

Operations and Management of the Drilling Vessel *JOIDES Resolution* for the International Ocean Discovery Program (IODP) NSF Site Visit Panel

The NSF/Ocean Drilling Program Panel met at the *JOIDES Resolution* Science Operator (JRSO) at Texas A&M University, College Station, Texas, August 07 – 08, 2019. The purpose of the meeting was to review operations relating to facility performance under the Cooperative Agreement Award (#1326927) for operation of the drillship facility *JOIDES Resolution* by the International Ocean Discovery Program (IODP) during FY 2018. The panel members included James Allan (Chair), Bob Houtman, Matthew Erickson and John Walter. The panel had access to extensive information prior to and during the site visit, including access to the report from the Co-Chiefs of the FY 2018 Expeditions.

The panel recognizes that performance under this award was excellent in FY 2018.

Rationale for Facility Operation

Is the facility required to meet the IODP Science Plan, and being appropriately utilized to meet the IODP Science Plan?

The drilling results of the five FY 2018 expeditions addressed challenges in all four themes of the IODP Science Plan. The panel congratulates the JRSO for its excellent management of the aging facility, that continues to successfully address the diverse science questions of the IODP Science Plan. The JRSO provides a facility that meets and often exceeds the needs of the IODP Science Plan. The JRSO is well positioned to effectively support the IODP Science Plan through its final years and support the science drilling community through FY 2024.

Management and Management Plan

Planning, Staffing, Implementation of Operations, and Leadership and Responsiveness to the IODP Program

The panel finds that JRSO planning and budgeting strategies provided the foundation to implement an operationally complex, five-expedition year that substantially exceeded the scope of the operationally simple yearly four-expedition plan called for in the Cooperative Agreement. The panel commends the JRSO use of lessons learned from previous operationally complex cruises, NSF panel guidance, Co-Chief and sailing scientist recommendations, and *JOIDES Resolution* Facility Board (JRFB) direction to address possible risks to the schedule and scope of FY 2018 expeditions. This is possible because the JRSO maintains institutional knowledge through career advancement opportunities and the practice of rotating seagoing technical staff. These management practices ensure robust operational and technical support for the scientific drilling community.

The panel recognizes that the JRSO has successfully implemented possibly the most complex

and operationally diverse program plan to date. The panel finds that leadership, shore-side and at sea, makes this possible. The management and organization structure are designed to address issues both at the planning and implementation stages. This is evident in how JRSO leadership ensured no science was lost by its response to the clearance complications and the dry dock incident.

Service to the IODP Community

Ship and Rig performance, Lab performance, Facility innovation, Shipboard Curation and Publishing/Archiving

The facility rating of actual vs. planned operations was 90.7% for FY 2018. The panel recognizes that the relatively high core recovery rates in the Brother's Arc volcanic hydrothermal environment is due to the JRSO's commitment to safely utilize the full performance of the ship and rig.

Ninety two percent of sailing scientists gave the lab group an "Excellent" rating and the panel finds this impressive. The strategy of cross-training laboratory staff and supervisors and the development of the wiki for laboratory manuals and information provides a dependable technical staff and capability. The rapidly implemented X-ray imager using existing space and core guides is an impressive accomplishment especially as it was constructed during an operationally complex year. The panel commends the JRSO's decision to move forward on the projects to upgrade the DESClogic data entry systems.

The panel finds that the publishing group has continued its excellent performance in maintaining publishing milestones. The panel commends the continued effort in utilizing alternative hosting and marketing services, ScienceOpen.com, and identifying long-term web-site archival options like Internet Archive to preserve IODP information.

Budget Performance

The panel commends JRSO in accomplishing an operationally and technically challenging FY 2018 under budget. The panel recommends that JRSO continue to identify and mitigate risk throughout the program and applauds the hire of a Clearance Officer to assist in these efforts.

Support for Outreach efforts

The panel commends the JRSO's efforts integrating Outreach Officers into the planning process and expedition science parties, and for providing the necessary ship-to-shore communications vital to these planned activities.

Effectiveness of IODP Program Support

Function of the Facility Board model, Adequacy of proposal review, Effectiveness of science party staffing, Post-cruise sampling effort, and Long-term core and data archiving

The panel finds that the continued operational and management oversight of the JRSO by the JRFB has provided a well-organized and effective interface between the proposal development and implementation of drilling operations. This model continues to provide a stream lined review process limiting the time to ~4.5 years from initial submission to sailing. The panel commends the JRSO's performance as a watchdog for ensuring only well-planned and operationally realistic proposals are forwarded to the JRFB.

The panel recognizes the major challenge in effective science party staffing due to the limited and sometimes inexperienced nominations provided by some Program Management Offices (PMO). The panel encourages continued efforts stressing the need for more nominations by the PMOs and providing clear expectations regarding cruise objectives and measurements to the PMOs prior to staffing.

Sampling parties continue to rate JRSO as "Excellent" regarding logistics and on-site support. The panel recognizes that the HVAC upgrade to the long-term core facility has greatly improved the facility and recommends that the JRSO continue its efforts in identifying future core storage capacity on-site.