

IODP Expedition 395E: Complete South Atlantic Transect Reentry Systems

Week 4 Report (25 April – 1 May 2021)

Operations

Hole U1560A

Week 4 of Expedition 395E, Complete South Atlantic Transect Reentry Systems, began on 25 April 2021 when the *JOIDES Resolution* had just started operations to install a reentry system in Hole U1560B (proposed Site SATL-25A). COVID-19 safety procedures remained in place until 28 April, 14 d after leaving port.

From midnight to 0700 h on 25 April, we rigged up the 10 $\frac{3}{4}$ inch casing, picked it up with the running tool, and landed it on the base of the reentry cone in the moonpool. Then we rigged up the drill pipe stinger, including a drill bit, underreamer, and mud motor, and tested it in the moonpool. By 1300 h we had lowered the stinger through the casing and secured it to the base. We assembled the reentry cone and welded it to the base, and at 1545 h we started lowering the assembly to the seafloor, reaching 3675 m below sea level (mbsl) at 0130 h on 26 April. We installed the top drive and deployed the subsea camera and conductivity-temperature-depth (CTD) instrument.

We spudded Hole U1560B at 0430 h on 26 April. A water depth of 3723.7 mbsl is assumed, based on the mudline depth at Hole U1560A. In the subsea camera images, Hole U1560B (30°56.4546'S, 26°37.7898'W) lies about 5 m to the west-southwest of Hole U1560A. We drilled to the target depth of 124 m below seafloor (mbsf) and disconnected the casing using the hydraulic release tool (HRT) at 1025 h. We filled the cased hole with heavy mud to prevent inflow and raised the subsea camera and CTD to the ship. We raised the stinger assembly to the ship, and the drill bit reached the rig floor at 2355 h and was disassembled. Wear on the bit indicated that basement was contacted, but the underreamer cutters were still in excellent condition, and it is unlikely that the underreamer and casing reached basement. Therefore, the basement contact at Hole U1560B is a little deeper than at Hole U1560A (120.1 mbsf), as a result of local basement surface topography.

We made up the bottom-hole assembly (BHA) for cementing and lowered it to just above the seabed. The subsea camera was lowered to the BHA to guide reentry, and at 1445 h on 27 April we reentered Hole U1560B. We positioned the base of the BHA at 3 mbsf, which was deep enough for the cup packer in the BHA to seal the top of the casing. We established circulation and pumped down 10 bbl of 15 ppg cement, and then pulled the BHA back out of the hole, clearing the reentry cone at 1545 h. The drill pipe was cleared of any residual cement by pumping down two pigs (pipe cleaning devices) and flushing it with seawater. The subsea camera was raised back to the ship. From 1730 to 2315 h we raised the BHA back to the rig floor, ending operations at Hole U1560B. The rig floor was secured for transit at 0045 h on 28

April. We raised the thrusters and started the sea passage at 0124 h on 28 April, ending operations at Site U1560.

On 26 April, the South Atlantic Transect Expedition 390 and 393 Co-Chief Scientists, Expedition Project Managers, and Operations Superintendent met to discuss how best to use the remaining operations time on Expedition 395E, given that the *JOIDES Resolution* departed from Cape Town four days later than originally scheduled. We decided to defer operations at proposed Site SATL-33B, which was originally planned to be the second site of Expedition 395E. Instead, Site SATL-33B operations will take place during Expedition 390 or 393. It was decided that the next hole of Expedition 395E will be Hole U1557D, where Expedition 390C had installed a reentry system including 60 m of 16 inch casing in November 2020. Expedition 395E will complete installation of the casing down to basement in Hole U1557D.

Transit to Site U1557

The ship transited 502 nmi to Site U1557 (proposed Site SATL-56A) in 44 h at an average speed of 11.4 kt. COVID-19 safety protocols were lifted on 29 April because it had been 14 d since the *JOIDES Resolution* left port.

Hole U1557D

We arrived at Site U1557D at 2130 h on 29 April. The thrusters were lowered and the ship switched to dynamic-positioning (DP) mode at 2215 h. The plan was to deepen Hole U1557D from the existing 16 inch casing depth (60 mbsf) down to 10 m into basement, in preparation for installing the next casing string in a separate run. We used this two-stage method because the water depth (5010.7 mbsl) and casing depth (~573 m) at Site U1557 meant that the mud motor stinger assembly, used at Hole U1560B, would be too heavy to deploy safely here.

The 14 $\frac{3}{4}$ inch drilling BHA was assembled at 0230 h on 30 April, and we ran it down to 4980 mbsl by 1100 h. We then deployed the subsea camera and CTD instrument. This confirmed that the upgrade to the fiber-optic pigtail connection that had been made during the port call was successful (the connection had failed in these water depths during Expedition 390C). From 1230 to 1430 h we slipped and cut drilling line as part of regular maintenance. We picked up the top drive and reentered Hole U1557D at 1600 h, retrieved the subsea camera and CTD instrument, and brought them back on board at 1815 h. At 1830 h we started lowering the BHA into the cased part of the existing hole, taking weight at 60 mbsf at 1930 h. Drilling of the 14 $\frac{3}{4}$ inch hole commenced and continued for the remainder of 30 April and through the next day. Drilling reached 500.6 mbsf by midnight on 1 May.

Science Results

The remaining geochemical and X-ray diffraction (XRD) measurements on samples from Hole U1560A were completed. Core description and any further sampling will take place on South Atlantic Transect Expedition 390 or 393.

Outreach

No onboard Outreach Officer is sailing during Expedition 395E. 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 Activities

- Finished measuring cores from Hole U1560A on the tracks. Also completed sample measurements in the Chemistry and XRD Laboratories. Data were transferred to the EPM.
- Deployed the towed magnetometer and collected 3.5 kHz ocean bottom data during the transit to Site U1557.
- Deployed the CTD three times with no issues, with the deepest run at ~4980 mbsl.
- Made a cardboard mock-up of the new X-ray imaging unit, placed it in the planned location in the Core Laboratory, and assessed the feasibility and core flow around this large instrument. Submitted images and comments to the XSCAN team.
- Reviewed Confluence bug list and began addressing issues on the tracks.
- Continued work on the Catwalk vinyl weather doors.
- Prepared and cut split liners for Expedition 395C.
- Started work on a guide for social media and outreach with U.S. Science Support Program and shore staff.

IT Support Activities

- Helped troubleshoot a network connectivity issue with the Dynamic Positioning PC.
- Cleaned up and stabilized the Cleveland server.
- Crowdstrike Falcon Sensor Updates were applied on all servers and workstations.

Developer Activities

- Fixed a problem with the Virtual Photo Table application.
- Fixed broken LORE link.

- Continued work on the GEODESC project.

HSE Activities

- Safety shower and eye wash stations were tested.
- COVID-19 protocols were lifted on Thursday, 14 d after the pilot disembarked.