



## CUSTOMER SUPPORT



*Issue 1*

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## **1.0 INTRODUCTION**

From accumulated experience, HPI is fully aware of the vital support functions associated with the supply, installation and support of critical equipment. The purchase of a new system is the first stage of a relationship that will continue for the life of the equipment. It is HPI's policy to insure that the highest level and quality of support is planned and executed efficiently.

## **2.0 CUSTOMER SUPPORT**

The Customer Support Department performs a vital role within HPI. This department provides all the necessary Customer Support Functions to maintain a safe and efficient system that serves the customer needs. These functions follow.

### **2.1 TRAINING**

Comprehensive hands-on training courses specific to the application are available either at our training facility or at customer designated sites.

### **2.2 FIELD SERVICE ORGANIZATION**

Provides worldwide installation and commissioning support. And, support service throughout the life of the equipment. A range of service and maintenance contracts are available in order to insure the continued operation of the equipment during its operational life and prompt on-site support in the unlikely event of failure. Dependent upon availability, Customer Support assigns a Site Engineer who had been part of the retrofit project team.

### **2.3 REPAIR**

HPI operates a comprehensive facility for repair of company products at its offices in Houston, Texas.

### **2.4 SPARES**

HPI's policy is to provide spares throughout the life of the system.

### **2.5 AFTER-SALES SERVICE**

Engineering support for installed equipment includes modifications and upgrades.

### **3.0 INSTALLATION**

Refer to the commercial section to determine HPI responsibilities for each particular application.

The HPI scope of work often includes Supervision of installation work and Demolition/Installation drawings and Instructions. Typical Installation activities are as follows:

- ↪ Remove redundant equipment in the Unit Control Panel (U.C.P.).
- ↪ Remove existing Fuel Control Valves.
- ↪ Mount new Control System equipment in the U.C.P.
- ↪ Lay new cables from the new Fuel Valves to the U.C.P.
- ↪ Mount new Gas Fuel Control Valve, Liquid Fuel Valve.
- ↪ Connect field terminal wiring to the Control System.
- ↪ Perform system Check.

HPI normally provides one Supervisor to oversee these installation tasks. It is estimated that the Installation phase for each turbine will take approximately 6 days. This assumes uninterrupted access to the equipment during this phase.

### **4.0 COMMISSIONING**

All commissioning will be managed by HPI in accordance with the agreed Commissioning Plan and assisted by relevant Customer personnel. HPI will maintain a commissioning log book which will be updated after each stage of the commissioning.

The Customer is responsible for re-installing the electrical power to the system. Fuel gas or distillate is not required until all non-fired start tests have been completed. It is estimated this activity will take five days.

The Commissioning task summary follows.

- ↪ Power-on system in stages with fuel valve stepper motor drive units removed.
- ↪ Check all I/O including calibration of analog signals.
- ↪ Test RVDTs on fuel valves.
- ↪ Perform valve tests.
- ↪ Test system sequence in local control.
- ↪ Customer to re-install fuel gas and distillate to fuel skid.
- ↪ Perform non-fired starts to set manifold pressure on gas and distillate.
- ↪ Perform fired starts on turbine, adjust stability if required. These starts to be unloaded.
- ↪ Connect to bus (if GenSet).

- ↪ Perform fired starts and load the system.
- ↪ Perform load tests.
- ↪ Perform load rejection tests (if GenSet).
- ↪ Black-start unit (if GenSet).
- ↪ Perform continuous engine run tests
- ↪ Customer to accept unit.

Check the following:

- ↪ Speed setpoint.
- ↪ No-load temperature.
- ↪ Exhaust stack temperature.
- ↪ Raise and lower controls.
- ↪ Overspeed test.
- ↪ Emergency stop.
- ↪ Normal stop.
- ↪ Temperature deviations alarms/shut down.
- ↪ General Alarms.

## **5.0 ON-SITE TRAINING**

After the commissioning phase of the unit is completed, there is a 24 hour run with load. During this period general instructions will be provided on-site to cover the following topics:

- ↪ Installation of HPI equipment.
- ↪ Operation of the system.
- ↪ System maintenance, fault investigation and module replacement procedures.

The instructions include procedures for checking the calibration of the Fuel Valve position, this instruction should take place during the commissioning period when the turbine is in a shutdown state.

A complete and detailed training course is recommended to promote full understanding of HPI system.

## **6.0 ADDITIONAL TRAINING**

The HPI Customer Support Department can provide more comprehensive instructions for operators, technicians and engineers in the use and maintenance of the HPI system. Depending on the complexity of the application, three to five days are required for training. Course materials will be provided, but basic computer knowledge is required. HPI recommends groups of up to six persons to maximize instructor interface with each attendee.

The course can be held at HPI during normal working hours, or at a customer designated facility.

A typical course syllabus follows:

- ✦ System overview.
- ✦ System integration.
- ✦ Hardware description.
- ✦ Fuel Valve.
- ✦ Governor.
- ✦ Maintenance, Fault-Finding and Module replacement procedures.
- ✦ HMI graphics package.
- ✦ Turbine/sequence control software.
- ✦ Ladder Logic (if PLC unit was supplied).
- ✦ Diagnostic Software.

HPI will provide an objective assessment of the course attendees upon completion of training.

## **7.0 DOCUMENTATION**

During the life of the equipment, HPI will supply additional Manuals and relevant Installation drawings at a nominal cost.

## **8.0 SPARES**

The HPI approach to Commissioning (Start-up) and Insurance spares is as follows:

### **8.1 COMMISSIONING AND START-UP SPARES**

These spares insure that Commissioning and Start Up is performed in a timely fashion. These spares are restricted to the minimum needed to operate the equipment from start-up to a successful completion of commissioning. These spares include HPI made parts which could require replacement during Installation, Commissioning and Start Up. Also, where practical these spares include third party vendor items.

### **8.2 INSURANCE SPARES**

These are spares carried by the customer and are items which usually require a long lead time or are considered necessary to avoid lengthy shutdowns of vital equipment.

In order to provide a fast replenishment of stock of Insurance spares, HPI operates a repair-by-replacement philosophy out of its facility in Houston, TX. This applies to HPI made products only.

HPI will hold a rotating pool of spares at its Houston facility. At a nominated base location the customer will carry a set of Insurance spares as defined in the technical section as recommended spares.

Upon failure of any unit in the field, that unit will be replaced by the spare held at the Customer-nominated base location. Upon notification by the customer of a failed unit and its imminent return to HPI premises, as an option, the customer could request HPI to forward a replacement to temporarily replace the base spares held unit.

The unit returned as having failed will then be repaired or replaced at HPI's option under warranty (if applicable) or at Customer cost. If applicable, any temporary replacement should be returned to the HPI rotating pool of spares.

## **9.0 SPECIAL TOOLS**

No special hardware is required for the commissioning or maintenance of the installed equipment. HPI uses a standard IBM or compatible PC to assist in some of the commissioning tasks.

## **10.0 WARRANTY**

HPI offers the warranty as specified in the commercial section of this proposal.

## **11.0 SERVICE AND MAINTENANCE FACILITIES**

HPI would welcome discussions on a Service Agreement once the contract is placed. HPI offers a range of service and maintenance support facilities to insure the optimum serviceability of equipment.

### **11.1 GENERAL TELEPHONE SUPPORT**

The Customer Support department within HPI provides a telephone support service to discuss and assist with any problems which might occur during normal working hours. If it is not possible to resolve problems by telephone, HPI offers a two-tier Call-Out Service for the benefit of our customers.

### **11.2 STANDARD SERVICE**

HPI will mobilize a Service Engineer to attend the site within the shortest possible time upon a formal request for assistance, dependent upon availability of suitable personnel.



### **11.3 PREMIER SERVICE**

The Customer Support department operates a paging system for on-call engineers which operates 24 hours per day, 7 days per week. When the Customer chooses to utilize the Premier Service, a Service Engineer will be mobilized to travel within 24 hours of a formal request for assistance.

### **11.4 PLANNED MAINTENANCE**

Many customers have regular (often annual) maintenance programs for their installations.

In order to insure the highest system availability and minimum downtime, HPI can offer a maintenance contract which provides regular planned visits and priority response to the Customer. HPI will be pleased to discuss tailoring service and maintenance to suit the customer requirements.

### **11.5 LONG TERM MAINTENANCE SUPPORT**

It is HPI's policy to provide long-term hardware and software support throughout the life of the system. HPI will provide Repair and Spares service throughout the life of the system. HPI software is fully documented in accordance with the company's quality procedure and will be maintained in the Company's software library throughout the life of the system.