Stennis Space Center (SSC)
B-2 Test Facility Prep for SLS

November 06, 2013
Representation of SLS Core Stage in the B-2 Test Stand
Summary of WP #1
Major Structural Modifications

Main Derrick Crane

Aspirator

Level 7

SLS Core Stage in the B-2 Test Stand
SLS Core Stage in the B-2 Test Stand

WP #1 & WP #2

Summary of WP #1
Major Structural Modifications

Summary of WP #2
Major Structural Modifications

Main Derrick Crane

"Battleship"
Booster Support Frame

Aspirator

Level 8

Level 7

Flame Deflector
(Tension Rods)

Ancillary Structures:
• Platforms & Stairs
• Tie-Down Tendons

Basement & Sub-Basement
SLS Core Stage in the B-2 Test Stand with New Superstructure

Summary of WP #1
Major Structural Modifications

Summary of WP #2
Major Structural Modifications

Summary of WP #3
Major Structural Modifications, Mechanical Restoration and Electrical Restoration

Main Derrick Crane
Top of Stage Core Stage Access
Intertank Region SLS Weight/Thrust Takeout Elevation
Existing MPTA Structure

"Battleship" Booster Support Frame

Aspirator
Ancillary Structures:
  • Platforms & Stairs
  • Tie-Down Tendons

Flame Deflector (Tension Rods)
Flame Deflector (Segment Repairs)
Basement & Sub-Basement

Design Concept for Upper Superstructure

Level 11
Level 16
Level 18
Level TBD

Level 7
Level 8

100 ft

"Battleship" Booster Support Frame
Structural Buildout

- Relocate existing MPTA structure will be moved 20’ 3” north
- Add bracing and supports (increase load bearing capacity) of MPTA structure and battleship
- Construct new tower, including thrust take out
- Includes stairs and ladders for egress
- Includes design of special access platforms for vehicle
Plan View: MPTA Structure
"Corvette" Above Battleship

Battleship (Level 11)

Existing MPTA Structure

Current Position of MPTA Structure

Level 16 - "Corvette"

Level 11

Weight of MPTA Structure: 1.161 Mlbs

Battleship

South Elevation

Weight of MPTA Structure: 1.161 Mlbs
Plan View: MPTA Structure
"Corvette" Above Battleship

Battleship (Level 11)

Existing MPTA Structure

Roll Back Position of MPTA Structure

Weight of MPTA Structure: 1.161 Mlbs

20 feet, 3 inches to the North

Level 11

Level 16 - "Corvette"

North Elevation

Weight of MPTA Structure: 1.161 Mlbs
Why Consider Rollback?

- Anticipated cost savings of $2+ M compared with building out the existing MPTA structure to accommodate the Core Stage.
- Anticipated schedule savings of 1-3 months.
- A Note on Risk: PEI’s lead structural engineer has designed numerous successful rollbacks of larger, heavier, and more top heavy “precipitators” for the pulp and paper industry.
Structural Wind Tunnel Testing

• Scale model of B-2 was tested in wind tunnel at CPP Wind Engineering, Fort Collins, CO
• Test results used in accordance with Method 3 of ASCE7-05 to calculate forces due to wind load
• Forces were significantly lower than forces calculated strictly analytically
• Resulted in cost savings greater than the cost of testing ($100K) and increased margin in design
• Effort being made to return model to SSC
B-2 Restoration and Buildout/STE Work Flow Timelines

**SLS Program Stages Element Milestones**

- Project Management Plan Development
- Restoration Complete: February 2015
- Buildout Complete: August 2015

**Planned RS-68 Tests**

**B-2 Restoration**
- Demolition (Levels 7-8, 11-16, Battleship)
- **WP#1 (Level 7 Fixed and Rolling Decks, Aspirator, and Derrick Crane)**
- **WP#2 (Levels 8 and 8-1/2, Battleship, Braces, Basement, Deflector Lateral Support, Major Structural Demo, Stairs and Platforms, Tie Down Tendons)**
- **Mechanical Package**
  - Piping Systems
  - Valve and Component Triage and Repair
- **Electrical Package (High Voltage and 28VDC)**
- **Miscellaneous Restoration** (Bunker Repair, Temporary Parking Lot, Paint Soft Core, etc.)

**B-2 Facility Buildout**
- **Requirements Development**
- **Structural (SLS Superstructure, Reposition Existing MPFA Structure at Levels 11-16, Flame Deflector Segment Repair)**
- **Mechanical Package (Piping Systems)**
- **Electrical Package (High Voltage and 28VDC)**

**B-2 STE**
- **Structural, Mechanical, Electrical Packages**
- **B-2 Activation/Test**
12NCBZ B-2 Test Stand MEP Demolition
Level 7 - Before
12NCBZ B-2 Test Stand MEP Demolition
Level 7 North Box Beam - After
12NCBZ B-2 Test Stand MEP Demolition
Level 8 - After
WP #1: Installation of Aspirator Girders at Level 7
WP #1: Aspirator Main Girders Installed
WP #1: Aspirator Corner Section Installation
WP #1: Level 7 Diving Board Restoration
WP #2: Coiling Door Demolition on Level 8
Busy Stand!

WP #1: Level 7

WP #2: Levels 8 and 8½
Questions