IODP Expedition 352: Izu-Bonin-Mariana Forearc

Week 1 Report (30 July–2 August 2014)

Operations

Week 1 of Expedition 352 (IBM Forearc) began with the first line ashore at Honmoku Berth #3, Yokohama, Japan, at 1042 h on 30 July 2014 (all times presented are ship local time which is UTC + 9). The IODP Laboratory Specialists, Expedition Project Manager, and Co-Chief Scientists boarded on the day of arrival. On the second day of the port call, the remainder of the science party boarded the vessel and the ship's crew change was completed. Loading of drill pipe, fuel, bulk mud, casing, expedition stores, and food were completed. Offloading of Expedition 350 and 351 cores and air/surface freight shipments was completed. Ocean Leadership staff conducted a property inventory audit. The passage plan was prepared for the voyage. At the end of the week, the vessel was being secured for transit and the final maintenance checks were being performed in preparation for departure from Yokohama on 4 August.

Science Results

During Expedition 352, we intend to drill a section through the volcanic stratigraphy of the outer fore arc of the Izu-Bonin-Mariana system in order to trace the processes of magmatism, tectonics, and crustal accretion associated with subduction initiation. This study in turn has implications for understanding the origin of the many ophiolites that are now believed to form in this setting, and the expedition provides a good opportunity to test this supra-subduction zone ophiolite model. We intend to drill two sites in the Bonin fore arc (Sites BON-1A and BON-2A), which form an offset-drilling pair that together should penetrate the full lava section. The sites have been surveyed and the surface has been sampled by submersible and dredging nearby. Studies of the recovered samples have revealed a stratigraphy in which peridotites, gabbros, and sheeted dikes are overlain by "fore-arc basalt" (FAB) and then in turn by boninites. Coring and logging at Sites BON-1A and BON-2A will contribute to our understanding of intra-oceanic convergent plate margins by providing (1) a high-fidelity record of magmatic evolution during subduction initiation; (2) a test of the hypothesis that FAB tholeiites lie beneath boninites; (3) a record of the chemical gradients within these units and across their transitions; (4) information on how mantle melting processes evolve during subduction initiation from early decompression melting of fertile asthenosphere to late flux melting of depleted mantle, providing key empirical constraints for realistic subduction initiation geodynamic models; and (5) a test of the hypothesis that fore-arc lithosphere created during subduction initiation is the birthplace of supra-subduction zone ophiolites.

The expedition started with port call activities. The Chief Scientists, Staff Scientist, Logging Staff Scientist, and technical staff boarded the *JOIDES Resolution* on 30 July. The science party boarded the vessel on 31 July and, after getting settled, received safety orientations. The scientists spent the rest of the week becoming familiar with the core flow, sampling, and laboratory procedures followed on the ship. The science party also discussed their research plans and formulated a comprehensive sampling plan. Laboratory teams started working on their methods, which will be documented in the *Proceedings* volume.

Education and Outreach

Two education officers boarded the vessel with the science party and participated in all the science orientations. Staff from the National Museum of Nature and Science in Tokyo visited the ship to discuss live broadcasts with the museum.

Technical Support and HSE Activities

Port call:

Day 1: Technical staff moved aboard and conducted crossover with departing staff. Texas A&M Environmental Health and Safety staff conducted radiation and laser safety training classes.

Day 2: Staff completed the majority of logistic activities and began the distribution of oncoming freight. Introduction and safety meetings were conducted for the oncoming science party.

Day 3: Staff continued with material distribution. The helium refill of the cryogenic magnetometer was completed. Scientists were introduced to their laboratories by the Marine Laboratory Specialists and trained on instruments and data systems. Staff assisted the catering group with food loading.

Day 4: Science party laboratory orientations continued. Technicians secured laboratories and storage areas for departure.

Other technical activities:

- Work started on safety upgrades to the laser engraver;
- Software updates started for both section half logging systems;
- XRD training was completed for the new technician;
- Ocean Leadership conducted equipment inventory.

HSE activities:

The science party and new technical staff completed the ship operator's safety induction and IODP's laboratory safety tour. The weekly fire and abandon ship drill is scheduled for August 4.