Return to Nominal EVA – Background

- During US EVA 35 in January 2016, one of the spacesuits allowed enough water to enter the helmet that the EVA was terminated
  - It is impossible to determine how much water was put into the helmet, but estimates range from 65cc to almost 500cc
  - A Problem Resolution Team (PRT) was convened, and that team's investigation concluded following ground testing of the hardware
  - Probable failure scenario: High latent loads and cold EVA conditions may have created high levels of condensate which may have overwhelmed the sublimator (which already had blocked supplemental slurper holes), and high metabolic rates may have driven additional moisture off the METOX further adding to the load on the system

Tim Kopra in SEMU 3011 during US EVA 35

Return to Nominal EVA – Residual Risk

- The January 2016 incident demonstrated that the hazard controls and safety features implemented after US EVA 23 are sufficient to protect crew safety in a water-in-the-helmet scenario
- The likelihood of terminating an EVA due to sublimator carryover from a spacesuit without failures is now understood to be higher
  - The likelihood of terminating and leaving the ISS in an unanalyzed configuration is now understood to be higher
  - Critical points in each EVA timeline are identified ahead of time, and impacts to hardware and mission objectives are evaluated assuming that the EVA may be terminated at each critical point
- Other EVA system failures have all been dispositioned with sufficient rationale to proceed with EVA operations
- EVA Non-Compliance Reports (NCRs) document accepted risks of continuing to operate this suit in the ISS environment
- Each on-orbit spacesuit has unique residual risk from system failures, waivers, on-orbit maintenance, and/or trends in system behavior

➢ There are no technical liens against the use of any on-orbit spacesuit