

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 30 April 2017, 0000-2400hr

**2. LOCATION:**

0000 – 2400 hr, 30 April 2017

Brownsville, TX at the dock in the Keppel Amfels shipyard.

**3. DESCRIPTION OF OPERATIONS:**

UT and Geotek have boarded the Q4000. All Geotek containers have been loaded onto the vessel. Phone and internet have been connected to company man and the 3<sup>rd</sup> party offices. Representatives from UT, Geotek, Helix, Schlumberger, and Weatherford met to discuss the status/plans for rig floor and container operations going forward. These plans include utility connections to Geotek containers, grating installation, Schlumberger wireline rig up through the top drive, Weatherford instrumentation, and mouse-hole installation/modification. The current priority is for Helix to finish loading and load-testing before the above operations can continue.

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

We are scheduled to depart from Brownsville tomorrow morning, May 1, at 0700. The plans discussed above will continue during the transit to GC 955.

**5. DOWNHOLE LOGGING OPERATIONS:**

**Hole:** NA

**LWD Totals:** NA

**Wireline Totals:** NA

**6. CORE DATA:**

**Hole:** NA

**PCTB Coring (pressure coring) Totals:** NA

**7. Science Activities**

NA

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 01 May 2017, 0000-2400 hr

**2. LOCATION:**

0000 – 0750 hr, 01 May 2017

Brownsville, TX

0750 – 2200 hr, 01 May 2017

Transit

2200 – 2400

Stationary offshore

**3. DESCRIPTION OF OPERATIONS:**

At 0750 hr the *Q4000* left the dock and was guided by the harbor pilot through the channel towards South Padre Island. At 1020 hr the vessel entered the Gulf of Mexico, and continued offshore at 1105 after the pilot disembarked. At 1300 there was a fire drill. Geotek gained access to clean freshwater for their containers. Most activities are paused until Helix finishes sea trials for the vessel.

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

The *Q4000* will stop and ballast late today and then Helix will perform sea trials of various vessel functions starting this evening, and should be complete by Wednesday. The transit to Green Canyon 955 will continue after the tests.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities:**

Reviewed drilling program and coring plan.

**Daily Operational and Science Report  
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**1. DATE:** 02 May 2017, 0000-2400 hr

**2. LOCATION:**

0000-2400 hr, 02 May 2017

26.1025° N, 96.05967° W

Approximately 60 nmi offshore South Padre Island, TX

**3. DESCRIPTION OF OPERATIONS:**

The Q4000 has remained stationary offshore while conducting a variety of tests. Geotek worked on organizing their containers and are awaiting electrical connections.

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

Helix will continue their FMEA sea trials.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party has been reviewing the drilling and coring plan.

**Daily Operational and Science Report  
UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 03 May 2017, 0000-2400hr

**2. LOCATION:**

0000 -2400 hr, 03 May 2017  
26.1025° N, 96.05967° W  
Approximately 60 nmi east of South Padre Island, TX

**3. DESCRIPTION OF OPERATIONS:**

The *Q4000* remained stationary and Helix completed FMEA tests. Geotek gained electrical power to their equipment and started one their chilling units.

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

After a crew change in the morning of 04 May 2017, the *Q4000* will de-ballast and begin transit to GC955. Forecasted strong winds may cause delays.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party has been reviewing the drilling and coring plan.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 04 May 2017, 0000-2400hr

**2. LOCATION:**

0000 – 1800 hr, 04 May 2017  
26.1025° N, 96.05967° W  
Approximately 60 nmi east of South Padre Island, TX  
1800 – 2400 hr, 05 May 2017  
Transit towards GC995

**3. DESCRIPTION OF OPERATIONS:**

Helix completed a crew change through the morning and afternoon with three helicopter flights. After transfers were complete, the *Q4000* was de-ballasted and began to transit towards GC955. Helix began installing the grating around Geotek's containers. Geotek continued to organize and inventory their equipment.

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

The *Q4000* will continue its transit to the northeast with an expected arrival at GC955 late on 06 May 2017.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party has been reviewing the drilling, coring and sampling plan.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 05 May 2017, 0000-2400 hr

**2. LOCATION:**

0000 – 2400 hr, 05 May 2017

**3. DESCRIPTION OF OPERATIONS:**

The *Q4000* continued transit towards GC955 throughout the day. Grating is installed around Geotek's containers and they are continuing to set up their equipment. UT, Helix, Geotek and all third parties had a pre-spud meeting to discuss the expedition objectives and the operational plan. Schlumberger and Helix worked on rigging up the wireline equipment to the top drive.

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

The *Q4000* is expected to arrive at GC955 at 1530 on 06 May 2017. The supply boat is ready and will arrive on Saturday.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party continued to review and refine the drilling and coring plan.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 06 May 2017, 0000-2400hr

**2. LOCATION:**

0000 – 1640 hr, 06 May 2017  
Transit to GC955  
1640 hr – 2400 hr  
On site at GC955-H002

**3. DESCRIPTION OF OPERATIONS:**

The Q4000 arrived 1 nmi from GC955-H002 at 1600 hr after a 307 nmi transit. The wireline equipment is now rigged up to the top drive. Geotek continued to prepare their equipment. The ROV was launched at 2040 to deploy four Compatt transponders and survey the site area. The H001 well was found at 2247 hr at a location of 27° 00.05126' N, 090° 25.58367' W in a WGS84 coordinate system. The condition of the top of the borehole is intact.

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

The supply boat is scheduled to arrive early 07 May 2017 and will be offloaded much of the day. Drilling mud will be offloaded and mixed. On-site mobilization will continue in preparation for the flow test. UT will work to unpack and organize the mud lab.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party continued to work on resolving the coring points and sampling protocols.

**Daily Operational and Science Report  
UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 07 May 2017, 0000-2400hr

**2. LOCATION:**

0000 - 2400 hr, 07 May 2017  
GC955H

**3. DESCRIPTION OF OPERATIONS:**

A partial crew change occurred via three helicopter flights. The supply boat was offloaded over most of the day; drilling mud, gel, and the mud lab were brought on board. The as-found survey with the ROV was completed. Geotek did a trial run of attaching an autoclave to PCATS. Helix increased the voltage at Geotek's containers to 204 V. Helix worked on installing the HVAC system for the mud pumps. Weatherford installed a new interface and software to record active signals during drilling.

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

Potable water and fuel will be transferred to the *Q4000*. Helix will make up doubles in drill pipe. The flow test is planned to occur sometime on 08 May 2017.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party worked to finalize the location of the H002 well based on the 'as found' location of the H001 borehole. The final location of the H002 well was selected to be: 27° 0.0460' N 90° 25.5930 W in the WGS84 coordinate system. This is 59 ft SSW from the existent H001 borehole. The Science Party worked on planning the expedition report.



# **Daily Operational and Science Report**

## **UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 08 May 2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 08 May 2017  
Green Canyon 955  
UT-GOM2-1-H002

**3. DESCRIPTION OF OPERATIONS:**

There was a fire/abandon ship drill at 0819 hr. The supply boat transfer was completed and the boat departed at 1227 hr. The mud lab was placed into location and hooked up to utilities. Helix finished installing the duct work for the mud pumps. Helix made up ~2300 ft of drill pipe between 1400-1930 hr and then between 1940-2200 hr brought up and laid down pipe in doubles. Starting at 2015 hr, Weatherford software began logging top drive data; they now can record all drilling parameters, except the stroke counter on the mud pumps. Helix performed pressure testing of the upper and lower IBOP valves and the wireline night cap starting at 2315 hr.

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

The BHA will be picked up in the morning of 09 May 2017 to begin PCTB flow testing. Geotek will install the cold shuck and chillers. There will be three to four helicopter flights tomorrow for additional crew change and the arrival of the remainder of the science party.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

**7. Science Activities**

The science party continued to refine coring points. Geotek trained UT personnel in quantitative degassing. UT worked on setting up the mud lab for sampling.

# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 09 May 2017, 0000-2400hr

**2. LOCATION:**

0000 -2400 hr, 09 May 2017  
UT-GOM2-1-H002

**3. DESCRIPTION OF OPERATIONS:**

0200        Pressure test of wireline night cap  
0310        Pressure test of lower IBOP  
0545        Pressure test of upper IBOP  
0930 hr     BHA picked up in preparation of the flow test.  
1230-1300   Space out with PCTB and instrumented core barrel

1621-1646 hr

**Surface Pump Test 1 PCTB-CS**

Bit just above sea surface below ship  
0-140 SPM; 0-28 GPM  
33-1450 psi standpipe pressure (Weatherford)

1653-1710 hr

**Surface Pump Test 2 PCTB-CS**

Bit just above sea surface below ship  
0-140 SPM; 0-28 GPM  
19-1824 psi standpipe pressure (Weatherford)

1953-2022 hr

**Surface Pump Test 3 (cement pump) PCTB-CS**

Bit just above sea surface below ship  
0.5-8.0 barrels per minute (BPM); 21-40 GPM  
80-1055 psi standpipe pressure (Weatherford need to confirm source)

2130 hr     Space out of cementing core barrel in outer core barrel

2205        Space out of center bit in outer core barrel

There were three helicopter flights for crew change, and the remainder of the science party arrived at 1445 and went through the safety orientation.

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

Trip pipe to the seafloor (~10 hrs). Run a pump test just above the seafloor. Spud hole near the end of 10 May 2017.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

## **6. CORE DATA:**

NA

## **7. Science Activities**

Preliminary analysis of data from Geotek instrumented core liner shows only small pressure differentials across the core liner during each of the three Surface Pump Test of the PCTB-CS as conducted on 09-May-17. The instrumented core liner upon visual inspection did not exhibit any damage or deformation.

The science party met to discuss the plan for the expedition report and began working on report chapters. The official hole names for this expedition are UT-GOM2-1-H002 and UT-GOM2-1-H005.

# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 10-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 10-May-2017  
Green Canyon 955  
UT-GOM2-1-H002

**3. DESCRIPTION OF OPERATIONS:**

0000-0015 JSA in support of BHA MU  
0015-0215 Continue to MU BHA (PCTB-CS) with drill collars  
BHA: 203.12ft drifted BHA W/ 4.105" drift  
0215-1200 MU in RIH BHA (PCTB-CS) and DP, fill with seawater  
1200-1630 Continue to RIH BHA (PCTB-CS) F/ 4929ft T/ 6550ft  
Drifted each joint W/ 4.125" drift.  
1630-1700 JSA/TBT in support of PCTB-CS pump test  
Vessel off lump sum mobilization  
1700-1930 Change bails on TDS, stage PCTB-CS, RU wireline  
1930-2110 MU and RIH instrumented core barrel F/surface T/6545ft and POOH  
2110-2230 RIH instrumented core barrel F/surface T/6200ft  
**Seafloor Pump Test X PCTB-CS (incomplete test)**  
Bit just above sea surfloor  
Using Hex Pump 2 switched to Hex Pump 1 (circulating seawater)  
Hex Pump 2: 30 SPM; 150 GPM; 32 psi (Weatherford)  
Hex Pump 1: 30 SPM; 150 GPM; 18 psi (Weatherford)  
2230-2235 Shutdown Hex Pump 1 because of electrical problem  
2235-2315 **Seafloor Pump Test 1 PCTB-CS**  
Bit just above seafloor  
Using Hex Pump 2 (circulating seawater)  
0-140 SPM; 0-700 GPM  
16-1922 psi standpipe pressure (Weatherford)  
2315-2400 **Seafloor Pump Test 2 (cement pump) PCTB-CS**  
Bit just above seafloor  
0.5-7.0 barrels per minute (BPM); 21-40 GPM  
1.0-239 psi standpipe pressure (Schlumberger gauge)

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

Update: Spudded hole UT-GOM2-1-H002 at 08:53 on 11-May-2017. Tagged seafloor, drill pipe measured depth 6719 ft. Coordinates: Lat: 27° 00.04548', Long: -90° 25.59312' (WGS 84).

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

## 6. CORE DATA:

NA

## 7. Science Activities

The PCTB-CS pressure core BHA reached near the seafloor (6716 MD) at 2110hr and the Geotek instrumented core barrel was deployed in preparation for conducting a series of seafloor level pump tests. The first attempted seafloor pump test was not completed because of an electrical problem associated with one of the ship's mud pumps. However, two additional seafloor pump tests were completed without any concerns. The pump tests also allowed for the analysis of the performance of all three pump units on the platform (i.e., Hex Pumps 1 and 2; and the Schlumberger cement pump). Analysis of data obtained from both the sea surface and seafloor pump test documented only small pressure differentials across the core liner for all of the completed tests. In addition, the instrumented core liner was not damaged during any of the completed pump test. Modifications to the drilling fluid flow paths through the PCTB-CS appear to have significantly reduced the internal pressure conditions that have in the past resulted in the collapse of core liners within the PCTB-CS system. The pump tests also represented an excellent opportunity for Geotek and the Q4000 rig crew to become familiar with operations and handling of the PCTB-CS pressure core system as deployed on this expedition.

The Science Party continued to work on core handling and sample plans in preparation for the spuding of the UT-GOM2-1-H002 hole now scheduled for early on 11-May-17. In addition, Geotek technical staff and UT scientists have reviewed and further refined the planned pressure core degassing experimental protocols that will be used to conduct new "slow degassing protocols".

*Confirmed following shipboard conversions (Geotek, UT, etc.):*

*-Mud pumps 5.04 US Gallons per stroke, will use 5.0 GPM/stroke in calculations*

*-US barrels to US gallons (1bbl = 42 gallons)*

# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 11-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 11-May-2017  
Green Canyon 955  
Hole UT-GOM2-1-H002  
Lat: 27° 00.04548', Long: -90° 25.59312' (WGS 84)  
Water depth: 6667.0 ft (6719.0 ft RKB)  
Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0100 Complete the PCTB-CS Seafloor Pump Test 2 from 10-May-2017  
Flow test Hex Pump 1 (unable to maintain pump rate)  
0100-0500 Prepare to spud Hole UT-GOM2-1-H002  
POOH instrumented core barrel F/6454 T/surface  
JSAs to deal with PCTB-CS and wireline systems  
MU and RIH PCTB-CS center bit barrel  
MU wireline night cap to TDS  
0500-0530 Test wireline night cap on TDS to 5000 psi  
0530-0600 Held Spud meeting with all personnel involved  
0600-0630 RIH DP F/6550ft T/6709ft  
0630-0730 *D/S Q4000* DP moved over proposed drill site  
0730-0830 RIH and tagged mudline at 6719.0 ft RKB  
Pull clear of mudline a reset data loggers  
0830-1200 Spud Hole UT-GOM2-1-H002 at 6667.0 ft (6719.0 ft RKB).  
Advance hole to 6992.0 ft RKB (273.0 fbsf)  
BSEE inspection (Inspectors Campo, Boudreaux, Fry, Shedd  
1200-2300 Advance hole to 8032.0 ft RKB (1313.0 fbsf)  
2300-2400 Circulate hole clean with 8.6 ppg mud

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

Continue to advance Hole UT-GOM2-1-H002 to planned first core point at 8062.0 ft RKB (1343.0 fbsf), deploy and conduct continuous pressure coring with the PCTB-CS system.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

NA

## 7. Science Activities

In the last 24 hours, spudded and advanced Hole UT-GOM2-1-H002 to a depth of 8032.0 ft RKB (1313.0 fbsf) by midnight without any significant problems. Geotek completed preparations for coring operations and developed plans for simulated core runs to be conducted before reaching core point as planned for the morning of 12-May-17. The UT Scientific Party refined and finalized the Hole UT-GOM2-1-H002 core plan and continued to work on the “Methods Section” writing assignments in support of the expedition initial results volume. The UT Scientific Party also continued to develop the core handling and processing plan. Based on 1) lateral correlation with seismic data from Hole GC955-H as drilled under the Gulf of Mexico Gas Hydrate Joint Industry Project Leg II (GOM JIP Leg II) in 2009 to the Hole UT-GOM2-1-H002 and 2) the seafloor depth at UT-GOM2-1-H002, the first pressure core point (Core UT-GOM2-1-H002-01) was set at 8062.0 ft RKB (1343.0 fbsf). Posted below is the finalized core plan for Hole UT-GOM2-1-H002.

GC955 H002 Coring Plan	
Water Depth (tvds)	6667
Rig Floor elevation above sl. (ft)	52
mud line depth RKB	6719
Hydrate Top (fbsf)	1358
Hydrate top (RKB)	8077
Hydrate Bottom (fbsf)	1444
core length (ft)	10
wash interval (ft)	10

Core #	Top (fbsf)	Bottom (fbsf)	Top (RKB)	Bottom (RKB)
1	1343	1353	8062	8072
2 (hydrate top in middle)	1353	1363	8072	8082
3	1363	1373	8082	8092
4	1373	1383	8092	8102
5	1383	1393	8102	8112
6	1393	1403	8112	8122
Drill/Wash	1403	1429	8122	8148
7	1429	1439	8148	8158
8 (hydrate base in middle)	1439	1449	8158	8168
9	1449	1459	8168	8178
10	1459	1469	8178	8188
Drill/Wash	1469	1719	8188	8438

## Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 12-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 12-May-2017  
Green Canyon 955  
Hole UT-GOM2-1-H002  
Lat: 27° 00.04548', Long: -90° 25.59312' (WGS 84)  
Water depth: 6667.0 ft (6719.0 ft RKB)  
Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0030 At Hole UT-GOM2-1-H002  
Continue to circulate hole clean and fill with F/8.6 ppg T/10.5 ppg mud

0030-0230 Performed coring simulations drilling down:  
F/ 8032 ft MD T/ 8042 ft MD  
F/ 8042 ft MD T/ 8052 ft MD  
F/ 8052 ft MD T/ 8062 ft MD

0230-0330 Circulate hole clean and fill with 10.5 ppg mud

0330-0730 Prepare to acquire Core UT-GOM2-1-H002-01  
JSA to review wireline operations  
Transfer PCTB-CS tools to rig floor  
Recover PCTB-CS center bit  
RU and RIH PCTB-CS F/Surface T/8062 ft RKB  
Circulate hole clean and fill with 10.5 ppg mud

0730-0900 **Core UT-GOM2-1-H002-01, F/8062 T/8072 ft MD: Recovered 2.26 ft, 0 psi**

0900-0930 Recover PCTB-CS inner core barrel  
Upon recovery stab into vertical cold shuck  
Upon inspection of core barrel discovered sample was not pressurized  
Pressure boost failed to fully-charge the PCTB-CS autoclave

0930-1010 **Conduct PCTB-CS BHA Water Test 1**  
Standard PCTB-CS configuration (with polypack seals)  
RIH F/ Surface T/ 8072 ft RKB, lock tool into BHA  
POOH PCTB-CS with standard pulling tool  
Upon inspection (0 psi) pressure boost failed  
Pressure boost failed to charge PCTB-CS autoclave

1010-1230 **Conduct PCTB-CS BHA Water Test 2**  
Upper seal changed to a 0-ring to allow limited fluid transfer  
RIH F/ Surface T/ 8072 ft RKB, lock tool into BHA  
POOH PCTB-CS with standard pulling tool  
Upon inspection (0 psi) pressure boost failed  
Pressure boost failed to charge PCTB-CS autoclave



1230-1830 Prepare to acquire Core UT-GOM2-1-H002-02  
 JSA to review wireline operations  
 PU and RIH PCTB-CS F/Surface T/8072 ft RKB  
 Circulate hole clean and fill with 10.5 ppg mud

1830-1900 **Core UT-GOM2-1-H002-02, F/8072 T/8082 ft MD: Recovered 5.33 ft, 0 psi**

1900-1945 Recover PCTB-CS inner core barrel  
 Upon inspection the core did not retract and the ball valve did not close

1945-2230 Prepare to acquire Core UT-GOM2-1-H002-03  
 PU and RIH PCTB-CS F/Surface T/8082 ft RKB  
 Circulate hole clean and fill with 10.5 ppg mud

2230-2330 **Core UT-GOM2-1-H002-03, F/8082 T/8092 ft MD: Recovered 1.08 ft, 0 psi**

2330-2400 Recover PCTB-CS inner core barrel  
*Note from 13-May-2017 UT-GOM2-1 Daily Operational and Science Report:  
 The PCTB-CS inner core barrel would not unlatch from the coring BHA using  
 the standard recovery tool. After several hours of attempting to free the tool, the  
 Geotek emergency release tool was used to successfully release the inner core  
 barrel; however, the normal functioning of this tool will not activate the ball  
 valve or other tool functions resulting in the depressurization of the core.*

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

Continue to advance Hole UT-GOM2-1-H002 with continuous pressure coring with the PCTB-CS system.

**5. DOWNHOLE LOGGING OPERATIONS:**

NA

**6. CORE DATA:**

**PCTB-CS Coring (pressure coring) Totals: 3 core, 30.0 ft cored; 8.67 ft recovery**

**Core UT-GOM2-1-H002-01**

**F/8062 T/8072 ft MD: Recovered 2.26 ft, 0 psi**

**Performed coring operations F/ 8062 ft T/ 8072'**

**Drilling/Coring Parameters : 50 RPM w/ 3.5 K torque and cement unit circulating 10.5 ppg WBM at 125 gpm and standpipe pressure of 15 psi, ROP 5-15 ft/hr, WOB 2-6 tons, With polypack diverter seal.**

**Core start time 0745 hr; Core end time 0840 hr; Core on deck at 0917 hr.**

Core barrel recovered on deck with ball valve closed but with little to no pressure in the autoclave. Core UT-GOM2-1-H002-01, which was the first core acquired during this expedition, recovered 2.26 ft of core in poor condition and failed to retain pressure. The deployment, cutting, and recovery of the core appeared to be conducted without any problems. We did not see any trouble with the latching of the tool or it's deployment in the pipe. But it took more than 6,000 lbs of pull to unlatch the tool from the BHA. The cutting of the core on bottom also appeared to be good with somewhat variable penetration rates and weight on bit. Upon recovery, the ball valve was closed but the pressure boost appeared not to have pressurized the autoclave below the new flow diverter set above the upper autoclave seal (polypack seals). It was speculated that the interaction of the new upper seal and flow diverter

had created a pressure seal (hydraulic lock) that did not allow the pressure charging of the autoclave. Two additional PCTB-CS operational tests were conducted in the open drillpipe (while not in contact with the sediment) that appeared to confirm that there was some form of pressure block in the tool. It is also important to add that the spring type core catcher was damaged upon recovery, showing evidence of inverted and twisted fingers.

**Core UT-GOM2-1-H002-02**

**F/8072 T/8082 ft MD: Recovered 5.33 ft, 0 psi**

**Drilling/Coring Parameters : 60 RPM w/ 3.5 K torque and cement unit circulating 10.5 ppg WBM at 125 gpm and standpipe pressure of 15 psi, ROP 20-90 ft/hr, WOB 1-20 tons, With O-ring diverter seal.**

**Core start time 1840 hr; Core end time 1857 hr; Core on deck at 2430 hr.**

Tool recovered on deck. Ball valve not closed; core liner visible through ball valve (no pressure). Core did not retract into the autoclave. The upper threaded connection of the liner to the top of the core plug was broken and the core catcher was damaged indicating that the core likely jammed, which caused core milling and the breaking of the liner. It also took about a 6000 lb pull to unlatch the inner core barrel from with the BHA during the recovery of the core. We have concluded that the main factor affecting/limiting our core recovery, core quality and sometime creating tool damage (preventing recovery under pressure) is 'formation jamming'. This happens when the formation is forced up inside the cutting shoe, without the core having been correctly cut and the cuttings removed. This can happen as a result of ship's movement indicated by the rapid and significant changes to the weight on bit (WOB).

**Core UT-GOM2-1-H002-03**

**F/8082 T/8092 ft MD: Recovered 1.08 ft, 0 psi**

**Drilling/Coring Parameters : 60 RPM w/ 3.5 K torque and cement unit circulating 10.5 ppg WBM at 125 gpm and standpipe pressure of 15 psi, ROP 7-24 ft/hr, WOB 5-15 tons, With O-ring diverter seal.**

**Core start time 2225 hr; Core end time 2315 hr; Core on deck at 0245 hr (13-May-17).**

Core UT-GOM2-1-H002-03 failed to hold pressure; however, it did return core to the surface. This failure of the core system to retain pressure was attributed to the fact that the retrieval of the inner core-barrel required a special procedure to release it from the latches in the BHA. We did not see any trouble with the deployment and latching of the tool before coring. The actual core cut event appeared to be good with somewhat variable penetration rates and weight on bit. However, at the end of the test the inner core-barrel was stuck in the BHA. The rig crew and Geotek staff core team managers worked with the Schlumberger wireline engineer for nearly four hours to unlatch the core barrel from the BHA. Eventually, the decision was made to use a special emergency release procedure that was successful but also presents the ball-valve on the tool from closing.

## **7. Science Activities**

The 'conventionalized' core material from each core was transferred to the UT mud lab whole rounds were subsampled and preserved for shore-based geochemistry, microbiology, and physical properties. Head space gas samples were sampled for shore-based analyses. A total of 2.65 ft was sampled as whole rounds and the remaining 6.02 ft was archived for shore-based splitting and description. Based on a quick description of core ends, the primary lithology in the recovered cores ranges from sandy silt with clay to silty sand with clay. A sample of drilling fluid was sampled and preserved to characterize potential contamination.

# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 13-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 13-May-2017  
Green Canyon 955  
Hole UT-GOM2-1-H002  
Lat: 27° 00.04548', Long: -90° 25.59312' (WGS 84)  
Water depth: 6667.0 ft (6719.0 ft RKB)  
Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0400 At Hole UT-GOM2-1-H002  
Core UT-GOM2-1-H002-03 core barrel would not unlatch from the BHA  
Pumped numerous mud sweeps and worked SLB slickline to free tool  
Deployed Geotech Coring -- Emergency Recovery Tool  
0345 unlatch and recovered tool to the surface via SLB slickline

0400-0630 Prepare to acquire Core UT-GOM2-1-H002-04  
Assemble new core barrel  
JSA to review coring and wireline operations  
RU and RIH PCTB-CS F/Surface T/8135 ft RKB

0630-0900 SLB slickline dropped core barrel off wireline  
Work and pull core barrel with Geotech Coring -- Emergency Recovery Tool  
POOH PCTB-CS F/8092 ft RKB T/Surface

0900-1300 Prepare to acquire Core UT-GOM2-1-H002-04  
Assemble new core barrel  
RU and RIH PCTB-CS F/Surface T/8092 ft RKB

1300-1330 **Core UT-GOM2-1-H002-04, F/8092 ft T/8102 ft MD: Recovered 4.6 ft, 3372 psi**

1330-1530 Recover PCTB-CS inner core barrel  
Upon recovery stabbed into vertical cold shuck  
Upon inspection of core barrel was confirmed to be pressurized

1530-1930 Prepare to acquire Core UT-GOM2-1-H002-05  
Rebuild upper and lower section of PCTB-CS  
RU and RIH PCTB-CS F/Surface T/8102 ft RKB

1930-2000 **Core UT-GOM2-1-H002-05, F/8102 ft T/8112 ft MD: Recovered 3.1 ft, 0 psi**

2000-2400 Recover PCTB-CS inner core barrel  
Difficulty unlatching PCTB-CS outer barrel  
Work and pull core barrel with SLB slickline  
Upon inspection of core barrel it was confirmed not to be pressurized

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

Continue to advance Hole UT-GOM2-1-H002 with continuous pressure coring with the PCTB-CS system.

## 5. DOWNHOLE LOGGING OPERATIONS:

NA

## 6. CORE DATA:

**PCTB-CS Coring (pressure coring) Totals: 2 core, 20.0 ft cored; 7.7 ft recovery**

### **Core UT-GOM2-1-H002-04**

**F/8092 ft MD T/8102 ft MD: Recovered 4.6 ft, 3372 psi**

**Performed coring operations F/ 8092 ft MD T/ 8102 ft MD**

**Drilling/Coring Parameters: 60 RPM w/ 3-6 K torque and Hex Pump 2 circulating 10.5 ppg WBM at 280 gpm and standpipe pressure of 12 psi, ROP 20 ft/hr, WOB 2-6 tons, with no seals in the diverter.**

Core UT-GOM2-1-H002-04 was recovered on deck with ball valve closed and at an internal autoclave pressure of 3372 psi, which was the first core acquired during this expedition at pressure. The deployment and recovery of the PCTB-CS core barrel was conducted without any problems. The cutting of the core at the bottom of the hole also appeared to be good with almost constant core penetration rates and weight on bit. Upon recovery, the PCTB-CS core barrel was placed in the vertical ice-shuck on the rig floor. The internal pressure of the PCTB-CS autoclave when received in the Geotech Coring Service Van measured 3372 psi, which is slightly less than the expected hydrostatic pressure at the depth of the cored reservoir section at this site. In the PCATS lab, an X-ray scan of the PCTB-CS autoclave revealed 4.6 ft (140 cm) section of sediment core and 4.0 ft (123 cm) sediment fill above the core rabbit, which indicates that formation sediment had been fluidized during coring and flowed up into the core liner through the small ports in the rabbit. The Geotek PCATS X-ray image of the recovered core section, from below the core rabbit, measured a total thickness of 4.6 ft (140 cm) and the following characteristics with depth along the core: **00-53 cm** sheared and biscuited core section with an upward decreasing bulk density trend, with the upper 32.0 cm of this section characterized by peak P-wave velocities ranging from 2,500 to over 3,200 m/s indicating the presence of a highly saturated gas hydrate-bearing sediments; **53-102 cm** is also characterized by an upward decreasing bulk density trend and several 10-25 cm thick intervals exhibiting velocities as high as 3,400 m/s also indicating the presence of gas hydrate ; **102-140 cm** is a third upward decreasing bulk density section with a relatively massively-bedded 23 cm thick high velocity likely hydrate bearing unit. The PCATS cut plan for this core is under review, but it is likely that most of this core will be preserved for post expedition analysis and some sections may be selected for quantitative degassing.

### **Core UT-GOM2-1-H002-05**

**F/8102 ft MD T/8112 ft MD: Recovered 3.1 ft, 0 psi**

**Performed coring operations F/8102 ft MD T/8112 ft MD**

**Drilling/Coring Parameters: 60 RPM w/ 4-8 K torque and Hex Pump 2 circulating 10.5 ppg WBM at 100-225 gpm and standpipe pressure of 12 psi, ROP 40-60 ft/hr, WOB 4-12 tons, with no seals in the diverter.**

**Core start time 1947 hr; Core end time 2000 hr; Core on deck at 2323 hr.**

For Core UT-GOM2-1-H002-05, the ball-valve failed to close or hold pressure; however, it did return core to the surface. For Core UT-GOM2-1-H002-05 the tool was recovered to the rig floor with the ball-valve closed but not sealed. Silt and sand was found packed between the ball

valve and seal; and the seal appeared to be damaged. We also had significant trouble unlatching this tool from the BHA during recovery, which may also have been caused by the impact of silt/sand on the operation of the latch system within the PCTB-CS BHA. Core UT-GOM2-1-H002-05 did recover 3.1 ft (94 cm) of non-pressurized core that was transferred and processed through the onboard UT core processing lab.

## **7. Science Activities**

In the last 24 hours, Hole UT-GOM2-1-H002 was advanced from 8092 ft MD to 8112 ft MD with 2 PCTB-CS pressure cores (Core UT-GOM2-1-H002-04 and Core UT-GOM2-1-H002-05). Only Core UT-GOM2-1-H002-04 was recovered near its pre-set pressure, the other PCTB-CS failed to hold pressure. PCATS processing and scans yielded significant evidence (i.e., P-wave velocities) for the occurrence of gas hydrate at high concentrations in Core UT-GOM2-1-H002-04. The failure of Core UT-GOM2-1-H002-05 has been attributed to problems associated with sand and silt interfering with the operations of the ball-valve in the PCTB-CS core system.

The Core UT-GOM2-1-H002-05 ‘conventionalized’ core material was transferred to the UT mud lab and a whole round was subsampled and preserved for shore-based physical property measurements. A head space gas sample was also acquired for post expedition analysis. A total of 0.17 ft (5 cm) was sampled as whole rounds and the remaining 2.93 ft (89 cm) was archived for shore-based analysis. Based on a quick description of core ends, the primary lithology in this core is sandy silt at the bottom and silty sand at the top. A sample of drilling fluid and a sample of PCATS water were collected and preserved to characterize potential core contamination in support of the geochemistry and microbiological analyses.

## Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition

1. **DATE:** 14-May-2017, 0000-2400 hr

2. **LOCATION:**

0000 - 2400 hr, 14-May-2017

Green Canyon 955

Hole UT-GOM2-1-H002

~~Lat: 27° 00.04548', Long: -90° 25.59312' (WGS 84)~~

**Corrected Location: Lat: 27° 00.04154', Long: -90° 25.58715' (WGS 84)**

Water depth: 6667.0 ft (6719.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

3. **DESCRIPTION OF OPERATIONS:**

0000-0200 At Hole UT-GOM2-1-H002

Prepare to acquire Core UT-GOM2-1-H002-06

Rebuild upper and lower section of PCTB-CS

RU and RIH PCTB-CS F/Surface T/8112 ft RKB

0200-0230 **Core UT-GOM2-1-H002-06, F/8112 ft T/8122 ft MD: Recovered 5.2 ft, 0 psi**

Stop coring and monitor hole until returns stop

0230-0315 Recover PCTB-CS inner core barrel

POOH PCTB-CS F/8122 ft RKB T/Surface

Upon inspection of core barrel it was confirmed not to be pressurized

0315-0730 Prepare to acquire Core UT-GOM2-1-H002-07

Rebuild upper and lower section of PCTB-CS

RU and RIH PCTB-CS F/Surface T/8122 ft RKB

0730-0830 **Core UT-GOM2-1-H002-07, F/8122 ft T/8132 ft MD: Recovered 1.5 ft, 0 psi**

Stop coring and monitor hole until returns stop

0830-0920 Recover PCTB-CS inner core barrel

POOH PCTB-CS F/8132 ft RKB T/Surface

Upon inspection of core barrel it was confirmed not to be pressurized

Noted cut O-ring on ball valve of core barrel

0920-1330 Prepare to acquire Core UT-GOM2-1-H002-08

Rebuild upper and lower section of PCTB-CS

RU and RIH PCTB-CS F/Surface T/8132 ft RKB

1330-1400 **Core UT-GOM2-1-H002-08, F/8132 ft T/8142 ft MD: Recovered 4.6 ft, 0 psi**

Stop coring and monitor hole until returns stop

1400-1530 Recover PCTB-CS inner core barrel

POOH PCTB-CS F/8142 ft RKB T/Surface

Upon inspection of core barrel it was confirmed not to be pressurized

Noted ball-valve did not accurate

1530-1630 Hole UT-GOM2-1-H002 TD at 8142 ft RKB (1423 fbsf)

Pumped 280 bbls of 10.5 ppg to sweep hole clean

1630-1730 Prepare for wireline logging operations

JSA and TBT in support of logging program

Install wireline logging sheaves  
 1730-1830 POOH BHA F/8142 ft RKB (1423 fbsf) T/7680 ft RKB (961 fbsf) at 5min/90ft  
 1830-2040 **Conduct wireline logging operations in UT-GOM2-1-H002**  
 JSA and TBT in support of logging program  
 Move logging tools from moonpool to rig floor  
 RU logging wireline through travel block and TDS  
 MU logging wireline packoff in TD  
 Terminate logging wireline cable head  
 MU logging tools and build logging string in DP  
 2040-2400 RIH with EDTC-HRLA-GPIT, DP set at 7680 ft RKB (961 fbsf)  
 Logging tool string includes Induction Inclinator  
 WL tools unable to pass 8045 ft RKB (1326 fbsf)  
 Obtain up hole log run from F/8045 ft RKB T/7680 ft RKB (Repeat Pass)  
 RIH with EDTC-HRLA-GPIT F/7680 ft RKB T/8045 ft RKB  
 Obtain up hole log run from F/8045 ft RKB T/7680 ft RKB (Main Pass)  
 Continue up hole log run to obtain seafloor log depth at 6704 ft RKB.  
 POOH logging tool string F/7680 ft RKB to T/5000 ft RKB

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

Complete wireline logging program in Hole UT-GOM2-1-H002, set cement plug and abandon Hole UT-GOM2-1-H002, move to location of Hole UT-GOM2-1-H005, and MU BHA and RIH.

**5. DOWNHOLE LOGGING OPERATIONS:**

Wireline Logs: EDTC-HRLA-GPIT F/7680 ft RKB T/8045 ft RKB (Main Pass)  
 Wireline Logs: EDTC-HRLA-GPIT F/7680 ft RKB T/8045 ft RKB (Repeat Pass)

**6. CORE DATA:**

**PCTB-CS Coring (pressure coring) Totals: 3 core, 30.0 ft cored; 11.3 ft recovery**

**Core UT-GOM2-1-H002-06**

**F/8112 ft T/8122 ft RKB: Recovered 5.2 ft, 0 psi**

**Performed coring operations F/8112 ft RKB T/8122 ft RKB**

**Drilling/Coring Parameters: 60 RPM w/2-5 Kflb torque and Hex Pump 2 circulating 10.5 ppg WBM at 100 gpm and standpipe pressure of 20 psi, ROP 20-50 ft/hr, WOB 6 tons, with no seals in the diverter.**

**Core start time 0155 hr; Core end time 0244 hr; Core on deck at 0355 hr.**

For Core UT-GOM2-1-H002-06, the ball-valve closed, seal at top end of autoclave plug failed; however, it did return core to the surface. For Core UT-GOM2-1-H002-06 the tool was recovered to the rig floor with the ball-valve partially closed (not sealed). Silt and sand was found packed between the ball valve and seal. Core UT-GOM2-1-H002-06 recovered 5.2 ft (158 cm) of non-pressurized core that was transferred and processed through the onboard UT core processing lab.



**Core UT-GOM2-1-H002-07**

**F/8122 ft RKB T/8132 ft RKB: Recovered 1.5 ft, 0 psi**

**Performed coring operations F/8122 ft RKB T/8132 ft RKB**

**Drilling/Coring Parameters: 60 RPM w/3-4 Kflb torque and Hex Pump 2 circulating 10.5 ppg WBM at 50-100 gpm and standpipe pressure of 20 psi, ROP 10-25 ft/hr, WOB 5 tons, with no seals in the diverter**

**Core start time 0727 hr; Core end time 0815 hr; Core on deck at 0855 hr**

For Core UT-GOM2-1-H002-07, the ball-valve failed to close or hold pressure (displaced BV seal); however, it did return core to the surface. For Core UT-GOM2-1-H002-07 the tool was recovered to the rig floor with the ball-valve partially closed (not sealed). Silt and sand was found packed between the ball valve and seal. In addition, sediment was also found above the core rabbit in the PCTB-CS autoclave, indicating that formation sediment had been fluidized during coring and flowed up into the core liner through the small ports in the rabbit. Core UT-GOM2-1-H002-07 did recover 1.5 ft (46 cm) of non-pressurized core that was transferred and processed through the onboard UT core processing lab.

**Core UT-GOM2-1-H002-08**

**F/8132 ft RKB T/8142 ft RKB: Recovered 4.6 ft, 0 psi**

**Performed coring operations F/8132 ft RKB T/8142 ft RKB**

**Drilling/Coring Parameters: 60 RPM w/2-4 Kflb torque and Cement Pump circulating 10.5 ppg WBM at 210 gpm and standpipe pressure of 20 psi, ROP 20 ft/hr, WOB 5-8 tons, with no seals in the diverter**

**Core start time 1310 hr; Core end time 1350 hr; Core on deck at 1440 hr**

For Core UT-GOM2-1-H002-08, the ball-valve failed to actuate or hold pressure. The ball-valve release sleeve (collett) failed by sliding over stop position, which resulted in the failure of the ball-valve to actuate. Core UT-GOM2-1-H002-08 did recover 4.6 ft (140 cm) of non-pressurized core that was transferred and processed through the onboard UT core processing lab.

**7. Science Activities**

In the last 24 hours, Hole UT-GOM2-1-H002 was advanced from 8112 ft RKB to 8142 ft RKB with 3 PCTB-CS pressure cores (Core UT-GOM2-1-H002-06, Core UT-GOM2-1-H002-07, Core UT-GOM2-1-H002-08). All three of the recovered PCTB-CS cores failed to hold pressure. The failure of the first two core runs have been attributed to problems associated with sand and silt interfering with the operations of the ball-valve in the PCTB-CS core system that could be linked to an internal core tool flow problem that is being currently evaluated.

The ‘conventionalized’ core material from cores Core UT-GOM2-1-H002-06, Core UT-GOM2-1-H002-07, and Core UT-GOM2-1-H002-08 was transferred to the UT mud lab and whole rounds were subsampled and preserved for shore-based microbiological, geochemical, physical property measurements. Head space gas samples were also acquired for post expedition analysis. A total of 3.25 ft (99 cm) was sampled as whole rounds and the remaining 8.0 ft (244 cm) was archived for shore-based analysis. Based on a quick description of core ends, the primary lithology in these cores ranges from sandy silt to silty, fine sand. A sample of drilling fluid was collected and preserved to characterize potential

core contamination in support of the geochemistry and microbiological analyses. Geotek finished logging Core UT-GOM2-1-H002-04 in PCATS (139 cm) including full CT. Draft pressure core cutting plan provided to UT science team. In total, 27.5 ft of sediment was recovered from Hole UT-GOM2-1-H002 (34% recovery), with 4.5 ft under pressure.

Hole UT-GOM2-1-H002 reached a TD of 8142 ft RKB (1423 fbsf) at 1630 hr with the recovery of Core UT-GOM2-1-H002-08, after which the hole was swept with 280 bbls of 10.5 ppg water-based mud in preparation for downhole wireline logging. The wireline logging tool string (including EDTC-HRLA-GPIT) was lowered to bottom of the hole, and two up hole log runs from 8045 ft RKB to 7680 ft RKB (Main Pass and Repeat Pass) were acquired without any problems. Because of borehole blockages, the wireline logging tool string could not pass below 8045 ft RKB and the BHA had been set back to a depth of 7680 ft RKB.

## **Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 15-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 15-May-2017

Green Canyon 955

Hole UT-GOM2-1-H002

Corrected Location: Lat: 27° 00.04154', Long: -90° 25.58715' (WGS 84)

Water depth: 6667.0 ft (6719.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0130 At Hole UT-GOM2-1-H002

Continue downhole logging operations

POOH logging tool string F/5000 ft RKB to T/Surface ft RKB

JSA for the personnel involved in wireline logging program

RD logging tools, wireline, and wireline sheaves

0130-0430 Prepare to set cement plug in Hole UT-GOM2-1-H002

RIH BHA F/7680 ft RKB T/8142 ft RKB (bottom of the hole)

Spot 25 bbls of 11.5 ppg Gel pad followed by 200 bbls of 10.5 ppg WBM

POOH BHA F/8142 ft RKB T/7900 ft RKB

Deploy Geotek cement barrel, free-fall to BHA

Build cement

0430-1230 JSA for the personnel involved in setting cement plug

Cementer pumped 20 bbls gel spacer

Cementer mixed and pumped 77 bbls 16.4 ppg cement

Place 500 ft cement plug F/7400 ft RKB T/7900 ft RKB

Cementer pumped 17 bbls of gel spacer

Cementer pumped 171 bbls of seawater

POOH BHA F/7900 ft RKB T/6611 ft RKB

Flushed DS and cement barrel W/seawater

Pumped 2 nerf balls and 350 bbls of seawater

Recover Geotek cement barrel on slickline

Flushed DS with 245 bbls of seawater

1230-1825 POOH BHA F/6611 ft RKB T/Surface

BO BHA (5 drill collars, 2 stabilizers, bit sub, bit)

1825-2400 Prepare to run PCTB-FB pressure core BHA

MU face bit and bit sub to outer core barrel

MU landing saver sub, top sub, head sub

Geotek performed space out on center bit core barrel

Geotek performed space out core barrel in outer core barrel

Geotek performed space out cementing barrel in outer core barrel

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

Conduct series of full function (water) tool test of the PCTB-FB in DP. Move onto location of Hole UT-GOM2-1-H005, RIH, and spud hole.

#### **5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

#### **6. CORE DATA:**

No additional cores acquired over the last 24 hr.

#### **7. Science Activities**

In the last 24 hours, the downhole logging program in Hole UT-GOM2-1-H002 was completed with the acquisition of a main pass and repeat pass surveys (EDTC-HRLA-GPIT) over the depth interval from 7680 ft RKB to 8045 ft RKB. Hole UT-GOM2-1-H002 was abandoned with the emplacement of a 500 ft cement plug that was set above the hydrate interval to avoid any potential problem associated with hydrate dissociation that may be caused by the heat generated by cement hydration. The last half of the day dealt with preparations to move onto the location of Hole UT-GOM2-1-H005.

The technical objectives of the Hole UT-GOM2-1-H005 drilling and coring program include (1) demonstrate the engineering capability of the “face-bit” version of the PCTB pressure-coring tool to effectively and consistently capture, collect, and recover hydrate-bearing sand sediments, (2) test the coring efficiency of the cutting shoe BHA, and (3) obtain up to 13 pressure cores in the methane-hydrate-bearing sand and adjacent interfaces.

The pressurized core from Hole UT-GOM2-1-H002 (Core 4) and the conventionalized core material from other cores collected from Hole UT-GOM2-1-H002 continued to be processed through their respective labs on the ship. A cut plan for Hole UT-GOM2-1-H002 was finalized and two sections were selected for quantitative degassing, and one section transferred to a storage vessel for shipment to UT. Head space gas samples obtained from degassing experiments of subsamples from Core UT-GOM2-1-H002-04 have yielded significant volumes of mostly methane gas.

The drilling, wireline, and core pressure/temperature data were integrated for analyzing the performance of each pressure core run. The core pressure/temperature data indicate that several cores that failed to hold pressure experienced substantial cooling due to hydrate dissociation during retrieval.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 16-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 16-May-2017

Green Canyon 955

Hole UT-GOM2-1-H002

Corrected Location: Lat: 27° 00.04154', Long: -90° 25.58715' (WGS 84)

Water depth: 6667.0 ft (6719.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0330 At Hole UT-GOM2-1-H002

Continue operations in support of the "PCTB-FB BHA Water Test 3"

Geotek completed space out test of the PCTB-FB core system

0330-0800 JSA for the personnel involved deployment of BHA

MU PCTB-FB BHA

RIH PCTB-FB BHA F/surface T/1090 ft RKB

Fill DP with seawater every 10 connections

0800-1000 **Conduct PCTB-FB BHA Water Test 3**

JSA for the personnel involved with slick line and RU PCTB-FB

RU slick line in TDS

MU PCTB-FB core barrel (with O-ring seal in diverter)

RIH CTB-FB F/surface T/1038 ft RKB; POOH running tool

RIH slick line with CTB-FB pulling tool F/surface T/1038 ft RKB

Circulate seawater at 2 bpm using Hex Pump 2

Shutdown Hex Pump 2, latch pulling tool

POOH CTB-FB core barrel F/1038 ft RKB T/surface

1000-1200 **Conduct PCTB-FB BHA Water Test 4**

MU PCTB-FB core barrel (with O-ring seal in diverter)

RIH CTB-FB F/surface T/1040 ft RKB; POOH running tool

RIH slick line with CTB-FB pulling tool F/surface T/1038 ft RKB

Circulate seawater at 2 bpm using Hex Pump 2

Shutdown Hex Pump 2, latch pulling tool

POOH CTB-FB core barrel F/1038 ft RKB T/surface

1200-1630 **Conduct PCTB-FB BHA Water Test 5**

MU PCTB-FB core barrel (with O-ring seal in diverter)

RIH CTB-FB F/surface T/1035 ft RKB; POOH running tool

RIH slick line with CTB-FB pulling tool F/surface T/1035 ft RKB

Circulate seawater at 1.75 bpm using Hex Pump 2

Shutdown Hex Pump 2, latch pulling tool

POOH CTB-FB core barrel F/1035 ft RKB T/surface

1630-1800 MU PCTB-FB center bit assembly to slick line

RIH PCTB-FB center bit assembly F/surface T/1034 ft RKB

JSA for the personnel involved rigging down slick line  
Rig down slick line  
1800-2400 RIH CTB-FB BHA F/1090 ft RKB T/6700 (18 ft above sea floor)

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

Re-enter Hole UT-GOM2-1-H002 with PCTB-FB BHA tag and test cement plug. Spud Hole UT-GOM2-1-H005 and advance to first core point at 7645 ft RKB.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores acquired over the last 24 hr. However, we conducted a series of full function (water) tool tests of the PCTB-FB in DP. The results of these tests have been described below in this report.

**7. Science Activities**

Operations and science activities over the last 24-hours focused mostly on reviewing the performance of the PCTB-CS core runs and the various tool “pump” and “water” tests that were conducted over the last six days of this field test. Also, a total of three full function (water) tool tests of the PCTB-FB were conducted today in the drill pipe as it was being deployed in preparation for drilling the next test hole in the project (Hole UT-GOM2-1-H005).

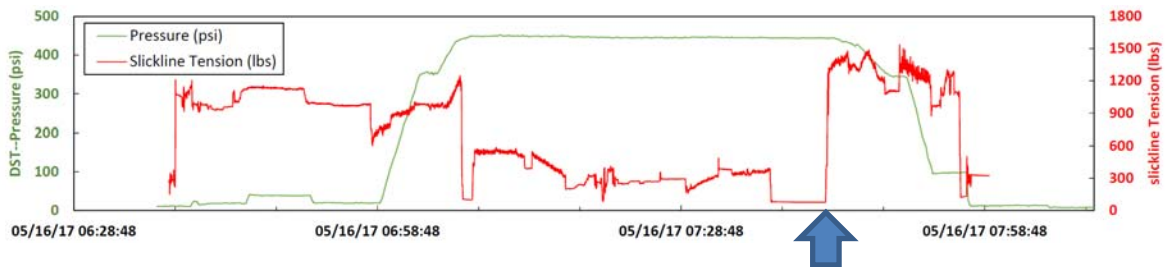
The Geotek and onboard UT-technical staff along with support from Weatherford, who are maintaining the systems that monitor shipboard drilling/coring parameters and performance, have been accessing, compiling, and analyzing the large number of drilling/coring data sets that have been generated during each tool test and core run over the last six days. These data include pressure and temperature data recorded in each core barrel when deployed in the borehole, data on the performance of the wireline system that deploys and recovers the pressure core barrels during each core run, information on drilling performance and drilling fluids (including drilling fluid pressures, temperature, bit penetration rates, weight on bit, drilling mud flow rates, rate of bit rotation, etc.) and many other important performance measurements.

To further test and demonstrate the engineering capability of the “face-bit” version of the PCTB pressure-coring tool, it was tested today in three successive tests in which the configuration of the tool was not changed between each tests and the coring and core handling procedures were conducted in a similar fashion in each test. The tools as tested were all the face-bit cutting version of the PCTB, which is also known as the PCTB-FB. In each case the “flow diverter” in the pressure core barrel was sealed with an O-ring. These tests were all full function tests in that the PCTB-FB inner barrel was lowered into drill pipe on a slick line wire, (2) the PCTB-FB inner barrel was locked into the BHA, (3) the wireline “running in” tool was used to deploy the PCTB-FB inner barrel and the wireline “pulling” tool was used to recover the PCTB-FB inner barrel to the deck of the ship. Under normal operations, the pulling tool is deployed and latches into the PCTB-FB inner barrel in the

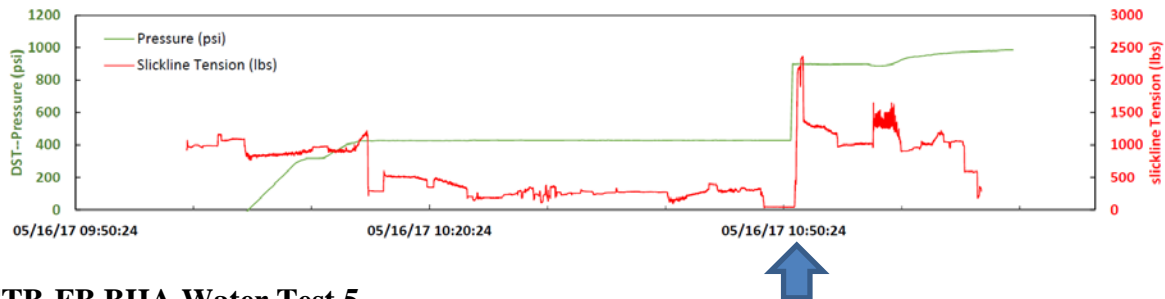
BHA and when pulled by the slick line the ball-valve at the bottom of the PCTB-FB inner barrel closes, the upper valve on the tool closes, the entire inner core barrel unlatches from the BHA, and the onboard pressure boost system activates to maintain internal tool pressures during recovery.

In the plots of the PCTB-FB BHA Water Test 4 and PCTB-FB BHA Water Test 5 we see good examples of the expected pressure boost as the PCTB-FB inner barrel is unlatched from the BHA; and the PCTB-FB was recovered sealed and at pressure for both of these tests (the large blue arrow in each plot marks the time the PCTB-FB inner barrel unlatches from the BHA). For Test 4 the autoclave pressure was measured at 1015 psi and for Test 5 the autoclave pressure was measured at 1113 psi. The PCTB-FB BHA Water Test 3, however, does not show the expected pressure boost and in this case the autoclave was not sealed.

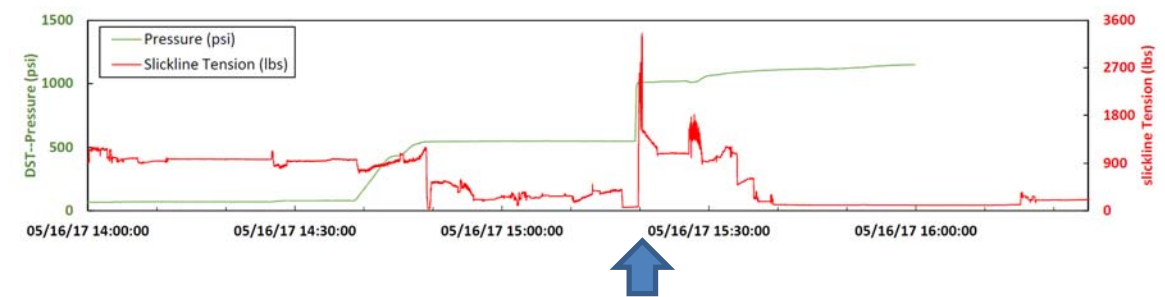
### PCTB-FB BHA Water Test 3



### PCTB-FB BHA Water Test 4



### PCTB-FB BHA Water Test 5



The pressurized core from Hole UT-GOM2-1-H002 (Core 4) and the conventionalized core material from other cores collected from Hole UT-GOM2-1-H002 continued to be processed through their respective labs on the ship. Quantitative pressure core degassing experiments have continued on two sections from Core 4. Head space gas samples obtained from degassing experiments of subsamples from Core UT-GOM2-1-H002-04 have continued to yield significant volumes of mostly methane gas that suggest high methane hydrate saturation in this core. Additional gas samples have been collected for shore-based gas analyses.

Helix also conducted a large crew change today with a total of four helicopter flights. The UT led science team on the *D/V Q4000* also saw the departure of Yongkoo Seol, Gilles Guerin, Anton Caputo, and Robert Andrew Ott.



# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 17-May-2017, 0000-2400 hr

**2. LOCATION:**

0000 - 2400 hr, 17-May-2017  
Green Canyon 955

**Location from 0000 – 0338 hr**

**Hole UT-GOM2-1-H002**

Corrected Location: Lat: 27° 00.04154', Long: -90° 25.58715' (WGS 84)

Water depth: 6667.0 ft (6719.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**Location from 0338 – 2400 hr**

**Hole UT-GOM2-1-H005**

Corrected Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0124 At Hole UT-GOM2-1-H002

Re-enter Hole UT-GOM2-1-H002 to tag and test cement plug

Move *D/V Q4000* over Hole UT-GOM2-1-H002

Stab drillstring into H002

RIH F/6700 ft RKB and tag top of cement plug at 6839 ft RKB

Set down 5000lbs on top of cement plug

POOH F/6839 ft RKB T/6690 ft RKB

0124-0230 Prepare to spud Hole UT-GOM2-1-H005

*D/S Q4000* DP moved over proposed drill site, ROV used to position DS

RIH and tagged mudline at 6718.0 ft RKB

Pull clear of mudline a reset data loggers

Held shallow gas well control drill

Held spud meeting

0230-0338 Spud Hole UT-GOM2-1-H005 at 6666.0 ft (6718.0 ft RKB).

Advance hole F/6718 ft RKB T/6778 ft RKB

0338-1330 Advance hole F/6778 ft RKB T/7645 ft RKB

1330-2230 Prepare to acquire Core UT-GOM2-1-H005-01

JSA to review wireline operations

RU slick line for coring operations

MU PCTB-FB inner core barrel at surface

RIH PCTB-FB inner core barrel F/surface T/7665 ft RKB

Unsuccessful core barrel failed to land in the BHA

POOH PCTB-FB inner core barrel F/7665 ft RKB T/surface

RD upper section of the PCTB-FB core barrel and move to Geotek Service Van

Geotek clean and repair upper section of PCTB-FB core barrel  
MU PCTB-FB core barrel  
RIH PCTB-FB core barrel F/surface T/7663 ft RKB  
2230-2330 **Core UT-GOM2-1-H005-01, F/7645 T/7655 ft MD: Recovered 6.7 ft, 4115 psi**  
POOH PCTB-FB core barrel F/7655 ft RKB T/surface  
Move recovered core sample to chiller for 20 minutes  
2330-2400 RIH PCTB-FM center bit F/surface T/7665 ft RKB

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

Continue to advance hole by drilling to second core point at 8081 ft RKB and acquire up to 9 cores to the bottom of the hole. The table below contains a detailed listing of the proposed core plan for Hole UT-GOM2-1-H005.

#### **5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

#### **6. CORE DATA:**

**PCTB-FB Coring (pressure coring) Totals: 1 core, 10.0 ft cored; 6.7 ft recovery**

**Core UT-GOM2-1-H005-01**

**F/7645 ft RKB T/7655 ft RKB: Recovered 6.7 ft, 4115 psi**

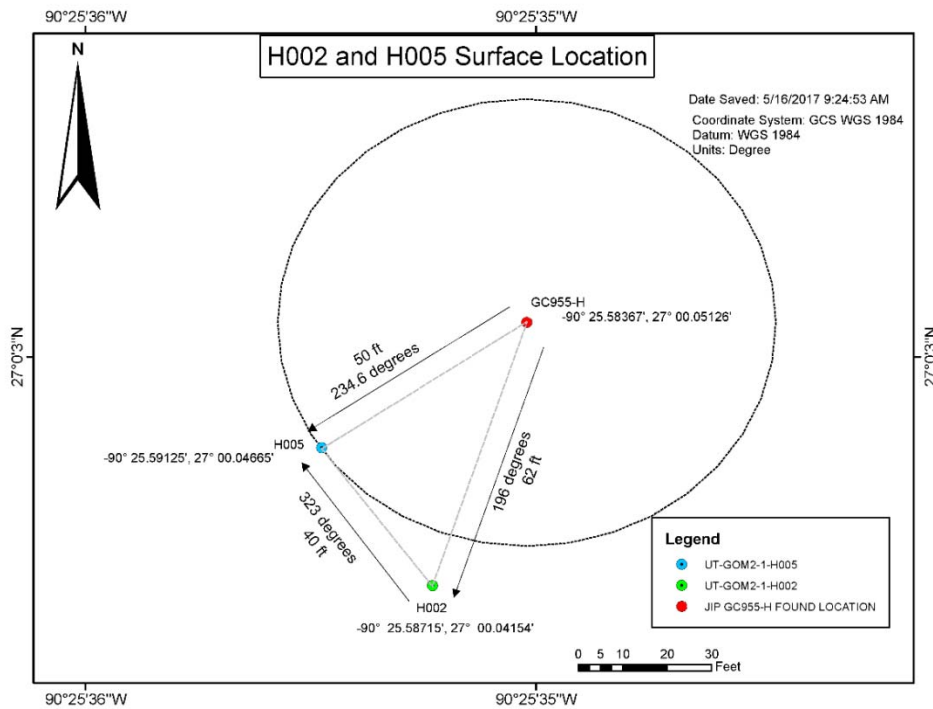
**Performed coring operations F/7645 ft MD T/7655 ft MD**

**Drilling/Coring Parameters: 60 RPM w/4.6 K lb torque and Cement Pump circulating sea water at 85 gpm and standpipe pressure of 12 psi, ROP 67 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

The UT-GOM2-1-H005-01 coring run was possibly compromised because of a depth discrepancy between the driller-calculated tag depth and the Weatherford sensor-derived well depths. It was determined that the driller-calculated tag depth was accurate and Core UT-GOM2-1-H005-01 was acquired assuming a core point depth of 7645 ft MD. The core throw for the 01 core was 10ft, but from drilling performance data it appeared that the core only cut about 5-6 ft of formation. The slick line deployment and retrieval of Core UT-GOM2-1-H005-01 was completed without any problems. On recovery, the ball valve was closed and the autoclave was conditioned in the cold shuck for 20 minutes before a pressure of 4115 psi was measured in the service van, indicating that the pressure boost had been retained. The autoclave was moved to PCATS for core handling and processing.

#### **7. Science Activities**

Operations and science activities over the last 24-hours featured the abandonment of Hole UT-GOM2-1-H002 and the spudding of Hole UT-GOM2-1-H005 along with the acquisition of a successful pressure core from a known fracture dominated hydrate-bearing section that overlies the hydrate-bearing sand-rich reservoir section that is the primary coring target at the Green Canyon 955 test site. The map below shows the location of the two holes drilled and cored during this expedition, along with the location of the JIP Leg II GC955-H hole that was LWD logged on 2009. The target depth for Core UT-GOM2-1-H005-01 was specifically selected to test the impact of mud-rich sediments on the PCTB-FB core system.



The UT Scientific Party also continued to develop the core plan for Hole UT-GOM2-1-H005, which is posted below in this report. The pressure core from Hole UT-GOM2-1-H002 (Core 4) and the conventionalized core material from other cores collected from Hole UT-GOM2-1-H002, obtained from earlier in the expedition, are being processed through their respective labs on the ship. Quantitative pressure core degassing experiments have been completed on one of the two sections from Core UT-GOM2-1-H005-4CS selected for degassing. The other section continues to be degassed, producing large volumes of methane. Additional gas samples were collected for onshore analysis.

## Hole UT-GOM2-1-H005 Core Plan

GC955H-005 Coring Plan	
Water Depth (tvdss)	6666
Rig Floor elevation above sl. (ft)	52
Mud line depth RKB	6718
Hydrate Top (fbsf)	1358
Hydrate top (RKB)	8076
Core length (ft)	10

Core #	Top (fbsf)	Bottom (fbsf)	Top (RKB)	Bottom (RKB)
1	927	937	7645	7655
2	1363	1373	8081	8091
3	1373	1383	8091	8101
4	1383	1393	8101	8111
5	1393	1403	8111	8121
6	1403	1413	8121	8131
7	1413	1423	8131	8141
8	1423	1433	8141	8151
9	1433	1443	8151	8161
10	1443	1453	8161	8171

## Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition

1. **DATE:** 18-May-2017, 0000-2400hr

2. **LOCATION:**

0000 – 2400 hr, 18-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

3. **DESCRIPTION OF OPERATIONS:**

0000-0625 At Hole UT-GOM2-1-H005

Continued drilling hole F/7655 ft RKB T/8081 ft RKB at 110 RPM, 12 - 20 klbs WOB, 3-5 K torque, 150 - 250 fph ROP while pumping 8.6 ppg S/W w/ HEX #2 @ 336 gpm w/340 psi. Pumping 25 bbl Hi vis sweeps every 2 doubles drilled.

0625-1130 POOH PCTB-FB center bit

JSA for RU slickline and recovering center bit from BHA  
RU slickline and recover center bit

1130-1200 Prepare for coring operations UT-GOM2-1-H005-02

MU PCTB-FB core barrel

RIH with core barrel

RIH with pulling tool

1200-1240 **Core UT-GOM2-1-H005-02, F/8081 T/8091 ft MD: Recovered 4.9 ft, 2834 psi**

ROP 29 ft/hr, 60 RPM, WOB 3-7 tons, flow rate 40-90 GPM

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

1240-1545 Prepare to take core UT-GOM2-1-H005-03

MU PCTB-FB core barrel

RIH with core barrel

DS tagged bottom of the hole at 8086 ft RKB – borehole fill

POOH PCTB-FB and inspect core barrel

Fall in material recovered in liner and saved

1545-1700 Pump 25 bbls gel sweep followed by 280 bbls seawater using HEX Pump 2

1700-1930 Prepare to take core UT-GOM2-1-H005-03

Tagged bottom of the hole confirming no fill

M/U PCTB-FB core barrel

RIH with core barrel

1930-2120 **Core UT-GOM2-1-H005-03, F/8091 T/8101 ft MD: Recovered 10 ft, 1780 psi**

ROP 12 ft/hr, 60 RPM, WOB 2.5-5 tons, flow rate 70-120 Gpm

Upon recovery stabbed into vertical cold shuck

Upon inspection core barrel confirmed to be pressurized, possible slow leak

2120-2230 Circulated 25 bbls gel sweep followed by 128 bbls seawater spotting sweep in drill string using HEX #2 at 220 gpm w/ 53 psi.

2230-2400 Prepare to take core UT-GOM2-1-H005-04

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

Continue coring to the next core point at 8111 ft RKB and ultimately acquire up to 13 cores to the bottom of Hole UT-GOM2-1-H005.

#### **5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

#### **6. CORE DATA:**

**PCTB-FB Coring (pressure coring) Totals: 2 cores, 8.0 ft cored; 14.9 ft recovery.**

##### **Core UT-GOM2-1-H005-02**

**F/8081 ft RKB T/8091 ft RKB: Recovered: 4.9 ft, 2834 psi**

**Performed coring operations F/8081 ft MD T/8091 ft MD**

**Drilling/Coring Parameters: 60 RPM w/4.6 K lb torque and Cement Pump circulating sea water at 40-90 gpm, ROP 29 ft/hr, WOB 3-7 tons, with O-ring seals in the diverter.** Successful coring run with clean pick up from BHA. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 45 mins before a pressure of 2834 psi was measured in the service van, indicating that there was a very slight leak which was located around the ball valve. The autoclave pressure was increased to 4000 psi before being transferred to PCATS.

##### **Core UT-GOM2-1-H005-03**

**F/8091 ft RKB T/8101 ft RKB: Recovered: 10.0 ft, 1780 psi**

**Performed coring operations F/8091 ft MD T/8101 ft MD**

**Drilling/Coring Parameters: 60 RPM w/4.6 K lb torque and Cement Pump circulating sea water at 70-120 gpm, ROP 12 ft/hr, WOB 2.5-5 tons, with O-ring seals in the diverter.** Another good coring run with clean pick up from BHA. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 45 mins before a pressure of 1780 psi was measured in the service van indicating that there might be a slow leak. The autoclave was transferred to PCATS where pressure was increased to 4000 psi before core handling and processing. DST record showed that autoclave had fully sealed during recovery.

#### **7. Science Activities**

Core UT-GOM2-1-H005-2 and Core UT-GOM2-1-H005-3 were logged in PCATS. These scans indicated high P-wave velocities consistent with hydrate at high-saturations and produced X-ray images clearly revealing sedimentary structures (see Figure 1 below). Drilling mud and PCATS water samples were collected for contamination control. The second quantitative core degassing from Core UT-GOM2-1-H002-4 was completed, producing a large volume of methane indicating high gas hydrate saturations. The Scientific Party continued to process data and write reports from Hole UT-GOM2-1-H002.

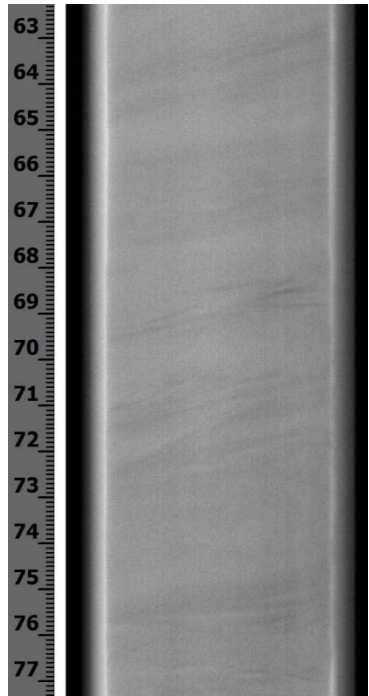


Figure 1. Example PCATS X-ray image from Core UT-GOM2-1-H005-2FB.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 19-May-2017, 0000-2400hr

**2. LOCATION:**

0000 – 2400 hr, 19-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0130 Prepare for coring operations UT-GOM2-1-H005-04

MU PCTB-FB core barrel

RIH with core barrel

RIH with pulling tool

0130-0330 **Core UT-GOM2-1-H005-04, F/8101 T/8111 ft MD: Recovered 10.5 ft, 3477 psi**

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

0330-0400 Gel sweep followed by seawater

0400-0630 Prepare for coring operations UT-GOM2-1-H005-05

MU PCTB-FB core barrel

RIH with core barrel

RIH with pulling tool

0630-0800 **Core UT-GOM2-1-H005-05, F/8111 T/8121 ft MD: Recovered 9.7 ft, 3242 psi**

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

0800-0900 Gel sweep followed by seawater

0900-1100 Prepare for coring operations UT-GOM2-1-H005-06

MU PCTB-FB core barrel

RIH with core barrel

RIH with pulling tool

1100-1230 **Core UT-GOM2-1-H005-06, F/8121 T/8131 ft MD: Recovered 9.4 ft, 3250 psi**

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

1230-1300 Gel sweep followed by seawater

1300-1500 Prepare for coring operations UT-GOM2-1-H005-07

MU PCTB-FB core barrel

RIH with core barrel

RIH with pulling tool

1500-1700 **Core UT-GOM2-1-H005-07, F/8131 T/8141 ft MD: Recovered 10.5 ft, 3164 psi**

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

1700-1830 Displaced well to 9.5 ppg WBM

1830-2000 Prepare for coring operations UT-GOM2-1-H005-08



MU PCTB-FB core barrel  
RIH with core barrel  
RIH with pulling tool  
2000-2300 **Core UT-GOM2-1-H005-08, F/8141 T/8151 ft MD: Recovered 8.2 ft, 3016 psi**  
Upon recovery stabbed into vertical cold shuck  
Upon inspection of core barrel was confirmed to be pressurized  
2300-2400 Prepare for coring operations UT-GOM2-1-H005-09  
MU PCTB-FB core barrel

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

Continue coring to the next core point at 8161 ft RKB and ultimately acquire up to 13 cores to the bottom of Hole UT-GOM2-1-H005.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

**6. CORE DATA:**

**PCTB-FB Coring (pressure coring) Totals: 5 cores, 50.0 ft cored; 48.4 ft recovery.**

**Core UT-GOM2-1-H005-04FB**

**F/8101 ft RKB T/8111 ft RKB: Recovered: 10.5 ft, 3477 psi**

**Performed coring operations F/8101 ft MD T/8111 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating sea water at 80 gpm, ROP 50 ft/hr, WOB 2.5-5 tons, with O-ring seals in the diverter.**

Good coring run with clean pick up from BHA. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 43 mins before a pressure of 3477 psi was measured in the service van indicating that the autoclave had sealed at in situ pressures. The autoclave was transferred to PCATS for core handling and processing. DST record showed that autoclave had fully sealed as it was lifted from the BHA. Core recovery 321 cm as measured by X-ray image in PCATS

**Core UT-GOM2-1-H005-05FB**

**F/8111 ft RKB T/8121 ft RKB: Recovered: 9.7 ft, 3242 psi**

**Performed coring operations F/8111 ft MD T/8121 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating sea water at 80 gpm, ROP 60 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

Clean pick up from BHA. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 35 mins before a pressure of 3242 psi was measured in the service van indicating that the autoclave had sealed around the in situ pressure. The autoclave was transferred to PCATS for core handling and processing. Core recovery was 296 cm as measured by X-ray image in PCATS.

**Core UT-GOM2-1-H005-06FB**

**F/8121 ft RKB T/8131 ft RKB: Recovered: Recovered 9.4 ft, 3250 psi**

**Performed coring operations F/8121 ft MD T/8131 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating sea water at 80 gpm, ROP 55 ft/hr, WOB 8 tons, with O-ring seals in the diverter.**

Good coring run with clean pick up from BHA and a sea floor 'cooling stop' for 15 mins. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 35 mins before a pressure of 3250 psi was measured in the service van indicating that the autoclave had sealed around the in situ pressure. The autoclave was transferred to PCATS for core handling and processing. Core recovery was 286 cm as measured by X-ray image in PCATS.

**Core UT-GOM2-1-H005-07FB**

**F/8131 ft RKB T/8141 ft RKB: Recovered: Recovered 10.5 ft, 3164 psi**

**Performed coring operations F/8131 ft MD T/8141 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating sea water at 70-80 gpm, ROP 27 ft/hr, WOB 10 tons, with O-ring seals in the diverter.**

General coring parameters: ROP=27 ft/hr, 60 RPM, WOB=10 tons, SW flow rate = 70-80 gpm. Good coring run with clean pick up from BHA and a sea floor 'cooling stop' for 15 mins. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 46 mins before a pressure of 3164 psi was measured in the service van indicating that the autoclave had sealed around the in situ pressure. The set pressure for this deployment was made at 3000 psi and consequently there was no boost. The autoclave was transferred to PCATS for core handling and processing. Core recovery was 321 cm as measured by X-ray image in PCATS.

**Core UT-GOM2-1-H005-08FB**

**F/8141 ft RKB T/8151 ft RKB: Recovered: Recovered 8.2 ft, 3016 psi**

**Performed coring operations F/8141 ft MD T/8151 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating sea water at 65 gpm, ROP 26 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

Switched from drilling with seawater to drilling with 9.5 lb/gal mud. Good coring run but the pick up from BHA took multiple efforts before it came free. The tool was stopped at the sea floor (cooling stop) for 15 mins. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 77 mins before a pressure of 3016 psi was measured in the service van indicating that the autoclave had sealed around the set pressure indicating that the accumulator boost may have assisted sealing the autoclave. The autoclave was transferred to PCATS for core handling and processing. Core recovery was 250 cm as measured by X-ray image in PCATS.

**7. Science Activities**

Core UT-GOM2-1-H005-04FB, -05FB, 06FB, 07FB, and 08FB were logged in PCATS.

These scans indicated interbedded intervals with high P-wave velocities (up to 3500 m/s) consistent with hydrate at high-saturations and produced X-ray images clearly revealing bedding and sedimentary structures (see Figure 1 below). The Scientific Party continued to process data and write reports from Holes UT-GOM2-1-H002 and UT-GOM2-1-H005.

Sediment from the last degassing experiment from UT-GOM2-1-H002-4CS was collected from the storage chamber.

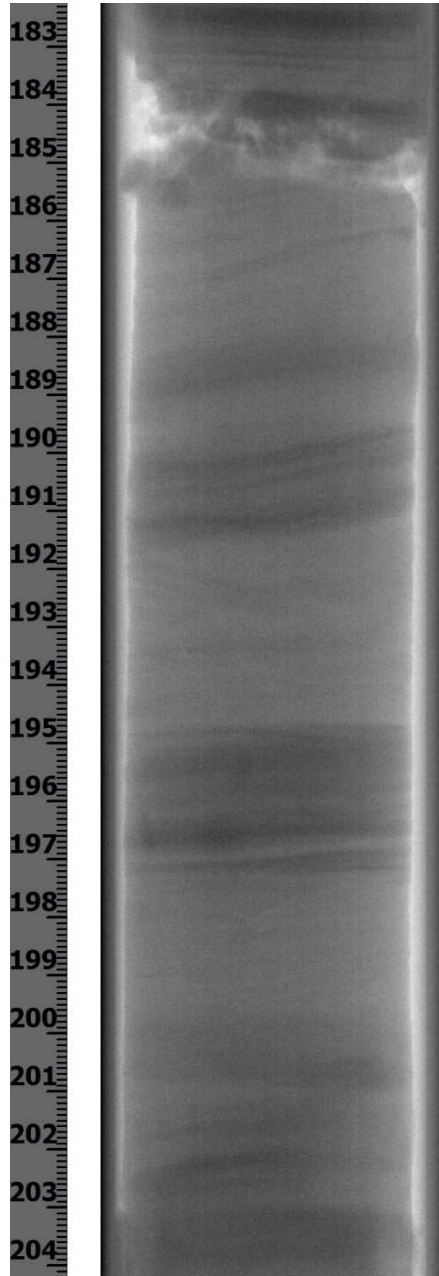


Figure 1. Example PCATS X-ray image from Core UT-GOM2-1-H005-05FB.

## Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition

1. **DATE:** 20-May-2017, 0000-2400hr

2. **LOCATION:**

0000 – 2400 hr, 20-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

3. **DESCRIPTION OF OPERATIONS:**

0000-0230 At Hole UT-GOM2-1-H005

Prepare for coring operations Core UT-GOM2-1-H005-09

Re-headed slick line

MU PCTB-FB core barrel

RIH with core barrel

POOH running tool

RIH pulling tool

0230-0630 **Core UT-GOM2-1-H005-09, F/8151 T/8161 ft MD: Recovered 10.5 ft, 746 psi**

POOH pulling tool with PCTB-FB inner barrel

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized (low pressure)

Sweep hole with 10.5 ppg mud using Hex Pump 2

0630-1030 Prepare for coring operations Core UT-GOM2-1-H005-10

Change out PCTB pressure control system

MU PCTB-FB core barrel

RIH with core barrel

Unable to latch PCTB-FB inner core barrel in BHA

POOH PCTB-FB inner core barrel

Remove broken latch pin

RIH with core barrel

POOH running tool

RIH pulling tool

1030-1200 **Core UT-GOM2-1-H005-010, F/8161 T/8166 ft MD: Recovered NA ft, 3255 psi**

BHA experienced high torque, stalled, and limited spring-back rotation

POOH pulling tool with PCTB-FB inner barrel

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

Sweep hole with 10.5 ppg mud using Hex Pump 2

1200-1600 Prepare for coring operations Core UT-GOM2-1-H005-11

MU PCTB-FB core barrel

RIH with core barrel

POOH running tool

RIH pulling tool

- 1600-1730 **Core UT-GOM2-1-H005-011, F/8166 T/8176 ft MD: Recovered NA ft, 3002 psi**  
 POOH pulling tool with PCTB-FB inner barrel  
 Upon recovery stabbed into vertical cold shuck  
 Upon inspection of core barrel was confirmed to be pressurized  
 Sweep hole with 10.5 ppg mud using Hex Pump 2
- 1730-2000 Prepare for coring operations Core UT-GOM2-1-H005-12  
 MU PCTB-FB core barrel  
 RIH with core barrel  
 POOH running tool  
 RIH pulling tool
- 2000-2400 **Core UT-GOM2-1-H005-012, F/8176 T/8185ft MD: Recovered 5.7 ft, 0 psi**  
 Partial core throw to accommodate for borehole fill  
 POOH pulling tool with PCTB-FB inner barrel  
 Upon recovery stabbed into vertical cold shuck  
 Upon inspection of core barrel was confirmed not to be pressurized  
 Sweep hole with 10.5 ppg mud using Hex Pump 2

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

Continue coring to the next core point at 8185 ft RKB and ultimately acquire up to 13 cores to the bottom of Hole UT-GOM2-1-H005. Complete directional survey and P&A Hole UT-GOM2-1-H005.

#### **5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data acquired over the last 24 hr.

#### **6. CORE DATA:**

**PCTB-FB Coring (pressure coring) Totals: 4 cores, 39 ft cored; [pending] ft recovery.**

##### **Core UT-GOM2-1-H005-09FB**

**F/8151 ft RKB T/8161 ft RKB: Recovered: 10.5 ft, 746 psi**

**Performed coring operations F/8151 ft MD T/8161 ft MD**

**Drilling/Coring Parameters: 60 RPM w/5-6 K lb torque and Cement Pump circulating 9.5 ppg WBM at 84 gpm, ROP 40 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

Good coring run with a clean pick-up from the BHA with a 15 minutes autoclave cooling stop at the sea bed to experiment with further cooling of the autoclave. On recovery the ball valve was closed and the autoclave was left in the cold shuck for 55 minutes before a pressure of only 746 psi was measured in the service van. On this occasion the set pressure was 4015 psi and hence the boost did not function as expected and there was no accumulator function. The pressure was pumped up to 3250 psi before being transferred to PCATS. The DST recordings showed that autoclave did not seal until it close at the surface and was probably aided by at least partial dissociation of gas hydrates. Core recovery was 321 cm as measured by the X-ray image in PCATS (includes a number of voids).

**Core UT-GOM2-1-H005-10FB**

**F/8161 ft RKB T/8166 ft RKB: Recovered: [pending] ft, 3255 psi**

**Performed coring operations F/8161 ft MD T/8166 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating 10.5 ppg WBM at 42-80 gpm, ROP 33 ft/hr, WOB 10 tons, with O-ring seals in the diverter.**

During the coring the cement pumps (mud pumps) stopped temporarily (~30 sec). At approximately 5 ft into formation bit reached very high torque (as much as 30 klbs) and released, causing the drill string to spin in reverse momentarily. Coring was discontinued immediately at this point. On recovery, the ball valve was closed but there was an indication there may be a slight leak (which proved to be wrong) and hence the tool was moved quickly out of the cold shuck to the service van where the pressure was found to be 3255 psi. It was then placed in the cold bath before being transferred to PCATS.

**Core UT-GOM2-1-H005-11FB**

**F/8166 ft RKB T/8176 ft RKB: Recovered: Recovered [pending] ft, 3002 psi**

**Performed coring operations F/8166 ft MD T/8176 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating 10.5 ppg WBM at 210 gpm, ROP 22-46 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

After the difficulties experience during the last core the main objective of Core UT-GOM2-1-H005-11FB was to advance through what is interpreted on the logs as a water bearing zone before another short gas hydrate interval beneath it. Consequently the pump rates were increased significantly at the expense of the core quality to ensure that a clean hole was developed for the next core (Core UT-GOM2-1-H005-12FB) which is back in a gas hydrate interval. The tool was deployed in the BHA before a core was cut using the 10.5 lb/gal mud. After picking up from BHA and retrieving to the rig floor the ball valve was closed and the autoclave was left in the cold shuck for 45 minutes before a pressure of 3002 psi was measured in the service van. The autoclave was placed in the cold bath while PCATS was being prepared.

**Core UT-GOM2-1-H005-12FB**

**F/8176 ft RKB T/8185 ft RKB: Recovered: Recovered 5.7 ft, 0 psi**

**Performed coring operations F/8176 ft MD T/8185 ft MD**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating 10.5 ppg WBM at 61-122 gpm, ROP 22 ft/hr, WOB 5 tons, with O-ring seals in the diverter.**

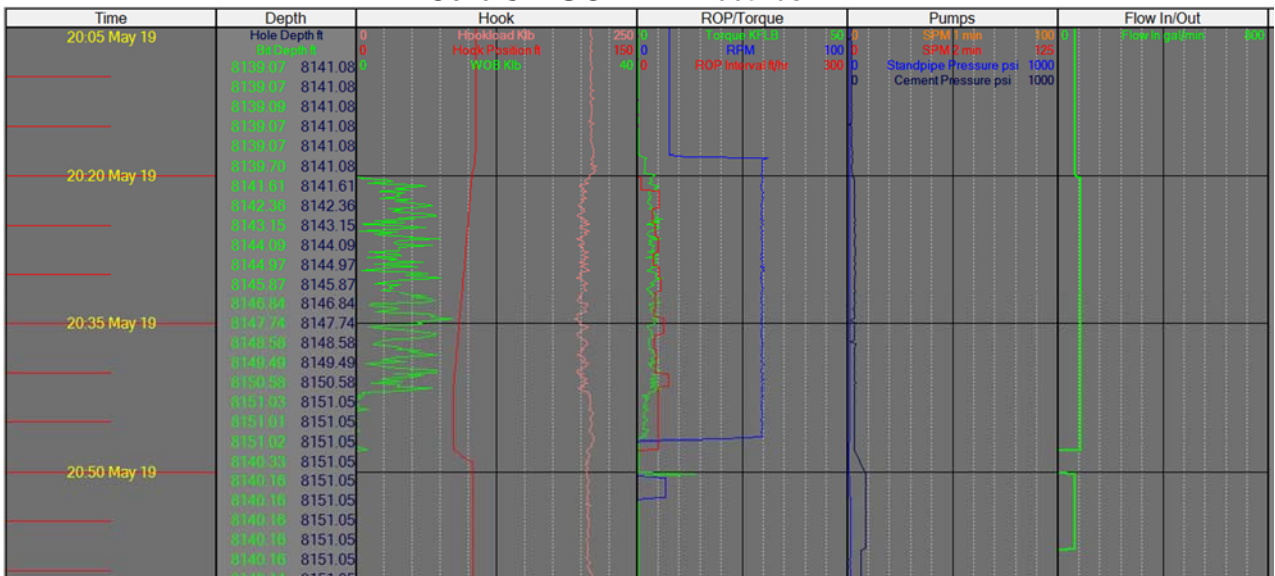
The tool was deployed in the BHA before a core was cut using the 10.5 lb/gal mud. Weight and torque came on bit 1 ft early (above core point) hence the run was stopped after a 9 ft advance. Generally a good coring run with clean a pick up from BHA, however on recovery the ball valve was only half closed trapping sediment in the ball follower and hence having zero pressure. Core barrel was over-filled, with rabbit against top plug and core material across the ball valve. Recovery was 1.75 m.

## 7. Science Activities

The onboard Scientific Party continued to process data and write reports from Holes UT-GOM2-1-H002 and UT-GOM2-1-H005. Conventionalized core samples from Core UT-GOM2-1-H005-12FB were transferred to the onboard UT core lab for processing and subsampling. Core UT-GOM2-1-H005-09FB was logged in PCATS at a total length 321 cm but including voids created during partial gas hydrate dissociation. This core was cut into 4 sections with one transferred to a 1.2 m storage chamber. Sections 2 and 4 were put on degassing manifolds and Section 3 was kept for long term storage as a possible experimental core for transport to UT. Despite partial dissociation, the degassing experiments have produced large volumes of gas, and gas samples have been collected for onboard and onshore analyses. PCATS and drilling fluid samples have continued to be collected for contamination control.

Rotary coring is accomplished by the manipulation of numerous drilling parameters that are designed to maintain safe operations and to yield in this expedition high quality pressure cores. To help visualize how the rotary core process works, the computer capture of the “real-time” Weatherford generated drillers displays of the acquisition of the Core UT-GOM2-1-H005-08 (cored from 8141 to 8151 ft MD, yielded a 8.2 ft long core at a pressure of 3016 psi) has been shown below in this report. As shown the core cutting event started at about 2020 hr ended about 23 minutes later at about 2043 hr. In this case, the flow rate of the drilling fluid (which was sea water) being pumped down the drill pipe was set at 65 gpm. The driller, by regulating the amount of weight that is applied to the drill bit (WOB) at the bottom of hole and the drilling fluid (mud) flow rate they can control rate of which the hole is advanced (ROP) and how much torque the formation transfers back onto the drill bit. In the example below we see a relatively uniform ROP and weight on bit that generally will yield a high quality core.

**Core UT-GOM2-1-H005-08**



## Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition

1. **DATE:** 21-May-2017, 0000-2400hr

2. **LOCATION:**

0000 – 2400 hr, 21-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

3. **DESCRIPTION OF OPERATIONS:**

0000-0030 At Hole UT-GOM2-1-H005

Prepare for coring operations for Core UT-GOM2-1-H005-13FB

MU PCTB-FB core barrel

RIH with core barrel

POOH running tool

RIH pulling tool

0030-0230 **Core UT-GOM2-1-H005-013FB, F/8185 T/8193ft RKB: Recovered 5.8 ft, 2806 psi**

Partial core throw to accommodate for borehole fill

POOH pulling tool with PCTB-FB inner barrel

Upon recovery stabbed into vertical cold shuck

Upon inspection of core barrel was confirmed to be pressurized

0230-0800 MU gyroscopic directional survey logging tool

RIH gyroscopic survey tool F/6718 ft RKB T/8100 ft RKB (in DP)

Conduct uphole gyroscopic survey F/8100 ft RKB T/surface (Run-1)

RIH gyroscopic survey tool F/6718 ft RKB T/8100 ft RKB

Conduct uphole gyroscopic survey F/8100 ft RKB T/surface (Run-2)

RD slickline

0800-0930 Prepare to set cement plug in Hole UT-GOM2-1-H005

Pump and spot 11.5 ppg high-viscosity mud at bottom of hole

POOH BHA F/8193 ft RKB T/7900 ft RKB

JSA with personnel involved in performing cement job

0930-1230 Set cement plug in Hole UT-GOM2-1-H005

Conduct pressure test of surface equipment

Pump 17 bbls of 10.5 ppg gel spacer

BO cement head and load nerf ball

Pump 3 bbl of 10.5 ppg spacer

Mix and pump 54.7 bbls of 16.4 ppg cement

Set cement plug F/7400 ft RKB T/7900 ft RKB

Pump 6.7 bbl of 10.5 ppg gel spacer

Pump 180.7 bbls of seawater

1230-1830 POOH BHA F/7900 ft RKB T/6600 ft RKB

Flush DP with 350 bbls of seawater and 2 nerf balls

1830-2230 RIH BHA F/6600 ft RKB T/7621 ft RKB unable to tag cement



2230-2400 POOH BHA F/7621 ft RKB T/6800 ft RKB  
Waiting on cement

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

Complete P&A operations in Hole UT-GOM2-1-H005. Begin demobilization of project equipment and people from *D/V Q4000*.

#### **5. DOWNHOLE LOGGING OPERATIONS:**

Wireline Log: Gyroscopic directional survey F/8100 ft RKB T/surface (Run-1)

Wireline Log: Gyroscopic directional survey F/8100 ft RKB T/surface (Run-2)

#### **6. CORE DATA:**

**PCTB-FB Coring (pressure coring) Totals: 1 core, 8 ft cored; 5.8 ft recovery.**

##### **Core UT-GOM2-1-H005-13FB**

**F/8185 ft RKB T/8193 ft RKB: Recovered: 5.8 ft, 2806 psi**

**Performed coring operations F/8185 ft RKB T/8193 ft RKB**

**Drilling/Coring Parameters: 60 RPM w/2-5 K lb torque and Cement Pump circulating 10.5 ppg WBM at 61-105 gpm, ROP 34 ft/hr, WOB 4 tons, with O-ring seals in the diverter.**

Before the deployment of the PCTB-FB inner core barrel, a 3/8 inch hole was drilled in the middle barrel and the set boost pressure was raised above the in situ pressure to ~4000 psi. This modification was designed to test whether the additional flow path would help create a boost pressure. Good coring run with a clean pick-up from the BHA with a 15 minutes autoclave cooling stop at the sea bed to experiment with further cooling of the autoclave. After picking up from BHA and retrieving to the rig floor the ball valve was closed and an autoclave pressure of 2806 psi was measured in the service van. The autoclave was placed in the cold bath while PCATS was being prepared. Core recovery was 5.8 ft (177 cm) as measured by the X-ray image in PCATS.

#### **7. Science Activities**

The onboard Scientific Party continued to process data and write reports from Holes UT-GOM2-1-H002 and UT-GOM2-1-H005. In the Geotek degassing lab, the controlled degassing of Sections 1 and 3 from Core UT-GOM2-1-H005-09FB were completed, chambers were emptied and cleaned, and the sediment residues were provided to UT for curation. Conventionalized core from UT-GOM2-1H005-12FB was sampled by UT for geochemistry, microbiology, and physical properties. After the early difficulties extracting Core UT-GOM2-1-H005-10FB from the autoclave in PCATS, a core 'fishing tool' was manufactured and the core was recovered with a length of 2.4 ft (72 cm). This included 2 pieces of core which are interpreted as gas hydrate rich with P-wave velocities over 3000 m/s; this sample was stored in a storage chamber. Core UT-GOM2-1-H005-13FB, after waiting for a while in the cold bath, the core was extracted in PCATS where the recorded recovery was 5.8 ft (176 cm); this core also produced some high quality samples consisting of what is interpreted as interbedded gas hydrate saturated sandy intervals with P-wave velocities up to 3300 m/s. PCATS scans of Core UT-GOM2-1-H005-11FB revealed only 0.9

(27 cm) of washed sediments, which is not a surprise considering the high pump rates required to safely penetrate this apparent unconsolidated water-wet stratigraphic section.

# **Daily Operational and Science Report**

## **UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 22-May-2017, 0000-2400hr

**2. LOCATION:**

0000 – 2400 hr, 22-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0900 At Hole UT-GOM2-1-H005

Continue borehole cementing operation

POOH BHA above mudline F/6800 ft RKB T/6600 ft RKB

Waiting on cement

Flush DP with 250 bbls of seawater

0900-1100 RIH BHA F/6600 ft RKB T/7691 ft RKB

Tagged Top of Cement and set down at 15K WOB

1100-1200 POOH BHA F/7691 ft RKB T/7172 ft RKB

1200-1230 POOH BHA F/7172 ft RKB T/6868 ft RKB

1230-1330 Circulate 10.5 ppg WBM – 300 bbls

1330-1600 Backload project equipment to HOS Red Rock

1600-1730 RIH BHA F/6868 ft RKB T/7691 ft RKB

Tagged Top of Cement and PU 5 ft

1730-2130 Backload project equipment to HOS Red Rock

2130-2200 JSA with personnel involved with performing cement job

2200-2400 Pumped 96 bbls of 10.5 ppg WBM

Cementer performed pressure test of deck iron to 3,000 psi visual

Cementer pumped 17 bbls of 10.5 ppg spacer at 4 bpm

Nerf ball in DP and cementer pumped 3 bbls of 10.5 ppg spacer

Cementer cleaned cement unit and caught mix water

Cementer mixed 16.4 ppg class H cement

Cementer pumped 58 bbls cement slurry

Cementer pumped 17 bbls tail spacer

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

Complete P&A operations in Hole UT-GOM2-1-H005. Continue demobilization of project equipment and people from *D/V Q4000*.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

## 7. Science Activities

The boarding of University of Texas scientists on the *D/V Q4000* more than 23 days ago in Brownsville, Texas not only marked the start of the “UT-GOM2-1: Hydrate Pressure Coring Expedition,” it also represented a critical milestone in the engineering and scientific research needed to understanding the role that gas hydrates map play as a potential energy resource, as a geohazard, or as an agent of climate change. The primary goal of UT-GOM2-1 expedition is to conduct a systematic and rigorous field marine test of the DOE Pressure Coring Tool with Ball Valve (PCTB) system. The UT-GOM2-1 expedition has featured the test of two unique designs of the PCTB system, often referred to the cutting shoe (CS) and face bit (FB) versions. Hole UT-GOM2-1-H002, which was spud on 11-May-17 and completed on 17-May-17, featured the test of the PCTB-CS tool through a series of flow and full-function tests in the drill pipe as it was suspended from the drilling vessel. PCTB-CS tool was also deployed a total of 8 times with only one of the deployments returning a pressurized core to the ship. However, all 8 of the PCTB-CS deployments recovered sediment cores (see below the composite well log and core recovery display for Hole UT-GOM2-1-H002). Hole UT-GOM2-1-H005, which was spud on 17-May-17 and completed on 23-May-17, featured the test of the PCTB-FB tool. The testing plan for Hole UT-GOM2-1-H005 also included a series of full-function tests of the PCTB-FB tool in the drill pipe. The PCTB-FB was deployed a total of 13 times and returned to the ship 12 cores under pressurized conditions. As shown below in the composite well log and core recovery displays for Hole UT-GOM2-1-H005, the core recovery for most of the runs was very high and for the most part the entire gas hydrate-bearing reservoir section was sampled with the PCTB-FB pressure core system.

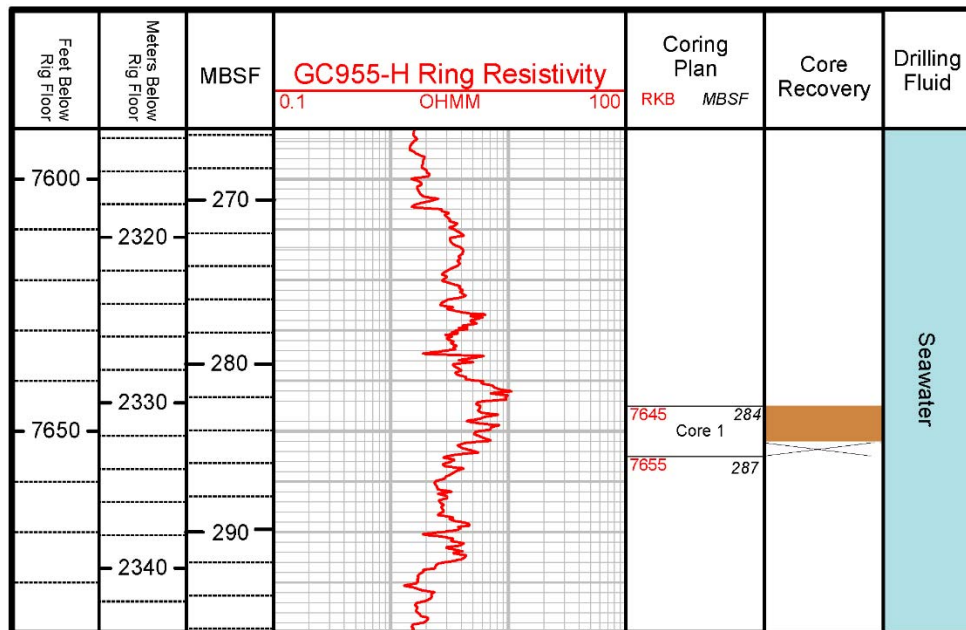
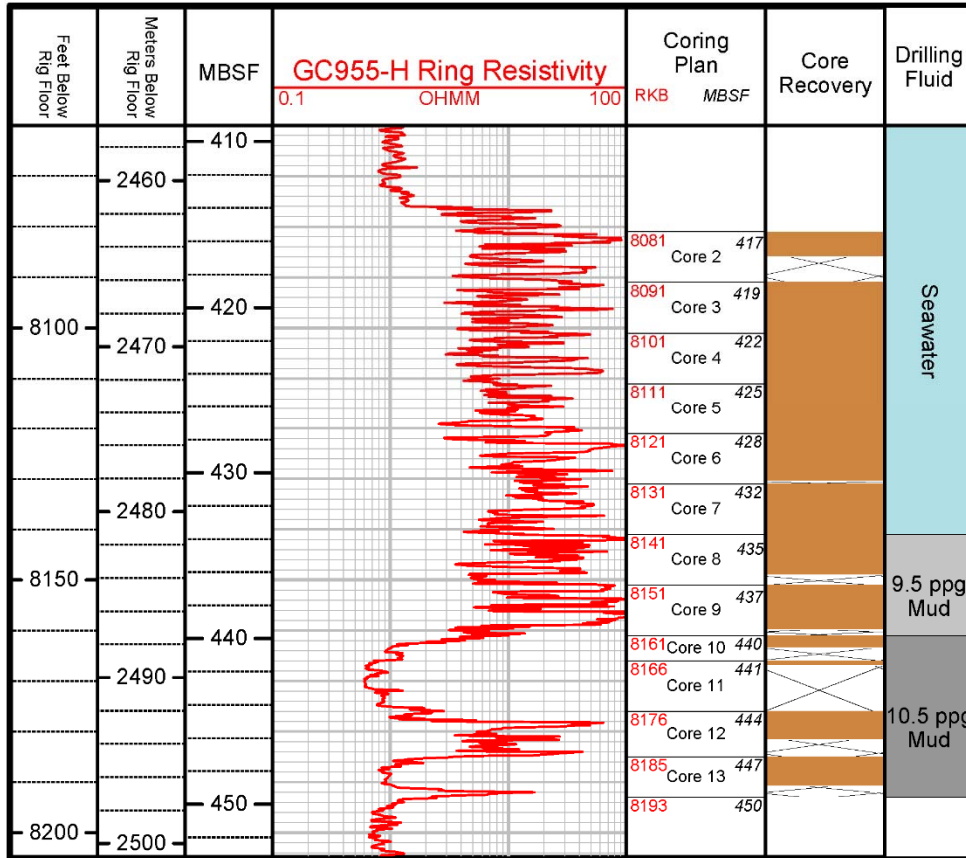
All of the cores recovered at pressure during UT-GOM2 have been processed through the onboard Geotek Pressure Core Analysis and Transfer System (PCATS) lab to perform a preliminary characterization of the cores. These core studies have included core logging of physical properties and X-ray imaging of the recovered cores. The PCATS has also been used to subsample a portion of the recovered pressure cores under conditions where hydrates are stable. The PCATS system has also been used to transfer some number of samples to pressurized storage chambers. A limited number of subsamples have undergone quantitative degassing to determine hydrate concentrations.

With the approaching end of the UT-GOM2-1 expedition, we now see the transition to the next and equally challenging stage of this project with the transfer of recovered and preserved pressure core samples to the UT shore-based pressure core laboratory that will be established in the Port Fourchon, Louisiana. PCATS data is now being interpreted in preparation for generating core cut plans for the work at the port. It is expected that the pressure core processing laboratory in Port Fourchon will be operational for about two weeks, after which approximately 20 (1.2-m-long) pressure core samples and an unprecedented number of conventionalized core samples will be transferred to University of Texas at Austin (UT). We will analyze these cores at the UT Pressure Core Center (PCC) and distribute them to the USGS Woods Hole, the National Energy Technology Laboratory, and others. Additional CT scans and quantitative degassing experiments are planned for Port

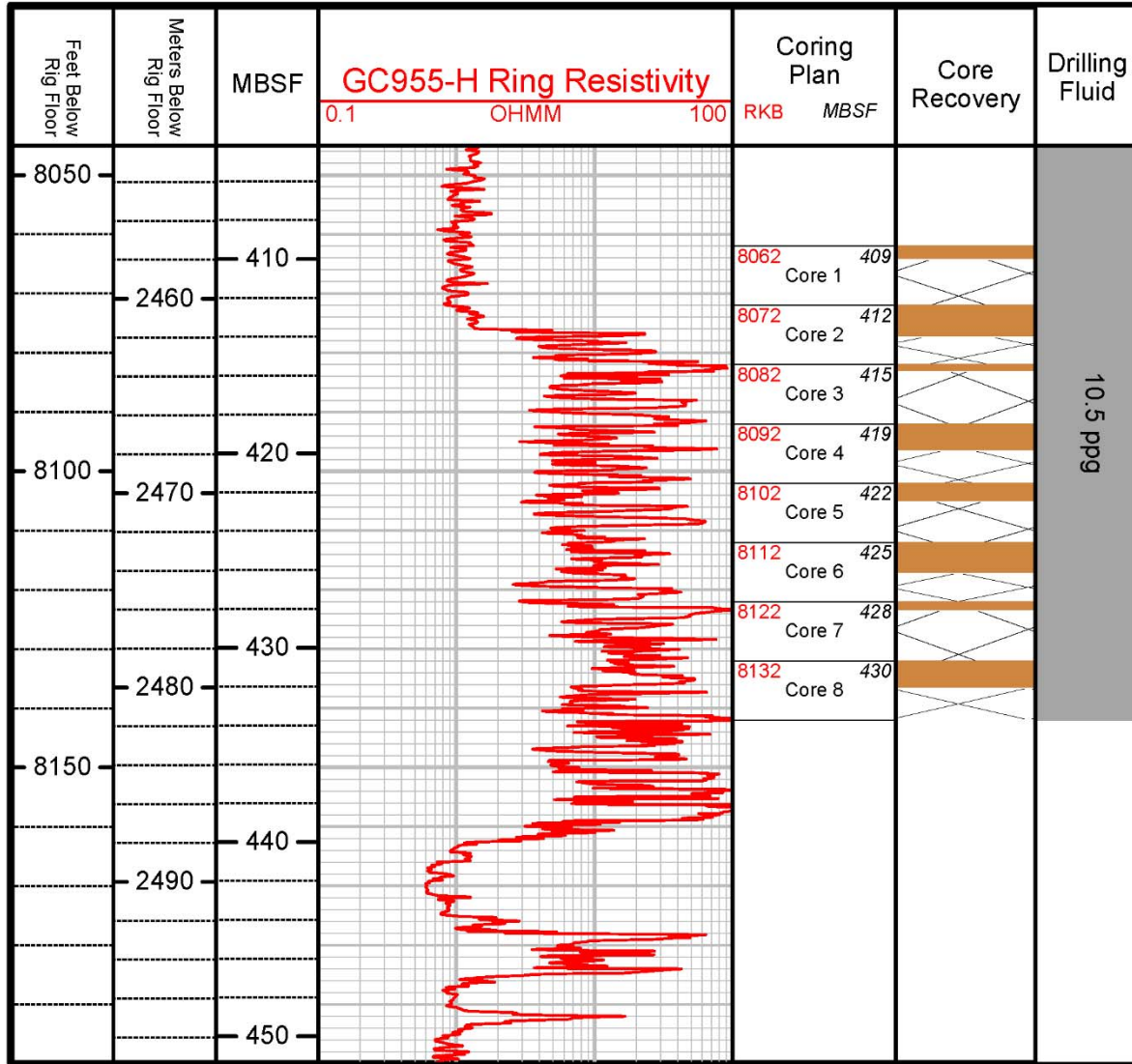
Fourchon. Depressurized (conventionalized) cores will be shipped to Ohio State University, University of Washington, Oregon State University, ExxonMobil, USGS Woods Hole, UT and other institutions.

Special thanks are extended to the crew of the Helix *D/V Q4000* for their unyielding support of this project and for their commitment to running a safe and efficient scientific expedition.

# Hole UT-GOM2-1-H005



# Hole UT-GOM2-1-H002



# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 23-May-2017, 0000-2400hr

**2. LOCATION:**

0000 – 2400 hr, 23-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-0100 At Hole UT-GOM2-1-H005

Continue borehole cementing operations

Cementer continued pumping 171.4 bbl of seawater

0100-0345 Cement in place ETOC 7391 ft RKB

POOH F/7685 ft RKB T/5976 ft RKB

BHA clear of seafloor

Flushed drillstring with 400 bbls seawater

0345-11:39 RIH BHA F/5976 ft RKB T/6674 ft RKB

Standby at 6674 ft RKB waiting on BSEE approval

11:39 Received BSEE approval to abandon Site 005 without tagging cement as per revised APM.

1200-1300 JSA with personnel involved in POOH

POOH F/6674 ft RKB T/6100 ft RKB

1300-1330 Waiting on weather due to lightning

1330-2400 POOH F/6100 ft RKB T/203 ft RKB

JSA for personnel involved in breaking down the BHA

Continue to breakdown BHA

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

Continue demobilization of project equipment and people from *D/V Q4000*.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Demobilization operations continued throughout the last 24 hours with the transfer of equipment to the *HOS Red Rock*. Borehole cementing operations in Hole UT-GOM2-1-H005 was completed.



# Daily Operational and Science Report

## UT-GOM2-1: Hydrate Pressure Coring Expedition

**1. DATE:** 24-May-2017, 0000-2400hr

**2. LOCATION:**

0000 – 2400 hr, 24-May-2017

**Hole UT-GOM2-1-H005**

Location: Lat: 27° 00.04665', Long: -90° 25.59125' (WGS 84)

Water depth: 6666.0 ft (6718.0 ft RKB)

Per Datum: RKB 52.0 ft above SL

**3. DESCRIPTION OF OPERATIONS:**

0000-1200 At Hole UT-GOM2-1-H005

JSA for personnel involved in breaking down the BHA

Continue to breakdown BHA

Backload BHA and DP

1200-2200 Backload project equipment to the *M/V HOS Red Rock*

Recover compatts

2200-2400 D/V Q4000 moved to one mile off location

*M/V HOS Red Rock* depart location

**2400 hrs - End of Lump sum demobilization**

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

Transfer project equipment and cores to the Port of Fourchon, LA via *M/V Red Rock*, ETA

1430 hrs on 5/25/17

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Demobilization operations continued throughout the last 24 hours with the transfer of equipment to the *HOS Red Rock*, which departed location 2337hr.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 25-May-2017, 0000-2400hr

**2. LOCATION:**

0000 – 1330 hr, 25-May-2017

*M/V HOS Red Rock* transiting from GG985 to the Port of Fourchon, LA

1330 – 2400 hr, 25-May-2017

**Intermoor, Port of Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-1230 *M/V HOS Red Rock* transiting from GG985 to Port of Fourchon, LA

1230-1300 Arrive Intermoor dock/facilities

1300-1500 Offload project equipment

PCATS system transfer, with pressure cores

UT core processing lab transfer

1500-2400 Setup PCATS and UT core labs

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

Complete setup and PCATS/UT lab setup at Intermoor, begin processing pressure cores by about 1300 hr. Complete offloading of HOS Red Rock mud boat. Move HOS Red Rock to Francis Drilling Fluids (FDF) to offload the excess mud & cement followed by tank cleaning operations.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

In the last 24 hours, completed UT-GOM2-1 demobilization operations with the arrival and offloading of the *M/V HOS Red Rock* in the Port of Fourchon, LA (Intermoor facilities). The pressure core storage van was offloaded by 1500 hr. From power disconnect to power hookhoop the transfer of the pressure core sample van took only 15 minutes. Also today, the UT and Geotek technical team met to review and finalize the pressure core cut, sampling, and degassing plans to be conducted at the PCATS/UT labs in Fourchon.

# **Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 26-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port of Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-1100 Setup PCATS and UT core labs

1100-2400 PCATS operation

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

Continue PCATS and degassing activities.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Setup of Geotek and UT labs at Intermoor were completed. UT continued to work on the expedition report, planning degassing activities, and preparing to ship geochemistry and microbiology samples. Geotek began PCATS scanning and cutting of Core UT-GOM2-1-H005-10FB.

# **Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 27-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port of Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-2400 PCATS and degassing operations

1000 Delivery of overpack container

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

Continue PCATS and degassing activities.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Geotek worked on scanning and cutting of Cores UT-GOM2-1-H005-11FB and 04FB.

Geotek/UT began quantitative degassing of two sections from Core UT-GOM2-1-H005-10FB. UT continued to work on the expedition report.

**Daily Operational and Science Report**  
**UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 28-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-2400 PCATS and degassing operations

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

Continue PCATS and degassing activities.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Geotek worked on scanning and cutting of Cores UT-GOM2-1-H005-4FB and -5FB. Geotek worked on preparing the overpack unit for the first shipment of 1.2 m storage vessels to UT. UT finished quantitative degassing of core sections UT-GOM2-1-H005-10FB-2 and -3, and began quantitative degassing core sections UT-GOM2-1-H005-4FB-2, -3, -4, -5, and -7, completing section UT-GOM2-1-H005-4FB-5. Gases were sampled for post-cruise analysis and the remaining sediment after degassing was processed through the mud lab. UT continued to work on the expedition report.

# **Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 29-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-2400 PCATS and degassing operations

0000-1100 Preparation of overpack for shipping

1115 Overpack departure

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

Continue PCATS and degassing activities.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Geotek worked on scanning and cutting of Core UT-GOM2-1-H005-5FB. It was determined that seals need to be purchased and replaced in PCATS and PCATS operation was paused. Geotek worked on preparing the overpack unit for the first of three shipments of storage vessels to Austin. The truck arrived in Fourchon and began transport with an expected arrival in Austin the next day 30 May 2017. UT finished quantitative degassing of core sections UT-GOM2-1-H005-4FB-2 and -7, while continuing to degas core sections UT-GOM2-1-H005-4FB-3 and -4. Gases were sampled for post-cruise analysis and remaining sediment after degassing was processed through the mud lab. UT continued to work on the expedition report.

# **Daily Operational and Science Report**

## **UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 30-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0600-1200 Locate seals for PCATS in New Orleans

1400-1800 Replace seals in PCATS

1800-2400 PCATS operations

0000-2400 Ongoing degassing experiments

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

Continue PCATS and degassing activities. Visit of DOE and UT personnel.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Geotek worked on obtaining and replacing seals for PCATS. UT continued quantitative degassing of two core sections UT-GOM2-1-H005-4FB-3 and -4, and began to measure samples for grain size analysis. UT continued to work on the expedition report. Back at UT, the first batch of pressure core storage vessels arrived at the UT Pressure Core Center at 0800 hr.

# **Daily Operational and Science Report UT-GOM2-1: Hydrate Pressure Coring Expedition**

**1. DATE:** 31-May-2017, 0000-2400hr

**2. LOCATION:**

0000-2400

**Intermoor, Port Fourchon**

540 Dudley Bernard Road

Fourchon, LA 70357

**3. DESCRIPTION OF OPERATIONS:**

0000-2400 PCATS and degassing operations

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

Continue PCATS and degassing activities. Loading and departure of the second batch of pressure core storage vessels.

**5. DOWNHOLE LOGGING OPERATIONS:**

No additional log data were acquired over the last 24 hr.

**6. CORE DATA:**

No additional cores were acquired over the last 24 hr.

**7. Science Activities**

Geotek worked on scanning and cutting of Cores UT-GOM2-1-H005-7FB and -8FB. The overpack unit was returned to Fouchon from Austin after the first delivery of cores. Geotek worked on preparing the overpack unit for the second of three shipments of storage vessels to Austin. UT continued quantitative degassing of core sections UT-GOM2-1-H005-4FB-3 and -4, and made additional grain size measurements. UT continued to work on the expedition report. DOE and UT personnel arrived today for a tour of the labs and a discussion of expedition results. Junbong Jang from the USGS arrived and joined the science party.