Ares Project Overview – Quality in Design

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Agenda

- Project Overview
- Testing Strategy
- Project Status
- Quality in Ares Design
Ares Project Introduction

- The next chapter in human space exploration—Moon, Mars and beyond
- Building on experience from 50 years of Saturn and Shuttle ops
- Exploration Systems Architecture Study (ESAS) established requirements
- U.S. Space Exploration Strategy
  - Complete the International Space Station
  - Retire the Shuttle
  - Develop and fly the Crew Exploration Vehicle (Orion)
  - Explore and establish an outpost on the Moon
  - Send humans to Mars
- Separate crew and cargo launch vehicles
Video: Moon and Beyond
Ares Project Status

First Stage Nozzle Process Simulation Article

Fabricating Gore Dome Panels for Upper Stage

J-2X Powerpack Testing

Over 4,000 Hours of Wind Tunnel Testing
Testing Strategy

- "Test as you fly" strategy
- Ground, flight, and orbital tests
- Ares I-X
  - April 2009
  - Suborbital flight test
  - Combination of operational and mockup hardware
  - Demonstrate ability to control Ares I vehicle

- Additional Ares tests
  - Ares I-Y: First flight of five-segment RSRB
  - Orion 1: First flight of J-2X and Orion
  - 2015: First crewed flight to International Space Station
  - 2018: First flight of Ares V
Lean, Kaizen, Six Sigma, and Other Best Practices in Ares Design

- Applied Lean practices to Ares I-X flight test organization and schedule margins
- Instituting Lean and Kaizen practices throughout the Ares Project
  - Creating Lean success stories
  - Using Kaizen to improve operational and business practices
  - Using Kaizen to develop new operational and business processes
- Using Six Sigma experiment design to develop and improve Ares upper stage production practices
- Establishing team norms to model appropriate behavior within Ares and S&MA
S&MA in Ares Design – Summary

- Providing more resources to support Ares design work
- Making S&MA more independent for objective assessments
- Improving discipline expertise as well as training and mentoring opportunities for new employees
- Adding value through Failure Mode Effect Analyses (FMEAs)
- Improving system safety
- Getting involved in quality up front using Lean, Six Sigma, and Kaizen practices
- Receiving respect for technical expertise
- Becoming an organization where NASA’s best and brightest want to work
- Bringing unique engineering expertise to the table in support of programs and projects
Questions?

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www.nasa.gov/ares