

# SANAE 49 NEWSLETTER

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Vol. 02

MONTHLY NEWSLETTER OF THE 49<sup>TH</sup> SOUTH AFRICAN NATIONAL ANTARCTIC EXPEDITION OVER-WINTERING TEAM

## One last CAT Train

**Part 1: Russians, Germans, and a quick visit to the corner garage & convenience store**

Roger Van Schie

**Antarctica: A place** where distance is not measured in units of length, but in the time it takes to travel to one's destination.

The time had finally come for another Bukta trip: the Akademik Fedorov was scheduled to be at the Atka Bukta (the ice shelf close to the German base) in a few days. Everyone was very excited, seeing that our "package" was almost here. A bonus to this trip was that we would get to meet our German counterparts - the last people besides our team mates that we would see until next summer. We would also see the newly constructed German base - Neumayer III.

The Challengers (our "little" tjorje) were all tuned, filled up, loaded with spares (for themselves and for us), survival gear, sleeping bags, water, canned food and lots and lots of jelly babies. Our only luxury was a camping stove and a portable percolated coffee maker. You have no idea how well a steaming cup of coffee goes down when the ice starts to take its toll.

Planning a trip like this is not easy, since there are many variables that influence the journey. Even the information that you consider to be a reliable constant, can change within half a day. The weather at Novo (one of the Russian bases where the Akademik Fedorov was docked before it was scheduled to sail to Neumayer) was temperamental. We were unsure whether the Akademik Fedorov would arrive at Atka Bukta on time. We didn't want to arrive late, and delay the ship, nor did we wish to get there too early and wait around for ages until the ship got there. On the plus side, it had not snowed for a while, so we weren't expecting to have to slog through thick snow on the way there. This game of logistical poker was played by André Harms, our team leader and mechanical engineer - who also, as it happens, is fluent in German and possesses a stern poker face. On his final hand he decided to put all his chips in for us to leave on Sunday the 7th of March. This date gave us enough time to deal with any foreseeable predicaments that

» continued, **PG. 5**



Two of the three Challengers with Vesleskarvet in the background

## PUMPING FUEL FROM THE Академик Фёдоров



Four SANAE 49 team members connecting the fuel line from the Russian Antarctic Ship, the Akademik Fedorov at the Atka Bukta

Hey kids! Help our Antarctic Explorer gear up for winter in the cut-out feature on p. 10

## PREPARING FOR A POLAR WINTER

James Hayes

**Arrival in Antarctica**, check. Successful summer relief period, check. A not-so-graceful wave goodbye from S49, as the SA Agulhas departs from Antarctica, check. Enough food for the entire winter and beyond, even more polar diesel (compliments of the Akademik Fedorov and Paul the German Chef), a solid testosterone-charged over-wintering team in high spirits, a "skrik-vir-niks" inventory of sponsored wines, regular skivvies on Mondays - check. It appears that S49, the "Antarctic Cowboys", have gripped the metaphorical ice-bull by the horns and settled into their niche as ephemeral patrons of the SANAE IV base. Truth is, however, that we still don't have a clue what "really cold" means, nor did we envision the amount of effort, toil, tugging, hauling, lifting and shoveling the preparation for winter would demand.

Apart from a few minor alterations in lifestyles and wardrobes, most South Africans have never truly had to concern themselves with preparations for a cold winter. For the bourgeois, winter preparation presents itself as a brief, frenzied time of crashing frugal

budgets and red-lining credit-transactions into the gaping coffers of department stores and clothing retailers - fashions of the season, which have to be re-acquired year after year, in order to stay toasty. For many more South Africans, the preparation for winter requires re-stocking domestic inventories with paraffin, to keep the cold at bay during those biting winter-nights. Apart from the modified wardrobe (cold weather gear, check), and the practice of burning fuel for heat, the South African climate does not warrant much existential knowledge in this regard.

Our lack of knowledge in terms of seasonal preparations might warrant a quest for solutions elsewhere - the animal kingdom has several approaches to weathering cold winters. The consumption of copious amounts of fatty foods will inadvertently lead to a thick layer of insulating adipose tissue - an effective and much exploited approach (especially for sea-dwelling mammals in Polar regions), but an option which could prove to be the bane of an over-wintering team-mate's existence upon the team's return to temperate South Africa. The Arctic Tern advocates migration, by championing across thousands of kilometres to enjoy warmer Northern Hemisphere summers during the Antarctic winter months - unfortunately, SANAE 49 is here to stay, for a winter. Hibernation is another viable option (at least for some members of the team), but a questionable application of tax-payer's Rands. The recesses of some ecologically informed minds might conjure up mental images of a European

squirrel that busies itself by gathering nuts before the cold season, but the preparation for Antarctic winter goes far beyond that too.

From exactly fifty years of South African experience in Antarctic expeditions, as well as the knowledge gleaned from our Northern Hemisphere counterparts, much has been learnt in regard to surviving Polar winters.

» continued, **PG. 2**



Loading of JET-A1 fuel drums, which were destined to be stored in the Winter Depot

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Editors: Ryno Jordaan and James Hayes

## « Preparing for a Polar Winter, continued

Not only is it important to ensure the safety of the expedition members, but also the longevity of the base and equipment. Apart from the obvious necessity to stockpile all consumables (think, European squirrel), preparation for winter entails two major activities.

Firstly, vehicles such as skidoos and Challengers have to be kept warm, and are loaded into the base's hangar. Secondly, extensive depot work is required for all the containers and cargo sleds that are kept on the ice during the winter. The order for completing these two activities is irrelevant, but preferably concurrent, if the manpower is available.

The cardinal issues that are faced during an Antarctic winter are as follows:

1. Extreme cold (which constantly ranges in the high minus thirties degrees Celcius) damages machines, and is considered problematic to the sustainable existence of Homo sapiens.

2. Extreme wind conditions have a detrimental effect on logistics and cargo management by blowing away loose items (such as the AB-link door on the base), and by causing snow buildup (or sastrugi), which buries cargo that is left on the ice.

### Mech Marlon Manko says:

The immensely low temperatures have the following effects on our vehicles:

- Excessive engine wear results from the fact that machines take longer to be heated to optimal operational temperatures, and machines cool down faster than normal.
- Non-starts are caused since batteries are drained faster than normal, and starter motor solenoids freeze up.
- Charging system problems are encountered due to the fact that belts freeze, become brittle and break - alternators stop charging.
- Hard ice build-up between track and wheels influences steering.

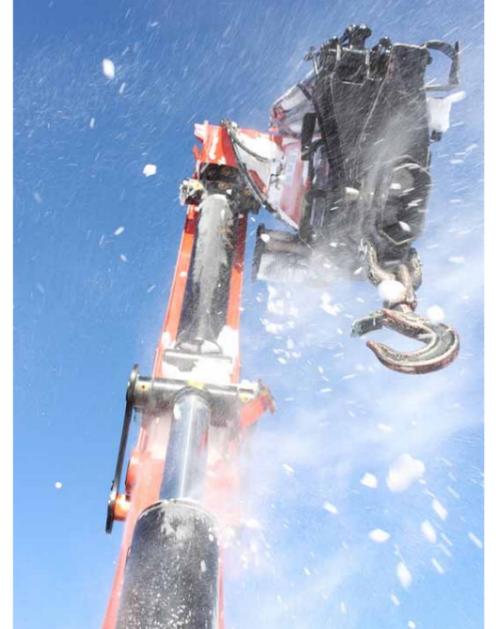
All things considered, it is best practice to remove these vehicles from the onslaught of the elements and keep them in the hangar during winter.

The work in the winter depot commenced in parallel with the last Bukta trip – which meant that three of the four team members that remained at the base would work in the depot, whilst the last member would see to lunch, answer phones, and oversee the operational status of the base. Turns were taken for the last-mentioned duty, since the designated tea-lady and base-secretary position was so coveted.

The depot work is simple in theory, but proved to be time consuming and laborious. The Webasto on a bulldozer would be started shortly before breakfast to prepare the vehicle for start-up, and the team of three would have breakfast and gear up for the day. Subsequently, the team would fire up the engines and drive the dozer to the Summer Depot, which is proximal to the base. Sleds would be hooked in a long train



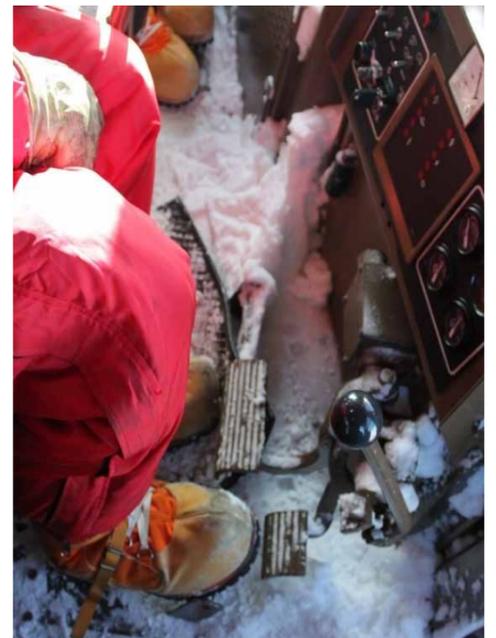
The blade-dozer pulling approximately 100 tonnes en route to the Winter Depot



ABOVE & BELOW: Equipment is always covered in ice



An empty cargo sled on its ice throne in the Winter Depot - two S49 team members are tying up the A-frame, so that it will not be buried under ice during the winter.



JET-A1 fuel drums are loaded onto a cargo sled, which is destined for the Winter Depot

behind the bulldozer (these machines can pull almost double the payload that a Challenger musters). The sleds would then be dragged to the Winter Depot, which is in the ballpark of three kilometers east of SANAE IV. The journey between the Summer and Winter Depots lasts almost an hour, with the faithful dozer chugging forth at three to four kilometers per hour.

Once in the Winter Depot, sleds would be off-hooked, one by one, and pushed onto 1,5 metre-high heaps of snow, that were bulldozed during the summer. As always, easier said than done – we were grateful for the adept bulldozing, driving, à la pushing of Marlon, who helped the sleds onto their respective mounds without any incident. Only later during the process did it dawn on us that we could pull the sleds onto their pedestals – by parking the dozer with rear winch on the opposite side of the snow heap, in a fashion that the dozer, snow mound, and sled form a straight line, one could winch the sled onto the raised snow – who could ever question the virtue of experience?

The flat-topped snow mounds serve as a raised platform that ensure that cargo sleds are not buried under snow during the winter. The mounds face into the wind, breath-wise, as to minimize the drag profile and also lessen the sastrugi that is cast on the leeward side. Once a sled is atop its resting place, the A-frame is lifted and tied up in order to prevent it from being buried under the ice. All the small precautions matter, especially in a place such as this.

Along with the depot work, the four teammates that remained at SANAE IV committed significant time to loading all the Skidoos into the hangar. Although some Skidoos will be used outside in the time to come, Marlon Manko exploited the opportunity to service all the units while they were inside the hangar.



Connecting a cargo sled's A-frame to the back of a bulldozer



Loading of JET-A1 fuel onto the cargo sled

# « Preparing for a Polar Winter, continued

Depot work was completed after the return of the "Neumayer six" – the extra manpower proved to make an immense difference. The last drums of Skidoo and JET-A1 fuel were loaded on sleds, and taken to the Winter Depot. The caboose, which returned from the half-way point on the Bukta trip, was also slotted into an empty space in the depot.

With the full team back at SANAE IV, we vexed our attention on loading the first Challenger into the hangar. The drill (or teething pains) for ushering a Challenger into the hangar can be summarized in just over half a dozen easy-to-follow steps:

1. Re-arrange the Skidoos in the hangar, and clear a Challenger-sized space.
2. Bulldoze a snow-ramp for the platform lift on the helideck.
3. Lower the platform lift, and grease the worm-gears as the lift descends.
4. Ensure that the snow-ramp is level with the lowered platform lift, and drive the Challenger onto the platform.
5. Raise the platform.
6. Ensure that the hangar space is still cleared.
7. Re-clear allocated space.
8. Drive the Challenger into the hangar (apply steady hands and severe caution during this step).

Naturally, a bit of planning goes into this operation. The total expected time for loading the Challenger was estimated around 3 hours. Total time, minus lunch: 7 hours. As always, the unspoken Antarctic Rule (which should become an amendment to Murphy's Laws): all Antarctic activities take more than double as long as one expects them to. That's the rule, the law, the reality – no exceptions.

As the forty eight teams did before us, we will brave this unforgiving winter, having confidence that our preparations will keep us, and the infrastructure going, for yet another winter, and many more to come. ◆



Step 1: Clear the hangar



Step 5a: Raise the platform, with the Challenger



Step 2: Bulldoze a snowramp



Step 5b: The Challenger finally arrives on the helideck



Step 2-b: Final touches to the snowramp



Step 8: "Hangar" the Challenger



Step 3: Apply plenty grease

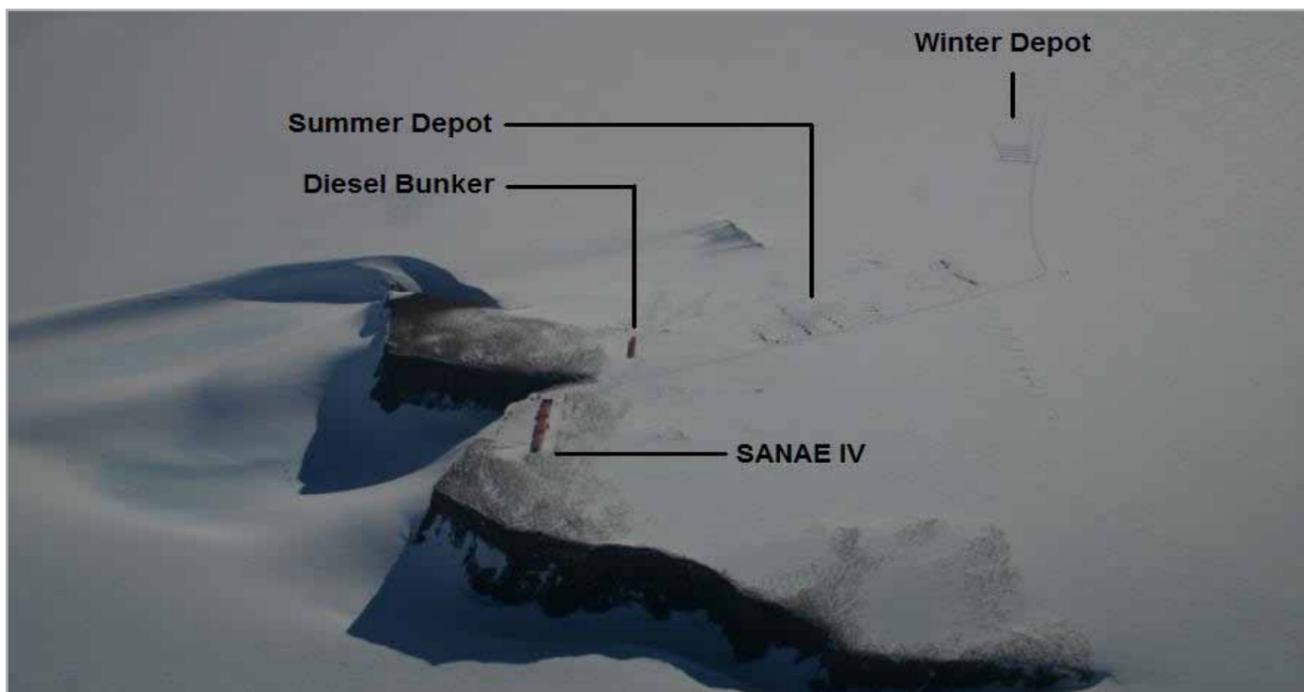


Step 4: Drive the Challenger onto the platform



Thumbs up - another day at the office

## « Preparing for a Polar Winter, continued



CLOCKWISE FROM TOP LEFT

1. This aerial photograph (taken from the South) indicates the topology of the SANAE IV base and the depot areas. The Winter Depot is approximately three kilometres from the base, and stretches for more than a kilometre. The cargo is left on the ice in a straight line, perpendicular to the direction of the prevailing wind, with the smallest surface plane of each object facing East. The intention is to minimise the drag and lessen the sastrugi that each object creates. The diesel bunkers can store up to 600,000 litres of Polar Diesel.
2. A view from the Northern side, facing back South. The Diesel bousers and caboose are stored on the Northern side, furthest from the base. The image clearly indicates the sastrugi on the leeward side of the cargo.
3. Sastrugi is cast towards the leeward side of the cargo - the bottom right image shows the Palfinger mobile crane on its snowmound, with the rear already buried under sastrugi.
4. A view of the Winter Depot from the South, facing Northwards. Note the snow-mounds and the lifted A-frames.



## RESEARCH VESSEL: THE AKADEMIK FEDOROV

Etienne Kruger

**Most people** who will be reading this know quite a bit about, or have at least heard something about the South African research vessel, namely the S.A. Agulhas. Few have had the privilege of experiencing some of the other vessels that also visit the frozen continent every year. We had the honour of assisting in cargo operations of the Russian Akademik Fedorov recently, and this sparked some interest into the ship.

Construction of the Akademik Fedorov was completed in 1987 and it has been the flagship of the Russian polar research fleet ever since. The vessel was named after Yevgeny Fyodorov, a Soviet geophysicist who participated in research on several polar stations, and headed the Arctic and Antarctic Research Institute in Russia in the 1940's. It covers many nautical miles every year and is used around the world, including the north pole and Antarctica.

The Akademik Fedorov is physically about 25% larger than the S.A. Agulhas, and weighs in at a hefty 12000 tonnes compared to the Agulhas' 6000. Despite this she can achieve a speed of 16 knots, but this comes at a price. On average the massive engines consume about 35 tonnes of fuel and 0,5 tonnes of oil per day. Nobody said polar research comes cheap... (Source: [http://en.wikipedia.org/wiki/Akademik\\_Fyodorov](http://en.wikipedia.org/wiki/Akademik_Fyodorov))

### Comparison Table: SA Agulhas - Akademik Fedorov

Vessel	S.A. Agulhas	Akademik Fedorov
Constructed	1977	1987
Length	111.95 m	141.20 m
Beam	18.05 m	23.50 m
Weight	6,123 t	12,660 t
Passengers	98	172
Crew	40	80
Aircraft	2 x Bell 212	2 x Kamov



The SA Agulhas docked in V&A Waterfront Cape Town



The Akademik Fedorov (Photo: Wikipedia)

## « One last CAT-train, Part 1 continued

(from p.1)...could arise on the way there, and ensured that we wouldn't arrive too early either, lest the Germans at Neumayer III thought that we were staying there as refugees.

One of the primary laws of SANAE IV is that there must at all times be at least four team members at the base, one of whom has to be a Diesel Mechanic; even choosing who must go and who must stay can be a puzzle on its own. This limits the away party to six, one of whom also needs to be a Diesel Mechanic (good thing we have two!). This means that only three Challengers could go, as each Challenger requires two drivers, who alternate their driving and resting shifts, as explained in last month's newsletter.

The Challengers that were chosen to go on the trip were:

- Challenger 5, the young long-wheelbase stallion in the stable that was expected to haul the biggest chunk of the load back to SANAE, manned by André Harms and Tyrell Sassen.
- Challenger 3, the perky teenager that was sailing through her adolescence, except for the odd pimple, crewed by Johan Nortje and Robert Schoeman.
- Challenger 1, the reliable old lady with a cheeky hooter, who just keeps on going and going, piloted by Etienne Kruger and Roger van Schie.

Starting a Challenger in Antarctica is not like starting a vehicle back in South Africa; you can't just turn the key and go. First, you need to remove all the covers from the vehicle that prevents (or at least reduce) snow from penetrating its orifices. This procedure involves taking off the air intake cover, the exhaust cover and the radiator cover. Once this is done you need to warm the engine, since diesel engines don't like starting at -18 degrees Celsius. If you do force the machine to start, you could cause quite a lot of damage to the engine. In order to pre-heat the engines we use a device called a Webasto. In essence, a Webasto is just a fancy stove that burns diesel to generate heat. This is then used to heat up water (same water/antifreeze that is used to cool the engine down during normal operation) which is then pumped through the engine block to heat the engine to within minimum operational temperatures. The Webasto takes about 45 minutes to heat the engine, before it is ready to be started. Once the engine has been started, it needs to idle for about 15 minutes just to bring the temperature up to a decent operating temperature. After that, the hydraulics need to be heated up by slowly turning the machine left and right in very small increments – a little shuffle of victory, now that the Challenger been taken through all the heating paces.

The start of the trip was quite scenic, winding around Vesleskarvet (the nunatak that SANAE IV stands on), with Piggen and Schumacher in the background. At V2K5 (the last GPS waypoint before we start the long stretch) we made a quick stop to check that all the cargo was still solidly strapped in and to take a few opportunistic photos of the newly erected direction marker - with the Vesles in the background. After this stop, all you see is ice, vast stretches of ice, and then some more ice. Every few hours we turned our heads to check whether or not Vesles was still visible. On these flat stretches of ice, you can see for miles: the Vesleskarvet only disappears once you're more than sixty kilometres away.

Our initial assumption about the road conditions was correct: very little snow, and the ice was hard, much harder than any of us expected. This allowed us to travel fast, averaging about 17km/h, and at some sections hitting a whopping 25km/h. But this also made the trip more uncomfortable. The Challengers don't have the softest suspension in the world, and we were feeling every bump in the road. For a trip that takes about 24 hours of continuous driving, the bumps take their toll and make sleeping in the Challenger very "challenging".

Sixty kilometres from SANAE, Challenger 5's alternator light started blinking. This was not a good sign. We stopped and Johan (our Diesel Mechanic) took a quick look. It appeared as though there was a bad connection to the terminals of the alternator, but by this stage the

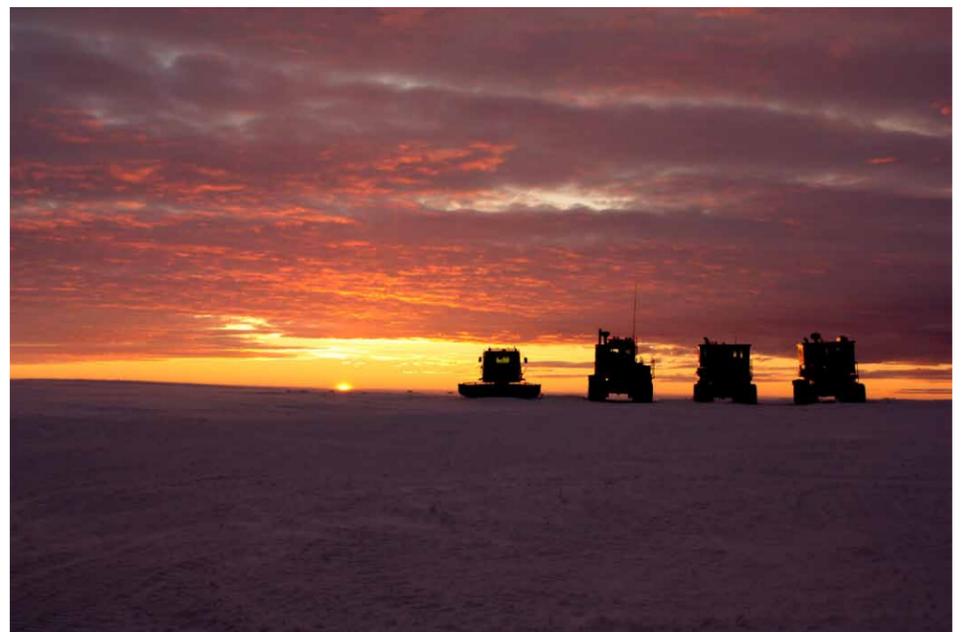
weather had deteriorated which made inspection difficult. Johan fiddled a bit and we decided to keep going and to keep an eye on the situation.

We arrived at the halfway caboose (a "mobile home", fitted with beds, a stove, a generator and a few other luxuries) just before midnight. The caboose had been left at a designated waypoint during the take-over period, in order to serve as a half-way refuge for drivers on their perpetual travels on the Cat Trains. We were all exhausted but we couldn't just go to sleep. We split up into two teams, team Alpha would refuel the Challengers and team Bravo would dig open the caboose's door and get the generator running. As soon as we climbed into our beds, we passed out.

The next morning we all woke up refreshed and relieved at the thought that we had slept well – a rare luxury on the Cat Train. Johan quickly swapped out Challenger 5's alternator with a spare part, whilst the rest of us made some coffee and packed our sleeping bags back into the Challengers. As soon as all of that was done, we hit the road. We still had just over a hundred kilometres to travel to Neumayer, and we didn't want to get there too late.

On the second day the road was even harder than the first. We had to slow down, since we still had time left and we didn't want to damage the Challengers, nor our kidneys. A mere 3km/h difference in speed has never meant so much to me in my entire life.

We arrived at Neumayer III late in the afternoon. We were greeted outside by Olaf and Paul, who then proceeded to chauffeur us into the base. The base was all sparkly and new and Johan could hardly hide his excitement to go and look at their diesel generators. We were given the chance to disrobe, after which we were taken to the bar. Here we had the opportunity to meet the entire German over-wintering team, and we seized the moment to get to know them as well as we could, as we were to have only one, perhaps two days in their company; at least that's what we thought, at the time... ●



Three Challengers (RSA vehicles) and a Pisten Bully (German vehicle) watching the sun go down

## One last CAT-train

### Part 2: Stuck in the German Mothership

Tyrell Sassen

We had arrived at the German base, Neumayer III, with the intention of spending the night there, pumping diesel the following day and being on our way back home the day after that. In Antarctica things rarely go quite according to plan. The good weather that had been with us since leaving SANAE had finally given up.

Weather forecasts indicated that we were to have snow and strong winds for almost two weeks and consequently, the pumping would have to wait. This of course was not too much of a problem, for the six South Africans at least; the food prepared by Paul, the German over-wintering chef, tempted many of us to rather spend the winter at Neumayer III. With the realisation that SANAP wouldn't greet such an action with the same kind of enthusiasm, kidnapping the chef in question was discussed as an alternative. In the end – and in order to prevent a war from breaking out between our two countries – this talk was put aside.

The German team was incredibly hospitable, even with us invading their bar and TV area, and we were treated to a very enjoyable time. With the excellent food, enjoyable conversation and an amazing roast pig, cooked on a spit barbecue, the time flew by.

**EDITORS NOTE: Achtung! Wichtig, bitte lesen:** During this time of feasting and leisure at Aventura Antarctica (a roast pig on the spit, for crying out loud), both the Editors of this publication were working themselves to the bone at SANAE IV – on winter depot work, as well as on the previous month's newsletter. Although a bitter pill to swallow, we publish the previous paragraph for the sake of our committed readership.

The situation began to look dire – there was constant swell in the Bukta, and visibility was poor. Days dragged on (or flew by, depending on the perspective) without any opportunity to offload cargo, and the time was arriving for the Fedorov to depart. The day before the ship was due to leave, the wind and swell finally died down. The plan was to offload our container using the helicopter, which was onboard the Russian ship. The pumping of diesel and the loading of the leftover containers from the decommissioning of Neumayer 2 would wait until the ship's return voyage in April.

Once the ship was abroad the ice shelf, it turned out that conditions weren't as bad as previously thought. Both the loading and the pumping could take place that same day. The science container was offloaded via crane, leaving the helicopter technicians to remove the rotor blades from the helicopter that was never used. Pumping went by with not even a hitch as

### Mech Marlon Manko says:

The journey needed good planning from all parties involved, especially the mechanical side. The warmer days had passed, so now there is a higher risk of break downs.

Its simple: if a machine breaks down and you are not prepared with the right parts and tools, you are stranded. There's no easy way to source parts, when you're in Antarctica.

For a trip of this kind there are guidelines for what kind of parts you need to take with and quantities thereof. Extra parts that were not on the list were taken along as well. You can never be over prepared.

The journey was not as smooth sailing as I would have liked it to be. A few alternators and one fan pulley failed.



Tough times at Neumayer III

## « One last CAT-train, Part 2 continued



The Russian vessel against Akta Bukta, with four SANAE diesel tanks that are ready to be filled

75,000 litres were pumped in a little over 3 hours. The rest of the day was spent packing up the pumping equipment and assisting the Germans in pulling some of the more difficult containers with our Challengers. The South African Challengers pulled the double containers with the lighter German Pisten Bully pushing from behind. Together we made a formidable team.

A long day on the ice works up an appetite and we were kindly invited aboard the Fedorov to share a meal with them. We were lifted onto the ship by the crane. This involved 6 of us standing on a wooden pallet, enclosed in a cargo nets. We were squashed together as the net lifted – definitely one of the more fun ways to board a ship.

With the work completed, we headed back to Neumayer III for our last night before embarking on the long trip home. The next day, after another excellent German lunch, we waved a sad goodbye to our German friends. On our way down the road, we hitched their mobile library to the back of our vehicle, with the aim of taking it with us. We thought it would look very nice in front of our base! A brief ‘high-speed chase’ ensued and we were forced to abandon the library and run for our lives – let’s hope that everyone at Neumayer III forgets about that unpleasant affair before our next trip down, otherwise our stay might not be quite so pleasant.

It was a long and tiring trip back. One of the vehicles’ alternators broke again and, running low on battery, we had to drive for a couple of hours using only a flashlight to guide us in order to conserve power. Luckily we were not too far from home and the battery lasted us until daybreak.

After a long 40 hour trip with minimal sleep it was good to be home. We were welcomed back by our teammates, who had been up very early cooking us a delicious breakfast. Yes, there is no place like home, even if you don’t have a mobile library. I suppose there’s always next year. ●

## SANAE BIRTHDAYS

Robert Schoeman

“Congratulations!!! It’s your birthday...”

In Antarctica, these words evoke somewhat mixed feelings on that special day. It’s the day that you will partake in a tradition that has been passed down from team to team over the past few decades. Seeing that the SANAE team members are away from their loved ones on their birthdays, we really go all out to make it a very special and unforgettable birthday for every member.

This year we have had two birthdays, so far, Ryno Jordaan (Electrical Engineer) and James Hayes (Space Weather Engineer). The day starts the same as every other day. Eventually “somebody” takes care of supper, and amidst the feasting, the birthday-boy’s anticipation evolves into mild anxiety.

After supper, the “every other day” routine is kicked to the curb, if the weather permits. Nine team members gear up in their protective cold-weather gear and make their way outside, armed with cameras and spades. A shallow hole is dug in the snow, just the right



Ryno Jordaan (above) and James Hayes (right) partaking in a cherished tradition - Happy Birthday gents.

# THE REASON FOR ANOTHER BUKTA TRIP

André Harms

The trip to the Atka Bukta, which six of us participated in, was not an elaborate excuse to visit our friends at the newly built German base, Neumayer 3. It was actually necessary for sound reasons which I will try to explain.

‘Only’ about 450 000l of polar diesel, the primary source of energy at SANAE IV, can be transported on the SA Agulhas – all of the diesel is eventually bunkered at the base. As our annual consumption sometimes tops that figure our bunkers need to be brought back to full capacity every two to three years in order to ensure that we have 1.5-2 years worth of supply - in case of emergency.

Consequently, the Agulhas would have to make a second trip during every second or third summer season unless a more economical solution can be found. This year such a solution presented itself in the form of the Russian polar supply vessel, the Akademik Fedorov, which happened to make a turn in Atka Bukta for other reasons.

While things were put in place to make use of this great opportunity a few other birds needed killing with the same stone.

For one, Etienne Kruger’s (the SANAE 49 Cosmic Ray Engineer) so-called “Potch crate”, had become a sore point during take-over. The crate was filled to the brim with crucial scientific equipment (needed to complete the projects at the base); and was declared missing during the take-over. After an intensive investigation it was ascertained that the crate never reached the SA Agulhas before its voyage to Antarctica, due to operational incompetency of a key South African logistics company. The reality was that there was no need to cry over spilt milk, for an entire year, and the crate had to find its way to SANAE IV so that an entire year would not be wasted on the Cosmic Ray projects. The Akademik Fedorov, which set sail in Cape Town, happened to provide an opportune solution to the lost-and-found equipment crate.

After the take-over, a thorough inspection of the base revealed that a few other odds and ends were required. In addition to reserve fuel and Potch equipment crate, the additional system- and vehicle parts, as well as assorted stocks, happily hitched a ride on the Fedorov.

Hence the reason behind the necessity for another Akta Bukta trip, Your Honour. It wasn’t an excuse to visit our German friends, even though we didn’t squander the opportunity to thoroughly enjoy our stay with them. ●

**Editor’s note:** The Cat Train team would normally head straight for the newly constructed E-base, in the event that a sleep-over is on the cards. The E-base is proximal to Neumayer III – and the German Overwintering Team was kind enough to extend the invitation for the SANAE 49 members on the Cat Train to spend their time in the German base. This kind of hospitality is highly esteemed and an excellent example of the ethos that is promoted by the Antarctic Treaty.

### Antarctic Dictionary:

**Bukta:** From the Norwegian word *bukt* meaning bay. - Translated by Websters-online dictionary (<http://www.websters-online-dictionary.org/translation/Norwegian/bukt>). SANAE mainly uses two bukta’s for ofloading, Penguin Bukta which is close to where SANAE III and the old E-base were, and Atka Bukta which is close to the old and new German Stations Neumayer II & III)

**Nunatak:** “A nunatak (from Inuit *nunataq*) is an exposed, often rocky element of a ridge, mountain, or peak not covered with ice or snow within (or at the edge of) an ice field or glacier. The term is typically used in areas where a permanent ice sheet is present. Nunataks present readily identifiable landmark reference points in glaciers or ice caps and are often named” – Wikipedia. (SANAE IV is built on top of the nunatak called Vesleskarvet. The closest other nunatak to our base is called Lorentsenpiggen, often referred to merely as “Piggen”)

**Sastrugi:** “Sastrugi or zastrugi are sharp irregular grooves or ridges formed on a snow surface by wind erosion and deposition, and found in polar and temperate snow regions. They differ from sand dunes in that the ridges are parallel to the prevailing winds. These words are plural: the singular is sastruga or zastruga. The word was taken from Russian and has a Russian-type plural. A Latin-type analogical singular sastrugus is used in various writings including Robert Falcon Scott’s expedition’s diaries, and Ernest Shackleton’s The Heart of the Antarctic.” – Wikipedia. (At SANAE we mostly use the word sastrugi as singular with the plural sastrugis. We also refer to large build-ups of snow behind objects as sastrugis)

size to accommodate an anxious tenth team member. Once the hole has been dug, the signal is given for the birthday team member to run down the stairs and receive his “special SANAE birthday present”. The birthday-boy dashes out the base, down the stairs, and into the shallow snow-grave wearing nothing more than his birthday suit

(a.k.a. “kalgat”), as the rest of the team members cheer and welcome him into the SANAE snow bath. Once team-mate number 10 jumps into the snow bath, he is covered with snow, leaving just his head sticking out. The team member is given a beer to funnel with the rest of the team singing “Happy Birthday”. Once the songs are finished, or the cold becomes unbearable, the birthday-boy bursts out of the snow-bath and runs as fast as possible back to the base, up the cold metal stairs, and into the warm base. The next five to thirty minutes consist of warming up and catching one’s breath.

Then, the festivities begin! Old-school, SANAE-style. Our next team member to have his special SANAE birthday is Dr. Lowellen Clarke. We can’t wait... ●



# THE ANTARCTIC DOCTOR

## Dabbling in Dentistry - Open up and say "aaargh!"

Dr Lowellen Clarke

**There's this scene** in the musical "Little Shop of Horrors" where one of the characters finds himself in the dentist's chair. The dentist is a rather surreal psychedelic sadist who goes about his business with a colossal drill, a deranged look in his eye, a wicked grin, and a catchy tune scratching out at the top of his voice "because I am your dentist..."

**evil laugh evil laugh evil laugh!**

Well, March saw the dentist from the "Little Shop of Horrors" plying his trade at SANAE IV. As mentioned in last month's newsletter, the SANAE doctor also doubles as the SANAE dentist.



The first strike - Dr Clarke and (engineer) James Hayes going for victory. As it happens, the victim Roger van Schie, fully recovered from the 'incident' by the time that this article was published.

Indeed, this is the scenario at most Antarctic bases, where, given the small sizes of the overwintering teams, multi-tasking is the order of the day.

The whole affair smacks of the ye oldie days of yore when barbers (oops, doctors!) did pretty much everything in the way of butchery (oops, medical treatment!) and is, as it ever was, a tad experimental. I say experimental, because the only dabble I have had in the demanding display of dexterity which I consider dentistry to be was a brief one week 'crash course' prior to coming to Antarctica, courtesy of Col. van Rensburg at the Institute of Maritime Medicine in Simonstown.

And so, it inevitably came to pass that him who is much more familiar with the administration of an anaesthetic, had to turn his hand to dentistry and to the wielding of the dreaded drill...

Victim (oops, patient!) number one was Space Weather Engineer, James Hayes, who had been experiencing tooth-ache. The physical examination was inconclusive, whilst X-ray analysis showed a possible small abscess. In consultation with Col. van Rensburg, it was decided to attempt a course of antibiotics to which James seemed to respond. Schuu...! Had this not worked, the next step would have been root canal treatment. We have currently still managed to keep this treatment option at bay.

***"I say experimental, because the only dabble I have had in the demanding display of dexterity which I consider dentistry to be, was a brief one week crash course"***

Patient number two was Radar Engineer, Roger Van Schie, who had also been complaining of tooth-ache. He was not so lucky! Examination yielded a large cavity in his last left upper molar – probably the most difficult place to reach with a drill, even in Roger's (metaphorically) big mouth! This did not bode well for a first attempt at a filling. I feared that I was in for a trying time.

Actually, barring a few minor equipment hitches along the way, all went swimmingly well. This thanks to a formidable team (comprising myself, my very adept and lovely assistant and quality controller in the form of James Hayes, as well as my co-operative guinea pig), some good teaching by the Colonel in Cape Town, and a bit of Dutch courage (in the form of Chivas Regal for the patient). Not to mention a drill, a deranged look in my eye, a wicked grin, and an ever-catchy tune...●

## E-BASE ANTICS

André Harms

**When the editorial team requested** that I write an article that explores the necessity of constructing the new emergency base, the thought puzzled me: "Why on earth would one have an emergency base, in a harsh, inhospitable and dangerous place like Antarctica?" To my surprise, the answer dawned on me: Clearly, it was there so that we could have a 'pozzie' in case of emergencies - such as getting locked out of SANAE, or in case a desperate urge arises to enjoy a holiday, change of scenery, or roadtrip.

Obviously there are a few more – yet very unlikely – emergency scenarios that could surface, and for those, a contingency base can come in quite handy.

Another name has been tossed around for the new 20-sleeper base, namely the "Summer Base", which hints at a further reason for its need: The E-Base will serve as a headquarter for the cargo operations in summer.

To my knowledge, it is SANAP's plan to unload most cargo at the Atka Bukta, near the German Neumayer 3 station, in the future. That is where our new cleverly designed, effective yet simple E-base was built; 5.5km north of the German's (as the Antarctic Snow Petrel flies) on the ice shelf.

The project sported great partnership with the German Antarctic Programme as it is not only a shared emergency base but was also constructed primarily of materials and components from the now decommissioned Neumayer 2 (the previous German Antarctic station). This construction project was an impressive feat of international collaboration, recycling, reducing waste and altogether minimising the environmental impact of human presence in Antarctica -

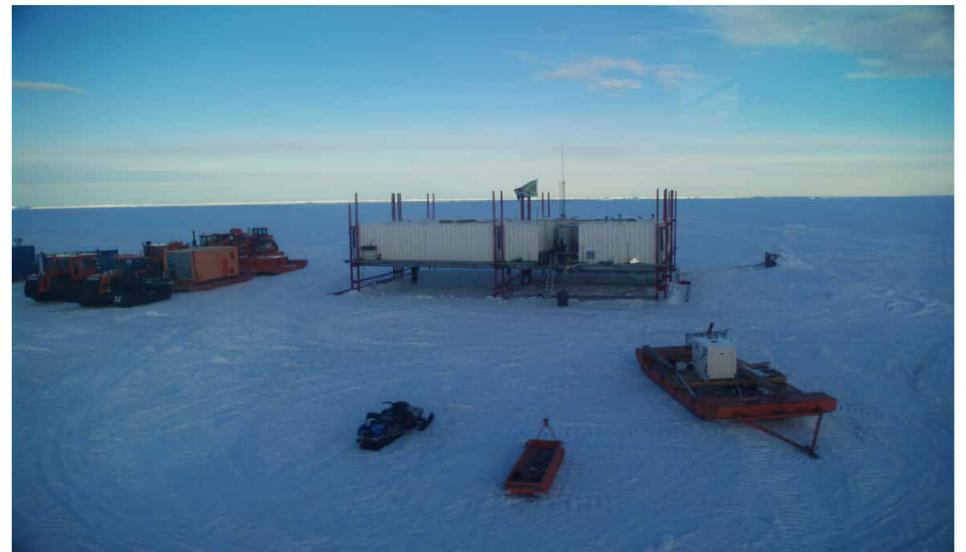
the corner stones of Antarctica's culture, as dictated by the Antarctic Treaty.

During winter, the base is generally unused and is left in a state of 'hibernation' from which it can be easily 'awoken', should the need arise. The simple steps to raising a hibernating E-base, are as follows:

1. Pop the exhaust cap,
2. remove a few covers and
3. hit the green button on the generator.

Tadaa! With this simple trickery, you have yourself a fully functional abode in the middle of nowhere.

Already, I'm looking forward to my next stay there! ●



The awesome new E-base shortly before completion – it now stands a few meters higher above the ice shelf



This will be the typical scenario at the E-base during the summer relief period. The photograph was taken two days before the SA Agulhas left for South Africa

# Breaking News: Construction started on SANAE V

Ryno Jordaan

The SANAP Antarctic Field Manual has the following to say about igloos: "... the most famous of all improvised snow shelters. It is not as difficult to make as it appears, proving by far the most durable and warmest improvised shelter."

Although the manual is quite correct about the simplicity of such an erection it did not in any way mean that it would be quick and easy. We set out the Saturday morning of 27 Feb. 2010 with a mission: "Today we are going to build an igloo..."

Action started (after long discussions during the previous weeks) by building a special igloo building tool: a moving brick mould that is anchored on the ground at a central point. After all, why would

Not too bad, if one considers the fact that it was our first try. I actually thought that we would have to go through at least 3 iterations before we would be able to build a half decent structure that would be able to obtain an occupation certificate from the Antarctic Building Inspector - safety first.

After a braai outside our new "improvised shelter" and a few beers inside as a roof wetting, we decided to leave the structure to the elements for a week so that the Antarctic wind could do its worst.

Igloo aptly means "home", in the Inuit language. Our igloo has been standing for more than a month now. The geometric profile of the structure is incidentally also ideal for the high windspeeds that it typically encounters. It is clear that these seemingly primitive structures are as robust as they are homely and aesthetically pleasing.

As the Antarctic Field Guide predicted: "...by far the most durable and warmest improvised shelter." ●



The completed igloo.



The original plan, an ice-brick compactor



Roger Van Schie spading a block of ice.

we believe the Antarctic Field Manual's method; a method that has been tried and tested by generations of ice-dwelling Eskimo's? We are engineers: there must always be an easier way of doing things.

We picked a site that would be as close to a door of the base as possible, on the prevailing wind side - so that any sastrugis that were prone to form behind our dome would be swept away by the wind sweeping underneath the base. After about half an hour of struggling in the snow we started to realize that although our tool might eventually work after some modifications and refinements, it is not that difficult to cut out rather large blocks of snow. Fortunately without realizing it we picked the perfect snow conditions, as there was a snow storm a few days before. The new snow compacted in a layer on the surface and was easily "cut" into blocks and popped loose with the help of the most versatile and can't-do-without-Antarctic-tool: the spade.

It took four guys about 6 hours to build the igloo (following the traditional method).



Inside the almost completed igloo



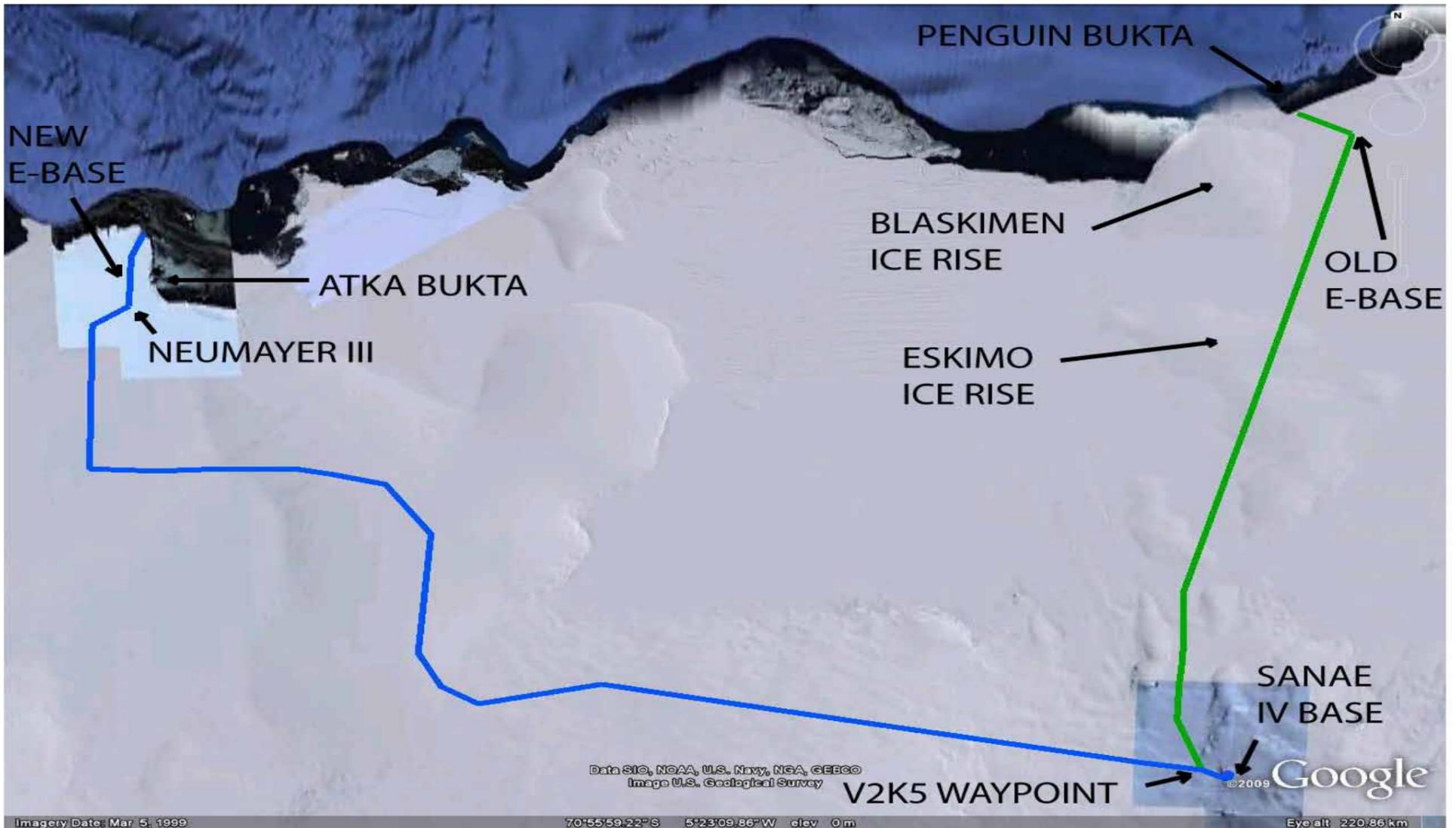
Robert Schoeman in his official capacity as construction-site braaiier.



The construction project near completion

# SANAE CAT TRAIN ROUTES

James Hayes



This Google Earth satellite image indicates SANAE's N1 and N2 highways. The blue route to Neumayer is approximately 320 km (or 24 to 36 hours by CAT train depending on the load and weather conditions) while the green route to Penguin Bukta is 174 km (or 12 to 20 hours)

**Antarctica is a land** of open spaces and ethereal landscapes. Those who sojourn through it's icy plains face little or no traffic, and forget "real-world" realities such as reckless taxi's, red lights and inconspicuous traffic cameras. Apart from the golden rules of keeping safety paramount and preserving the pristine landscape, almost anything goes - as far as traffic rules are concerned. An Antarctic rooky will be forgiven for believing this emancipation from the bondage of traffic rules to be a free ticket to drive wherever his whims dictate.

There is however an insidious danger, that always gnaws at the back of an expeditioner's mind as one travels across the ice. This lurking danger has cost the lives of many an expeditioner, and are the major safety concern when travelling across Antarctic terrain - crevasses.

A crevasse constitutes a tear in the ice, which forms due to glacial movement and the concomitant tension and shear forces on bodies of moving ice. Crevasses can be several tens of metres deep. During storms, the gaping tears are snowed over, and ice bridges

form over the crevasses. These ice bridges are often substantial enough to carry the weight of a person or light vehicle, but have the tendency to collapse when loaded. The presence of crevasses between SANAE IV and the supply Buktas necessitates meticulous route planning for Cat Train journeys. Safe routes are mapped with GPS waypoints. Challenger drivers follow these routes, and are not permitted to deviate from the designated route by more than a couple metres.

The two main Cat Train routes are illustrated in the satellite image above. These routes are revised regularly, due to the fact that the crevasse fields are prone to movement, and consequently demand minor alterations to the safe route.

The length of Cat Train journeys are measured in travel time, rather than distance. Challenger payloads, weather conditions, and equipment failure all play a role - and puts a major spin on the variance of the triptime. Instead of "kilometre", the catch-phrase "ETA", or "expected time of arrival", becomes the order of the day. ●



This aerial photograph shows a clearly visible crevasse field.



As seen from this aerial photograph, crevasses can become inconspicuous due to the snow bridges that form over them.



The ends of these crevasses have been exposed due to collapsed snow bridges. Note how the rest of the crevasse is still hidden below the intact part of the snow bridge.



Final Destination for the Cat Train: The new German Antarctic Station, Neumayer III.

# HEY KIDS!

## Cut-out puzzle: Help our Anarctic Explorer, *Glacier Man*, gear up for winter

Part 1: Basic cold weather gear (Tyrell Sassen, Roger Van Schie & Ryno Jordaan)



### Base Layer:

First Ascent "Performance" Base Layer shirt and tights.

Composition:

84% Polyester

16% Bamboo (yes, please)

Description:

The base layer is the first layer of clothes. It is also called "thermal underwear. Glacier Man has several pairs of these, and washes them regularly."

Synthetic materials are used for the base layer, since they have the ability of "wicking" sweat off the body. It is very important that sweat does not freeze on Glacier Man's skin.

Standard Issue woollen socks



### Middle Layer:

Standard Issue woollen shirt

### Standard Issue Footwear:

Product Manufacturer:

Asics/Onitsuka

Product Model

Arctic Cold Weather

Description:

The Onitsukas, also lovingly referred to as "Pampoenskoene" are heavy duty cold-weather shoes. They are much bigger than regular shoes, and also have thick inner layers which can be removed. The Pampoenskoene are fastened by laces and a strap around the ankle. The shoes weigh approximately 1,5 kilograms!



### Middle Layer:

Standard Issue overall pants



## « Cut-out puzzle, continued



### Standard Issue Shell Layer:

Product Manufacturer: K-May

Product Model

Composition:

Custom designed  
K-Tech hydrophilic  
breathable waterproof  
fabric

Description:

The outer layer consists of a pair of dungarees and a jacket. This layer is the warmest layer and is worn over all the other clothes.

### Cold-weather Accessories:

Beanie

### Snow goggles with UV shielded visors

The Antarctic Sun is very bright and can damage your eyes. If Glacier Man does not wear his protective goggles, the Sun's light is also reflected off the white snow and ice, which can lead to "snow-blindness"

Protective Mittens

## SANAE TRENDS

### Current statistics, conditions, affairs and fads

#### Temperature Trends

Minimum: -23,3 °C

Maximum: -6,7 °C

Average: -15,6 °C

#### Wind-speed Trends

Maximum: 108,7 km/h

#### Geomagnetic Trends

Maximum Daily Deviation: 175 nT

#### Daytime lengths

1 March 2010: 15:24 hours

31 March 2010: 10:32 hours

#### Quote of the Month

A certain Russian, to Etienne Kruger, prior to being hosted for lunch on the Akademik Fedorov:

**"We give you food. I guarantee it will not cause medical problem, but you will not enjoy."**

However, contrary to these ominous words, the food was excellent!

#### Song of the Month

Of Montreal - Wraith pinned to the mist ("Let's pretend we're in Antarctica")

#### Movie of the Month

Zombieland

#### Birthday of the Month

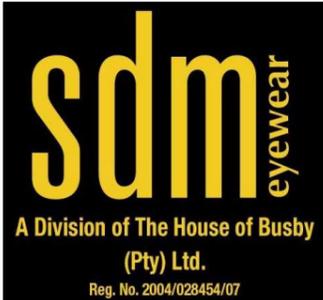
James Hayes

2 March 1984

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