**Appendix F.** *Marine Technician Operations*

EN 651 Discussion

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## Coring:

The Soutar box corer was only tried once during this cruise and had sat on the shelf for 10 years prior. It’s hard to speculate as to why it failed to collect mud. Did it washout over it’s 4 km haulback? Did it pre-trip? Did it not trip correctly? Before it is used again, there are several holes rusted in the frame which need to be repaired.

The MC800 was purchased by URI in 2017 or 2016 and has only been deployed in the Gulf of Mexico or in near coastal regions since. This may very well have been the first repeated test in open ocean, which is why the weighting scheme was found to be inadequate for anything but the calmest of conditions. That being said, we did seem to find the upper limit of its abilities on the last station, seeing 4.5 meters of heave at the stern. Payout was at 30m/min, one of the most conservative rates in the fleet. Haulback was 45 m/min. The MC800 generally spent 2-3 minutes on the seafloor and returned, when tripped correctly, with roughly 30 - 50 cm of mud. We rarely saw short cores, and we did not see any over-penetrated to the point that mud came out the top.

The pingers. One BFP-312 was mounted on the wire, 10m above the package (both MC800 or Soutar). This functioned well. The battery life was unpredictable, but otherwise functionality was good. It gave us a great view of when we were going to make contact with the seafloor. Another pinger, a “Williams pinger”, was used in a myriad of configurations to alert us of a pre-trip scenario. This was never successfully enacted. For future uses, this should be made to work as this information would be very helpful, especially on deeper casts.

Lydia (MATE intern on board) had an internally recording camera and lights from B. Phillips to test. It proved to be a very valuable tool, showing us the pre-trip scenario on the one cast that it survived. For future cruises, a camera should be considered a very valuable for troubleshooting.

We had a strange problem on this cruise: Too many samples. The freezers aboard were full to the brim by the end of the trip and the sampling containers were all gone.

## Air sampling:

The Hi-Vol air samplers could be set up better. Unfortunately, I don’t have any suggestions to improve it. Unistrut and ratchet straps were the keys to securing everything. The “diving board” to re-direct the wind, over the wind screen, withstood 30+mph winds (motoring into 20+ kt winds). The hi-vols require more power than originally thought - about 8 amps each at 110 volts. The European ones (220v) were run on a welding cable, routed up from the muffler room. This was done after they melted the transformers that were brought by the science party. For future cruises: a “burn-in” (dry-run) period would help to avoid finding these problems at sea.

## Underway sampling:

In the wet lab and special purpose lab, there were some leaks and splashes that could be tightened up or re-routed for next cruise. Overall, straightforward. No interruptions from a ship-service side. Both diaphragm and centrifugal pumps were used.

The Endeavor’s 20+ year old IMU, the ADU2, failed this trip. The ADU5 had failed before leaving GSO. The OS75 ADCP deck box also failed during this cruise, something in the power supply module. By the end of the cruise, we effectively did not have any ADCP data. A new ABXTWO is on order.

Some noise was “heard” in the Knudsen deck box. Whether it was electrical, or acoustic is uncertain. It did cause angst at one site but has seemed to come around since. Correspondence with Knudsen techs is ongoing currently.

## Weather/ ship/ external factors:

The weather cooperated for most of the trip. An argument could be made that only the last site was missed due to weather. All other pre-trips occurred before the weighting of the MC800 was dialed in.

One of the ship’s generators required repair in Barbados, taking 3 days.

The Endeavor’s main lab gets warm during mid-day in the tropics, even with the AC running, temps were in the low 80s.

Satellite communications for roughly the central third of this trip were non-existent. The service provider (Marlink/HiSeasNet) failed to update our options file (telling our antenna what satellites are available, and where). Additionally, some satellite coverage may not have been well mapped.