CONFIGURATION CONTROLLED DOCUMENT

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Multi-Program Integrated Milestones

Legend

- Shuttle Flight
- uncrewed COTS flight
- uncrewed/crewed Constellation Flight
- ? facility utilization TBD
- X no further facility utilization identified

CY 2006 / CY 2007 / CY 2008 / CY 2009 / CY 2010 — FY 2007 / FY 2008 / FY 2009 / FY 2010 — FY 2011 / FY 2012 / FY 2013 / FY 2014 / FY 2015 / FY 2016 / FY 2017 / FY 2018 / FY 2019 / FY 2020

VSE Milestone: Human Lunar Return

Moon

Lunar Reconnaissance Orbiter

International Space Station

International Partners: Soyuz, Progress, ATV, HTV

Int'l Partners: Soyuz, Progress, ATV, HTV

Six person crew capability

Assembly complete

Russian purchasing authority ends

NOTE: Orions 7 and 8 and COTS are contingent on ISS end-of-life date and potential for continuing U.S. ISS ops

NOTE: Orions 9 and 10 and COTS are contingent on continuing U.S. ISS ops

NOTE: Orions 11 and 12 and COTS are contingent on continuing U.S. ISS ops

NOTE: Orions 14 and 16 and COTS are contingent on continuing U.S. ISS ops

NOTE: Orions 18 and 20 and COTS are contingent on continuing U.S. ISS ops

NOTE: The potential for ISS operations from 2016 – 2020 is under review

LEO / Space Shuttle

12A.1, 13A, 13A.1, 10A, 1E, 1J/A, 1J, HST SM4, ULF2, 15A, 2J/A, 17A, ULF3, 19A, ULF4, 20A, ULF5

116, 117, 118, 120, 122, 123, 124, 125, 126, 119, 127, 128, 129, 130, 131, 132, 133

Last SSME on-dock

NOTE: *Atlantis* retirement under review.

Atlantis retired

Last ET on-dock

Discovery retired

Endeavour retired

NOTE: ULF4 and ULF5 are manifested as contingency ISS logistics flights.

COTS Capability to ISS

COTS

SpaceX: Demo 1 PDR; Financing round 1; Demo 2 SRR; Demo 1 CDR; Demo 3 SRR; Financing round 2; Demo 2 PDR; Demo 3 PDR; Demo 2 CDR; SpaceX Demo 1; Demo 3 CDR; Financing round 3; SpaceX Demo 2; SpaceX Demo 3; IOC

RpK: SRR; Financing round 2; Pressurized Module CDR; Unpressurized Module CDR; ISS TRR; Rendezvous s/w TRR; Financing round 3; K-1 to Woomera; COFR; Risk Reduction Flight; 1st Demo Flight; 2nd Demo Flight; IOC

COTS Phase I

COTS Phase II

Facilities

SSP last-need for O&C

SSP last-need for A-1

SSP last-need for LCC Firing Room 1; transfer to Cx for modifications

A-1 ready for Cx testing

LC-39B configuration for last SSP flight off pad

SSP last-need for MLP 1

SSP last-need for VAB HB 2

LC-39B and MLP 1 configuration for Ares I-X

LC-39B configuration for Ares I-Y

SSP last-need date for LC-39A

LC-39A configuration for Ares V

SSP last-need for VAB LB and HB 3 and 4

SSP last-need for OPF 3

SSP last-need for VAB HB1

SSP last-need for MLP 3

SSP last –need for A-2

SSP last-need for MLP 2

SSP last-need for CT 1 and 2

A-2 and A-3 ready for Cx testing

SSP last-need for OPF 1 and 2

Constellation

Sub-Orbital: Pad Abort 1; Ares I-X *4 seg. 1st stage, dummy u/s*; AA-1 *transonic*; Pad Abort 2; AA-2 *max-q*; AA-3 *tumble*; Ares I-Y *5 seg 1st stage, dummy u/s*

NOTE: Sub-orbital test flights prior to Orion 1 subject to change with test experience and funding requirements.

Orion 1 *5 seg 1st stage, active u/s, active Orion capsule*; Orion 2 *IOC test flight LIDS*; Orion 3 *test flight, LIDS*; Orion 4 *FOC*; **Orion** *IOC*; Orion 5, Orion 6, Orion 7, Orion 8, Orion 9, Orion 10, Orion 11, **Ares V-Y**, Orion 12, Orion 14, Orion 16, Orion 18, Orion 20; **LSAM 1 / Orion 13**, **LSAM 2 / Orion 15**, **LSAM 3 / Orion 17**, **LSAM 4 / Orion 19**

Initial Capability (IC) Level 1 SRR; IC Level 1 SDR; IC Level 1 PDR 1; IC Level 1 PDR 2; IC Level 1 CDR; IC Level 1 SAR

Orion SRR; Orion SDR; Orion PDR; Orion CDR; Orion DCR

Ares I SRR; J-2X SRR; Ares I 1st stage SRR; Ares I-X PDR; Ares 1 U/S SRR; J-2X PDR; Ares I SDR; Ares I-X CDR; Ares I U/S SDR; Ares I U/S PDR; Ares I 1st stage PDR; Ares I PDR; J-2X CDR; Ares I CDR; Ares I U/S CDR; Ares I 1st stage IDR; J-2X MPTA; Start of J-2X testing on A3; Ares I 1st stage CDR; Ares I U/S DCR; J-2X DCR; Ares I 1st stage DCR; Ares I DCR

NOTE: The shadowed Orion 2 IOC flight in 2013 is the programmatic manifest date at the 33% confidence level. The bold Orion IOC in 2015 flight is the current Agency commitment at the 65% funding confidence level for the flight manifest.

Lunar Capability (LC) Level 1 SRR; LC Level 1 SDR; LC Level 1 PDR; LC Level 1 CDR; LC Level 1 SAR

Ares V project SRR; Ares V project PDR; Ares V project CDR; Ares V project DCR

LSAM project SRR; LSAM project PDR; LSAM project CDR; LSAM project DCR

NOTE: Reusable Solid Rocket Motor segment production

RSRM

0 Constellation 35 Shuttle | 5 Constellation 35 Shuttle | 10 Constellation 35 Shuttle | 10 Constellation 0 Shuttle | 12 Constellation | 13 Constellation | 15 Constellation | 15 Constellation | 15 Constellation | 19 Constellation | 27 Constellation | 31 Constellation | 36 Constellation | 41 Constellation