Christiani & Nielsen's Activities in Antarctica 1980–81

BY DIETRICH ENSS
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Early in 1980 the Minister for Technology and Research, German Federal Republic awarded the contract for the supply and erection of the first German research station in Antarctica to Christiani & Nielsen Ingenieurbüros AG, Hamburg (see also CN Post No. 129, May 1980, p. 9).

After thorough planning of all aspects of the project the procurement and construction of all parts and equipment were concluded on schedule and the last shipped from Germany in November 1980. The erection crew and winning team followed by air in December, meeting the three ships of the expedition in Macquarie.

The expedition arrived early in January 1981 in Antarctica, where, however, heavy pack ice prohibited access to the planned landing place and forced the expedition to change plans and proceed to an alternative location. Here, a concentrated effort over 6 weeks gave all participants an extraordinary experience characterised by outstanding teamwork and unusual challenges.

The manager of CN AG, Mr. Dietrich Enss, who personally took charge of the expedition, here gives an account of the final phase of this unique construction contract.

By Dietrich Enss

Ice conditions in the Weddell Sea were by far worse this season than last year, but by no means unusual. Our three ships of the expedition, MV Polarplatzt (50 m long, 590 dwt, 2455 HP), MV Titan (77 m long, 1600
Tian and Polarsirkel as seen from Gotland II off Gould Bay at the Fitchner Iceshelf. Here the west coast was buried by the pack ice covering up 91/10 of the sea towards Gould Bay at the northern limit of the Weddell Sea. At 77°47’s 43°28’W, heavy pack filled with unbroken fast ice barred our way to the proposed landing place only 90 miles away at the Fitchner Iceshelf. Air reconnaissance by helicopter further revealed that a huge ice berg threatened to crash into the stretch of the ice edge low enough for our vessels. The waiting time from 7th through 15th January was easier to endure for the scientists onboard Polarsirkel who could start to go on with their programmes. When no sign of changing weather showed and time ran out for the station, the decision was taken to adjust the station at a location to the southeast of the Fitchner Iceshelf, a decision was obtained from the station, the decision of research and technology to turn about and try an alternative site. The ice edge was so low that it could not be seen from the Fitchner Iceshelf. We had to reach the Aka three days later we suffered still another delay when we were unable to make progress due to strong ice conditions. Finally, on the 23rd of January, we had succeeded in breaking through with the help of our northerly wind which reduced the size of the closely packed floes to 1,000 tonnes each. Gouldland II was caught sitting astride such a floe unable to move for one night. Due to some uneven ridges, the ice edge at the west side of the Aka is not straightforward, forming several small islands usually filled with one year old fast ice until late in the season. After much laborious search for a crevasse-free landing place, Gouldland II landed just in the only suitable inlet, and we started unloading onto the fast ice. The term "fast ice" is misleading, however, because soon enough cracks opened and there was only a few cracks opened and there was an ice ridge with a crevice between them. We kept on trying to get across with large blocks of ice. Special care was required when we unloaded them from the ship. One of our helicopters hovered over the sea with rescue equipment ready while Klaus Oehlbrügge bravely stood them over the ship and the men then unloaded them. The situation at the unloading place caused much concern. We decided to alter our plans and give up priority to unload ships and get away from the ice edge. Collecting all cargo in a depot some 600 m away from the edge, we were only half through, however, when all of the sudden the ice in the inlet started moving towards the bay, breaking the mooring lines of MV Gotland and sinking our hatch covers. Since we kept one piece of cargo together with one sled and vehicle only on the floes at any one time no losses were suffered here.

While the ships moved out, awaiting a new chance for landing the rest of our equipment, our men on the ice rushed cargo in conveyors of two or three vehicles with these to five sledges from the depot to the site some 7.5 kilometres to the west. The route slowly rising at on the surface had been flagged out by the skiers and was later in addition marked with skis and empty drums. Unloading was resumed when the floes had left the inlet and Gotland II was able to make fast direct to the shelf ice near our old ramp. This place could be used for getting the rest of our 1,000 tonnes of cargo, although it had to be left temporarily for short periods whenever sea or wind threatened to bump the ship against the 8 m high ice wall. One of our helicopters, a Dauphin 360, carrying some personnel and 900 kg of cargo, helped very much by taking off almost all fuel in drums from the ship, some 250 tonnes altogether. Meanwhile our men on the ice made their first experience with the weather and especially with the drifting snow, which could hamper the sight so much that one could not see the next flag along the route 20 metres away. The drift also covered in minutes all items left unmarked in the snow. When combined with snow-fall or certain other conditions, the so-called "whistling" occurred, stopping all activities as the open due to complete lack of orientation. We experimented walking into steep walls of snow or falling into trenches during such conditions. Although 400 miles further away from the pole than the Fitchner Iceshelf, weather conditions at Aka are more severe for building a station. There, depressions pass on their easterly course while they hit Aka, often gaining strength by picking up energy from the warmer sea. The average wind speed at Aka is double that at Fitchner Iceshelf and February is the windiest month. We covered nine days in February with winds of 100 or above force 7 Beaufort and many more with force 6 winds. Snow fall in February at Aka also occurs with double the frequency.

The main wind direction is ENE. All materials placed on the surface for storage should therefore be staked out in a line perpendicular to that direction in order to be least affected by drifting snow. Even so we could not entirely avoid to dig out equipment and materials after heavy snow storms. It was astonishing to notice how extremely hard the snow can get when accumulated by drift. Temperatures range from a few degrees above freezing point to 10 degrees in January and February. Temperature alone, however, is of little consequence to working conditions. The combination with winds usually termed wind-chill determines whether work and travel are still comfortable or becoming uncomfortable or even hazardous. In our experience at Aka, the limiting factors for outside work were drifting snow, reducing visibility to nil and blinding sunglasses and goggles, white out as well as wind chill stopped us with temperature down to minus 12 degrees and a force 8 wind. The snow had one disagreeable property as we were soon to find out: if the tracks of the
vehicles broke through the hard surface of the drifts, the soft snow underneath proved to have its advantages and thus caused the tracks to spin and the vehicles in turn to come to rest on their skis. Assistance from another vehicle was then required to free the immobilised one.

The last beginning, changed and different weather conditions plus difficulties snarled for during unloading with necessary change of plan, completed us to challenge the validity of the contract. This stipulated an unloading and construction time of 45 days including 15 bad-weather days, and severe fines in case of non-completion, viz. to come back next season at our own expense and finish the work. It was agreed with the client to go on as if the contract was still in force and evaluate our qualification in case of delayed or part completion.

Our race against time and weather thus began. It was imperative to get as many of our 34 men to work as soon as possible, although most of them had been signed on because of their special skills required sometime during the building process. Now one could see radio speeches Tanzania flotilla up to the site from our depot and our cook firing in beams for our construction camp.

The camp was established after 5 days, complete with workshop, power station, radio station, snowmobile, shovels, totes, sleeping and dressing facilities, kitchen and messroom, the latter being the 'biggest room for hundreds of miles around'. There were voices claiming that our camp was the 'largest camp in the Antarctic'.

We had a base now from where to press on with the construction proper of the research station, where another blow hit us at a somewhat different and our biggest vehicles, a chefuefet 195 HP with attached 10 mettera hydraulic crane, developed engine trouble. Repairs were unsatisfactory, assessed under appalling conditions, but the vehicle had to be given up for the time being, limiting our crane capacity to less than 3/5 of the original.

The mishap had some good effect. It made our uppermost priority the more determined to get through on our own way. The good spirit was even not broken when a snowstorm in no time blew snow up to the rim of our excavation for the two 20 m long steel tubes which were to give structural protection for the concretized buildings of the research station.

The Arpico-tube solution consisting of galvanised corrugated steel plates which were bolted together to form a pipe section is a proven design for underground structures in both polar regions. As the annual natural accumulation of snow will quickly bury any structure not designed and jacked up again and again, the main function of the pipe section is to accommodate all pressures exerted by the surrounding snow and ice.

Our 'all-weather gangs', hammering homely hogs by hogs with their impact wrenches was soon to become the symbol of our swing and stamina. A second team followed on their heels installing the steel girders inside the tube bottom which were to support buildings and wooden platforms. 340 tons of steel went into steel construction, the heaviest parts being the bulkheads, designed so to withstand 25 m of snow in the bottom.

Before we could seal off our tubes with bulkheads, however, we had to bring in the containers which weighed up to 10 tonnes. Since placing them with cranes on our special carriage running on steel tracks along the tube was not any longer possible we resorted to building a steel platform in the side of the tube entrance. Containers were jacked onto this platform from their sleds and from there by help of chains pulled skidded onto our carriage, pulled to its final position and lowered down.

Only from now on all our specialists could exert at their skills. It was at this time when the contractor would not itself that all the materials they saw built up in or lying about had been carried in on single ship of little Godtan's size. In fact, the organisation of transport, storage and distribution of materials was a major task of the whole scheme. We had prepared computer lists identifying all items as regards weight, dimensions, classification, packings, markings, mowing in the ship, designation in the station, and other salient information. The files with these lists soon became known as our rabble.

As the containers with the power station were brought in first, we soon had staff-supplied power in the tubes. A heated sewage pipe of 50 m length had been lied right at the beginning, so that after connecting a few pipes inside the station we could produce fresh water in our melter and hot water in the boiler for the kitchen, bathroom and toilets, and dispose of it through the pipe. The snow water works with surplus heat from the cooling water of our station's diesel generators.

The wireless station was soon established. All antennae are mounted on access and ventilation-shafts of the station with the exception of a Marconi antenna in a fibreglass dome and one shortwave-antenna, which are placed on a extra shaft right above the radio station. From the Marconi terminal in the radio room, inel and telephone traffic are conducted via satellite with extremely good quality of communication being assured.

In order to finnish the interior of our second tube we had to dismantle our construction camp and transport 8 containers furnished with sleeping for the tube. This also enabled most of us to move into the station and to far a more protected place.

According to our plans the remainder of our camp was to be transported back to the ship while the rest of our work was carried out at the station. In the meantime, however, the weather at the bay had become first for days on end and the ice edge and ice fields were in constant motion. Big pieces of ice were permanently breaking off, ice feet (underwater projections) were forming everywhere and swelled from the open sea prohibited berthing altogether. At the same time the bay was filling with bergs, floating on irregular tracks due to unpredictable tidal currents.

A decision was reached then, rather so leaves the camp where it was and let all materials be taken over by the station. Now all hands could be used for finishing the station. Our Danish ice pilot on Godtan, North, Anders Jacobson, in an ice band in these waters, recommended the 5th of March as the latest day for a safe departure. Time was running short, owing to the last start. It became clear that the weather, especially conditions in the bay, would not permit us to make use of the contractual 45 days.

On the 3rd of March, 40 days after we had started the first load ashore, the "Georg von Neumayer-Stations" was completed and approvably of Germanischer Lloyd. On the same day the Federal Republic of Germany was elected full member of the Consultative Body of the Antarctic Treaty States at Buenos Aires.

"Chriandau & Nielsen A.G., Hamburg under a separate contract is also responsible for maintaining and maintaining the station for the first year. Our five men to winter at the station, Ekkart Müller-Hedlen, Jurgen Janneck, Paul Herbert Hay, Matthias Lidl and Fridrich Ohlmsen had helped with the precision as much as they could, all the while not knowing whether the race against time and odds would be won. So these brave men were happy and sad at the same time when we left them in the morning of March 4 after everything was ready for its long and lonesome vigil. The farewell could easily have lasted a day or more longer, because a force 8 wind blew and flying our people back on board the bawing ships was still only just possible.