



TURBINE TIPS

Turbine Tips provided by Pond and Lucier, LLC. ®

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Subject: Compressor Performance

Applies to: All GE gas turbines

A quick way to determine if the axial-flow compressor on your GE gas turbine is performing “up to snuff” is to measure three variables and refer to a chart as in Fig. 1 below. These signals include:

- Compressor Discharge Pressure, PSIG
- Compressor Inlet Temperature, Degrees Fahrenheit
- Compressor Discharge Temperature, Degrees Fahrenheit

Most GE turbines have thermocouples (2) that read compressor discharge temperature. Also, gas turbines have either a pressure gage or pressure transducer (or both) for reading compressor discharge pressure. Finally, the compressor inlet temperature can be read in the vicinity of the inlet air filters.

COMPRESSOR DISCHARGE PRESSURE & TEMPERATURE
VS. AIR INLET TEMPERATURE

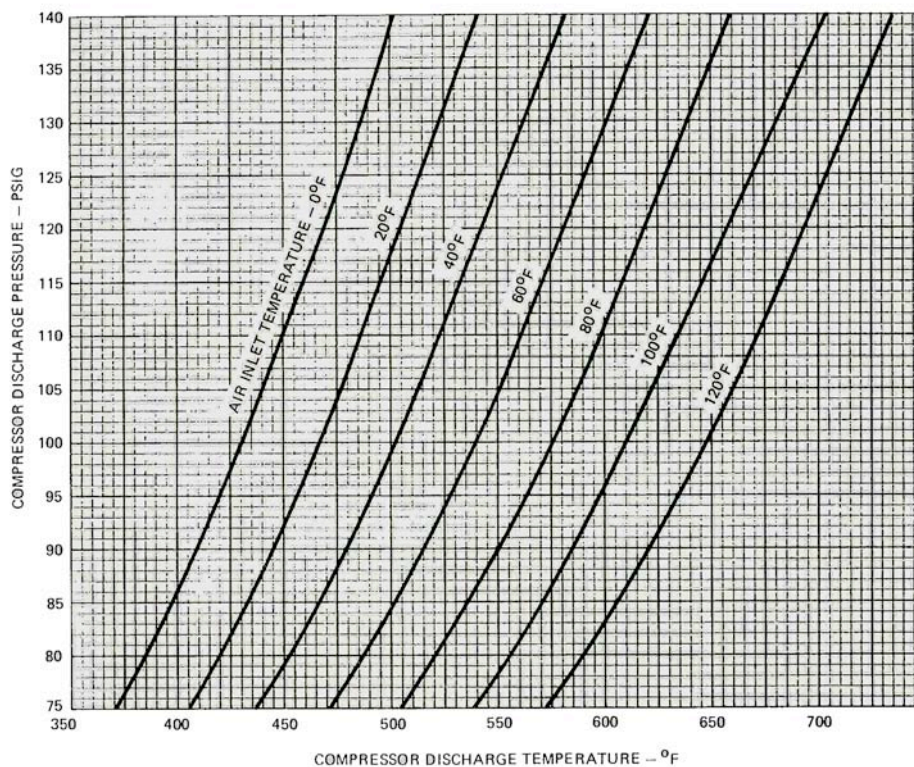


Fig. 1: Compressor Discharge Pressure versus Temperature for Various Air Inlet Temperatures

The temperature selector for compressor discharge temperature is often on right front of the turbine control panel. In power block applications (4 turbines), there may be a single temperature meter and one selector switch for each turbine. See Fig. 2 below for a power block configuration. There is a multi-position switch for each turbine that is connected to the temperature meter when the correct signal is selected.

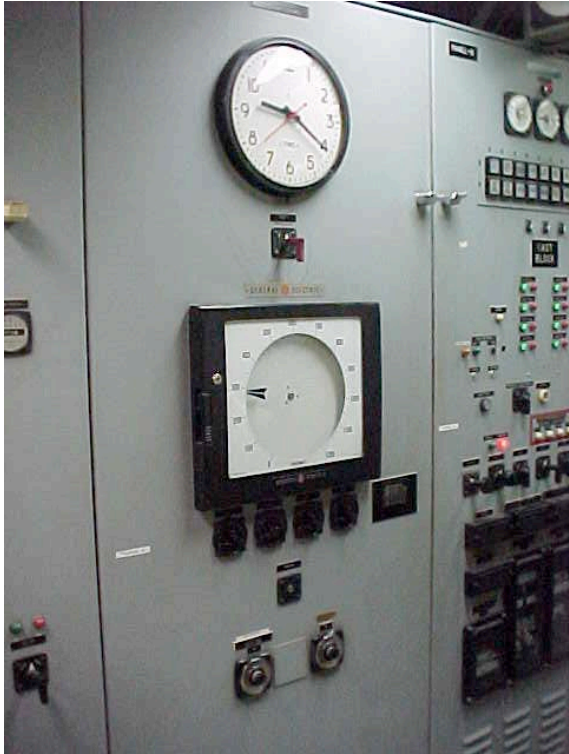


Fig. 2: Temperature Meter in center of panel with selector switches below



Fig. 3: Compressor Discharge Pressure (PCD) Gage

Record the following data:

<i>Parameter</i>	<i>Reading</i>	<i>Comments</i>
Compressor Discharge Temp, Tcd-1 (°F)		Left side of compressor
Compressor Discharge Temp, Tcd-2 (°F)		Right side of compressor
Compressor Inlet Temp, Tci-1 (°F)		Upstream of inlet filters
Compressor Discharge Press, PCD (psig)		Be sure gage is properly calibrated.

Now go to the chart and plot a point based on the data recorded above.

Example:

Suppose you recorded the following data:

<i>Parameter</i>	<i>Reading</i>	<i>Comments</i>
Compressor Discharge Temp, Tcd-1 (°F)	503	Left side of compressor
Compressor Discharge Temp, Tcd-2 (°F)	497	Right side of compressor
Compressor Inlet Temp, Tci-1 (°F)	40	Upstream of inlet filters
Compressor Discharge Press, PCD (psig)	95	Read on pressure gage panel as in Fig. 3

Averaging the two compressor discharge temperature readings (Tcd-1 and Tcd-2) you get 500 °F. The PCD gage reads 95 psig and the ambient compressor inlet temperature is 40 °F. From the chart, you expected that PCD would be 98 psig. Thus, the compressor is under performing. It may need to be washed or perhaps the blades are eroded or corroded.

For more information, contact Dave Lucier at PAL engineering, tel: 518-371-1971.