

NHU CO2 Satellite

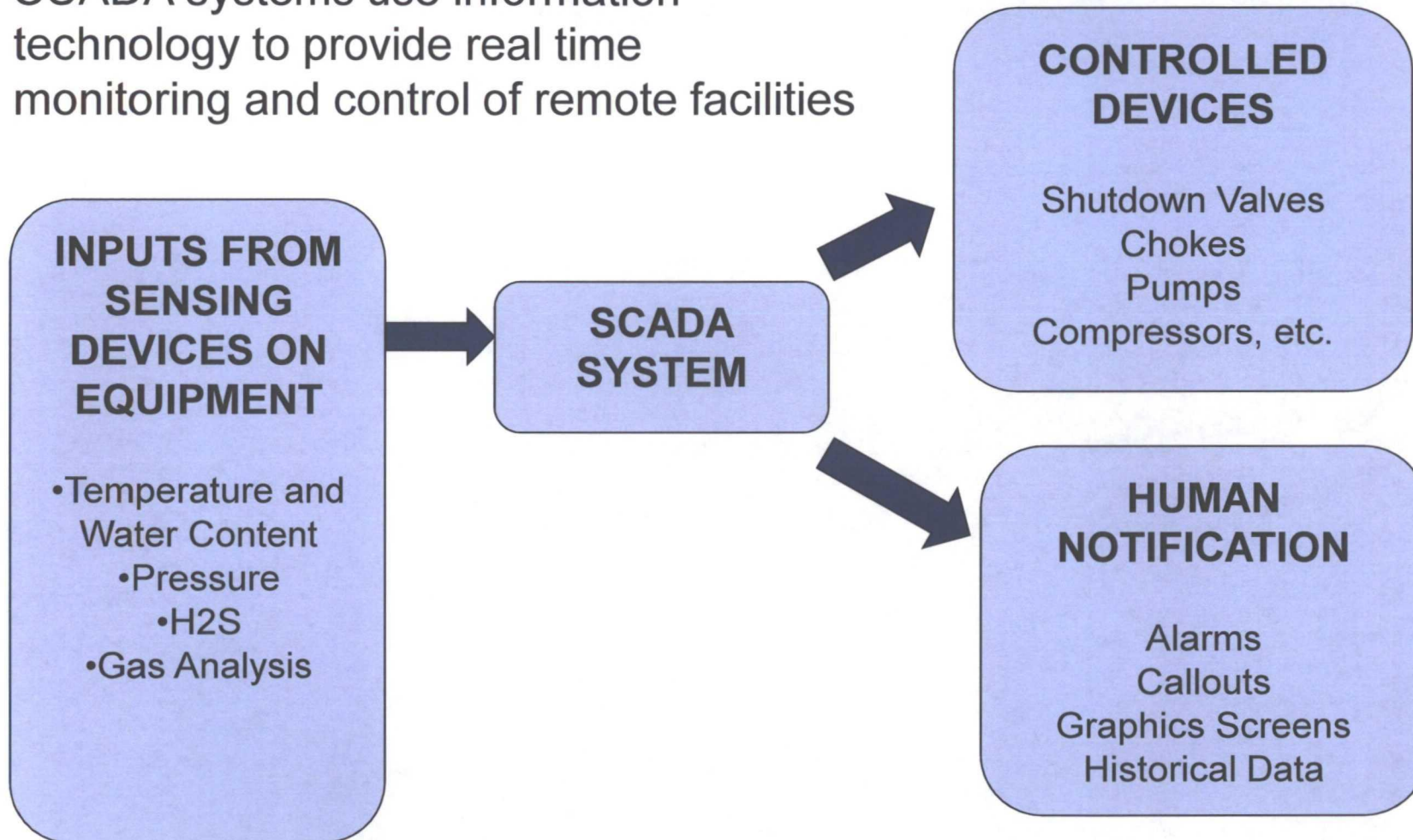


BEFORE THE OIL CONSERVATION
COMMISSION
Santa Fe, New Mexico
Exhibit No. 10
Submitted by: **OXY**
Hearing Date: May 9, 2013



SCADA – Supervisory Control and Data Acquisition

SCADA systems use information technology to provide real time monitoring and control of remote facilities



SCADA – Temperature and Water Content

Purpose:

Temperature and Water content are monitored to prevent hydrate formation and corrosion management.

Location of Temperature/Water Content Sensors:

- Downstream of the Dehydration at the RCF (Temperature and Water Content)
- Each Injection Header (Temperature)
- Each Injection Well (Temperature)

Notifications:

- RCF Dehydrator Alarm notifies Oxy Staff when water saturation exceeds outside programmed parameters
- Injection Header Alarm notifies Oxy Staff when outside programmed parameters
- Injection Well Alarm notifies OXY Staff when outside programmed parameters



Water Saturation Analyzer (RCF)

The NHU Reinjection Compression Facility incorporates a TEG Absorption Dehydration System to lower the water vapor in the gas stream

The RCF Water Saturation Analyzer takes continuous gas samples downstream of the TEG dehydration system and records the water saturation

Dehydrating the gas stream significantly decreases the possibility of corrosion or hydrate formation in the injection piping.



SCADA – Pressure Monitoring

Location of Pressure Sensors

Well Site

- Tubing and Casing on both Injection and Production Wells
- Injection lines and Production Flowlines

Injection and Production Satellites

- Injection and Production Headers
- Pressurized Vessels at Satellite and Battery Locations
- Gas Gathering System
- Fluid Gathering System

Reinjection Compression Facility

- Inlet Header, Compression Discharge, and Gas Distribution System

Notifications/Alarms/Control:

- Alerts production personnel in the event of pressures outside of programmed parameters
- Activates Shut Down Equipment in the event of pressure outside of programmed parameters

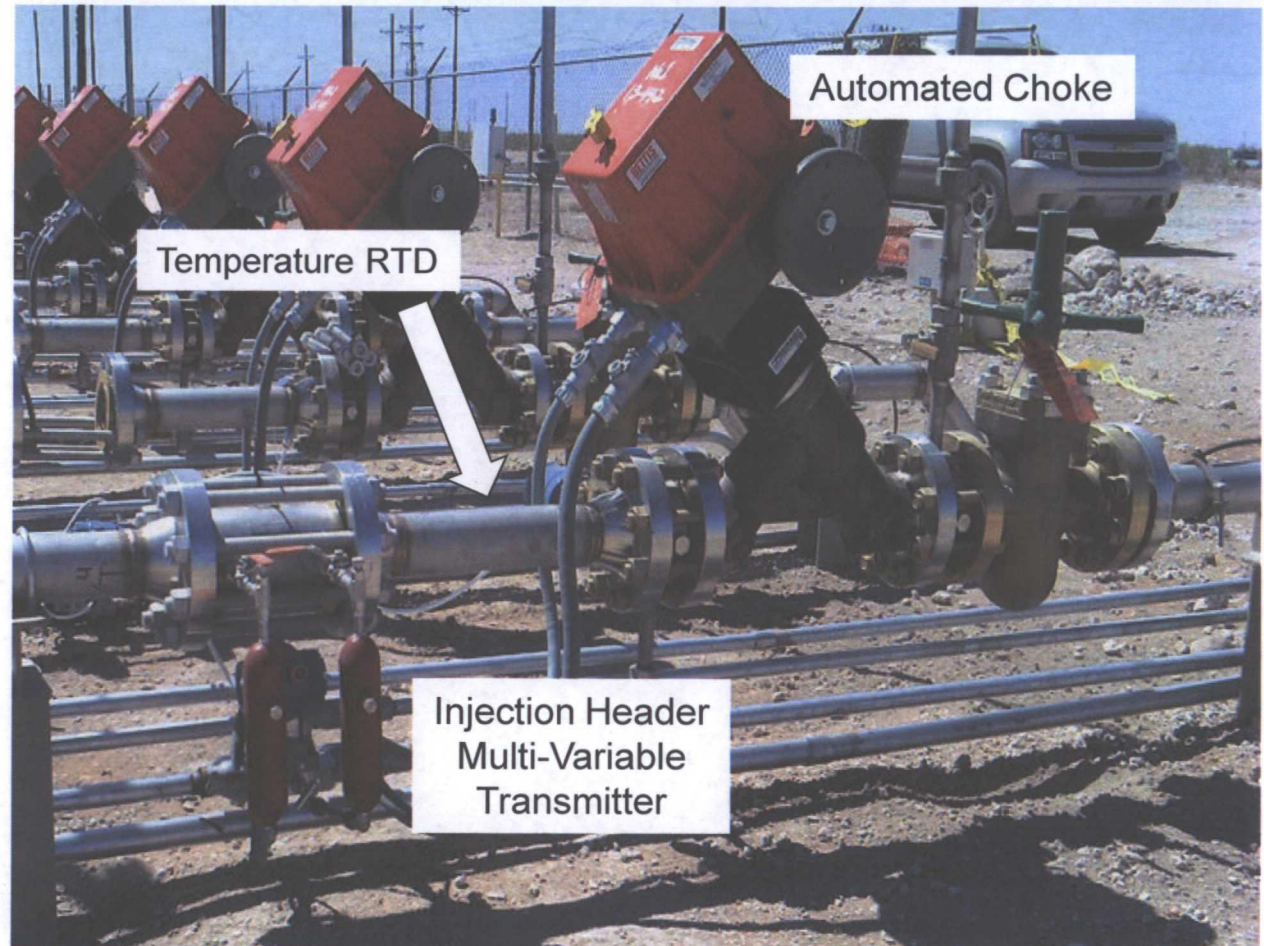


SCADA - Injection Satellite Header

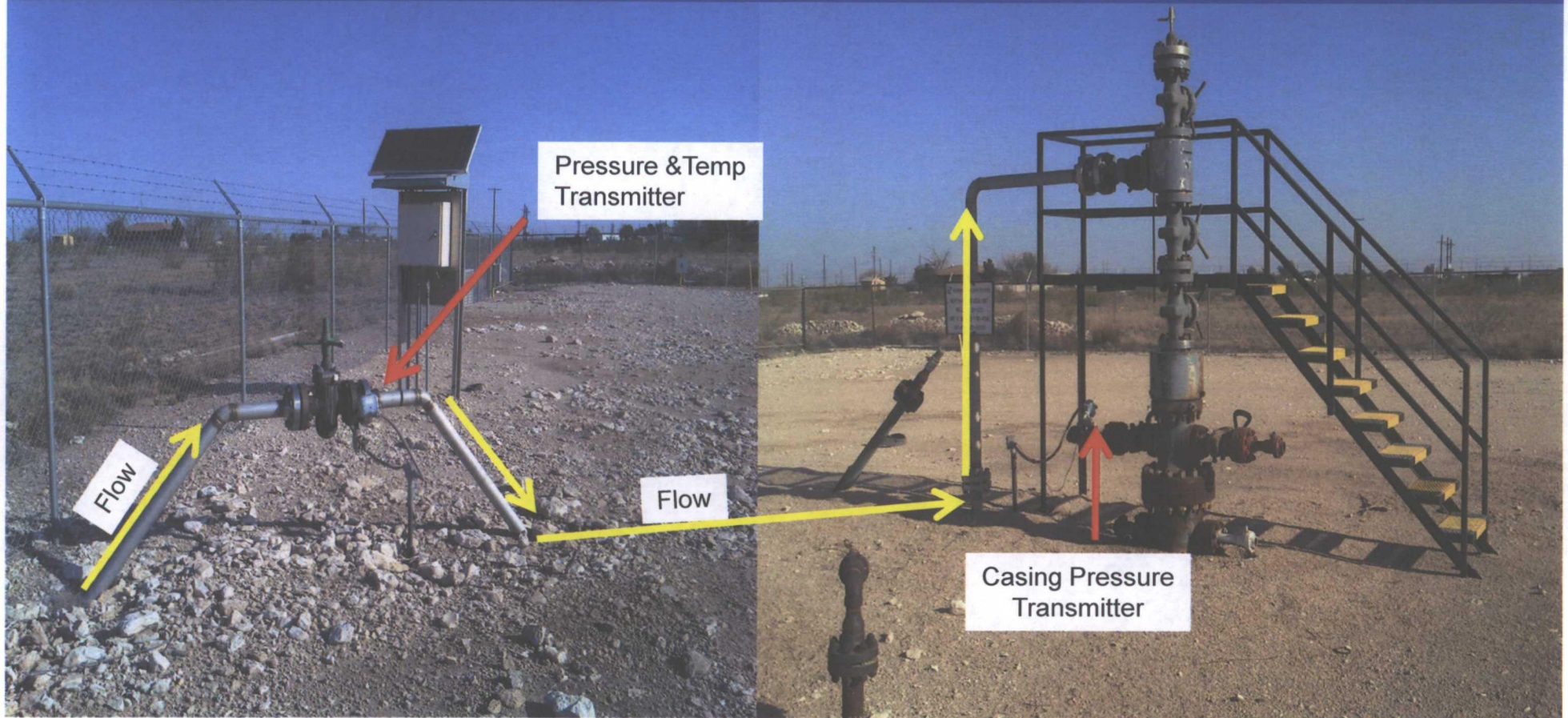
Temperature and Pressure are measured at the injection Satellite Header with Multi-Variable Transmitters.

The automated choke is controlled by the PLC and will shut off flow in each of the following conditions:

- Low or High Manifold Pressure
- Low or High Tubing Pressure
- Power Loss or Comm Failure
- Transmitter Fault



WAG Injection Well Setup



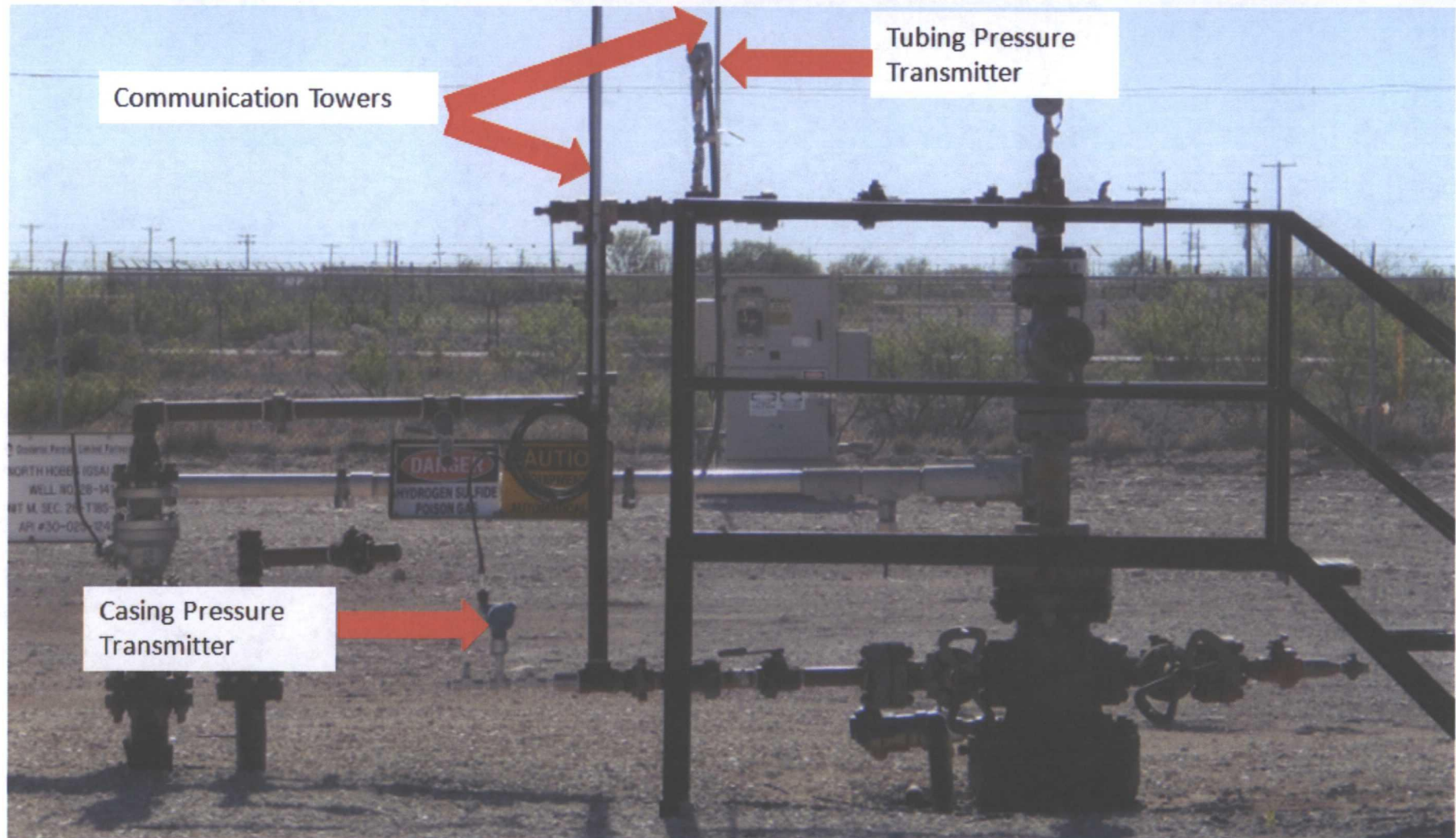
Pressure Transmitters are connected to the casing valve on all injection wells in NHU

Transmitters communicate directly with the SCADA Host through the onsite PLC

An alarm will notify OXY personnel when pressure is outside of programmed parameters.

Shut down will be automatically initiated at the choke at the injection header and notify Oxy Personnel if a casing pressure is outside of programmed parameters..

ESP Production Well Setup



SCADA – H2S Monitoring

Strategically located on the perimeter of the RCF and selected CO2 Flood Satellites and Batteries

Programmed to initiate a shut down command, flash a blue light beacon, and call out OXY personnel when H2S is detected at a concentration of 10ppm

Calibrated on a quarterly frequency but not to exceed 90 days.

Loss of power or fault condition initiates a shut down and a call-out alarm



Gas Analysis

At the RCF, the Gas Chromatograph analyzes a representative gas sample once each day to determine the gas composition, including H₂S concentration

In addition, the following H₂S Samples are taken:

- Monthly Tutweiler analysis at the RCF
- Annual Tutweiler at the Production Satellites



SCADA - Communication

Communication

- Communication is established between well site PLC's via Fiber Optic Cable
- Communication between the RCF, Injection Satellites, and SCADA Host is via radio

Alarms and Remote Control

GraphworX is used as the Host system and resides on a server at the Hobbs Oxy Office. GraphworX will allow the operator to remotely monitor, control or shutdown operations with the use of laptop computers.

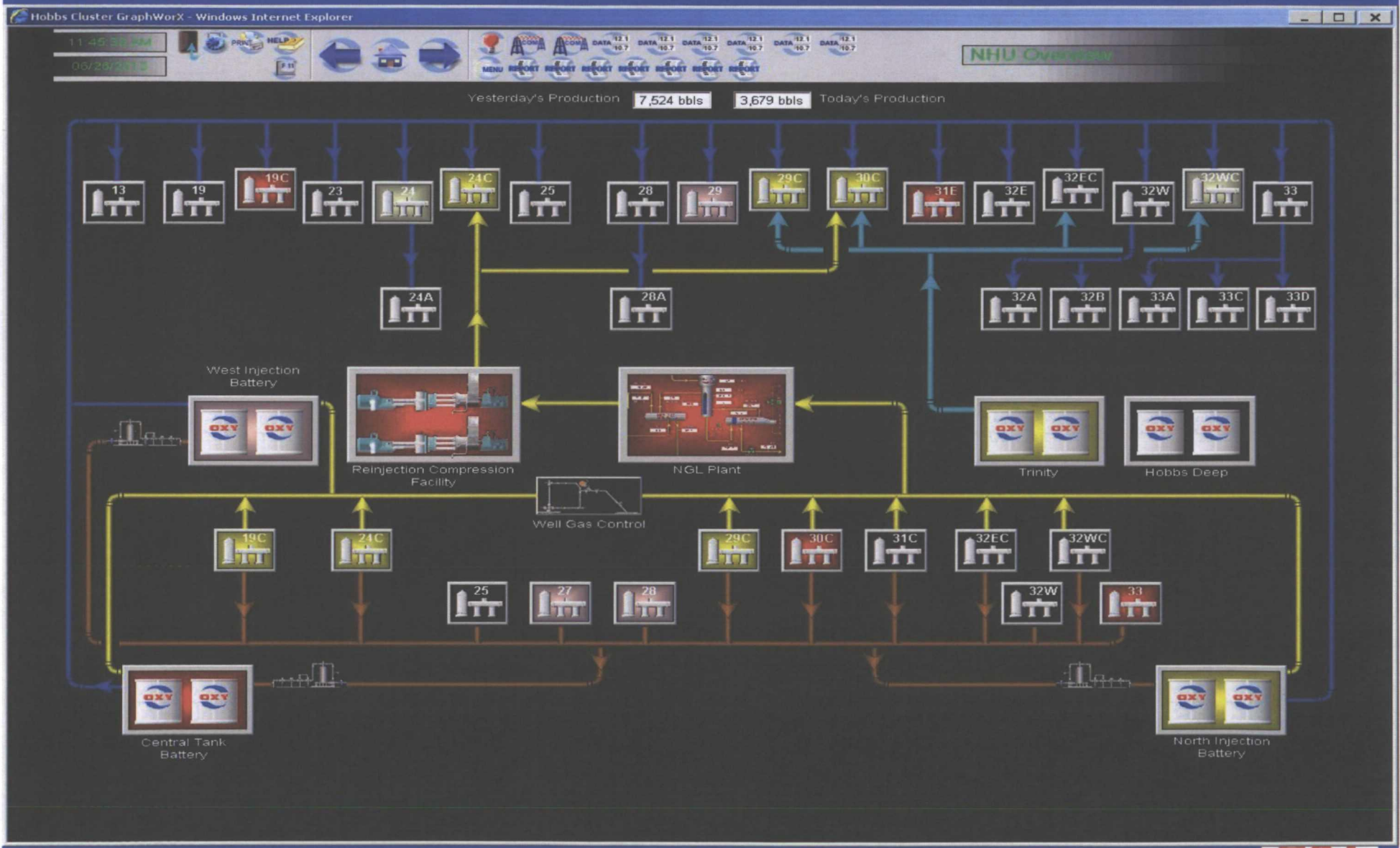
The alarms are also monitored through AlarmworX and a callout is initiated to the nearest operator so that they are able to respond to the condition.

Loss of Power

- A voltage monitor will initiate a shut down when a voltage condition $<120V$ is encountered.



GraphworX



Programmable Logic Controller

