

In the previous publication, you had a quick introduction to the team and how they came to be in Antarctica. Going forward, we will introduce ourselves in more depth (one member at a time) and start telling you more about our lives, Antarctica and the SANAE IV base we live in.

In this chapter, our Team Leader, Mr. Jacques Robbertze, will tell you more about himself, we will introduce the big Smelly monster and more...



Editor: Salomé Odendaal April 2019



Contraction 1.11/ 21 1983, at Antalchea 5 years

# **MEET OUR TEAM LEADER**

Jacques Robbertze (DEA Diesel Mechanic & Team Leader)

#### Hello again everyone!

This time round I am formally going to introduce myself, and in coming months the rest of the team will do the same.

I grew up on a farm close to a little town called Vanzylsrus in the Kalahari. From an early age all I wanted to do was to be outside and go exploring, which I had the privilege of doing! It was these years that ignited a passion for the wide-open spaces,

the simple outdoor life, roads less travelled and it paved the way for many other adventures that I've been up to and that have been part of my life so far.

From the little farm school in Vanzylsrus onto Upington for secondary school and then pretty much the school of life, oh yes and in between I qualified as a Diesel Mechanic. I have lived and worked all over the world. As an Overland Expedition leader, I have been privileged to have visited and explore some of the most amazing and off the beaten track places on earth. Running a camp in the Okavango Delta, fishing guide, farm manager in the Kalahari, building boats and now this. What more can one ask for?!

Not only is Antarctica one of the seven continents, but also the one that is less visited by people and even better, people who stay (read over winter). I will be here for a year and suppose you can say completing the circle. As a diesel mechanic my job here is to maintain, service and repair our base generators that supply us with power, CAT Challengers and Dozers for transport, dozing of ice build-up around the base and Snow Mobiles for everyday run around and scientific field trips, if we have visiting scientists and geologists on base.

This is me in a nutshell and I am really looking forward to the rest of the year and to experience what this amazing continent has to offer, from 24hr daylight to 24hr darkness, auroras, white-outs and making lifelong friends in the process!

# SMELLY

Tshimangadzo Jufter Munyai (DEA Electrical Engineer)

I'll be talking to you on how we get water at SANAE IV. We have a state-of-the-art plant we use to melt snow into water here at Antarctica and we call it a snow smelter. In short, we call it the 'SMELLY'. It's a plant buried underneath the snow which has two tanks and a control room. Inside the control room we have a control panel, pumps, filter, heater banks and pipes that are connected to the tanks and the main line that is used to pump water to the base.

The main line runs a distance of approximately 200 meters. The tank's capacity is 18000 litres for both tanks combined. It is a big step-up from the old smelly, which had a capacity of 4300 litres for both tanks combined. When pumping water to the base we always leave about 4500 litres in the tanks, which we use to melt snow.



At the snow smelter (SMELLY), with the SANAE IV base visible in the background.



Inside the control room, at the snow smelter tanks, under the snow.

So, this is how the process of melting snow to water goes: we fill up the two tanks with snow and then the water that we left inside the tanks circulate through the heater bank, which heats up the water, and the water is sprayed through the nozzles, running on top of the tanks, which then melts the snow until it becomes water. There are temperature sensors which monitor the water temperature and once the desired temperature is reached, the heater elements on the heater bank switches off and the water just keeps on circulating until a command is send to the programmable logic controller (PLC) to tell it to pump to base.

Once we are ready to pump water to the base, the valves for circulation closes and other valves open to allow pumping in the direction of the base. Before pumping to base is initiated, we switch on the heater tape to warm up the main line running to the base to warm it up. If that's not done, water in the line will freeze before reaching the tanks inside the base.



The dozers are very helpful with filling up the smelter a lot quicker (above left). The main water-pipe line from the smelter to the base (above right).

Inside the base we have six receiving tanks with a capacity of about 6500 litres each and they are connected in series. The tanks are also monitored and they have their set point for a minimum and a maximum, minimum being 15000 litres and maximum being 36000 litres which can be changed but that's how we set them for our use.



Doors of the water tank are opened (above left) and then the team members shovels snow into the smelter tank (above middle). Once the tank is full of ice (above right), the doors are closed and melting process is started.



Once the smelly is full, the doors to the tanks are closed and we retreat back to the comfort of the base.

# **OUR WEATHER**

Marvin Rankudu (Senior Meteorological Technician)

SANAE IV weather statistics as recorded for the month of April 2019.

Weather Statistics: April 2019			
SANAE IV - VESLESKARVET			
	Maximum	Minimum	Average
Temperature	-11.3°C	-27.2°C	-17.9°C
Humidity	90%	23%	68%
Wind Speed	~255km/h	2.4km/h	-
Pressure	898.9hPa	867.3hPa	883.7hPa

### WIND IN ANTARCTICA

Marvin Rankudu (Senior Meteorological Technician)

When coming to Antarctica the last thing I had in mind was how strong the winds blew here down at the South Pole, especially when everyone who had already been here was going on about the one thing I was actually prepared for. . . the cold. Having spent four and a half months at the SANAE IV base already, I've learnt to appreciate that just because a typical Antarctic day starts off with almost no wind blowing, doesn't mean that by the time you're done donning your cold gear it would not have picked up to 50km/h or more. Back inside you go!



A map outline indicating research bases by country. The South African National Antarctic base is indicated by the arrow.

This month's focus is placed on the behaviour of winds around the Antarctic region and their relationship with other atmospheric factors, such as temperature and pressure. Also included are the wind diagrams from January 2018 to November 2018, as collected by the previous Met Tech (Meteorological Technician), showing the general distribution and intensity of winds over the months.

#### THE RELATIONSHIP BETWEEN WIND AND PRESSURE



(Left) An illustration showing the convective cell movement of air from a high pressure to low pressure cell.

(Right) An illustration of the prevalent wind direction experienced at the SANAE IV base.



While wind can generally be considered as the perceptible movement of air, more formally it is the movement of air molecules due to regional pressure differences. Pressure describes the mass of the atmosphere over a region. As indicated in the above schematic illustration on the left, periods of high pressure are characterised by descending cold air that diverge from a high pressure cell and those of low pressure by ascending warm air. Wind thus moves from high pressure cells toward low pressure cells in a conductive cell motion.

At SANAE IV the predominant wind direction is from the south east to the north west, illustrated in the previous schematic on the right. However, the general range is much broader (as indicated by wind diagrams below), depending on the position of the pressure cells in relation to one another.

As illustrated in the previous illustration above on the left, it can be generally stated that low pressure cells are associated with cloud formation and high pressure cells with cloud dispersion and clear sunny skies. This too is reflected by weather data for SANAE IV, although this data will be presented in the coming issues of the Petrel Post. Intuitively you can see how the former is true as winds will blow whatever material it finds in its path away from the region under high pressure to that of low pressure.



Wind diagrams illustrating the distribution of wind patterns and their relative intensities by the month for part of the 2018 year. January is represented by the first diagram to the top left, November is located at the bottom right. Data provided by SAWS records for the 2018 period. Wind Speed Legend: **BLUE**: >10.7m/s; **GREEN**: 8.7-10.7m/s, **OTHERS**: <8.7m/s

The data in the above diagrams was recorded using a RM Young anemometer, a wind sensor that measures both wind speed and direction. For our region at the SANAE IV base, wind direction ranges between south east (SE) and east of north east (ENE). As illustrated above, the period between May and September experiences the highest recorded wind speeds. The less windy months generally are January and December. Despite the general behaviour of the wind per season, calm conditions do prevail for a few days during the windiest periods and high intensity winds do exist during calmer periods.

From the wind diagrams above we can then deduce that low pressure cells predominate over the coastal regions where temperatures are warmer, migrating about the region between the Southern Ocean and Weddel Sea, to give the respective wind directions shown in the above wind diagrams for SANAE IV base. High pressure cells predominate in the interior of the south pole, where temperatures cool with elevation and proximity to the centre of the south pole.

# THE 10<sup>th</sup> S58 TEAM MEMBER

Salomé Odendaal (Team Medical Doctor)



research institutions. Unfortunately, the one engineer's position (North-West University) has fallen away from this year, due to lack of funding. The position's responsibilities, the neutron monitors and other cosmic ray experiments, have been taken over by the other remaining engineers. Tangibly aware of this loss, we decided to revive the 10<sup>th</sup> team member, who keeps on popping up in different areas of the base. See if you can spot him in our photos of the coming month's newsletters...

#### **FIREFIGHTING FUN**

Salomé Odendaal (Team Medical Doctor)

During March 2019, we had a session where we refreshed our firefighting knowledge and skills. Fire Marshals were appointed and we had the opportunity to dress in the required clothing and practiced how to use the breathing apparatus correctly, since it can be quite disastrous trying to figure it out for the first time while a blazing fire is threatening your survival...



# **ANTARCTICA MATTERS**

Salomé Odendaal (Team Medical Doctor)

At the SANAE IV base, in the library, there is a wall of remembrance. One of the pictures is of a man called Hannes Ia Grange (Johannes Jacobus Ia Grange: 13 October 1928 – 21 April 1999). Hannes Ia Grange was born at Ladismith (Western Cape) in South Africa, completed his schooling at Villiersdorp (Western Cape) and went to work at the South African Weather Bureau in Pretoria. He was in charge of several weather stations in South Africa at a time. He also served as a meteorologist on Marion Island from October 1950 until April 1952 and again from March 1954 until November 1954.

In 1955, he was selected by Sir Vivian Fuchs, from Europe, to participate in the preparations for the 1955-1958 Trans-Antarctic Expedition (TAE) and later, on Sir Vivian Fuchs' recommendation, selected as one of the members of the team that will be crossing the Antarctic continent. Hannes did South Africa proud by his



Framed photo of Hannes la Grange in the SANAE IV library.

display of determination and loyalty as a member of this Commonwealth expedition and became the first South African to set foot on the geographical South Pole.

As a signatory and founder member of the Antarctic Treaty in 1959, a new era for South Africa began with formal involvement in the frozen continent. It was then also in September of that year (1959) that South Africa was designated to begin with preparations for an expedition to Antarctica, leaving in December 1959. Even though many in the South African decision-making hierarchy believed that the country will not be able to man its own expedition as South Africans were not accustomed to the harsh Antarctic conditions. Hannes la Grange, in light of his recent TAE experience and many other qualities and background, was viewed as best person to lead the first South African overwintering party. At the age of 32 years, Hannes was thus automatically chosen as leader of the first SANAE (South African National Antarctic Expedition). There was only two and a half months for planning and preparations. Within that time, they rushed to get all together, including travelling overseas to purchase majority of the necessary gear and supplies, and the other 9 members of the team were selected.

The main task of the expedition was to take over Norway Station and establish South Africa amongst the participant nations in Antarctica and the second, of equal importance, was to carry out as much scientific work as possible in order to establish the country in the Antarctic scientific community.

They left South Africa on 3 December 1959 and arrived to the ice shelf in Antarctica on 8 January 1960, after a 5-week voyage on board the Norwegian sealer from Alesund, the Polarbjørn. The take-over of Norway Station was completed and on 15 January 1960 the Polarbjørn departed, leaving SANAE 1 behind with a massive task and expectation behind. Over the year, the team performed their respective duties, hauled their stores from the ice-shelf, organized their supplies, dug it up again from out of the snow when needed, spent a lot of time on repairs and maintenance of the base (as it had exceeded its originally planned lifetime), took care of the huskies (dogs needed for the sledge journeys), did their skivvy's, cooked, explored and carried out scientific work.

On 9 January 1961, one year and one day after their arrival to the ice shelf, they departed on the return journey back home and docked in Table Bay, Cape Town, early on 20 January 1961. The foundation for subsequent expeditions were laid. They successfully achieved what had been planned, proving that South Africa was fully capable of maintaining and Antarctic base, and established South Africa as a viable member of the Antarctic Treaty.

Today, SANAE 58 follows in their footsteps and is continuing on with that original vision and responsibility.

#### References:

- Du Preez, M.J. & Von Brunn, V. 1999. Memoir.
- La Grange, J.J. 1991. The Beginning: 2 The first South African national Antarctic Expedition, 1959-1960. S. Afr. T. Nav. Antarkt., 21 (2), 98-106.

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Amazing spices that blow our socks off every time we used hem, favourites are the original and the Worcester.

PQD

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http://www.ultimateheli.com A dartboard and charcoal for the year as ours was "forgotten" back home. Thanks guys, you made every braai day this year happen for us.





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