Ni - 13:4)

- *b) Discharge diameter (mm) : 1550
*c) No. of runner blades : 15

8. Shaft
a) Material : Forged steel
CK35N (DIN 17200)

9. Guide Vanes (wicket gates) and Operating Mechanism
a) Material of guide vanes : Stainless steel
(Cr:Ni - 13:4)
b) Number of guide vanes : 20 (Nos.)

10. Stay Rings and Spiral Casing
a) Material and dimensions : As is where is.

11. Draft Tube Liner
a) Material and dimensions : As is where is.

12. Turbine Guide Bearing
a) Type of bearing : Oil lubricated bearing

13. Shaft Seal
a) Type : Mechanical seal
b) Material : Special non-metallic material
c) Cooling/Flushing water : Required from cooling water
requirements and source : circuit
d) Micro strainer included : Yes
e) Maintenance seal : Yes

14. Guide Vane Servomotors
a) Location : Inside of turbine pit
b) Type : Double acting
c) Nominal oil pressure (kg/cm²): Less than 160

15. Guaranteed Particulars for Total Rotating Mass
a) Pressure rise for full load : <35
throw off (above max
static pressure)(%)
b) speed rise (above rated : approx. 60
speed) for full load throw
off (%)

Elevations

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|----|---------------------------------------|---|-------------------------|
| a) | Bottom of draft tube exit (M) | : | |
| b) | Top of draft tube exit (M) | : | |
| c) | Deepest point of the draft tube (M) | : | Same as existing levels |
| d) | Turbine floor level (M) | : | |
| e) | Highest elevation of crane hook (M) | : | |
| f) | Unloading/maintenance bay floor level | : | |

Discharge channel might be modified to raise downstream water level

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