



Management Directive

ISS MD XXXX

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TO: Distribution

SUBJECT: Charter for Systems Engineer Working Group

OFFICE OF PRIMARY RESPONSIBILITY: International Space Station (ISS) Systems Engineering & Integration Office

1.0 PURPOSE

This charter establishes the International Space Station Program (ISSP) Mobile Servicing System (MSS) Systems Engineering Working Group (SEWG). The MSS SEWG is established to provide a mechanism for Systems Engineering for the end-to-end MSS function.

The MSS end-to-end function includes the Space Station Remote Manipulator System (SSRMS), the Mobile Remote Servicer (MRS) Base System (MBS), Robotic Work Station (RWS), Special Purpose Dexterous Manipulator (SPDM), Video Signal Converters (VSC), and Operations Control Software (OCS), the Mobile Transporter (MT), and by interfaces between and among these elements, and United States On-Orbit Segment (USOS) distributed systems, and other International Space Station Elements and Payloads, (including the Power Data Grapple Fixtures (PDGFs), MSS Capture Attach System (MCAS) and the Mobile Transporter Capture Latch (MTCL)). This end-to-end function will be supported by the ISS and MSS ground segment facilities.

This charter defines the scope and limits of the program authority and document control that is delegated to the SEWG and it also identifies the panel core membership and specific operating policies.

2.0 SCOPE

The scope of SEWG activities covers the system engineering and integration of the end-to-end MSS function through the design, development and operational phases of system.

This includes:

- Manage systems engineering and integration including MSS systems requirements
- Lead and coordinate the resolution of issues (and their operational implications) between the elements that make up the MSS (excluding the Special Purpose Dexterous

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- Manipulator) and between the MSS elements and USOS distributed systems beginning with element definition, during all phases of the MSS program
- Consider and assess the effects on and interdependencies with the ISS and MSS ground segment systems for all resolution of issues
 - Obtain MIP concurrence for proposed issue resolutions or changes that affect MSS and/or ISSP cost, technical, or schedule baselines
 - Co-ordinate horizontal integration across MSS elements interacting with USOS distributed systems and ISS elements and payloads
 - Address the design, integration and verification requirements baseline for MSS elements and for interfaces to USOS systems and ISS elements and payloads.
 - Evaluate all issues and enhancements affecting the performance and functionality of the MSS system
 - Coordinate USOS distributed systems software and avionics integration issues with the MSWG and report to the ASCB
 - Assign actions as necessary to implement issue resolutions that are contained within its scope of work.

3.0 POLICY

The SEWG will be operated in accordance with the ISSP Partner Program Directive ISS PPD 522 Rev A, "International Space Station (ISS) Policy for Multilateral Control Board and Control Panel Operations," with specific SEWG operations provisions specified in this section and SEWG Operating Instructions.

For formal SEWG endorsement, core members will be polled. Other participant opinions will be sought; however their position will not be included in the formal core member poll.

The SEWG will attempt to achieve consensus among its members and affected participants, however, the co-chairs have the authority to jointly determine the disposition of issues or changes which are presented to the working group.

SEWG will have the provision to disposition items outside of board at the Co-Chairs discretion.

3.1 Meeting Frequency

The SEWG will meet weekly via teleconference with face to face meetings as required. Full membership meetings will be called on other occasions as determined necessary by the working group chairs. The frequency of the regular meetings may be revised by the SEWG chairs. Joint meetings between the SEWG and the DRIT/SIT/MSWG may be convened as required to review topics of mutual interest.

3.2 Responsibilities

The Chairs are responsible for ensuring that decisions are made based on the information received from the SEWG members. Attendance of each member or designated alternate is mandatory. Members shall provide the names of designated alternates to the SEWG Secretariat. Members can designate alternates for specific agenda items, as desired. Attendance shall be either in person or via

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telecon. Members are responsible for ensuring that the necessary technical support is provided at SEWG meetings based on the specific agenda items scheduled for each meeting.

3.3 Authority

The SEWG is chartered to manage the end-to-end systems engineering of the MSS function and to effect resolution of issues and assessment of system enhancements. Authority is delegated from the MSS Integration Panel (MIP) as specified in the following paragraphs. Changes to this authority will be reflected in updates to this charter.

The SEWG will assign actions as necessary to implement issue resolutions that are contained within its scope of work. Proposed issue resolutions or changes that affect MSS and/or ISSP cost, technical, or schedule baselines shall be presented to the MIP for concurrence

The SEWG is authorized to convene task teams, comprising staff from NASA, CSA and contractors, as required to address end-to-end MSS system engineering and integration issues.

The SEWG, through the NASA Co-chairperson, will request development support from the various NASA contractors as necessary to conduct studies and analyses to assess issues and support the development and assessment of changes submitted to the ISSP. The SEWG, through the CSA Co-chairperson, will request development support from the various CSA contractors as necessary to conduct studies and analyses to assess issues and support the development and assessment of changes submitted to the ISSP. Contractor support deemed necessary by the SEWG shall be funded by NASA and/or CSA within the resource constraints and approval framework of the respective Agency and its programs.

The following teams shall report to the SEWG for all technical matters affecting performance and functionality of the MSS: MSS Software Working Group (MSWG) (dual reporting of MSWG to SEWG and the ASCB), MSS System Problem Reporting Team (MSS SPRT) (dual reporting of SPRT to SEWG and MIP), MSS Graphical User Interface (GUI) Integration Product Team (IPT), and the Robotics Integration Product Team (RIPT). The SEWG will interact and coordinate with the SSRMS Integration Team (SIT) and the Dexterous Robotics Integration Team (DRIT) as required to share action item status and formal data requests.

The following shall be forwarded to the MIP with a SEWG disposition recommendation.

- Changes with any cost impacts to NASA or CSA,
- Changes which impact Level I schedule milestones,
- Changes to the MSS Segment Specification functional performance and characteristics requirements (including top level configuration changes, deviations and waivers to the established baselines),
- Changes with unresolved issues or that represent significant risk to the ISS Program.

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3.4 Product Control

The MIP is responsible for reviewing changes to documents under baseline control that are within the authority granted in this charter. The MSEICB may delegate documentation control to the MIP. A list of these documents is identified and maintained in the SSP Controlled Documentation Report available from Configuration Status Management Operations System database.

3.5 Member Coordination

The SEWG will make every attempt to reach decisions by consensus. If consensus cannot be accomplished, and there is a significant cost, schedule or programmatic impact for the dissenting member, the issue will be referred by the Chairs and dissenting member to the MIP for resolution. If consensus cannot be accomplished but, in the opinion of the Chairs, the issue does not have a significant cost, schedule, or programmatic impact on the dissenting member, the chairs shall coordinate with the dissenting member and make the decision.

3.6 Appeal

Any MIP member can appeal a decision to the MIP. The SEWG Co-Chairs will assist all SEWG members with processing appeals. However, if the decision is time critical, NASA or CSA may implement a proposed change at risk while the MIP appeal process is proceeding. In this case, the party proceeding with implementation must notify the SEWG, in writing, within 2 weeks after the SEWG meeting. If a member appeals a decision, that member may elect not to implement the SEWG decision until the MIP resolves the appeal. The appeals process is described in ISS PPD 521, Charter for the Space Station Control Board (SSCB).



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4.0 MEMBERSHIP

Joint Chairs:

Robotics Systems Manager (NASA)
Manager, MSS On-Orbit System, CSSP (CSA).

The co-chairs may appoint temporary alternates as needed in their absence. However, they may not sub-delegate their co-chair responsibility and authority on a permanent basis without approval from MIP. Decisions by alternates shall be binding.

Members:

Member Organization Participants are expected to participate in all SEWG meetings. Core Members shall designate a primary and alternative point of contact to ensure their organization is represented at all SEWG meetings. Other members are expected to participate in SEWG meetings as necessary. SEWG meeting announcements will include Core Member primary and alternative representatives and will identify any other key participants needed for particular meetings. Other organizations will be requested to support as necessary.

SEWG - Core Member Organization Participants

- CSA Systems Engineering
MDA Systems Engineering
- NASA Robotics Engineering (ER3)
NASA ISSP Robotics (OM7)
NASA Safety (NE)
- Crew Office Robotics (CB Robotics)
FOD Robotics (CX2)

SEWG — Participants (as required)

CSA Systems Engineering Manager
CSA Manager, MSS Project Engineer, MSS H/W Systems
CSA Representative, MSS Integration and Test
CSA Representative, Safety and Product Assurance
CSA Representative, MSS Operations
CSA Representative, MSS Training
CSA Representative, MSS Software
CSA Representative, MSS Configuration Management
CSA Representative, Logistics and Sustaining Engineering
ISSP Representative CSA Elements and Robotics Integration
NASA Representatives for SSRMS, MBS, MT, RWS and SPDM
ISSP Representative, Configuration Management Office
NASA Representative, Avionics and Software Integration Office

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NASA Representative, Flight Operations Directorate
MDA, Robotics Work Station Representative
MDA, MSS Systems Engineering (for SSRMS, MBS and SPDM)
Boeing Prime Contract, ISSP Robotics Representative
NASA Structures and Thermal Engineering (ES)
NASA Transportation Integration Office (ON)