Pump Condition Monitoring
Scada System Fracking Pumps

Typical Frack Site

Pump Condition Monitoring
Scada System Fracking Pumps

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 then 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*

Alternative # 1

Iron may be in the way
– not a good option

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.

Alpha Box with C-DAQ Controller, Strain Gage Conditioners, Accelerometer Conditioners and Pressure Terminals.
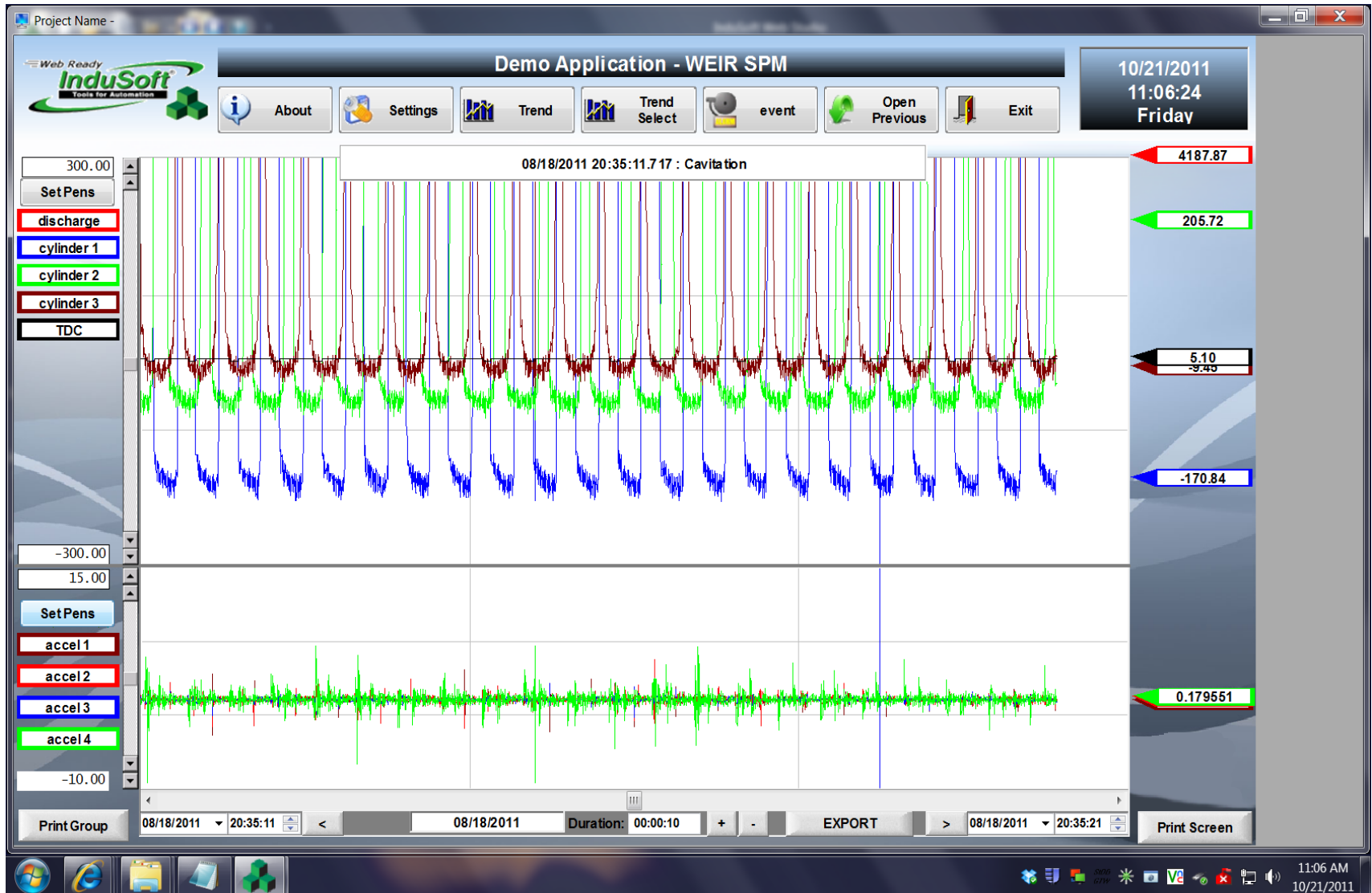
Pump Condition Monitoring Real Time Screen

Alpha Field Monitoring Screen Showing Valve Failure
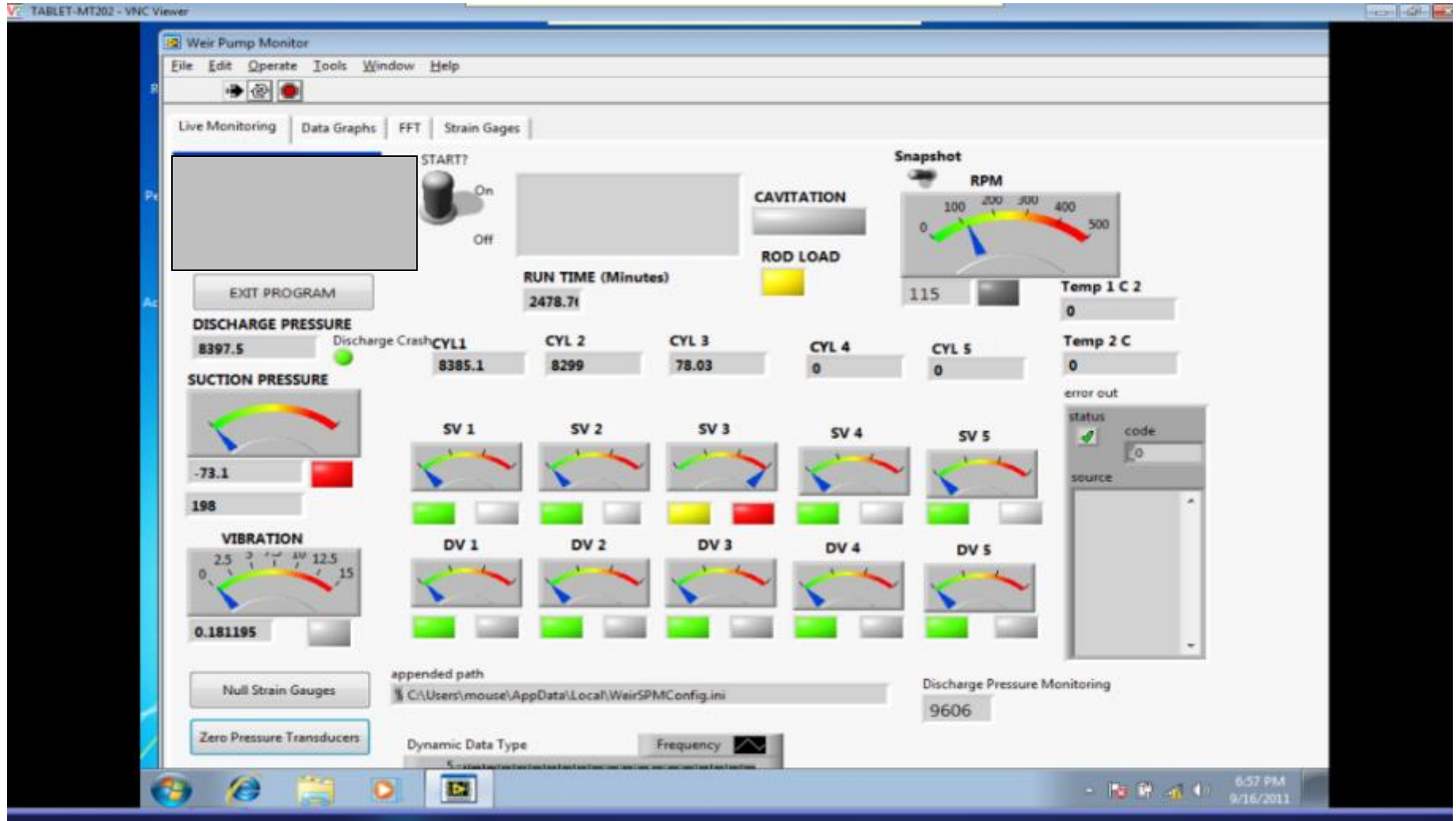
Pump Condition Monitoring - Analysis of Data

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.