Sentry
Summary of Corrective Actions to 2016 Debriefs

Pre-cruise - Recommendations

- During 2 cruises, *Sentry's* operational capabilities were not what the PI expected*
  - Vehicle had difficulty operating near-bottom on steep slopes.
  - There has been much improvement and remaining issues are mostly at photo height on slopes > 45 degrees. Further improvement requires a substantial re-write and testing of control code that we hope to see funded in a future overhaul
  - *Sentry* was expected to transmit data to enable dive plan mods during dive. This capability was 'rudimentary and iterative' and was not really available until last dive.
  - Sentry was believed to have the capability to perform 'tow-yo' transects in the water column.
  - These were described as developmental capabilities. We will attempt to be more clear in the future on what developmental means.

*PIs noted that some of the blame falls to them for 'hearing what they wanted to hear'.

Pre-cruise - Recommendations

- During 2 cruises, *Sentry's* operational capabilities were not what the PI expected
  - **Suggestion**: Describe proven capabilities more prominently on *Sentry* webpage and update webpages regularly. Clearly distinguish between proven capability and potential capability
  - Proven capabilities are clearly articulated and updated ~ 2x per year at www.whoi.edu/main/sentry/guide Everything else is under development
  - **Suggestion:** Continue to reinforce capabilities during pre-cruise discussions to be sure users are aware of the limitations.

Operations - Recommendations

- *Sentry* was expected to transmit data to enable dive plan mods during dive. This capability was ‘rudimentary and iterative’ and was not really available until last dive. Data was transmitted even when ship was out of range.
  - **Recommendation**: *Sentry* should be able to cache data until acoustic are reestablished -or- be able to communicate through via surface repeater (e.g., an autonomous surface craft).
  - *The Autonomous surface craft has a WHOI funded demo. This will NOT be a capability, just a demo.*
  - *Cached data is feasible, but complex and should be part of a larger improvement in acoustic communication strategy. We are considering submitting a NASA proposal and/or we would welcome access to a program like OTIC that allowed software projects where we could develop this.*

Sensors - Recommendations

- Vehicle power fluctuations created background noise that was interfering with sensor data. PI believes that integrating analog-to-digital sensors may be a persistent problem for Sentry because of electrical noise.
  - **Suggestion**: This should be reviewed.
  - Sentry's main power bus is being compared to a battery and LDO regulated independent system. This will never be an equal Significant additional improvement (though not parity) is possible with a complete redesign of the main electronics chassis which we hope to propose as part of a future major overhaul.

Sensors - Recommendations

- Multibeam data required extensive post-processing
  - **Recommendation**: *Sentry* group should support post-processing for bathymetry data at sea or onshore.
  - This cannot be done at sea with current staffing levels. We would welcome this opportunity on-shore and believe that it would serve our customers well. It will have to be paid for in some fashion…
  - Other products such as photo mosaics should be considered as well.

Alvin
Summary of Corrective Actions to 2016 Debriefs

Operations - Recommendations

- *Minor problems with 1 Alvin camera (small leak required disassembly and drying after dives)*.
  - **Suggestion**: If possible, have a spare to allow for swapping out cameras rather than disassembling/reassembling after each dive
  - **Response: This comments is associated with the Insite Mini-Zeus HD cameras. The group contacted Insite and determined that this was a known issue with the seal design. In response, both of Alvin's Mini-Zeus cameras were sent for seal upgrade/repair after the Kurz cruise. Additionally, the group is sourcing spare/alternate cameras for use on the vehicle.**

Operations - Recommendations

- *Effectiveness of Casius survey to calibrate USBL was mixed*. Calibration hadn't been done in a while, and while the previous calibrations were done by Sentry, unclear who is responsible for the system (Atlantis, Alvin, Sentry, SSSG)
  - **Suggestion**: Assign who is responsible for maintaining that system
  - **Response: Although the Alvin group has taken a lead role in the care, maintenance and sparing of the USBL system (see Alvin Upgrades & Improvements), the ultimate 'ownership' of the system needs further discussion within the facility (NDSF,SSSG etc). Alvin personnel intend to continue to play a lead role in the use/status/ care of the system on Atlantis.**

Operations - Recommendations

- *Alvin renav not available post cruise, science processed the data with Sentry code. When does the renav become available on FrameGrabber?*
  - **Suggestion**: Use Sentry code for future Alvin programs and alert PIs when to expect renav availability on FrameGrabber.
  - **Response: Alvin-specific processing pipeline is now in place and will be operated by SSSG.**

Data hand over - Recommendations

- *Speed of video duping was slow (hindered by intranet) also Chief sci recommended adding an index to the files on the drive for ease of access.*
  - **Suggestion**: Add an index to data files (not sure about intranet issues)
  - **Response: NLF project for NDSF data developing data tracking and delivery management system that should improve this.**

Corrective Action

Jason

Summary of Corrective Actions to 2016 Debriefs

Results from PCAR

- Science Objectives: 10
- Pre-cruise planning: 10
- Science party contribution: 10
- Vehicle equipment: 9
  - Clarification desired
- Safety of Vehicle Operations: 10
- Operations Team: 10
- Ship: 10
- Data Transfer: 10

Jason Debrief Highlights

- Overall, very positive, this was a cruise focused on recovering OBSs, meaning numerous short dives.
- Jason-related issues: a consistent 30m offset between USBL nav and actual bottom position was noted, this did not effect operations.
  - No offset was noted in the Jason NAV system.
  - The offset could have been the original positions
  - *Or* offset in Jason NAV

Jason Debrief Highlights

- Operations related issues, challenging to do many launch and recoveries that require whole Jason team, resulting in interruption of watch and sleep schedules. Will new or modified launch/recovery system reduce number of Jason folks needed for L/R?
  - The single body system will reduce personnel required
  - Still learning this system and will identify number rqd' at later date

- OBS recovery system not optimally designed for ROV recovery, possible discussion point for NDSF folks and OBS designers (LDEO in this case).
  - Upgraded system will make this easier
  - Under Jason lift via lift winch
  - AHC on ascent