

**Daily Operational and Science Report**  
**UT-GOM2-2 Coring Expedition**  
**Terrebonne Basin, Gulf of Mexico Outer Continental Slope**

**1. DATE:** 12-August-2023, 0000-2400hr

**2. LOCATION:**

2400 hr, 12-August-2023

Hole: *Helix D/V Q4000* was located over Hole UT-GOM2-2-H003

**Last Drill/Core depth: 7015 ft RKB**

RKB to Mud line: 6506 ft on Drill pipe measurements

Water depth: 6454 ft (updated 05-AUG-2023)

Per Datum: 52 ft

Lat 26°39'46.50488"N, Long 091°40'33.82464"W

**3. DESCRIPTION OF OPERATIONS:**

**0000-2400 At Hole UT-GOM2-2-H003**

General Maintenance: Performed corrosion maintenance in misc. areas and “weekly” maintenance on the vessel cranes. Performed 250-350 psi / 3,000 psi for 5 min test on Full-Opening Safety Valve (FOSV) using vessel mud pumps with 8.3 ppg.

0000-0130 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string  
0130-0300 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string  
0300-0530 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string  
0530-0600 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string  
0600-0930 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string  
0930-1000 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string  
1000-1330 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string  
1330-1500 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string  
1500-1930 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string  
1930-2100 Pump 25 bbl 10.5 ppg Hi-Vis sweep at 75 psi while reciprocating drill string  
2100-2400 Monitor the well while circulating 8.6 ppg SW at 70 psi while reciprocating drill string

**4. OPERATIONAL PLAN (Next 24 Hours):**

Waiting on a replacement blower motor (cooling fan motor) for the Q4000 top drive system (TDS), while conditioning and reciprocating the drill string. Possible installation of TDS blower motor and return to coring operations.

**5. DOWNHOLE LOGGING OPERATIONS:**

Hole: NA

Wireline Totals (directional): NA

**6. CORE OPERATIONS AND DATA:**

Hole: UT-GOM2-2-H003

G-APC Coring Totals: NA

G-XCB Coring Totals: NA

**PCTB-CS Coring Totals: NA**  
**PCTB-FB Coring Totals: NA**

## 7. DOWNHOLE MEASUREMENTS

**Hole: UT-GOM2-2-H003**

**Pressure and Temperature Tool Deployment (T2P): NA**

**Temperature Tool Deployment (APCT-3): NA**

## 8. SCIENCE ACTIVITIES

Upon inspection of the damaged Q4000 TDS blower motor (cooling fan motor) at the Houma Armature Works it was determined that the motor was more severely damaged. The new replacement blower motor, however, is expected to arrive in Houston tonight (12-AUG-23). When it clears customs, the replacement blower motor will be transported to Houma, Louisiana. We hope it will leave Sunday (13-AUG-23) morning and will be flown out by helicopter to the Q4000 (or possibly transported by service boat). Installation of the new blower motor is expected to go quickly. If the blower arrives at the Q4000 on Sunday, we should be able to return to coring operations sometime in the evening 13-AUG-23.

The onboard scientific operations over the last 24-hours continued to focus on processing both conventional and conventionalized core samples previously collected in Hole GOM2-2-H003 (see Figures 1 and 2). One of the critical sample data sets being collected during the expedition includes microbiological samples that are being subsampled on the Q4000 from both conventional and conventionalized cores. Over the last 40 years, our knowledge of viable microbes in deep geological environments has become incorporated into our broader understanding of Earth's biosphere, and of deep subsurface environments that contain methane hydrates. Early studies verified both the presence of microorganisms in hydrate-bearing sediments and that much of the methane found in hydrates originates from microbial methanogenesis. However, knowledge on the distribution of microbial communities, including methanogens, proximal to methane hydrates is lacking. The compositions of microbial communities in different sediment types that exist in hydrate zones is also unknown, yet integral to our understanding of the driving factors responsible for methane hydrate formation. To address these unknowns, sub-samples are being acquired from conventional cores and conventionalized cores collected using pressure coring tools, which were depressurized onboard, and preserved at -80°C (for microbial community analysis) and 4°C (for genomics, organic matter degradation potential, potential for carbonate precipitation, assessment of the presence of single-celled Eukaryotes (Foraminifera), and enumerations of microbial cells). The -80°C stored cores will be further processed at the Geotek facilities in Salt Lake City and preserved as cryo frozen sub-cores for future microbial community characterization.

Shipboard analysis of recovered pressure cores has also continued with detailed X-ray, gamma-density, and compressional-wave scanning of the successfully recovered pressure cores in the Geotek Pressure Core Analysis and Transfer System (PCATS) along with quantitatively degassed pressure cores. Table 1 below includes details on the seven pressure-core (PCTB-CS) deployments in Hole GOM2-2-H003.

*Table 1: PCTB-CS pressure core performance in Hole UT-GOM2-2-H003 through 10-AUG-2023.*

| CORE Top (fbsf) | CORE Bottom (fbsf) | CORE Advance (ft) | Bottom of Hole (RKB ft) | Start Coring Bit Depth (RKB ft) | CORE System | Core Number | Advanced (ft) | Curated length (ft) | Recovery (%) | In situ Pressure (psi) | Tool Boost Set Pressure (psi) | Recovery Pressure (psi) | Date/Time   |
|-----------------|--------------------|-------------------|-------------------------|---------------------------------|-------------|-------------|---------------|---------------------|--------------|------------------------|-------------------------------|-------------------------|-------------|
| 89              | 99                 | 10                | 6595                    | 6595                            | PCTB-CS     | 4           | 10            | 10.63               | 106          | 2920                   | 3500                          | 0                       | 5 Aug 0815  |
| 99              | 106                | 7                 | 6605                    | 6605                            | PCTB-CS     | 5           | 7             | 7.51                | 107          | 2925                   | 3500                          | 3475                    | 5 Aug 1338  |
| 153             | 163                | 10                | 6659                    | 6659                            | PCTB-CS     | 8           | 10            | 8.07                | 81           | 2949                   | 3500                          | 2075                    | 7 Aug 1556  |
| 255             | 265                | 10                | 6761                    | 6761                            | PCTB-CS     | 13          | 10            | 3.94                | 39           | 2994                   | 3500                          | 3531                    | 8 Aug 1623  |
| 290             | 300                | 10                | 6796                    | 6796                            | PCTB-CS     | 15          | 10            | 11.52               | 115          | 3009                   | 3500                          | 0                       | 8 Aug 0148  |
| 364             | 374                | 10                | 6870                    | 6870                            | PCTB-CS     | 19          | 10            | 11.35               | 114          | 3042                   | 3500                          | 3042                    | 9 Aug 1527  |
| 474             | 484                | 10                | 6980                    | 6980                            | PCTB-CS     | 24          | 10            | 11.35               | 114          | 3091                   | 3500                          | 3091                    | 10 Aug 0816 |

We also need to report that we have seen the number of active COVID cases on the vessel increased with four additional members of the drilling crew being quarantined and a third member of the science party testing positive for COVID. Face masking is now required for common areas on the ship where people congregate.

The Scientific Party continued to work on organizing and writing the “Methods” section of the Expedition Report. In addition, we are working to organize our data storage from our activities and we are beginning to write up our results.

## **9. ACRONYMS**

|           |  |
|-----------|--|
| bpm       | Barrels per minute                                   |
| Fish      | The object to be recovered from the borehole/BHA     |
| M/U       | Make up  |
| PCATS     | Pressure Core Analysis and Transfer System           |
| PCTB-CS   | Pressure coring tool with ball-cutting shoe version. |
| POOH      | Pull out of hole                                     |
| psi       | Pounds per square inch                               |
| RIH       | Run in hole  |
| RKB       | Depth measured from the rig floor                    |
| SLB       | Schlumberger   |
| Slickline | Wireline used to deploy and recover core, etc.       |
| TD        | Total depth  |
| TDS       | Top drive system                                     |

# UT-GOM2-2-H003

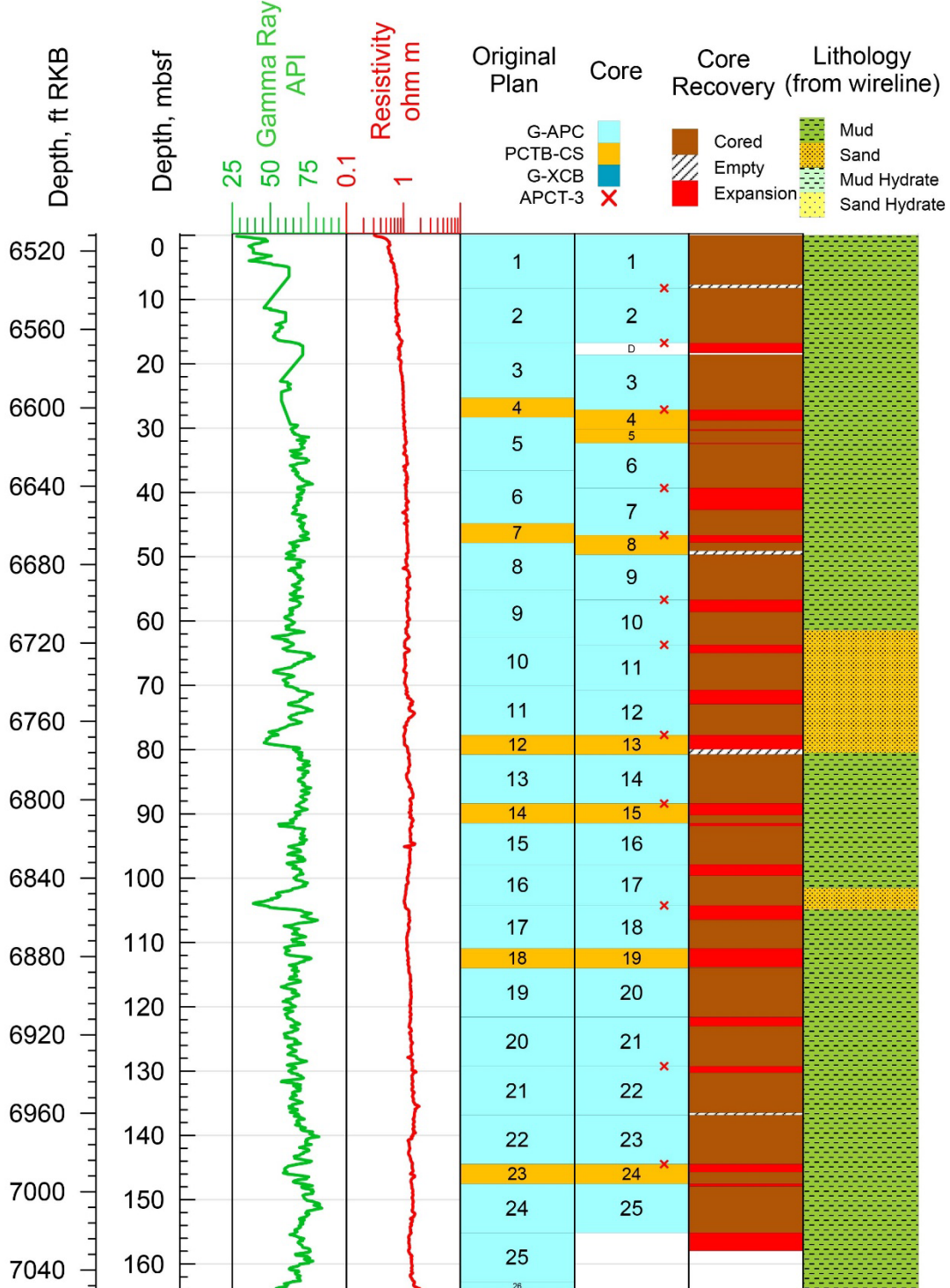


Figure 1: Core recovery plot for the UT-GOM2-2-H003 well as of 24:00 hr 12-AUG-2023. 'G-APC' records core recovered by the Geotek Advanced Piston Corer. 'G-XCB' records core recovered by the Geotech cutting shoe coring cool (the G-XCB core systems has not yet been deployed). 'PCTB-CS' records core recovered by the cutting shoe version of the Pressure Coring Tool with Ball (PCTB). 'APCT-3' records the location where temperatures were measured with a specially instrumented coring shoe.

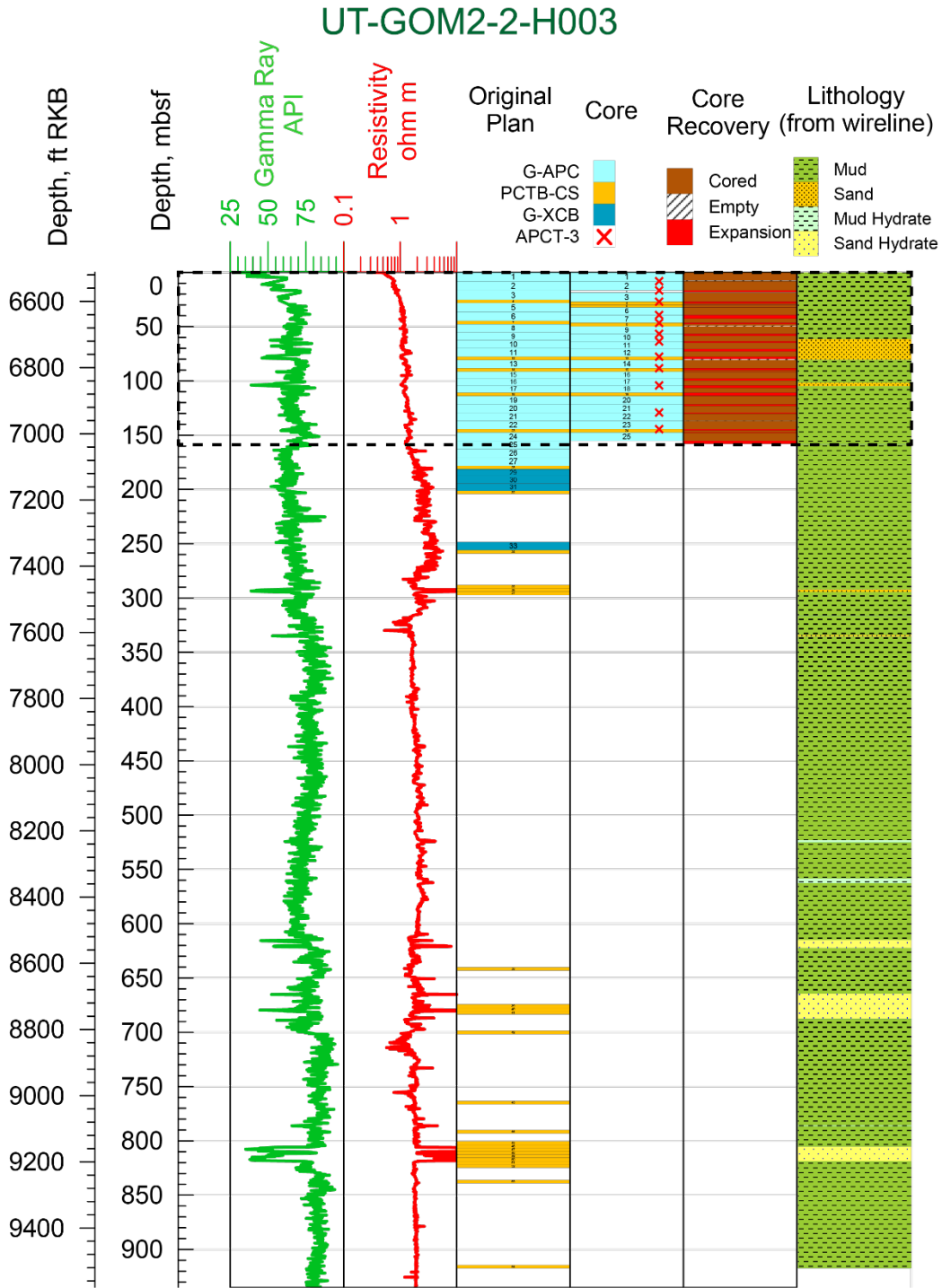


Figure 2: Planned and actual core recovery for the entire UT-GOM2-2-H003 well. 'G-APC', 'PCTB-CS', G-XCB, and 'APCT-3' are defined in the caption to Figure 2. Dashed box defines the interval cored through 24:00 hr 12-AUG-2023.