



## Commitment to our Clients

*OSI's staff consists of qualified professionals in all engineering disciplines related to the engineering, design and construction of manufacturing and process related facilities. Our services range from concept development through commissioning of process systems including project management, detailed engineering, 3D design, procurement, and construction.*

*As our business has grown in support of our clients and our business plan, our scope of services has also grown from providing engineering and design services to ongoing plant operations, to several other engineering services, such as Process Safety Management and Operations Consulting.*

*OSI is committed to helping our clients achieve and exceed their business objectives while maintaining a safe and productive work environment for our employees.*

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# ENGINEERING SOLUTIONS

## Electrical / Instrumentation / Controls Capabilities

***Power Transmission/Distribution Engineering and Installation***

***Power System Study***

***Motor Starting Analysis***

***Switchgear & Motor Control Center Design/Installation***

***Protective Device Coordination Study***

***AC-DC Variable Speed Drives Programming***

***Motor Schematics***

***Electrical Heat Trace Design and installation***

***Infrared Thermography***

***Arc Flash, Short Circuit Analysis and Load Flow***

***- Etap, SKM, Easy Power***

***Intrinsically Safe System Design and Installation***

***Substation Engineering/Installation***

***Electrical Equipment Specification Development***

***Safety Instrumented System Services***

***Implementation of PHA & LOPA Recommendations***

***Process Measurement and Control Instrumentation Installation***

***Electrical, Instrumentation, Controls Drafting and installation***

***Boiler Controls & Burner Management Systems Installation***

***Client Specific Control System Architecture***

***Distributed Control Systems (DCS) Installation and Programming***

***Network Integration (Fiber Optics, Modbus, Ethernet)***

***Control Panel Design and Fabrication Shop***

***Programmable Logic Controllers (PLC) Design and Programming***



# ENGINEERING SOLUTIONS

## Mechanical / Civil / Structural Capabilities

*AFE/Capital Project Development w/TICe*  
*Equipment Specification Development*  
*Pipe Stress Analysis (Caesar II)*  
*ASME Pressure Vessel Design (PV Elite)*  
*3D Plant Equipment Layout (CADWorx)*  
*Piping Routing and Isometrics*  
*Piping Hydraulic and Sizing Calculations*  
*Material Handling Equipment Selection*  
*HVAC specification and load calculations*  
*Mechanical CAD Services*  
*Installation and Fabrication Drawings*  
*Plan View / General Arrangement Dwgs.*  
*Root Cause Failure Analysis (RCFA)*  
*Pneumatic Conveying Routing and Isometrics*

*Structural Design and Analysis (STAAD)*  
*Civil Design and Analysis*  
*Civil and Structural CAD Services*  
*Footing / Foundation Design*  
*Lifting Beam Devices*  
*Anchor / Anchorage Analysis*  
*Building Evaluation / Code Compliance*  
*Building Design and Renovation*  
*Structural Steel Design and Detailing*  
*Crane Support Systems*  
*Wind Load Analysis*  
*Site Selection, Analysis, and Design*  
*Elevations and Grade Work*  
*As-built Drawings using 3D Laser Scanning*



# ENGINEERING and CONSTRUCTION SOLUTIONS

## Process

*Process Safety Management*

*Relief System Design and Evaluation*

*PHA/HAZOP/LOPA Studies*

*Process Flow Diagrams*

*P&ID Development/Verifications*

*Safety Instrumented System (SIS)  
Analysis/Design/Verification*

*Safety Integrity Level Analysis/Verification*

*Safety Instrumented Function  
Analysis/Design/Verification*

## Construction

*Project Management*

*Project Schedule & Construction Plan*

*Procurement & Expediting*

*Construction Management & Cost Reporting*

*Design/Build (E/P/C)*

*Project Cost Controls*

*Project Checkout, Start-up, & Commissioning*

*Electrical and Instrumentation infrastructure  
installation*



# Project Management Solutions

## Projects

*Process Safety Management program development*

*Onsite Project managers available*

*SAP and Maximo experienced*

*Knowledgeable in stage gate project approvals (PDRI, LPWP, FEL)*

## Construction

*Project Management*

*Project Schedule & Construction Plan*

*Procurement & Expediting*

*Construction Management & Cost Reporting*

*Design/Build (E/P/C)*

*Project Cost Controls*

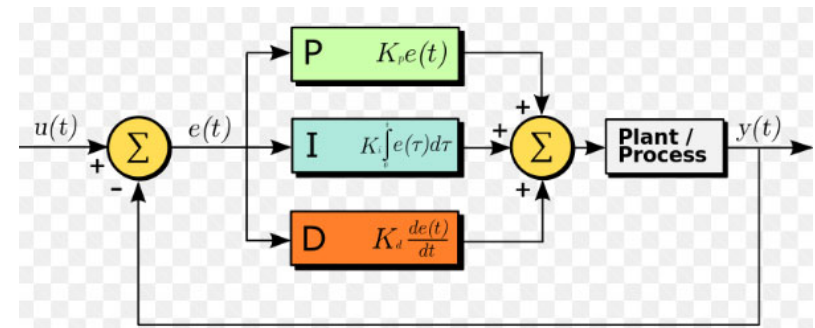
*Project Checkout, Start-up, & Commissioning*

*Electrical and Instrumentation infrastructure installation*

# PROJECT SOLUTIONS

## Select Electrical & Controls Engineering Capabilities:

- Power Distribution Analysis (ETAP, SKM Power Tools, EasyPower)
  - Breaker Coordination
  - Ampacity
  - Load Flow
  - Arc-Flash
- Process Instrumentation & Controls Design/Installation
  - Specification of process instruments
  - PLC/DCS Design, Programming and Integration
  - Instrumentation Setpoint & Scaling Calculations
  - Electrical & Controls Value Engineering (Process & Systems Improvements)
  - Heat Trace Design and Calculations
  - Process Modelling
- Electrical & Controls Panel Builds
  - Process Skid Design & Build
  - Electrical Distribution Panels
  - PLC & DCS I/O Panels
  - UL508





# Capital Project Execution FEL I / Initial Design & Cost Estimate

A comprehensive understanding of the final project and associated cost.

- Refine project goals and preliminary scope
- Basic Data developed to evaluate options and technology
- Define project execution plan
- Conceptual 3-D plant design
- +/- 50% TIC cost estimate
- Process Battery Limits defined
- Major Electrical loads defined
- Develop project milestone schedule
- Determine Critical Technologies for project
- Development of Block Flow Diagrams





# Capital Project Execution FEL II / Facilities Design Planning

*Further refine the overall project development.*

- Development of Plant “Site Critical” options
- Evaluate Key Risk Areas
- Project schedule supporting the estimate and execution plan
- Process Flow Diagrams refined
- P&ID’s
- Battery Limits defined
- Major Electrical loads defined
- Determine Critical Technologies for project
- Development of Block Flow Diagrams
- 3-D Plant Design with Unit Details and Major Equipment Placed
- Process vessel designs completed
- Rotating Equipment Specified
- Process Control requirements refined
- Conceptual Electrical Area Classification
- Environmental Review
- +/- 30% TIC Estimate
- Project Strategy finalized
- Final Project Objectives identified





# Capital Project Execution FEL III / Detailed Engineering/Design Equipment Specification

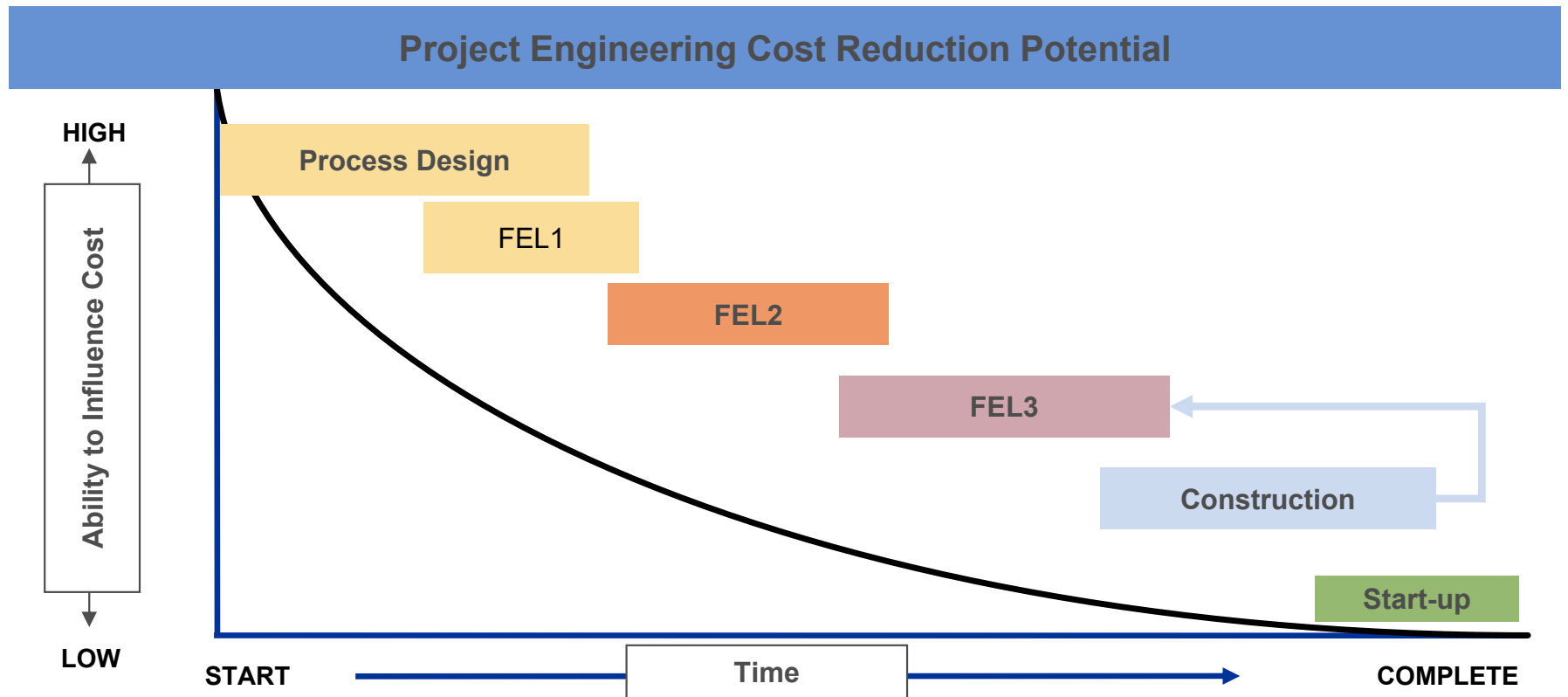
*Working drawings, that will guide construction contractors, are developed during this particular phase of the process.*

- Process Design (PFD/P&ID) basis approved/frozen
- Project process for single point authorization of any change Instituted
- Contingency Plan in place
- Decision and Risk Analysis
- Electrical Classification drawings
- Piping Stress Analysis
- Relief Device list and calculations
- Constructability Review
- Process Hazard and Operability Study
- Layers of Protection Analysis
- P & I D's complete
- Process Control and Safety system logic
- Electrical, Instrumentation, and Process Controls Design
- I/E Data Sheets
- Equipment Arrangements
- Pipe routing and isometric drawings
- 10% Total Installed Cost Estimate





# Capital Project Execution Process Design





# PROJECT SOLUTIONS

## Daikin America – Fluorination Plant E&I Installation Project

\$4,250,000 Fluorination Plant E&I Installation Project where OSI provided for the installation of all electrical upgrades to the plant electrical system to support the new fluorination plant installation as well as the installation of all instrumentation for the new fluorination plant to include instrument and infrastructure installation, instrument set up and calibrations, loop check of all control loops, PLC program modifications, programming of Allen Bradley motor controls and programming of Allen Bradley variable speed controllers. OSI also provided Construction management for Civil and Mechanical installation as well as the E&I installation. Construction management included the mechanical, civil, and structural engineering design. Management included installation per the general arrangement developed drawings, civil site design, fire protection piping, process sewer, pump containment, process flow diagrams, piping and instrumentation diagrams, equipment, pumps, piping, structural steel platforms, civil concrete foundations, and field engineering support.



# PROJECT SOLUTIONS

## Upstream Oil Projects -Multiple

Multiple Upstream E&I projects have been completed by OSI Electric. Projects where OSI provided for the installation of all electrical upgrades to the site electrical systems, instrumentation and control systems. These installations include instrument and infrastructure installation, instrument set up and calibrations, loop check of all control loops, PLC program modifications, addition of temporary generator sets, flaring systems controls and permanent power to site installation. Clients to include Tripoint, Scala, EOG and others.



# PROJECT SOLUTIONS

## Calumet Flare Compressor Controls Upgrade

~1.6 million      OSI provided an EPC solution for the Calumet Shreveport Refinery to replace the existing control PLC for the flare system compressors A, B and C with new separate controls so the compressors could be controlled on an as needed basis. A PHA review was completed of the system to identify the client changes to the system. OSI then developed an FEL package for approval to replace the existing system with SIS rated PLC controls. The design was completed, equipment purchased, PLC control panels were built and FAT/ SAT testing completed at the factory and site. Osi then provided an installation plan to replace the existing system while operating and installed all required E&I infrastructure and equipment. OSI assisted in the startup of the systems and the shutdown of the existing system and subsequent demolition of the old control system.



# PROJECT SOLUTIONS

- Pipe Support Structures**
- Tank and Pump Containment**
- Fluid Filtration/Separation**
- Metering and Fluid Transfer**
- Rail Loading/Unloading**

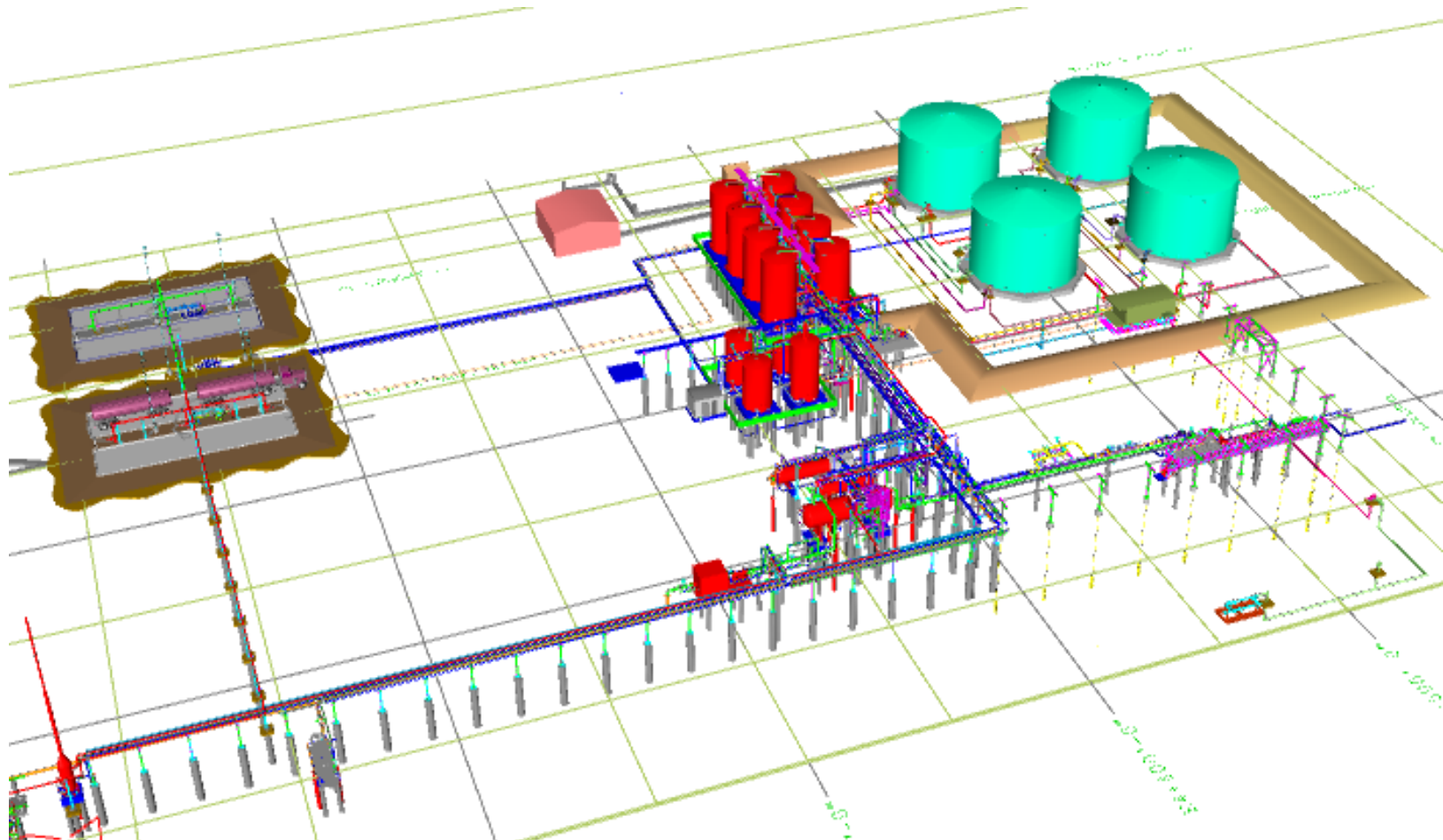




# PROJECT SOLUTIONS

## Midstream Oil - Central Distribution Point

\$65,000,000 Expansion Project that included legal for trade truck loading terminal, Four 10,000 BBL storage tanks, pump house, MCC and flare System. Engineering scope included, piping and instrumentation diagrams, process vessels, equipment, pumps, piping, drilled pier tank foundation, instrumentation, controls, electrical power requirements, DCS Programming, project scheduling, construction management, commissioning and start-up.





# PROJECT SOLUTIONS

## Midstream Oil - CDP(cont'd)

- Scope of Work Development, Engineering Estimation, and Total Installed Cost Estimation
- Civil and Structural Design scope included:
  - General Site Arrangement Development
  - 4 – 10,000 BBL Oil Storage Tanks with Earthen Berm
  - Drilled Pier Tank Foundation
  - 4 – 600 GPM Pumps with Building and Foundation
- Development of Piping and instrumentation Diagrams
- Design and Project Support scope included:
  - Piping Design to include sizing and stress analysis and isometric fabrication drawing development
  - Pump and Filtration Equipment to include hydraulic system analysis
  - Certified Legal for Trade Truck Loading Terminal
  - New Flare Addition for Truck Loading Terminal
  - Piping and equipment design for Tank Storage/Truck loading and metering stations
  - Piping Design for Pig Receiving Station on Main Crude Receiving Pipeline
  - Develop complete 3D Model:
  - Commissioning, DCS Programming, loop check and start up support at CDP
  - [Arrow CDP.nwd](#)





# PROJECT SOLUTIONS

- 4 – 10K BBL Oil Storage Tanks  
w/Earth Berm Containment
- 3 – 600 GPM Pumps/Building
- 4 - Truck Loading Stations
- Truck Vapor Flare System

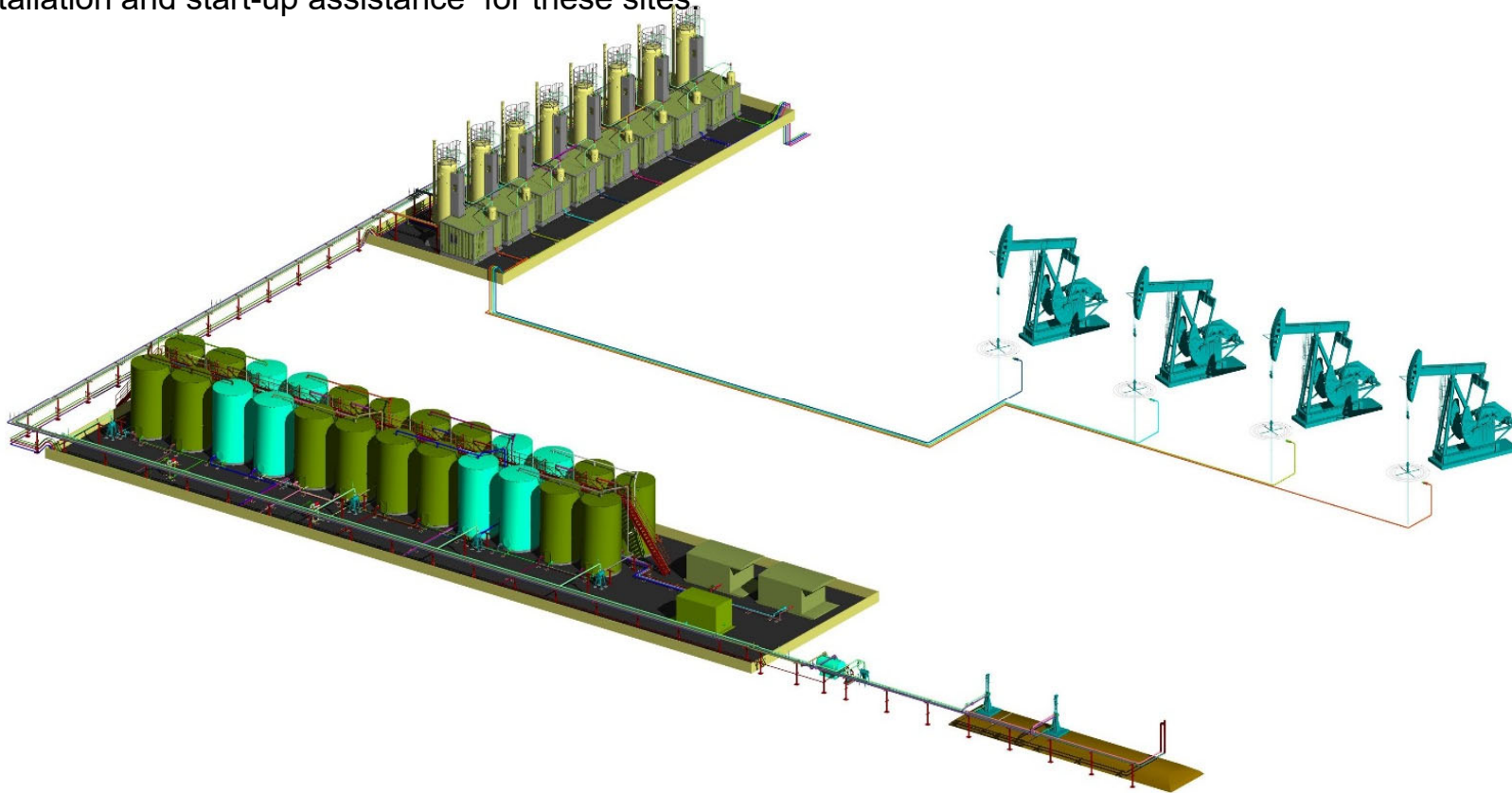




# PROJECT SOLUTIONS

## Upstream Oil - Well Pad

OSI has worked with Upstream Oil for the past three years developing more than 18 well pad designs. OSI has optimized their process while reducing their installation cost due to our development of a full 3D model, fabrication isometrics, construction drawings, bid package. This has provided our client the opportunity to competitively bid the construction while standardizing their equipment/components. OSI has provided I/E/C installation and start-up assistance for these sites.





# PROJECT SOLUTIONS

## Upstream Oil - Well Pad (cont'd)

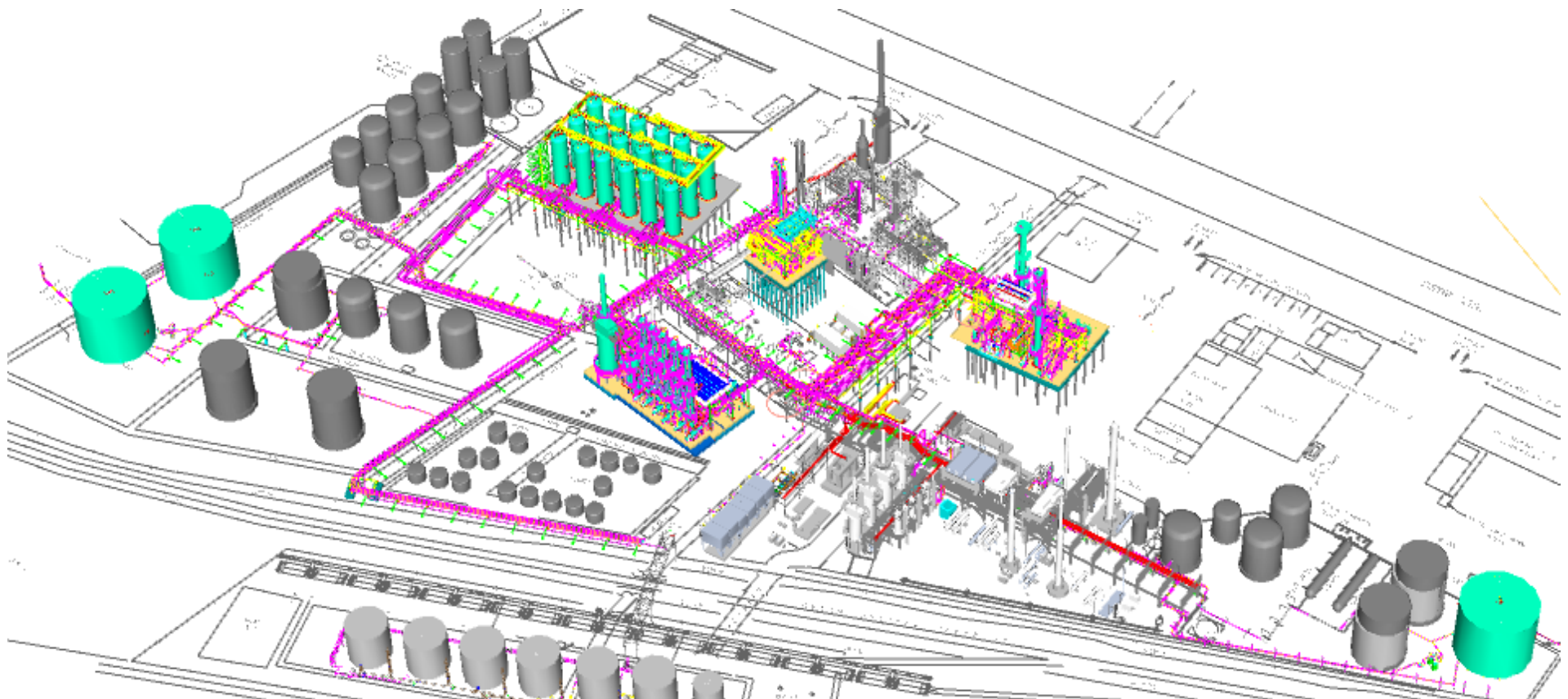
- Optimization of well pad has included 3D modelling of the following equipment and/or components while developing specifications.
  - Process Separators/Treaters
  - Oil and Water storage Tanks
  - Process Pumps
  - Oil Beam Pumping Units
  - Transmission Pump and Metering Skids
  - Knock Out Pots
  - Flares
  - Process Pumps
  - Pipe Racks/Supports
- Developed 3D model in CADWorx for preliminary and final design reviews with client
- Developed all required fabrication drawings and Bill of Materials (plans, elevations, pipe racks and supports)
- OSI has installed I&E infrastructure, instruments, Control systems and provided services for start-up, programming, and commissioning.



# PROJECT SOLUTIONS

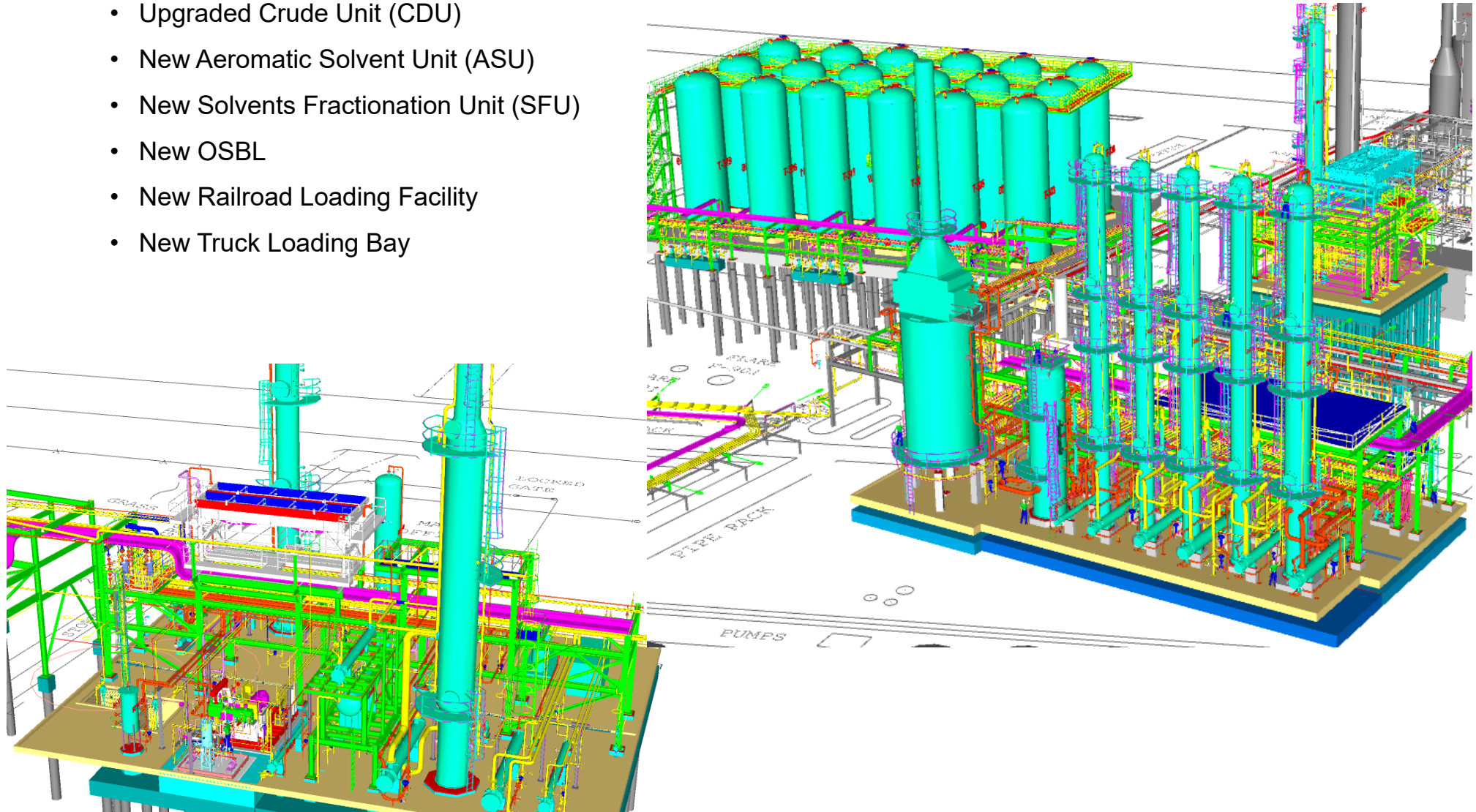
## Texas Refining – Solvents Expansion Project

\$100,000,000 Refinery Expansion Project where OSI supported Expansion with mechanical, civil, structural, electrical, and controls construction management. Engineering scope included, civil site design including earthen containment for tank farms, fire protection piping, pump containment, hydraulic analysis, process flow diagrams, piping and instrumentation diagrams, equipment, pumps, piping, piping stress analysis, structural steel platforms, structural steel calculations, civil concrete foundations including tank ringwalls and drilled piers, Electrical power requirements, controls design , DCS programming, field engineering support and project management.



## Texas Refining – Solvents Expansion Project (con't.)

- Upgraded Crude Unit (CDU)
- New Aeromatic Solvent Unit (ASU)
- New Solvents Fractionation Unit (SFU)
- New OSBL
- New Railroad Loading Facility
- New Truck Loading Bay





# PROJECT SOLUTIONS

## Texas Refining – Solvents Expansion Project (cont'd)

- Scope of Work Development, Engineering Estimation, and Total Installed Cost Estimation
- Development of Process Flow Diagrams and P&IDs
- Civil and Structural Design scope included:
  - General Site Arrangement Development
  - Tank Farm Layout : Containment Calculations and Earthen Berm Gradework Design
  - Tank Ringwall Foundation Design
  - Structural Analysis for Member Sizing and Foundation Design
  - Railroad and Truck Loading Facility
- Mechanical Design scope included:
  - Piping Design to include sizing and stress analysis and isometric fabrication drawing development
  - Fire Protection System piping and equipment design for Tank Farms
  - Piping and equipment design for railcar /truck loading and metering stations
- Controls/Electrical Design Scope
  - Specified all instrumentation controls and procurement
  - Programmed the SIS and DCS system interface using Delta V
  - Scoped and incorporated all Hazop/Lopa recommendations
  - Completed all loop and controls drawings
  - Completed all conduit/cable tray routing plans with cable schedule



# PROJECT SOLUTIONS

- 2 – 10K BBL Oil Storage Tanks  
w/Earth Berm Containment**
- 5 Position Railcar Loading Station**
- Truck Loading Stations**
- Metering and Fluid Transfer**





# PROJECT SOLUTIONS

- Project Management**
- Piping Hydraulic Analysis**
- Electrical Control Panel Design**
- Equipment Controls Programming**
- System Automation**
- Mechanical and Electrical Construction Management**
- Commissioning and Start-up Support**



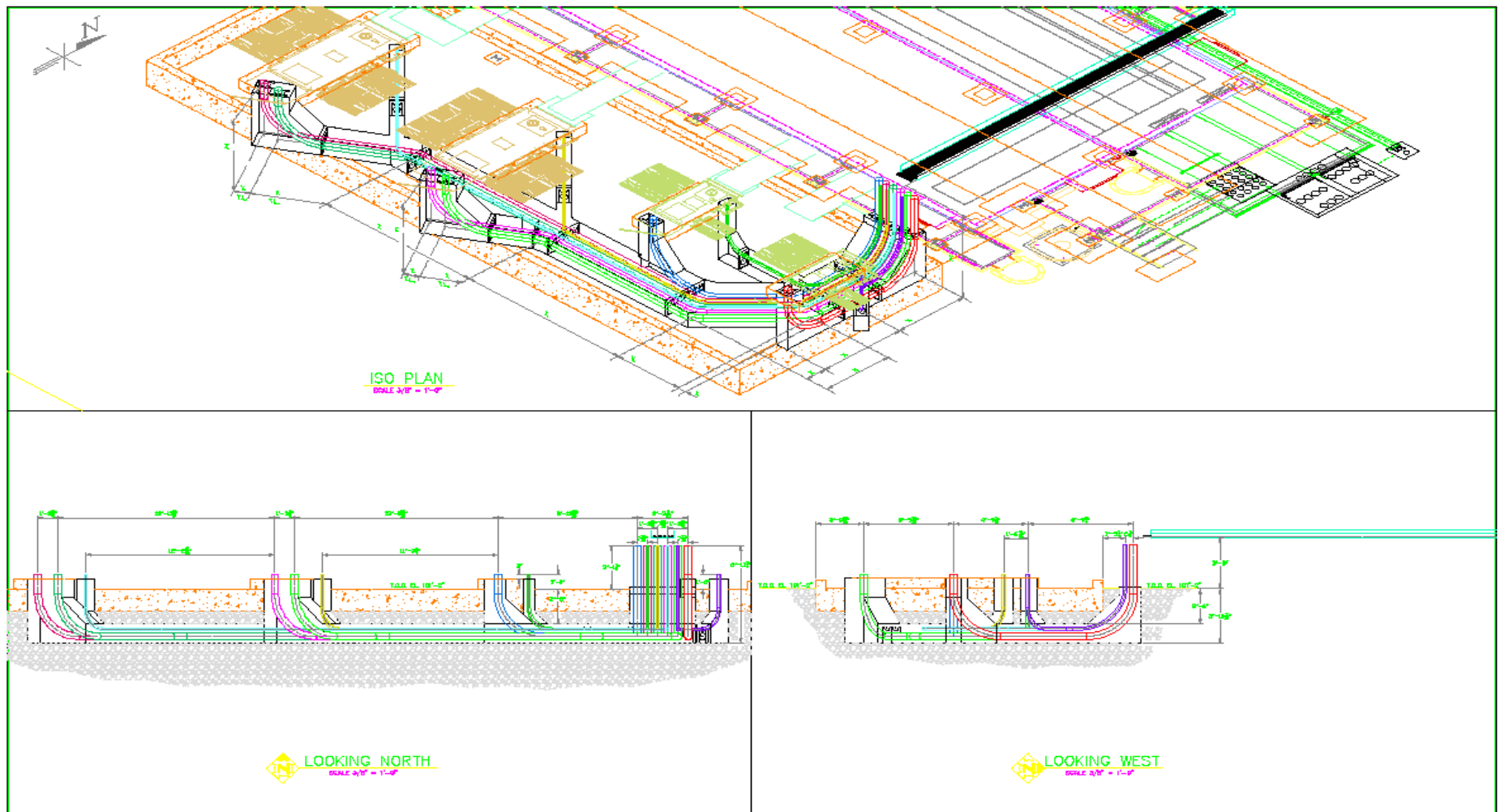




# PROJECT SOLUTIONS

## Hydrotreater Expansion Project

~11 million Hydrotreater Expansion project included installation of 4 new transformers with underground duct bank requirements. Two 10000 KVA and two 1500 KVA transformers were engineered with all cable sizing, conduit schedules, underground concrete details, locations, and specifications for installation. Construction management of E&I Hydrotreater upgrade, new boiler, compressor and all distribution centers to include installation of a new two story distribution center and commissioning of all E&I.





# PROJECT SOLUTIONS

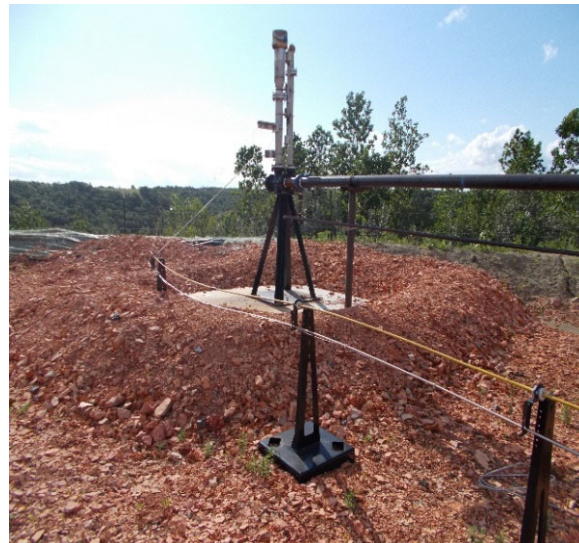
**Process Instrumentation**

**Power Distribution**

**Legal for Trade Instrument Skids**

**Power and RIO Building Design**

**DCS, SIS and PLC Programming**





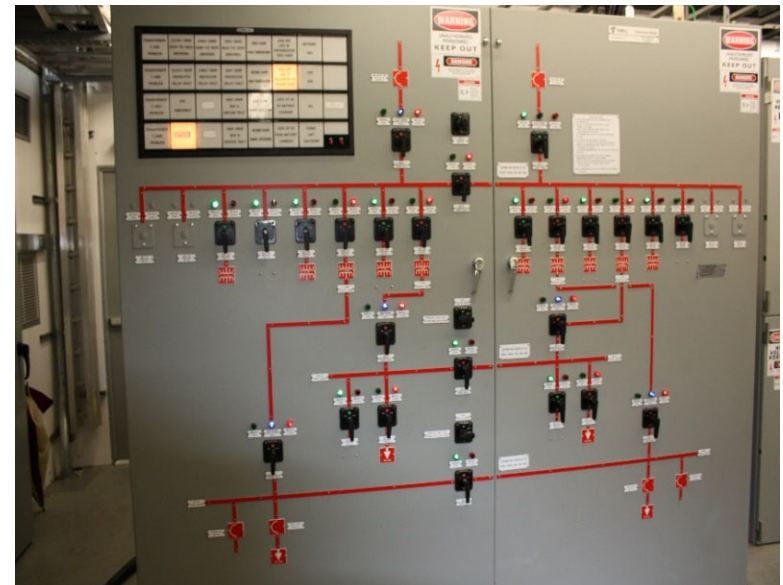
# PROJECT SOLUTIONS



**Electrical Distribution, Switchgear, and Motor Control Center Design and Installation, Mimic Panel Controls**

## Complete Power System Integration

Omniscient Solutions has specified high, medium and low voltage control systems and provided specification, construction management, commissioning and troubleshooting of systems.





# PROJECT SOLUTIONS

Power House Design

Panel Board Modification

VFD Sizing and Programming

Material Off-Loading Controls



OSI can complete all Electrical engineering requirements. Load calculations, conduit & cable tray sizing, power distribution, motor & VFD schematics.



# PROJECT SOLUTIONS

**In-House Panel Build Shop**  
**PLC panels, Instrument Junction Box, Specialty Control Panels**





# PROJECT SOLUTIONS

**Control Room Modification**

**HMI Screen Development**

**Safety Instrumented System Design**

**RIO Building Design**

DCS and PLC Design – Complete sizing, specification/purchase, I/O assignment, wiring layout, field checking services



## PLC Design

Complete DCS and PLC design, specification/purchase, I/O assignment programming, wiring layout and field checking services.

