

# NDSF Responses

## ROV Jason / Medea

De-brief summaries – Dec 2012 – Dec. 2013 - 1 year

Area	Project	Dates	Ports	Ship and cruise name
<i>Hawaii – Lo'ihl Seamount</i>	<i>Iron-oxidizing mats</i>	<i>Mar. – Apr. , 2013</i>	<i>No debrief yet</i>	<i>R/V Thompson</i>
<b>Cascadia margin</b>	- Recover OBS units Telepresence -Inner Space Center (URI)	June 25 – July 8, 2013	Astoria <->	<b>R/V Atlantis</b>
<b>East flank of the Juan de Fuca Ridge</b>	Service a series of six borehole observatories	July 13 – 26, 2013	Astoria <->	<b>R/V Atlantis</b>
<b>Washington margin and subduction zone</b>	Heat flow measurements Deployment of 'mosquito' flow sensors	July 31- Aug. 21, 2013	Astoria <->	<b>R/V Atlantis</b>
<b>Axial Seamount Vents</b>	- Sampling of Vent Fluids - Deployment of vent instruments to extract energy from hydrothermal vents - Study inflation of seafloor at Axial Volcano	Sept. 3- 19, 2013	Seattle <->	<b>R/V Thompson</b>

# 1. Pre-Cruise Planning:

In general PIs felt that pre-cruise planning went well, except for

- A minor disconnect in communication between those involved in the pre-expedition telecom and the Jason technical team.

*It was not mentioned during the pre-expedition planning telecom that the Jason team members might make up connections to the vehicle in advance of the port call - > cables and connectors would have been shipped separately to the Jason team to expedite the process*

**We try to remind PI's of the importance of providing cables etc., in advance but may have neglected to in this instance. Will endeavor to remind people in the future and ensure this material is made available to the ops team as appropriate.**

## 2. Mobilization/Demobilization:

All went really well

Jason team was very proficient and proactive

*Minor remark: There were some Fedex shipments that had to be tracked down aboard ship*

### 3. Operations - Vehicle

**In general Jason performed very well, except for:**

- R/V Atlantis ship's bow-thruster failed (July cruise) -> lost ~8 h of operation - ship's bow-thruster failed again (Sept. cruise) during the 2nd dive. The team worked around this by minimizing the use of the bow thruster but dives were somewhat less efficient without it – loss of ~ 0.5 day of operations
- Failure of the optical fiber connection in the Jason-Medea tether ~15 minutes before end of the last dive -> dead-boat vehicle recovery for Jason (failure tracked to the termination at the Jason end) -> *no impact on science for that cruise*
- The failure might have resulted from extensive towing of Jason, during transits, and as a result of work that was carried out on the immediately preceding cruise (100 km length of seafloor survey in one dive, vehicle was towed by Medea over large distances between measuring points)

**We got 11 months and ~ 500 km of subsea transit from this tether. Looking for better ways to predict tether life to prevent unexpected failures while maximizing tether life.**

## 4. Operations NDSF - provided equipment

**Navigation** (USBL and LBL) worked really well.

**Jason / NDSF heat flow probe** was used extensively and worked well

## 4. Operations NDSF - provided equipment *cont.*

**Cameras** worked beautifully in general - **Lighting** was improved

- Scorpio digital still camera was mounted on the same pan & tilt as the pilot's HDTV camera = not optimal -> PIs on 2 cruises requested to have controls for it on the Science Pan & Tilt
- Super Scorpio is a new larger DS camera and does not fit on the SCI P&T with a Mini Zeus. Looking at alternate position beside Pilot P&T. The option of moving it to light bar should be considered.
- New DSC is an improvement but exposure settings are very cumbersome to change manually
- Working with mfr. to remedy
- Weaknesses in the current Science HDTV video controls:
  - There are two separate controllers required to operate the HDTV cameras optimally – one each for the pan & tilt functions and for zoom & iris
  - The cables for each controller are not long enough for control of the camera to be switched, readily between the Watch Leader and the Event Logger
- Will lengthen cable and try to better integrate the two controls

## 5. Operations - User-provided equipment

- Equipment was implemented successfully by the Jason team and worked well
- The Jason team showed skill, patience and creativity to work through difficult operations
- There were problems with science provided flow meters and a bore hole instrument string that were not part of Jason's responsibilities

## 8. Data hand-over:

Data hand-over went well in general.

- The major issue concerning data hand-over was that the PI considers the delivery of video files on DVDs is anachronistic in the 21st Century.
- Jason should be recording routinely to hard drives by now. Also, the conventional DVD files are of a size (4.6 Gb each) and format that makes them difficult to use. It would be better if these files were recorded in smaller chunks (maybe 10-15 minutes each) in a more standard editing/viewing format.
- HD solution has been developed. Details in *Jason* upgrades.
- The PI noted that there is still no effective search capability on the version of the Jason Virtual Van that is handed over in “static” form (burned to DVD) at the end of the cruise, which is disappointing. It would be nice if the “static” Virtual Van were searchable, like the version on-line.
- The standalone product contains no executable components, and relies on a web browser to navigate its HTML hierarchy. Searches are limited by a web browser's imbedded "find" functionality. To support more robust searches would require delivery of a nearly complete VV server consisting of:
  - A computer running the linux OS with a pre-defined configuration
  - GeoBrowser database engine
  - VirtualVan server executable components
  - The cruise data
- This could be made a standard product, delivered on a laptop or perhaps implemented via live DVD or bootable USB. The community would have to decide whether demand warrants the development, production, and per-cruise costs. Production would require a significant portion of the at-sea data processor's time, and may mean that the data package is not completed by cruise end.



## 10. User Recommendations

Having access to the **telepresence connection was great, positive and rewarding**

Yet:

It should be recognized that all the advantages of Telepresence come with an associated cost which included:

- Giving up one science berth to bring a dedicated engineer tasked with maintaining the telepresence equipment (covered in telepresence costs)
- Bringing a 4 person E&O team (funded through a supplement to the PI's original grant proposal and an additional proposal) (broader impacts) to take full advantage of the system.

Primarily the PIs relied upon graduate and undergraduate students for telepresence activity, including a community college physics instructor and two CC students.

- > It involved a lot of effort for coordinated presentations, which unfortunately did not often align with the Jason dive schedule necessary to achieving science goals.
- The printers on the Atlantis are ancient and need replacing.

# *Sentry* de-brief summaries – 2013

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## NDSF Responses

### Operations - Vehicle:

- First 3 dives were lost.
  - Two were lost to an unexpected electrical fault which we had never seen before and which was intermittent. We are now long-term protected against a recurrence.
  - One issue was new software that had not been field-tested prior to cruise
- For the software issue, we need to better align engineering dives to follow overhaul periods rather than convenient holes in the ship's schedule. Will address with marine ops.

# *Sentry* de-brief summaries – 2013

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## **Data Hand-over**

- Confusion associated with versioning of data during/after cruise
  - Difficult to identify “final” data products
  - Multiple versions, date-stamps not consistently applied
- We are still working on this. Some data processors are better than others but we will soon have formal standards.
- Problems accessing external drive of data provided to PI (NTFS vs EXT4)
- We ask each scientist which they would like pre-cruise. There is no clean answer that works in all cases (NTFS has significant file corruption problems at our data volume when used from Linux or Mac). We have reached out to the DeSSC data community and other colleagues and no clear answers have resulted there either. We continue to look for better options and welcome suggestions.

# *Sentry* de-brief summaries – 2013

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## Recommendations:

- Having to stay with 1-2 km of *Sentry* during dives was an unexpected operational limitation. It would be good to find a way for the ship to move further away from *Sentry* to enable other ship-based sampling activities during dives.
- WHOI has demonstrated this technology in shallow water and submitted proposals to move this to deep water. To date the proposals have been declined. The price tag is ~\$0.5M and thus will not fit within the standard *Sentry* ops budget.
- Use a standard data-format for drives delivered to the PI from the *Sentry* cruise and test that the PI can read the drives provided to them before the cruise ends.
- See previous slide. There is no suitable single standard.