

STS 120 EVA 4 INHIBIT PAD

Orbiter

| | |
|-----------------|---|
| TCS | |
| L12 | 1. √TCS POWER – OFF |
| KU-BAND ANTENNA | |
| MCC-H | 1. √KU-BAND Mask – active 2. √KU-BAND EVA Protect Box – active |
| RCS | |
| IV | If EV crew < 27 ft. from FRCS |
| O14,15,16 | 1. √DAP: VERN, FREE, LO Z 2. √RJDF F1, F2, F3, F4 MANF DRIVER (four) – OFF LOGIC (four) – OFF |
| MCC-H | 3. √Above RCS config |
| IV | 4. √RCS F – ITEM 1 EXEC (*) √JET DES F1U – ITEM 17 (*) F3U – ITEM 19 (*) F2U – ITEM 21 (*) |

Ground

| | |
|--------------|--|
| Ground Radar | |
| MCC-H | 1. √TOPO console, ground radar restrictions in place for EVA |

USOS

| | |
|--------------------|--|
| SSPTS DEACTIVATION | |
| MCC-H | 1. RPCM LA1A4A D RPC 3 – Open, Close Cmd Inhibit 2. RPCM LA2A3B D RPC 1 – Open, Close Cmd Inhibit 3. RPCM Z14B A RPC 2 – Open, Close Cmd Inhibit 4. RPCM Z13B A RPC 2 – Open, Close Cmd Inhibit |

| | |
|--|--|
| PCU | |
| NOTE | |
| PCUs may require up to 1 hr warm-up period before they are operational | |
| MCC-H | 1. √PCUs (two) operational in discharge mode and one of the following: a. CCS PCU EVA hazard control enabled b. No more than two arrays unshunted c. No more than two arrays pointed <105° from velocity vector |
| OR | |
| | 2. One or no PCUs operational in discharge mode and one of the following: a. No more than two arrays unshunted b. No more than two arrays pointed <105° from velocity vector |

| | |
|------------|----------------------|
| Lab Window | |
| IV | Close window shutter |

| | |
|--------------|---|
| Port SARJ | |
| MCC-H | 1. √DLA (1) – LOCKED at 142.5 2. All motor setpoints set to zero 3. All motors deselected |

| | |
|--------------|---|
| Port SAWs | |
| MCC-H | 1. BGA angle 4B = 130, 2A = 270 2. 4B, 2A motor state – OFF 3. 4B, 2A Latch 1 pin status – Latched 4. 4B array shunted |

RSOS

| | |
|-------------|---|
| SM Antennas | |
| IV | 1.GTS – Deactivate 2.ARISS (Ham Radio) – Deactivate or VHF (144-146 MHz) TX only |

EVA 4 NOTES, CAUTIONS, AND WARNINGS

NOTES

1. Bolt install: report torque and turns
2. Bolt release: report torque and turns if different from published range
3. EVA connectors: after disconnection and prior to connection; verify pin and EMI band integrity; verify connector free of FOD
4. Inspect QDs for damage prior to mating
5. Toolbox doors must be closed with one latch per door when EV crew not in immediate vicinity
6. Avoid contact with OBSS striker bars (Vitrolube coating)

CAUTION

ISS Constraints

- A. Avoid inadvertent contact with
1. Grapple fixture shafts (drylube)
 2. PIP pins
 3. EVA Crane [PMA1]
 4. TCS Reflectors [PMA2, PMA3]
 5. APAS hardware [PMA2, PMA3]
 6. CETA Lights (Z-93 paint) [LAB, S1, Node 1]
 7. Passive UMAs
 8. MBS VDU, MCU, CRPCMs, and Cameras (taped radiative surfaces, silver Teflon)
 9. Deployed TUS cable
 10. S0 aft face Radiator
 11. GPS Antennas (S13 paint) [S0]
 12. UHF Antennas [LAB, P1]
 13. ETCS Radiators [S1, P1]
 14. EETCS/PV Radiator bellows and panels [P6, P4, S4]
 15. SASA RF Group [Z1, S1, P1]
 16. Heat pipe radiators [Z1]
 17. PCU cathode and HCA ports [Z1]
 18. Ku-Band Antenna (SGANT) dish [Z1]
 19. CMG cover/shells [Z1]
 20. SSRMS Cameras
 21. Open CBM petal covers and LAB window shutter

CAUTION (Cont)

ISS Constraints (Cont)

- B. Electrical cables
1. Avoid bend radii < 10 times cable diameter
- C. Fiber optic cables
1. Avoid bend radii < 10 times cable diameter
 2. Avoid pulling on cable during mate/demate
- D. Fluid line flex hoses and QDs
1. Avoid bend radii < 5 in for hoses with diameter < 1 in on LAB, S0, S1, P1, and 10-in for hoses with diameter < 1 in on all other elements
 2. Avoid bend radii < 14 in for hoses with a diameter ≥ 1 in
 3. Additional care should be taken to not exceed bend radii when applying loads at the flexible hose to rigid tube stub interfaces
 4. Ensure fluid QD booties are fully closed prior to leaving worksite; wire tie if reqd
- E. For structural reasons
1. Avoid vigorous body motions, quick grabs and kickoffs against tether restraints
 2. Avoid performing shaking motions (sinusoidal functions) more than four cycles
 3. Avoid kicking S1/P1 radiator beam
If any of these occur, wait 2 to 5 min to allow structural response to dissipate

EVA 4 NOTES, CAUTIONS, AND WARNINGS (Cont)

CAUTION (Cont)

ISS Constraints (Cont)

F. Other

1. ITT Cannon connector: On demated connectors, do not rotate collar or manipulate cable/connector using collar or connector tool
2. WIS Antennas: do not use as handholds [Node 1, P6, Z1]
3. Lubricant from Ku-Band SGANT gimbals [Z1], CMGs [Z1], and RTAS Ground Strap fasteners [P6,P4,S4] can contaminate EMU
4. MLI handholds are not rated for crewmember translation loads
5. CBM petal covers may not be used as handholds unless both launch restraint pins are engaged

CAUTION (Cont)

Shuttle Constraints

G. Avoid inadvertent contact with

1. OBSS and SRMS Composite Sections and Cable Harnesses
2. LCS (silver Teflon) and LDRI (silver Teflon) and ITVC (gold foil) [OBSS]
3. WVS Antenna [ODS Truss & PLB Sill]
4. Payload Bay wire harnesses, cables, and connectors

H. No touch

1. LDRI diffuser [OBSS]
2. OBSS saddle contacts (when OBSS unberthed) [OBSS]
3. Monkey fur [PLB]
4. Cameras: metallic surfaces [PLB]
5. Ku-Band Antenna black dish and gold thermal blankets [PLB]

EVA 4 NOTES, CAUTIONS, AND WARNINGS (Cont)

WARNING

ISS Constraints

- A. **Avoid inadvertent contact with**
1. Grapple fixture targets and target pins
 2. SSU, ECU, beta gimbal platform, mast canister, SAW blanket boxes unless the beta gimbal is locked and the motor is turned off
 3. Stay inboard of SARJ when active
 4. Stay 2 ft from S1/P1 radiator beam rotational envelope when beam is free to rotate
 5. Stay 5 ft from moving MT on face 1
- B. Handrails
1. Handrails previously used for MISSE attachment may not be used as a safety tether point [A/L endcone 564 & 566, A/L Tank 2 nad/fwd & port/fwd, P6 5389]
- C. **Pinch**
1. NZGL connector linkage. Use caution when mating/locking
 2. ITT Cannon Connector rotating housing
 3. EV side of IV Hatch during Hatch operation (also snag hazard) [A/L]
 4. LAB window shutter and CBM petal cover linkages during operation
- D. QDs
1. If QD is in FID when valve is opened (bail fwd), QD will leak and fluid line may whip
 2. Do not rotate if in mated/valve open config

WARNING (Cont)

ISS Constraints (Cont)

- E. **RF radiation exposure**
1. Stay 3.6 ft from S-Band (SASA) high gain Antenna when powered [S1,P1,P6]
 2. Stay 1.3 ft from S-Band (SASA) low gain Antenna when powered [S1,P1,P6]
 3. Stay 1 ft from UHF Antenna when powered [LAB, P1]
- F. **Sharp Edges**
1. Inner edges of WIF sockets
 2. Mating surfaces of EVA connectors. Avoid side loads during connector mating
 3. Back side of MMOD shield fasteners
 4. Spring loaded captive EVA fasteners (e.g., 6B-boxes, BMRRM); the end of the spring may protrude
 5. PMA umbilical launch restraints-exposed bolt threads
 6. Adjustable Fuse Tether (Fish Stringer) buckles stowed in Node Bag
 7. Nickel coated braided copper Ground Straps may contain frayed wires [P6, P4, S4]
 8. Z1 handrail 6061 by the Ku-Band boom launch restraint [Z1]
 9. Solar Array Blanket Box [P6]
 10. Keep hands away from SSRMS LEE opening, and snares
 11. Fastener threads on back of Z1 U-jumper male FQD panel, if nutplate cap missing

WARNING (Cont)

ISS Constraints (Cont)

- G. **Thermal**
1. EVA connectors with booties may become hot if left uncovered. Handling may need to be limited
 2. PMA handrails may be hot. Handling may need to be limited
 3. Turn off glove heaters when comfortable temp reached to prevent bladder damage. Do not pull fingers out of gloves when heaters are on
 4. Uncovered trunnion pins may be hot
 5. SSRMS/MBS operating Cameras and lights may radiate large amounts of heat
 6. Stay 1 ft away from PMAs and MMOD shields > 270 degF if EMU sun visor up
 7. Stay at least 1 ft away for no more than 15 min from PMAs and MMOD shields > 300 degF if EMU sun visor up
 8. Stay 0.5 ft away from PMA and MMOD shields > 325 degF
 9. Do not touch EMU protective visor if temp has been < -134 for > 15 min
 10. No EMU TMG contact of PMAs and MMOD shields when temp > 320 degF
 11. No EMU boot contact with foot restraint when temp < -120 degF or > 200 degF
- H. **Electrical Shock Hazard**
1. Stay ≥ 2 ft from following ungrounded floating connectors if not inhibited: SSPTS on Lab fwd and stbd Node 1, H-jumper on FGB, MT cables, and S0 Bay 00, 02, and 03

EVA 4 NOTES, CAUTIONS, AND WARNINGS (Cont)

WARNING (Cont)

ISS Constraints (Cont)

- I. Solar Array
- 1. Sharp Edges:
 - a. SABB (skirt, swing bolts)
 - b. Solar cells
 - c. Springs along tension bar
 - d. Panel hinges
 - e. Guide cable burrs or frays
 - f. Mast Canister roller guides
 - g. Braided cables
 - h. Fastener exposed threads
 - i. Exposed bolts in rib cavities on mast canister
 - j. Keep hands away from SSRMS LEE opening, and snares
- 2. Avoid inadvertant contact with:
 - a. SSU, ECU, beta gimbal platform, mast canister, SAW blanket boxes unless the beta gimabl is locked and the motor is turned off
- 3. Pinch:
 - a. Lower SABB exposed reels and pulleys (guide wire and tensioning mechanisms)
 - b. Solar array mast during retraction
- 4. Other:
 - a. EV crew will only contact energized surfaces with approved tools that have been insulated with Kapton tape to prevent molten metal and shock
 - b. Solar array to be manipulated will be shunted prior to EV crew entering worksite

WARNING (Cont)

Shuttle Constraints

- I. Arcing/Molten Debris
 - 1. Stay ≥ 2 ft from exposed EFGF connector when OBSS berthed, powered, and EFGF not grappled [PLB]
 - 2. Stay ≥ 2 ft from exposed Stbd Fwd MPM contacts [PLB]
 - 3. Stay ≥ 2 ft from exposed Node 2 SPDU connectors when OBSS grappled by SRMS and LCS is powered [PLB]
- J. Pinch
 - 1. PRLA operation [PLB]
- K. RF radiation exposure
 - 1. Stay 2.0 ft from S-Band Antenna when powered
 - 2. Stay 1 ft from top and side of UHF PLB Antenna radome surface when in high powered mode [ODS truss]
 - 3. Stay 0.33 ft from top and side of UHF PLB Antenna radome surface when in low powered mode [ODS truss]
 - 4. Remain below the level of the PLB door mold line for first 20 in Aft of Fwd bulkhead when S-Band Antenna powered [PLB]
 - 5. Remain on the inboard side of the Stbd slidewire (sill handrails if slidewire not installed) for first 20 ft Aft of Fwd bulkhead when Ku-Band Antenna powered [PLB]

WARNING (Cont)

Shuttle Constraints (Cont)

- L. Sharp Edges
 - 1. PRLA grounding wipers [PLB]
 - 2. LDRI baffles (Also an entrapment hazard) [OBSS]
 - 3. Keep hands away from SRMS EE opening and snares
 - 4. TCS connector backshells have exposed threads
- M. Thermal
 - 1. Illuminated PLB lights; do not touch
 - 2. OBSS grapple fixture shafts/cams may be hot. Limit handling if required
 - 3. Stay 27 ft from PRCS when powered
 - 4. Stay 3 ft from VRCS when powered
 - 5. Stay 3 ft from APU when operating
- N. Thruster Contamination
 - 1. Stay out of the immediate vicinity of leaking jet or APU

10A EVA 4 PRE BRIEF

ROLES (ALL)

| | | |
|--|----------------------|-----------------------|
| EV1: Scott EV2: Wheels Onboard IV: Paolo | Suit IV (pre): Peggy | Suit IV (post): Peggy |
|--|----------------------|-----------------------|

MILESTONES (ALL)

| | |
|---------------------------------------|-----------------------------------|
| __:__:__ Wake-up EVA Prep Start | __:__:__ Start of Post Depress |
|---------------------------------------|-----------------------------------|

COMM SET-UP (ALL)

| Name | Loop Selected | | Taking to | From | Used for |
|----------|---------------|-----|---------------------|--------------------|---|
| | STS | ISS | | | |
| Big Loop | A/G1 | 1 | MCC-STS, MCC-ISS | STS, ISS, EMU | All EVA/(S)SRMS ops, emergencies |
| A/G2 | A/G2 | - | MCC-STS | STS, BPSMU | Non-EVA, non- emergencies, STS related |
| S/G2 | - | 2 | MCC-ISS | ISS | Non-EVA, non- emergencies, ISS related |
| ICOM | ICOM | 3 | STS, ISS | STS, ISS, BPSMU | Comm. Not intended for ground |
| ICOM | - | 5 | ISS-A/L, EMUs | ISS-A/L, EMUs | ATU4, 5, 6 intercom pre/post EVA |

NOTE: always start a transmission by stating the loop talking on (unless it is the Big Loop)

GENERAL EMERGENCIES (ALL)

| |
|---|
| <p>For ISS or shuttle Fire/Depress/ATM Contamination:</p> <ul style="list-style-type: none"> • Everybody "safes" what he is doing, executes JEE (ISS crewmember will execute gray steps in A/L), and return to home vehicle • For smoke/flames or ATM contamination, don PBAs or ИПК • If no ammonia contamination, EVs and IV will retrieve equipment per Emergency Undocking cue card. MS2-Steph will help at the PMA • If EVs in EVA, terminate EVA and return to ISS A/L (if possible, IV will join in A/L and assist) • If suited in E/L => suit doff (+ power down if time permits) • If C/L depressed => "fast" repress • If E/L at 10.2 => expect immediate auto ("fast") repress <p>For EVA emergencies:</p> <ul style="list-style-type: none"> • Abort & terminate procedures (including incapacitated/lost EV) => non essential shuttle and ISS activities will be terminated, IV and CMOs will go to E/L as soon as EVs in C/L • For lost crewmember/tool => CDR-PLT-MS2-IV in shuttle flight deck, if possible obtain 2 camera views (read pan/tilt angles) and HHL reading R/Rdot |
|---|

EVA PREP (EV1, EV2, IV, Suit IV)

- Camp-out review
- WCS usage, food/drink
- While at 10.2: shave, brush teeth, wash face, comb hair
- Wear mask if not at 10.2
- Tool config (last minute tools/equipment)
- E/L activities
- Parallel suit donning
- SAFER, MWS, tool, bag stowage
- 10.2 depress/repress review
- C/L depress review

REPRESS/POST-EVA (EV1, EV2, IV, Suit IV)

- Coldsoak
- C/L repress review
- Parallel Suit
- Food/drinks requests

10A EVA 4 PRE BRIEF (Cont)

EVA DETAILED REVIEW (EV1, EV2, IV)

Fill in detailed review if desired:

CHICA MANTRAS (EV1, EV2, IV)

- | | |
|---|---|
| <ul style="list-style-type: none">• Day/Night Cycles<ul style="list-style-type: none">• Lights – on• Sun visor – day: down, night: up• Cooling – as required• Bayonets – locked• Gloves:<ul style="list-style-type: none">▪ Heater – on/off as required▪ Inspect/report:<ul style="list-style-type: none">▪ RTV status▪ Vectran abrasions/cuts (specifically inspect thumb, index finger, C-cup)• Condition: Alpha, Bravo, Charlie• Safety Tether Swap<ul style="list-style-type: none">• Gates – closed• Hooks – locked• Reel – unlocked• PGT Ops<ul style="list-style-type: none">• XX – turns• YY – torque• (Green light) | <ul style="list-style-type: none">• PGT Extensions<ul style="list-style-type: none">• XXX installed on YYY• Good pull test• Electrical Connectors<ul style="list-style-type: none">• Pins straight• No FOD• EMI band – intact• If mated – mated, good bend radius• TA clamps – closed• APFR Install<ul style="list-style-type: none">• Black on black• Good pull test |
|---|---|

10A EVA 4 PRE BRIEF (Cont)

COMM PROTOCOL (EV1, EV2, IV)

- Short and concise (everybody stops to listen when COMM is “active”)
- Start with EVX, IV, R(M)X, then switch to names
- Give appropriate/timely info
- Anticipate when possible, do not overload
- Hand signals (between EVs and/or IV/ground via WVS) => review crew notebook

EMERGENCIES (EV1, EV2, IV)

- All emergencies => verbalize, IV leads, challenge-response protocol
- DCS => speak up for symptoms (verbalize)
- Abort & terminate procedures => as per cuff check list (review)
- Incapacitated crewmember => EV secures other EV to himself, returns to A/L, IV + CMO in A/L
- Lost Crewmember => call over Big Loop, request cameras and HHL reading, SAFER ops
- Hydrazine/NH3 contamination => IV will direct ops per checklist

GENERAL REMINDERS (EV1, EV2, IV)

- Verbalize any DCM messages
- Suit/gloves => stiffer than training H/W
- Glove heaters => it takes 2-3 min to feel heat
- EHIP lights => leave them on
- Translations => slow & deliberate, avoid feet first, check tethers often, check buddy when able
- Mass handling => one axis trans/rot at a time, watch for inertia
- Tether management => fairleads, stay clear of each other, 30 sec rule for snags or entanglements
- ORU control => positive transfer of control
- PGT ops => Red light – low torque, Green light – in torque window, Red/Green lights – HI torque
- PGT CAL procedure => Ratchet collar – Not motor, Speed collar – Cal, Pull trigger (CAL passed message)
- Video/cameras view for IV => change tapes, adjust WVS at SR/SS
- Errors & Lost tools => acknowledge and continue
- For lost tool/ORU => EVs verbalize what, when, direction, speed; IV gets 2 camera views/HHL (if possible)

EVA 4 SUMMARY TIMELINE

| PET HR : MIN | IV | 10A EVA 4 – 4B SAW INSPECTION EV1 – Pz | EV2 – Wheels | PET HR : MIN |
|-----------------|----|--|--|-----------------|
| 00:00 | | <u>EVA 4 A/L EGRESS AND SETUP (00:30)</u> <ul style="list-style-type: none"> Post Depress Egress/Setup and retrieve WIF EX from ESP-2 | <u>EVA 4 A/L EGRESS AND SETUP (00:30)</u> <ul style="list-style-type: none"> Post Depress Egress/Setup | 00:00 |
| 01:00 | | <u>OBSS SETUP AND APFR INGRESS (00:30)</u> <ul style="list-style-type: none"> Translate to P1 Bay 12, perform req'd tether swaps Install PAD / WIF Adapter on OBSS Install WIF Extender / APFR and Ingress | <u>OBSS SETUP AND APFR INGRESS (00:30)</u> <ul style="list-style-type: none"> Translate to P1 Bay 12, perform req'd tether swaps Assist EV1 configuring OBSS Assist EV1 to Ingress APFR | 01:00 |
| 02:00 | | <u>SSRMS / OBSS MANEUVER TO 4B SAW (01:00)</u> <ul style="list-style-type: none"> Perform OBSS Dynamic Characterization prior to maneuvering away from P1 MNVR to P6 SAW worksite | <u>GET-AHEAD ACTIVITIES AND EV1 SSRMS GCA (01:00)</u> <ul style="list-style-type: none"> Provide GCA to clear EV1 of structure Retrieve and Install NODE 2 OIH (get-ahead) PDGF Horseshoe Connector Release (get-ahead) Translate to P6 4B mast canister & setup worksite Provide GCA for EV1 arrival at worksite | 02:00 |
| 03:00 | | <u>4B SAW TROUBLESHOOTING (02:30)</u> <ul style="list-style-type: none"> Assess / report guide wire initial configuration Perform required activities to clear guide wires: <ul style="list-style-type: none"> Clear guide wire using Kapton tape covered tools Cut guide wire (if required) [Coordination required to ensure EV1 clear of SAW's dynamic response to cutting guide wire] Perform Cuff Link (Hinge Stabilizer Tool) Installation <ul style="list-style-type: none"> GCA to each required hinge line location Install Cuff Link Hinge Stabilizer | <u>4B SAW TROUBLESHOOTING (02:30)</u> <ul style="list-style-type: none"> Assess / report guide wire initial configuration Perform required activities to clear guide wires: <ul style="list-style-type: none"> Provide GCA to EV1 for SSRMS maneuvers to access guide wires Assist in guide wire cut (coordination required to keep EV2 clear of retracting guide wire) Provide GCA to EV1 for Cuff Link (Hinge Stabilizer) installation | 03:00 |
| 04:00 | | | | 04:00 |
| 05:00 | | <u>SSRMS / OBSS MNVR TO APFR EGRESS POSN (01:00)</u> <ul style="list-style-type: none"> MNVR to P1 Bay 12 for APFR egress | <u>GET-AHEAD ACTIVITIES AND EV1 SSRMS GCA (01:00)</u> <ul style="list-style-type: none"> Provide GCA of EV1 at SAW / clean up worksite Retrieve and Install NODE 2 OIH (get-ahead) PDGF Horseshoe Connector Release (get-ahead) Provide GCA for EV1 arrival at APFR egress posn | 05:00 |
| 06:00 | | <u>APFR EGRESS AND OBSS CLEANUP (00:30)</u> <ul style="list-style-type: none"> Egress APFR, remove and stow OBSS hardware Translate to A/L, perform req'd tether swaps | <u>APFR EGRESS AND OBSS CLEANUP (00:30)</u> <ul style="list-style-type: none"> Assist EV1 with egress and OBSS cleanup Translate to A/L, perform req'd tether swaps | 06:00 |
| 06:30 | | <u>EVA 4 CLEANUP AND A/L INGRESS (00:30)</u> <ul style="list-style-type: none"> Stow WIF Ex on ESP-2, Stow Tools and Cleanup Ingress/Pre-Repress | <u>EVA 4 CLEANUP AND A/L INGRESS (00:30)</u> <ul style="list-style-type: none"> Tool Stow and Cleanup Ingress/Pre-Repress | 06:30 |

PRE EVA 4 TOOL CONFIG

EV1

EMU D-rings

- 1 – Tether Extender on Left
- 2 – Waist Tethers
- 1 – 55-ft Safety Tether (TS)

MWS

- Small trash bag [right inside]
 - GP Caddy
 - 2 Overgloves
 - 2 – RET (sm-sm)
 - 1 – Adj tether [right] (optional)
 - 1 – RET (sm-sm) [left]
 - 1 – RET (with PIP pin) [right]
 - 2 – Wire ties
 - Swing Arm [right side]
 - 1 – EVA Camera/Bracket
 - 1 – RET (sm-sm)
 - BRT [left side]
 - 3 – Wire Ties, short
 - 1 – RET (sm-sm)
- SAFER

Items Remain In Crewlock

Prior to EVA, inspect:
 RET cord for damage
 Small trash bag bristles for damage or deformation
 Safety & waist tether load alleviating straps: no red
BRT for sharp edges on rigidizing collar and vicinity; report any sharp edges to MCC

Total RETs sm-sm used – 10
 Total RETs with PIP pin – 2
 Total RETs Lg-sm – 2
 Total Adj tethers – 6

EV2

EMU D-rings

- 1 – Tether Extender on Left
- 2 – Waist Tethers
- 1 – 85-ft Safety Tether (TS)

MWS

- Small trash bag [right inside]
 - 1 – RET (sm-sm)
 - Overglove
 - 1 – RET (with PIP pin) [left]
 - Overglove
 - 1 – RET (sm-sm) [right]
 - 1 – Adj tether [left]
 - 2 – Wire ties
 - Swing Arm [right side]
 - PGT w/7/16-6 in ext S/N _____
(A6, CCW2, 30.5)
 - 1 – RET (sm-sm)
 - BRT [left side]
 - 3 – Wire Tie, short
 - 1 – RET (sm-sm)
- SAFER

CREWLOCK

Staging Bag additions

- BRS Pin Contingency Tool (w/Tape)
- IV Bag
- 1 – Fish Stringer
 - OIH 0371 “Chica-rail”
 - MUT EE / Ball Stack / MUT EE
 - Cheater Bar (w/Kapton Tape)
 - 1.5" Bail Drive Lever (taped to cheater bar)

CREWLOCK (cont)

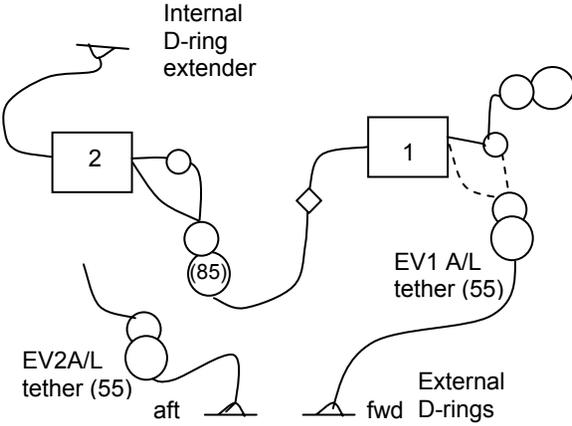
1 – RET (Lg-sm)

- C/L Bag#1 (Solar Array Tools)
- GP Caddy
 - Compound Cutter (w/Tape)
- GP Caddy
 - Vise grips (w/Tape)
 - Loop pin puller (w/Tape)
- 6 Kapton Tape Strips (3 layers) on inside of lid
- TPS Scraper (w/Tape)
- Hockey Stick
- Fish Stringer
 - Cufflinks 3,1,2,4 & 5
- Adj tether on outside (for C/L bag temp stow on WIF Extender)
- EV1 85-ft safety tether (SSRMS)

1 – RET (Lg-sm)

- C/L bag #4
- GP Caddy
 - Loop pin puller (w/Tape)
 - Needle nose pliers (w/Tape)
 - guide wire keeper (taped wire tie)
- GP Caddy
 - EVA Scissors (w/Tape)
- PAD (√in SD) (on int)
 - WIF Adapter
- 3 – Adj tethers (linked together for Mast Canister handhold)
- EVA Camera/Bracket
- Bungee Caddy (for overglove temp stow)
 - 1 – RET (sm-sm) on outside

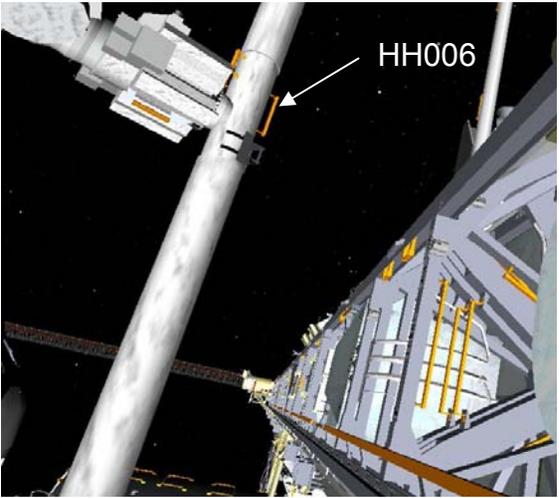
EVA 4 A/L EGRESS AND SETUP (00:45)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|--|---|---|
| <p>1. √MCC Inhibits in place: √SARJ = 142.5 deg √4B Beta Gimbal = +130 deg √2A Beta Gimba = +270 deg</p>  <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>1 – 55-ft A/L tether - EV1 → Outside 1 – 55-ft A/L tether - EV2 1 – 55-ft TS tether – EV1 → On CM 1 – 85-ft TS tether – EV2 1 – 85-ft SSRMS – EV1 -- C/L bag #1 1 – 85-ft P5 tether – EV2 - C/L Bag #4</p> </div> <p>2. Post crew egress: WVS Software: Select page – RF Camera sel 'Advanced controls' S-Band level (two) – max</p> | <p><u>INITIAL CONFIG</u></p> <p>1. Verify:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Right waist tether connected to EV2's 85-ft safety tether <input type="checkbox"/> Hook locked <input type="checkbox"/> Don overgloves after SCU disconnect <p><u>EGRESS/INITIAL SETUP</u></p> <ol style="list-style-type: none"> 1. Open hatch thermal cover 2. Egress crewlock 3. Retrieve 55-ft safety tether anchored on fwd A/L D-ring 4. Attach to left D-ring ext <ul style="list-style-type: none"> <input type="checkbox"/> Inspect load alleviating strap <input type="checkbox"/> √Gate closed, hooks locked and reel unlocked 5. Retrieve 55-ft safety tether anchored on aft A/L D-ring <ul style="list-style-type: none"> <input type="checkbox"/> Inspect load alleviating strap <input type="checkbox"/> √Anchor hook locked 6. Attach to EV2's 85-ft safety tether 7. <u>Pass 55-ft safety tether to EV2 into A/L</u> <hr style="border-top: 1px dashed black;"/> <ol style="list-style-type: none"> 8. Receive crewlock bag #1 from EV2 9. <u>Attach crewlock bag #1 to BRT</u> 10. Receive cheater bar/bail lever tool | <p><u>INITIAL CONFIG</u></p> <p>1. Verify:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Right waist tether connected to A/L D-ring extender <input type="checkbox"/> Hook locked <input type="checkbox"/> Don overgloves after SCU disconnect <p><u>EGRESS/INITIAL SETUP</u></p> <ol style="list-style-type: none"> 1. Receive 55-ft safety tether from EV1 2. Attach 55-ft tether to left D-ring ext <ul style="list-style-type: none"> <input type="checkbox"/> √Gate closed, hooks locked and reel unlocked 3. Release right waist tether from A/L D-ring extender 4. <u>Transfer crewlock bag #1 to EV1</u> 5. <u>Pass cheater bar/bail lever tool to EV1</u> 6. Attach crewlock bag #4 to BRT RET 7. Egress crewlock; attach crewlock bag #4 to BRT |

EVA 4 A/L EGRESS AND SETUP (00:45) (Cont)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|----|---|---|
| | <p>11. Transfer cheater bar/bail lever tool to EV2</p> <hr style="border-top: 1px dashed black;"/> <p>12. Verify SAFER config <input type="checkbox"/> √L Handle down (MAN ISO Vlv – Open) <input type="checkbox"/> √R Handle down (HCM – Closed)</p> <p>13. Translate to ESP-2 WIF 03, stbd side 14. Attach crewlock bag #1 to WIF-E 15. Retrieve WIF-E; stow on BRT</p> <p>16. Translate to tether shuttles via fwd path; leading EV2, fairleading tightly along CETA spur</p> <p>17. Retrieve tether shuttle 18. Install on CETA rail (port) <input type="checkbox"/> √Locked</p> <hr style="border-top: 1px dashed black;"/> <p>20. Attach 55-ft safety tether to tether shuttle <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <input type="checkbox"/> √Reel unlocked</p> <p>21. Remove A/L 55-ft tether 22. Stow A/L 55-ft on HR 3413 (CETA handrail bridge)</p> <p>23. Translate to SSRMS tether swap location, CETA marker 8910, P1, Bay 10</p> <p>24. Perform glove inspection</p> | <p>8. Retrieve cheater bar/bail lever tool; stow on swing arm 9. Close hatch thermal cover</p> <p>10. Verify SAFER config <input type="checkbox"/> √L Handle down (MAN ISO Vlv – Open) <input type="checkbox"/> √R Handle down (HCM – Closed)</p> <p>11. Translate to tether shuttles via aft crewlock path; following EV1</p> <hr style="border-top: 1px dashed black;"/> <p>12. Retrieve tether shuttle 13. Install on CETA rail (stbd of EV1) <input type="checkbox"/> √Locked</p> <p>14. Attach 85-ft safety tether to tether shuttle <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <input type="checkbox"/> √Reel unlocked</p> <p>15. Remove A/L 55-ft tether 16. Stow A/L 55-ft on HR 3444 (port of HR bridge)</p> <p>17. Translate to EV1 SSRMS tether swap location, following EV1</p> <p>18. Perform glove inspection</p> |

SSRMS/OBSS SETUP (00:30)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|--|--|---|
| <p>SSRMS: Tether Swap Set-up Position</p> <p>SSRMS: On EV1 GO GCA for tether swap</p> <p>IV: Give M1 GO for mnvr to APFR Install SSRMS: On IV GO, mnvr to APFR Install SSRMS: On EV1 GO GCA for APFR install</p> <div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> <p style="text-align: center;">WARNING</p> <p>Minimize OBSS loads. Minor loads can cause SSRMS joint brake slip and joint back-drive allowing contact between EMU and ISS structure</p> </div> | <p><u>SSRMS/OBSS SETUP</u></p> <p>20. GCA SSRMS for tether swap as reqd</p> <p>21. Remove 85-ft safety tether from crewlock bag #1</p> <p>22. Translate on to OBSS HH 6 and move port for access to LEE HH</p> <p>23. Attach anchor point of 85-ft safety tether to SSRMS LEE tether point</p> <ul style="list-style-type: none"> <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <p>24. Stow LAS end of SSRMS tether on CETA rail</p> <p>25. Translate stbd of OBSS for clearance</p> <p>26. Give IV GO to mnvr to APFR install position, watching safety tether extend as SSRMS moves Nadir</p> <p>26. GCA for APFR install as reqd</p> <p>27. Translate to OBSS</p> <hr style="border-top: 1px dashed black;"/> <p>28. Receive PAD/WIF adapter from EV2</p> <p>29. Install PAD/WIF adapter on OBSS striker bar, PFR socket towards the OBSS tip</p> <p>29. Rotate knob cw to CL (closed); lock knob</p> <p>30. Temp stow crewlock bag #1 on truss</p> <p>31. Install WIF-E in WIF adapter (12,M,7)</p> <p>32. Translate to CETA cart 2 (inboard-most), WIF 2 (stbd TFR swing arm)</p> <p>33. Retrieve APFR; stow on BRT</p> <p>34. Install APFR in WIF-E (12,PP,F,12)</p> <p>35. Perform glove inspection</p> | <p><u>SSRMS/OBSS SETUP</u></p> <div style="text-align: right;">  </div> <p>15. Remove PAD/WIF adapter from crewlock bag 4; transfer to EV1</p> <hr style="border-top: 1px dashed black;"/> <p>16. Stabilize OBSS as reqd</p> |

WARNING

1. Sharp edges:
 - a. SABB (skirt, swing bolts)
 - b. Solar cells
 - c. Springs along tension bar
 - d. Panel hinges
 - e. Guide cable burrs or frays
 - f. Mast Canister roller guides
 - g. Braided cables
 - h. Fastener exposed threads
 - i. Exposed bolts in rib cavities on mast canister
2. Shock hazard:
 - a. Avoid EMU contact with FCC and Kapton part of solar array panels
 - b. EV crew will only contact energized surfaces with approved tools that have been insulated with Kapton tape to prevent molten metal and shock
 - c. Solar array to be manipulated will be shunted prior to EV crew entering worksite
3. Pinch:
 - a. Lower SABB exposed reels and pulleys (guide wire and tensioning mechanisms)
 - b. Solar array mast during deploy/retraction
4. Avoid inadvertent contact with:
 - a. SSU, ECU, beta gimbal platform, mast canister, SAW blanket boxes unless the beta gimbal is locked and the motor is turned off

WARNING

1. Verify glove gauntlets cover wrist disconnects

WARNING

Minimize contact between metal array components and exposed damaged solar cells on active side. Note some sparking may be expected.
Avoid contact with solar panels except with insulated tools.
Sharp edges likely present at damage locations.

4B SAW TROUBLESHOOTING (02:30)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|----|---|---|
| | <div data-bbox="1014 362 1661 485" style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p style="text-align: center;"><u>NOTE</u> Obtain MCC concurrence prior to executing any actions on the solar array wing.</p> </div> <p><u>4B SAW TROUBLESHOOTING</u></p> <ol style="list-style-type: none"> 1. Inspect guide wire, hinge, damage area and report condition to MCC 2. If time and lighting allow, or on MCC call, take photo 3. Pre-stage caddy with vise grips and loop pin puller 4. Install cuff link #3 per cuff installation diagram And Block C: Install Cuff Links <div data-bbox="667 792 1316 984" style="border: 3px double black; padding: 10px; margin: 10px 0;"> <p style="text-align: center;"><u>WARNING</u> Array motion may occur when snag clears. Position body and use hockey stick as reqd to prevent contact between moving array components and EMU, particularly MWS</p> </div> <ol style="list-style-type: none"> 5. If wire not frayed. Attempt to clear snagged wire and grommets 6. If snag due to hinge wire, go to Block B: Trim Hinge Wire 7. IF NO JOY – go to Block A: Cut Guide Wire 8. If snag cleared, execute Block B: Trim Hinge Wire 9. Inspect guide wire; if grommet snag hazards present, go to Block A: Cut Guide Wire 10. Manipulate hinges with hockey stick to fold all panels in accordion manner 11. If no snag hazards present, install cuff links 1,2,4 & 5 per Block C: Install Cuff Links 12. GCA to center of array 13. Pull panels toward bottom of array until remaining top panels are flat 14. IF NO JOY due to grommets snagging on damaged guide | <p><u>4B SAW TROUBLESHOOTING</u></p> <ol style="list-style-type: none"> 1. Translate to 4B mast canister 2. Posn body near base of right blanket box 3. Monitor clearances as reqd: <ul style="list-style-type: none"> • EV1 and array • OBSS/SSRMS and structure |

| | | |
|--|---|--|
| SSRMS: On EV1 GO GCA to P6 4B Worksite Setup posn | wire, go to Block A: Cut Guide Wire 15. Report condition of array to MCC 16. Perform final inspection of repair and cuff link installations 17. Take photos of final repair 18. GCA SSRMS to P6 4B Worksite Setup posn | |
|--|---|--|

4B SAW TROUBLESHOOTING (02:00) (Cont)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|--|--|--|
| BLOCK A – CUT GUIDE WIRE | | |
| <p>SSRMS: On EV1 GO GCA to center of array</p> <p>SSRMS: On EV1 GO GCA for panel manipulation</p> <p>SSRMS: On EV1 GO GCA for top cut posn</p> | <div style="border: 2px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <p><u>WARNING</u></p> <p>Array motion may occur when guide wire is cut. Position body and use hockey stick as reqd to prevent contact between moving array components and EMU, particularly MWS</p> </div> <ol style="list-style-type: none"> 1. Assess guide wire load and potential for array motion, use hockey stick or other tool as reqd 2. On EV2 GO, Cut guide wire below snag. Let clean cut guide wire retract through grommets 3. On EV2 GO, GCA to center of array, as close to top blanket box as possible (SSRMS reach limited) 4. Pull panels toward bottom of array until remaining top panels are flat 5. GCA to guide wire to be cut (2 panels below as close to top as possible) <div style="border: 2px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <p><u>WARNING</u></p> <p>Array motion may occur when guide wire is cut.</p> </div> <ol style="list-style-type: none"> 6. Assess guide wire load and potential for array motion, use hockey stick or other tool as reqd 7. Cut guide wire as close to top blanket box as possible to minimize remaining guide wire length 8. Pull upper guide wire free from 2 grommets to create slack 9. Hold end of upper guidewire ¼ in from end with vise grip 10. Tap end of wire with loop pin puller to deform end 11. GCA to small hinge damage area | <p><u>GUIDE WIRE RETRACTION MANAGEMENT</u></p> <ol style="list-style-type: none"> 1. Attach BRT to mast canister HR <div style="border: 2px solid black; padding: 5px; text-align: center; margin-bottom: 10px;"> <p><u>WARNING</u></p> <p>Avoid contact with lower blanket box surfaces and mast canister ribs</p> </div> <ol style="list-style-type: none"> 2. Retrieve needle nose pliers from caddy 3. Restrain guide wire in keeper of needle nose pliers 4. Grasp guide wire using 90 degree bend in needle nose pliers; clamp down on wire 5. Give EV1 GO to cut wire 6. Control retraction of wire into reel housing until wire is completely retracted 7. Give EV1 GO to GCA, monitor clearances  |

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|-----------------------|---|-------------------|
| | 12. If not already done, Execute Block B: Trim Hinge Wire <div data-bbox="709 332 1367 511" style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><u>WARNING</u></p> <p>Do not touch cut ends of guide wire (sharp edge)</p> <p>Only contact guide wire with taped tools while wire in contact with array.</p> </div> | |
| SSRMS: Clearance Posn | 13. Remove separated portion of guide wire: repeatedly pull short sections (6-12") out of grommets, cut, and stow in trash bag 14. Repeat step 10 until entire section of guide wire removed <u>Perform any of the following steps not yet completed:</u> 15. Manipulate hinges with hockey stick to fold in accordion manner 16. Install cuff links in locations 1,2,4 & 5 per Block C 17. MnvR to Clearance Position | |
| | <p style="text-align: center;">BLOCK B – TRIM HINGE WIRE</p> 1. Assess end of hinge wire; if entangled, cover with tape for retention 2. Assess guide wire load and potential for array motion <div data-bbox="653 1010 1310 1188" style="border: 2px solid black; padding: 5px; margin: 10px 0;"> <p style="text-align: center;"><u>WARNING</u></p> <p>Array motion may occur when hinge wire is cut. Position body and use hockey stick as reqd to prevent contact between moving array components and EMU, particularly MWS</p> </div> | |
| | 3. Cut and remove hinge wire in 3-4" sections, stow in trash bag; leave ~ 8" of hinge wire protruding from hinge 4. Using vise grips, crimp hinge wire 2" from end, leaving ~ 6" of straight wire protruding from hinge 5. Smooth large damaged panel with hockey stick or other tool as reqd, Insure all cuff links clear of blanket edge and hinges | |
| | 6. Return to main procedure flow | |

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|------------------------------------|--|-------------------|
| SSRMS: On EV1 GO GCA to lower hole | BLOCK C – INSTALL CUFF LINKS | |
| | <ol style="list-style-type: none"> 1. Retrieve cuff link from crewlock bag 2. Install cuff link per cuff install diagram; GCA as necessary 3. Insert one end of cuff link through BRS pin hole by hand 4. Visually verify plate is completely through hole 5. Pull back toward panel to allow plate to flatten against panel 6. Remove RET 7. Straighten cuff link wire 8. GCA as reqd to lower hole 8. Use Loop pin puller to pull upper hole into position 9. Insert remaining end of cuff link through second BRS pin hole; use vise grips as required 10. Visually verify plate is completely through hole 11. Pull back toward panel to allow plate to flatten against panel 12. Return to main procedure flow | |
| | | |
| | | |

SSRMS/OBSS MNVR TO APFR EGRESS (01:00) AND APFR EGRESS AND OBSS CLEANUP (00:30)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|---|--|--|
| <p>IV: Give M1 GO for mnvr to P6 4B Worksite S/U SSRMS: On IV GO mnvr to P6 4B Worksite S/U SSRMS: Mnvr APFR Egress</p> <p>SSRMS: On EV1 GO GCA for APFR egress</p> <p>IV: Give M1 GO for mnvr to APFR Removal SSRMS: On IV GO mnvr APFR Removal</p> <p>SSRMS: On EV1 GO GCA for APFR removal</p> <p>IV: Record APFR Settings __, __ (__, __, __)</p> <p>IV: Give M1 GO for mnvr to tether removal posn SSRMS: On IV GO mnvr to tether removal posn</p> <p>SSRMS: On EV1 GO GCA for tether removal</p> | <p><u>SSRMS/OBSS MNVR TO APFR EGRESS (01:00)</u> 1. Give IV GO to mnvr back to P6 4B worksite Setup and (then APFR egress – no GO reqd)</p> <p><u>APFR EGRESS AND OBSS CLEANUP (00:30)</u> 1. GCA SSRMS for APFR egress as reqd 2. Egress APFR 3. Tether swap to tether shuttle safety tether <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <input type="checkbox"/> √Reel unlocked 4. Stow LAS of SSRMS safety tether on CETA rail 4. Give IV GO for mnvr to APFR Removal 5. Don overgloves during mnvr</p> <p>5. GCA SSRMS for APFR removal as reqd</p> <p>6. Remove APFR from OBSS; stow on CETA cart 2 WIF 2, report settings 7. Remove WIF-E from OBSS; temp stow</p> <p>8. Perform glove inspection</p> <p>9. Relocate crewlock bag #1 to WIF extender</p> <p>10. Remove PAD/WIF adapter; transfer to EV2 11. Verify OBSS clear of tethers 12. Give IV GO to mnvr to tether removal position, watching safety tether retract as SSRMS moves zenith</p> <p>13. GCA SSRMS for safety tether removal as reqd</p> <p>14. Retrieve safety tether from SSRMS; transfer to EV2</p> | <p><u>SSRMS/OBSS MNVR TO APFR EGRESS (01:00)</u> 1. As time permits, perform get aheads</p> <p><u>APFR EGRESS AND OBSS CLEANUP (00:30)</u> 1. Assist EV1 as reqd</p> <p>2. Receive PAD/WIF adapter from EV1 3. Stow PAD/WIF adapter in crewlock bag #4</p> <p>4. Receive SSRMS safety tether; stow in crewlock bag #4</p> |

APFR EGRESS AND OBSS CLEANUP (00:30) (Cont)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|--|---|--|
| <p>IV: Give M1 GO for mnvr to Clearance Position SSRMS: On IV GO mnvr to Clearance Position</p> | <p>15. Give IV GO to mnvr away to clearance position 16. Attach WIF-E/ crewlock bag to BRT</p> <p>17. Translate to HH 3413 (CETA HR bridge) 18. Tether swap to A/L safety tether <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <input type="checkbox"/> √Reel unlocked 19. Remove tether shuttle, stow on stowage location: <input type="checkbox"/> √Locked</p> <p>20. Translate to ESP-2 WIF 3; stow WIF extender (3,A,1) 21. Perform glove inspection</p> | <p>5. Translate to HH 3413 (CETA HR bridge) 6. Tether swap to A/L safety tether <input type="checkbox"/> √Gate closed <input type="checkbox"/> √Hook locked <input type="checkbox"/> √Reel unlocked 7. Remove tether shuttle, stow on stowage location: <input type="checkbox"/> √Locked</p> |

EVA 4 CLEANUP AND A/L INGRESS (00:30)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|---|---|--|
| <p>1. Perform prior to ingress: WVS PWRDN (P/TV, <u>WVS CUE CARD</u>)</p> <p>2. <input type="checkbox"/> <input checked="" type="checkbox"/> With MCC SSPTS inhibits in place (if retrieving APFR3)</p> | <p><u>INGRESS</u></p> <ol style="list-style-type: none"> 1. Translate to Airlock 2. Initiate EMU cold soak 3. Perform tool inventory <hr style="border-top: 1px dashed black;"/> <ol style="list-style-type: none"> 4. Receive cheater bar 5. Transfer cheater bar to EV2 6. Transfer crewlock bag #1 to EV2 7. Translate to A/L stbd toolbox; retrieve digital camera/flash and adj tether; stow on BRT 8. Translate to A/L, transfer digital camera/flash to EV2 | <p><u>INGRESS</u></p> <ol style="list-style-type: none"> 1. Translate to Airlock 2. Initiate EMU cold soak 3. Perform tool inventory 4. Remove cheater bar from swing arm; transfer cheater bar to EV1 5. Ingress Airlock with crewlock bag #4 6. Receive cheater bar, stow in airlock 7. Receive crewlock bag #1; stow in airlock 8. Receive camera/flash from EV1, stow in airlock |
| | <ol style="list-style-type: none"> 9. Translate to either: (stow in low profile) <ul style="list-style-type: none"> <input type="checkbox"/> APFR 3 (Lab WIF 13 -fwd, zenith, port with ingress aid) <input type="checkbox"/> APFR 7 (A/L WIF 10 – aft) 10. Retrieve APFR; stow on BRT; translate to airlock 11. Transfer APFR to EV2 <hr style="border-top: 1px dashed black;"/> <ol style="list-style-type: none"> 12. If time available and room in airlock, retrieve other APFR 13. Perform glove inspection 14. Receive EV2 safety tether, stow on handrail <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Hooks locked <input type="checkbox"/> <input checked="" type="checkbox"/> Reel unlocked | <hr style="border-top: 1px dashed black;"/> <ol style="list-style-type: none"> 9. Receive APFR from EV1; stow in airlock 10. Connect right waist tether to A/L D-ring ext <ul style="list-style-type: none"> <input type="checkbox"/> <input checked="" type="checkbox"/> Hook locked 11. Pass A/L EV2 safety tether to EV1 |

EVA 4 CLEANUP AND A/L INGRESS (00:30) (Cont)

| IV | EV1 – Pz (FF) | EV2 – Wheels (FF) |
|----|---|--|
| | <p>15. Attach right waist tether to EV2's left waist tether <input type="checkbox"/> √Hooks locked</p> <p>16. Disconnect EV1 A/L safety tether, stow on handrail <input type="checkbox"/> √Hooks locked <input type="checkbox"/> √Reel unlocked</p> <p>17. Ingress airlock</p> <p>DCM 18. Retrieve SCU, remove DCM cover 19. Connect SCU to DCM, √Locked 20. Water – OFF 21. Hatch thermal cover – close 22. Secure thermal cover Velcro strap</p> <div data-bbox="976 706 1539 768" style="border: 1px solid black; text-align: center; padding: 2px;"> <p>CAUTION Do not close hatch until EMU water – OFF for 2 min</p> </div> <p>23. √EV Hatch clear of FOD and obstructions 24. EV Hatch – verify handle position per hatch decal; close and lock 25. Go to PRE REPRESS portion of {CREWLOCK DEPRESS/REPRESS CUE CARD} (SODF: ISS EVA SYS: EVA PREP/POST)</p> | <p>DCM 12. Retrieve SCU, remove DCM cover 14. Connect SCU to DCM, √Locked 15. Water – OFF</p> <p>16. Go to PRE REPRESS portion of {CREWLOCK DEPRESS/REPRESS CUE CARD} (SODF: ISS EVA SYS: EVA PREP/POST)</p> |

SAW REPAIR – TASK DATA

Tools:

| | |
|-----------------|-------------|
| EV1 (FF) | EV2 (SSRMS) |
| See Tool Config | |

EVA Fasteners:

| Fastener Name | Head Size | Install Torque (ft-lb) | Release Torque (ft-lb) | Failure Torque (ft-lb) | Turns | RPM |
|---------------|-----------|------------------------|------------------------|------------------------|-------|-----|
| N/A | | | | | | |

EVA Connectors:

| Harness | From | To | Conn Size | Function |
|---------|------|----|-----------|----------|
| N/A | | | | |

Foot Restraints:

Notes:

1. TBD

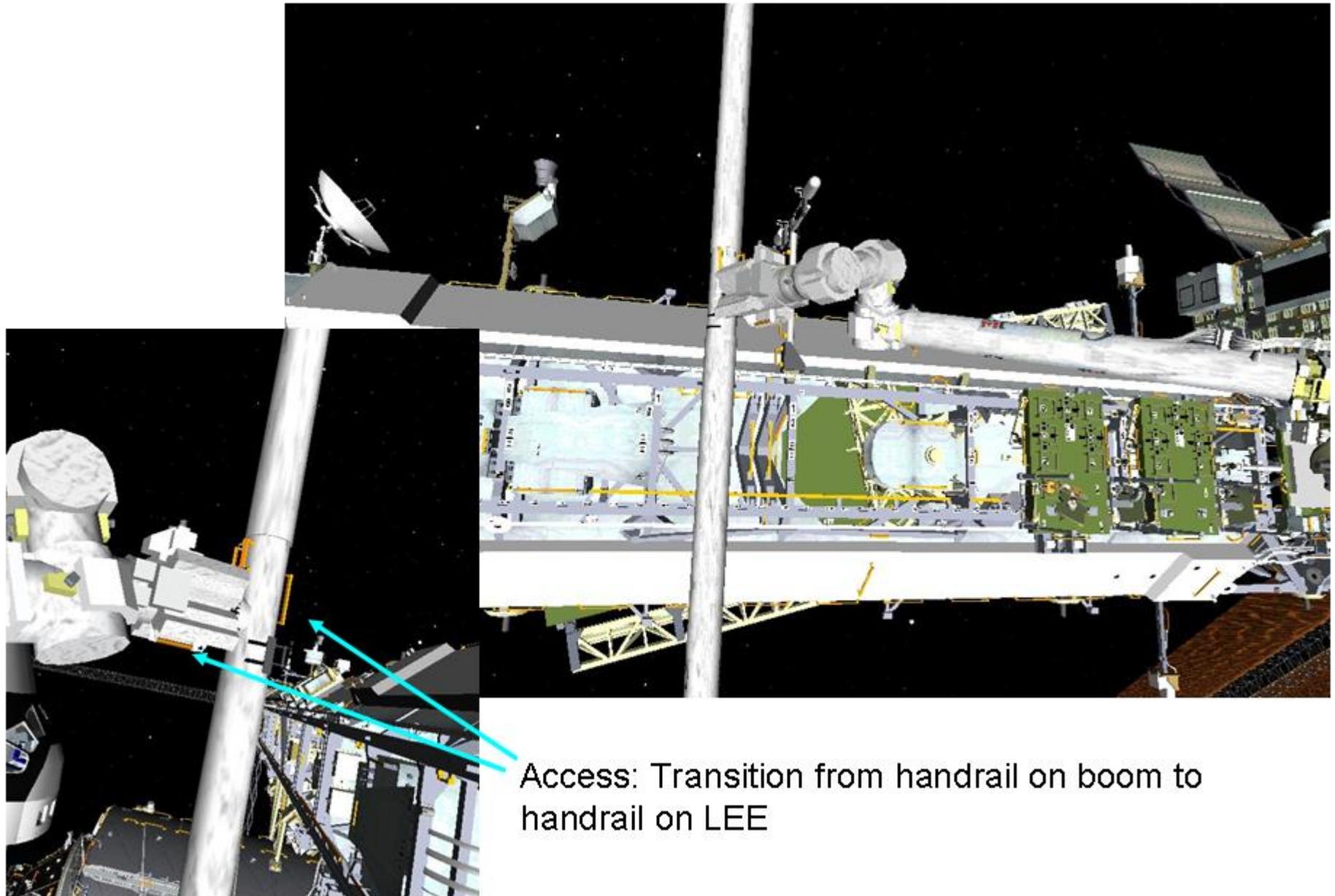
Cautions:

1. TBD

Warnings:

1. TBD

Position for Tether Swap to SSRMS LEE (Likely will need to GCA nadir)



APFR Ingress Position

