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# **AltairStrickland Presentation FCCU Revamp Constructability Issues**



League City, Texas  
April 12-16, 2010



# AltairStrickland



- LaPorte, TX, (Houston, TX area)
- Founded 1976
- Non-Union
- Principal areas of focus:
  - ✓ Project Management and Execution
    - Project controls
    - Complex mechanical scopes
    - Heavy rigging
    - Subcontractor management and coordination
  - ✓ FCC and Coker TAR's and revamps
  - ✓ Constructability optimization
    - Execution driven engineering
    - Value creation





# Door Sheet Equipment Installations

# FCCU Revamp Case Study #1



## Air Grid Installation

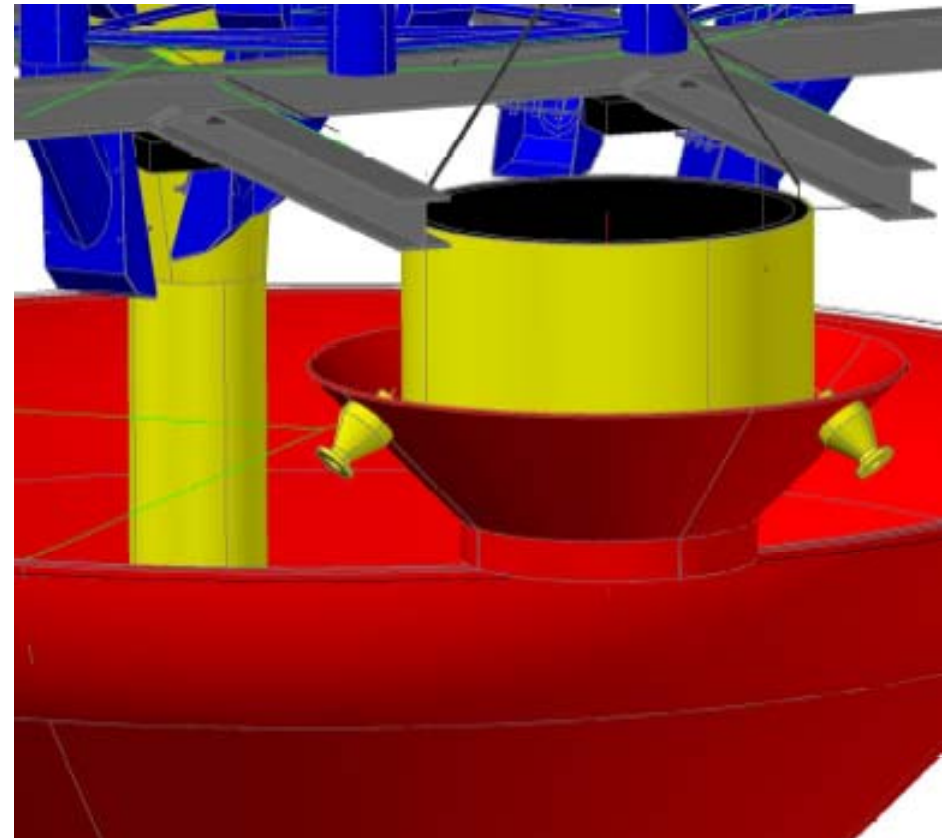
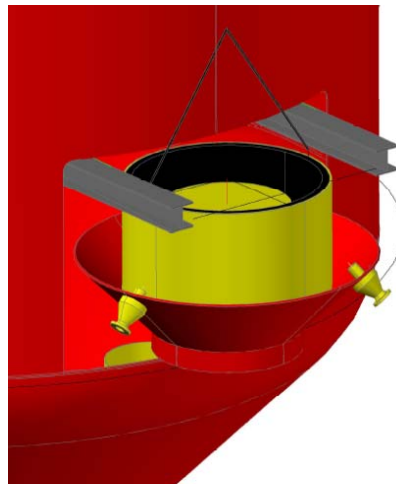
### Complete Scope Included:

- Installation of Regenerator lower cone section
- Replacement of Regenerator air grid
- Replacement of feed section on riser
- Replaced reactor trickle valves
- Flue gas line repairs
- Knife gate valve repairs
- Extensive refractory work
- Miscellaneous maintenance work scope

# FCCU Revamp Case Study #1



## Cone with Air Grid Trunk Installation

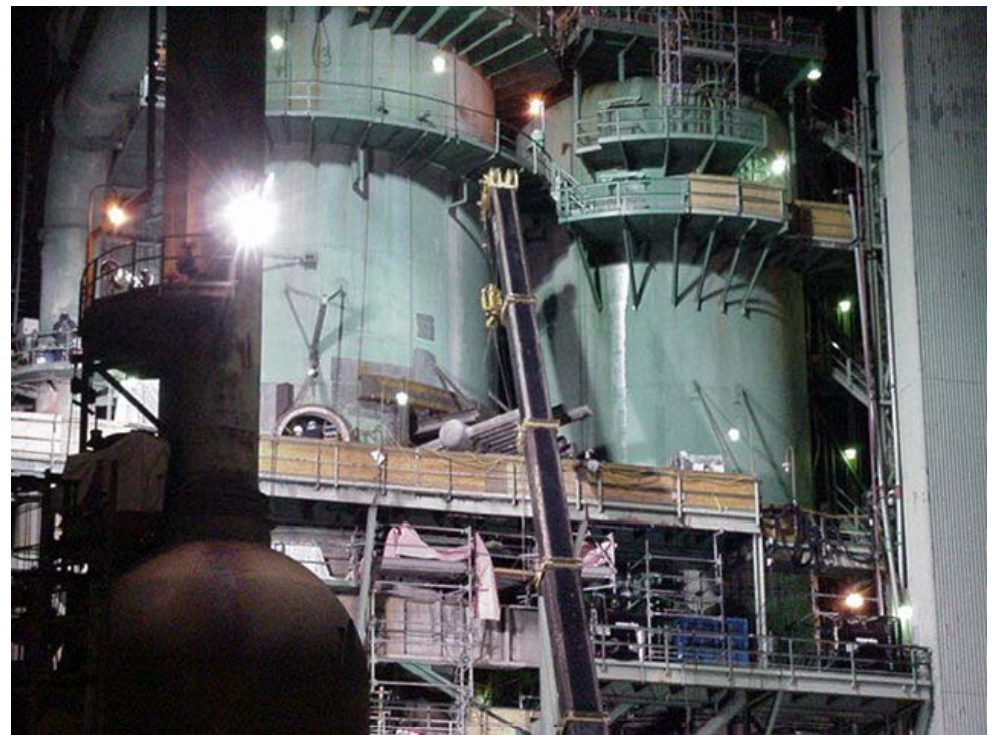




# FCCU Revamp Case Study #1



## Air Grid Installation





# FCCU Revamp Case Study #2

## Regenerator Cyclone Installation

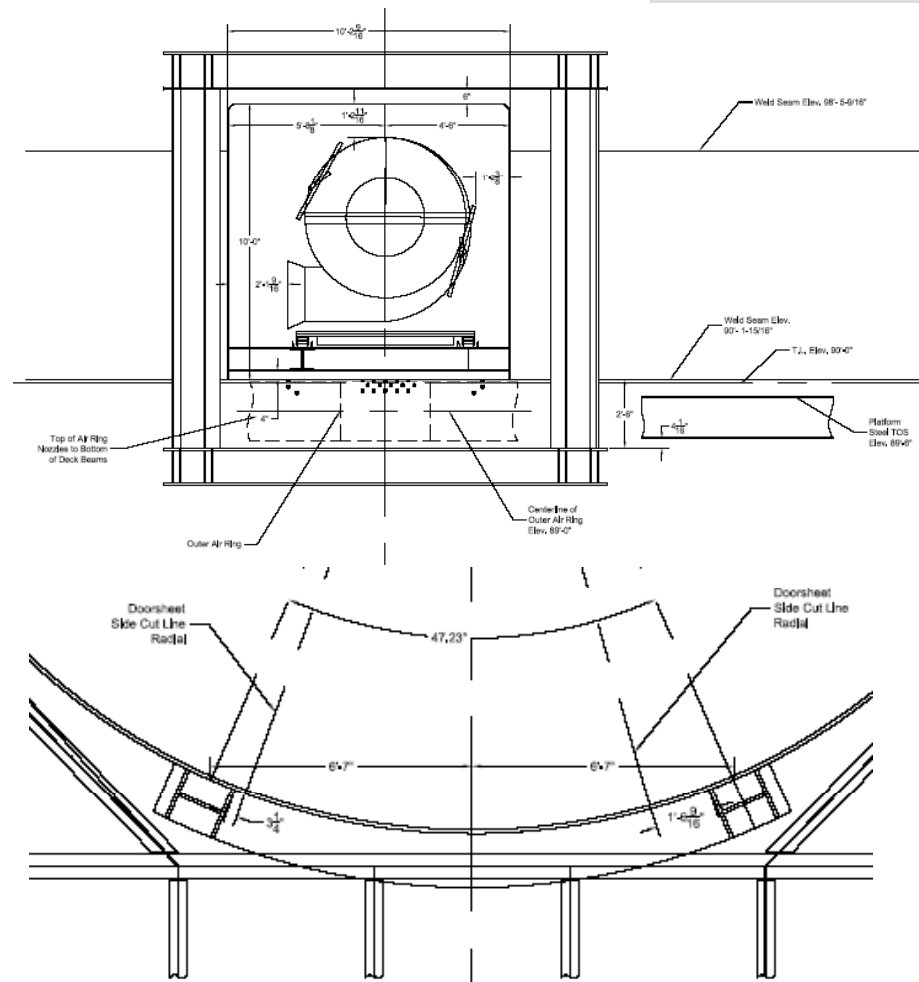
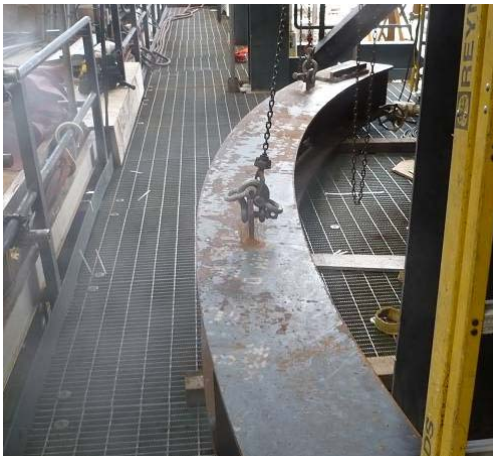
### Complete Scope Included:

- Removal and replacement of the first stage regenerator, primary and secondary cyclones. (6 each)
- Removal and replacement of external risers (2 each)
- Removal and replacement of regenerated catalyst slide valves (2 each)
- Removal and replacement of regenerated catalyst standpipes (2 each) and wye sections (2 each)
- Removal and replacement of the rough cut cyclones (4 each) complete with overhead vapor lines and crossovers. (3 Sisters)
- Removal and replacements of second-stage regenerator withdrawal wells (2 each) complete with overhead lines and nozzles.
- Installation of Erosion-resistant refractory on reactor first stage cyclone inlets.
- Coke anchors added to the reactor cyclones.
- Removal and replacement of reactor first stage cyclone dip legs and dustbowls complete with trickle valves.
- Installation of two new 36" man ways on the reactor.

# FCCU Revamp Case Study #2



## Regenerator Cyclone Installation

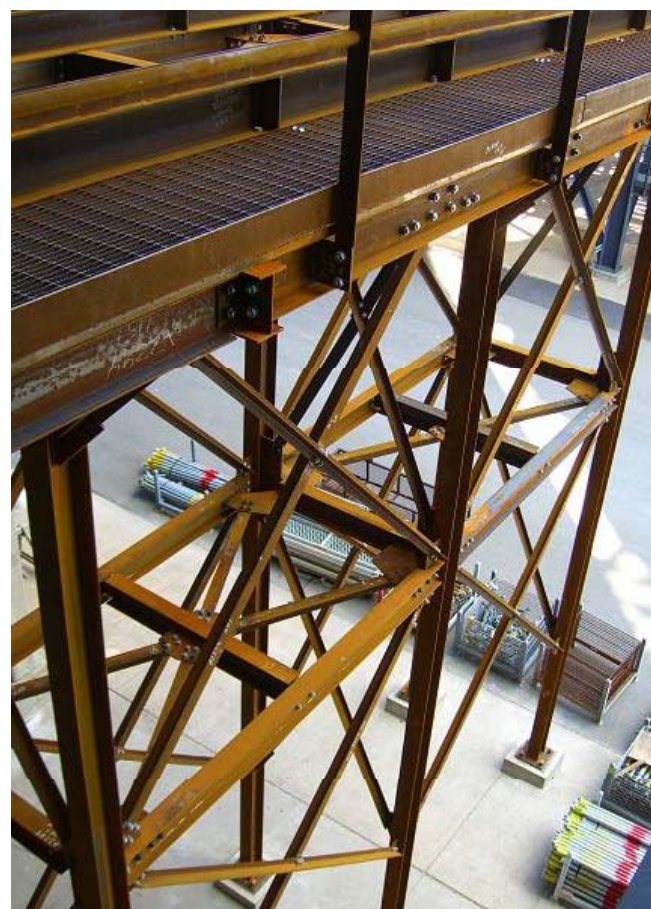




# FCCU Revamp Case Study #2



## Regenerator Cyclone Installation



# FCCU Revamp Case Study #2



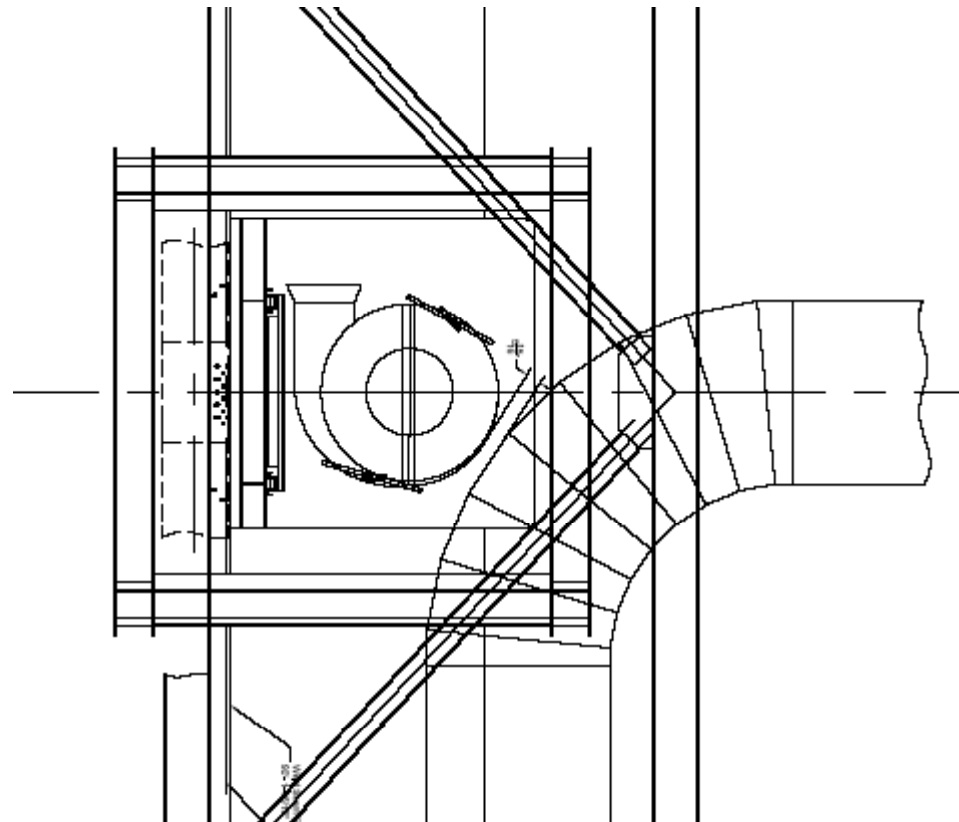
## Regenerator Cyclone Installation



# FCCU Revamp Case Study #2



## Regenerator Cyclone Installation

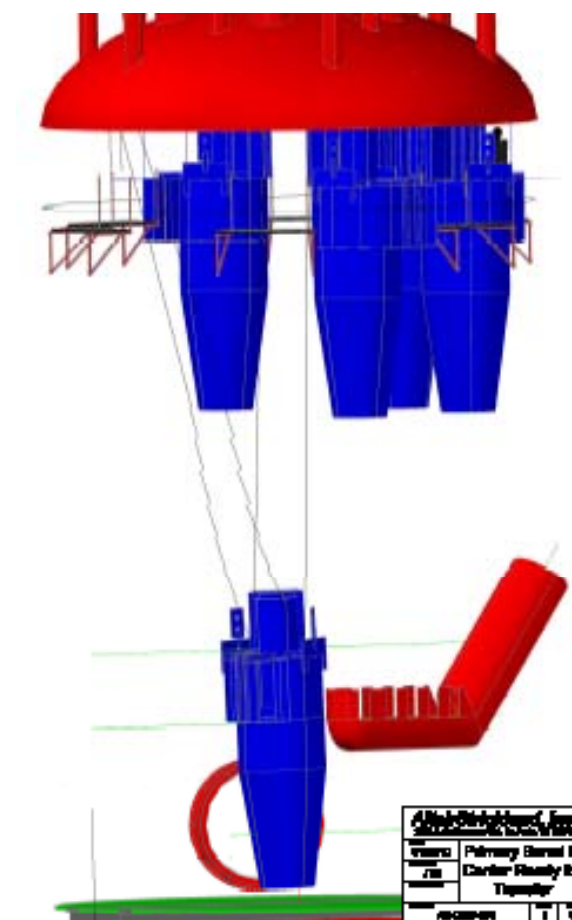
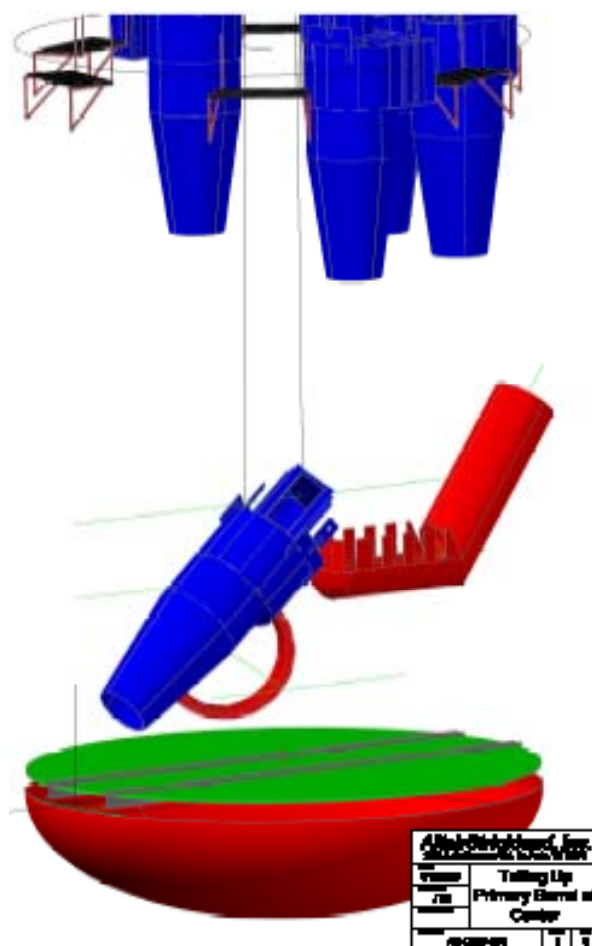






# FCCU Revamp Case Study #2

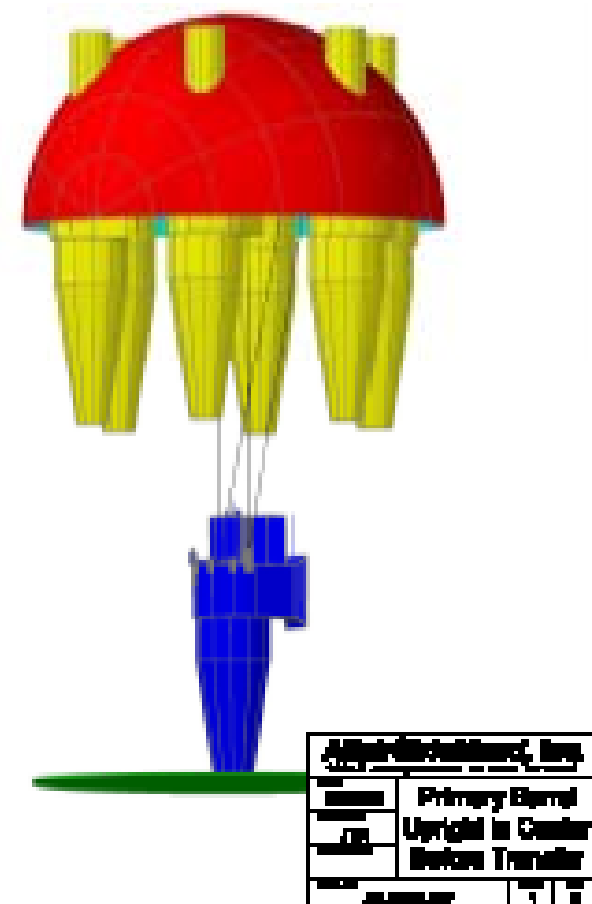
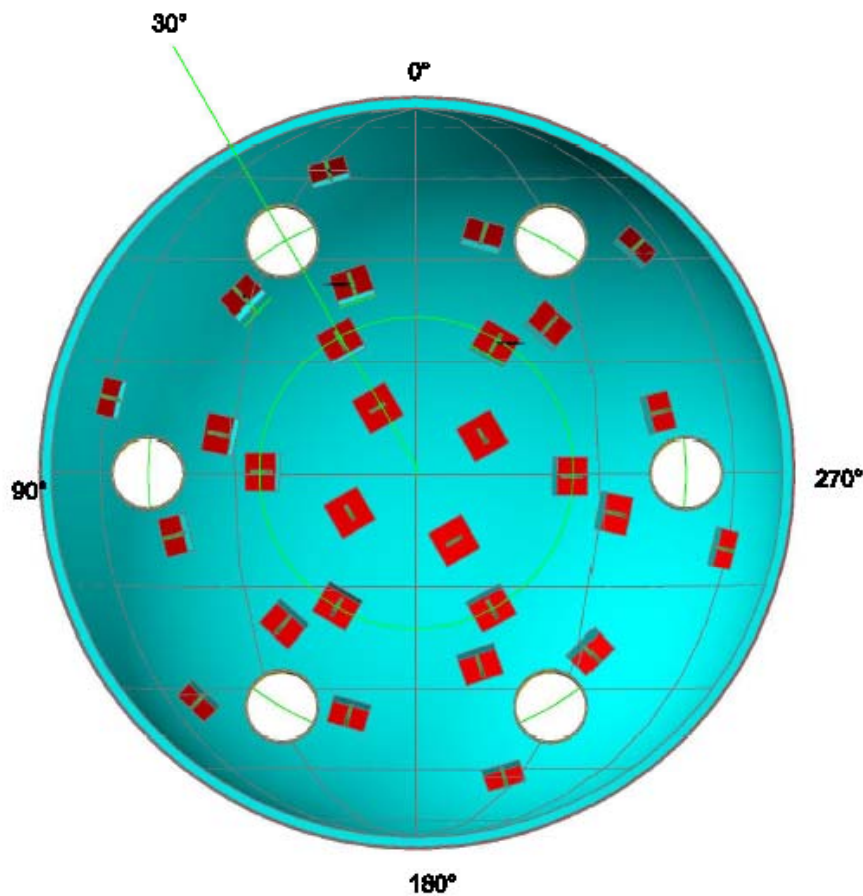
## Regenerator Cyclone Installation





# FCCU Revamp Case Study #2

## Regenerator Cyclone Installation



Equipment Details	
Item	Primary Blower
Location	Upright in Center
Notes	Before Transfer
Author	J. J. J.



# FCCU Revamp Case Study #2



## Regenerator Cyclone Installation



Modeling for  
fit up pre job



Ensuring  
Welder  
Access



# Crane Installations - Considerations



# FCCU Revamp Case Study #3

## Crane Installation

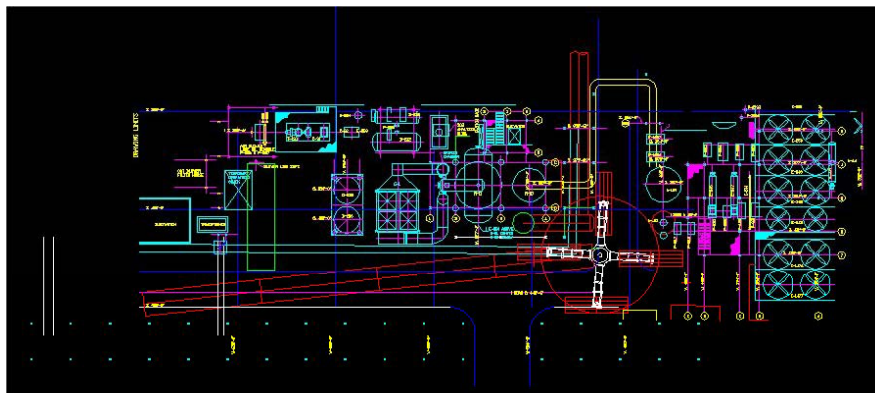
### Complete Scope Included:

- New regenerator shell, new regenerator head and cyclones
- New combustor
- New stripper
- New cat hopper
- Removal and installation of fin fan coolers
- Tie ins for new scrubber
- All new lines under combustor
- This FCCU Revamp involved the replacement of near 80% of the equipment in the structure
- Major structure modifications during pre down and turnaround schedule

# FCCU Revamp Case Study #3



## Crane Installation





# FCCU Revamp Case Study #3



## Crane Installation





# FCCU Revamp Case Study #4



## Crane Consideration Example

### Complete Scope Included:

- Transportation and Installation of new reactor
- New air grid
- Replacement of refractory in all regenerator dust bowls (discovery work)
- New main air blower
- New support structure for reactor

# FCCU Revamp Case Study #4



## Crane Considerations for Reactor Installation





# Major Equipment Installation

# FCCU Revamp Case Study #5



## Major Equipment Installation

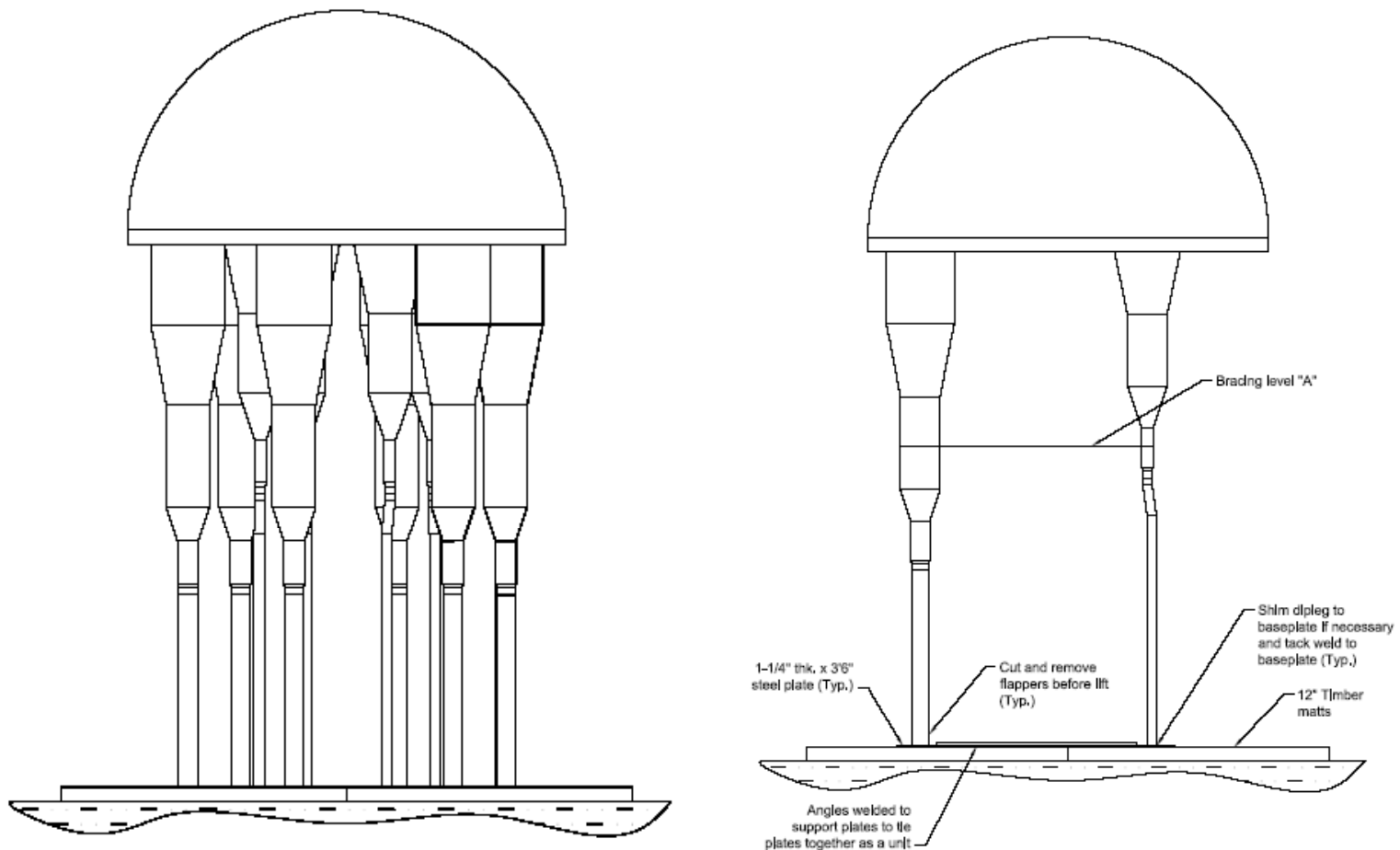
### Complete Scope Included:

- New head and cyclones in regenerator
- Installation of new reactor
- Tie ins to FCC for new scrubber
- Flue gas cooler work
- Major structure work



# FCCU Revamp Case Study #5

## Major Equipment Installation

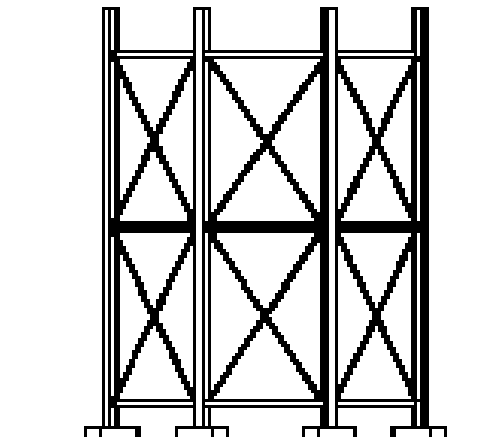
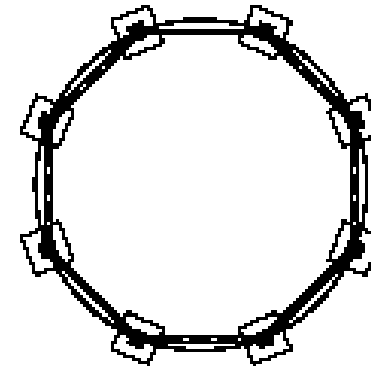
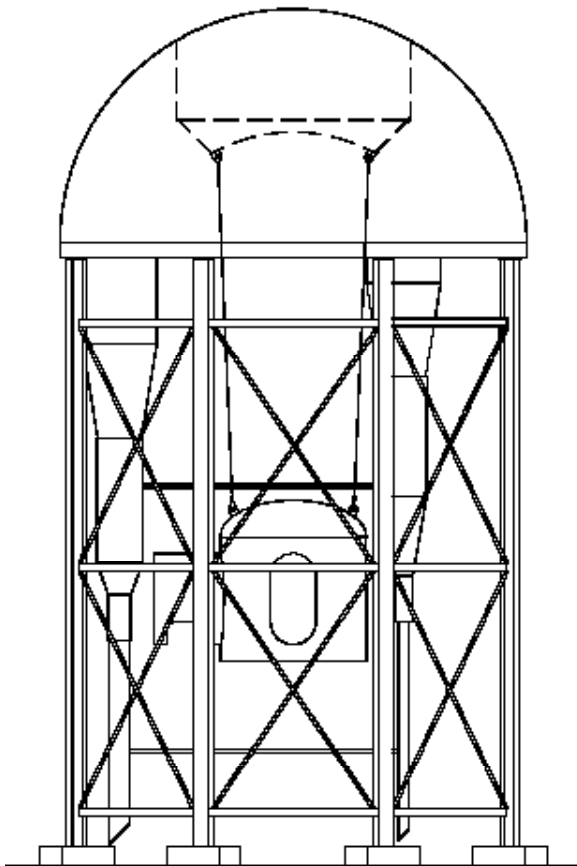




# FCCU Revamp Case Study #5



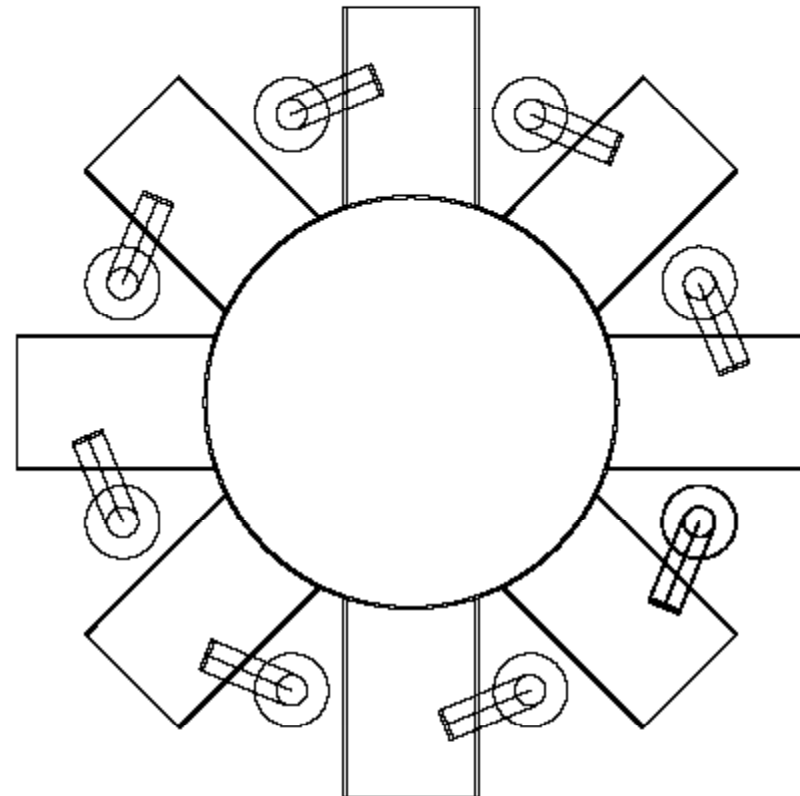
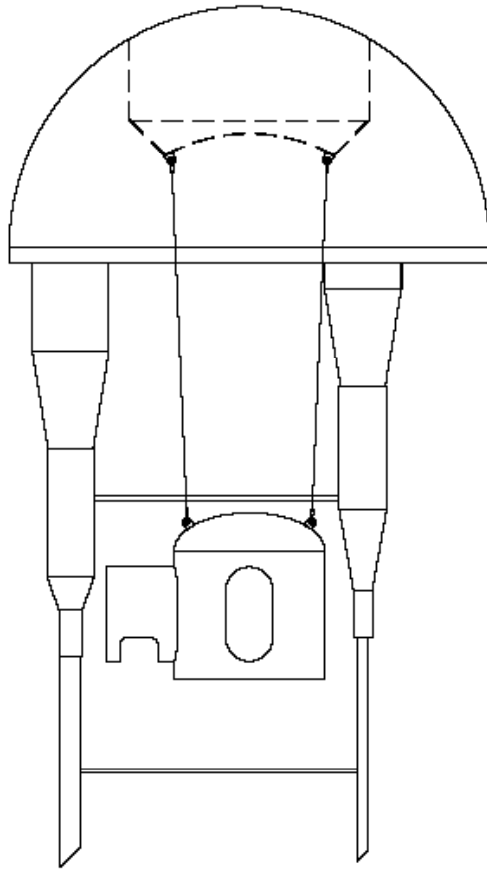
## Major Equipment Installation



# FCCU Revamp Case Study #5



## Major Equipment Installation



# FCCU Revamp Case Study #5



## Major Equipment Installation





# FCCU Revamp Case Study #5



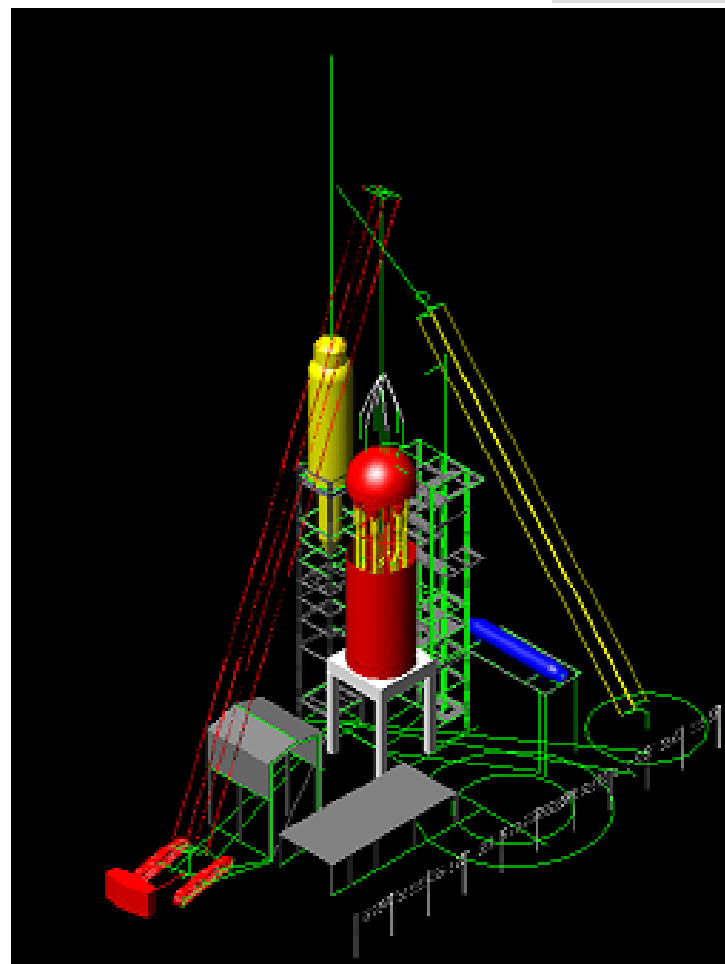
## Major Equipment Installation



# FCCU Revamp Case Study #5



## Major Equipment Installation







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