

PEPCO FT4 Control System Overview

PEPCO is the world leader in FT4 control upgrades with more than 4,000 MW of FT4 power generation running on PEPCO controls throughout the world. Yet, with this large number of units in operation, PEPCO does NOT have a field service department dedicated to servicing these units. That is by design, and has proven the test of time. PEPCO control system design is based on using the highest quality, industrially/utility proven off-the-shelf components available. PEPCO then provides our customers with the training to make them as self-sufficient as desired. Of course, PEPCO has field service personnel available to be dispatched for emergencies in which plant operators need assistance. In addition to on-site emergency support, all PEPCO installations are setup with the ability for PEPCO engineers to access the control system computer via the internet or dial-up phone, as controlled by the customer, for immediate support. Most often, remote access support is all that is required to identify the problem so that plant operators can take corrective action.

PEPCO's system design is based on NOT changing the operator's unit control interface. There is no operational reliance on the Operator Workstation computer. All of PEPCO's upgrades use the same pushbuttons and switches for operation which the OEM control does, so there is no difference in the way the unit is run by an operator. This design makes the operational transition to the new control system seamless. Although the computer Operator Workstation is not required to run the unit, its advanced functionality and information will greatly improve any unit troubleshooting which may be required and allow the display and trending of analog data which is historically recorded for analysis & review.

It is important to note that all of the components which PEPCO uses are not only industrially/utility proven components, but they are readily available components. More important is the selection of the Quantum Control System. This is available through Square D/Schneider Electric distributors world-wide which means that you have multiple local distributor sources (Graybar Electric is a local Square D/Schneider Electric stocking automation distributor) to purchase any repair parts, in addition to PEPCO who will provide you the parts if you prefer. Because Quantum is a general control system, they are produced in large quantities, are readily available, and use industry standard communications protocols. No additional hardware or software is required to be connected to most SCADA software or other vendor's control systems. The Quantum control system provided talks Modbus Serial and Modbus TCP/IP natively. In addition, there are thousands of programmers knowledgeable in programming Modicon Quantum PLCs. Our customers return to PEPCO because of the service and expertise we provide, not because they do not have other options.

This system is capable of communicating over multiple protocols. PEPCO installed a Steam Plant control system which provides the following connectivity:

- communications with the ISO RIG,
- provides steam plant power control AGC (all three plants),
- the new SCADA system required by ISO with connectivity via L&G 8979 protocol,
- communicates (bi-directionally) with NUs D20 SCADA system via DNP3 serial , and
- communicates to corporate's marketing/operations network via DNP3 TCP.

PEPCO also designed and installed an Automated Electronic Dispatch system for a New England customer. This system communicates with the ISO rig and automatically starts any of six (soon to be eight) remote unattended FT4s over a private WAN, automatically acknowledges the ISO RIG, and sends email notifications of designated events to cell phones, PDAs, and computers.

One important point to note about the PEPCO control system design is that PEPCO drives the existing OEM 400Hz mod-valve actuator directly without any modifications. This prevents the necessity to either change the mod-valve and actuator completely or install a non-standard actuator, with potential physical mod-valve modifications. Therefore, PEPCO's use of the OEM valve enables you take advantage of existing spare mod-valve parts which are readily available and prevents the need to break into the fuel system piping during an upgrade, and the potential problems associated with that.

Also, PEPCO's system design has proven to extend mod-valve actuator life significantly. The most common actuator problem is wearing a flat spot in the feedback pot due to SPC-2(A) fuel control hunting. The PEPCO SPC-2FB digital fuel controls do not hunt like the OEM SPC-2(A) fuel controls, in addition, our design only powers the mod-valve during operation which further reduces potential mod-valve wear. We have more then 75 FT4 fuel controls in operation, some for more then 10 years. That is about 375 years of flawless PEPCO FT4 fuel control operations. Two of the three FT4 engine test cells in the US have chosen PEPCO Fuel controls to run test cell engines.

Most existing OEM modvalves and actuators function well, however, as an option, PEPCO can overhaul existing modvalve actuators, to ensure optimum performance.

PEPCO uses Modicon's Concept IEC61131 programming environment, which is arguably the best in the world. Our programs are written in an advanced function block language similar to any DCS system.