

1    **B-24 Gas Turbine Condition Assessments, \$307,100**

2    Q.    Provide details of operating problems, other than normal maintenance,  
3            experienced at the Stephenville gas turbine site over the period 2001 to  
4            2006F.

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7    A.    There have been numerous instances when either of the two gas turbines  
8            has failed to start, or one or both of the two gas generators at this facility has  
9            been unable to achieve rated output, or one or both gas generators has  
10          tripped or other failures have occurred. A portion of the station log is  
11          appended.

## SVL Gas

Date	Event
8/11/2006	Anti -Ice Valve GGB
7/5/2006	Compressor A Failure
4/27/2006	GGB Burners EGT
3/30/2006	GGB Burners EGT
3/27/2006	Compressor A Failure
3/21/2006	Compressor A Failure
3/21/2006	Compressor B Failure
3/16/2006	SVL GT Trip
3/10/2006	Access Doors
3/10/2006	Lube oil pump Fail
3/6/2006	EGT alarm GGB
2/28/2006	Failed start GGA
2/23/2006	GGA loading
2/22/2006	Failed Control display
2/7/2006	GGA GGB EGT Spread
2/2/2006	GGB Combustor Cans EGT
1/25/2006	Fuel Meter Fail
1/18/2006	GGB EGT Spread
1/15/2006	GGA GGB EGT
1/15/2006	GGB EGT Spread
11/2/2005	Air leak
10/27/2005	GGB EGT Spread
10/27/2005	Gen Fail
10/3/2005	GGA GGB EGT
8/4/2005	GGA Sync Fail
7/15/2005	Printer fail
6/2/2005	Gen alarm
4/21/2005	GGB Fuel Actuator
4/13/2005	Air receiver A & B
4/12/2005	Air receiver A
4/7/2005	Lube Oil Sys failure
3/21/2005	Compressor A Failure
3/11/2005	Gen Exciter trouble
3/10/2005	Compressor B Failure
3/2/2005	GGB failed to start
2/28/2005	Air dryer leak
2/21/2005	Inlet plenum B
2/21/2005	Fuel sys
2/3/2005	Printer fail
1/26/2005	cooling sys modify
1/20/2005	GGA & GGB
1/19/2005	GGB failed
1/12/2005	Sump System
12/22/2004	Lube Oil Sys failure
10/8/2004	GGB Exhaust leak
10/29/2004	Fuel forwarding trouble
10/28/2004	GGA trip on high temp
10/28/2004	GGA Exhaust gas leaks
10/28/2004	GGA & GGB hot end inspection
10/13/2004	GGB high temp alarm
10/8/2004	Unit controls fail
9/9/2004	240 v battery
8/12/2004	Compressor A Failure
7/22/2004	GGB failed to Sync
7/22/2004	Jct Box JB7B corrosion
7/15/2004	Paint rusted fuel tanks
6/18/2004	GGA combustion chamber drain valve
6/17/2004	GGB combustion chamber drain valve
6/4/2004	GGA & GGB Heaters fail
6/3/2004	Battery room heater installed
4/20/2004	Compressor A Failure
4/15/2004	Lube Oil Sys failure
3/16/2004	Gen Fail
3/4/2004	GGA & GGB start fail
2/24/2004	GGB Sync Fail
2/23/2004	GGA Failed start
2/18/2004	Printer failed
2/11/2004	Air dryer fail
1/27/2004	GGA Failed start

1/20/2004 Annunciator fail  
12/17/2003 AVR Floor Repaired  
12/11/2003 GGA & GGB logic changes  
12/10/2003 Lube Oil Sys failure  
10/24/2003 250 v battery bank replaced  
10/17/2003 GGB Exhaust leak  
10/10/2003 Fuel sys leak  
10/7/2003 Generator cooler fail  
9/30/2003 GGA Failed start  
8/28/2003 Compressor A Failure  
8/13/2003 Fuel sys leak  
7/2/2003 GGB failed sync  
6/27/2003 Motor contactors fail  
6/18/2003 Compressor B Failure  
6/17/2003 Generator AVR repairs  
5/14/2003 GGA & GGB Inlet filter diff fail  
4/30/2003 GGB Temp Trouble  
4/6/2003 Air dryer fail  
2/6/2003 Unit metering fail  
2/4/2003 GGA EGT fail  
1/28/2003 Air dryer fail  
1/15/2003 lube oil sys alarm  
11/1/2002 lube oil cooler housing  
10/16/2003 GT fuel leak  
10/10/2002 lube oil leak  
5/31/2002 GGB Failed to start  
Install thermal assembly on fuel temp  
5/9/2002 regulator  
4/30/2002 Main Fuel valve leak  
4/30/2002 GGA & GGB EGT alarm  
4/16/2002 Fuel level fail  
4/4/2002 GT unavailable  
3/15/2002 GT Control fail  
3/5/2002 Clutch fail  
2/4/2002 Fuel metering fail  
12/12/2001 GGA fuel valve repair  
12/7/2001 GGB fuel valve repair  
8/24/2001 Inlet plenum A paint  
7/6/2001 Fuel tank farm  
1/23/2001 Exhaust A replace volute fabric  
1/17/2001 GGA & GGB Control logic adjustments  
1/12/2001 GGB sent to Rolls Wood for repairs  
1/10/2001 GGB Inlet plenum broken hinges  
1/9/2001 GGB Actuator oil leak repaired  
12/8/2000 Compressor A Failure  
11/22/2000 GGB Exhaust gas bellows replaced  
11/7/2000 Mube oil sys fail  
9/22/2000 GGA Exhaust gas bellows replace  
8/9/2000 GGB Actuator repair  
6/28/2000 Generator fail  
5/18/2000 cooling sys fail  
5/18/2000 GGA & GGB hot end inspection  
4/27/2000 Compressor B Failure  
3/13/2000 Generator alarm  
3/9/2000 Clutch A fail  
1/6/2000 Clutch A & B Heaters not working  
12/20/1999 Fuel off loading  
11/3/1999 Exhaust A replace volute fabric  
9/10/1999 Low volts DC alarm  
9/2/1999 Inlet plenum floor paint  
9/1/1999 GGB removed and shipped to HWD  
8/16/1999 Cooling sys motor overhauled  
3/24/1999 Datalogger fail  
1/1/1900 Cooling sys leak  
3/30/2001 GGA damaged burner  
7/24/2001 Fuel tanks  
9/15/2006 GGA & GGB Repair and paint structure

## Turbine Work Order History

### Details

Removed and shipped to HWD, HWD GGA failed  
New piston rings, seals and gaskets  
Removed and sent to Rolls Royce for inspection  
Installed burners in GGB that were removed from HWD GGB  
Replaced damaged box cable  
Replace flexible air line  
Replace flexible air line  
Logic for EGT modified  
Enlarge access covers on GGA & GGB  
Replace bearing  
Modify logic  
Adjusted fuel transducer  
replace fuel strainers and filters  
Replaced monitor  
Modified fuel flow logic  
replaced with overhauled cans (8)  
Meter replaced  
Remove / test thermocouples  
Inspection by Rolls Wood  
replace strainer and banjo assemblies  
Replace gasket on receiver  
Cleaned burners  
Check exciter straps  
Logic revised  
Adjusted fuel valve  
Replace cable  
???  
Install Heat tracing  
Replace pressure relief valve  
Replace failed pipe  
replace pressure switch  
Replace gaskets and rings  
repair exciter metering  
replaced after cooler  
  
new filters and clean valve  
Repair holes in floor  
replace transducers for overfill protection  
configure printer  
add conditioner  
repair cracks in exhaust stacks and enclosures  
fan motor repaired  
Modify logic  
exchanger cooling fan belts  
repairs to turbine casing flange joint  
  
Retorqued bolts  
Also cleaned fuel nozzles  
  
Repairs to cards in DCS  
replaced cell  
repair oil leak  
  
install heater  
  
repair heater connections  
  
replace gaskets and oil  
Replace heater circuit breaker  
inverter failed and replaced  
fuel heating repairs  
  
Fuel valve adjusted  
Changed settings  
modified output line and check valve

replaced cards

reset logic

Retorqued bolts  
leaking filter  
belt replaced  
adjusted fuel transducer  
Head gasket

fuel valve problem  
required cleaning  
replace aftercooler

replaced tubing and repaired switch  
Replaced thermocouple wire  
Replaced check valve  
repairs to KWH meter  
repairs to fuel pressure transducer  
replaced filters  
lube oil added  
repairs to screen and frams  
repairs to fuel valve  
repairs to tregulator flange  
Repair to oil pressure switch

replace gasket  
Logic changes  
Transmitter fail  
TRF SS1 high temp alarm  
Switch replaced  
Solenoid checked  
Calibrate meter

install expansion tank

new gaskets and rings

replaced timer

Bushing replaced  
repair glycol pump  
With Rolls Royce rep. On site  
new gaskets and rings  
Heater fail  
locking solenoid fail

repair start button

Replace pump seals  
replaced  
Installed level transmitters on all tanks

## SVL Gas Turbine Station Log History

Date	Event	Details	
1/5/2001	GGB returned and inatalled	Returned from Scotland	
1/16/2001	GGB EGT spread trip	Tuning and making adjustments with Craig Warren next 2 days	
1/17/2001	GGA Clutch problem	Clutch had to be dis-engaged manually by mechanic	
1/22/2001	GGA Outage	Replace exhaust fabric	
1/23/2001	GGA Burner #4 loose shroud nut		
	Lube oil high temp and low level		
2/22/2001	alarm	oil added	
3/8/2001	Unit Tripped	Main lube oil temp / low level alarm	
3/30/2001	GGA Burner # 4 replaced		\$8,000.00
5/15/2001	Fuel Sys Problems	All three fuel transmitters sent away for calibration	
5/28/2001	GGB tripped	EGT trip	
5/28/2001	GGA failed start	Incomplete sequence	
5/28/2001	GGB tripped	EGT tripped several attempts	
5/29/2001	GGB start fail	Fuel transducer	
6/7/2001	GGB failed start	ignition problem	
6/8/2001	GGB Fuel transducer adjusted		
9/19/2001	GGA Low fuel pressure alarm	Filters replaced	
11/5/2001	GGA Alarms	Temp alarms in Turbine BRG, Lube oil and Gas Gen Enclosure	
11/29/2001	GGA Trip	Speed sensor fail	
12/4/2001	GGB failed start	Solenoid burnt out	
12/4/2001	Sync Condense trip	Glycol pump fuse blown	
12/4/2001	GGA Clutch fail	Mechanic had to disengage manually.	
12/5/2001	GGB failed start	Liquid fuel valve position fail	
1/10/2002	New Energen system in service		
1/31/2002	Generator trip	Reverse power	
2/22/2002	GGB failed start	Low DC volts alsrm	
2/27/2002	GGA Temp alarm	Failed thermocouples	
3/5/2002	GGA Clutch solenoid replaced		
3/5/2002	GGA Failed start	Low fuel pressure. Filter replaced	
3/5/2002	Main lube oil temp alarm	Failed regulating valve	
	ECC unable to select sync condense		
3/15/2002	to generate mode	Logic problem	
4/4/2002	SS1 High Temp Alarm	RTD connections failed	
4/20/2002	GGB tripped	Lube oil pressure switch fail	
	GGB Logic changes made by		
4/30/2002	Engineering		
5/7/2002	Fuel leak	Fuel filter o-ring replaced	
5/30/2002	GGB failed start	Failed lube oil pressure switch	
	Fire dampers on GGA & GGB		
9/18/2002	replaced		
10/16/2002	GGB Fuel valve fail	Faulty microswitch	
10/24/2002	Alarm, Unit not ready	Air system failure	
11/2/2002	Generator trip	Reverse power	
11/15/2002	Sync Condense trip	Main lube oil pump leak	
11/26/2002	Air dryer fail	Broken prefilter	
	GGB not operational until GGB oil is		
11/29/2002	changed		
1/27/2003	Alternator cooling problem	Fan motor failure	
1/28/2003	Dryer assembly replaced		
	GGA, GGB and alternator not		
1/29/2003	available	Main lube oil alarm. Faulty relay in heater	
1/30/2003	GGA EGT trip		
1/31/2003	GGA trip	Fuel pressure switch failure	
2/14/2003	GGB trip	Exhaust door failure	
2/14/2003	GGB Fail to start	Hydraulic actuator malfunction	
3/14/2003	Fire impairment	Water supply from town frozen, restored 4/28/2003	
3/27/2003	250V battery trouble	Cell #14 & 56 removed	
4/7/2003	Unit control problems	Monitor and keyboard failure, returned to service 5/14/2003	
4/21/2003	GGB trip	Reverse power	
4/25/2003	GGA failed start		
4/30/2003	GGA failed start		

6/18/2003 MCC contactors trouble	Required cleaning
6/29/2003 GGB failed start	Auto sync trouble
6/29/2003 GGB failed start	EGT high
6/30/2003 GGB failed start	Fuel transducer adjusted
8/22/2003 GGB EGT trip	
9/18/2003 GGA EGT trip	
9/30/2003 GGA failed start	Fuel transducer problem
10/6/2003 Cooling system failed	Fan motor belts replaced
10/15/2003 Gas generator	Retorqued flange bolts on power turbine casing
10/24/2003 250V battery bank replaced	
11/9/2003 GGB trip	Enclosure high temp
11/9/2003 GGA failed start	Three times on EGT
12/2/2003 GGA & GGB failed start	Jacking pump blown fuse
12/27/2003 Control system failure	Inverter failure
1/1/2004 Air system failed	Dryer after filter housing failed
1/5/2004 Control system failure	Inverter failure. Removed from service
1/7/2004 Logic changes	Generate/sync condense mode
1/7/2004 GGA failed start	Light off problems. Fuel transducer adjusted
1/7/2004 GGB snow doors failed to close	Operating pressure adjusted
2/2/2004 GGB failed sync	Control problems
2/16/2004 GGA failed start	Failure to light off
2/18/2004 Printer replaced	
2/22/2004 Main lube oil temp alarm	Heater breaker tripped
2/25/2004 Fire relay for glycol pump replaced	
3/4/2004 Fuel re-circ heater returned to service	
3/12/2004 New inverter in service	
3/19/2004 Fuel re-circ heater logic changes	To prevent heater from staying on if unit trips
4/19/2004 Lube oil pressure alarm	Filters replaced
4/28/2004 GGA & GGB power turbine	Retorqued flange bolts
5/18/2004 GGB hot end inspection	
5/19/2004 GGA hot end inspection	
6/14/2004 All three fuel tanks painted	
125V battery bank removed from	
7/16/2004 service	Thermal runaway on VRLA
9/27/2004 Generator trip	Alternator main lube oil temp. Fan failure
9/28/2004 GGA EGT trip	
9/30/2004 GGA failed start	High EGT
10/2/2004 GGB shutdown	Auto sync trouble
10/8/2004 DCS logic changes	
10/13/2004 GGB EGT trip	Fuel actuator adjusted
10/13/2004 GGA clutch failure	Proximity switch fail
10/18/2004 GGB failed start	Fuel transducer
10/21/2004 New 125V battery bank in service	
12/7/2004 GGA trip	Liquid fuel failure
12/7/2004 GGB EGT trip	
12/7/2004 GGA failed to light off	
12/7/2004 Generator trip	Reverse power
12/13/2004 GGA failed start	
12/13/2004 Main lube oil failure	Relay failure
1/12/2005 Sump level logic modified	
1/13/2005 Computer repairs	New power supply fan
1/19/2005 GGB enclosure fan motor replaced	
1/20/2005 GGA GGB exhaust stack repairs	Cracks repaired
2/22/2005 GGB failed start	Generator overspeed trip. Actuator adjusted
2/23/2005 Generator trip	High bearing temperature. Blown fuse
2/23/2005 GGB EGT trip	
2/23/2005 GGA EGT trip	
3/8/2005 Main lube oil control relay failure	
3/9/2005 Compressor #2 fail	After-cooler replaced
3/14/2005 Air receiver tank #1 severe leak	Tank isolated and removed from service and repaired by contractor
6/2/2005 Sync condense trip	DC ground
Start sight assessment for	
6/23/2005 hydrocarbons	
8/3/2005 GGB failed start	Exhaust thermocouple quality
8/3/2005 GGA failed start	Sync trouble

9/2/2005 Generator trip	Reverse power
9/2/2005 GGB EGT trip	
9/15/2003 GGB failed start	High EGT
10/3/2005 Control logic changes	
10/25/2005 Generator excitor failure	Blown fuses. Failed excitor straps
10/27/2005 GGB EGT trip	Burners #1 & 4 cleaned with no success
10/27/2005 GGA failed start	Liquid fuel valve position fail
10/28/2005 Fuel transducer adjusted	
11/2/2005 GGA air starter leak repaired	
11/14/2005 GGA hot end inspection	Engineering and Rolls Royce on site
11/15/2005 GGB hot end inspection	Engineering and Rolls Royce on site
11/21/2005 Fuel meter replaced	
11/23/2005 GGA failed start	EGT spread
11/26/2005 GGB failed start	Failed to light off
12/1/2005 GGA & GGB logic changes	
12/2/2005 GGA failed start	EGT spread
12/16/2005 Emergency diesel installed	
1/3/2006 Cooling failure	Main lube oil temp. Belts replaced
1/16/2006 GGA failed start	EGT
GGB fuel nozzles removed and sent	
1/19/2006 to the UK for overhaul	
1/23/2006 GGA failed start	Adjusted fuel transducer
1/24/2006 GGA failed start	EGT spread
1/25/2006 GGA sync condense	Three attempts before success
	GGB combustors cans replaced with refurbished set stored at HWD. Rolls Royce rep on site
1/30/2006 GGB combustor cans	
2/2/2006 GGA failed start	EGT spread
2/5/2006 GGA failed start	EGT spread
2/6/2006 GGA failed start	EGT spread
2/6/2006 GGA fuel transducer adjusted twice	
2/7/2006 GGA logic	Engineering on site for logic changes
3/6/2006 GGB logic changes	
3/16/2006 GGA logic changes	
Anti-ice valve returned to GGB from	Fuel nozzles from HWD GGB installed in SVL GGB. Three attempts to light off GGB failed. Fuel transducer adjusted
4/5/2006 HWD	
4/25/2006 Snow doors repaired	
6/9/2006 Compressor #1	New rings
Replaced voltage snubbers in control	
6/15/2006 circuit	
8/8/2006 GGB unavailable	Combustor cans, fuel nozzles removed from SVL GGB and sent to HWD GGB. Anti-ice valve removed from SVL GGB sent to HWD GGA
8/17/2006 GGA failed start	EGT. Three attempts. Fuel transducer adjusted