

Wolf Creek Nuclear Power Plant



**Custom RX Head (RVHFA) Work Platform
RF-22 Refueling Outage April 2018**

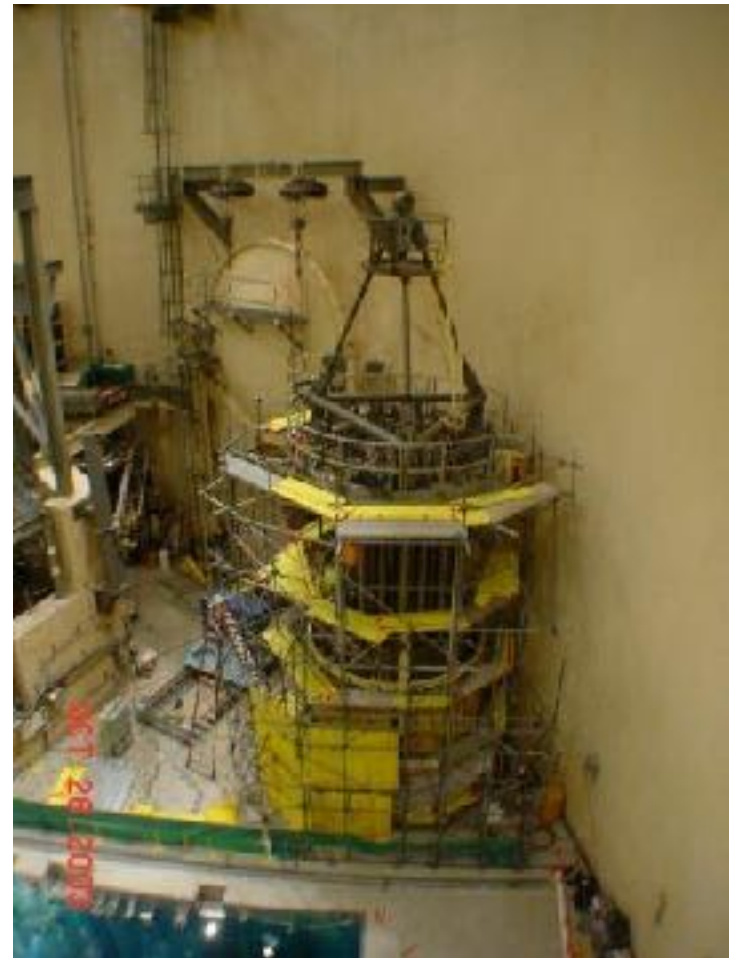
BHI Energy Power Services Is Comprised Of The Following Team Members...



Quality Design, Fabrication and Contract Mfg.
Services since 1983

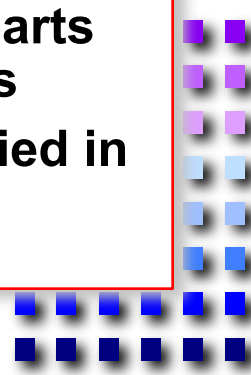
Wolf Creek's Expectations From Utilizing A Custom Fabricated RX Head Access Work Platform.....

- ◆ **Improve industrial safety by eliminating work deck trip hazards**
- ◆ **Reduce outage critical path time**
- ◆ **Lowering man rem expenditures & craft manpower labor cost**
- ◆ **Decrease the number of craft man hours required for construction**
- ◆ **Access package must be more user friendly for first time builders**
- ◆ **Mitigate the amount of tube & clamp staging components used**
- ◆ **Ability to have the structure support lead shielding blankets**
- ◆ **Free up floor space around hatch to expedite move in of equipment**





Benefits Of Having Excel Custom Fabricated RVHFA Specialty Scaffold Package.....

- ◆ **Enables the fabrication of unique Excel parts by Deltak as required for work the platform to perform properly & efficiently**
 - ◆ **Cantilevers inserted into RX head stud holes allowed for quicker erection of RVHFA work platform & eliminated building off floor**
 - ◆ **Cantilevers supported the entire large structure & lead blankets required to shield the shine coming from beneath the RX Head**
 - ◆ **Custom length & adjustable horizontal bars allow construction of various shapes of work bays going around the entire head**
 - ◆ **Use of custom diamond plate work deck components allowed for them to fit odd sized work decks and eliminated trip hazards**
 - ◆ **Excel positive locking ledgers & bearers resulted in fewer parts being utilized for construction & mitigated use of hand tools**
 - ◆ **Unique custom parts were all tested, qualified and PE certified in a manner that allowed them to meet all OSHA requirements**
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**Full Scale Mockup Phase In
Walker LA, Used Demo
Replicate Of RX Head
Flange With Interior
Scaffold Structure Installed
For Stabilization Purposes
Only**



Installing Custom Cantilever Bullet Nosed Brackets Into RX Head Demo Mockup Unit Stud Holes



**Installing First Set of
Inner & Outer Excel
Vertical Legs On Top Of
Custom Cantilever
Brackets**





**Starting Installation
Of Excel Adjustable &
Fixed Horizontals Into
Excel Vertical Legs
Assemblies**

**Installation Of Inner Legs That Allowed
For installation Of Horizontal Bars**



**Installing The Initial Aluminum Deck Panel At The Access Ladder
Bay Area That Was Beginning Of First Full Work Deck**



Installation of First Full RVHFA Work Platform Deck Complete



Installing Diagonal Bracing



First Work Deck And Next Full Wrap Of Horizontal Bars Complete



**Installation of Additional
Upper Level The Required
Horizontal Bars &
Diagonal Bracing**





**Installation Final Upper
Wrap And Top Work Deck
With Smaller Size Aluminum
Deck Pans**

Continued Installation of Top Level With Smaller Size Deck Pans





Installation Of Swing Gate,
Ladders And Low Profile
Aluminum Deck Pans

Installation Of The Upper Work Deck And Hand Rails





**Construction Of The Custom
RVHFA RX Head Package Is
100% Complete**

**Custom Cantilever Inserted In RX Head Stud Hole With
Excel Vertical Leg Installed**



**Lead Blankets Installed Below The Custom Cantilever Insert On Horiz
Bars To Reduce Dose Rates From Streaming From Under RX Head**



**Cantilevers Bracket Inserts Were Capable Of Supporting Weight Of
The Entire Structure Without Having To Sit On Refuel Floor**



**RVHFA Low Profile Aluminum Work Platform Deck Plates With
Inspection Doors In Closed Position**



**RVHFA Aluminum Work Platform With Inspection Doors Open For
Easy Craft Access To Perform Visual Examinations**



**RVHFA Structure Comprised
Of Custom Size Fixed Bars &
Telescoping Expandable Bars
Which Significantly Reduced
The Historical Requirement
For Using Tube & Clamp**





**RVHFA Work Platform With
Swing Gates & Ladders &
Diagonal Bracing In Place**

**RVHFA Work Platform Sitting Next To Ctmt Exterior Wall Which
Was Accomplished With Smaller Reduced Size Deck Pan Inserts**



**RVHFA Work Platform Sitting
Next To Equipment Hatch
With Reduced Footprint
From Compact Design
Allowed For More Efficient
Move In Of Equipment Into
Ctmt**



Wolf Creek Payback Estimates Associated With Utilization Of Custom RVHFA Work Platform

- ◆ **Reduced overall outage critical path time by 6 hours, build time went from 1.5 shifts down to 1.0 shift (Based on 12 hr shifts)**
- ◆ **Decreased the craft labor man hours required for installation by 112 (58%) man-hrs from 192 man-hrs down to 80 man-hrs**
- ◆ **Decreased the number of craft labor personnel utilized for construction by 4 (33%) craft from 12 craft down to 8 craft**
- ◆ **Lowered project man rem expenditures for RX Head platform installation by 600 (66%) Mrem from 900 Mrem down to 300 Mrem**
- ◆ **Dropped craft manpower labor cost used for installation by \$6.2K (58%) from \$10.7K down to \$4.5K**
- ◆ **Reduced amount of tube & clamp staging components used by roughly 95%, reduced quantity of actual parts handled by 45%**
- ◆ **Increased efficiency of CTMT move in through the equipment hatch by reduced foot print of more compact RVHFA package**

Custom Excel RVHFA Work Platforms Have Been Previously Utilized At The Following Plants

- ❖ Millstone
- ❖ Turkey Point
- ❖ St Lucie
- ❖ Indian Point
- ❖ Vogtle
- ❖ Calvert Cliffs
- ❖ Palisades
- ❖ Oconee
- ❖ McQuire
- ❖ Catawba





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