
WinDaq Monitors and Documents Control Rod Drive Welds

DATAQ Instruments

Inserting graphite control rods into the fission process controls the rate of nuclear fission in a nuclear power plant. The rate of nuclear fission is inversely related to the amount of graphite present in the system. Our customer manufactures a circular welding tool used to weld the control rod to a control rod drive assembly. As you may imagine, the quality of the weld is of critical importance to the proper functioning of the power plant. As such, our customer needed to both monitor the weld process in real time, and produce a permanent record of each weld performed. He chose our DI-500 data acquisition system and WinDaq software.

Four signals were monitored from each circular welding machine:

Signal	Range
weld voltage	0 to 20 volts
weld current	0 to 100 amps
weld wire feed speed	0 to 250 cm/min
rotation speed	0 to 15 cm/min

The DI-500 provides isolated signal conditioning and digitization for each signal connected to it. It also delivers the digitized data to a personal computer using a printer port interface, so the welding team is free to use desktop as well as laptop PCs in the field.

During the welding process, all four channels are monitored by technicians for proper operation in relation to each other. At the same time, waveform data described by the four signals are recorded to disk to form a permanent record of the weld around the entire circumference of the rod.

Use of the computer-based WinDaq solution in this application avoids cumbersome traditional instruments like chart recorders and their resulting paper-based record. Instead, each weld is represented by a small and easily archived WinDaq file maintained on a server. Further, the files of any troublesome welds may be e-mailed to the home office for diagnosis by a team of engineers half a world away.