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# **Soyuz-32/33 Mission Planning Network Support Group (NSG) 09/11/12**



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# Agenda



- **International Space Station (ISS) Expeditions**
  - Overview of current and future launches
- **Soyuz Missions/ISS Increments**
  - Soyuz 30S through 35S
  - Increments 32 to 36
- **Soyuz Mission Support**
- **Soyuz undocking support**
- **C-band Contingency Support**
- **Summary**
- **Backup**
  - Expedition/Increment Definition





# ISS Expeditions



## ISS Expeditions May 2012 - April 2013



### Soyuz-30/TMA-04M-Expedition 31

- Launch 05/15/12



### Soyuz-31/TMA-05M-Expedition 32

- Launch 07/15/12



### Soyuz 32/TMA-06M-Expedition 33

- Launch 10/15/12



### Soyuz 33/TMA 07M-Expedition 34

- Launch 12/05/12



### Soyuz 34/TMA 08M-Expedition 35

- Launch 04/02/13





# Soyuz Missions/ISS Increments



- **Soyuz missions since last NSG (April 2012) to current NSG (Sept. 2012)**
  - Soyuz TMA-04M/30S - 05/15/12 – 09/17/12
    - Standard undocking support – (Increment 32 end)
  - Soyuz TMA-05M/31S - 07/15/12 – 11/12/12
    - Standard undocking support – (Increment 33 end)
- **Future Soyuz Missions**
  - **Soyuz TMA-06M/32S - 10/15/12 – 03/19/13**
    - Launch support in planning process
    - Increment 34 ends with undocking
  - **Soyuz TMA-07M/33S - 12/05/12 – 05/16/13**
    - Launch support in planning process
    - Increment 35 ends with undocking
  - Soyuz TMA-08M/34S - 04/02/13 – 09/2013
    - Increment 36 ends with undocking

} Planning missions





# Soyuz Mission Support



- **Pre-mission, Launch and Early Orbit Operations**
  - **Conduct Mission Operation Readiness Reviews (MORR); generate and review mission support documentation**
    - Interim Support Instruction (ISI), Network Advisories, Schedule Requests, TDRSS Network Operations Support Plan (TNOSP), etc
  - **Verify readiness of Very High Frequency-2 (VHF-2) Network for Soyuz early orbit support through docking at the ISS**
    - Two-Line-Elements (TLE) and Line Summary data distributed/Station Readiness Test (SRT) performed
  - **Coordinate Critical Period tracking for emergency communications (Orbits 6-8)**
    - Support Johnson Space center (JSC) verification of VHF-2 Station communications interfaces
  - **Coordinate schedules for tracking of Continental United States (CONUS) view periods (orbit 6 thru docking)**
    - Support critical ISS docking period





# Soyuz Undocking/Landing Support



- **Soyuz undocking/landing support**
  - **Generate ISS Critical Period ISI for undocking time frame**
    - **Based on Critical Support Request from ISS Ground Controller (GC)**
  - **Spaceflight Mission Manager (SMM) staffs Network Integration Center (NIC) console at undocking minus 3 hours**
    - **Conducts briefing with Communication Managers and White Sands Complex (WSC) Operations Supervisor (OS)**
    - **Informs ISS GC of Integrated Network (IN) status**
    - **Monitors Tracking and Data Relay Satellite (TDRS) support during defined critical period**
    - **Coordinates call-up of C-band radar for contingency support**
      - **Undocking normally occurs over the Russian Range with TDRS support to ISS only**
      - **Radar may be needed to provide tracking for extended Soyuz orbital operations over US Range**
      - **Tracking would provide pointing data for NASA VHF stations**





# C-band Support



- **C-band Support**
  - **C-band Radars are no longer scheduled for early orbit (4 through 8) support**
    - JSC provides pre-launch vector to Flight Dynamics Facility (FDF)
    - FDF generates TLE data for VHF station antenna pointing
      - Tracking will be for contingency support
      - Uplink transmission authorized for emergencies only
  - **Contingency declared by ISS Flight Director (FD)**
    - ISS GC advises the Network
  - **Call up procedure for contingency support is included in the TNOSP**





# Summary



- **Soyuz 32 preparations in progress**
  - **Standard support similar to Soyuz 31**
    - **No C-band required except contingency**
  - **Line summary data available on Modernized FDF; details in Early Orbit ISI**
  - **Soyuz TLE distributed via E-mail and on Modernized FDF**
  - **WSC/ISS engineering test pass (including VHF-2 interfaces) completed 06/25/12**
  - **Station Proficiency Simulations conducted by Human Space Flight (HSF) include VHF-2 Interfaces**
    - **Simulated DFRC/WGS ISS passes completed 05/01/12; DFRC/WSC completed 08/27/12**
    - **Conducted with participation of Houston Communications Technician (HCT)**
    - **Exercise VHF scheduling, interface and pass procedures**
    - **No ISS or docked Soyuz participation required, simulated support only**





# Summary



- **Soyuz 33 preparations expected to mirror Soyuz 32**
  - **Standard documentation to be issued starting approximately launch minus 30 days**
  - **Advance planning E-mail to be issued following confirmation of launch time**
    - **Includes support times for orbit 6, 7 and 8**





# Backup



- **Expedition/Increment Definitions**

- **Expedition Crew**

- A complement of crew members that maintains the same ISS Commander (CDR) and Flight Engineer(s) (FE) for a period of time

- **Crew Increment**

- A specific time period that combines different operations such as assembly, scientific research, maintenance and other ISS systems utilization
    - Defined as the time period from the undocking of a Soyuz to the undocking of the next Soyuz

