**High-density XBT cruise report AX181214**

**Ship Name:** ***M/V Sunshine Ace***

**Call Sign: C6XN6**

**IMO: 9338852**

**Project Title:** Ship Of Opportunity Program

 High Density XBT Transect AX18

**Beginning date:** Departing Zarate, Argentina, 28 November 2014.

**Ending date:** Arriving Durban, South Africa, 11 December 2014.

**Scientific Ship Riders:** Mr. Philip Massie- NOAA AOML, University of Cape Town

1. **XBTs deployed:** 241
2. **Equipment, tools and supplies needed:** I think it would be useful to have a good box cutter in the tool kit, and maybe some replacement blades for the small craft knife. Also a roll of Duct tape and an earth cable for the short launcher.
3. **Problems:**

I used the longer launcher. On setting up the shorter launcher we (Luis and I) noted that there was a grounding problem. We were unable to locate a grounding wire ad so switched to the longer launcher which I used for the remainder of the voyage.

I used the connector box which I marked with a pencil. The other connector box’s blue light flashed when switched off. Unsure what this meant we opted for the other box.

Thane transceiver interface hangs from time to time. Can't kill process or shut down the PC and this leads to the need to reset the PC.

Pc hangs fairly often. I tried disabling windows search service which was identified as the last process before the hang in the event viewer. This does not seem to have helped. Zach suggested a daily restart, which I have been doing. Most of the time it is fine, but on at least one occasion the pc hung shortly after a restart.

Alarm clock issues: Thanks for this alarm! Although this alarm clock worked fine most of the time, I did notice an annoying tendency for the clock to adjust the *time* if you happen to accidentally press the 'hour' or 'minute' button *before* the 'alarm' button, instead of the alarm! While this is easy enough to avoid during usual operating hours, in the early hours of the morning between short sleeps, this could easily lead to mistakes and missed stations. Perhaps a powered speaker linked to the pc playing the XBT programs alarm might be better as it removes the opportunity to make these sorts of errors. The rope room gets extremely noisy and a loud alarm is very important. I found a half decent interval timer for my android (reMind) which worked well, but was too faint. That might have been fine with a loud external speaker too.

There were 26 bad casts during the voyage. At one point bad casts accounted for more than 20 % of the total. Many initial bad casts were due to aiming for a 750 m depth. Reducing this to 600m along with a small launcher adjustment reduced the occurrence of bad casts considerably. Nevertheless, at the start of the intermediate density section it was decided to increase the sampling station spacing from 30km to 40km. This was soon reduced again to 35 km where it stayed for the remainder of the stage. This decision was made so as to ensure that there were enough probes to complete the transect.

When the shipping agent arrived to fetch the boxes he had not printed all the emailed sheets, and as a result had not cleared the XBT boxes. After liaising with Zach and various shipping agents, we concluded that the only legal thing to do was to leave the boxes on the ship and ask the crew to dispose of them at the next port. This was regrettable and could have been avoided by the shipping agent double checking his manifest against the list of items, and photographs thereof, which I had emailed through earlier.

During logging of the XBT casts in some cases I used position data from the ‘Time Drop Plan, SIPP\_ISA, AOML AutoLauncher, Thrane Xmit’ screen sidebar and in other cases from the ‘Status Report / Drop Plan: Time’ window’s ‘Previous Profiles’ list. I did not realise that these values differed.

2014/12/01: Testing the tubes before the first launch I found that tube 3’s pin did not retract at first. It then retracted but would not re-extend. After this I disabled tube 3 for most of the remainder of the voyage.

2014/12/03: Between 18:51 and 18:53 the software failed to launch probe from tube 5. This was not immediately obvious to me and when I went to reload the tube, I found the unlaunched probe with pin pulled. Unfortunately the probe was lost. I’m not sure why the software skipped the probe and indicated that the tube was empty. Perhaps it did not detect the probe in the first place.

2014/12/06 05:11: Missed station. Unfortunately a number of events coincided resulting in my missing an early morning station on 2014/12/06 at 05:11. The system was set up without a no splash fallback, and I hadn't changed this. When I started te machine, everything was set up and I decided not to change too many settings. Before getting in to bed for the night, I reloaded all the active tubes, and pulled the pins. Unfortunately I must have missed a single leading to the 05:11 missed cast. Added to this, my alarm either didn't wake me or I miss-set it after the previous station. As a result, the system didn't drop the next probe, *and* I wasn't aware of the problem. I awoke for the following station, and that's when I noticed the discrepancy. I'm very sorry for this mistake.

2014/12/07 ~17:20: After a routine PC restart the cursor began flashing diagonally across the screen on its own This issue seemed to be resolved by restarting the computer and reseating the mouse and keyboard plugs. After above cursor issue, I started photographing all settings screens that I could in preparation for booting up the backup pc. Unfortunately, while doing so I inadvertently stopped the time server and struggled to get the system up and running again. Eventually I worked it out and got the system back online in time for the subsequent station.

2014/12/08: 16:04 Tube 4’s pin did not retract (cast #209). The auto launcher defaulted to T 5 which worked well. I made contact with pin 4 via diagnostics, but couldn't test the tube as it was loaded. I then set up T 4 as the next tube to launch but it failed again and the system moved on to T 6 which gave a bad profile. T3 had shown indications that it may have started working again and I then manually set off T3 to see if it was working correctly. It appeared to work correctly and the probe gave a good profile. Unfortunately the probe in T 4 was ultimately lost. After the loss I tested the T4’s pin again and it seemed to be working. I will try both 3 and 4 carefully again before enabling them for tonight's run (Tuesday 8th).

2014/12/08 20:33 cast #216. I tested tube 3 again with an XBT with pin still inserted. T 3 began to retract its pin, at which point I released the XBT pin, buffering the tube pin from the XBT with my fingers. Unfortunately, the tube pin stopped moving at around the half way point. In order not to waste the XBT, I pressed the tube pin down, releasing the XBT, and the data looks fine. After this I deactivated T 3 once again.

1. **Recommendations**: Perhaps the cruise plan document could be updated to include the 600m depth target and to fix the interval typos on page 4, paragraph 3.
The rope room is extremely loud and maybe a powered speaker would be a good idea for either smart phone interval timers or PC alarms.
The rope room is also quite remote and I didn’t see a fire extinguisher anywhere nearby. Maybe a small fire extinguisher would be a good idea. The electricity leads provided by the ship were extremely sketchy and there was quite a lot of sparking etc at times. It did occur to me that an electrical fire was a possibility.
2. **Other narrative:** The crew aboard the Sunshine Ace were, by and large, helpful and responsive during the voyage.
3. **Ship contact:** Captain Sandip Kumar