Welcome
Dan Dumbacher, NASA Deputy Associate Administrator for Exploration Systems
Human Exploration and Operations Mission Directorate

SLS Program Overview
Todd May, SLS Program Manager
Marshall Space Flight Center

NRA Intent and Schedule
Chris Crumbly, Chairperson
Marshall Space Flight Center

NRA Summary
Chris Crumbly, Chairperson

Break
All

NRA Model Contract
Kellie Craig, Contracting Officer
Marshall Space Flight Center

Questions and Answers
All

Networking
All
The Congress approved and the President signed the National Aeronautics and Space Administration Authorization Act of 2010.

- Bipartisan support for human exploration beyond low-Earth orbit (LEO)

The Law authorizes:

- Extension of the International Space Station (ISS) until at least 2020
- Strong support for a commercial space transportation industry
- Development of Orion Multi-Purpose Crew Vehicle (MPCV) and heavy lift launch capabilities
- A “flexible path” approach to space exploration, opening up vast opportunities including near-Earth asteroids and Mars
- New space technology investments to increase the capabilities beyond Earth orbit (BEO)

Delivering on the Laws of the Land … and Obeying the Laws of Physics
SLS Is a National Asset for Multiple Stakeholders and Partners

SLS — Going Beyond Earth’s Orbit

Planetary Exploration
- Mars
- Solar System

Exploring Other Worlds
- Low-Gravity Bodies
- Full-Capability Near-Earth Asteroid Missions
- Phobos/Deimos

Into the Solar System
- Interplanetary Space
- Initial Near-Earth Asteroid Missions

Gaining the High Ground
- Cis-Lunar Space
- Geostationary Orbit
- High-Earth Orbit
- Lunar Flyby & Orbit
- Lunar Surface

Initial Exploration Missions
- Space Launch System
- Multi-Purpose Crew Vehicle
- 21st Century Ground Operations

SLS —
Going Beyond Earth’s Orbit

Legend:
- Objective
  - Missions

Surface Capabilities Needed
Advanced Propulsion Needed
High Thrust In-Space Propulsion Needed
Long Duration Habitat Needed

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SLS Driving Objectives

♦ Safe: Human-Rated

♦ Affordable
  - Constrained budget environment
  - Maximum use of common elements and existing assets, infrastructure, and workforce
  - Competitive opportunities for affordability on-ramps

♦ Initial capability: 70 metric tons (t), 2017–2021
  - Serves as primary transportation for Orion and exploration missions
  - Provides back-up capability for crew/cargo to ISS

♦ Evolved capability: 130 t, post–2021
  - Offers large volume for science missions and payloads
  - Modular and flexible, right-sized for mission requirements

SLS First Flight in 2017
SLS Architecture Uses Existing and Advanced Technologies to Fly in 2017

**Orion Multi-Purpose Crew Vehicle (MPCV)**

**Payload Adapter (PA)**

27.5 ft. (8.4 m)

**Payload Fairings**

SLS Architecture Uses Existing and Advanced Technologies to Fly in 2017

**Launch Abort System**

**Orion**

**Interstage**

70 t
318 ft.

**Solid Rocket Boosters**

27.5 ft. (8.4 m)

**Core Stage**

**RS-25**
(Space Shuttle Main Engines)

**Upper Stage with J-2X Engine**

**Liquid or Solid Rocket Boosters**

130 t
376 ft.

Built in the U.S.A.
SLS Maximizes U.S. Aerospace Workforce and Capabilities

♦ Boosters (3-phased approach)
  - Phase I: 5-segment Solid Rocket Booster in-scope modification to existing Ares contract with ATK for initial flights through 2021
  - Phases II and III: Advanced Boosters
    - II: Engineering demonstration and risk reduction via NASA Research Announcement (NRA): Full and Open Competition in FY12; award by FY13
    - III: Design, Develop, Test, & Evaluation (DDT&E): Full and Open Competition (RFP target FY15)

♦ Stages
  - Core/Upper Stage: Justification for Other Than Full and Open Competition (JOFOC) to Boeing, modifying current Ares Upper Stage contract
  - Instrument Unit Avionics: In-scope modification to existing Ares contract with Boeing; consolidated with Stages contract to Boeing

♦ Engines
  - Core Stage Engine: RS-25 JOFOC to existing Space Shuttle contract with Pratt & Whitney Rocketdyne (PWR)
  - Upper Stage Engine: J-2X in-scope modification to existing Ares contract with PWR
  - Future Core Stage Engine: Separate contract activity to be held in the future

♦ Spacecraft and Payload adapter and Fairing
  - Initial design:
    - Adapter and Fairing design and development in-house through early design phase
    - Fairing Full and Open Competition planned for FY13

Delivers Near-Term Initial Capabilities and Spurs Competition for Evolved Capabilities
Three-Phase Booster Development Approach

**Advanced Booster Design, Development, Test, and Evaluation (DDT&E)**
- **Scope:** Follow-on procurement for DDT&E of a new booster
- **Date:** RFP target is FY15
- **Capability:** Evolved at 130 t
- **Contract:** Full and Open Competition (Liquids or Solids)

**Advanced Booster Engineering Demonstration And/Or Risk Reduction NRA**
- **Scope:** Award contracts that reduce risks leading to an affordable Advanced Booster that meets the evolved capabilities of SLS and enable competition by mitigating targeted Advanced Booster risks to enhance SLS affordability
- **Date:** Issue draft NRA Dec 12, 2011; award targeted for Oct 1, 2012
- **Capability:** Leading to 130 t
- **Contract:** NRA Demonstrating Specific Technologies and Affordability Risk Reduction for Advanced Boosters
  - Liquid Rocket Boosters or Solid Rocket Boosters

**Booster Fly-out for Early Flights through 2021**
- **Scope:** Build two 5-segment SRB Flight Sets
- **Date:** In progress
- **Capability:** Initial 70–100 t
- **Contract:** Mod to Ares contract with ATK

Moving Forward from Initial to Evolved Capability
SLS is a national capability that empowers entirely new exploration for missions of national importance.

Program key tenets are safety, affordability, and sustainability.

SLS builds on a solid foundation of experience and current capacities to enable a timely initial capability and evolve to a flexible heavy-lift capability through competitive opportunities:

- Reduce risks leading to an affordable Advanced Booster that meets the evolved capabilities of SLS
- Enable competition by mitigating targeted Advanced Booster risks to enhance SLS affordability and performance

The road ahead promises to be an exciting journey for present and future generations, and we look forward to working with you to continue America’s space exploration.
Advancing the U.S. Legacy of Human Exploration

National Aeronautics and Space Administration