***High Density XBT Cruise Report (28/11/2016 – 21/12/2016)***

***AX081216 – Maersk Vilnius***

***Call sign: 9V8503***

***Technical rider: Fiona Preston-Whyte***

***Dates XBT’s deployed: 3/12/2016 to 20/12/2016***

***Total XBT’s deployed: 479***

I joined The Maersk Vilnius in Durban on the 28th of November 2016 Gus Mckay joined me for insulation, training and testing. However, AX081216 officially began on the 3de December 2016 on leaving Cape Town. During the voyage, Expendable bathythermographs (XBTs), and ARGO floats (table 1) were deployed. Going at an average speed of 16 knots (speed ranged from 13 to 17 knots), XBTs were deployed, on average, every 50 minutes (time ranged from 62 to 48 minutes) so as to provide a drop every 25 km. This provides a high density, high resolution section of the AX08.

The cruise saw big swell around South Africa, which calmed as we approached the equator.

On the 17th December, the ship adjusted course to avoid the worst of a low pressure weather system. Increasing swell and rain saw the Captain ban everyone from venturing outside. This ban occurred at 21:00 GMT, with 5 probes in the auto launcher, I adjusted to time between drops to every three hours, allowing a continued sampling plan until the predicted lifting of weather conditions on the 18th December at 14:00 GMT. The Captain actually lifted the ban slightly earlier than predicted at 12:00 GMT on the 18th December.

***ARGO Float deployments***

*Table 1: Table summarizing the details of the ARGO float deployments*

|  |  |  |  |
| --- | --- | --- | --- |
| ***Serial Number*** | ***Date Started (time GMT)*** | ***Date Deployed (time GMT)*** | ***Deployment position*** |
| *7371* | *28 November2016 (07h30)* | *5/12/2016 (17h41)* | *23°58.43 S ; 005°55.08 E* |
| *7363* | *“* | *8/12/2016 (01h10)* | *14°00.15 S ; 005°33.98 W* |
| *7379* | *“* | *10/12/2016 (00h40)* | *05°03.79 S ; 015°27.59 W* |
| *7364* | *“* | *10/12/2016 (11h04)* | *03°02.65 S ; 017°41.28 W* |
| *7330* | *“* | *10/12/2016 (21h30)* | *00°59.80 S ; 019°54.94 W* |
| *7383* | *“* | *11/12/2016 (02h44)* | *00°04.13 S ; 020°57.41 W* |
| *7303* | *“*  *+29 November 2016 (08:30)*  *+30 November 2016 (11:00)* | *\*Not deployed* | *\*Not deployed* |

The conditions for many of the deployments were ideal with medium to small swells, light winds and clear or overcast conditions.

All the floats were deployed from the aft of the ship with the float being lowered by rope till it makes contact with the water and the salt collar dissolves. This method proved successful for all the floats and was made easy with the assistance of the AB. The floats were deployed while the ship was underway travelling at approximately 16 knots. Very little issues were experienced during the deployments. It is suggested that decent, thick gloves are used during the deployment of the floats.

One must be aware that if the salt collar dose not dissolve immediately (float 7330), the pull on the rope from the ships draft is extensive, it is best to let go of the rope in such circumstances, as one has tied it to the ship, loss of rope is not a concern, however damage to hands can be extensive if one try’s to hold on. After detailed discussions with the Captain, Officers and AB’s, the following is suggested: In addition to measuring out the length of rope needed and securing it to the vessel; between the hook and where one plans on controlling the rope, this area of rope should be wrapped around (two or three times) a railing/bulkhead etc. this allows one more control over the lowering of the float, or any forces brought in by the draft.

***Drifter deployments***

No drifters were deployed on this cruise.

***XBT Deployments***

Going at an average speed of 16 knots (ranged 13-17 knots), XBTs were deployed every 50 minutes (ranged 62-48 minutes) so as to provide a drop every 25 km. This provided a high density, high resolution section of the AX08. Due to poor weather conditions, this sampling plan was interrupted between 21:00 GMT on the 17th December -12:00 18th December, where a drop every 3 hours occurred (see above).

On the 9th December, Pin 7 on the Auto Launcher (ALX01) malfunctioned by refusing to come out again. As a result, tube 7 was removed from the sequence and so the larger part of the cruise was completed using the remaining seven tubes. On the 19th December, Pin 3 on the Auto Launcher (ALX01) malfunctioned by refusing to come out again. As a result, tube 3 was removed from the sequence and so the last two days of the cruise was completed using the remaining six tubes.

A recurring issue was that the tubes (5&2) did not recognize that they had a probe in them – this was solved by either re”checking tubes” or adjusting the probes in the auto launcher. A frozen computer (during MK21 work), and alarms no longer working was solved by restarting the computer – to limit this issue, the computer was restarted every few days.

Redrops: 5

Faulty or problem probes: 6

Lost probes (due to pin not coming out): 3

***Problems:***

Argo Float 7303 refused to gain a GPS signal (28th November 2016), even though, startup sound and inflation/deflation occurred. A reattempt to start this float occurred on the 29th and 30th November. Received instructions not to deploy this float.

Frozen computer problems were solved through restarting the system regularly.

A number of probes proved faulty as the system did not recognize they were in the auto launcher (checked connection before deemed faulty).

One probe lost due to tube 7 ‘s pin not coming out again.

Two probes lost due to tube 3’s pin not coming out again.

Tube 7 had to be removed from the system as the pin refused to come out again on 9 December.

Tube 3 had to be removed from the system as the pin refused to come out again on 19 December.

The alarm system temporarily stopped working – this was solved through restarting the computer.

A recurring issue was that the tubes (5&2) did not recognize that they had a probe in them – this was solved by either re”checking tubes” or adjusting the probes in the auto launcher.

At one point the pin in tube 5 did not retract, however, after a verity of trouble shooting, this problem solved itself.

***Recommendations:***

There was no insulation tape in the equipment boxes. If it wasn’t for the electrician, this could have been quite a problem.

***Equipment tools and supplies needed:***

Silicone spray, insulation tape, cable ties and wire cutter (the brand new one broke during setup).

***General Comments***

The Maersk Vilnius is an ideal vessel for all types of deployments with the captain and crew being more than willing to assist with the deployments even during the early hours of the morning. The set up the Auto launcher makes for an easy setup. A huge thank you to the Captain Ajay Sreekumar and crew of the Maersk Vilnius, for all the effort and assistance, with the deployments and reloading during the early hours of the morning, and for the great hospitality aboard the cruise.