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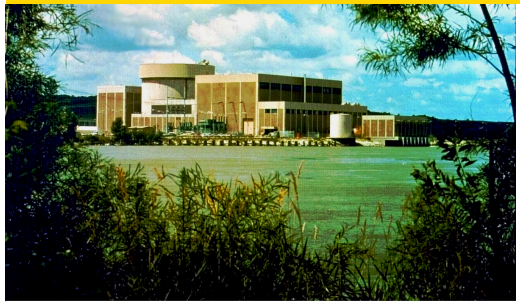
Highways • Bridges • Treatment Plants • Tunnels • Oil & Gas • Hydroelectric Facilities • Office Buildings • Nuclear • Dams • Light Rail • Reservoirs • Hotels • Transit Systems • Power • Piers • Off-Shore Platforms




Modular Construction
May 13, 2008

Agenda

- Introduction to Peter Kiewit & Sons
- Nuclear Experience
- Kiewit Offshore Services
- Modular Experience
- Modular Construction Sequence

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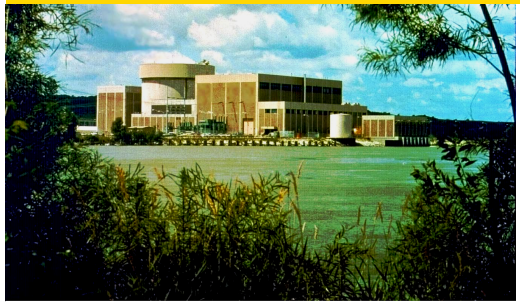
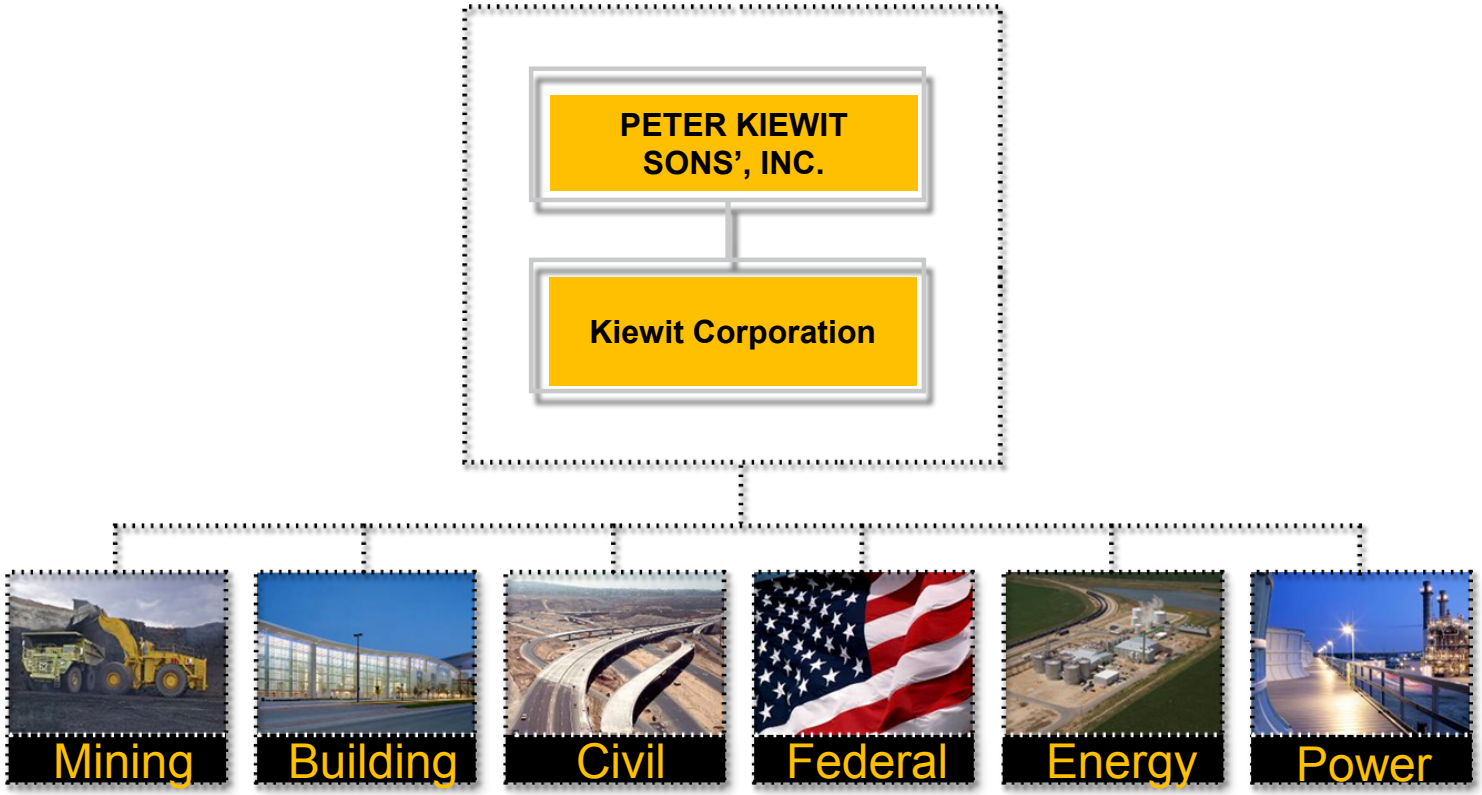



WHO IS PKS ?

Kiewit Organization



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Peter Kiewit Sons', Inc.

- Established in 1884
- Headquarters: Omaha, Nebraska
- One of North America's largest contractors and most successful contractors
- Industry leader in Design/Build
- Owned entirely by active employees
- PKS backlog exceeding $11 billion
- Highly de-centralized
- Balanced, diversified, stable
- Outstanding safety record

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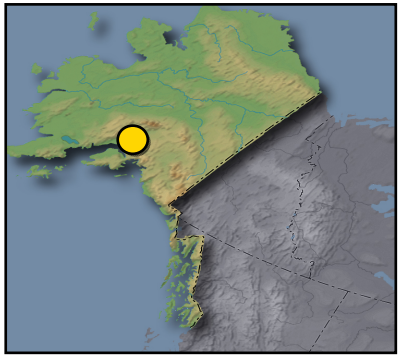
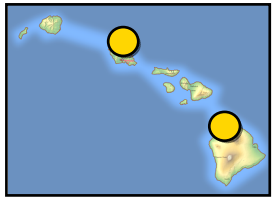
Facilities Across North America

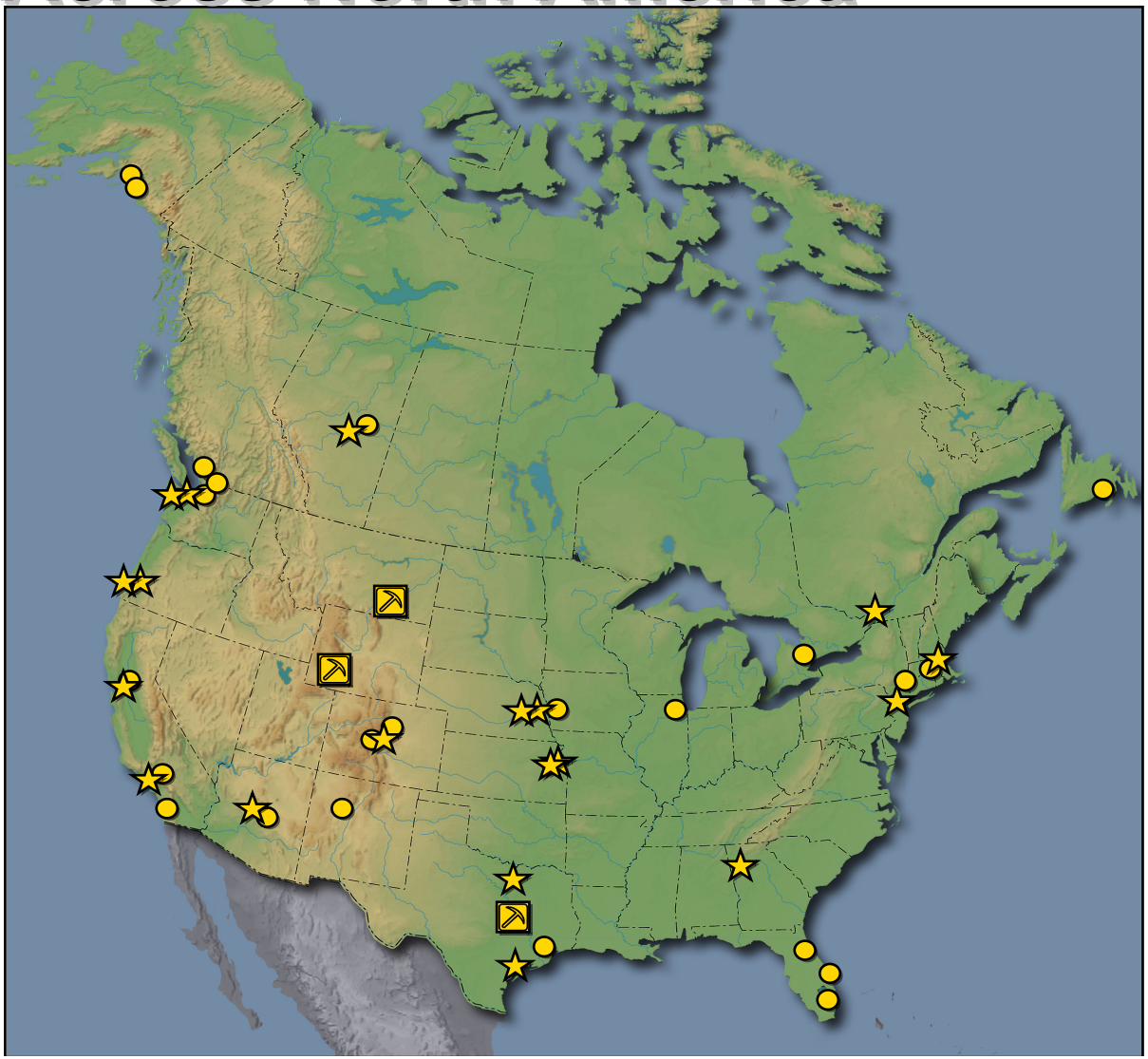




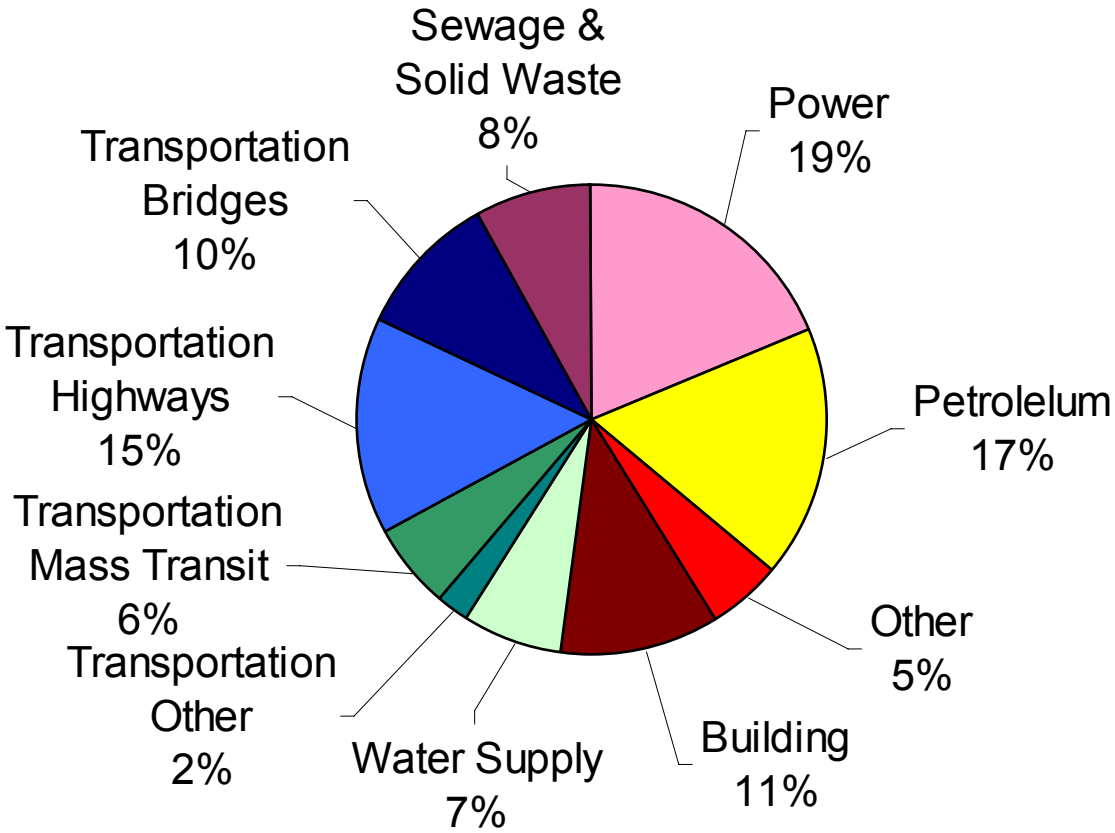
District Office

Area Office

Mine



Backlog by Type of Work



NUCLEAR EXPERIENCE

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Fort Calhoun Nuclear Facility

Satsop Nuclear Facility

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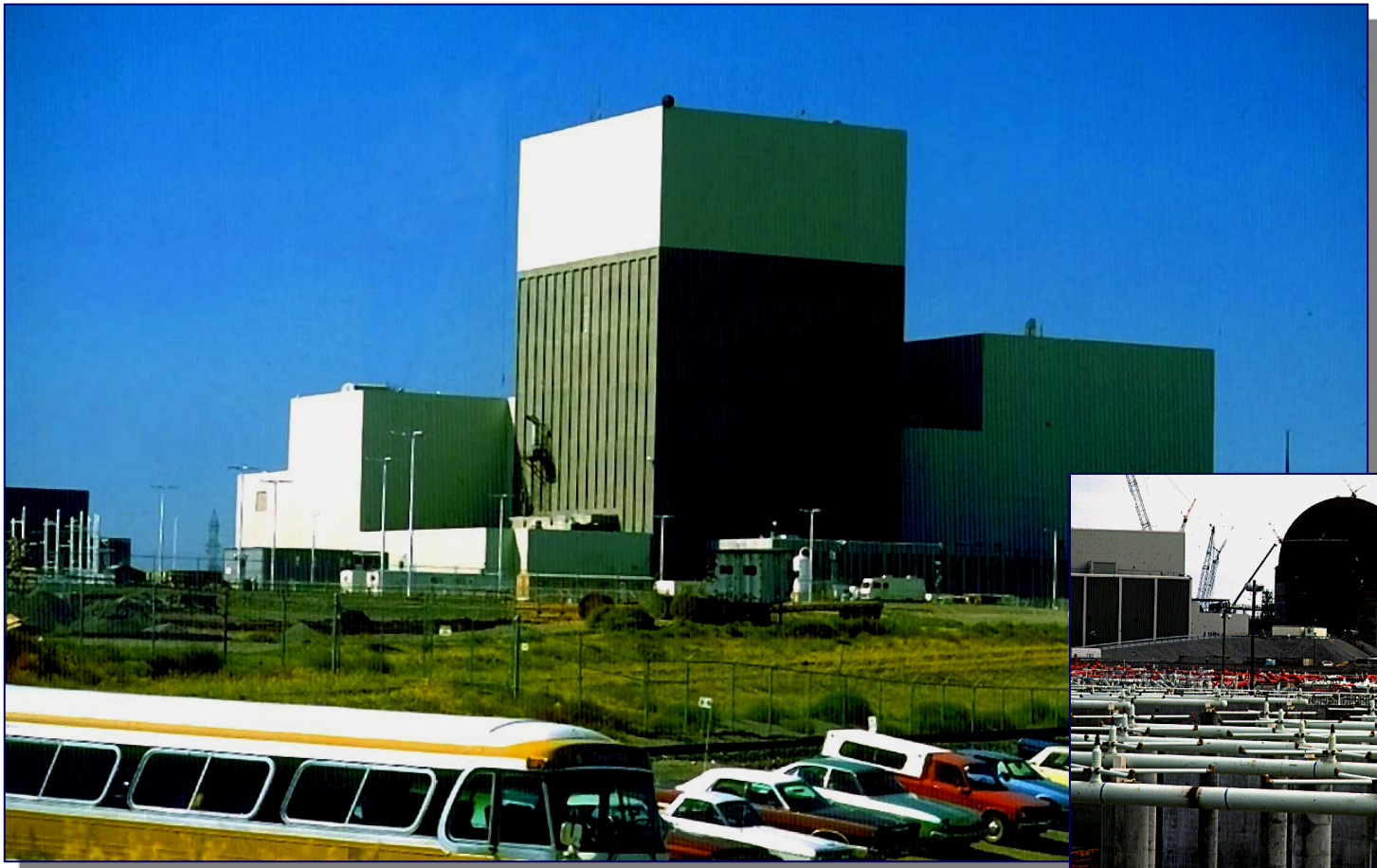
Hanford Nuclear Facility



Kiewit Nuclear Plan

- Kiewit Power Constructors
  - Nuclear Quality Program Development
    - ASME Section III Program Manual
    - Accreditations Division 1 and Division 2
- Kiewit Offshore Services
  - Nuclear Quality Program Development
    - ASME Section III Program Manual
    - Certifications in 2008 – NA, NPT, NS and CC-Structural Division 1 and Division 2 (metallic parts only)
    - ASME Survey May 2008

KIEWIT OFFSHORE SERVICES

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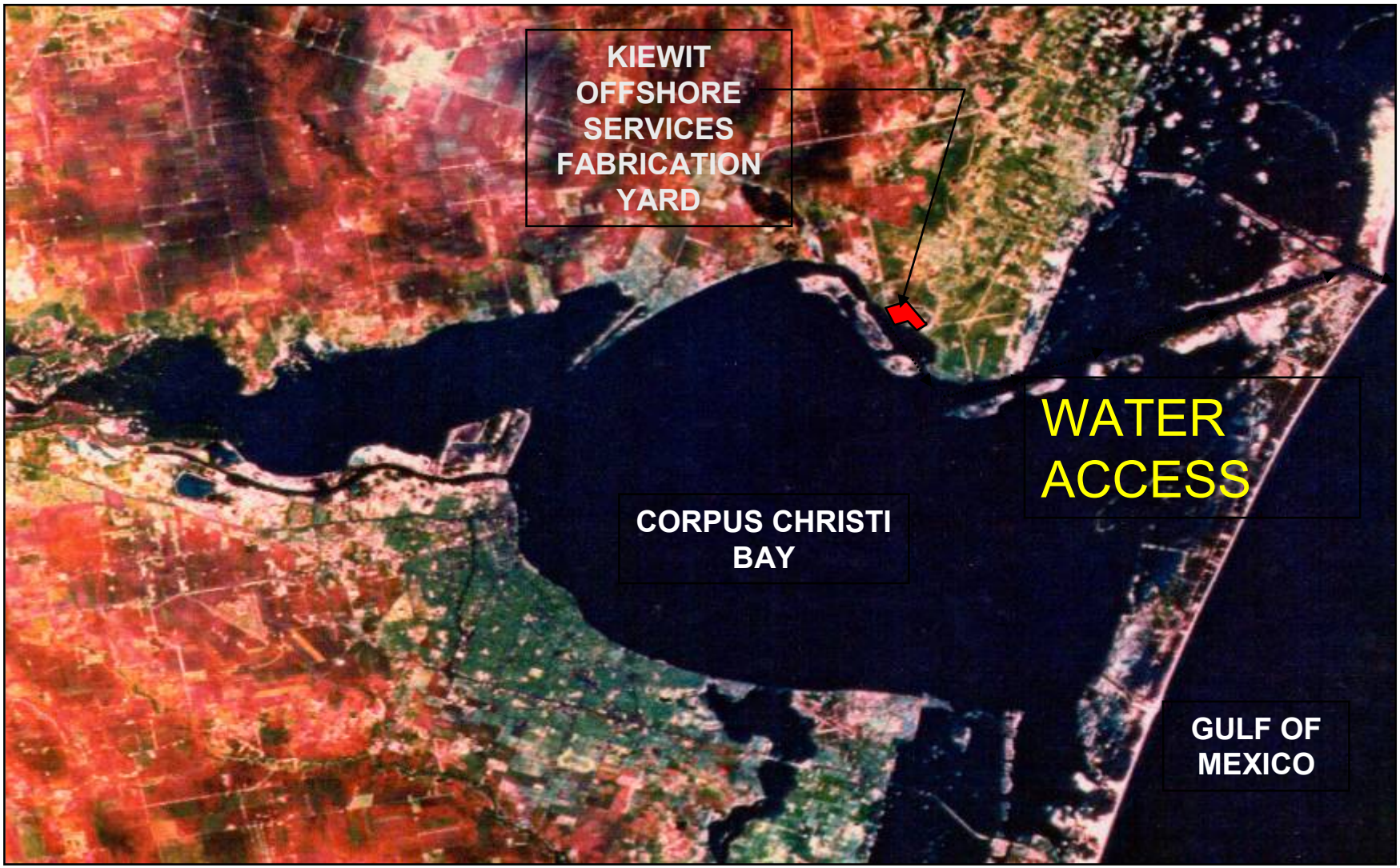
KOS Yard Location & Access



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Kiewit Offshore Services, Ltd.

FACILITIES

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KOS Facilities

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Skills Center

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KOS Facilities

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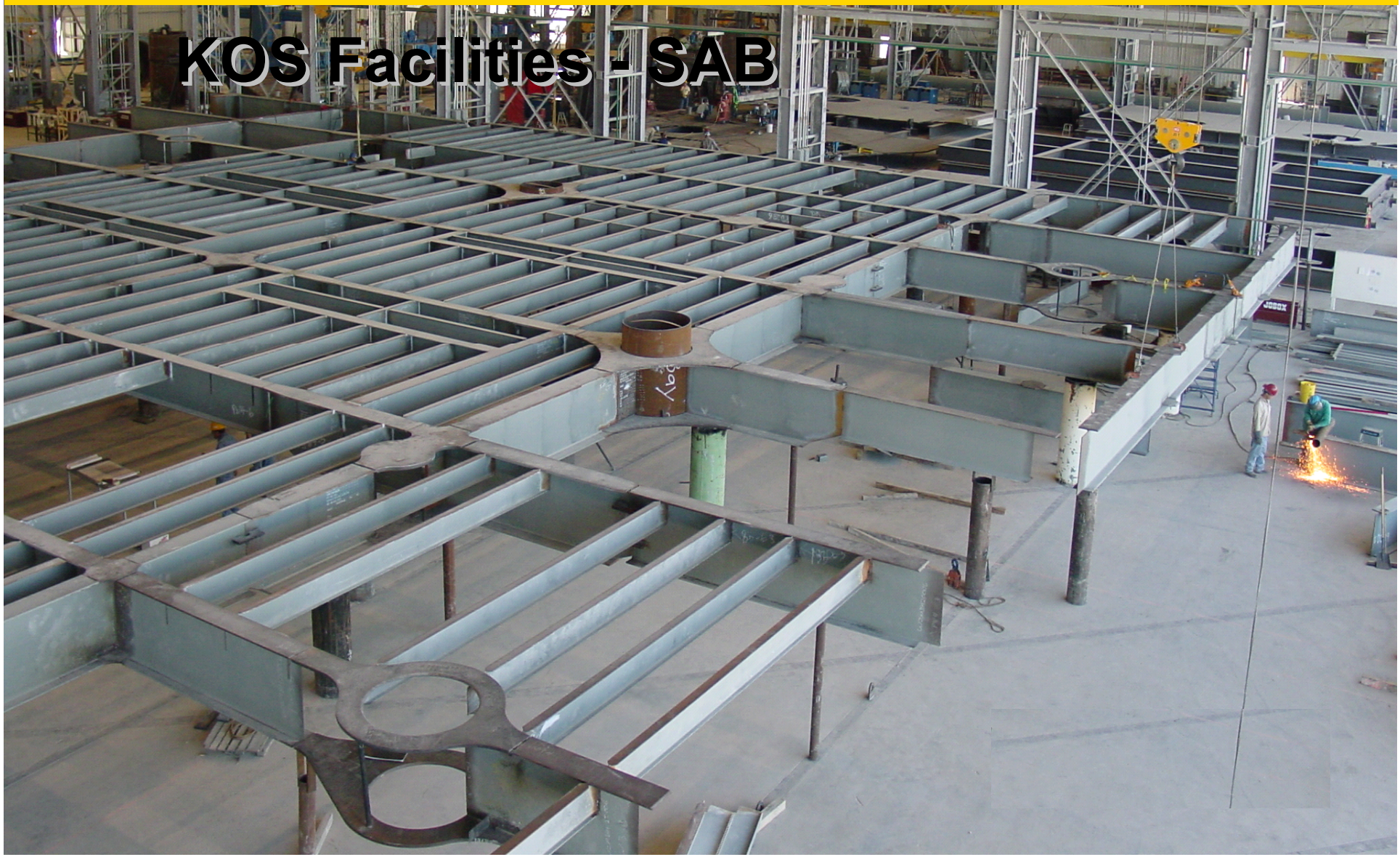
KOS Facilities - SAB



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Beam Cutting

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KOS Facilities – Plate Rolling

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QUALITY

Kiewit

Quality Manual

- Based on ISO 9001:2000
- AISC Certified
- ASME Survey

Scheduled May 2008

American Institute of Steel Construction, Inc.

is proud to recognize

Kiewit Offshore Services, LTD.

Ingleside, TX

for successfully meeting the quality certification requirements for

Simple Steel Bridges and Major Steel Bridges

Fracture Critical Endorsement
Sophisticated Paint Coating Endorsement-Exposed

Roger E. Ferch

Bobbi Marstellar

Certification valid through April 2008

Quality Procedures

- Material Control
  - Mill Test Reports Verification
- Material Traceability
- Weld Traceability
- Welding Procedure Specification
- Procedure Qualification Record
- Corrective Actions
- Continuous Improvement/Lessons Learned
- As Built Drawings

PROJECT EXPERIENCE

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Independence Hub

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BP Thunder Horse

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Equipment Skid

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Zafiro

TRANSPORT OPTIONS

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Transportation - Road

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Transportation - Rail

Transportation - Water

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Loadout and Heavy Lifts

MODULARIZATION

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Modularization

- Benefits
- Module Construction
  - Offshore Oil/Gas
  - Refineries
  - Civil
  - Nuclear
- Typical Fabrication Sequence
- Inspection

Modularization

Benefits

- Up Front Planning & Engineering
- On Site Labor Requirements Reduced
- Fabrication in Controlled Environment
- Improve Critical Path Schedule
- Labor Cost Savings

MODULES

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Process Module

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Piperack Module

Modules in Japan

- Candidates for large modules
  - RCCV – liner & rebar = 1,000 tons
  - Reactor internals
  - Condenser/Turbine Island
  - Balance of Plant

Nuclear Modules – Hitachi Approach

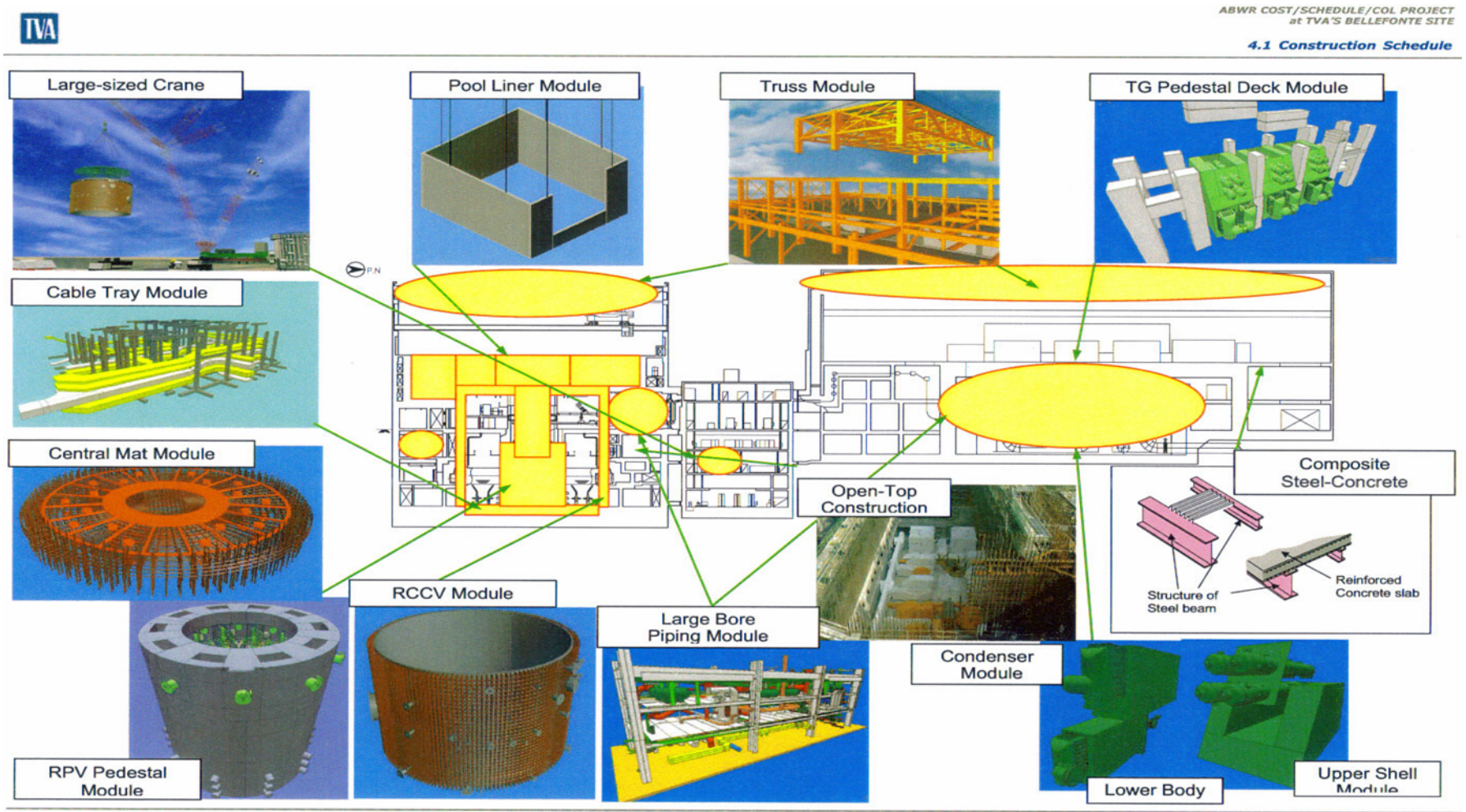


Figure 4.1-2 Principal Construction Method for ABWR

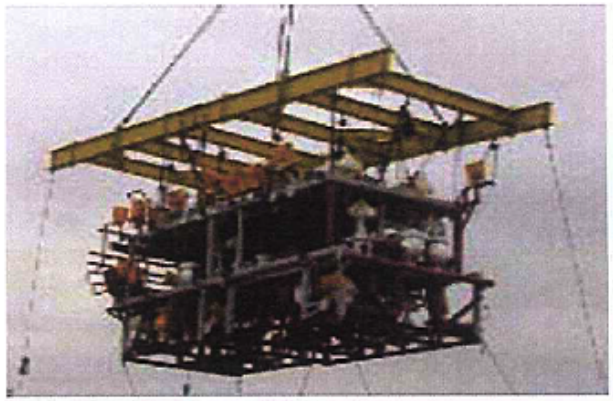
Nuclear Modules – Hitachi Approach

Off-gas Equipment Module

Piping Unit in T-G Pedestal Module

CUW Heat Exchanger Module

MSV/CV Module



Condensate Demineralizer Module

CUW Reheat Exchanger Module

FABRICATION SEQUENCE

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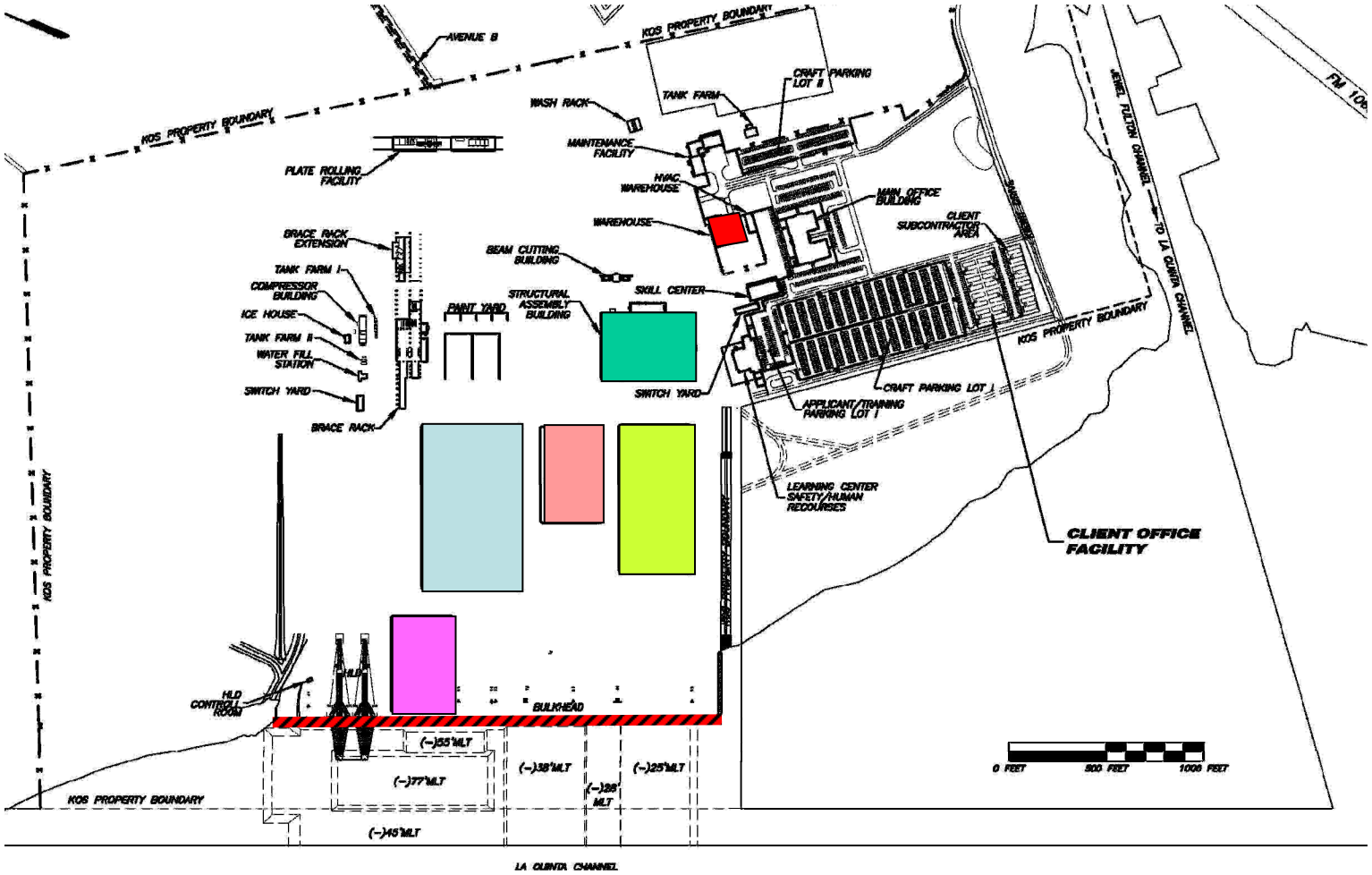
Module Fabrication Layout



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Lower Level Assembly - Shop

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Process Module – Field Assembly

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Pipe Support Installation

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Spool Racking

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Process Module Fabrication

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Cable Tray Installation

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Equipment Assemblies

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Testing & Commissioning

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Process Module Movement

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Process Module Loadout

Modularization

Inspection

- Material Controls
- Weld Traceability
- PQR/WPS
- Corrective Action Program
- Testing and Commissioning
- ITAACS

QUESTIONS

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Material Control / Traceability

- Material
  - Mill Test Reports and Material Chemistry Verification
  - As Builds

Prepared By: Don Blanchard

Rev. 0 8/16/06

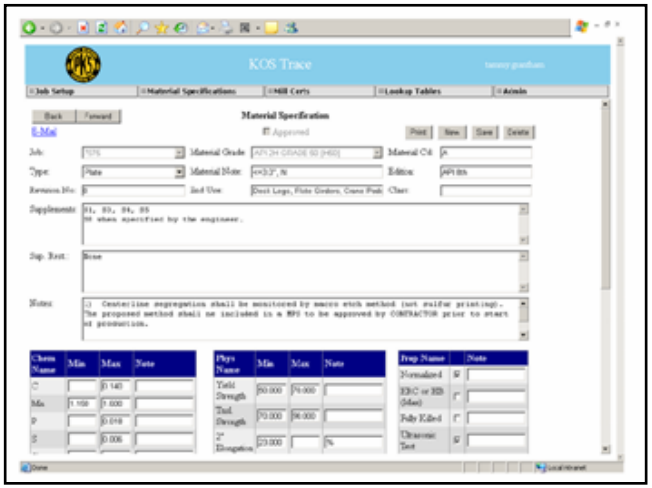
MATERIAL & WELD TRACEABILITY MATRIX
SHENZI
JOB No. 21114 TOPSIDE

Client Approval

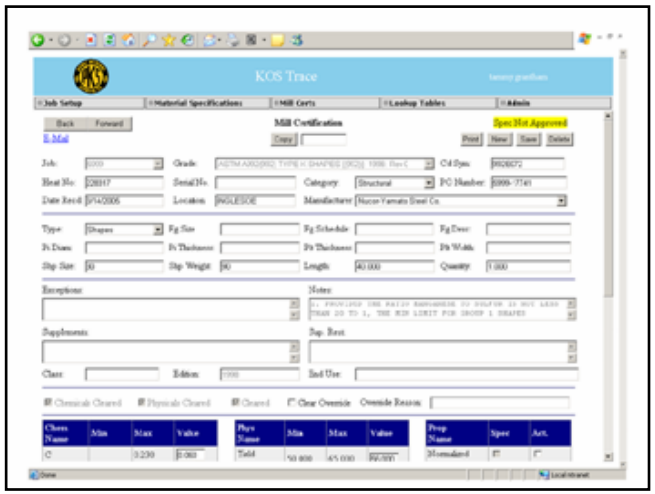
Component	Sub-assembly	Material Grade Verified against PO at time of Receipt	Code Symbol Hard Stamped on Material	Material Code Symbol Documented on Work Drawings	Material Code Symbol Documented in E-File	Weld Map on Drawings	NDE Documented in E-File
Deck							
	Fabricated Pipe API-2B	Yes	Yes*	No	Yes	No	Yes
	Legs	Yes	Yes*	Shop Drawings	No	Shop Drawings	Yes
	Plate Girders & Stiffeners	Yes	Yes*	Shop Drawings	No	Shop Drawings	Yes
	Truss Row Braces and Main Framing Beams	Yes	Yes *	No	Yes	Piece Marked Drawing	Yes
	Stringer Beams and Beams not on Truss Rows	Yes	Yes *	No	Yes**	Piece Marked Drawing	No***
	Stairs and Stair Landings	Yes	Yes *	No	No	No	No***
	Handrails, Drain troughs, etc.	Yes	Yes *	No	No	No	No***
	Pad-eyes and Trunnions	Yes	Yes *	Shop Drawings	No	Shop Drawings	Yes
	Crane Pedestal	Yes	Yes*	Shop Drawings	No	Shop Drawings	Yes
	Flare Boom	Yes	Yes *	No	Yes	Piece Marked Drawing	Yes
	Bridge	Yes	Yes *	No	Yes	Piece Marked Drawing	Yes
	Helideck	Yes	Yes *	No	No	Piece Marked Drawing	No ***

Material Specifications

- Material Chemistry and Mechanical Requirements



- Mill Certificates Entered and Checked Against Specifications

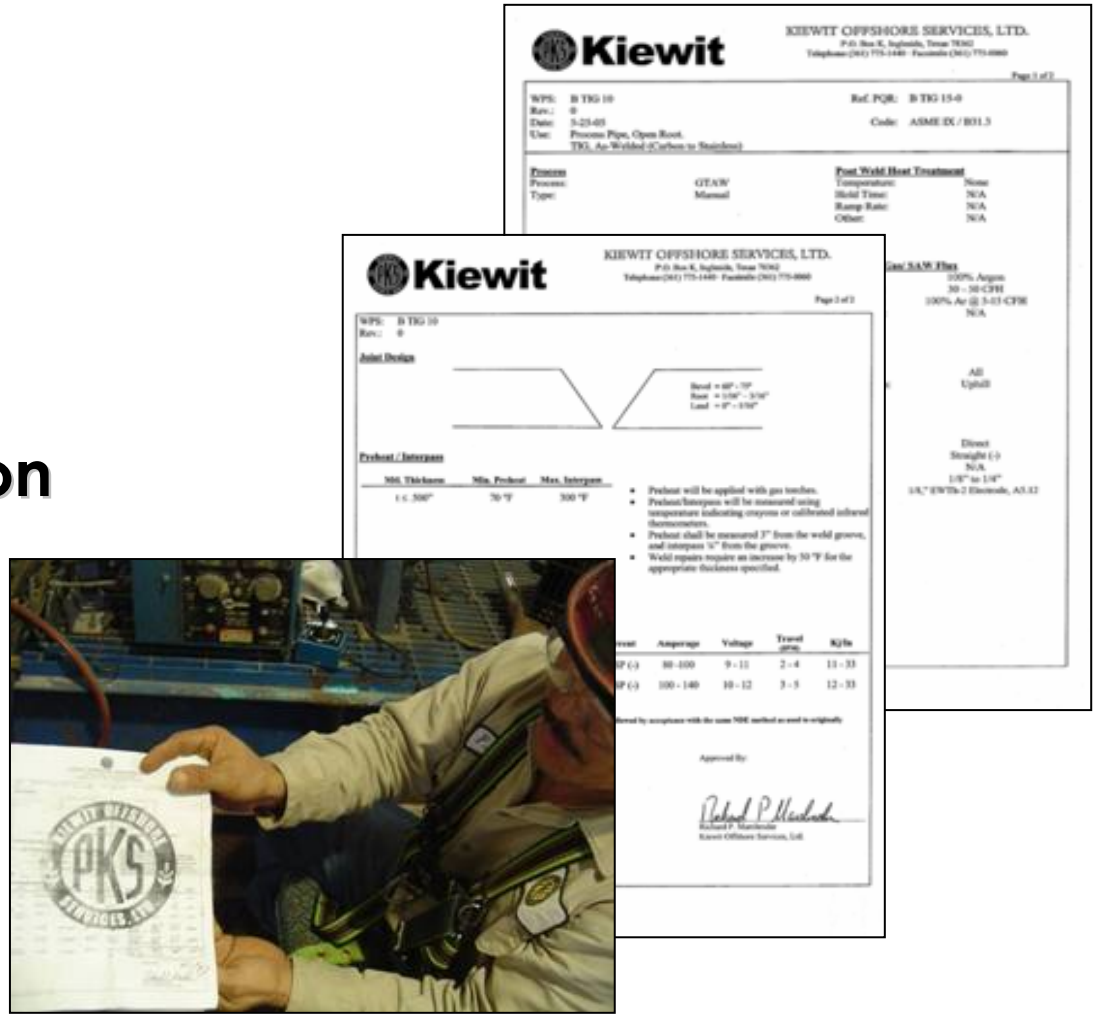


Weld Traceability

- Weld Time and Welder
- WPS
- NDE

Welding Procedure Specification (WPS)

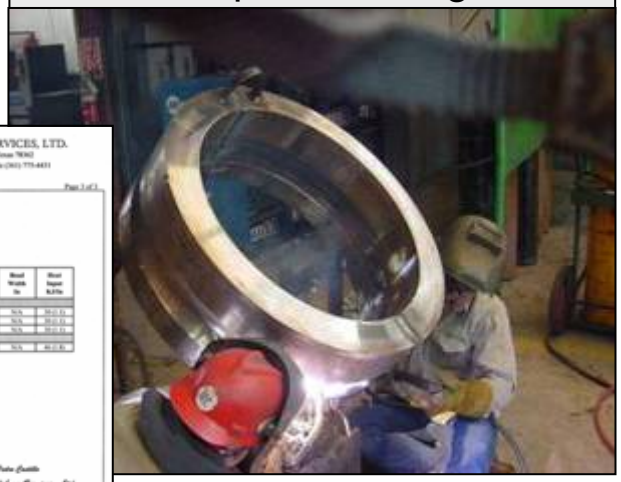
- Consolidation of Codes/Specs
- Variable Ranges
- Issued for Production
- Deviation Will Alter Mechanical Properties



Procedure Qualification Record (PQR)

- Written Record Welding Variables
- MTR
- NDE Report
- Mechanical Test Report

Coupon Welding



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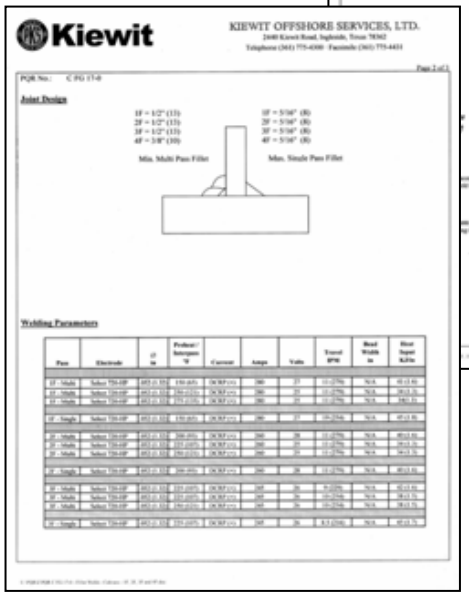
KIEWIT OFFSHORE SERVICES, LTD.



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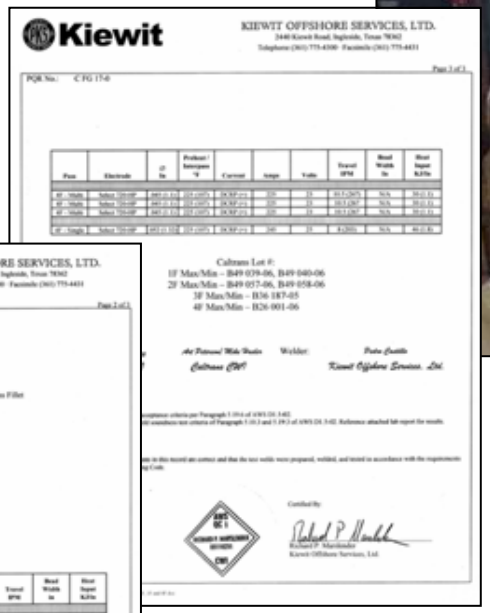

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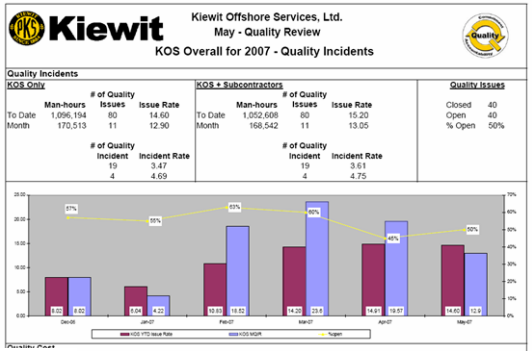
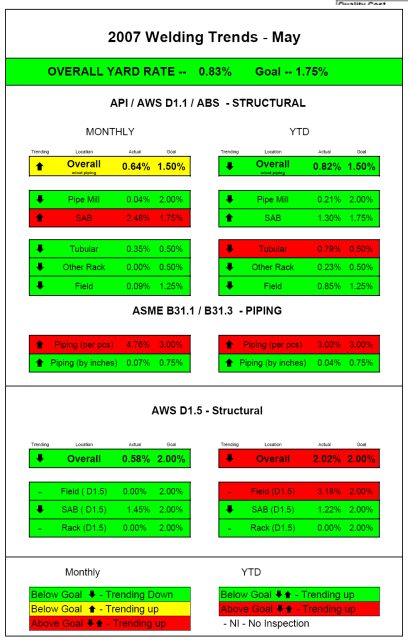
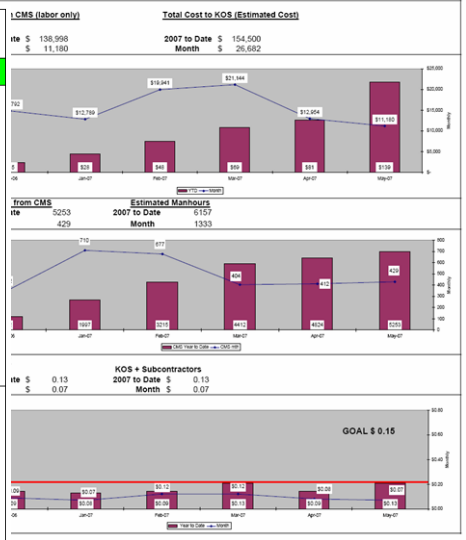
Continuous Improvement

- Monthly Quality Assessment
  - Quality Incident Rate
  - Rework Cost / Rework Man-hours
  - Cost per Man-Hour
  - Weld Repair Rate
- Lessons Learned Program
- Quality Audits
- Project Quality Assessments
- Client Assessments







Corrective Action / Root Cause

Quality Issue Log

Lesson Learned

Success Story

Kiewit

Kiewit Offshore Services
7978 Devon Deck
2440 Kiewit Rd, Ingleside TX 78362

Quality AT EVERY STEP

Lesson Learned Report

ISSUE DATE: 12-05-2006
SUB-FUNCTION: Building the Work
DISTRICT CAUSE: Lack of Attention to Details
TYPE OF PROBLEM: Fitting-Cutting

LESSON LEARNED: LL: Table Operator was not paying attention. A web plate to be cut had a 3/4" notch on one of the long sides. The operator input the shorter width into the computer so that the notch was cut out and most of the web plate is 3/4" too narrow. A new plate had to be transferred over to replace the incorrectly cut plate.

1) Operator not paying attention – Talked to all operators about issues Leadmen
2) No plate check list and no operator sign off sheet and plate not nested by lofting – Leadman now are required to sign off all plate that does not go thru lofting before and after cut is made.

Type of Problem: Fitting Cutting
District Cause: Lack of Attention to details
Subcontractor or Supplier

Lesson Learned (Ctrl + 8)
Describe the Lesson Learned

Type of Problem: Fitting - QC
District Cause: Lack of Attention to details
Subcontractor or Supplier

Describe the Issue's cause or perform a root cause analysis
Quality Alert View | Root Cause Analysis View

	Cause	Corrective Action	Assigned To	Due Date
1	Poor lack of attention to detail by Brace / Pipe Hill management.	Write a lessons learned and address it with everyone. Double check latest revision and check measurements of drawing to piece.		

Root Cause Analysis Report

Issue: 22 - Weld Repair P72 (Diaphram Plate Corr)
Type of Problem: Welding
Date Opened: 10-13-06
Date Closed: 10-20-06
District Cause: Improper method
Location: Field, Diaphram Vertical P72
Description: Slag inclusion non-fusion was found on the vertical joint (Approx 6.83')

ID	Cause	Corrective Action	Assigned To	Due Date	Comments
1	Poor Welding Technique, Batch of Weld Wire, Not following Parameters, Unskilled welders	Leadman/QC checked parameters to WPS, perform testing with weld wire, review welder repair history, reset all questionable skilled welders.	Duane Capozzoli	10-16-06	Qualified welders were on the project but unable to perform complete field welds. These welders were removed from the Project.