SANAE 49 NEWSLETTER

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MONTHLY NEWSLETTER OF THE 49TH SOUTH AFRICAN NATIONAL ANTARCTIC EXPEDITION OVER-WINTERING TEAM

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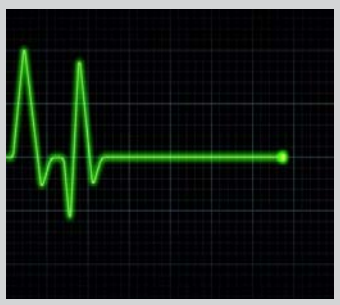
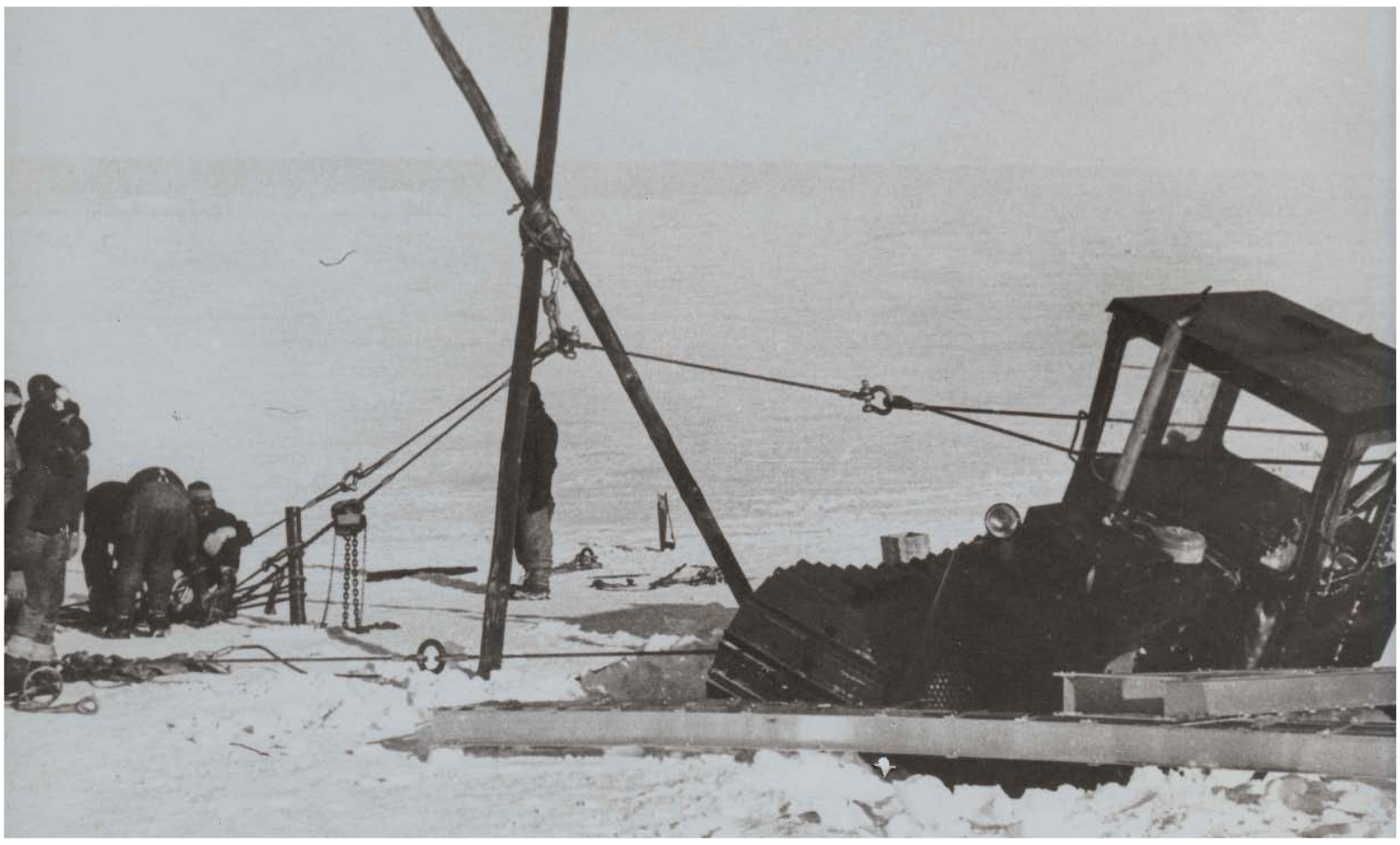


EDITORS:
James Hayes & Ryno Jordaan

THE PERILS OF ANTARCTIC TRAVEL



D4 Catterpillar being recovered from a crevasse in December 1971

OLD-SCHOOL NAVIGATION

Roger Van Schie

...in the days before GPS was king

In our series of newsletters, there have been numerous articles relating to the cross country trips that we do. But how do we find our way through this white expanse? Simple, with a GPS (Global Positioning System). The GPS gives us our exact location (with about a two metre error), tells us the exact bearing we need to be heading in as well as how far off track we are. Very easy, any monkey can find it's way.

But what if the powers-that-be, decide to flip the switch and turn off their network? How would we find our way home, or to the coast? Such a situation would be equivalent to that which the previous 'pre-GPS' teams faced. The only exception is that we don't have maps, nor any navigation training – in the good old days, such training would have been gained during the army years - which disqualifies all of us young-uns, except for Johan.

Many people have a romanticised idea of sailors, from a time long passed, staring at the stars through a sextant to determine their current location. This is a very effective method to determine your location, but one must remember that in the summer months the sun never sets on Antarctica – there are no stars, and the sun just swivels above your head.

In contrast to our current base that is 180 kilometres away from the closest coast, the previous SANAE bases were in the order of 20 kilometres away from the coast. As a result, hauling cargo to and from the ship during take-over was not too complicated as the drivers could just follow poles planted in the ice to guide them – yet, they still needed to keep their wits about them.

There were however other geological bases that were established further inland (some were as far as 380 kilometres from the coast). The geologists needed to navigate to the base, and on occasion their supplies had to be restocked from the main base.

Here is an extract from Dr. Peter Sutcliffe's diary, written during their trip to the Borga base:

"24 November 1969 - We were now to aim for the ice rise, but as the route is not marked very well, we became somewhat lost, but continued

» continued, **p. 2**

LONG DISTANCE RELATIONSHIPS

Lowellen Clarke

The Love-Doc's Guide: Going the extra mile(s), with Antartic LDR's

As one of only three SANAE 'singletons', I am rather intrigued by the fact that the majority of us are (still) involved with 'significant others' – especially given that the ten of us here have signed on for what effectively amounts to a voluntary, isolated prison stint for a year (ok, so we get paid a tad more than your average Pollsmoor 26's member). The nature of these relationships varies from a 30 year-long marriage to one in its infancy, started during the 2009/2010 take-over period.

What I find even more interesting though, is how these couples go about maintaining their respective long distance relationships (LDRs), as well as how the whole Antarctic Adventure has affected the dynamics thereof. Consequently, I set myself the task of playing 'investigative journalist', by interviewing both parties - the beautiful SANAE WAGs (Wives and Girlfriends) back in South Africa, as well as their hirsute halves right here. This in an effort to gain some insight into the whole LDR mindset, as well as to provide some pointers to those readers who may, in the future, be able to benefit from their

» continued, **p. 3**

« Old-school navigation, continued

from p1... *in a generally southerly direction. It was especially difficult to find your location on the ice shelf due to there being no natural landmarks, such as mountains - it's only ice, and the ice itself constantly shifts."*

On the 25th of November 1969, Dr. Sutcliffe wrote:

"We did not stop to sleep but drove on. At about 01h00 we broke through a small crevasse and I had my first look at what a crevasse really looks like, it's a beautiful sight, the walls being covered with icicles and crystals of all shades of blue. Henry thought that these crevasses were a sign that we were too far east, so we went to the west, but consequently got ourselves really well lost..."

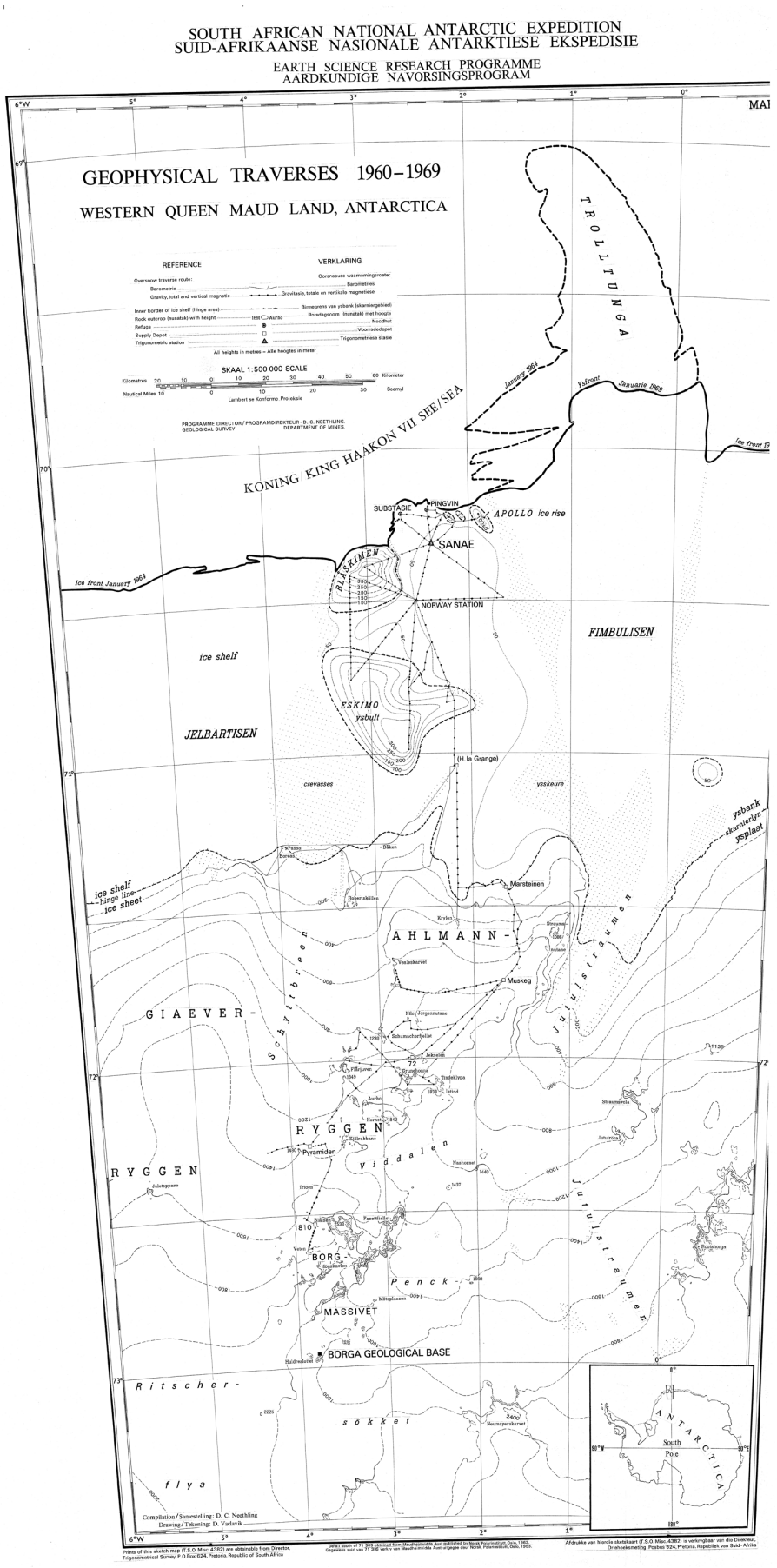
To get an approximation of their position whilst travelling, expeditioners needed to know the distance and direction that they had travelled. They used to measure the distance travelled with a cyclometer, which looks like a bicycle wheel with a little "speedo" attached to it. The cyclometer was mounted on the back of the last sled. Due to the fact that the vehicle's tracks would constantly slip on the ice, it wasn't viable to mount an odometer directly on the vehicle itself. These cyclometers were also used on the sleds that were pulled by dogs. An accurate compass bearing could not be obtained from inside the vehicle. In order not to get stuck, it is important to maintain a vehicle's momentum whilst hauling cargo across soft snow. Due to this limitation, they could not always stop to take compass measurements. To circumvent this, one of the passengers would have to jump out of the vehicle whilst it was still moving, wait for the last sled to pass so that he could take a reading on the cyclometer. Then, a compass bearing would be taken and he would have to dash back to the vehicle and jump in.

"At about 04h00 Gordan saw the first mountain in the distance, vs Krylen. To me it just looked like 2 small patches of blue sky in the general background of white and grey cloud. On taking of compass bearing on Krylen we discovered that we had crossed the ice rise far west of the route…"

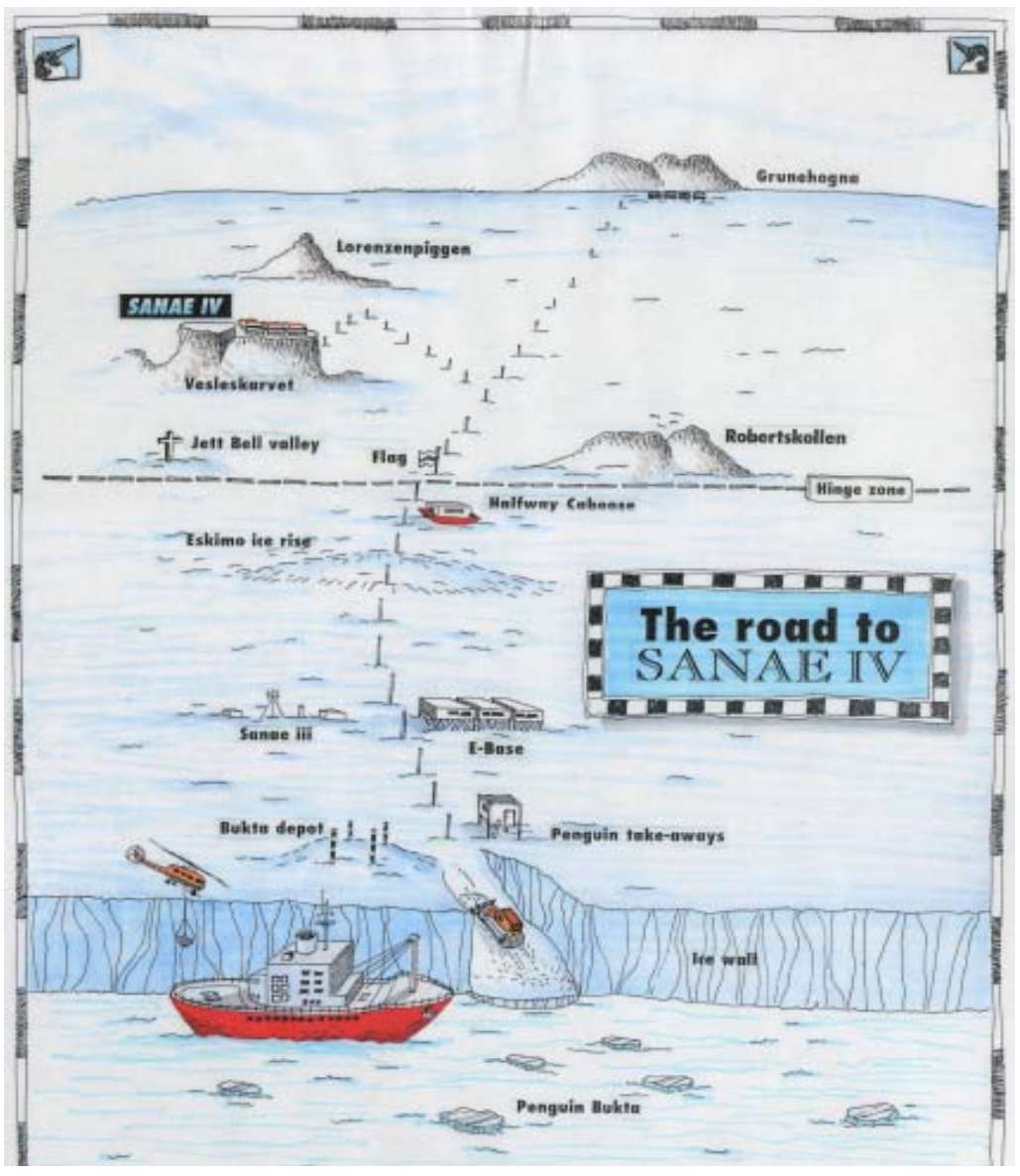
As mentioned in the diary extract, they used a map and a compass to get the bearing to a landmark, from which they could triangulate their position. This presented its own problems, as mentioned to me by Gustav Nel, who started going to Antarctica in 1970: you had to discern which mountain was which to be able to correlate its position on the map. As you can imagine, this required an intimate knowledge of the environment, which could only really be gained through experience.

These trips were rather dangerous, especially in the area where the ice shelf meets the main land, know as the hinge area. Due to the motion of the floating ice shelf, the hinge area is renowned for being riddled with crevasses.

"At 11h30 we reached Draaipunt which is the beginning of the hinge area - that is crevasse area. . . . After this we started hitting the crevasses. Quite a few small ones of one to three feet across broke open under the sleds. I also fell into one waist deep when I jumped off a sled. We crossed a few very wide ones (one of 23 feet across) but luckily the snow bridge over it took the weight of the Muskeg and the three sleds."



A detailed map showing the geophysical traverses during the 1960's (Obtained from the Surveyor General's office in Cape Town).



An old drawing showing the route from the Penguin Bukta (Courtesy DEA).

To crevasses on the route, and routes are visually inspected from a helicopter during takeover. Although this method has proved to be adequate, it is not a guarantee that crevasses don't exist, since they are generally covered with a snow bridge, which makes them very difficult to spot.

So, how have things changed over time? Are we crossing 23 foot wide crevasses every time we go on a trip? Has the danger and excitement of Antarctic travel waned in the winds of time. The answer is: we don't really know. There have been no incidents related

Times have changed since South Africa first started exploring this great white desert. Despite the changes, it is still no place for the faint-hearted. This is a land where nature still rules - if you do not respect her might, you will come second; she takes no prisoners.⬣

One of the Canadian Bombardier Muskegs used in the 1970's.

This black full-cabin Muskeg on the right was named "Vaaljapie".

« LDR's, continued

from p1... advice. Also, as method to my madness, I rather selfishly did it to get the scoop on how to succeed in basically any relationship, because let's face it - following a string of aborted attempts at courtship, I quite frankly need help!

Before we get to the practicalities however, I thought it might do to mention some interesting little tit-bits which I unearthed:

All respective LDRs entered into have been successful to date. Indeed, the majority seem to have been strengthened during the course of our 'loved-up' peoples' separations! This pertains not only to those who have never experienced a LDR, but also to some who have already had LDRs within their current relationship status, and others who have had previously failed LDRs. I found this rather striking, especially in light of the fact that LDRs have a notoriously difficult-to-uphold reputation.

The other matter which emerged in abundance, was that a change had occurred, and had been noted, in both shaggy SANAEan and his 'Goose' (I find that 'Birds' generally don't respond well to being called 'Chicks' – so here's a new tack!)! This change has been for the good, and seems to have manifested as a new-found confidence in their general approach to life. It has also resulted in enrichment within, as well as the two becoming an inspiration to, one another. For want of a better analogy, they seem to have become each other's Muse, but ironically, whilst being separated by one hell of a distance. In the case of our married couple, who have experienced multiple LDRs before, it's as if a brand-new husband returns each time, and this allows them to fall in love all over again.

A valid point made by one of the interviewees was the concept of a 'filtered' LDR. This referred to the phenomenon currently at SANAE whereby we are an exclusively male team and thus have no physical exposure to other females. Realistically, we are thus 'filtered' regarding possible viable alternatives. Whether we like it or not, the presence of said women, even outside of this isolated environment, would probably prove to be at least a tiny distraction to even the most faithful of hot-blooded young men involved in any 'normal' LDR (not that LDRs are 'normal'). I am sure that similar distractions afflict the flip side of the coin too, and that almost certainly, a few rather rash offers have been extended to some of those stunning Penelopes back home whilst their Odysseus journeys about the Great White Continent. Fortunately none of those have been accepted! And perhaps just as fortunately, no closets have popped open unexpectedly, although I must admit that some of the boys are starting to look quite buff! So for now, we don't have to worry when we happen to drop the soap in the shower...

Another unique concept which I encountered, was that of a 'hibernating relationship', established after a sustained period apart. By way of paraphrasing, this is one which is basically limited because the parties have become used to limited contact. They come to accept the state of affairs, and then maintain it in that way. If I understand this correctly, the relationship kind of ticks over, waiting for that moment when the two are reunited for what is then (hopefully) an explosive rekindling? Given the limited opportunity to nurture the physical 'togetherness', as well as sensual, sexual and financial aspects thereof, the term could probably be applied to all of these 'SANAEtionships' to a certain degree. However, I think that there still exists scope to develop the psycho-emotive component.

So then, what is the secret, the veritable Holy Grail, to not only maintaining a LDR, but making one flourish? Let's hear what the respondents had to say... The overwhelming, unanimous übertool was communication, communication, communication. This was followed closely by trust and honesty.

It seems that without the physical aspects to befuddle things emotional, communication allows our couples to get to know each other and build trust in each other. In so doing, this leads to the creation of a good grounding for their relationship and consolidation of their friendship. What they are striving for is to understand the frustrations that are inevitably encountered, thereby taking each other's feelings into consideration as they go about trying to determine who the other person really is, how they are actually doing, and what can be offered in terms of support.

Not only is connection important, but how they do so, and what the content is also plays a part. Nearly all converse telephonically on a daily basis – some for hours at a time (we have a bet on every month here at SANAE to see who wins the phone bill contest!). Some talk 'normally', others more light-heartedly - avoiding the negative vibes associated with separation. Some talk about random stuff, whilst others prefer deeper topics. At the end of the day however, I get the impression that as long as there is what both parties perceive to be quality conversation, we have a winner!

There is also written correspondence via email, instant messaging facilities, letters given by SANAE members to trusted ones back in South Africa to distribute during the course of the year, the exchange of food recipes, and diaries or calendars with daily messages of love, longing and support. Visual contact is maintained via photographs and video clips either brought with, left behind or electronically updated. Due to the very narrow band-width at SANAE, 'Skype dating' is only on hand if you happen to be the communications engineer who, with his omnipotence regarding the 'interweb', is able to halt all other traffic at a whim for a private moment or two! Not that any of us romantics really mind...

Other elements that were brought to the fore include the fact that change is going to occur and must be accepted. As mentioned above, in this case, it has been predominantly positive. Also, that it takes an effort from both parties to maintain a working LDR, but I rather think that this applies to any relationship. Rewards should be celebrated for passing milestones (for example, certain anniversaries) or for resolving conflict. For some, developing their relationship within the context of their religion is important.

Fully apprising a partner of developments, be they major, or just day to day tidings, plays a part. It allows all concerned to share and learn through their experiences. In this instance, making the ladies feel a part of the adventure is imperative. This is achieved by regular updates and communication, but some of the 'girls' have also been rather enterprising and have gotten together to form (for want of better words) a 'book club' of sorts – lunches, dinners, movies and weekends away together – where I am sure they swap SANAE stories as well as get to know and support each other.

Imagination is vital to the success of any LDR. Some of our twosomes exchange gifts regularly. It clearly makes a difference to the mood around here when André sneaks a 'pressie' to one of the lucky guys on a predetermined date. One couple often go on 'movie dates' together. This entails them trying to synchronise the same movie on two different computers nigh on a world apart, whilst keeping tabs via telephone – challenging stuff! Another is keeping personal journals which are to be swapped when we get back to South Africa so that they can learn and share more about each other's experiences. This same couple is also reading a sort of relationship 'manual' together. It is entitled "The Five Love Languages", was recommended by one of the other team members, and gives them the opportunity to discuss and implement what they have read when they speak to each other.

Finally, there are a few polished gems which just had to be exhibited. The first was the admission that just a touch of jealousy can help keep things spiced up and moving in the right direction. The second was that the philosophy of keeping your knees together and your bits in your pants goes a long, long way to making a success of any relationship!

In the spirit of celebration, let us all raise a glass of the finest bubbly to the unparalleled success of all these challenging endeavours. May they live long, continue to flourish and culminate in the birth of seven lovingly harmonious entities.

As for the three single souls amongst us... well, hopefully the accompanying SANAE classifieds will net each of us a fine catch! ⬣

Glacier MAN

This ouke is DIK HOT, ladies!

Likes: Long strolls on the beach, travelling, playing chello, writing poetry, helping out at orphanages and deep conversations over a fine wine.
Dislikes: Facebook, oil spills, dishonesty, cruelty to baby seals and penguins.

Mister Doc

One heck of a man

Likes: Sunsets, fine wine, good times and The Rolling Stones. Quite partial to pink feather boas.

Dislikes: Wearing clothes, losing at crossword puzzles.

The James

Adorably dysfunctional

Likes: Facebook, pyromania and doing stuff. Has been 'klapping the gym' lately.

Dislikes: Beetroot (in any form), superficiality and puppies (except his own pair).

The Beard

Can you handle it, china?

Likes: LAN-parties, cage-fighting, all music from DJ Rammstein, and traditional Germanic interpretive dancing.

Dislikes: Other Jedi knights.

SANAE ENERGY SYSTEMS

Ryno Jordaan

Mark Twain once said:

"And what is man without energy? Nothing – nothing at all."

Although I'm sure he meant it in a completely different way, it surely is very true for man living in Antarctica.

The last of our series of technical articles dealing with the base therefore tries to explain how we produce and how we use energy in the base, in all its forms.

We will take a quick look at how we store up to 600 000 litres of polar diesel and then use this to make electrical as well as thermal energy. We will also try to explain to the layman why two of the three diesel generator engines had to be replaced this year. ⬣

BASE HEATING

André Harms

Heating the base the savvy way: the lowdown on heating an Antarctic base whilst minimising its carbon footprint.

If ever you have accidentally leaned on the exhaust of a running engine, you will know that they are rather hot. Very hot actually; common diesel engine exhaust gasses reach temperatures of between 540 and 650 degrees Celsius.

At best a decent 4-stroke automotive diesel engine converts only about 30-35% of the energy content of its fuel into power (at the flywheel), most of the rest is converted to heat.

What to do with all this heat?

The question which faces designers of Antarctic bases is what to do with all this excess heat. Well, we all know that this place is inhospitably cold year-round. As you can imagine, the base needs to be heated. Instead of dumping the heat outside in an attempt to heat up the Antarctic, it makes much more sense to reapply the 'waste' energy by directly heating the base. This not only prevents the waste of the available energy in the hot exhaust gasses but also prevents or minimises the need for electric heating. It is the environmentally responsible thing to do as it lowers diesel consumption and reduces harmful emissions and the release of greenhouse gasses. Operating costs will thus fall and basically everyone is happy – except the poor sods that have to do the maintenance, but we'll get to that later…

At SANAE IV and at most other Antarctic bases that run diesel–electric generators, this approach is employed; we extract heat from our ADE engines at two places.

Firstly, we draw thermal energy from the cooling system. As with any other running engine, if you do not cool it down it will overheat quite quickly. In most cases a coolant is pumped through the engine to transfer heat from the combustion chamber (and a few other places) to a radiator. The radiator dissipates the gathered heat to the surrounding air, often with the help of a fan.

Our set-up is slightly different. Coolant is also pumped through the engine to absorb heat, but that heat is not dissipated by a radiator. Instead of being dissipated it is transferred to a separate closed system – called the primary hot water system - using a heat exchanger.

Secondly. the water in the primary hot water system is further heated up by extracting heat from the exhaust gasses using another heat exchanger.

Now that we have extracted a fair amount of heat from our engines' waste heat, we need to get it distributed into the base. The primary hot water system removes heat from the engines (thereby preventing them from over-heating) and distributes this energy via two other systems into the rest of the base. These two are the domestic hot water and more importantly, the central heating (air) systems.

The central heating system, referred to at SANAE as the fan coil unit (FCU) system, consists of a liquid (water and antifreeze mix) that is heated in the above mentioned heat exchanger and then pumped through a series of pipes to three individual FCUs, one in each block of the base. In the FCUs the warm liquid flows through a radiator and a fan blows air over it to cool the liquid down and heat the air up. The air then flows into each room of that block via a network of ducts. The speed of the fan can be controlled to change the temperature of the air and thus the temperature in the base.

As I mentioned earlier, the elegance of this solution leaves everyone smiling and happy, except for the maintenance personnel. As soot accumulates in the tubes of the heat exchangers on the exhausts, they begin to transfer heat less effectively. Therefore it has to be cleaned on a regular basis. Tradition has it that each mechanical team do the honours in the beginning of their year's stay. This saw Johan, Marlon and myself brush away ferociously at the heat exchangers during the routine generator shut-down in January this year. Finally, after more than six gruelling hours, and covered in sweat, soot and grime, we went for well deserved showers and could rest assured that we would be warm enough in the coming cold and dark winter. ⬣

The two hardworking fellas on the mechanical team, and one lazy white guy, shortly after cleaning the engine exhaust heat exchangers in January- the mechanical team looked like coal miners compared with the rest of us.

THE LIFE-GIVING BLOOD OF SANAE

Marlon Manko

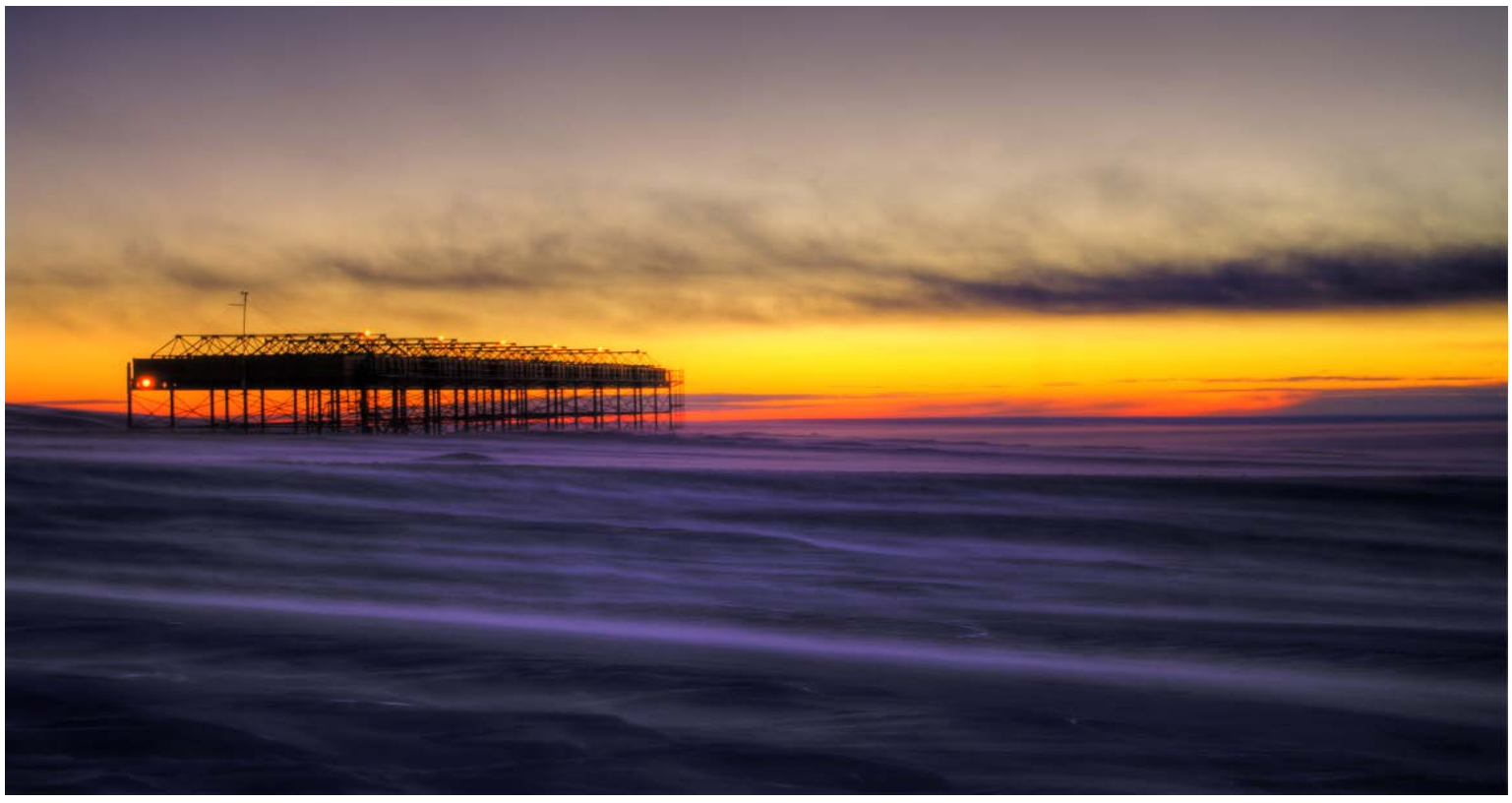
Any living body is dependent on a steady blood supply to keep all major organs functioning. In this case, the body I am referring to, is a place I've been calling home for the past few months. SANAE IV is essentially a living body with all its remarkable organs (machinery), and the power generators at its heart; which brings me to what I am going to cover in this article.

The blood that keeps the SANAE IV station up and running is our precious fuel. Without fuel we won't have the comfortable life we have now – we probably would not survive for long. The fuel is ultimately the source of heat, power, light and water. A person does not always realise the comforts they have and it is easy to take them for granted.

Because of the adverse conditions - it is rarely above 0 degrees Celsius here - we need a special type of fuel with additives to withstand the utmost of cold conditions. This wonder-product is called Polar diesel. It contains additives which prevent the formation and precipitation of paraffin crystals due to low temperatures. If these crystals are present when the need for fuel arises, pumps suck them into the fuel system. This then causes clogging of the fuel filters and pipes – which is not a good thing. The additives have another unique characteristic and that is the prevention of water absorption. Without additives, normal diesel can absorb water - up to roughly 8% of its initial volume. That is why normal diesel starts to lose its characteristics once the water starts freezing at 0 degrees Celsius. We have a trusted and reputable supplier who supplies pre-mixed fuel. Due to the conditions we cannot risk mixing our own additive to the fuel here; incorrect mixing will cause disaster or the fuel will freeze up even before we can mix it with the additives.

Before we can use the fuel we have the great challenge of transporting such high volumes across about 170km of treacherous Antarctic terrain. It needs to get to SANAE from the coastline, where it is pumped off the ship into fuel tankers that are specially adapted to fit securely on cargo sledges. These tankers are definitely not small. The two different types of tankers we have here are: one with a capacity 18,000 litres and a larger one with a 25,000 litre capacity. The smaller tanker is used mostly for storage purposes at the Bukta when fuel transfer and fuel transport is in progress. The larger ones are used for transporting fuel from the Bukta to SANAE IV. For safety and spillage reasons these tankers are never filled to their maximum capacity.

On arrival at SANAE, polar diesel gets transferred into the storage bladders, where it will remain until the time arrives for it to serve



The diesel bunker, against the backdrop of an Antarctic sunset. This bunker is located downhill, towards the north-east of the base.

« The life-giving blood of SANAE, continued

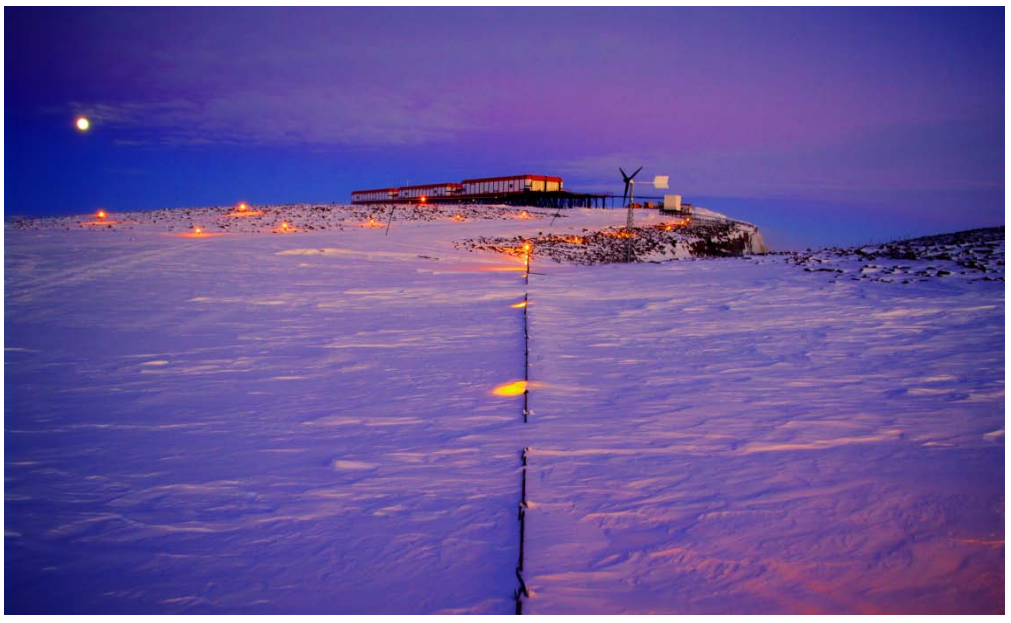
its purpose. The fuel gets transferred via a mobile transfer pump that pumps from the tankers to the bladders. In our diesel bunker (bulk storage platform) there are six bladders with a total capacity of 600,000 litres, so each bladder can take 100,000 litres. These bladders are manufactured from rubber, and each one is fitted with 2 breather valves on top of the bladder to vent any air that might get trapped inside. The bunker consists of a metal shell for each bladder to protect it from the elements. Even though all bladders are connected with one common pipeline, each bladder has its own shut-off valve which must be open or closed manually. For safety reasons each bladder has an extra shut-off valve inside the shell, in case of a spill or maintenance on the pipes.

The bunker is elevated above the ground for two main reasons. Firstly, so that vehicles can be re-fuelled via gravity feed and secondly, to minimise sastrugi formation (snow build-up). Next to the bladders, is a hatch which houses three pumps. One of the three pumps, the duty pump, serves to pump fuel from the bladders to the base via a pipeline that is about 300 metres long. The fuel is pumped into a storage tank, known to us as the 'day tank'. This tank has a capacity of approximately 3000 litres, which should last us a minimum of three days. The other 2 pumps are standby pumps and are only in use if the duty pump is non-functional. These pumps can be operated from inside the base with a control panel that is mounted on the day tank.

There are a few backup and safety systems at the fuel bunker. This includes the wiring inside the hatch, which is designed to allow one to operate a pump from inside the hatch in order to transfer fuel to the base, should the control panel be faulty. Also, due to the height of the bunker it is fitted with two ladders and a walking platform that is fitted with side railings for when we have to work in conditions where the wind is not so friendly.

As you can see, it takes quite a bit of planning, infrastructure and the correct type of fuel to ensure that the heart of SANAE IV can maintain its steady pulse.⬣

A peek inside the guts of the diesel bunker showing the enclosure and the 100 000 litre rubber bladder.



The diesel bunker and the fuel line between it and the base are well lit - this is essential for preventing mishaps during the times when it is necessary to refuel vehicles in low light or poor visibility conditions.

GENNIE ADMIN

Johan Nortje

As the Senior Diesel Mechanic responsible for the base's generators, I'm looking after three old, but very distinguished "ladies", which we all lovingly refer to as Genny 1,Genny 2 & Genny 3. Currently, they are the only units to supply electrical power to the base - our own 'reliable' version of Eskom!

Unfortunately, these ladies go on strike at times! Therefore, all the occupants of the base have to be alert at all times, so that I can be notified as soon as something goes wrong with the power, in which case it is my responsibility to sort it out in the shortest possible time.

These three ladies spend every moment in what we call the "Genny room". They rest alongside each other, with two water heat exchangers above them, to make hot water for the base. The exhaust silencer is above and between them, with a long exhaust pipe leading to the outside of the base.

FYI, to all our petrol (and diesel) heads: all three machines are ADE 442 twin-turbo V8 engines, each producing 260kW of power at 2100rpm, and 1600 Nm of torque at 1100-1500rpm. They are not inter-cooled.

We had unexpected (and rather severe) problems with the generators, in the last two months. First, Genny 2 had to be replaced. A couple of weeks later, Genny 1 faced the same fate. Without going into too many technical details, the problem was found to be as follows: The engine coolant had found its way into the engine lubricating oil, rendering the oil unfit to lubricate the moving parts inside the engine. The exact same fault happened to both engines – the problem occurred as a result of the coolant-mixture that has been used: the mix between the two respective coolants proved to be corrosive.

Both engines will need to be stripped completely and the inside parts either replaced or re-machined to specifications. Since the proper repairs can only be done in South Africa, we needed to replace the complete engine; fortunately we had two spare engines at the base. Exchanging the engines was quite a mission on its own, mostly due to the restricted space, but it was accomplished and in the end it worked out well – yet again, we have the thee content ladies, noisily purring at each other, inside the genny room. ⬣

SANAE GENERATOR SPECIFICATIONS

Electrical		**Mechanical**	
No. of Generators:	3	Engine manufacturer:	Atlantis Diesel Engines
Continious power rating:	180 kW	Model:	442 V8 Twin turbo
Apparant power rating:	225 kVA	Output power:	260 kW (@2100rpm)
Alternator manufacturer:	Leroy Somer	Output Torque :	1600 Nm (@1500rpm)

Control

Syncronization and general control system:	Gencon II Pro
Governor controler:	Woodward Governor
Second generator starts up and cuts in at:	140 kW (Total load of base)
Second generator cuts out and shuts down at:	120 kW (Total load of base)

(The average electrical load of the base is 100 - 120 kW)

The genny room, with the empty frame of the generator (the alternator is the red unit on the left).

The engine of Gennie 1, showing four of its eight massive cylinders.

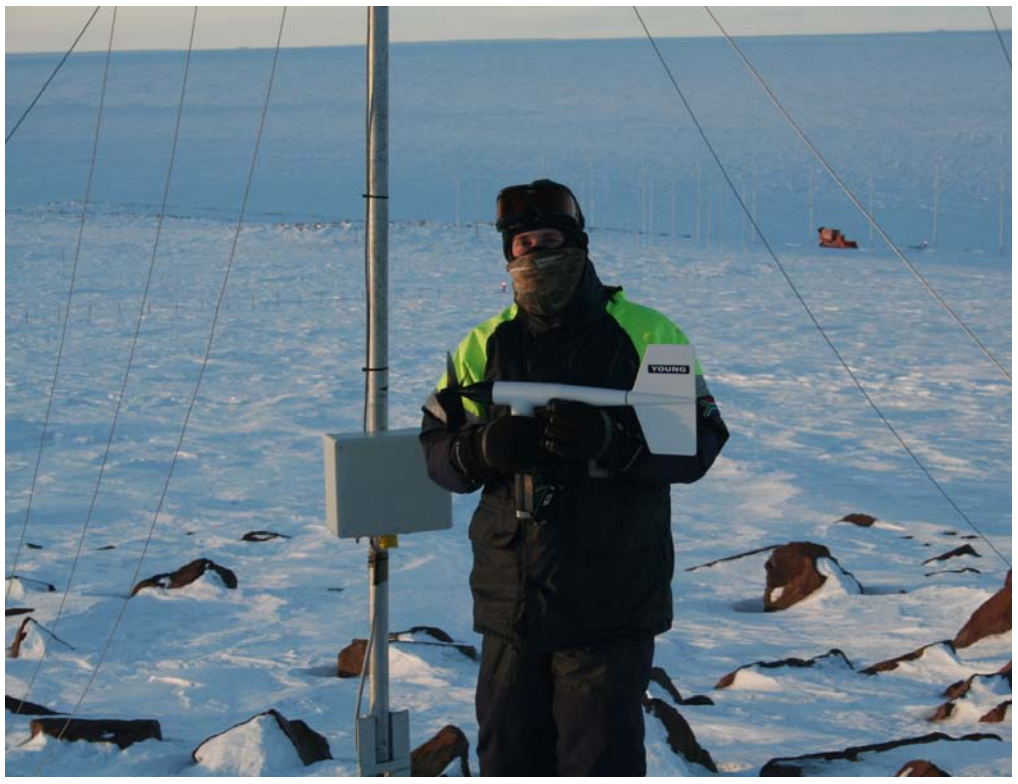
GUSTY TALES

Robert Schoeman

So, what happens when the wind doesn't play nicely, and destroys the very anemometer that is supposed to measure it?

This month gave rise to some incredibly fierce winds that literally shook the SANAE base like a reed. On the 21st, the wind actually ripped our wind sensor off its mast – which chimed in with the theme of the last two months: "repairs".

The wind had been relatively normal during the early weeks of August. However, during the early-morning hours of the 21st, winds of up to 89 knots (164.9 km/h) began to shake the base, and we could feel how it was vibrating and rocking back and forth – almost as if we were back on the SA Agulhas. The record wind speed recorded at SANAE was recorded in September 2008 and equalled120.3 knots (222.8 km/h). I can only imagine what the base must have been doing in those times.



The 'metkassie', the anemometer and the mast (Hint to those readers that don't know what an anemometer looks like: our peace-loving meteorologist isn't cradling a cruize missile in his arms, we promise)

As it happens, there is an Antarctic Teletubby that comes out to play, whenever we need a helping hand.

The powerful winds left quite some destruction in its path. The wind sensor had to be replaced and some of the radar equipment was in need of repair. These repairs were carried out as soon as the weather permitted us to work outside.

At the first opportunity that the weather afforded, the team gathered for a meeting, and groups were designated for the different tasks at hand. The whole team got ready and helped with every aspect of the repairs.

Editor's note: *Not only the meteorological systems took a knock during the severe storm - minor repairs were necessary on the Radar's interferometer array, and also on one of the VLF antennas. Readers with an eye for detail might have noticed a tiny bulldozer in the background of the left-most image - there were repairs commencing on the radar in parallel to the activity on the anemometer.*

Three team members assisted with taking the wind mast down. Naturally, we have spare anemometers for situations just like this. The anemometer comes fully assembled, so it is just a case of reconnecting the wires and raising the mast again. Although this may sound easy, working outside in these conditions can be very difficult, especially trying to work with stay-wires and cables whilst wearing thick gloves.

The team truly pulled together, and things were back to normal by the end of the day - Phenomenal work, S49! ⬣

SANAE SCIENCE

Etienne Kruger

Saving the Planet, one magnetometer at a time...

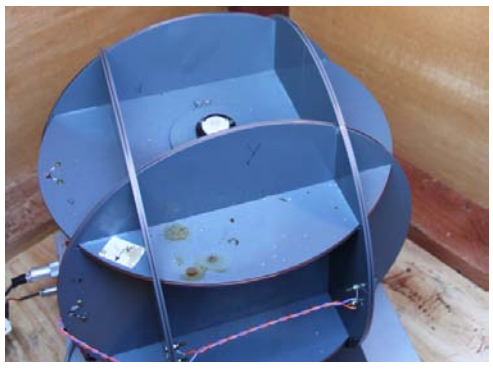
In the previous edition of this newsletter we introduced you to the scientific installations we have at SANAE-IV and the regions of the solar system we monitor. In this issue we will discuss the magnetospheric research projects running at the base.

Our planet has an intrinsic magnetic field that forms a region around Earth which we call the magnetosphere. The magnetosphere acts as a barrier to shield our planet from the solar wind, which we have mentioned before. Without this barrier, life on Earth as we know it would never have been possible. Scientists believe that Mars has lost much of its oceans and atmosphere due the lack of magnetic field.

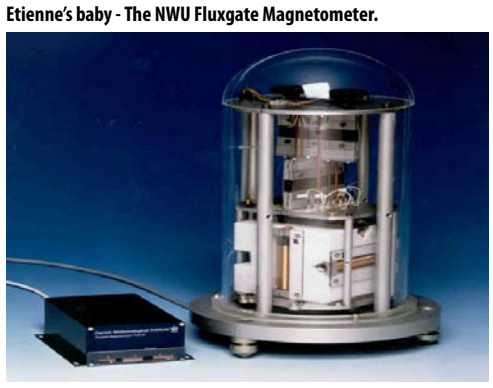
Occasionally, our Sun's emissions drastically increase for short periods of times. A coronal mass ejection (CME), which has been described in the April newsletter, is an example of such an event. The interaction between such solar emissions and Earth's magnetic field can create shock-waves in our magnetic field, which in turn induce damaging surge currents in our electrical utility networks, pipelines, and other large metal grids.

Clearly, we have more than enough reason to conduct detailed studies on this protective force-field as to better understand the effects of the magnetic field on our technologically-dependent way of life, and to comprehend one of the reasons that our planet is inhabitable while so many others are not.

Earth's magnetic field is generated mainly by a dynamo process in the core of the earth, but the complete magnetic field is a result of this process combined with a multitude of comlex electrical currents flowing in the upper atmosphere. These currents range from a constantly flowing ring current in the upper Ionosphere, to momentary current 'jets', called electrojets, that accompany the polar aurora. To study these currents we need accurate magnetic field measurements from as many locations across Earth as possible. Magnetometers that are installed around the polar regions give us insight into very different phenomena than magnetometers located closer to the equator. The collective knowledge obtained from the data of magnetometers scattered around the planet can enable scientists to gain full understanding of the magnetosphere.



Etienne's baby - The NWU Fluxgate Magnetometer.



James' baby - The HMO's Tri-Axial Fluxgate Magnetometer

The North-West University currently has two magnetometers installed at SANAE-IV, the Hermanus Magnetic Observatory another two, and the University of Kwa-Zulu Natal has another. Some of these magnetometers measure the absolute magnetic field strength, while others are sensitive only to a change in the magnetic field. The combined data can give accurate measurements of all the properties of the Earth's magnetic field at this location. There are many scientists from these and various other institutions worldwide that are committed to studying the data we gather here, in order to better understand our planet. This is just one more way Antarctic research is making the world a better place. ⬣

SANAE TRENDS

Current affairs, statistics, conditions and fads

Temperature Trends

Minimum: - 35.2 °C (4 August 2010)
Maximum: - 13.6 °C (22 August 2010)
Average: - 23.6 °C

Wind-speed Trends

Maximum: 164.9 km/h (21 August 2010)

Day Lengths

1 August 2010: 2 hours 21 minutes
31 August 2010: 8 hour 35 minutes

Quotes of the Month

Marlon, randomly walking into the kitchen:
"I'm looking for a volunteer to rub my belly!"

James, in reference to a 'falafel' during Tyrell's vegetarian supper:
"This is the closest I'm going to get to meat tonight, unless one of you gents ... {awkward silence}"

Johan to Marlon (with whiskey in hand), whilst watching two of the service engineers fixing and cleaning the kitchen waste-water macerating pump:
"What a good feeling for two mechanics to watch engineers doing actual work!"

Song(s) of the Month

Kobus - Volk van main
Boo - Champion!

Movie of the Month

The Boat that Rocked

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