Sarcolab-3 & HRF Ops in Columbus

Possible interference concerns between MARES and HRF1 & 2 rack access

49/50 ESA TIM
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HRP Concerns – Centrifuge Ops

- After reviewing cabin video from a previous MARES commissioning activity, HRP came to the conclusion that scheduling centrifuge operations while MARES is deployed should be avoided
  - There is insufficient room to perform the blood draw in the endcone of COL while MARES is deployed and access to the centrifuge for sample loading and unloading is restricted. Crew could potentially still load and unload samples, but it would be an awkward process since a crewmember cannot float directly in front of the centrifuge with the door open while MARES is deployed. This would most likely violate our vein to MELFI constraint.
  - FD5-12 Sarcolab-3 ops is within the window of Kimbrough's FD60 Biochem Profile/Repository session as well as Pesquet's FD15 session and Whitson's FD15 Biochem Profile/Cardio Ox/Repository session

HRP Concerns – USND Ops

- Non-Sarcolab-3 Ultrasound scanning would be impacted by MARES deployment
  - The crew scans in front of the HRF Racks and there would be insufficient room. FD5-12 Sarcolab-3 ops is within the window of Whitson's FD15 Cardio Ox session
  - R-10 +/-8 Sarcolab-3 ops (in Inc 51) would carry the same impacts as above for Pesquet and Whitson's R-14 Biochem Profile, Cardio Ox and Repository sessions
  - FD45 +/-15 Sarcolab-3 ops is the exact same window as Fluid Shifts for Pesquet, Whitson and Novitsky
    - HRP recommends that the Dilution Measures (because of the blood draw and centrifuge) and Baseline Imaging Measures (Ultrasound scanning in front of HRF Racks) should be performed without MARES deployed.
    - From an HRP perspective, Chibis ops could be planned in the same timeframe as Sarcolab-3 because both Ultrasound units can be used.

HRP Concerns – HRF PC Ops

- Access to our HRF PCs 1 and 3 would be restricted and probably impossible during MARES deployment
  - PC1 is required to downlink Ultrasound data (other than the Sarcolab Ultrasound data which will use our HRF PC2 on HRF Rack 2), so could delay downlink of Fluid Shifts Chibis Ultrasound data.
  - PC3 supports the Lighting Effects experiment, so could not be scheduled at the same time. Lighting Effects does not have specific flight days, so planning can accommodate that potential conflict.
- In general, most of HRF Rack 1 cannot be accessed during MARES deployment
  - It would have to be worked during WLP planning to retrieve and temp stow anything needed for HRP experiment ops during MARES deployment

49/50 Gr&C Constraints

- Execute Planning Gr&C 5.2.15 discusses MARES constraints with HRF
  - **Rule**: Operations on HRF1 and HRF2 front racks and STBD cross panel shall not be scheduled when MARES is temporary stowed in bay 4
    - *Rationale: When MARES is temporary stowed in bay 4 to allow maintenance operations in bay 3, reduced crew work envelope for accessing HRF1, HRF2 and STBD cross panel items has been detected.*
  - **Rule**: When MARES is in its deployed configuration, use of SLAMMD calibration should not be scheduled
    - *Rationale: Interference has been detected between the HRF1 SLAMMD left side calibration work envelope and the on orbit protrusion (right side) when MARES is installed in F3 in stowage configuration.*
  - **Rule**: When MARES is deployed in Bay 3, crew tended operations on HRF2 and EPM shall not be scheduled concurrently to MARES crew tended operations
    - *Rationale: Despite of no Interference is detected between HRF2 work volume in A4 and MARES when deployed in bay 3, a corridor in bay 4 AFT side shall be maintained for guarantee the emergency egress when MARES is in deployed configuration in bay 3.*

Next steps

- Does ESA have any data/analysis to show any possible interference?
  - Does ESA have any input from the last crew to use MARES on access issues?
- POIC planners will work to de-conflict Sarcolab-3/MARES ops from other HRF rack use but a priority call may be needed if this is not possible
  - Prelim OOS TIM was able to de-conflict these ops fairly well
- POIC would like to propose a splinter at the next POIWG in July so HRP and ESA can discuss these issues. If ESA can bring any analysis they have to that discussion that would be very helpful.