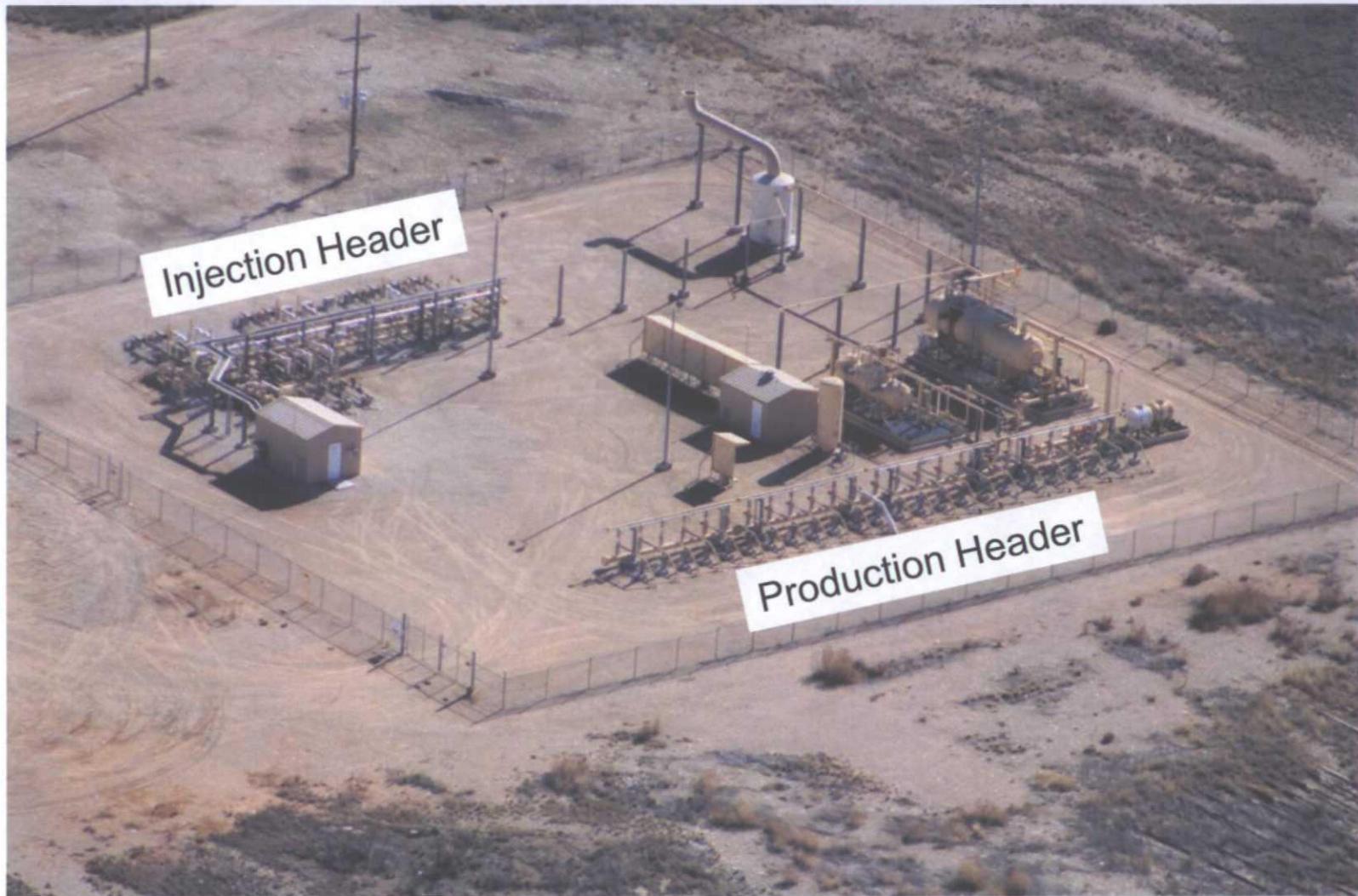
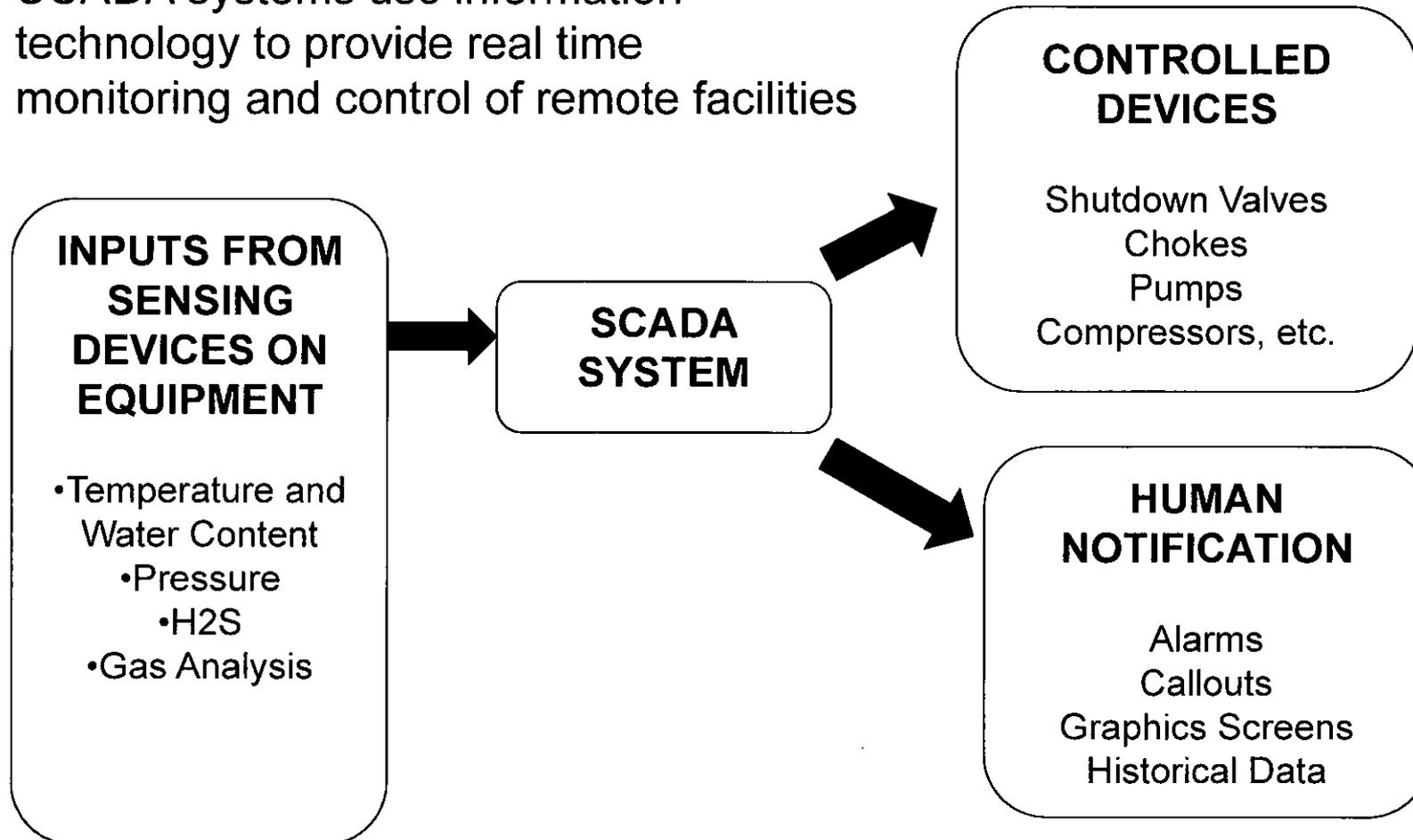


# NHU CO2 Satellite



# SCADA – Supervisory Control and Data Acquisition

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

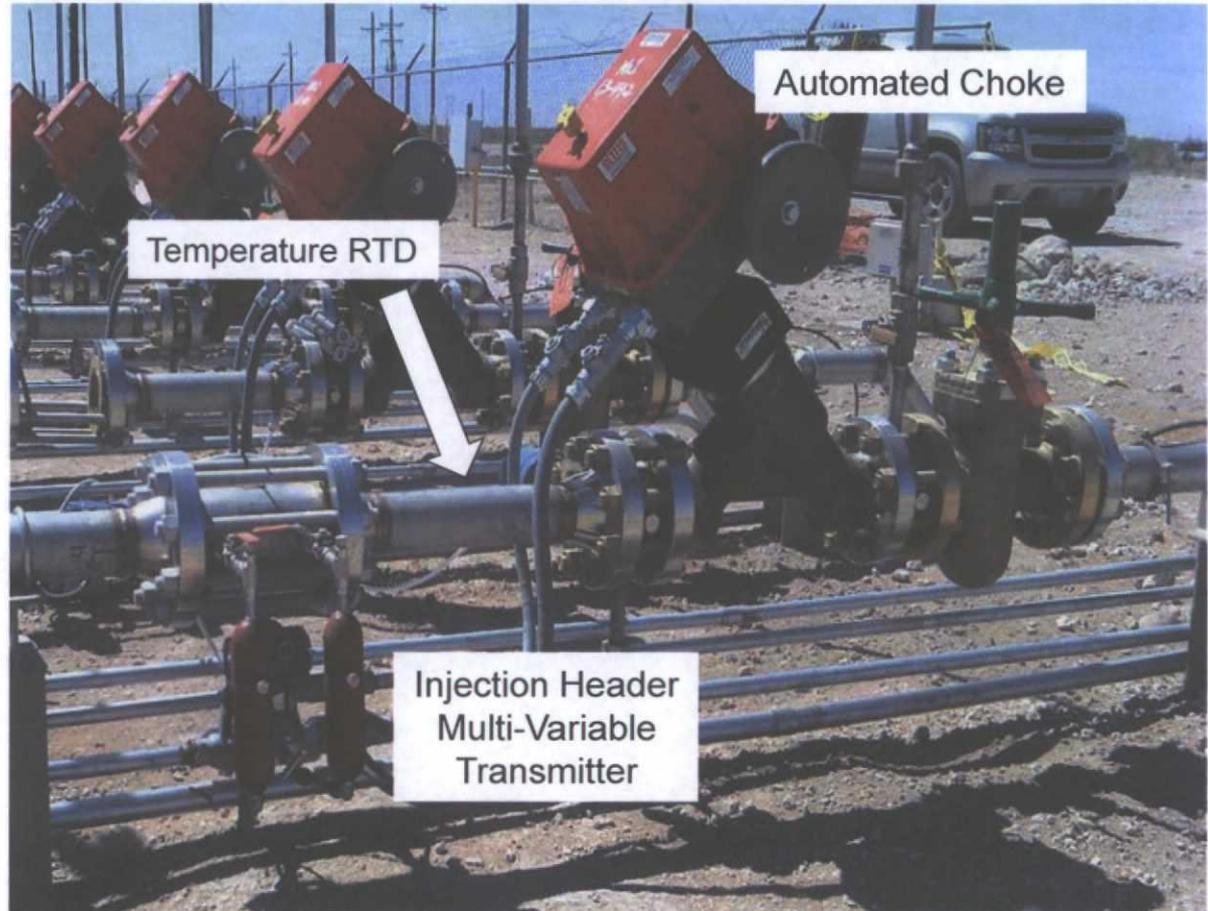


# SCADA - Injection Satellite Header

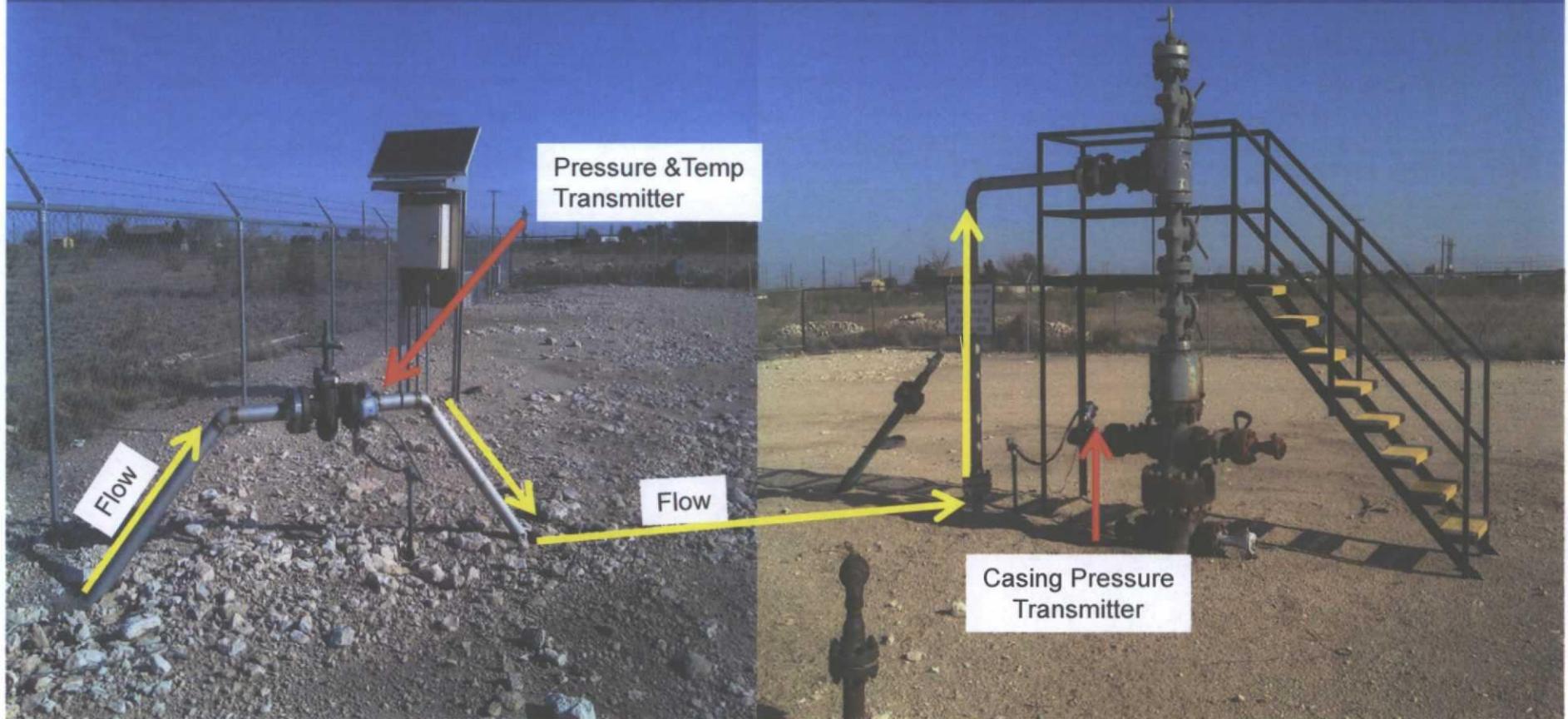
Temperature and Pressure are measured at the injection Satellite Header with Multi-Variable Transmitters.

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

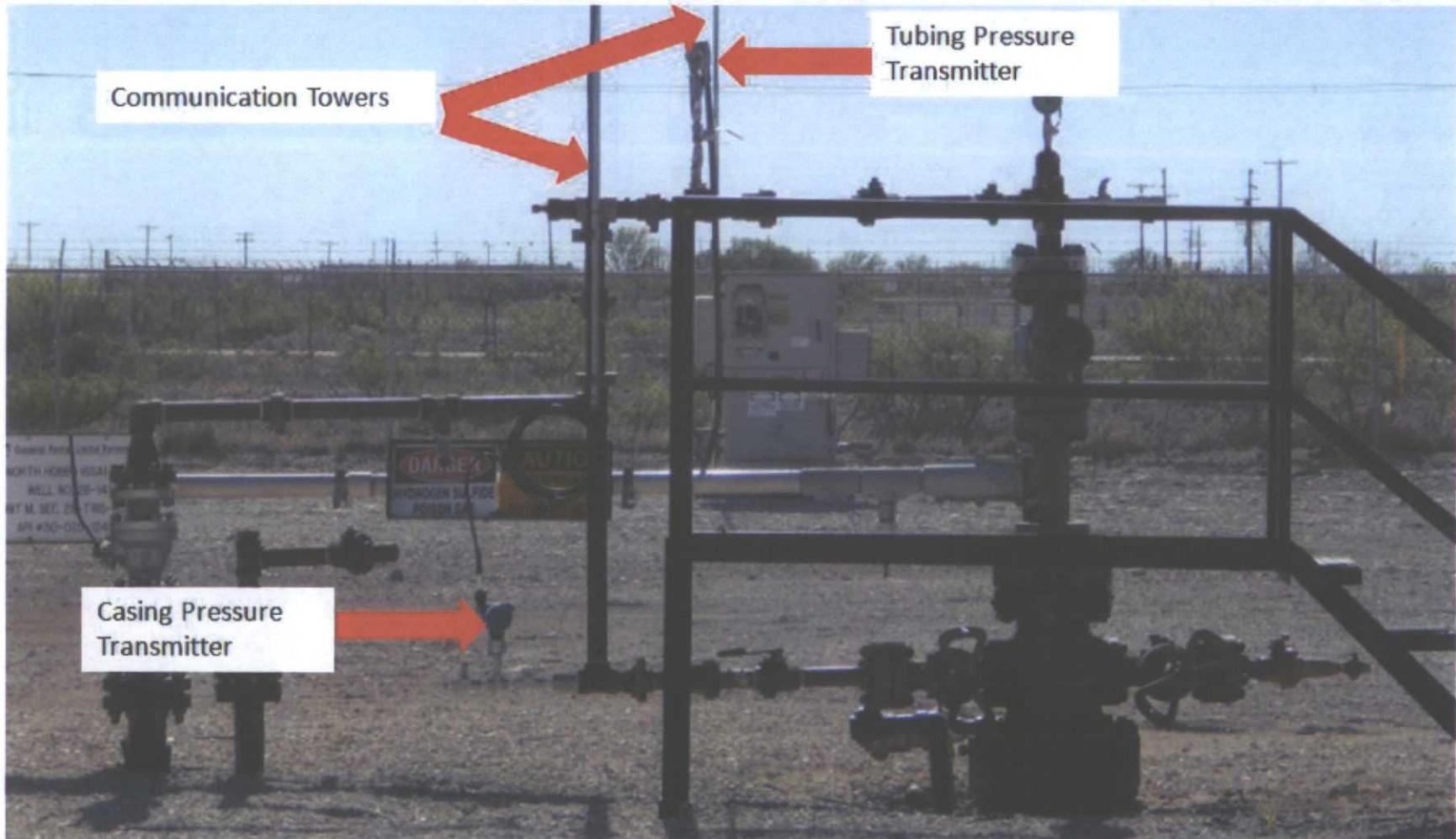


# WAG Injection Well Setup



- 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 – H<sub>2</sub>S Monitoring

Strategically located on the perimeter of the RCF and selected CO<sub>2</sub> Flood Satellites and Batteries

Programmed to initiate a shut down command, flash a blue light beacon, and call out OXY personnel when H<sub>2</sub>S 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



# 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

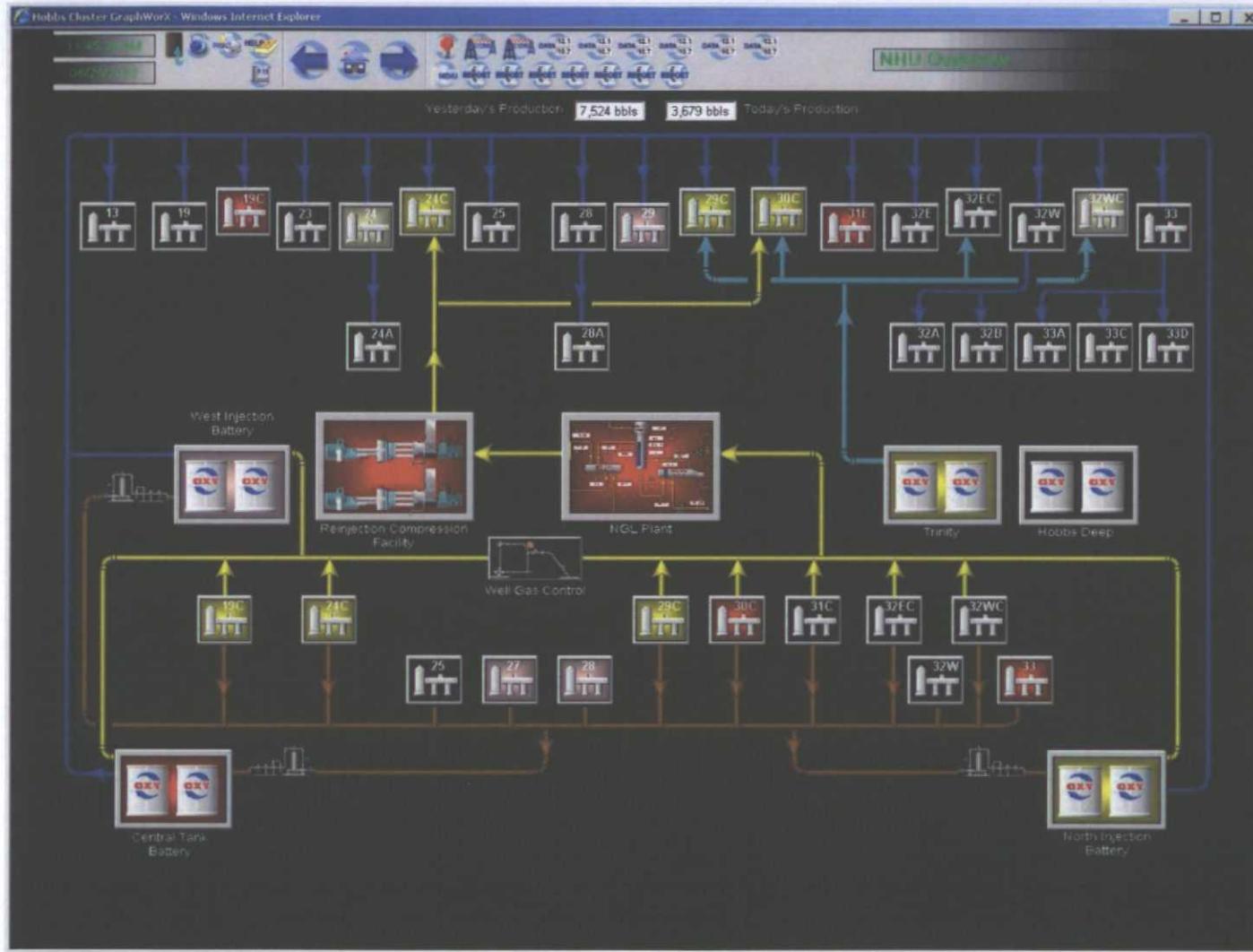
GraphworX is used as the Host system and resides on a server at the Hobbs Oxy Office. GraphworX will allow the operator to remotely monitor, control or shutdown operations with the use of laptop computers.

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.

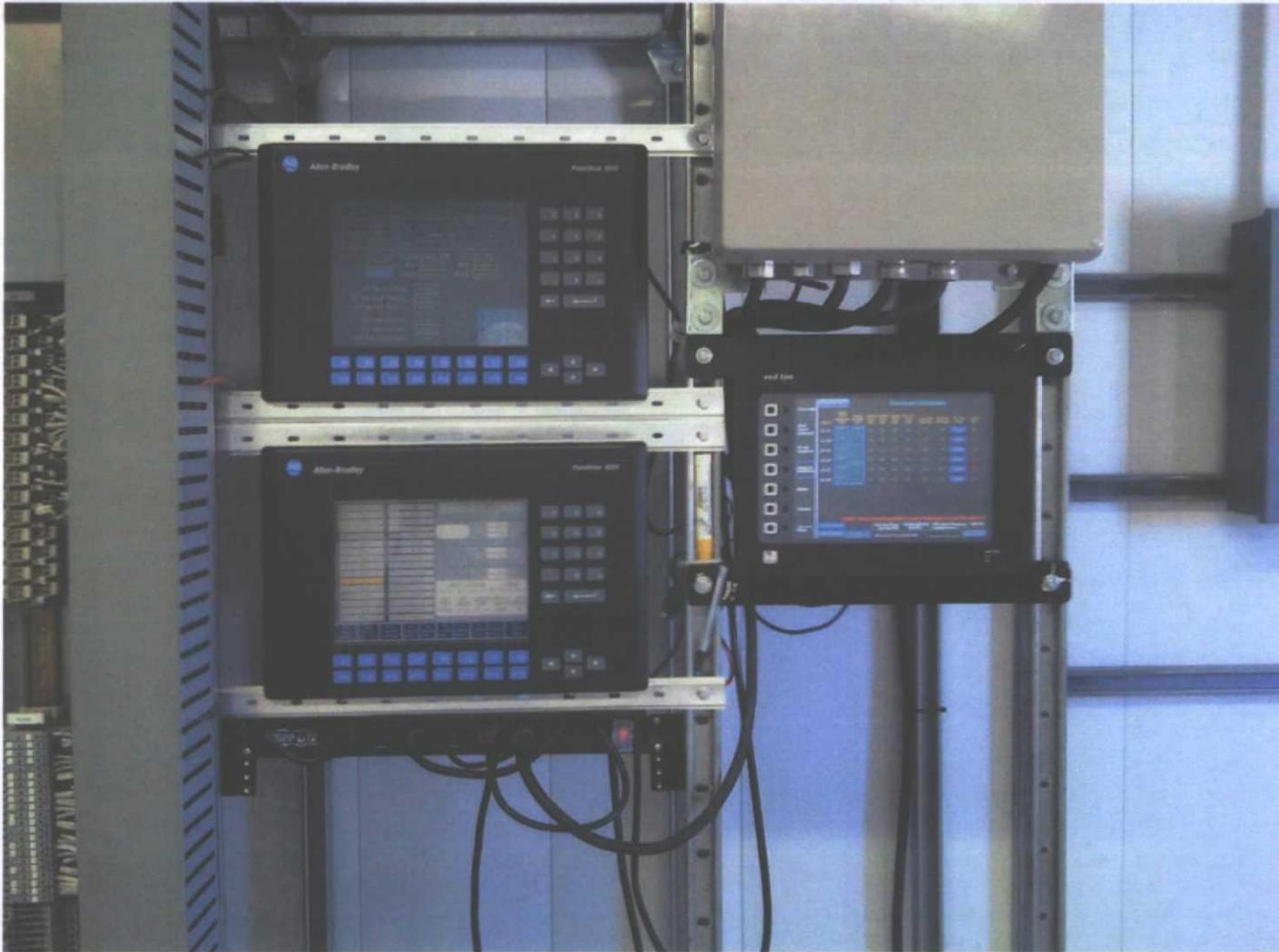
## Loss of Power

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

# GraphworX



# Programmable Logic Controller



# New Mexico Standards

## **19.15.11.14 STANDARDS FOR EQUIPMENT THAT MAY BE EXPOSED TO HYDROGEN SULFIDE:**

*“Whenever a well, facility or operation involves a potentially hazardous hydrogen sulfide volume, the person shall select equipment with consideration for both the hydrogen sulfide working environment and anticipated stresses and shall use NACE Standard MR0175 (latest edition) or some other division-approved standard for selection of metallic equipment or, if applicable, use adequate protection by chemical inhibition or other methods that control or limit hydrogen sulfide’s corrosive effects.”*

# Additional Oxy Requirements

## Design

ASME Sec VIII Div1, NBIC

API 650, API 12

API 6A

ASME B31.3, ASME B31.4, ASME B31.8

UV stamp

## Fabrication

ASME Sec IX, ASME Sec V, AWS

## Maintenance

ASME Sec V, API 510, API 570, NB VR, API 653, API 12R

# Downhole Corrosion Mitigation

Compliant with NACE MRO175

Injection tubing is fiberglass lined

Injection packer is nickel plated carbon steel

Annulus is filled with inert packer fluid

# MIT Frequency for Temporarily Abandoned Wells

## 19.15.25.12 APPROVED TEMPORARY ABANDONMENT:

“The division may place a well in approved temporary abandonment for a **period of up to five years**. Prior to the expiration of an approved temporary abandonment the operator shall return the well to beneficial use under a plan the division approves, permanently plug and abandon the well and restore and remediate the location or apply for a new approval to temporarily abandon the well.”

# Proposed Changes to MIT Program for TA'd Wells

Oxy performs an MIT as per NMOCD requirements when well is initially TA'd.

Where Oxy installs a pressure sensing device on a TA'd well:

- Oxy will inform NMOCD District Office of installation

- Oxy will monitor device with SCADA system

- Data will be available to NMOCD upon request

Oxy will perform an MIT as per **19.15.25.14** every 5 years

Oxy will continue annual bradenhead testing requirement

This provision was recently approved in the South Hobbs Unit injection order.