IODP Expedition 395E: Complete South Atlantic Transect Reentry Systems

Week 1–2 Report (6–17 April 2021)

Operations

Port Call and Transit Activities

International Ocean Discovery Program (IODP) Expedition 395E, Complete South Atlantic Transect Reentry Systems, started in Cape Town, South Africa, at 0800 h (UTC + 2 h) on 6 April 2021. There is no science party on Expedition 395E. JRSO personnel had arrived in Cape Town on 1 April in order to quarantine in the hotel for seven days prior to boarding. They took COVID-19 tests on 4 and 7 April, and these tests returned negative results, enabling the JRSO personnel to board the *JOIDES Resolution* (JR) on 8 April.

However, three of the Siem Offshore crew tested positive for COVID-19 in the hotel, so they and their 14 close contacts quarantined longer than originally planned. The extra quarantine time meant that the JR was not able to depart as originally scheduled on 11 April. These crew members were tested again on 11 April and the results came back negative for the close contacts. On 13 April, an additional round of testing of all shipboard personnel was conducted dockside, with everybody testing negative. The 14 close-contact crew members boarded the JR early on 15 April. The three original cases were not allowed to join the JR and will return home at the earliest opportunity.

During the port call, the fiber-optic pigtail on the vibration isolated television (VIT) subsea camera was upgraded by a contractor (former IODP staff), and the job was completed by 11 April.

The harbor pilot boarded the vessel at 0922 h on 15 April, and the last dock line was released at 1000 h. The pilot was away at 1026 h and the sea voyage started at 1100 h. Abandon ship drills were conducted at 1300 h, one for crew and one for JRSO staff. The ship's clock was set back 1 h at 1400 h on 17 April, putting the vessel at UTC + 1, or 6 h ahead of College Station. The week ended at midnight on 17 April, with the vessel underway at 11.1 kt to Site U1560 (proposed Site SATL-25A), having travelled 721 km since leaving Cape Town.

Science Objectives

The primary goal of Expedition 395E is to complete the installation of the reentry systems for the South Atlantic Transect (Expeditions 390 and 393) that was partially completed during Expedition 390C. The plan for the first two sites of Expedition 395P, proposed Sites SATL-25A and SATL-33B, is to core single advanced piston corer (APC) holes to basement to conduct gas safety monitoring and to determine the exact depth of basement. Reentry systems, comprising casing to basement and a reentry cone, are to be installed at these two sites. The JR will then

proceed to the western end of the transect, where we will install a reentry system to basement at Site U1556. At the final site, Site U1557, a reentry cone and 60 m of casing is already in place, and Expedition 395E will deploy casing to basement. These installations will allow more time to be devoted to scientific coring on Expeditions 390 and 393.

The South Atlantic Transect sites start near the Mid-Atlantic Ridge overlying crust ~7 Ma and continue to the west onto progressively older basalt crust up to ~63 Ma. Expeditions 390 and 393 will drill the crust and overlying sediment to examine how crustal alteration proceeds over time. Microbiology objectives include documenting sediment and crustal microbial communities and metabolic capabilities as a function of substrate composition and age. Paleoceanographic objectives through the entire Cenozoic can also be addressed through sediment coring.

On Expedition 395E, sediment cores will be run through the track systems, including the Whole-Round Multisensor Logger (WRMSL), the Natural Gamma Ray Logger (NGRL), the Section Half Multisensor Logger (SHMSL), the Section Half Imaging Logger (SHIL), and the superconducting rock magnetometer (SRM). One whole-round sample per core will be taken for squeezing and geochemical analyses of interstitial water, increasing to two samples per core within 40 m of the sediment-basement contact. After the expedition, core catcher samples will be distributed to micropaleontologists staffed on Expeditions 390 and 393, so that a preliminary age model can be developed prior to the full expeditions. No discrete samples will be taken. Hard rock cores will not be split during this expedition. Core description and additional analyses will be conducted during Expeditions 390 and 393 in 2022.

Science Results

Laboratory upgrades, maintenance, and staff cross-training were conducted to ensure readiness for coring. Plans for shipboard sediment core analyses were discussed with the Laboratory Officer and Assistant Laboratory Officers. Communication with the Expedition 390 and 393 Co-Chief Scientists confirmed details of planned measurements. We will follow a very similar measurements plan to that of Expedition 390C, in order to maintain consistency.

Outreach

No onboard Outreach Officer is sailing during Expedition 395P. Limited social media posts were made via the JR Facebook (https://www.facebook.com/joidesresolution) and Twitter (https://twitter.com/TheJR) accounts, run by the JRSO technical staff.

Technical Support and HSE Activities

Laboratory Port Call and Transit Activities

Laboratory Activities

Week 1

- Staff attended daily expedition meetings, the Expedition 395E kickoff meeting, and completed Zoom crossovers from the hotel.
- Mike Meiring joined the vessel and completed repairs to the fiber-optic pigtail of the VIT subsea camera with help from the Siem Offshore crew.
- Began testing OpenCPN navigational software for the purpose of replacing WinFrog.
- Replaced the lifting ropes of the X-ray logger doors.
- Met with shore to discuss the SHIL calibration procedures.
- Attended an outreach meeting with the U.S. Science Support Office (USSSP) to plan possible outreach activities.
- Prepared the SRM and compressors for the biannual compressor maintenance.
- Calibrated and tested the whole-round tracks, and performed routine maintenance on the water and density standards.
- Unpacked, distributed, and received remaining air freight items into the laboratories.
- Completed laboratory tours and safety training for the new technicians.
- Performed routine computer updates and basic instrument checks throughout the Core Laboratory and Chemistry Laboratory.

Week 2

- Deployed the magnetometer once outside the Exclusive Economic Zone (EEZ) of South Africa.
- Replaced vinyl shielding on the X-ray door and improved the shielding on the port end of the X-ray track. A radiation survey was completed following the shield modifications.
- Staff completed safety training (laser, radiation, TrainTraq required courses) and programming training (LabView and Python courses).
- Completed Core Laboratory training for new technicians.
- Started work on cold weather enclosure vinyl doors for the catwalk.
- Prepared the shipboard sampling plan.
- Installed spare Cryomech compressor for the SRM. Replaced adsorber in the old compressor and flushed the cooling lines prior to storing. A new field was trapped in the SRM following the compressor exchange.
- Prepared advanced piston corer temperature (APCT-3) and orientation tools for use at Site U1560.
- Resolved the Petrel Licensing issues.

- Completed SHIL calibration, which resolved the issue with vertical lines in the images.
- The NGR home switch was replaced after it failed due to corrosion.
- Started work on various instruments in the Chemistry Laboratory and prepared for cross-training technicians.

Shore Projects

- Catwalk meeting and testing.
- GEODESC meetings, testing, and documentation.
- Digital Asset Management (DAM) system migration meeting.

IT Support Activities:

- Completed initial laptop setup and training with new and regular participants.
- Assisted with the replacement Trimble SPS365 GPS receiver setup in the ship network.
- Troubleshooting firewall configuration on WinFrog computers.
- Encountered an internet outage on 15 April. Siem Offshore worked with Marlink to convert us from Ku to C band, and restored internet services by 0100 h the next day.
- Upgraded Windows 10 drivers on SHIL, SHMSL, Gantry, SRM, KappaBridge, and NGR.
- Updated ship web pages with shore content.

Developer Activities:

- Confirmed database access.
- Created a new user with privileges for the new Curator.
- Continued work on GEODESC's Template Manager.

HSE Activities:

- Safety shower and eye wash stations tested.
- Began contact tracing for the JRSO staff as a precautionary measure.
- Completed health, safety, and environment (HSE) and Life at Sea training with new technicians.
- Abandon ship drills completed (one for Siem Offshore/Entier and one for JRSO staff)
- Lifeboat and survival suit training for new technicians and crew.