



# CST-100 Commercial Crew Update/Status

February 2014

# Diverse Range Of Complex Human Aerospace Vehicles



- **Half a century of human space flight experience**
  - Focus on reduced risk in all life cycle phases
- **Innovative global commercial design and manufacturing**
  - Technological advances
  - Streamlined Lean manufacturing
- **Global marketing network and relationships to support growth**
- **Corporate processes to enable reaching across the company to bring the best of One Boeing to every market, every customer**

# Mature System Design



## Atlas V Launch Vehicle



- 43 successes, and counting!
- Proven rocket significantly reduces system risk
- CCTS integration and crew accommodations are well underway via CCiCap

## CST-100 Spacecraft



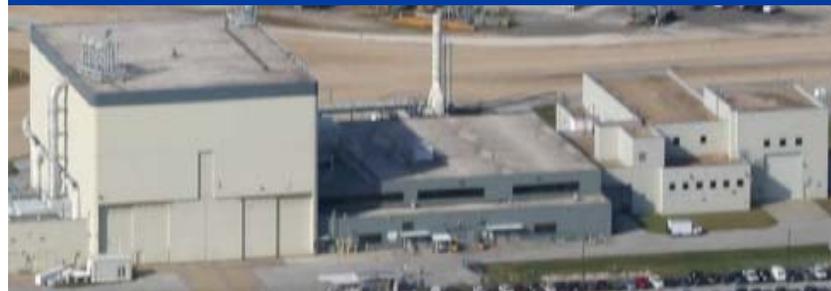
- Flight proven systems
- High TRL technologies
- On solid path to June 2014 CDR

## Mission Operations



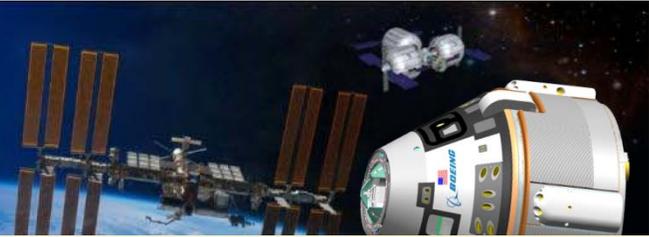
- CCTS approach incorporating expertise of NASA Mission Operations Directorate
- Crew engagement throughout the planning process

## Ground Processing Operations

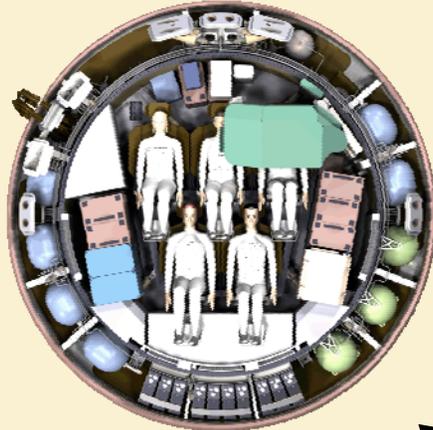


- Orbiter Processing Facility 3 (OPF3) modifications underway
- Lean production based on Boeing commercial approach
- Integration, testing, and quality processes based on Shuttle and Station approaches

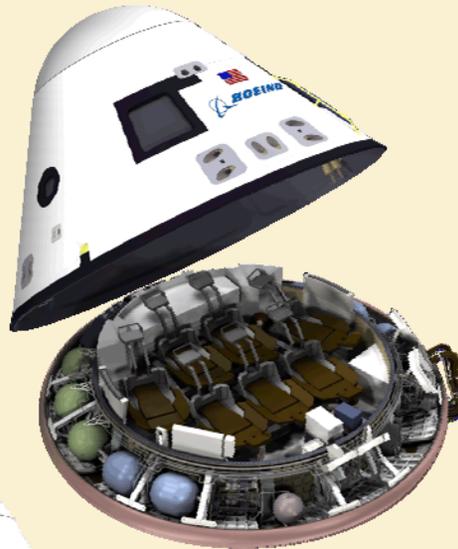
# CST-100 Features



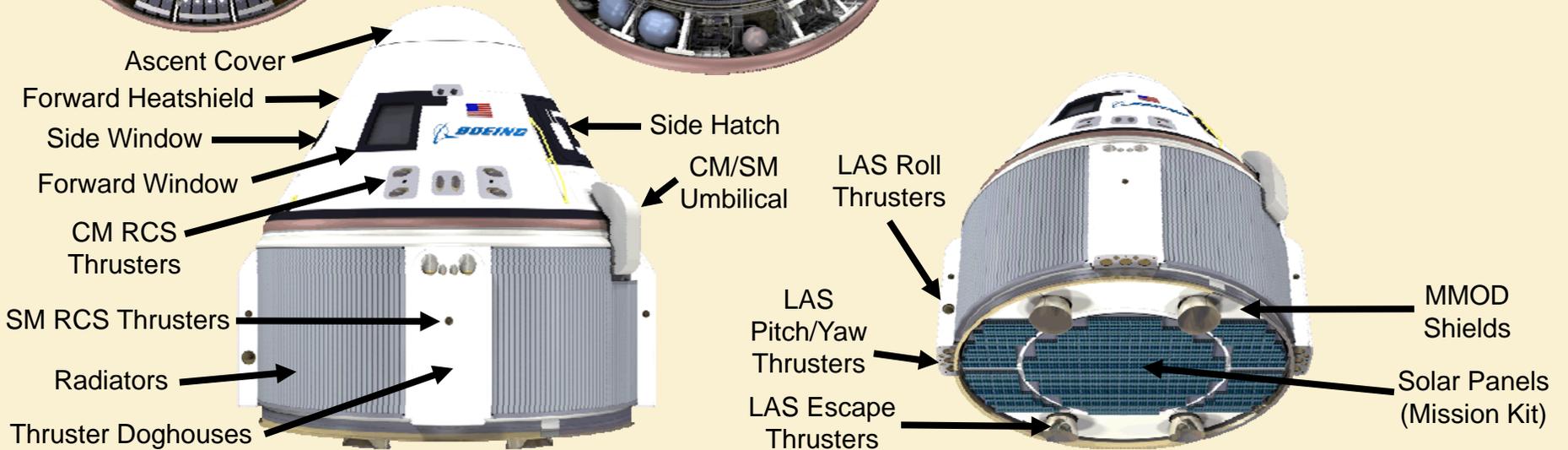
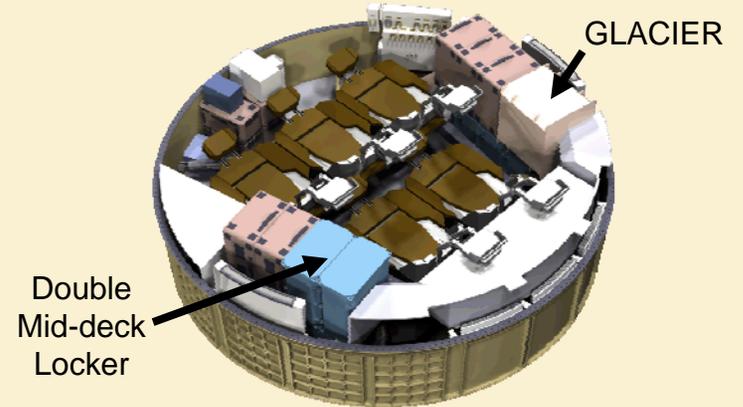
**Seating for up to 7 crew**  
to meet commercial  
business case  
(5 crew + 2 crew equivalent of  
cargo shown)



**Clam Shell CM Design**  
allows easy hardware  
installation



**Flexible cabin design**  
Accommodates mix of  
crew & cargo



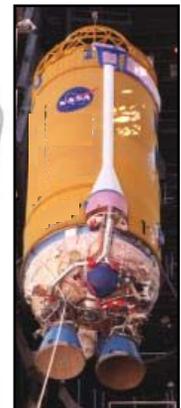
# Concept of Operations



# Boeing C/CiCap Milestone Progress & Completion



Integrated System Review	August 2012
Production Design Review	October 2012
Phase 1 Safety Review	November 2012
Software Integrated Engineering Release 2.0	January 2013
Landing & Recovery / Ground Communication Design Review	January 2013
Launch Vehicle Adapter PDR	February 2013
Integrated Stack Buffet Wind Tunnel test	April 2013
Dual Engine Centaur Liquid Oxygen Duct Dev Test	April 2013
OMAC Engine Dev Test	September 2013
MCC Interface Demo Test	September 2013
SM Propulsion System CDR	November 2013
Certification Plan Release	November 2013
Launch Vehicle Adapter CDR	December 2013
Emergency Detection System Standalone Testing	December 2013
ASIL Multi-String Demo Test	December 2013
Spacecraft Primary Structures CDR	January 2014
Pilot in the loop Demo	February 2014
<b>Software CDR</b>	<b>April 2014</b>
<b>Integrated CDR</b>	<b>June 2014</b>
<b>Phase 2 Spacecraft Safety Review</b>	<b>July 2014</b>



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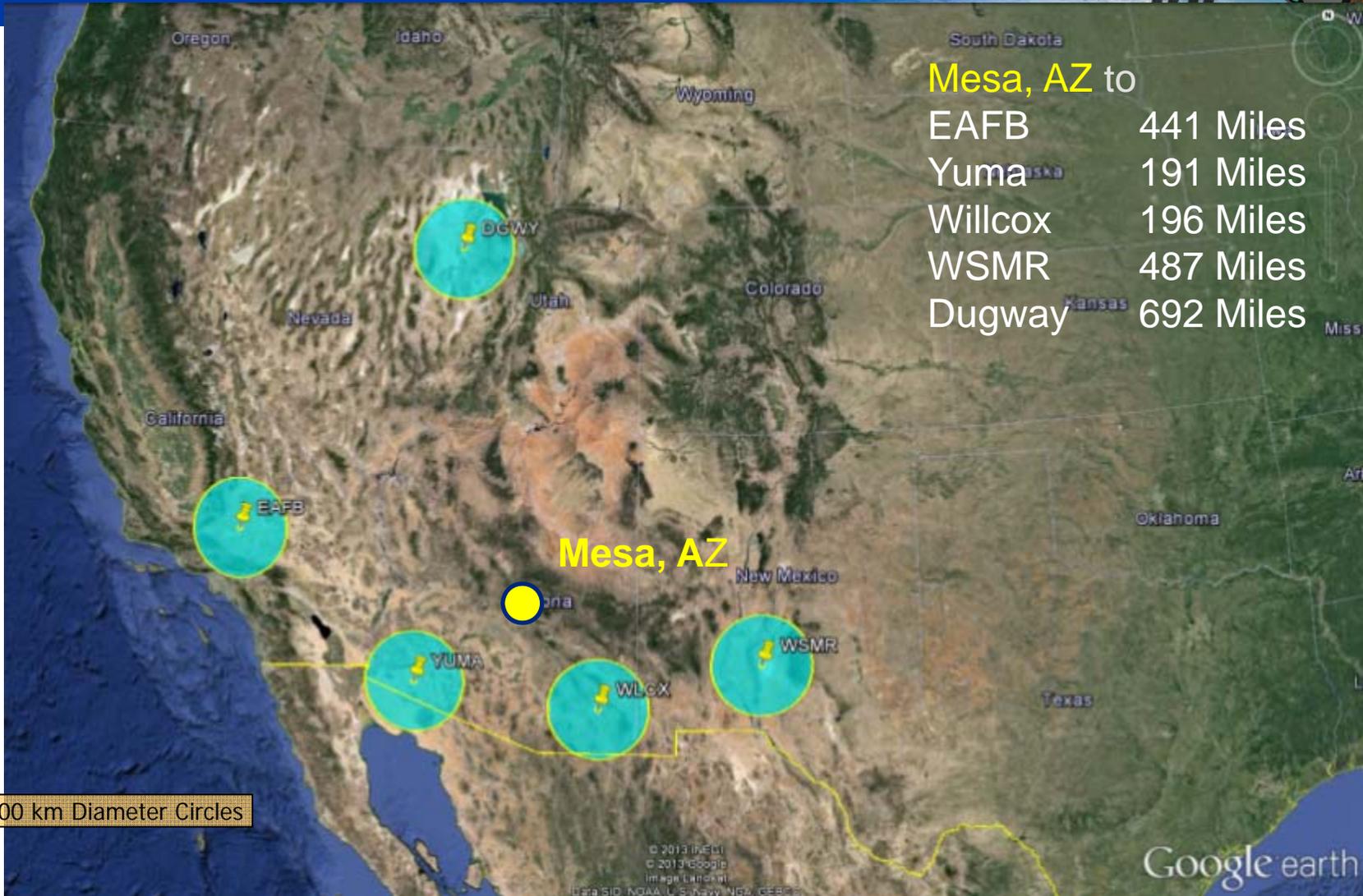
# Boeing C/CiCap Recent Progress & Completion



# Boeing CCoCap Recent Progress



# Primary Landing Sites and Logistics



200 km Diameter Circles

# Landing Airbag Development



# Landing Site Development



