



# TURBINE TIPS



Turbine Tips provided by Pond and Lucier, LLC. ®

634 Plank Road, Suite 103 Clifton Park, NY 12065

Phone: 518.371.1971 Fax: 518.371.1756 E-mail: pal@pondlucier.com

**July 2005**

**Subject:** “Home Running” Thermocouple Wiring

**Applies to:** General Electric gas turbines

Thermocouples should be connected with the *fewest* number of terminations possible between the sensing tip and the signal processor. This is done to minimize the possibility of short circuits, electrical grounds or corrosion at the TC terminations. Fig. 1 below shows several thermocouples (abbreviated TC hereafter) installed around the perimeter of an exhaust plenum.



Fig. 1: Exhaust thermocouples encircle gas turbine exhaust plenum

The tubing leads (iron-constantan TC wires inside) are then run around in a circular pattern to a new “pass-through” box on the compartment wall. Notice that the extended leads of tubing are coiled underneath the box to avoid cutting the leads before they run into the box. See Fig. 2 below.



Fig. 2: Thermocouple tubing leads coiled and run up to the "pass through" box.

The actual TC wires are not exposed to the turbine load compartment environment. They enter the *inside* box (Fig. 3 below) before continuing through to the *outside* box shown in Fig. 4. Notice the two TC shown installed in the exhaust plenum. Brackets provide support (standoffs) for the tubing to keep them away from the plenum and to minimize vibration.



Fig. 3: Thermocouple connections under the inside "pass through" box

All twelve exhaust TC leads continue to the *outside* box and down to a new junction box on the side of the turbine I-beam base. The junction box has terminal strips (not shown) where the

twelve TC are first terminated. This allows easy access for inspection and testing. The TC lead wires are then run inside a conduit back to the control room. See Fig. 4 below.

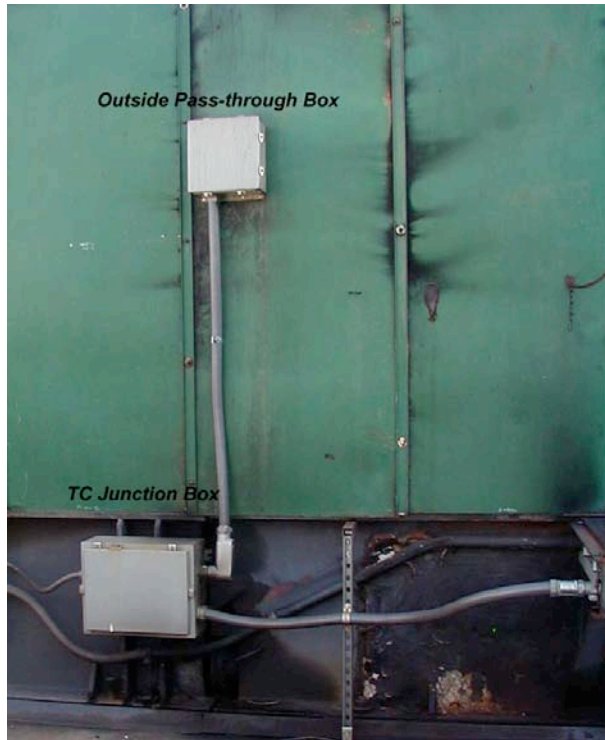


Fig. 4: Thermocouple Junction box installed on I-beam base

Finally, the TC wires are run through new conduit and up to the control room to the signal processor without additional interconnections. This is the safest way to bring exhaust thermocouples to the control signal processor in the control cab. See Fig. 5 below.

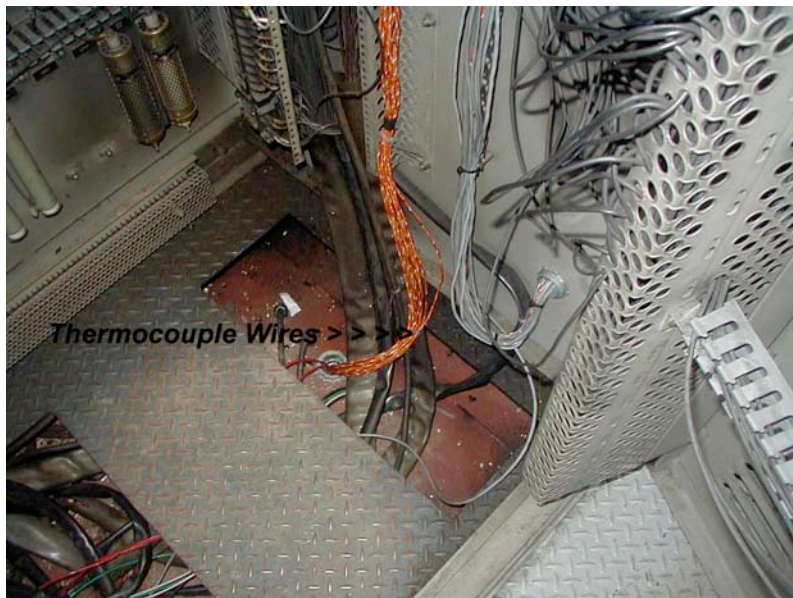


Fig. 5: Thermocouple wires are “home run” back to control room through the floor

For further information about “home running” thermocouples, contact Dave Lucier of ***Pond and Lucier, LLC*** by calling: 518-330-4801.