

## Power Generation at the Lyons Ferry site.

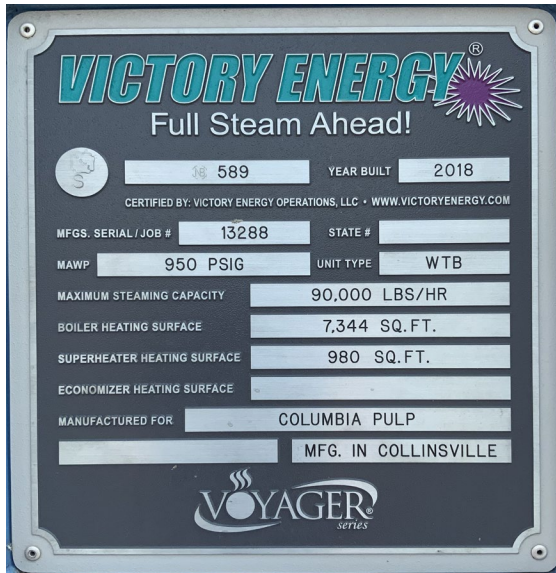
Power at Lyons Ferry is generated using a natural gas fired boiler powering a steam turbine generator (STG), and a Cummins natural gas generator (NGE). Power is produced at 13,800V and 60hz, up to 6.4mW when run in parallel. Up to 5MW comes from the STG and up to 1.4MW from the NGE. The parasitic load is approximately 600KW, bringing actual normal output to ~5.8MW.

The STG is supported by a water-cooled condenser to recycle used steam back into feed water and a Reverse Osmosis system for raw water makeup, along with a Marley 4 cell Cooling Tower. The NGE when paralleled with the STG is normally baseload controlled at 1000KW, while the STG is frequency controlled to handle all additional load.

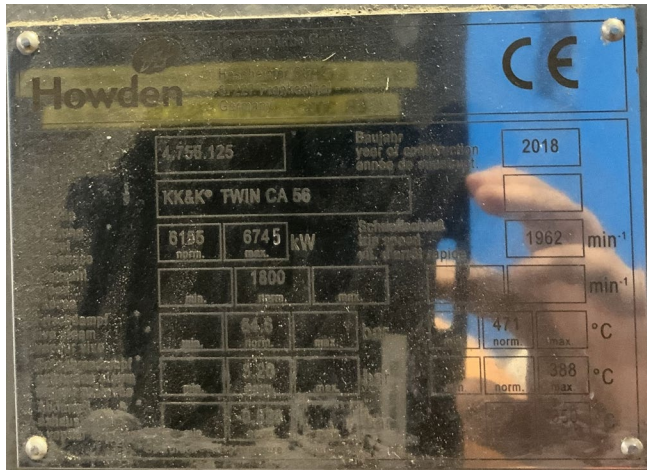
Both systems do have minimum loads, the NGE needs to operate at a minimum of 70% or 980KW. The STGs minimum is approximately 1.6MW or 18KPPH steam flow from the boiler. During startup and operation of these systems a 1000KW load bank is used to control load. The NGE is required to bring the boiler online but can be shutdown once the STG is online or run in parallel.

## Equipment-

Boiler- Victory Energy Voyager series superheated boiler with economizer. Manufactured in 2018, the boiler operates at 800PSI with a maximum output of 90KPPH



Turbine- Howden KK&K Twin CA56. Manufactured in 2018, the turbine operates at 1800RPM and allows for extraction steam



Generator- ToyoDenki Power Systems TC150. Manufactured on 2018. The generator operates at 1800RPM with a normal output of up to 5050KW.

A.C.GENERATOR		tdps	
MADE IN INDIA			
OUTPUT	8750 kVA	TYPE	TC150
STANDARD	NEMA	YEAR OF MANUFACTURE	2018
NO.OF PHASES	3	WEIGHT	23800 kg
NO.OF POLES	4	ENCLOSURE SYSTEM	IP54
VOLTAGE (AC)	13800 V	COOLING SYSTEM	IC81W
CURRENT (AC)	366 A	COOLANT TEMP. WATER	32 °C
FREQUENCY	50 Hz	MAX. TEMP OF ST. BY RTD	125 °C
SPEED	1800 min <sup>-1</sup>	CLASS OF INS. ARM. F	FLD. F
LIMITING SPEED	2280 min <sup>-1</sup>	BRGS.	DE SLEEVE NDE SLEEVE
P.F.	0.8	GRS/OIL	OL-ISO VG46
TYPE OF STATOR CONN.	Star	QTY.(gm/lpm)	DE 6 LPM NDE 6 LPM
EXC.VOLTAGE (DC)	95 V	LUB.INT.	DE - hrs,NDE - hrs.
EXC.CURRENT (DC)	863 A	M/C No.	T-04420
ALTITUDE	<1000 M	DUTY	S1
CONTINUOUS OVER LOAD	- %	PHASE SEQ.	- U/V/W
ROTATION VIEWING AT DRIVEN END.		ACW	CW
MANUFACTURED BY TD POWER SYSTEMS LIMITED, INDIA			

Natural Gas Engine Generator- Cummins QSK60G. Manufactured in 2018. Skid mounted (but not portable) engine/generator combination producing 13,800v up to 1400KW.

**Cummins Power Generation**

Manston Park, Columbus Avenue,  
Ramsgate, Kent, England, CT12 5BF

Generating set ISO 8528

Model Number	C1400 N6C
Serial Number	F18D001456
Manufacturing Order Number	552606
Year of Manufacture	2018
Generating set max mass - wet (kg)	16357
Controller	PC3.3

Declared rating	ESP	PRP	COP	DCC
Rated power (kVA)	-	-	1750	-
Rated power (kW)	-	-	1400	-
Rated current (A)	-	-	73	-
Rated voltage (V)	-	-	13800	-
Rated frequency (Hz)	-	-	60	-
Rated power factor	-	-	0.8	-

**CE** **EAC**

Country of Origin: United Kingdom

Ancillary systems- RO skid, Cooling Tower, Boiler Chemical addition, Cooling Tower chemical addition, Condenser, feedwater system, and Extraction (exhaust) Steam