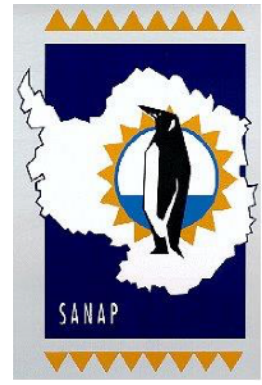




# 71° Below

**SANAE 57 Newsletter**  
**February 2018**



It has been another challenging and amazing month here at SANAE IV. Most importantly the overwintering team are finally alone! The last of the construction and maintenance crew flew out at the end of the month, leaving behind what can only be called a construction site that will keep the whole team busy for a while to clean up and make orderly. This would all be in preparation for them to return next summer to complete a few of the projects that were not able to be finished due to some severe weather and other logistical constraints. However, in this newsletter I will be continuing the journey from the ship to the base with all the cargo and fuel that are required to run a remote research base in Antarctica.

## **The Ice Shelf**

After sailing 4000km south to get to Antarctica with all the cargo the SA Agulhas II now needs to get this cargo off onto the actual continent so it can be transported to the base. This year, since the base was undergoing some significant upgrades, there was much more cargo than usual, with multiple huge shipping containers full of equipment and materials. There was also the usual assortment of food, maintenance supplies, clothing and personal effects, medicine and medical supplies, and so much more! This made this cargo far heavier and more complicated than usual. Certain containers were more urgent than others and so had to be offloaded first. All the while the ship is at the mercy of the ice and tides, making it difficult to get done what needs to be done. And what needs to be done is simply breathtaking!



The ship arrives at a small bay called Akta Bukta (or Penguin Bukta) which is about 170km directly north of the base. At this bay there is no land, rock or beach. Only a shelf of ice running for hundreds of kilometres in each direction. The shelf extends out from the actual continental ice by about 100km. Thus, at the spot where we offload, the ice is simply floating on the south Atlantic,

not touching the seafloor at all. Since the ice shelf is about 40m thick it means that roughly 360m of pure, dense, glacial ice is below the water. So in total the ice shelf is approximately 400m thick!

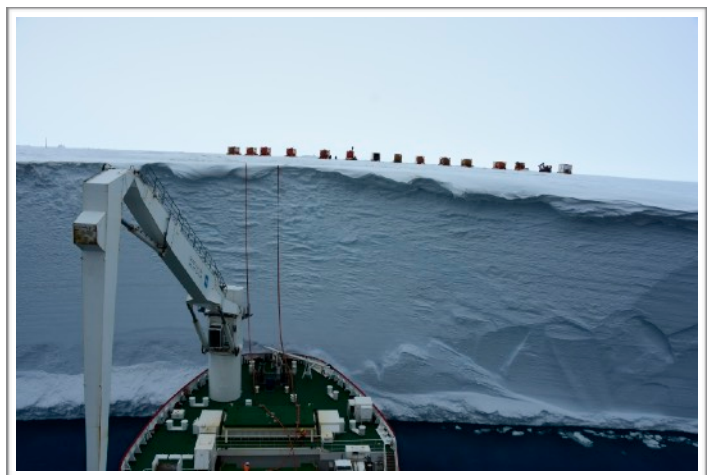
Vehicles from the base, driven by some members of the previous overwintering team, towing sledges, arrived at the point where the ship was waiting in the Bukta. Once the vehicles have arrived with sledges the offloading can begin. The ship slowly and carefully pushes up against the ice shelf to keep stabilised, and uses the crane at the front of the ship to move cargo, vehicles and people up onto the shelf. The stabilising system in the ship keeps it level and stable while shifting some very heavy loads that would otherwise cause the ship to roll.



Slowly, container by container, the cargo is unloaded. A Caterpillar bulldozer (Cat) drives close to the edge (not too close!) towing a sledge. Sometimes the Cat is towing a sledge with a waste container that needs to go back to SA. In this case the ship will take that container off first, then bring up the next cargo container, bound for the base. Once all the sledges are full and the Cats are towing their maximum capacity then the Cat train sets off for the base (sometimes after a night resting on the ship).

Fuel is handled slightly differently. The fuel needs to get to the base in huge bowsers, basically large tankers on sledges. We have two sizes, 18000L and 25000L. We need to transport roughly 460 000L so it takes a few trips, since each Cat train can only transport maybe 5 of these bowsers.

To get the fuel from the ship to the bowsers two thick pipes, coming from the ship's fuel stores, are lifted by crane onto the ice shelf and dragged by a team of people to the bowsers. Non-drip connectors with trays underneath are used to ensure there is no spill of diesel onto the pristine ice during the transfer. All the bowsers are lined up and the lines are taken to each bower in turn until they are all filled. Then the bowsers are dragged by the Cat train to the base.



## Cat Train across the Ice

So now the cargo is offloaded from the ship onto sledges then there is nothing left to do but drive to the base. The vehicles used by the SA Antarctic program are big Caterpillar bulldozers. They are immensely powerful, capable of towing huge loads. However they are very slow! Top speed without a load might be around 30km/hr. With the huge loads that we need to tow often only 8 or 9km/hr is possible. Downhill it might go as high as 15 or 18km/hr!

We travel in convoy, driving parallel lines, staying close but not behind another vehicle. Thus if a vehicle stops for any reason there won't be a collision. It isn't easy to change directions suddenly in these vehicles, towing these tremendously heavy loads.

The route from the ice shelf to the base is very carefully mapped out by GPS, taking detours around known crevasse fields. Also every year parts of the route are scanned by ground-penetrating radar to ensure the route is still safe. The GPS gives extremely detailed route instructions and information. We will know second by second whether we are left or right of the track and also how far off. We all try to stay within 100m each side of the track to ensure safety and also to maintain visual contact.



Sometimes in heavy weather we can't see each other. In fact in very heavy weather we can't see the front of the vehicle! In these situations we can still drive safely by following the detailed route on the GPS, following the turns, and by maintaining radio communication with the other vehicles.

Half-way along the route, at the beginning of the season, we leave an 18000L bowser for the Cat trains to use for refuelling, whether travelling north or south. At the end of the season we collect it, refill it and will deposit again at half-way for the next season.



So the Cat train proceeds slowly from the ice shelf to the base. However things don't always go so smoothly and it's common for the Cats to get stuck, especially uphill. In this case the procedure is to unhook to last sledge and take the remaining sledges up the hill. Once on level ground we unhook the sledges we did carry up and then drive back to fetch the remaining sledge. Some hills are gradual and several kilometres long, so these little trips can take several hours to get everything back together! Thus the 170km journey regularly takes a whole day. The longest trip this season was 36 hours!

But eventually we reach SANAE IV base, which has quickly become home! More on this next month!

## Our Sponsors

A huge thanks to our sponsors who generously donated some of their quality products to the overwintering team to make our winter more homely! We have tucked into the fantastic coffee from Arabikaz and ContiCoffee with relish. Cobus has some experience working as a barista and has been teaching those who want to learn how to make a cappuccino with proper foam! We also celebrated our freedom from the construction crew with some excellent Belgian beer, kindly supplied by the Belgian Beer Company.

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