

Pump Condition Monitoring Scada System Fracking Pumps

Typical Frack Site



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**Project Scope: Design, Implementation, Start-up and Data Analysis
of Pump Condition Monitoring & Diagnostic System**

GOALS & REQUIREMENTS

- **The Frack pumps of a large Pump Manufacture were having a life of less than 200 hrs. The goal of the Pump Condition Monitoring System was to:**
 - **Determine the root cause of the pump failure and derive a solution**
 - **Detect conditions that result in catastrophic failure (cavitation)**
 - **Predict valve failure in order that maintenance could be performed before damage (wash out) occurs preventing shut down of Frack operation**
 - **Build a database of information for operating conditions**
 - **Remote monitoring capabilities**

Pump Condition Monitoring Factory Test Unit

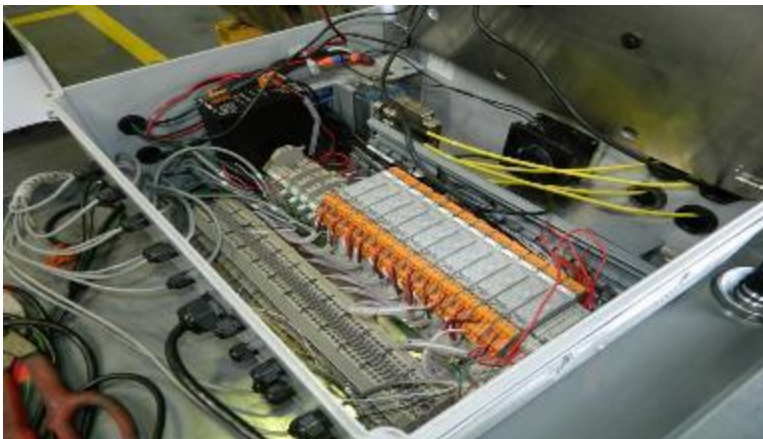
VI. Under Study, Optional PCM Layout - Magnetically Mounted PCM Locations



Wor GPRP Risk Toler Collaboration with Rotor Hughes

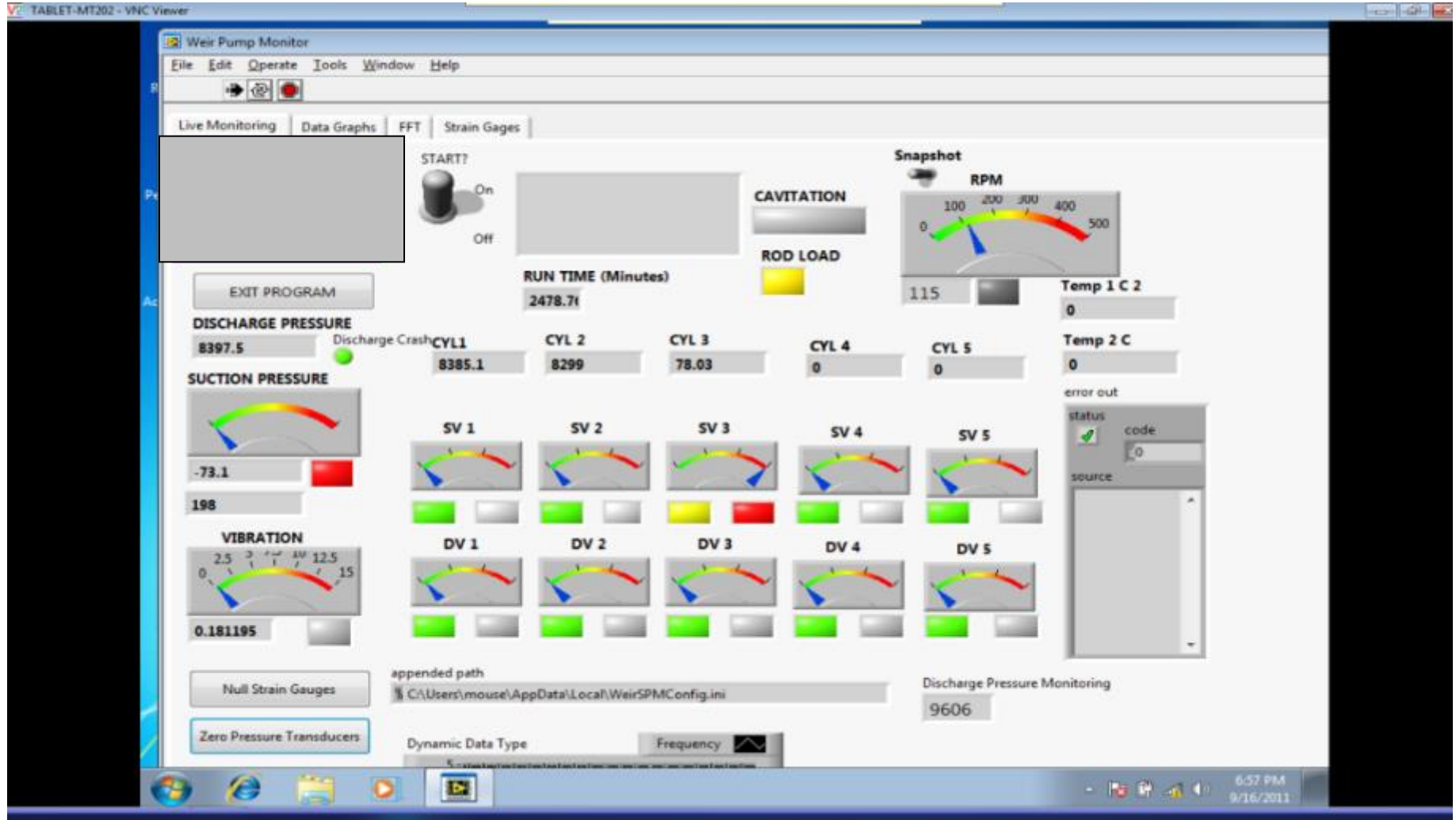
Alpha System consists of a military grade PC mounted directly on the pump bodies.

After consulting with the transmitter manufacture, Pressure Transmitters were built with a range from -600 psi to 15000 psi.



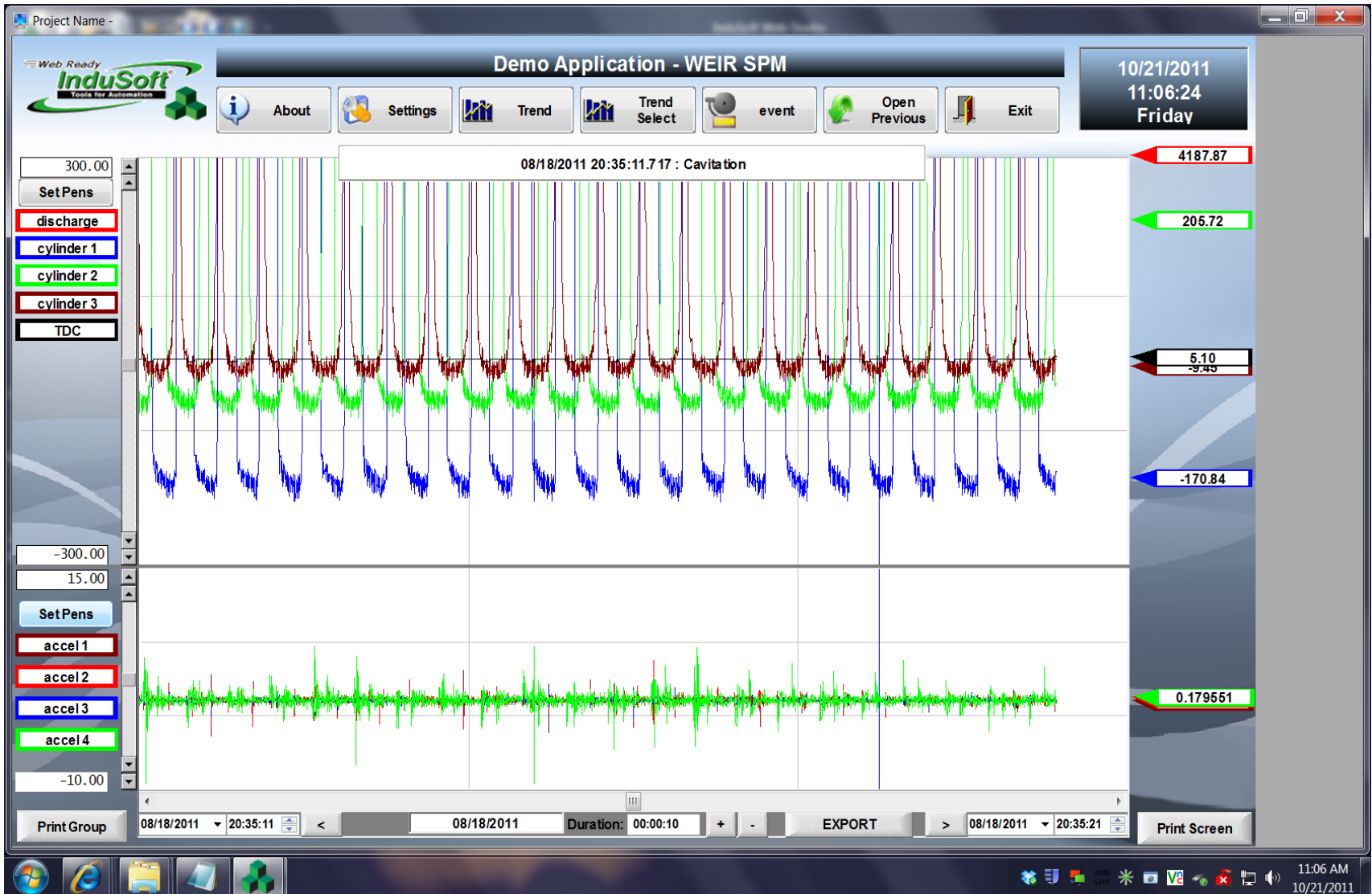
Pump Condition Monitoring Real Time Screen

Alpha Field Monitoring Screen Showing Valve Failure



Pump Condition Monitoring - Analysis of Data

Alpha Database showing Valve Failure



Pump Condition Monitoring

Deployment of Beta System with Lessons Learned

- Suction Manifold was modified to incorporate a pulsation dampener.
- The PC Tablet/cDAQ combination was replaced with a cRIO single board processor.
- A compact 316SS Nema 4x box directly mounted to the truck frame with a weatherproof oil resistant harness, weatherproof AP Clients with Omni directional antennas are used.
- Extensive training of company personal and contract labor was conducted.

