# Field season report 2008
# North Greenland Eemian Ice drilling
# (NEEM) 2007-2011:

## Construction of a fully equipped NEEM ice core drilling and processing camp

**Prepared by Ice and Climate Group, NBI**

**for**

**The NEEM Steering Committee and Danish and Greenlandic authorities.**


***Greenland ice core drilling made it to the stamps.***

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**Copenhagen, 200409**

**Table of contents:**

## Table of Contents

## Preface

This report has been prepared by the NEEM logistics group. The purpose is to provide the NEEM Scientific Steering Committee, the relevant authorities and the NEEM 2008 participants with documentation of the events of the field season. The report contains information on the activities leading up to the field season and activities on the ice sheet. The SITREPs and camp life diary and some pictures are included.

Besides listing the facts, it is our hope that the report can relay some of the special experiences which were part of the multinational efforts on the ice sheet.

The many complicated logistical tasks of the field season 2008 required a lot of good will and flexibility of planning from the CH2MHill/CPS Polar Field Services and the 109$^{th}$ TAG, NYANG to make the field season a success. The NEEM crew wishes to express their sincere gratitude to Robin Abbott, Mark Begnaud, Ed Stockard and Earl Vaughn, CPS and the New York Air National Guard for their assistance.

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# Report on the 2008 activities of the NEEM project

## *Background.*

During 2005 and 2006 the interest for a new deep drilling in Greenland increased. A drilling to bedrock at the NEEM location to obtain an undisturbed sequence of Eemian ice layers was supported by IPICS (International Partnership in Ice Core Science) and by the IPY (International Polar Year) community.

After a successful test at Flade Isblink in 2006 of a new drilling fluid, the Ice and Climate Group approached the international ice core community for support and collaboration for a new deep drilling operation in North Greenland.

The Ice and Climate Group suggested an international effort with a logistical and scientific organization similar to the NGRIP project, i.e. a Danish led international effort with the main financial support from Danish funding agencies.

The Danish national committee for IPY did not succeed in securing funds for IPY during the fiscal year 2006. In order to keep momentum to ice core science in Greenland and to insure that a future NEEM activity would be able to start during the IPY. The Ice and Climate Group sent in a proposal for a small scale operation, a traverse from NGRIP to NEEM to map the ice divide and move vehicles and assets from NGRIP to NEEM. The proposal was submitted in September 2006.

Representatives from the group participated in the Arctic Planning Conference at Stratton Air Base in October 2006, where we filed a request for 3 LC-130 flights in support for the traverse. In December 2006 we received notification from the Danish Research Council that they were unable to support such a large logistical operation. At the same time, the U.S. National Science Foundation expressed a wish to support the NEEM project with a significant contribution. Over Christmas 2006, NEEM became a political issue involving members of Parliament and by January 2007 NEEM was granted special funds under the Danish IPY initiative.

By this time we had to reactivate the planning for a 2007 field campaign, which had been put away in December. For that reason the planning for NEEM 2007 was started a bit late. There is a time lag between a political decision and action. Money for NEEM 2007 was not available to spend before April 2007 – two months before scheduled start. Also, what was planned as a skeleton operation now suddenly grew as the perspective now was a full 4 year drilling operation.

During the summer 2007 NEEM purchased a heavy Pistenbully 300 W Polar with crane and tiller and lumber for camp construction. These items were sent to Greenland by ship in September 2007. Two people went to Greenland in October at put the Pistenbully in the NEEM building 442 in

Kangerlussuaq. NEEM also purchased two garage weatherports and skiway markers for the new skiway. These items overwintered in the U.S.

During winter 2007/2008 several major items went on order, such as drilling fluid, main generator, main dome building, ice core boxes and fuel tanks. In parallel, NEEM conducted successful negotiations with Greenland authorities on issues of taxation, environmental conditions and safety. In May 2008 NEEM received land use permit of the site from the Greenland home rule, with a set of operational conditions to increase safety and limit the environmental impact of NEEM. NEEM operations is committed to fulfill these conditions.

In October 2007 NEEM participated in the Arctic Planning Conference at Stratton Air Base in New York. Here NEEM together with NSF representatives requested 23-29 missions to NEEM in 2008.

In spring 2008 NEEM was ready to deploy and construct a fully operational deep ice core drilling camp at the NEEM site.

### *Kangerlussuaq (Søndre Strømfjord, SFJ)*

NEEM had Field Operations Managers (FOMs) throughout the 2008 campaign, and made good use of the logistical assets from the NGRIP project. The lease of warehouse 442 has been renewed, and 442 is now leased until 2016. In 442 NEEM has an operational 4m x 4m walk-in freezer for ice cores and food. The FOM office (KISS 208) has been leased on a flat rate basis until 2011. Kangerlussuaq International Science Support (KISS) accommodated all participants while in Kangerlussuaq.

NEEM operates the following vehicles in Kangerlussuaq: A 8 ton forklift, a 5 ton forklift, a 8 ton Ford flatbed truck with hydraulic crane, a Toyota landcruiser (which was part time lent out to the IPY office operated by Danish Polar Center), a F-250 truck, a VW 4-wheel drive pickup and a Chevrolet step-van.

The 8 ton forklift has developed serious engine problem and is at the end of it's use. While we are looking into obtaining another fork lift, CPS has kindly allowed us to use their articulated loaders and flat pallet truck (K-loader). We hope we may use these assets also in 2009.

The FOM office maintained contact with the field crew by telephone and internet. The HF radio connection broke down during the season due to an antenna fault in Kangerlussuaq.

The 2008 field campaign was very busy for the FOMs in Kangerlussuaq, not only because a lot of cargo and people had to be handled but also because of several complications in cargo transport arose very late.

Among the complications were:

1. Both Summit and NEEM had very intense field campaigns (NEEM 24 missions and Summit 26). This caused severe bottle neck problems in Kangerlussuaq as the amount of multiple pallet trains staged in Kangerlussuaq almost exceeded capacity.

2. The main dome construction material (estimated by the producer to be 36,000 lbs and 11 pallets) turned out to be more bulky and heavy than planned (52,000 lbs and 16 pallets). Also, the producer was late in completing the construction parts, which led to a lot of hard work and frustration by aerial port and CPS personnel at both Stewart AB and Stratton AB.

3. The main dome was scheduled to arrive by C5 galaxy on 28th April, but was postponed to a C5 arriving in Kangerlussuaq on 29th May, due to deployment of the Greenland Ice sheet Traverse (GRIT) equipment at Thule Air Base.

4. The casing pipes from Australia were delivered long after deadline and they had to be transported to Denmark by air freight. From Denmark they had to be airlifted to Greenland by the 109th after the air show at Karup Air Base. The scheduled cargo from Karup had to be put on the ship for Kangerlussuaq in the very last minute.

5. We could not get the skiway at NEEM good enough for a cargo load upgrade in time before the heavy loads were flown in. The FOMs had to re-shuffle loads on the fly which caused a lot of frustration among Aerial Port and Load Masters.

Eventually the complications were overcome by a coordinated effort involving an outstanding help from 109th Aerial Port and CPS personnel both in Schenectady and in Kangerlussuaq.

It was planned to have 2-3 FOMs during busy periods and only one FOM the rest of the time, however in retrospect only one FOM in June turned out to be inadequate. Also NEEM needs to train more people in being FOMs.

## *Start of field season.*

The Field Season started with the arrival of three FOMs in Kangerlussuaq on 24th April. The FOM office was opened, vehicles were activated and licenced. The FOMs unpacked the warehouse and picked up lumber from 2007 at the port. On 5th May the put-in crew arrived.

## *Put-in at NEEM.*

The put-in crew of 5 flew to NEEM on 6th May, but as weather on site did not allow for landing, the plane returned to Kangerlussuaq. On 7th May at 11:22 the put-in was successful. The 5 persons found the weatherport left in 2007 in good condition. And by the end of the day, the crew had the snowmobiles excavated from their snow cave, generators running, the tomato shelters excavated and one flexmobile running. The second put-in plane arrived 8th May and after that camp crew started to work on marking the skiway up to 109th standards and marking out the positions of the

NEEM camp structures. By 10th May grooming of the skiway could begin, all cargo from 2007 had been excavated, and the first NEEM structures (two weatherports) had been erected.

## *Communication.*

Telephone communication was done by handheld Iridium phones and sometimes it was necessary go outside for a good link. We had internet connection through Inmarsat BGAN and being at this high latitude, the connection was lost in periods of a 24 hour day. Also, the BGAN system had a tendency to drop communication in the middle of uploads which often left the operator with frustration as the upload of daily reports had to restarted many times. HF radio communications suffered from noise on the mains from the generators so we were sometimes forced to shut down generators when we had incoming flights. The VHF air-band base station did not work; but we managed using handheld VHF sets. Next year we will buy a new VHF base station.

## *Camp lay out.*

Lay out of camp in two parallel rows perpendicular to prevailing wind, skiway and apron appeared to be working fine. By May 28 all weatherports, two dome tents and one garage were erected. The large red dome was outfitted as kitchen and dining area.

## *Pistenbully incident.*

The Pistenbully arrived in 6 parts: Two drive belts, one crane, the vehicle, the tiller and the blade. The main vehicle fitted exactly into the C130 with less than 5 cm clearing. The lamp frame on top of the cab had to be removed. The vehicle was rolled onto 6 empty pallets from the plane, and we planned to use the crane to lift and align the heavy drive belts for roll over and mounting of belts. During the mounting process, the return hose for crane hydraulics was disconnected while the crane was pressurized. This caused the crane arm spontaneously to move and smash into the control system and caused all valves in the remote control servo to blow due to over pressure. After some days of exchanging images and information with the crane producer and Kaesbohrer, we were able to switch off the electronic control section and operate the crane manually.

## *The main dome.*

The construction of the main dome turned out to be a troublesome affair. As mentioned earlier, the dome was bulkier and heavier than planned. The dome construction was also complicated by the choice of construction elements. The foundation and the metal frame were completed in 15 days (1st June to 16th June). Then we began to mount the outside wall panels. These triangular panels were 30 cm thick sandwiches with rubber and splint wood on the outside, PU foam insulation in the middle and splint wood on the inside. The panels had to be mounted on the outside of the frame, and each panel had to be held in place with the crane during mounting, while people were climbing on the outside. To make such panels fit on to a spherical frame requires very precise dimensions, and this proved not to be the case with the panels delivered.

During the mounting process it was necessary to trim the panels with a saw by hand, which left a lot of up 5 cm cracks in the dome wall. Also, the glue used to attach the outside rubber turned out not to be cold resistant, with the result that the rubber peeled off.

Due to a misunderstanding between the dome contractor and us, we were one carpenter short during the construction phase. Much more work had to be put into dome construction than anticipated, and the dome was not finished before a crew had spent also the entire second half of the season climbing around on the outside of the dome filling in the cracks with new PU foam and putting the rubber cover back on with new glue and clamps. Now some work remains on the interior of the dome. This will have to be done in 2009.

The ceiling height on the ground floor was 4.17 m, which was 1 m more than anticipated. This error in construction was due to a conversion error between feet and meter on the drawings that were sent to Copenhagen for approval (true measures were given in feet and inches; but the metric numbers given on the drawing were wrong).

In retrospect, we should not have accepted the use of outside panels. For future projects, we find the frame good, but instead of using panels, we should have insisted on using a simple rubber and plywood cover on the outside of the frame, insulation in the frame and a second set of plywood covers mounted on the inside of the frame.

### *Excavating the trenches.*

Excavation of the drill trench began May 26. We had hoped that with the acquisition of a new Yanmar snow blower, the excavation could be done in a short time. However, during the first day of excavation, the man drive belt on the old Yanmar broke, and we were forced to excavate using the new Yanmar only. May 26, the two parallel trenches for roof foundation were excavated.

May 31, after four days of bad weather excavation was resumed. Depth 1.5 m. June 2, depth 2.3 m, June 4, 3.5 m, June 7, 4.5 m, June 8, crash, June 12 depth 5m, June 17 drill trench completed after 22 days of construction.

The science trench was excavated in 6 days from June 18 to June 23.

### *Yanmar crash.*

The unfortunate drifting in of the 1m deep trenches along the outside top wall of the drill trench was causing a potentially dangerous incident on June 8. The top wall trenches are excavated for immediate refilling with snow from the snow blower. After sintering this reworked snow forms a base for carrying the roof beam supports. Because of bad weather May 26 to May 31, the trenches were allowed to drift in with very soft and unconsolidated snow. We were not careful enough to remove this soft snow before we filled the trenches completely. This created a soft layer underneath a hardened snow surface. During the preparations of putting a roof on the drill trench,

the snowdrifts on each side were removed and each side was leveled off using the snow blower. As the snowblower and operator were working along the edge of a 5 m deep trench, it was decided to keep clear of the edge by 30 cm. Even with this clearance, the snowblower began to slide sideways as the top of the trench wall began to collapse. The operator prudently let go of the machine and watched it drop 5m into the trench. The snow blower was subsequently hoisted to the surface with the Kaesbohrer crane. Repairs took 4 days, and on June 12 excavation was resumed.

## *Skiway problems.*

Preparation of the skiway began immediately. The first step was to put flags up for a fully marked skiway. This was accomplished in four days. Grooming was done with a Flexmobil and our beam groomer. During our grooming, we noticed several very long wave undulations crossing the skiway. These undulations manifested themselves by areas where the beam groomer was sliding on the surface without getting "a good bite" in the snow and areas where the snow was softer and the groomer had "a good bite". Even with zig-zag grooming, these undulations did not go away. The undulations caused some trouble for us, as the 109$^{th}$ were reluctant to increase payload of cargo at the rate we planned for. Therefore, during the put-in period of the first month of operations we had to use two extra missions to accomplish our cargo plans. After we were able to use the Pistenbully and its tiller, the skiway improved considerably and during the second half of the season, we were able to save one planned mission.

When we laid out the skiway and flagged it, we believed it was according to 109$^{th}$ regulations, however the regulations had changed, and for a full certification we needed flags with a "2" at the 2000 foot distance from each end of the skiway. Eventually this problem was resolved with "homemade" number "2" flags, and the skiway was certified.

During the field season we became more and more puzzled by the wind direction. The wind appeared to be persistent at an angle of more than 45 degrees off the skiway – and at 45 degrees to the "prevailing wind" from weather observations. Throughout the field season we wondered about this persistent anomaly in wind direction, which caused a lot of frustrations in flight operations and in skiway grooming, as snow drifts constantly formed across the skiway. Also, the build-up of snow drifts in camp between structures was more than expected. The wind normally came from S and during strong wind from SW, and since the skiway was SE-NW and the lines of structures in camp NE-SW, the structures were aligned to strong winds, and this exacerbates build-up of snow drifts.

## *Weather.*

NEEM is a windy place. Typical winds are at 6 m/s or 12 knots. However in 2008 there were days when the wind picked up to 13 m/s or 26 knots. Because camp was under construction, and therefore most of the work was to be done on the surface, the days with strong winds and low

visibility caused delays. At crew change at mid-season on 23rd June, we had recorded 10 days lost due to weather. Most planned construction work for the second half of the season was 10 days behind schedule.

Temperatures in May are between -36 and -16 C, in June between -17 and -3 C, in July between -21 and -2 C and in August between -26 and -3 C. This means that during June and July flights at noon time or in the afternoon should be avoided as the snow becomes soft at temperatures above -10 C.

The wind appeared always to be coming from the South, at 45 degrees from the skiway, which was laid out at 131 degrees true, according to weather data from a PARCA project weather station at NEEM. This came as a surprise to us, and the 109th several times had trouble getting air borne in conditions with cross winds. After the field season, it turned out, that the wind sensor on the PARCA station had an off set of 45 degrees, and that the prevailing winds at NEEM are from the South indeed. During the 2009 season, we will turn the skiway 45 degrees into the prevailing wind. We have decided that it is not feasible to turn the alignment of structures in camp.

## *The traverse to NGRIP and strain net re-measurement.*

The traverse to NGRIP had to be put in to the field plan of 2008 because we ran out of time in 2007 to go back to NGRIP to pick up remaining vehicles, furniture and fuel. A key vehicle to bring to NEEM was the Caterpillar loader which mainly serves as a fork lift for loading retro cargo pallets onto LC-130 aircraft. The delay turned out to be a blessing in disguise. We now had the Pistenbully instead of the two Flexmobiles to pull the sledges. The traverse, with three people, left NEEM on schedule 18th July with one Pistenbully pulling three heavy sleds and one snowmobile with Nansen sleds. On the sleds were a tomato cabin, a Yanmar snow blower, fuel, food, and spare parts. The traverse arrived at NGRIP 21st July after only three full days of travel. Using the snowmobile it was possible to remeasure the strain network setup the previous year. The traverse group made shelter in the NGRIP dome, and they excavated the dome entrance and the entrance to the Lucht Castel garage. In just four days they managed to stow remaing cargo at NGRIP on the sleds, and they began their return journey 25th July with the last two old snowmobiles from NGRIP in tow. They arrived at NEEM 28th July after making an average speed of 12 km/h, which is more than double the speed of the Flexmobiles (5 km/h).

## *Summary of Deep Drill activities NEEM 2008*

During the course of the 2008 field season the pilot hole was successfully drilled, reamed, and cased, and the infrastructure in the deep drill trench was established. Unsolved problems with the winch control prevented testing of the deep drill which will be addressed upon opening camp in 2009. The winch motor and the winch control was taken back to Europe for testing.

Operations to set up the NEEM deep drilling commenced after the science and drill trenches were blown and covered by the early season crews. The preparations began with the pilot hole drilling to 106.0 meters (from trench floor) with the 3" shallow drill. This was followed immediately by the casing operation. The casing operation was complicated by the discovery that the casing tubes delivered to NEEM had a diameter 2 cm more than expected. The casing operation normally requires 4 reamers with increasing diameters to accommodate the tubes, but a new 5$^{th}$ reamer diameter was required which was quickly designed as a modification to the existing 4$^{th}$ reamer tube and was successfully fabricated in Copenhagen and delivered to NEEM without delaying the operation. As an effort to establish a liquid tight barrier at the base of the casing, the deepest tube was set with o-rings and its tapered end was sunk tightly into the base of the reamed borehole at a depth of 87.0 meters. A video camera was successfully deployed down hole and clearly showed 1) the ledges created along the borehole wall from the different reamer diameters, 2) that the lower most casing tube did indeed set tightly, and 3) that the level of chips filling the borehole at depths great than the base of the casing will require several cleaning runs over 19 m before drilling can start in 2009.

Next, the foundation beams for the tower and winch were placed and the 8.7 meter incline trench was excavated as preparation for the placement of the drill tower and winch. After successful placement of the winch, unfortunately unsolved problems with the winch control prevented the full deployment and testing of the new drill itself. Therefore, attention was then turned to making the drill trench as ready for 2009 as possible. The walls had to be trimmed up to 50 cm in width. Two heated cabins were set up in the drill trench, one for a mechanics workshop and another that will serve as an operator's cabin. The tower was installed and raised. The first tables and floors were constructed along the sides of the tower and around the core extraction area. A new core pull-out table was constructed based on the drawings of the one used at NGRIP. Preparations were made and components were installed for the drill liquid mixing area and ventilation systems. Finally, the inclined ramp entrance from the surface to the drill trench was closed. Upon opening in 2009 access to the drill trench will be via the staircase and elevator in the science trench until the large elevator is installed behind the driller's workshop.

## *Problems with the casing.*

Even before the filed season began, there were problems with delivery of the casing pipes from Australia. Due to various issues mentioned by the producer, the delivery was severely delayed, and we missed the opportunity to send them to Europe by ship. In the end a very expensive air freight became necessary, and after arrival in Kangerlussuaq, it turned out that the outside diameter of the casing pipes was larger than specified. Our workshop in Copenhagen had to produce a set of bore hole reamers that allowed for the drillers to enlarge the hole to accommodate the casing pipes. This was done, and casing could be performed.

### *Processing line.*

Due to the overall delay in camp construction, the main dome and the drill trench took priority over the construction of the science trench. However he team managed to setup facilities for logging, ECM, sample cutting and packing the top of the main core and the two shallow cores from the firn/air sampling program. By the end of the season some tables and saws were set-up and one Viessmann cabin for CFA analysis and shelf system for core storage were constructed. As we ran out of time, we did not set-up the main staircase and the heavy elevator for access to the drill and science trenches. A temporary staircase and bridge was constructed over the roof of the Viessmann cabin for access to the science trench through the passage of the small cargo elevator in the science trench.

### *Firn air sampling.*

The planned campaign to perform shallow drilling and firn air pumping for a Danish/Swiss and a U.S. team was performed and completed on schedule 11$^{th}$ to 28$^{th}$ July. A firn pumping site was setup with generator, a Viessmann cabin and a tent for the pumping equipment. We used a procedure developed at NGRIP where the Danish shallow drill performed "pendulum drilling". The drill drilled a new core increment in one hole while firn air was sampled in the other. Then the drill was moved to the other hole, and the process was repeated. Both teams were satisfied with the outcome. There was even time to drill a third hole for U.S. sampling of trace gases.

### *Kansas radar survey.*

CReSIS from Kansas University made successful measurements with their radar depth sounder in a 10 km by 10 km grid around NEEM. One of the Mattrax on the Toyota broke, and the last few measurements had to be done by Flexmobil, however the crew stayed on schedule: 1$^{st}$ August to 11$^{th}$ August. After this operation and after repair of an identical break to the one in 2007, it was concluded that the Mattrax were not strong enough to support the Toyota. In the future this vehicle will only be used in very few occasions.

### *Seismic station.*

The seismic station operated by GEUS was set-up in a snow pit South of the overwintering 2007/2008 weatherport. From 23th July to 31$^{st}$ July data from the datalogger was collected and the station was re-located into an excavated side cave in the science trench and re-activated.

### *GRIT traverse and future.*

In the coming years, the U.S. NSF has planned to supply the Summit Camp with bulk and oversized cargo by overland traverse from Thule AB to Summit. The planned route passes NEEM, and we hope NEEM in coming years will benefit in terms of fuel delivery as this will save costs of LC-130 flights. The heavy tractors and sleds arrived at Thule AB 28$^{th}$ April and the first test traverse arrived at NEEM on the way to Summit on 14$^{th}$ June. They left a few fuel bladders in depot before they

continued onwards. On 9th July the traverse returned and they were able to transfer 11,356 liter JP-8 fuel from their depot to NEEM tanks before continuing back to Thule AB. The test was successful, and the traverse will return next year, which means that we can factor in the traverse in our planning.

### *BAS radar.*

British Antarctic Survey (responsible. Richard Hindmarch and Hugh Corr) had two people in camp operating BAS radars on NEEM snowmobiles and Nansen sleds. The measurements and tests were performed on schedule 27th June to 6th July. In fact, the measurements went so well, that the two people from this project were able to lend two pair of strong hands in the construction of NEEM camp.

### *Distinguished visitors*

On 31st July to 1st August a number of distinguished visitors came to camp. Among our guests were Danish miniter for energy and climate, Greenlandic minister for the environment and Director of the IPCC. The visit went well.

## *Resume of the logistic and scientific outcome.*

The construction of NEEM camp has been a very large operation, and during the season quite a few frustrating situations arose. We have learned a lot. It took time to re-establish a good and constructive relation with the 109th while learning about new requirements and standards. It turned out that our barometer was off which is bad for flight operations. The barometer will be re-adjusted for next year and we will also have a full weather station at NEEM. Introduction of a new aviation fuel pump caused some headaches, as we did not have all the proper fittings and hoses for both fuelling and defueling of aircraft. We also need a meter to measure the amounts of fuel transferred. The new steel tanks are promising, but the skis under the tanks are flat instead of “v”-shaped and that made it very tricky to navigate the tanks in soft snow. Excavation of the trenches and in particular construction of the main dome took much longer time than anticipated. This caused many delays and put a strain on camp infrastructure as crew grew to more than 30 in July without a fully operational main dome. Among the causes for these delays were: The breakdown of one of the snowblowers at a critical time in trench construction, delayed arrival of dome parts and many complications in the dome construction itself (see task calendar below). All planned scientific projects and ice core drillings were completed; but we were not able to begin deep drilling. In 2009 we are ready to begin deep drilling, as the drill trench is now complete. We did not mount the heavy elevator and the staircase to the trenches as we ran out of time. In summary, season 2008 was not quite as successful as we hoped; but we managed to build a deep ice coring camp which is ready for next year.

# Fuel statistics 2008:

| | |
|---|---|
| Fuel left in depot at NEEM: | 4000 liter JP-8 in tank, 9600 liter DFA in drums |
| Fuel delivered at NEEM: | 35,500 liter (incl. 13,300 liter by US traverse and 8,000 liter from NGRIP) |
| Fuel stored at NEEM 2007 | 2,000 liter Jet A-1 |
| Consumption (100 days): | 29,700 liter. |
| Mogas consumption 2008 at NEEM | 2000 liter. |
| Drill fluid at NEEM | 11,400 liter ESTISOL and 2800 liter COASOL |
| Drill fluid in SFJ | 8,000 liter ESTISOL and 1,200 liter COASOL. |

Needs in 2009:

| | |
|---|---|
| Fuel | 30,000 liter |
| Mogas | 2000 liter |
| Drill fluid (up by ship 2009) | 19,600 liter ESTISOL and 4,000 liter COASOL. |

# Loads carried 2008:

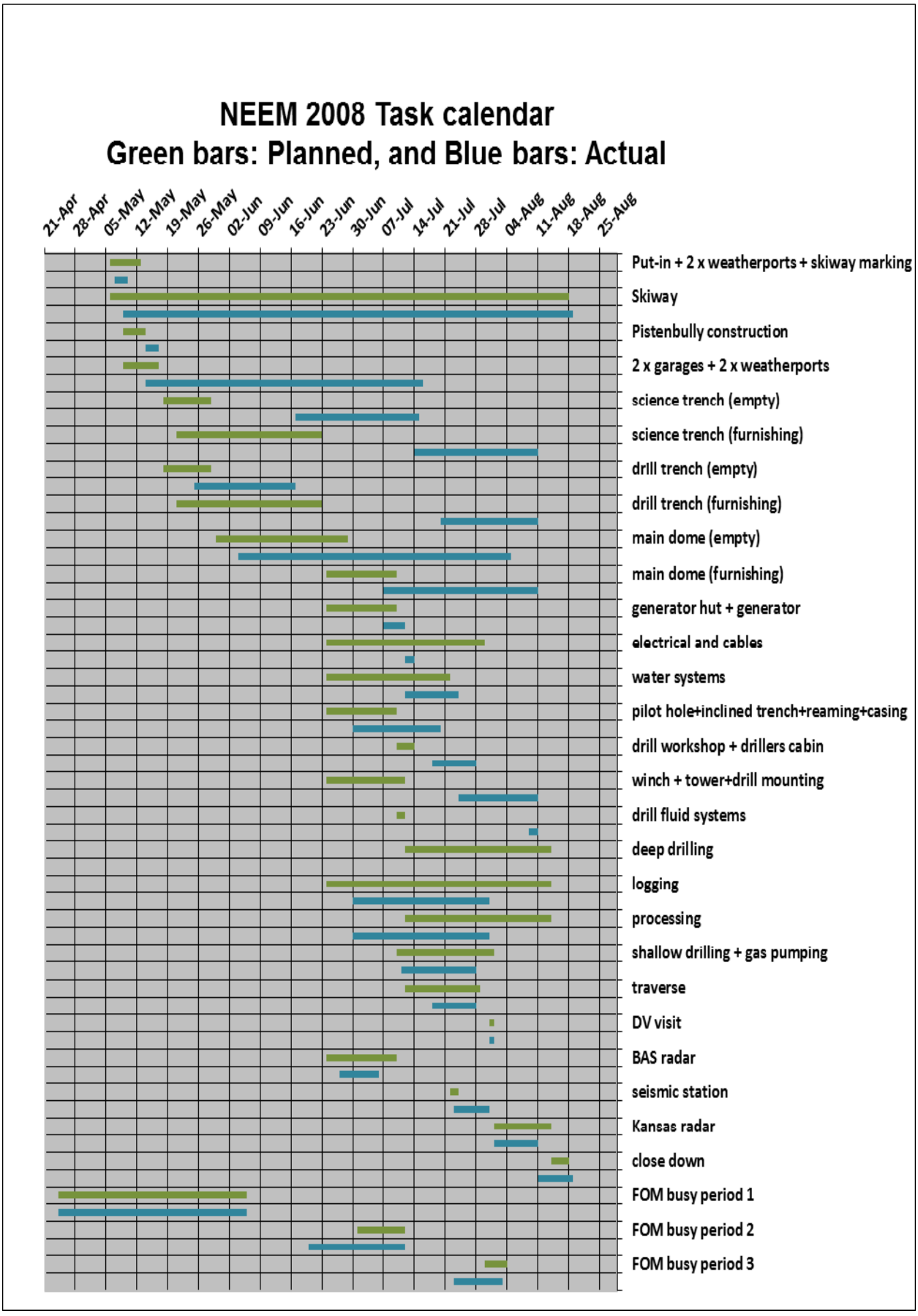
A total of 443100 lbs (201,500 kg) was transported to NEEM in 24 missions. Below is a table showing the missions. All weights in the table are in lbs.

| Flight statistics 2008 (cargo incl. PAX weight): | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| Mission # | date | month | up PAX | down PAX | up cargo | down cargo | change in | camp | flight | |
| | | | | lbs | | lbs | PAX | PAX sum | hours | comment |
| | | | | | | | | in camp | | |
| 1 | 7 | May | 5 | 0 | 9000 | 0 | 5 | 5 | 5.2 | |
| 2 | 8 | May | 0 | 0 | 10000 | 0 | 0 | 5 | 5.2 | |
| 3 | 13 | May | 0 | 0 | 13870 | 0 | 0 | 5 | 5.2 | |
| 4 | 14 | May | 1 | 0 | 14435 | 0 | 1 | 6 | 5.2 | |
| 5 | 15 | May | 0 | 0 | 20150 | 0 | 0 | 6 | 5.2 | |
| 6 | 15 | May | 3 | 0 | 15823 | 0 | 3 | 9 | 5.2 | |
| 7 | 16 | May | 1 | 0 | 15125 | 0 | 1 | 10 | 5.2 | |
| 8 | 16 | May | 0 | 0 | 15000 | 2000 | 0 | 10 | 5.2 | |
| | 24 | May | 2 | 0 | | | 2 | 12 | 0 | Liz Morris |
| 9 | 31 | May | 7 | 2 | 14390 | 3850 | 5 | 17 | 5.2 | |
| 10 | 1 | June | 0 | 7 | 20000 | 1575 | -7 | 10 | 5.2 | |
| 11 | 3 | June | 2 | 0 | 19580 | 2000 | 2 | 12 | 5.2 | |
| 12 | 4 | June | 0 | 0 | 19965 | 0 | 0 | 12 | 5.2 | |
| 13 | 5 | June | 0 | 0 | 22131 | 0 | 0 | 12 | 5.2 | |
| 14 | 5 | June | 1 | 0 | 22000 | 0 | 1 | 13 | 5.2 | |
| 15 | 25 | June | 9 | 6 | 21923 | 5700 | 3 | 16 | 5.2 | |
| 16 | 26 | June | 4 | 3 | 21100 | 5000 | 1 | 17 | 5.2 | |
| 17 | 27 | June | 0 | 0 | 17750 | 0 | 0 | 17 | 5.2 | |
| 18 | 9 | July | 8 | 1 | 21990 | 2750 | 7 | 24 | 5.2 | |
| 19 | 10 | July | 0 | 3 | 21530 | 2925 | -3 | 21 | 5.2 | |
| 20 | 11 | July | 15 | 3 | 23300 | 2025 | 12 | 33 | 5.2 | |
| 21 | 23 | July | 5 | 5 | 23513 | 6275 | 0 | 33 | 5.2 | |
| 22 | 31 | July | 16 | 11 | 19227 | 12379 | 5 | 38 | 5.2 | |
| 23 | 1 | August | 5 | 28 | 19121 | 14313 | -23 | 15 | 5.2 | |
| 24 | 19 | August | 0 | 15 | 22176 | 14999 | -15 | 0 | 5.2 | |
| | | | | | | | | | | |
| | | | 84 | 84 | 443099 | 75791 | | | 124.8 | |
| | | | | | | | | | | |
| | | | Liz Morris and partner | | | | | | | |
| | | | only flew out from NEEM | | | | also half share of C5 mission | | | |

# Actual calendar on tasks.

| **Actual calendar for tasks in camp 2008:** | | | | |
|---|---|---|---|---|
| **Task:** | **Planned** | **period** | **Actual** | **period** |
| | | | | |
| Put-in + 2 x weatherports + skiway marking | 06-May | 13-May | | |
| | | | 07-May | 10-May |
| Skiway | 06-May | 18-Aug | | |
| | | | 09-May | 19-Aug |
| Pistenbully construction | 09-May | 14-May | | |
| | | | 14-May | 17-May |
| 2 x garages + 2 x weatherports | 09-May | 17-May | | |
| | | | 14-May | 16-Jul |
| science trench (empty) | 18-May | 29-May | | |
| | | | 17-Jun | 15-Jul |
| science trench (furnishing) | 21-May | 23-Jun | | |
| | | | 14-Jul | 11-Aug |
| drill trench (empty) | 18-May | 29-May | | |
| | | | 25-May | 17-Jun |
| drill trench (furnishing) | 21-May | 23-Jun | | |
| | | | 20-Jul | 11-Aug |
| main dome (empty) | 30-May | 29-Jun | | |
| | | | 04-Jun | 05-Aug |
| main dome (furnishing) | 24-Jun | 10-Jul | | |
| | | | 07-Jul | 11-Aug |
| generator hut + generator | 24-Jun | 10-Jul | | |
| | | | 07-Jul | 12-Jul |
| electrical and cables | 24-Jun | 30-Jul | | |
| | | | 12-Jul | 14-Jul |
| water systems | 24-Jun | 22-Jul | | |
| | | | 12-Jul | 24-Jul |
| pilot hole+inclined trench+reaming+casing | 24-Jun | 10-Jul | | |
| | | | 30-Jun | 20-Jul |
| drill workshop + drillers cabin | 10-Jul | 14-Jul | | |
| | | | 18-Jul | 28-Jul |
| winch + tower+drill mounting | 24-Jun | 12-Jul | | |
| | | | 24-Jul | 11-Aug |
| drill fluid systems | 10-Jul | 12-Jul | | |
| | | | 09-Aug | 11-Aug |
| deep drilling | 12-Jul | 14-Aug | | |
| | | | | |

| | | | | |
|---|---|---|---|---|
| logging | 24-Jun | 14-Aug | | |
| | | | 30-Jun | 31-Jul |
| processing | 12-Jul | 14-Aug | | |
| | | | 30-Jun | 31-Jul |
| shallow drilling + gas pumping | 10-Jul | 01-Aug | | |
| | | | 11-Jul | 28-Jul |
| traverse | 12-Jul | 29-Jul | | |
| | | | 18-Jul | 28-Jul |
| DV visit | 31-Jul | 01-Aug | | |
| | | | 31-Jul | 01-Aug |
| BAS radar | 24-Jun | 10-Jul | | |
| | | | 27-Jun | 06-Jul |
| seismic station | 22-Jul | 24-Jul | | |
| | | | 23-Jul | 31-Jul |
| Kansas radar | 01-Aug | 14-Aug | | |
| | | | 01-Aug | 11-Aug |
| close down | 14-Aug | 18-Aug | | |
| | | | 11-Aug | 19-Aug |
| FOM busy period 1 | 24-Apr | 06-Jun | | |
| | | | 24-Apr | 06-Jun |
| FOM busy period 2 | 01-Jul | 12-Jul | | |
| | | | 20-Jun | 12-Jul |
| FOM busy period 3 | 30-Jul | 04-Aug | | |
| | | | 23-Jul | 03-Aug |


NEEM 2008 Task calendar
Green bars: Planned, and Blue bars: Actual
21-Apr
28-Apr
05-May
12-May
19-May
26-May
02-Jun
09-Jun
16-Jun
23-Jun
30-Jun
07-Jul
14-Jul
21-Jul
28-Jul
04-Aug
11-Aug
18-Aug
25-Aug
Put-in + 2 x weatherports + skiway marking
Skiway
Pistenbully construction
2 x garages + 2 x weatherports
science trench (empty)
science trench (furnishing)
drill trench (empty)
drill trench (furnishing)
main dome (empty)
main dome (furnishing)
generator hut + generator
electrical and cables
water systems
pilot hole+inclined trench+reaming+casing
drill workshop + drillers cabin
winch + tower+drill mounting
drill fluid systems
deep drilling
logging
processing
shallow drilling + gas pumping
traverse
DV visit
BAS radar
seismic station
Kansas radar
close down
FOM busy period 1
FOM busy period 2
FOM busy period 3

# Actual manning

| | **NEEM 2008 Actual Manning.** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Name | Nationality | To SFJ | To NEEM | From NEEM | From SFJ | Number of days in camp. | Number of days in KISS |
| | | | | | | | | |
| FOM | Bjerregaard Simonsen, Sebastian | DK | 24-Apr | | | 17-May | 0 | 23 |
| FOM | Larsen, Lars Berg | DK | 24-Apr | | | 06-Jun | 0 | 43 |
| FOM | Rasmussen, Sune O. | DK | 24-Apr | | | 06-May | 0 | 12 |
| GFA | Durand, Gaël | F | 05-May | 07-May | 25-Jun | 26-Jun | 49 | 3 |
| GFA | Hedfors, Jim | S | 04-May | 07-May | 01-Jun | 04-Jun | 25 | 6 |
| MECH | Hilmarsson, Sverrir Æ. | IS | 05-May | 07-May | 25-Jun | 26-Jun | 49 | 3 |
| GFA | Overly, Thomas | US | 05-May | 07-May | 01-Jun | 05-Jun | 25 | 6 |
| FL | Steffensen, Jørgen Peder | DK | 05-May | 07-May | 25-Jun | | 49 | 1 |
| COOK | Harvey, Sarah | US | 12-May | 15-May | 26-Jun | 28-Jun | 42 | 5 |
| DOC | Florian, Hans Christian | GRL | 12-May | 15-May | 01-Jun | 04-Jun | 17 | 6 |
| HVO | Bang, Claus | DK | 10-May | 15-May | 11-Jul | 11-Jul | 57 | 5 |
| GFA | Bjerregaard Simonsen, Sebastian | DK | | 17-May | 25-Jun | 27-Jun | 39 | 2 |
| FOM MECH | Strand, Michael | DK | 22-May | 05-Jun | 19-Aug | 22-Aug | 75 | 17 |
| SCOTT POLAR | Morris, Liz | UK | | 24-May | 31-May | | 7 | 0 |
| SCOTT POLAR | Hignell, Martin | UK | | 24-May | 31-May | | 7 | 0 |
| DOME | Wolfram, Blair F. | US | 28-May | 31-May | 26-Jun | 28-Jun | 26 | 5 |
| DOME | Davis, William J. | US | 28-May | 31-May | 25-Jun | 28-Jun | 25 | 6 |
| ELECTRIC | Vaughn, Bruce | US | 28-May | 31-May | 26-Jun | 28-Jun | 26 | 5 |
| DOC | Sørensen, Hasse Møller | DK | 02-Jun | 04-Jun | 25-Jun | 26-Jun | 21 | 3 |
| FOM | Chalmas, Remi | DK | 02-Jun | | | 26-Jun | 0 | 24 |
| GFA | Langen, Peter | DK | 02-Jun | 04-Jun | 10-Jul | 11-Jul | 36 | 3 |
| BAS RADAR | Gillet, Fabian | GB | 23-Jun | 26-Jun | 10-Jul | 12-Jul | 14 | 5 |
| BAS RADAR | Burton, Timothy | GB | 23-Jun | 26-Jun | 10-Jul | 12-Jul | 14 | 5 |
| DOC | Benn, Marianne | DK | 23-Jun | 25-Jun | 09-Jul | 10-Jul | 14 | 3 |
| VVS | Bundgaard, Henrik VVS | DK | 23-Jun | 25-Jun | 23-Jul | 25-Jul | 28 | 4 |
| DRILLER | Curran, Mark | AUS | 23-Jun | 25-Jun | 23-Jul | 22-Aug | 28 | 32 |
| FL | Dahl-Jensen, Dorthe | DK | 23-Jun | 25-Jun | 19-Aug | 22-Aug | 55 | 5 |
| DR.MECH | Hansen, Steffen Bo | DK | 23-Jun | 25-Jun | 01-Aug | 02-Aug | 37 | 3 |
| DRILLER | JiWoong Chung | COR | 23-Jun | 26-Jun | 19-Aug | 22-Aug | 54 | 6 |
| DRILLER | Johnsen, Sigfus Johann | IS | 23-Jun | 25-Jun | 01-Aug | 02-Aug | 37 | 3 |
| PROCESSOR | Masson-Delmotte, Valerie | F | 23-Jun | 26-Jun | 01-Aug | 04-Aug | 36 | 6 |
| CARPENTER | Moret, HansPeter | CH | 23-Jun | 25-Jun | 01-Aug | 02-Aug | 37 | 3 |
| DRILLER | Popp, Trevor | US | 07-Jul | 09-Jul | 19-Aug | 22-Aug | 41 | 5 |
| COOK | Ravnebjerg, Louise Wolff | DK | 23-Jun | 25-Jun | 19-Aug | 22-Aug | 55 | 5 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DR.MECH | Vistisen, Dennis MECH | DK | 23-Jun | 25-Jun | 23-Jul | 25-Jul | 28 | 4 |
| FOM | Kettner, Ernesto | DK | 23-Jun | 11-Jul | 11-Jul | 18-Jul | 0 | 25 |
| FOM | Gkinis, Vasileios | DK | 23-Jun | 11-Jul | 11-Jul | 18-Jul | 0 | 25 |
| FOM | Steffensen, Jørgen Peder | DK | 25-Jun | | | 22-Aug | 0 | 58 |
| FIRN GAS | Sowers, Todd | US | 07-Jul | 11-Jul | 01-Aug | 02-Aug | 21 | 5 |
| FIRN GAS | Petrenko, Vas | US | 07-Jul | 11-Jul | 31-Jul | 02-Aug | 20 | 6 |
| HVO | Pedersen, Thomas Ramsdal | DK | 07-Jul | 09-Jul | 19-Aug | 22-Aug | 41 | 5 |
| TRAVERSE | Larsen, Lars Berg | DK | 07-Jul | 11-Jul | 01-Aug | 02-Aug | 21 | 5 |
| TRAVERSE | Hilmarsson, Sverrir Æ. | IS | 08-Jul | 09-Jul | 19-Aug | 22-Aug | 41 | 4 |
| DRILLER | Alemany, Olivier | F | 07-Jul | 11-Jul | 31-Jul | 04-Aug | 20 | 8 |
| DOC | Beck, Thomas | DK | 07-Jul | 09-Jul | 31-Jul | 04-Aug | 22 | 6 |
| FIRN GAS | Blunier, Thomas | DK | 07-Jul | 11-Jul | 01-Aug | 02-Aug | 21 | 5 |
| SH.DRILLER | Jenk, Theo | DK | 07-Jul | 11-Jul | 01-Aug | 02-Aug | 21 | 5 |
| IT | Panton, Christian | DK | 07-Jul | 11-Jul | 01-Aug | 04-Aug | 21 | 7 |
| MECH | Rufli, Henry | CH | 07-Jul | 09-Jul | 31-Jul | 04-Aug | 22 | 6 |
| FIRN GAS | Schwander, Jakob | CH | 07-Jul | 09-Jul | 31-Jul | 01-Aug | 22 | 3 |
| ELECTRIC | Sheldon, Simon | DK | 07-Jul | 09-Jul | 01-Aug | 02-Aug | 23 | 3 |
| SH.DRILLER | Steen-Larsen, H.C. | DK | 07-Jul | 11-Jul | 19-Aug | 22-Aug | 39 | 7 |
| TRAVERSE | Svensson, Anders M. | DK | 07-Jul | 09-Jul | 01-Aug | 02-Aug | 23 | 3 |
| FIRN GAS | Uglietti, Ciara | CH | 07-Jul | 11-Jul | 31-Jul | 01-Aug | 20 | 5 |
| PROCESSOR | v.d. Veen, Carina | NL | 07-Jul | 11-Jul | 19-Aug | 22-Aug | 39 | 7 |
| PROCESSOR | Vinther, Bo | DK | 07-Jul | 11-Jul | 19-Aug | 22-Aug | 39 | 7 |
| GFA | Thing, Henning | DK | | 11-Jul | 23-Jul | | 12 | 0 |
| GFA | Stocker, Thomas | CH | 21-Jul | 23-Jul | 01-Aug | 02-Aug | 9 | 3 |
| SEISMIC | Dahl-Jensen, Trine | DK | 21-Jul | 23-Jul | 31-Jul | 04-Aug | 8 | 6 |
| GFA | Burton, Timothy | UK | 28-Jul | 01-Aug | 19-Aug | 22-Aug | 18 | 7 |
| RADAR | Leuschen, Carl | US | 28-Jul | 01-Aug | 19-Aug | 21-Aug | 18 | 6 |
| RADAR | Lehigh, Kieth | US | 28-Jul | 01-Aug | 19-Aug | 21-Aug | 18 | 6 |
| RADAR | Sundermeier, Dennis | US | 28-Jul | 01-Aug | 19-Aug | 21-Aug | 18 | 6 |
| DOC | Elliott, Elizabeth | AUS | 29-Jul | 01-Aug | 19-Aug | 22-Aug | 18 | 6 |

In total there was 1648 man days spent in camp and 512 in Kangerlussuaq

2008 ice core production and sites:

| Site | Core name | Position | logged | processed |
|---|---|---|---|---|
| NEEM main | 2008 S1 | N 77.4449867;W51.0690702 (position of NEEM reference, 100 m west of hole) | 102 m | yes |
| Firn/air station | 2008 S2 | N77 26.020'; W51 06.720' | 75.90 m | yes |
| Firn/air station | 2008 S3 | N77 25.996'; W51 06.161' | 88.00 m | yes |
| Firn/air station | 2008 S4 | close to firn station | 48.6 m | no core |

# Situation Reports (SITREPS).

## *NEEM - SITREP no. 1, Sunday 27 April 2008.*

This SITREP covers the period April 24-27, 2008 (inclusive).

**Movement of personnel:**
April 24: Sebastian Bjerregaard Simonsen (DK), Lars Berg Larsen (DK), Sune Olander Rasmussen (DK) from CPH to SFJ by Air Greenland.

**Movement of Cargo:**
April 27: 737 kg (31 colli): Office equipment, radio, manuals, spare parts, HCSLs experiment, ice boxes, etc. from CPH to SFJ by Air Greenland.

**Activities:**
The NEEM field office in Kangerlussuaq has been opened by the first team of FOMs from Copenhagen Thursdag April 24. The office and the warehouse (442) was found in good shape. The main activities have been related to setting up the office with various hardware and getting the vehicles running. Currently, internet, network, printers, and phones are operational. The Toyota still has problems, but the rest of the vehicles are running fine. The flatbed truck passed the safety check and got new number plates, the remaining vehicles are either without plates or have kept plates on since last year.

Working on cargo has started, but was slowed down today because of snow. Tomorrow we will hopefully get advice and approval from 109$^{th}$ airial port staff for the big Pisenbully crane pallet.

Work on the web page has been going on in SFJ and CPH in the evenings.

NEEM Field operations office,
Sebastian Bjerregaard Simonsen, Lars Berg Larsen, Sune Olander Rasmussen

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## *NEEM - SITREP no. 2, Sunday May 4, 2008.*

This SITREP covers the period April 28 – May 4, 2008 (inclusive).

**Movement of personnel:**
May 4: Jim Hedfors from CPH to SFJ by Air Greenland.

**Movement of Cargo:**
May 1: 234 kg (7 colli received, 1 box missing, tracking initiated): Scientific equipment, stove, cargo scale, field gear, tripod, camera from CPH to SFJ by Air Greenland.
May 1: 490 kg (1 colli): Cargo rollers from CPH to SFJ by Air Greenland.

**Activities:**
The week's main activity has been receiving, handling, and packing of cargo, getting ready for a put-in during the coming week (see below). Our dome did not arrive with the C5 cargo airplane Monday, but will probably be flown up here late May.

Also, considerable time has been spent mounting the crane on the Pisenbully and assembling a new skidoo. Procedures for waste handling, food and drink import etc. have been negotiated.

Work on the NEEM web page has been going on in CPH and in SFJ in the evenings. The web page has been launched today, May 4, and is available on **http://neem.ku.dk**.
The daily reports are only available on the web page (http://neem.ku.dk/field_diaries/) and will not be distributed by e-mail.
Please also note that all national representatives are encouraged to supply a link address to their national NEEM pages (see the French example at http://neem.ku.dk/partners/).

The 109th arrived in SFJ Sunday. Based on the outcome of the mission commander meeting and the current weather forecasts, a Wednesday or Thursday put-in seems most likely, possibly with a second flight Friday.

NEEM Field operations office,

Sebastian Bjerregaard Simonsen, Lars Berg Larsen, Sune Olander Rasmussen

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## *NEEM - SITREP no. 3, Sunday May 11, 2008.*

This SITREP covers the period May 5 – May 11, 2008 (inclusive).

**Movement of personnel:**

May 5: Gaël Durand (F), Jim Hedfors (S), Thomas Overly (US), Sverrir Hilmarsson (IS) and Jørgen Peder Steffensen (DK) from CPH to SFJ by Air Greenland.

May 7: Gaël Durand (F), Jim Hedfors (S), Thomas Overly (US), Sverrir Hilmarsson (IS) and Jørgen Peder Steffensen (DK) from SFJ to NEEM by 109th LC-130.

May 10: Claus Bang (DK) from CPH to SFJ by Air Greenland.

**Movement of Cargo:**

May 6: 5 kg (1 coli); Expedition equipment from CPH to SFJ by Air Greenland.

May 7: 4.181 kg. K-track, ski-way flags, ski-doo from SFJ to NEEM by 109th LC-130.

May 8: 4.863 kg. k-track, garage frame, cargo rollers from SFJ to NEEM by 109th LC-130

May 8: 1.092 kg (3 coli); Hazmat cargo from CPH to SFJ by Air Greenland.

May 8 162 kg (6 coli); Cargo from CPH to SFJ by Air Greenland.

**Activities:**

After the attempt to fly into NEEM on Tuesday, the flight to NEEM Wednesday was successful with a very experienced 109'Th crew, almost the same crew from the NGRIP 2007 put-in.
The plane landed at 11:22 L and left again 11:52 first attempt with ATO's.
The camp structures from last year were covered by snowdrifts. Only the top of the four heavy sledges and the vehicles left on the surface last year were visible. The hill on which we built the kitchen weather port last year was gone, and the northern side of the kitchen was covered by heavy snow drifts. All pallets of cargo left last year was completely buried. The kitchen weather port was undamaged. The 5kW diesel generator at was started 13.30 to power the kitchen for melting snow and for heat. Digging went on all day until midnight. The tracked vehicles and the snow blower was up and running by 17:00.
All snowmobiles were in good condition. The roof of the snowmobile cave was under 35 cm snow, which is a good indication of the snow accumulation since August last year.

Second mission to NEEM was Thursday, the Skier landed in the camp with more construction material and left the again on first attempt using ATO's

The second diesel generator was started the camp has now 10 kW of power.
Due to frost condensation it took a couple of days before it was safe to run pc and communication in the kitchen tent.
The third day at NEEM maintenance check on the vehicles was carried out and at the end of the day all cargo was accessed and grooming of the ski way could begin.
First structure of NEEM camp erected: A 10' x 10' weather port.

At the end of the week camp layout was marked, another 12' x 20' weather port was erected and a new cargo line was build.

The ski way is now fully flagged and intensely grooming started prior to next week's five missions to the camp

Weather all week mostly: Blue sky, -30 C to -19 C, winds at 5 – 8 m/s

Camp population: 5

In Kangerlussuaq the NEEM office is busy, with help from the 109'th Aerial Port Support, to build pallets for five LC-130 loads in next week.

NEEM Field operations office,

Sebastian Bjerregaard Simonsen, Lars Berg Larsen,

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## *NEEM - SITREP no. 4, Sunday May 18, 2008.*

This SITREP covers the period May 12 – May 18, 2008 (inclusive).

**Movement of personnel:**

May 12: Hans Christian Florian (GRL) from CPH to SFJ by Air Greenland. Sarah Harvey (US from KSCH to SFJ by 109'th New York Air National Guard (NYANG) LC-130.

May 15: Claus Bang (DK), Hans Christian Florian (GRL) and Sarah Harvey (US) from SFJ to NEEM by NYANG LC-130.

May 17: Sebastian Simonsen (DK) from SFJ to NEEM by NYANG LC-130.

**Movement of Cargo:**

May 12: 2220 kg; One pallet camp food from KSCH to SFJ by NYANG LC-130.

May 13: 6282 kg; Snow blower, tents, beds and plywood from SFJ to NEEM by NYANG LC-130.

May 14: 6513 kg; PistenBully track vehicle, 16kW generator from SFJ to NEEM by NYANG LC-130.

May 15 9525 kg; PB crane, 16 drums Jet-A1, food, garage parts from SFJ to NEEM by NYANG LC-130.

7269 kg; Red dome tent, PB-Blade/Tiller, plywood from SFJ to NEEM by NYANG LC-130.

27 kg; chains, connectors, straps from NEEM to SFJ by NYANG LC-130.

May 16 6304 kg; Lumber and Jet-A1 from SFJ to NEEM by NYANG LC-130.

1451 kg; Empty pallets, from NEEM to SFJ by NYANG LC-130.

May 17 6758 kg; Lumber, chain hoists, ladders from SFJ to NEEM by NYANG LC-130.

850 kg; empty pallets, nets, chains, hooks from NEEM to SFJ by NYANG LC-130.

**Activities:**

It has been a busy week, with 6 successful LC-130 missions to NEEM and more than 42.000 kg airlifted to the site. Camp activities during the whole week focused on preparing for/and receiving the airplanes. First mission was troubled by wind 45 degrees to the ski way and the grooming was not deep enough. The landing revealed a series of deep rollers that were very hard and the plane needed a number of take off attempts. The rollers on the ski way were very hard on the airplanes landing gear. The crew in camp struggled to even the ski way during the week in order level out the rollers.This was not possible and the 109$^{th}$ therefore could not certify the ski way for heavy loads. The ski way though improved significantly during the week. The camp received a new PistenBully 300W and it is expected that this vehicle has the capacity to work the ski way to a better standard the next couple of weeks.
Due to the condition of the ski way and less payload than hoped for, an extra mission was needed to get enough construction material to the camp in order to be able to construct the drill trench. Construction of the science trench is postponed to after next flight period when the rest at the construction wood should go to the camp. Thus increased labor will be put into the finish of the drill trench if possible.

The first flight in was used to test the rebuilding of a German traverse sledge into a multiple pallet (T-2, T-3) receiving sledge with rollers in order to offload/load three pallets at a time direct into the airplane.This worked fine and four times the sledge was in action.

Loading and unloading the PistenBully into/from the LC-130. with a clearance of 1 inch went fine without the tracks, blade and tiller (rotations grooming device attached to the rear of the PB) only minor items needed to be removed from the vehicle, which was winched onboard. Offloading the vehicle went smooth in less than one hour. Not having any lifting equipment it was some of a challenge to mount first the 3 ton crane then the 2.5 ton belts.
Unfortunately the camp suffered a strike of bad luck as they were about to mount the crane. As the PistenBully was pulled under the crane, some hoses needed to be moved from crane. For unknown reasons, the crane suddenly began to move all by itself. Nobody was at the controls of the crane. The result was that the crane arm bent down and smashed the hydraulic control system. Luckily nobody was hurt. The crane is now out of function.
The PistenBully was later mounted the tracks and is now fully operational.

The cargo line was moved out of the snow and reorganized
Four weather ports were built during the week and a total of six is now erected. One of them will be used as heated storage for non freeze food etc.

The camp crew has been able to move from sleeping pads on the snow surface in the tents to bunk beds in the weather port. This together with an arriving cook, a medical doctor and two more crewmembers life in camp has become easier.

Sunday, construction of overwintering structures began. A 2m hill was made for a red dome tent, and the floor laid out. Also construction of the snow hill and arches for the first garage has begun.

**Constructions this week:**
4 weather ports
Rebuilt cargo sledge
Moved cargo line
Assembling PistenBully (without crane)
Flagged ski way.
Powered heated weather port.
Positioned hills for garage and red dome
Grooming skiway several times.

One PB 100 Flexmobile developed an oil leak and needs a complicated repair when garage tent is erected.

**Operational equipment at site:**
PB 300 W (new), no crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
Two Yanmar snow blowers
One Mase 16 kW generator (gasoline)
Two Hatz 5 kW generators (diesel)
One Honda 4.5 kW generator (gasoline)

**Weather:** Except for the crosswind Tuesday and a small weather delay Wednesday due to light snow. The weather was perfect for air operations; Blue sky, -31 C to -13 C, winds at 0 – 8 m/s mostly from S and SE

**Camp population:** 9

In Kangerlussuaq 19 cargo pallets were built and shipped to camp. We have been receiving and reorganizing cargo and food into our SFJ freezer. Tuesday our two forklifts broke down (broken key and exploded tires) and a puncture on the borrowed CPS (former VECO) bobcat gave a little setback time wise. But thanks to the local GLV-garage and CPS crew, both vehicles got repaired during the day.
Nice weather and temperatures about 0 to +15 C

First sign of mosquito activity in water ponds…
(Heavy mosquito season expected due to the large amount of snow and melt water this year)

NEEM Field operations office,

Sebastian Bjerregaard Simonsen, Lars Berg Larsen,

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## *NEEM - SITREP no. 5, Sunday May 25, 2008.*

This SITREP covers the period May 19 – May 25, 2008 (inclusive).

**Movement of personnel:**

May 22: Michael V. Strand from CPH to SFJ by Air Greenland

**Movement of Cargo:**

May 23: 1660 kg; 31 Colli, Generator and spare parts from CPH to SFJ by Air Greenland.

**Activities:**

It was a very cold and windy start of the week. Wind was more than 20 m/s and with temperatures at -31 C outdoor work was almost impossible. Only work from vehicles was carried out and the two meter high platform for the red tent domes was made. Tuesday the blizzard struck. The main generator ceased to work and the backup generator refused to work. The kitchen tent was without power. After three hours of work on the main generator in the blowing snow, it started, but ran only for half an hour before it stopped due to a serious engine break down. The kitchen tent was heated by kerosene and gas heaters until the spare generator was ready to run. When weather cleared up midweek the tiller was mounted on the PistenBully and the first test was made to find the right configuration for the ski way.
During the week two new structures was erected, the two red domes. The smaller one will serve as housing for four people, the other will serve as kitchen dome while camp population increases and until the new main dome is built. The red dome was ready and installed with a new kitchen Saturday.
Saturday was also the day the NEEM camp visitors, Liz Morris and Martin Hignell, Scott Polar arrived after one month successful traverse in northern Greenland. They will fly out to Kangerlussuaq on one of the flights next week.
Another encouraging thing during a week with a lot of repairing, maintenance and cleanup after the storm was that the PB crane could be made operational after some suggestions from the company. The crane is now mounted on the PB and functions though only by carefully tending the manual controls. This is a big relief as the crane will play a crucial role in the coming construction work. The PB and crane was already in action Sunday when the construction of the first garage began.

**Constructions this week:**
Two red domes
New kitchen
Mounted tiller on PB
Mounted crane on PB
Dug out Toyota
Intermediate shower
Positioned hills for garage and red dome
Grooming ski way several times.

**Operational equipment at site:**
PB 300 W, tiller and manually controlled crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
Two Yanmar snow blowers
Two Hatz 5 kW generators (diesel)
One Honda 4.5 kW generator (gasoline)

Non operational:
Mase 16 kW generator, need repair/spareparts
PB-100 Flexmobil (yellow shovel) needs repair for oil leak.

**Weather:** Cold, strong winds, one day blizzard (> 15 m/s), then beautiful weather rest of the week with Blue sky, -36 C to -16 C, winds at 1 – 8 m/s.

**Camp population:** 11

In Kangerlussuaq preparation was made for the next 1½ weeks of flight operations which include 5-6 LC-130 missions to NEEM and a C-5 cargo airlift from the United States.
Weather -5 C to + 10 C, snow, rain and sun. Windy

NEEM Field operations office,

Michael Valentin Strand, Lars Berg Larsen,

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*NEEM - SITREP no. 6, Sunday June 1, 2008.*

This SITREP covers the period May 26 – June 1, 2008 (inclusive).

**Movement of personnel:**

May 28: Bruce Vaughn (US), Blair Wolfram (US) and William Davies (US) from SCH to SFJ by NYANG 109'Th LC-130

May 31: Bruce Vaughn (US), Blair Wolfram (US), William Davies (US), Claudia Buckenmaier (D) Matthias Jung (D), Thomas Schimmack (D) and Marc-Christoph Wagner (D) from SFJ to NEEM by NYANG 109'th LC-130.
Liz Morris (UK) and Martin Hignell (UK) from NEEM to SFJ by NYANG 109'Th LC-130.

June 1: Hans Christian Florian (GRL), Jim Hedfors (S), Thomas Overly (US),Claudia Buckenmaier (D) Matthias Jung (D), Thomas Schimmack (D) and Marc-Christoph Wagner (D) from NEEM to SFJ by NYANG 109'th LC-130.

**Movement of Cargo:**

May 23: 144 kg; 3 Colli, spare parts from CPH to SFJ by Air Greenland.

May 29: 21972 kg from SCH to SFJ by NYANG 105'Th C-5

May 30 24 kg 1 colli from CPH to SFJ by Air Greenland

May 31: 6803 kg from SFJ to NEEM by NYANG 109'Th LC-130.

1396 kg from NEEM to SFJ by NYANG 109'Th LC-130.

June 1: 9071 kg from SFJ to NEEM by NYANG 109'Th LC-130.

**Activities:**

It has been a week troubled by the weather. In the beginning with snow later very windy. A deep low pressure system travelled the icecap from south to north. The wind peaked Thursday night with gusting winds at 35 knots. Other camps on the ice sheet were hit by wind speeds at 74 knots. It was hard to do outdoor construction work but the camp crew managed in several attempts to erect the large 26x40 feet garage tent. and setup of the workshop could begin. The excavation of the drill trench got delayed due to fill in from drifting snow.
Three to four flights were planned to the camp this week and preparations of the ski way had high priority in order have to ski way certified to a payload at 20.000 lbs. Intense grooming with the beam and the new tiller was done throughout the whole week.
Due to a two day weather delay it was only possible to get two missions to the camp so far. It is a back to back week and after a crew change by the 109'th, flights to NEEM will continue next week.The conditions of the ski way had improved and it got upgraded to a 20.000 lbs payload. It will only need some small modifications in order to get certified for an instrument approach.
This week the first science was conducted. A stable isotope experiment was set up outside NEEM Camp.

And the camp had the first media visit this year, ARD-1. (German national television) A four crew TV team visited the camp and stayed overnight.

**Constructions this week:**
Finishing Garage 26 x 40 weather port
Started blowing snow for Drill trench.
Grooming ski way several times.

**Operational equipment at site:**
PB 300 W, tiller and manually controlled crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
One Yanmar 3440 snow blower
Mase 16 kW generator (diesel).

One Hatz 5 kW generator (diesel)
One Honda 4.5 kW generator (gasoline)

Non operational:
One Yanmar 3420 snow blower, broken belts
PB-100 Flexmobil (yellow shovel) needs repair for oil leak.
One Hatz generator, needing repair. Almost worn out.

**Weather:** 12 cm snow, mainly strong winds, -17 C to -4 C, winds at 1 – 18 m/s.

**Camp population:** 9 (peak 16)

In Kangerlussuaq, the hard weather closed the airport and the Air Greenland passengers were diverted on the same day as the C-5 arrived. It had to abandon the first landing attempt due to very high winds. The C-5 was offloaded within some hours and returned to the states. NEEM cargo was reconfigured for the LC-130 going to NEEM.
Weather -5 C to + 5 C, snow, rain and sun. Very windy
Many mosquitoes.
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NEEM Field operations office,

Michael Valentin Strand, Lars Berg Larsen,

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*NEEM - SITREP no. 7, Sunday June 8, 2008.*

This SITREP covers the period June 2 – June 8, 2008 (inclusive).

**Movement of personnel:**

June 2: Hasse Møller Sørensen (DK), Peter Langen (DK) and Rémi Chalmas (DK) from CPH to SFJ by Air Greenland/SAS.

June 4: Hasse Møller Sørensen (DK), Peter Langen (DK) from SFJ to NEEM by NYANG 109'Th LC-130. Hans Christian Florian (GRL) from SFJ to NUUK by Air Greenland. Jim Hedfors (S) from SFJ to CPH by Air Greenland.
June 5: Michael Valentin Strand (DK) from SFJ to NEEM by NYANG 109'Th LC-130. Thomas Overly (US) from SFJ to CPH by Air Greenland.
June 6: Lars Berg Larsen (DK) from SFJ to CPH by Air Greenland.

**Movement of Cargo:**

June 4: 24 kg; 1 Colli, chains for Fyns kran from CPH to SFJ by Air Greenland.
8881 kg and 9056 kg from SFJ to NEEM by NYANG 109'Th LC-130 (2 missions).
907 kg and 954 kg from NEEM to SFJ by NYANG 109'Th LC-130.

June 5: 10042 kg and 9979 kg from SFJ to NEEM by NYANG 109'Th LC-130 (2 missions).
100 kg and 900 kg from NEEM to SFJ by NYANG 109'th LC-130

**Activities:**

The weather improved towards more mild conditions this week with less wind and almost blue sky every day, which allowed us to do a lot of work in the camp.
Although weather conditions behaved above the marginal at the beginning of the week, the first flight mission got aborted after the plane flew over the camp, much to the dismay of camp personnel. The mission got aborted due to a lack of certification of the ski way. The issue of certification has been worked out between the 109'th and NEEM camp and NEEM office in order to get the missions back on track again, as no more delays were wanted.
The efforts paid off as the two next days (Wednesday and Thursday) the 109'th managed to fulfill 4 missions in a row without any trouble, carrying fuel, food and most importantly all the final sections of the main dome. The ski way got even upgraded to receive 22000 lbs.
With the NEEM project back on the scheduled timetable as nice weather all week long, the camp moved ahead with the ongoing building of the main dome and the excavation of the drill trench.

**Constructions this week:**

The drill trench is now 4.5 m deep. It has been really hard work for the people working there. The strong winds and almost persistent snow drift caused the drill trench to backfill almost at the same

speed as it was excavated. It has been frustrating. As the weather forecast for Monday signalled very strong winds, a decision was made to spend the entire Sunday laying the roof on the trench. In further excavation to full depth, we will remove the roof cover in both ends of the trench and blow the snow out. People worked very hard until 23.30 to lay the roof. The drill trench should now be secure.
After the foundation sections of the main dome arrived Thursday, work on the dome is in good progress. Half of the dome frame is complete.
On Sunday while preparing the roofing on the drill trench, the snow wall gave way, and one of our snow blowers fell into the drill trench. Luckily nobody was hurt, and after hoisting the snow blower out of the trench with the crane, we could assess the damage. The snow blower requires two days of repair.

**Operational equipment at site:**
PB 300 W, tiller and manually controlled crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
SDMO 16 kW generator (diesel)
Mase 16 kW generator (diesel).

One Hatz 5 kW generator (diesel)
One Honda 4.5 kW generator (gasoline)
One Robin 5 kW generator (gasoline)

**Non operational:**
One Yanmar 3420 snow blower, broken belts
PB-100 Flexmobil (yellow shovel) needs repair for oil leak.
One Hatz generator, needing repair. Almost worn out.
One Yanmar 3440 snow blower

The Yanmar 3420 will be in action soon.

**Weather:** 12 cm snow, mainly strong winds, -17 C to -4 C, winds at 1 – 14 m/s.

**Camp population:** 12 (peak 16)

In Kangerlussuaq, the weather got sunny with spring conditions which made more easy to prepare the flight operations which include 5 LC-130 missions to NEEM.

Weather 10 C to 20 C, sunny with some clouds, no rain. Almost no wind.
Many many many mosquitoes and all their angry/hungry relatives.

NEEM Field operations office,

Rémi Chalmas

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*NEEM - SITREP no. 8, Sunday June 15, 2008.*

This SITREP covers the period June 9 – June 15, 2008 (inclusive).

**Movement of personnel:**

No movement

**Movement of Cargo:**

June 9: ~2 kg; 2 colli, spare parts from CPH (from F.U. Hansen A/S) to SFJ by Air Greenland.
41 kg; I colli, science materiel for T. Blunier from CPH (from LGGE in Grenoble) to SFJ by Air Greenland.
40 kg; I colli, Metal sample container from CPH (from Univ. of Eaton/Norwich) to SFJ by SAS.

June 12: ~20 kg; I colli, from CPH to SFJ by Air Greenland.
3636 kg; 45 colli (shall be confirmed by Lars), from Karup to SFJ by by NYANG 109'Th LC-130.

June 13: 442 kg; 9 colli, from CPH (from Bern/J. Schwander) to SFJ by Air Greenland.

June 14: 1983 kg; 39 colli, from CPH to SFJ by Air Greenland.

**Activities:**

The week started with a blizzard. Luckily we were forewarned by weather forecasts which gave us the necessary time to cover the excavation for the drill trench with a roof before it would drift in by blowing snow. The week also ended with a blizzard, which arrived Saturday at noon.

Since our arrival to NEEM May 7$^{th}$, we have so far had 8 days with so bad weather conditions that no real work was possible outside, and 13 days with strong winds and considerable snow drift. Therefore it so far has taken 12 working days for two persons working in shift to excavate the drill trench.

From Tuesday to Sunday we have been able to complete the main dome structure and putting ground floor and 1$^{st}$ floor in. Meanwhile, the excavation of the drill trench is still going on and is now near completion.

At the end of the week (Saturday) we got visitors from the traverse that carries cargo from Thule to Summit. As NEEM camp is on their way we have the opportunity to get extra supplies (fuel) from Thule without using the NYANG 109'Th LC-130.
Maintenance and repairs are continuously performed in the garage and on days with adverse weather some construction work in also performed indoors.

All is well in camp.

**Operational equipment at site:**
PB 300 W, tiller and manually controlled crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
SDMO 16 kW generator (diesel)
Mase 16 kW generator (diesel).
Two Hatz 5 kW generators (diesel)
One Honda 4.5 kW generator (gasoline)
One Robin 5 kW generator (gasoline)
One Yanmar 3440 snow blower

**Not operational:**
One Yanmar 3420 snow blower, broken belts
PB-100 Flexmobil (yellow shovel) needs repair for oil leak.
One Hatz generator, needing repair. Almost worn out.

**Weather:** Monday, Saturday and Sunday: winds between 10 and 15 m/s, overcast, snow and blowing snow with temperatures from -11 C to 0 C. Tuesday to Friday fine with moderate winds (5-6 m/s) and temperatures around -10 C.

**Camp population:** 12 with 4 GRIT traverse guests Saturday and Sunday.

In Kangerlussuaq, the weather is still sunny with almost summer conditions now. The time is mostly used to prepare the arrival of the ship (June 19$^{th}$) with cargo for the next flight period. Some cargo has already arrived by air.

Weather 10 C to 20 C, sunny with few clouds, rain just one evening. Almost no wind.
Still many mosquitoes in town and around.

NEEM Field operations office,

Rémi Chalmas

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*NEEM - SITREP no. 9, Sunday June 22, 2008.*

This SITREP covers the period June 16 – June 22, 2008 (inclusive).

**Movement of personnel:**

No movement

**Movement of Cargo:**

June 20: 1191 kg; 40 colli, from CPH to SFJ by Air Greenland.
33 kg; 3 colli, from Nuuk to SFJ by Air Greenland.

June 22: 9361kg; I container (RALU 210728-3), from CPH to SFJ by ship cargo.
3250 kg; 1 colli, generator from CPH to SFJ by ship cargo.

**Activities:**

The building of the dome has been one of the main activities this week. After the structure was done, it was time to mount panels on the dome, which required a lot of efforts as sometimes agility from the entire group. This was a great task to perform as snowy weather was on us until Thursday.

At the same time, the excavation of the drill trench was completed on Tuesday. Since Wednesday, the excavation team is working on excavating the science trench and connecting tunnel and this work is progressing fine. The excavation is nearing its final stages as the depth Sunday evening was more than 5 m.

Since Thursday, good weather allowed the team to progress well in their different task, in spite of some mechanical problems with our PistenBully and Flexmobile. Luckily there have so far been the necessary parts in camp to fix these problems.

The skiway has been put in shape for next weeks flights.

All is well in camp. Both Icelandic and Greenlandic national days were celebrated.

**Operational equipment at site:**
PB 300 W, tiller and manually controlled crane
PB 100 Flexmobile (black shovel)
Toyota Mattracks Landcruiser
Four Lynx Yeti V-800 Snowmobiles
SDMO 16 kW generator (diesel)
Mase 16 kW generator (diesel).

Two Hatz 5 kW generators (diesel)
One Honda 4.5 kW generator (gasoline)
One Robin 5 kW generator (gasoline)
One Yanmar 3440 snow blower

**Not operational:**
One Yanmar 3420 snow blower, broken belts
PB-100 Flexmobil (yellow shovel) needs repair for oil leak.
One Hatz generator, needing repair. Almost worn out.

**Weather:** Monday to Wednesday, Cloudy and a lot of snow, winds between 3 and 7 m/s, temperatures from -12 C to -9 C. Thursday to Sunday: Fine with moderate winds (5-6 m/s) and temperatures -17 to -9 C.

**Camp population:** 12

In Kangerlussuaq, the weather is fine with almost constant south westerly wind which drowns the city into sand storm. This makes life easier with fewer mosquitoes. The ship arrived delayed Saturday afternoon. The unloading of the ship started Sunday morning at a low speed (one of the two barges is out). Nevertheless we got already one container and the generator at our warehouse. Unfortunately, no time to celebrate Greenland national dag Saturday.

Weather 10 C to 20 C, mixed between cloudy weather and blue sky, rainy on some occasions. When the wind is down, the mosquitoes are back.

NEEM Field operations office,

Rémi Chalmas

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## *NEEM - SITREP no. 10, Sunday June 29, 2008.*

This SITREP covers the period June 23 – June 29, 2008 (inclusive).

**Movement of personnel:**

June 23: Louise Ravnebjerg(DK), Steffen Bo Hansen(DK), Marianne Benn(DK), Henrik Bundgaard(DK), Mark Curran(AUS), Sigfus Johnsen(IS), HansPeter Moret(CH), Dennis Vistisen(DK), Dorthe Dahl-Jensen(DK), Valerie Masson-Delmotte(F), JiWoong Chung(COR), Fabian Gillet(UK), Timothy Burton(UK), Vasilios Gkinis(GR) and Ernesto Kettner(D) from CPH to SFJ by SAS/Air Greenland.

June 25: Louise Ravnebjerg(DK), Steffen Bo Hansen(DK), Marianne Benn(DK), Henrik Bundgaard(DK), Mark Curran(AUS), Sigfus Johnsen(IS), HansPeter Moret(CH), Dennis Vistisen(DK) and Dorthe Dahl-Jensen(DK) from SFJ to NEEM by 109th LC-130.
Hasse Møller Sørensen (DK), Sverrir Hilmarsson(IS), Gaël Durand(F), Sebastian Bjerregaard Simonsen(DK), William Davis (US) and Jørgen Peder Steffensen(DK) from NEEM to SFJ by LC-130.

June 26: Valerie Masson-Delmotte(F), JiWoong Chung(COR), Fabian Gillet(UK) and Timothy Burton(UK) from SFJ to NEEM by 109$^{th}$ LC-130.
Sarah Harvey(US), Blair Wolfram(US) and Bruce Vaughn(US) from NEEM to SFJ by 109$^{th}$ LC-130.
Hasse Møller Sørensen (DK), Sverrir Hilmarsson(IS), Gaël Durand(F) and Remi Chalmas(DK-FOM) from SFJ to CPH by SAS/Air Greenland.

June 27: Sebastian Bjerregaard Simonsen(DK) from SFJ to CPH by SAS/Air Greenland.

June 28: William Davis (US), Sarah Harvey(US), Blair Wolfram(US) and Bruce Vaughn(US) from SFJ to Schenectady by 109$^{th}$ LC-130.

**Movement of Cargo:**

June 24: 2755 kg in container TTNU 390519-8 , 9307 kg in container 417290-4. 9481kg in container CDKU 286687-6, 8756 kg in container RALU 210980-8, 2501kg in container GESU 306494-0 and 3 fuel tanks arrived by ship.

June 25: 21923 lbs Casing, drill tubes, winch, spares, drill equipment from SFJ to NEEM by 109$^{th}$ LC-130.

5700 lbs empty fuel drums/garbage and pallets from NEEM to SFJ by 109$^{th}$ LC-130

June 26: 7 colli Australian gas equipment from CPH to SFJ by Air Greenland. 6 colli equipment from CPH to SFJ by Air Greenland.

21100 lbs generator, drill equipment, tower parts, camp equipment and food from SFJ to NEEM by 109$^{th}$ LC-130.

5000 lbs tools, small generator, empty pallets from NEEM to SFJ by 109$^{th}$ LC-130.

June 27: 17750 lbs fuel tank, sledge, air craft pump, mogas, beds and BAS radar from SFJ to NEEM by 109$^{th}$ LC-130.

June 28: 1700 lbs tools from SFJ to Schenectady by 109$^{th}$ LC-130.

**Camp Activities:**

This week we had a major crew exchange, and as the ship from Denmark had arrived early, ship cargo became available in the beginning of the week, we had three missions to camp instead of the one planned. In camp, the building of the dome and the laying of roof on the science trench have been the main activities. All outer panels on the main dome have been mounted as well as

several windows. The crew will now continue to seal the panels and complete the rubber covering. The science trench is now covered by a roof, and the crew now only needs to cover the tunnel between science and drill trench.

Otherwise camp life has changed significantly as 9 people left camp and 13 arrived. The three flights 25, 26 and 27 June, went really fine, all planes had easy take-offs, using only half of the skiway. The planned mission on June 24 was cancelled due to clouds and warm weather, and all missions this week were flown early morning with landing at NEEM around 7 AM. Collaboration between the 109$^{th}$ and NEEM staff had been very good, and we thank in particular the Areal Port crew in Kangerlussuaq and the load masters for their efforts and collaborative spirit.

**Drilling:**

Drilling equipment has been placed in the drill trench and the position of the deep borehole marked. We expect drilling of the pilot hole to commence next week with the shallow drill.

**Science:**

The BAS radar team has marked their positions with GPS and have started the radar measurements.

**Weather:**

Weather all week as been mostly fine, except Monday and Tuesday, which were cloudy with snow, winds between 3 and 6 m/s, temperatures from -17 C to -3 C.

**Camp population:** 16

In Kangerlussuaq, weather has been 10 C to 20 C, mixed between cloudy weather and blue sky, rainy on some occasions. Some small dust storms and when the wind is down again, the mosquitoes are back. There has been an exchange of FOM in Kangerlussuaq as Remi Chalmas left on Thursday and J.P.Steffensen took over. The gate on the warehouse has been repaired, the big red fork lift is running again and the freezer has been repaired. Temp. in freezer is now -19 C again. The freezer malfunction was caused by excessive condensation frost on the evaporator after a lot of traffic in and out of the cold room during the week.

NEEM Field operations office,

Jørgen Peder Steffensen, Vasilios Gkinis and Ernesto Kettner

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*NEEM - SITREP no. 11, Sunday July 6, 2008.*

This SITREP covers the period June 30 – July 6, 2008 (inclusive).

**Movement of personnel:**

No movement of personnel

**Movement of Cargo:**

There has been no flights to camp this week, but we have received the following cargo:

68 kg AWB 631-2620 0101 1 collo from CPH.

115 kg AWB 117-1621 5872 9 colli from NIPR Tokyo

605 kg AWB 631-2620 0090 18 colli from CPH

35 kg AWB 631-2561 4945 1 collo from CPH

61 kg AWB 631-2561 4956 2 colli from CPH

Air Greenland has been flying with another aircraft as their Airbus is having maintenance. The maintenance has been delayed until next Wednesday, so some cargo has been delayed due to reduced cargo capacity.

**Camp Activities:**

This week the NEEM deep drilling began as drillers began drilling in the drill trench. On the main dome all panels have been fixed and many cracks sealed. Most of the large windows have been mounted and all floors have been completed. A staircase has been built between 1$^{st}$ and 2$^{nd}$ floor. The main entrance door has been mounted. The mechanics have been repairing generators and both snow blowers are now operational. The first fuel tank has been mounted on it's sled, and the crew is now practicing with the new air craft fuel station. The camp had a breakthrough as people were able to tunnel through between the drill trench and the science trench. The two trenches are now connected underground via a tunnel.

**Drilling:**

Drilling of the pilot hole is performed with the 7.5 cm Danish shallow drill. Pilot hole drilling was stopped at 106.16 m depth on Thursday and reaming of the hole to a larger diameter began immediately. Reaming of the hole is still in progress.

Statistics: Daily core length 25.99 m in 27 drill runs.

**Science:**

Just before drilling began, the official “zero depth” was defined by using a theodolite from three flags that were placed in the undisturbed snow on the 5.may 2008 surface. This way it was established that the first core drilled at the bottom of the science trench started in 7.28 m depth below the “zero depth”. The core has been logged all the way, and the core now awaits processing in the science trench when it is fully operational. Total length of logged core: 98.88 m.

The BAS radar team has had a successful GPS topo survey. However the radar has had problems. The problems were solved on Thursday, and the crew is now working hard to complete their program.

**Weather:**

Weather all week as been mostly fine, with gentle winds from SSE, towards the end of the week winds turned towards SW and peaked at 8 m/s on Friday, temperatures from -21 C to -2 C.

**Camp population:** 16

In Kangerlussuaq, weather has been dry and hot up to 22 C, towards the end of the week clouds have been coming in, but without rain yet. A few small dust storms and when the wind is down again, the mosquitoes are back. The three FOMs have been busy emptying all ship cargo containers and building pallets for the coming flight week. All six containers are now empty, and 6 pallets and 2 double pallets are now ready for shipment to camp. The work in the yard in Kangerlussuaq has been hampered by the lack of Big Red forklift which is broken again and swarms of aggressive mosquitoes. VECO/CPS has kindly let us use their articulated forklift for our work.

NEEM Field operations office,

Jørgen Peder Steffensen, Vasilios Gkinis and Ernesto Kettner

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## *NEEM - SITREP no. 12, Sunday July 13, 2008.*

This SITREP covers the period July 7 – July 13, 2008 (inclusive).

**Movement of personnel:**

7th July: Theo Jenk(DK), Thomas Blunier(DK), Christian Morel(F), Chiara Uglietti(CH), Carina v.d.Veen(NL), Bo M. Vinther(DK), Olivier Alemany(F), Christian Panton(DK), H.C.Steen-Larsen(DK), Lars Berg Larsen(DK), Thomas Beck(CH), Thomas R. Pedersen(DK),
Simon G. Sheldon(DK), Anders Svensson(DK), Trevor Popp(DK), Jakob Schwander(CH) and Henry Rufli (CH) from CPH to SFJ by SAS/Air Greenland.

Todd Sowers(US) and Vasilii Petrenko(US) from Schenectady to SFJ by 109th.

8th July: Sverrir Hilmarsson(IS) from CPH to SFJ by SAS/Air Greenland

9th July: Thomas Beck(CH), Thomas R. Pedersen(DK), Simon G. Sheldon(DK), Anders Svensson(DK), Jakob Schwander(CH), Henry Rufli (CH), Trevor Popp(DK) and Sverrir Hilmarsson(IS) to NEEM from SFJ by 109th.

Marianne Benn(DK) from NEEM to SFJ by 109th.

10th July: Peter Langen(DK), Fabian Gillet(UK) and Timothy Burton(UK) from NEEM to SFJ by 109th.

Marianne Benn(DK) from SFJ to CPH by SAS/Air Greenland

11th July: Theo Jenk(DK), Thomas Blunier(DK), Christian Morel(F), Chiara Uglietti(CH), Carina v.d.Veen(NL), Bo M. Vinther(DK), Olivier Alemany(F), Christian Panton(DK), H.C.Steen-Larsen(DK), Lars Berg Larsen(DK), Todd Sowers(US), Vasilii Petrenko(US), Henning Thing(DK), Ernesto Kettner(DK) and Vasilis Gnikis(DK) from SFJ to NEEM by 109th.

Claus Bang Jensen(DK), Ernesto Kettner(DK) and Vasilis Gnikis(DK) from NEEM to SFJ by 109th.

Peter Langen(DK) and Claus Bang Jensen(DK) from SFJ to CPH by SAS/Air Greenland.

12th July: Fabian Gillet(UK) and Timothy Burton(UK) from SFJ to CPH by SAS/Air Greenland.

**Movement of Cargo:**

7th July: 600 kg food and 600 kg science equipment from Schenectady to SFJ by 109th.

9th July: 9085 kg gas science equip., Viessmann panels, day tank from SFJ to NEEM by 109th

1140 kg pallets and garbage from NEEM to SFJ by 109th .

10th July: 9790 kg tank, tank sled, tower, Viessmann from SFJ to NEEM by 109th .

990 kg pallets and radar equipment from NEEM to SFJ by 109th.

11th July: 8932 kg plywood, viessmann, drill fluid from SFJ to NEEM by 109th.

625 kg pallets from NEEM to SFJ by 109th.

825 kg Kaesbohrer hydr. Oil, viessmann doors, new drill tube from CPH to SFJ by Air Greenland.

Due to cargo delays the shipment from CPH on Friday arrived after the departure of the last mission of this period.

**Camp Activities:**

The three flights this week were all successful. The planes had no trouble taking off on the hardskiway. Because of the high day temperatures (up to -3 C) all missions were carried out as early morning missions with departure from SFJ at 4:30 L. All construction material is now in camp, as well as drilling equipment and science equipment. Camp activities have been focused on making the main dome habitable and on Thursday the kitchen and dining area and communications were moved to the main dome. The dining area can now contain 32 persons. Friday and Saturday the main generator hut was constructed and just before Saturday night dinner, the main generator was started. The camp has now 110 kW power. Construction inside the main dome continues with installation of showers, wash basins, toilets and kitchen equipment. The laying of main cables began on Sunday. The GRIT traverse arrived Wednesday on their return leg from Summit camp towards Thule, and camp enjoyed their visit. The new air craft fuel pump was tested and we were able to transfer 11.356 liter of fuel from a traverse bladder to one of our fuel tanks in 15 minutes. Also, the fuel pump was tested successfully in a test refuel operation on an LC-130 airplane.

**Drilling:**

The four step reaming to 222 mm was completed on Thursday, and on Friday the new reamer 5 arrived. This was put to use immediately, but at 38.4 m the reamer was stuck. It was free again after a couple of hours after using glycol to free it. Reaming is soon complete, and this makes the drill available for the two planned shallow drillings for the firn gas sampling program.

**Science:**

The BAS radar team has returned to Europe after completing their program. The sites for the firn gas samplings programs have been selected 1500 m SW of the NEEM deep hole. Setting up at the sampling sites is in progress.

**Weather:**
Weather all week as been mostly fine, with winds at 2 – 9 m/s from SSE and S. Temperatures from -3 C to -16 C.

**Camp population:** 32

In Kangerlussuaq, weather has been mostly dry and warm up to 20 C. The three FOMs and arriving personnel have been busy building pallets for the flights this week. All scheduled ship cargo has been sent to camp. Mosquitoes are now less aggressive.

NEEM Field operations office,

Jørgen Peder Steffensen

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*NEEM - SITREP no. 13, Sunday July 20, 2008.*

This SITREP covers the period July 14 – July 20, 2008 (inclusive).

**Movement of personnel:**

18th July: Vasilios Gnikis (DK) and Ernesto Kettner(DK) from SFJ to CPH by SAS/Air Greenland.

18th July: Sverrir Hilmarsson(IS), Anders Svensson(DK) and Lars Berg Larsen(DK) from NEEM on traverse towards NGRIP.

**Movement of Cargo:**

**No movement of cargo.**

**Camp Activities:**

Construction work has been going on in camp the whole week. The main generator has been running fine and cables have been laid through most of the camp so that by this week end all structures are powered by the main generator. There have been some problems with the heat exchange system which should distribute heat from the main generator engine to the main dome and the main snow melter. Using a different type of heat exchange, it appears that camp can now operate the snow melter and the radiators in the main dome. On Wednesday garage 2 was completed, and thus all structures in camp are now erected. In the main dome walls and tables and shelves have been constructed and people moved back from an interim dining area on the first floor to the ground floor on Saturday as the kitchen is nearing completion. An insulated main duct for water, power and heating has been constructed between the main generator and the main dome. An elevator has installed in the science trench. Tables and band saws have been setup in the science trench to allow for processing of shallow cores. A Viessmann heated cabin has been erected in the drill trench for drillers work shop. On Saturday most of the surface work has to be stopped as camp was hit by a blizzard with 14 m/s winds.

On Friday at 10:30 the planned traverse to NGRIP departed. The traverse will pickup remaining assets at NGRIP and perform re-measurement of the strain net setup in 2007.

**Drilling:**

Drilling business had had a very busy week. The main bore hole has been reamed to the end diameter of 281 mm, and Saturday the casing operation was completed. Prior to and after the casing the hole was inspected with a bore hole camera and footage was recorded. Now the drillers are busy constructing floors and mounting the infrastructure for the deep drill. The shallow drill was moved to the firn gas pumping sites, and parallel drilling and pumping began on Wednesday.

**Science:**

Firn air samples are collected for the following institutions: University of Copenhagen (Centre for Ice and Climate), University of Bern (Climate and Environmental Physics), Pennsylvania State University, INSTAAR Boulder, NIPR Tokyo, University of East Anglia Norwich, LGGE Grenoble, LSCE Paris, CSIRO Aspendale, IMAU Utrecht.
Firn gas is extracted from two holes drilled 1.5 km, 220° from the maim NEEM camp. The distance between the holes is 65 meter. Two air extraction equipments are used for the two holes, while drilling is done alternatively with the Danish 3-inch shallow drill. Sunday evening the gas pumping depths of the two holes are: 34.7 m (S2 core, Mainly the European programs) and 57.5 m (S3, Mainly the U.S. programs). A total of xy samples have been collected to date from 8 depth levels and the surface.
CO2 of the samples is monitored at both sites. The present surface concentration of 380.5 ppm is relatively low due to peak photosynthesis in northern latitudes. Max. CO2 of 388.5 ppm is at 10 m depth then slowly decreasing with depth.
A 10-m temperature profile has been measured in a hand augered hole. The temperature at 9.8 m is -28.0 °C.
The firn cores from the gas programs have been logged, sampled for stable isotopes at 2.5 cm resolution and been measured by ECM. The melt layer from 1889 AD has been seen in the cores at 43 m depth. The processors have recorded two independent density profiles which are completely alike. The density profile at NEEM has thus been completed.

**Weather:**

Weather all week as been overcast with snow and windy, with winds at 6 – 10 m/s from S and SW. Temperatures from -6 C to -16 C. On Saturday camp was hit by a blizzard peaking at 14 m/s

**Camp population:** 29, on traverse 3

In Kangerlussuaq, weather has been dry and warm up to 20 C. The FOM is preparing cargo for the flight next week. Mosquitoes almost gone.

NEEM Field operations office,

Jørgen Peder Steffensen

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*NEEM - SITREP no. 14, Sunday July 27, 2008.*

This SITREP covers the period July 21 – July 27, 2008 (inclusive).

**Movement of personnel:**

21st July: Trine Dahl-Jensen(DK) and Thomas Stocker(CH) from CPH to SFJ by SAS/Air Greenland.

21st July: Sverrir Hilmarsson(IS), Lars Berg Larsen(DK) and Anders Svensson(DK) to NGRIP from NEEM by traverse.

23rd July: Trine Dahl-Jensen(DK), Thomas Stocker(CH), Jens Peter Rövekamp (CH-TV), Laurin Merz(CH-TV) and Ramon ORZA(CH-TV) from SFJ to NEEM by 109th LC-130.

23rd July: Dennis Vistisen(DK), Henrik Bundgaard(DK), Henning Thing(DK), Mark Curran(AUS) and Christian Morel(F) from NEEM to SFJ by 109th LC-130.

25th July: Dennis Vistisen(DK), Henrik Bundgaard(DK) and Christian Morel(F) from SFJ to CPH by SAS/Air Greenland.

**Movement of Cargo:**

20th July: 500 kg food and 1100 kg Kansas radar equipment from Schenectady to SFJ by 109th.

22nd July: 300 kg spare parts from CPH to SFJ by Air Greenland

23rd July: 10,687 kg timber, drill fluid, Viessmann panels, spare parts from SFJ to NEEM by 109th LC-130.

23rd July: 900 kg pallets, ice core samples from NEEM to SFJ by 109th LC-130.

**Camp Activities:**

Construction work has been going on in camp the whole week. A big move has been completed so that Garage 1 now serves as carpenters workshop and storage and Garage 2 is vehicle maintenance workshop. With the arrival of the final parts for the Viessmann cabins, the drillers workshop could be completed. The base for the deep drill has been installed and excavation of the 8 meter deep inclined trench has reached 5.5 meter. Both trenches are now receiving the finishing touches with cleaning out of excessive snow, and construction of the shelving system in the core storage is in progress. The main dome has running water with sinks, dishwasher, toilets and laundry machines working. Work in the main dome continues with the mounting of shelves and railings for stairs. On the dome exterior the rubber cover is being put into place as winds this week allowed for work on the outside.

Several vehicles received maintenance this week, including our Toyota which got a new set of Mattrax belts. The Toyota is now ready to receive the Kansas radar group next week.

The traverse arrived at NGRIP on Monday at 13:30. They found everything in good condition. They used the NGRIP main dome as shelter and managed to start the old generator. On Thursday the traverse had loaded up fuel, vehicles and other items and began the return trip to NEEM on Friday. Sunday evening the traverse was 50 km from NEEM, and they will arrive at NEEM Monday morning. Average cruising speed has been 12 km/h, both empty and laden.

**Drilling:**

In the drill trench construction work for the installation of the main drill is in progress. At the firn air sampling sites, the DK shallow drill has been doing parallel drilling. The U.S. gas sampling program is completed: Hole/core depth 75 m. The European team continued sampling on Sunday at 75.75 m. A third core is being drilled to supply two other research programs with air/ice (Röckmann and Wagenbach)

**Science:**

**The U.S. firn air program has been successfully completed, and the European program is close to completion.**

The shallow cores (S2, European hole) and (S3, U.S. hole) have been processed in the science trench. Both have been sampled at 2.5 cm resolution for stable isotopes. The ECM profiles have shown the 1783 AD Laki Eruption in both cores at 70.2 m and 70.6 m respectively. For comparison the Laki eruption was found in the NEEM main hole (S1) at 69.7 m and in the NEEM 2007 shallow core at 69.2 m.

The Seismic station set up in 2007 has been retrieved from the 3 m pit. It had recorded data from August 6, 2007 to October 5, 2007. Now the seismic station has been moved to a cage inside the science trench and restarted.

**Weather:**

Weather all week has been windy, with winds at 6 – 12 m/s from SE and SW. Temperatures from -4 C to -17 C. Some days with overcast and snow, other days with blue sky. Considering the wind speeds, the amounts of drifting snow have been limited. The plane on Wednesday landed in rather strong winds, but the wind direction was along the skiway which was an advantage.

**Camp population:** 29, on traverse 3

In Kangerlussuaq, weather has been mostly dry and warm up to 18 C. But this last week we've had two days of rainy weather, which is the first rain in 50 days.

NEEM Field operations office,

Jørgen Peder Steffensen

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*NEEM - SITREP no. 15, Sunday August 3, 2008.*

This SITREP covers the period July 28 – August 3, 2008 (inclusive).

**Movement of personnel:**

28th July: Timothy Burton (UK) from CPH to SFJ by SAS/Air Greenland.

28th July: Sverrir Hilmarsson(IS), Lars Berg Larsen(DK) and Anders Svensson(DK) to NEEM from NGRIP by traverse.

28th July: Dennis Sundermeyer(US), Carl Leuschen(US) and Keith Lehigh(US) from Schenectady to SFJ by 109th LC-130.

29th July: Elizabeth Elliott(AUS) from Ilulissat to SFJ by Air Greenland.

31st July: Connie Hedegaard(DK-DV), Kim Kielsen(GRL-DV), Håkan Ludvigsson(S-DV), Ian Parker(UK-DV), R.K.Pachauri(IND-DV), Thomas Sinkær(DK-DV), Klaus Bock(DK-DV), Nils O.Andersen(DK-DV), Jette Andersen(DK-DV), Katherine Richardson(US-DV), Stuart Bell(US-DV), Robert Hemenway(US-DV), Thomas Friedman(US-DV), Ann Friedman(US-DV), Bryan Walsh(US-DV) and Raj Chengappa(IND-DV) from SFJ to NEEM by 109th LC-130.

31st July: Trine Dahl-Jensen(DK), Jens Peter Rövekamp(CH-TV), Laurin Merz(CH-TV), Ramon Orza(CH-TV), Chiara Uglietti(I), Henry Rufli(CH), Jakob Schwander(CH), Olivier Alemany(F), Thomas Beck(CH) and Vas Petrenko(US) from NEEM to SFJ by 109th LC-130.

1st August: Timothy Burton(UK), Elizabeth Elliott(AUS), Dennis Sundermeyer(US), Carl Leuschen(US) and Keith Lehigh(US) from SFJ to NEEM by 109th LC-130.

1st August: Connie Hedegaard(DK-DV), Kim Kielsen(GRL-DV), Håkan Ludvigsson(S-DV), Ian Parker(UK-DV), R.K.Pachauri(IND-DV), Thomas Sinkær(DK-DV), Klaus Bock(DK-DV), Nils O.Andersen(DK-DV), Jette Andersen(DK-DV), Katherine Richardson(US-DV), Stuart Bell(US-DV), Robert Hemenway(US-DV), Thomas Friedman(US-DV), Ann Friedman(US-DV), Bryan Walsh(US-DV), Raj Chengappa(IND-DV), Anders Svensson(DK), Christian Panton(DK), Hans Peter Moret(CH), Lars Berg Larsen(DK), Simon Sheldon(DK), Theo Jenk(DK), Thomas Blunier(DK), Thomas Stocker(DK), Todd Sowers(US), Valerie Masson Delmotte(F), Steffen Bo Hansen(DK) and Sigfus Johnsen(IS) from NEEM to SFJ by 109th LC-130.

1st August: Jakob Schwander(CH), Chiara Uglietti(CH) and Thomas Beck(CH) from SFJ to CPH by Air Greenland.

2nd August: Anders Svensson(DK), Hans Peter Moret(CH), Lars Berg Larsen(DK), Simon Sheldon(DK), Theo Jenk(DK), Thomas Blunier(DK), Thomas Stocker(CH), Steffen Bo Hansen(DK) and Sigfus Johnsen(IS) from SFJ to CPH by Air Greenland.

2nd August: Vas Petrenko(US) and Todd Sowers(US) from SFJ to Schenectady by 109th LC-130

**Movement of Cargo:**

28th July: 600 kg food from Schenectady to SFJ by 109th LC-130.
28th July: Approx 15000 kg fuel, Caterpillar loader, snowmobiles, and various materials from NGRIP to NEEM by traverse.

31st July: 6920 kg drill fluid, gratings, food and spare parts from SFJ to NEEM by 109th LC-130.

31st July: 1200 kg ice core samples and gas equipment from NEEM to SFJ by 109th LC-130.

1st August: 8009 kg Kansas radar, fuel tank, lumber and drill fluid from SFJ to NEEM by 109th LC-130.

1st August: 3050 kg air sampling equipment and DK shallow drill from NEEM to SFJ by 109th LC-130.

2nd August: 600 kg U.S. firn gas equipment from SFJ to Schenectady by 109th LC-130

**Camp Activities:**

During the week work has continued on the outside of the main dome. The rubber cover has now been fastened to the outside. Now only finishing by gluing the rubber sections together is needed. In the drill trench, the excavation of the 8.3 m deep inclined trench has been completed and stairs have been carved out in the trench for access. Some work has also been put into straightening out the walls of the drill trench. The science trench has been cleared for excess snow and the core buffer is now ready to receive 240 core troughs. The Toyota on Mattrax has been made ready for the Kansas radar crew. On Monday at 14:00 the traverse came back to NEEM after a successful trip. They had performed remeasurement of the 2007 strain net and brought with them a lot of cargo from NGRIP, including the 8 ton Caterpillar loader and some fuel. A major event was the Distinguished Visitor trip on Thursday and Friday, which culminated with the 96% solar eclipse Friday morning at 7:30. The visit went well and both the Thursday and Friday planes were permitted by weather to fly on schedule. The planes also brought with them the final resupply for this season and brought out all samples and equipment from the firn air experiments. The satellite firn air drilling site has been closed and all equipment and structures have been brought back to camp.

**Drilling:**

Drilling at the firn air site has been completed. Three bore holes have done. The Danish shallow drill has been returned to Kangerlussuaq for overhaul in Copenhagen before it is sent to Antarctica this winter. In the drill trench, the winch has been mounted in place as well as the base of the deep drilling tower. A 10 m hand augered core will be drilled outside the drill trench to ensure continuity all the way to the top of the NEEM main core. Besides from this there will be no more drilling this year, but the team continues mounting deep drilling equipment and installations in the drill trench.

**Science:**

The processing of the firn air ice cores S2 and S3 has been completed. The age of both cores is around 350 years at the bottom. ECM has picked up volcanic markers from Katmai 1912, Krakatau 1887, Tambora 1815 and Laki 1783. The melt layer of 1889 is seen in both cores. Both cores have been sampled for isotopes at 2.5 cm resolution all the way to the top.

The Firn air project has been successfully completed by Wednesday. A total of approx. 400 air samples have been collected from over 20 depth levels in the S2 and S3 holes. An additional hole (S4) has been drilled to 60 m to collect 8 high volume samples.

The air lock-in zone at the NEEM site extends roughly from 62 to 80 m. The lowest samples have been obtained at 78 m depth with a CO2 concentration of 312 ppm.

The temperature profile has been extended to 80 m in the S2 hole. It confirms the warming trend from -29°C to -28°C between 80-m and 10-m depth.

The two sampling sites have been taken down. All firn air equipment and samples have been retrograded to Kangerlussuaq.

The CReSIS radar team arrived to camp this week and have set the radar up together with a GPS system and a computer system to pre-process data. Test runs have been made in the camp and the team is ready to mount all equipment in the Toyota for the planned measurements.

**Weather:**

Weather all week has been mostly overcast, with winds at 2 – 8 m/s from SW. Temperatures from -5 C to -12 C. 30 minutes before the culmination of the solar eclipse the sky cleared, and clouds reappeared 30 minutes after the eclipse. This gave spectators an experience of several beautiful phenomena due to the sudden 4 C temperature drop from the eclipse: Haloes, diamond dust and rare colours.

**Camp population:** 15

In Kangerlussuaq, weather has been dry and warm up to 22 C.

NEEM Field operations office,

Jørgen Peder Steffensen

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*NEEM - SITREP no. 16, Sunday August 10, 2008.*

This SITREP covers the period August 4 – August 10, 2008 (inclusive).

**Movement of personnel:**

4th August: Trine Dahl-Jensen(DK), Henry Rufli(CH), Olivier Alemany(F) and Christian Panton(DK) from SFJ to CPH by SAS.

4th August: Valerie Masson Delmotte(F) from SFJ to Ilulissat by Air Greenland

**Movement of Cargo:**

No movement of cargo

**Camp Activities:**

The work scheduled for the main dome this year was completed on Wednesday as the panels around the dome base were mounted. The last rubber was fixed and glued and the top windows in the "pentagon" tower were mounted Tuesday. In the science trench floors have been leveled and the core buffer storage has been completed with shelves and troughs. Lamps and lighting in science trench and drill trench has been mounted. The floor in Garage 1 has been renewed and shelves have been built and adjusted. Camp crew has found the windows for the Viessmann units and they have now been mounted. Outside the main dome, the crew has completed a connection box for heating, water and power, so that the main generator can be hooked up to the main dome in short time next year. Camp crew found that the glycol mixture used in the heating system of the main dome was wrong. The mixture has been exchanged. In the vehicle workshop there have been maintenance and repairs on the CAT, Toyota and snow blowers. There has been routine maintenance on the main generator. Camp is beginning to pack down. Three weatherports have been taken down and snow hills for overwintering cargo have been built. Cargo lying on the surface has been taken down into the trenches or into garages, giving the camp a much more tidy look.

**Drilling:**

The inclined trench has been completed with stairs and slush pan. The tower has been mounted and the tilting mechanism tested. The tower is now aligned to the inclined trench and the roof. Next year we will mount a "submarine" window over the top of the tower. Floors and gratings

have been put in and ventilation installed. By Sunday the extraction table was completed. Work is now in progress to install the drill fluid and chips treatment stations.

**Science:**

A 10 m core has been drilled outside the drill trench. It has been sampled for stable isotopes and ECM has been performed on the bottom sections. This core will be the top section of the NEEM deep core. After this processing, the ECM bench has been packed down as processing of cores this year is concluded. Last ice has been packed.

Several visits have been made to the PARCA Automatic Weather Station some 7 km N of NEEM camp. In preparation of a move of this station to a location closer to camp, several years of data have successfully been downloaded.

The CReSIS radar team has made several tracks of successful measurements. A noise problem from the computer has been fixed and measurements have been going well until Sunday morning when one of the main bearings of a Mattrax broke down. The Toyota has been pulled to camp for repairs and in the mean time the radar equipment has been mounted into a Flexmobil tracked vehicle.

**Weather:**

Weather all week has been mostly clear, with winds at 2 – 8 m/s mainly from SSW. Temperatures from -3 C to -19 C.

**Camp population:** 15

In Kangerlussuaq, weather has been dry and warm up to 20 C.

NEEM Field operations office,

Jørgen Peder Steffensen

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**NEEM - SITREP no. 17, Sunday August 17, 2008.**

This SITREP covers the period August 11 – August 17, 2008 (inclusive).

**Movement of personnel:**

No movement of personnel.

**Movement of Cargo:**

11th August: 115 kg To Tokyo, 396 kg to Norwich, 1375 kg to CPH, 581 kg to Bern, 37 kg to Saclay, all by Air Greenland via CPH.

**Camp Activities:**

Crew has continued work on setting up tables in the drill trench and working on the processing line in the science trench. All Viessmann cabins have been completed, and a staircase from the science trench over the Viesmann warm labs. to the surface has been constructed. Work has continued on the fluid mixing station and ventilation in the drill trench. In the drill trench, the pull out table has been completed, flooring has been laid and slush pans mounted.

On Wednesday crew began packing down for the end of the season. Cargo has been split and some cargo has been put on heavy cargo sledges which have been pulled to the snow hills on the cargo line, some cargo has been brought into the trenches for over wintering, and some has been stored in garages.

The snow surface around the trenches has been leveled in order to limit snow drifts over winter. The ramp leading into the drill trench has been closed.

On Sunday the water system of the main dome was disconnected in preparation of the disconnection of the main generator. The main generator hut will be hauled to a snow hill on the cargo line on Monday.

The PARCA Automatic Weather Station has been moved from 7 km NE of NEEM camp to a location 600 m SW of camp. Data has been downloaded successfully and a new battery pack has been installed.

Final pull-out from camp is scheduled for Tuesday Noon.

**Drilling:**

Although all drilling activities have ended for this year, the crew is still experimenting with the electronic winch control in order to trap a fault.

**Science:**

The water vapour sampling experiment and snow collecting experiment for stable isotope analysis has been completed and the equipment collected.

**Weather:**

Beginning of the week cloudy with snow and sometimes windy. Winds at 2 – 8 m/s mainly from SSW. Temperatures from -3 C to -19 C. On Friday the arrival of a new colder air mass heralds the approaching autumn. The week ended with winds from NE to SE at 3-7 m/s, some clear patches and temperatures between -17 C to -26 C. The Sun is now at the horizon at Midnight, and ice fog is

lingering until Noon.

**Camp population:** 15

In Kangerlussuaq, weather has been mostly overcast and rainy with temperatures around 10 C.

NEEM Field operations office,

Jørgen Peder Steffensen

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## *NEEM - SITREP no. 18, Sunday August 24, 2008.*

This SITREP covers the period August 18 – August 22, 2008 (inclusive).

**Movement of personnel:**

19th August: Carl Leuschen (US), Dennis Sundermeyer(US), Keith Lehigh(US), Timothy Burton(UK), Elisabeth Elliott(AUS), Louise Ravnebjerg(DK), Dorthe Dahl-Jensen(DK), Michael Strand(DK), JiWoong Chung(COR), Sverrir Hilmarsson(IS), Thomas R.Pedersen(DK), Trevor Popp(DK), Karina v.d.Veen (NL), Bo Vinther(DK) and Hans Chr. Steen Larsen(DK) from NEEM to SFJ by 109th LC-130.

21st August: Carl Leuschen (US), Dennis Sundermeyer(US) and Keith Lehigh(US) from SFJ to Schenectady by 109th LC-130.

22nd August Timothy Burton(UK), Elisabeth Elliott(AUS), Louise Ravnebjerg(DK), Dorthe Dahl-Jensen(DK), Michael Strand(DK), JiWoong Chung(COR), Sverrir Hilmarsson(IS), Thomas R.Pedersen(DK), Trevor Popp(DK), Karina v.d.Veen (NL), Bo Vinther(DK), Hans Chr. Steen Larsen(DK) and J.P.Steffensen(DK) from SFJ to CPH by Air Greenland/SAS.

**Movement of Cargo:**

19th August: 9600 kg Diesel Fuel Arctic from SFJ to NEEM by 109th LC-130

19th August: 1230 kg radar equipment, 2000 kg ice core samples and drilling equipment from NEEM to SFJ by 109th LC-130.

21st August: 1230 kg radar equipment from SFJ to Schenectady by 109th LC-130

22nd August: 2300 kg ice core samples and drilling equipment from SFJ to CPH by Air Greenland.

**Camp Activities:**

During Monday the final packing down of camp was done. The entrances to the trenches were sealed. The vehicles were parked in the garages, and heavy sledges with cargo and generator hut were placed on snow hills. The fuel tanks were also placed on snow hills. Final pull out from camp occurred Tuesday at noon. Unloading and loading of the aircraft went fine, and after a ground time of 75 minutes, the plane took off in first attempt.

**Drilling:**

At the drill site, the tower, winch, floor and drilling cabin is ready for mounting of the drill. The winch motor and the electronic winch control have been sent back to Europe for fault finding.

**Science:**

No scientific work has been done this week.

**Weather:**

Summer is ending: It has been mixed cloudiness, some ice fog in the nights with temperatures -22 to -8 C. Winds have been at 3-5 m/s from S to SE.

**Camp population:** 0

In Kangerlussuaq, weather has been mostly overcast with temperatures around 10 C. On Thursday the remaining NEEM crew hosted a dinner at the Row Club for CPS and the 109$^{th}$ personnel. Friday morning, the FOM office in Kangerlussuaq was closed for the season.

NEEM Field operations office,

Jørgen Peder Steffensen

# NEEM DIARY.

2008-04-24

## Field office in Kangerlussuaq opened


The NEEM field office in Kangerlussuaq was opened by Lars Berg Larsen, Sebastian Bjerregaard Simonsen and Sune Olander Rasmussen. This trio will over the next two weeks act as FOMs (Field Operation Manger) and prepare for the put-in at the NEEM site, which will take place around May 6.
The next cargo will not arrive at Kangerlussuaq until Sunday so the FOMs will in the next couple of days work on practical things both at the office and in the warehouse. Especially the warehouse needs some attention to be fully efficient for the coming season.

What we did today:

- arrived in the morning (without Sune's luggage)
- said hello to a lot of people
- started vehicles (except Toyota: flat tire and battery)
- tested new VW crew cab pickup truck - seems OK
- tried to get number plates on flatbed truck. We will have to get the truck checked in the workshop tomorrow
- cleaned and arranged furniture in FOM office
- ordered airport airside entry cards
- started installing communication equipment: internet connection fully functional, phone line operational for outgoing calls.

2008-04-26

## Fleet management

Since the field office opening, the field operation managers (FOMs) have been busy in the warehouse. The first important task is to get the vehicles up and running. The operational fleet now consists of two pick-up trucks, two forklifts, one flatbed truck, and a skidoo. Our Toyota Landcruiser is experiencing some problems (narrowed down to a punctured tire and a dead battery). The last vehicle in the warehouse is the big new and shiny Pistenbully tracked vehicle, which will be going to the ice camp in a few weeks. Before that, the FOMs will assemble the crane to put onto the Pistenbully. It is only a matter of a few bolts to assemble the crane, but these are thought to be in a box on the driver's seat inside the vehicle. But we are not able to get into the vehicle because the keys are in the cargo boxes that have been delayed on their way to Greenland.

What we did today and yesterday:

- worked on vehicle maintenance
- got number plates on flatbed truck.
- moved stuff from warehouse (also known as "442") into FOM office
- started working on Pistenbully pallet
- worked on web page
- drained area in front of 442

2008-04-28

## A big bird in town

Our cargo from Copenhagen has arrived, and a US Air Force 105th Air National Guard C5 cargo airplane visited Kangerlussuaq Monday.

On Sunday, we received cargo from Copenhagen and started sorting out equipment for the camp, the storage, and the field office. The office is now fully functional. Monday morning we located some of our ship cargo from last summer and brought it down to our warehouse. In the afternoon we went to the airport to see the big C5 cargo airplane from the US Air Force 105$^{th}$ Air National Guard. The airplane was planed to have carried the main dome for the NEEM site to Kangerlussuaq, but the airplane was loaded with equipment for a US traverse that will drive on the ice sheet from Thule Air Base to the Summit camp. The dome will arrive with another plane slightly later. The C5 stopped in Kangerlussuaq for refueling and to take on some additionally cargo before going to Thule Tuesday morning. The size and cargo capacity was mind-blowing, especially compared to the Hercules planes we normally use for transport to the ice.

2008-05-01

## From harbour to airport

The main tasks of Tuesday - Thursday have been to assemble a new skidoo (which will be the only one in camp to start with as the others have to be dug out first), move cargo, and work on the formal issues of environmental approval, tax, and import procedures. We have also completed the maintenance of the vehicles. The Toyota is now operational and the VW pickup has been eqipped for use on the airport apron.

Despite a rainy morning, two of the Field Office Managers started Wednesday morning with a run to nearby Lake Ferguson (well, not THAT nearby) to the big surprise of the local residents. Wednesday afternoon and Thursday morning was spent moving approximately 35 tonnes of construction wood from the harbour to the airport apron so it is ready to be packed on pallets for the flight to NEEM. At the NEEM site, the wood will be used to construct the drill trench roof and other facilities under the snow surface. Because the harbour is 13 km away from town, the operation involved spending quite some time on the bumpy harbour road, supposedly a part of Greenland's longest road.

Also, an effort from both the FOMs and the NEEM Webmaster has been invested in making the new NEEM web page ready for launch before the put-in next week.

2008-05-02

## Yet another day at the office

After another day working with cargo, skidoo assembly, and office work, the FOMs decided to take advantage of the perfect weather and spend the evening on a visit to the ice margin.

A low sun angle, little wind, and mostly clear sky are optimal conditions for a trip to the ice margin. At 7:30pm, we packed up some food in the Ford truck and began the 40 km ride. The road is decaying fast, but it was a beautiful trip with great views the way. The melting season has just begun, and the caribous are clearly seen in the landscape with their white fur. We stopped at the view point from where there is a 250 degree view over the ice. It was clear that a large ice-dammed lake had drained since last time the FOMs visited – compare the top picture with this one from 2003:

The lake drained in summer 2007, releasing an estimated 38 million qubic meters of water, lowering the lake level by 50 meters. The enormous amounts of water flooded large areas in the valley of Kangerlussuaq, but only caused minor damage. Drainage of ice-dammed lakes occurs once in a while and are known as Jökulhlaups, or "glacial bursts" in Icelandic.

2008-05-06

## Out and back

The weekend was spent finalizing cargo for the first missions and preparing the required manifests etc. for the flight missions. Three Hercules airplanes from the 109th airlift wing of the New York Air National Guard arrived Sunday afternoon, and the coming week's missions were planned at the mission commander meeting.

On Monday, the remaining four members of the put-in team arrived from Copenhagen. The weather forecast was marginal, but an attempt was made to fly to the NEEM site. Today at 08:30L, a Hercules airplane with 4–5 tons of passengers and equipment left Kangerlussuaq for the NEEM site. The camp and skiway flags were partially visible through the clouds, but the weather did not allow a landing attempt to be made, and the plane returned to Kangerlussuaq.

The weather forecast is better for Wednesday where a second attempt will be made.


The rest of the day was spent mounting the radio antenna on the roof of the field office building and making the Pistenbully tracked vehicle ready for shipment. It is a bit too tall for the Hercules planes, but the problem can be solved by dismantling it slightly.

2008-05-07

## Arrival at NEEM

*Sverrir at the front of our kitchen tent. Luckily everything was intact inside.*
*Photo: Jim Hedfors, NEEM team.*

After the attempt to fly into NEEM on Tuesday, the flight to NEEM today was successful. We departed Kangerlussuaq 8:25 on board Skier 94. Whether it was coincidence or planned by the 109th, we do not know, but four of the flight crew of six were the same individuals who flew us to NGRIP in 2007 where we got stuck together for three days in a blizzard. This crew has courage.

We landed at NEEM at 11:22. As the plane taxied into camp, all cargo was drifted out the rear. Then the put-in crew of five: Thomas, Gaël, Jim, Sverrir and J.P. left the plane. We went towards camp while the flight crew armed the starting rockets (ATO) on the plane. The snow was hard and crunchy, and we didn't sink in as we walked. At 11:52 the plane took off into the wind towards ENE using rocket start. Later inspection showed that the plane took off after leaving a 1.6 km long ski track. The ski tracks were 10 - 20 cm deep, which is a clear sign of a hard snow surface.

After the plane departed, we began to take in the surroundings. We were greeted by the chirpings of a little bird that flew around camp. What later became of the bird, we don't know. It was hard to recognize the camp we had left last year. Only the top of the four heavy sledges and the vehicles, we left on the surface last year, was visible. The hill on which we built the kitchen weatherport last year was gone, and the northern side of the kitchen was covered by heavy snow drifts. All pallets of cargo left last year were completely buried. Lars in Kangerlussuaq had provided us with personalized showels and they now became our primary tools.

We started digging. After 15 minutes we got access to the kitchen. Everything was as we left it last year. The kitchen weatherport was undamaged. We started our diesel generator at 13:30 to power the kitchen for melting snow and for heat. Digging went on all day until midnight. We had one of the tracked vehicles and the snowblower up and running by 17:00. Then the big sled carrying the two red fibreglass domed huts (tomatoes) was pulled out and parked next to the kitchen. We set up a dome tent so that everybody got a place to sleep. In the evening we opened the snow cave where three snowmobiles were parked last year. All snowmobiles were in good condition. The roof of the snowmobile cave was under 35 cm snow, which is a good indication of the snow accumulation since August last year. We had to postpone getting the other tracked vehicle up, as our hot air blower (Herman Nelson) started to play tricks on us.

We worked hard all the time with only short breaks for something to drink and microwave-heated slices of pizza from Kangerlussuaq, or just to get out of the wind. Temperature in the kitchen at 19:00: -16°C

Everybody went to bed at midnight feeling very tired and cold.

Weather all day: Blue sky, -27°C, winds at 5 - 7 m/s from ENE.

Field Leader, J.P. Steffensen

2008-05-08

## We dig and receive the second plane at NEEM this year

Most people slept in, except the weatherman who had to report weather to Kangerlussuaq from 6:00.

The second plane to NEEM departed Kangerlussuaq at 8:34, and it arrived in camp 11:25. Since there were no passengers, the cargo was drifted close to camp, and the plane departed for Thule AB at 12:00, using 1/2 skiway and ATO rockets.

Weather was ideal for flight operations but a bit snippy for outside work:
Blue sky, -30°C, 7.5 m/s wind from 170 Magnetic (which is straight down the skiway) and good visibility.

*The empty plane just before departure at NEEM. Photo: Jim Hedfors, NEEM team.*

Everybody was feeling the effect of yesterday's hard work; but physical labour proved to be the best way to stay warm and to make the body adapt to the cold environment. Nobody has had any altitude effects. We discussed this, and most likely the altitude difference of 450 m between NGRIP (2930m) and NEEM (2480 M) makes a big difference.

Inside the kitchen tent we had problems with the cold. Due to the added humidity from human activity, the melting of snow for drinking and soup, and coffee making, frost condensed everywhere. We therefore did not attempt to switch on electronic equipment except for the hand held Iridium phone and the HF radio. At 19:00 the condensation problems were going away, and we could spend the evening meal (pizza and bread) at +6°C at table top level.

In the evening the crew went through the list of tasks which had to be completed before the arrival of the next plane on Tuesday. The list is long, but it is possible to complete the tasks.

What we have done today:

1. Using survey equipment, we marked up positions of all future NEEM camp structures.
2. We began re-flagging the skiway to meet the 109th standards for skiway marking.
3. The other tracked vehicle was started and pulled to surface.
4. The second diesel generator was started, and we now have 10 kW power in camp.

Field Leader, J.P. Steffensen

2008-05-09

## A fine day spent doing planned tasks.

*The NEEM camp on the third day. From left to right: The "tomatoes", the parked vehicles, a dome tent for three persons and the excavated kitchen tent. Photo: Jim Hedfors, NEEM team.*

Today was warmer than the past two days, and as there was less wind, work outside was quite comfortable.

The shovel was again the main tool. It takes a lot of shovelling to excavate a heavy sled with cargo. The bottom the sled is 2.5 m down in the snow drift, and for safety reasons you can not remove snow too close to the sled with motorized equipment. To complicate matters even further, it

required digging away snow from underneath the sleds to free the skids which were frozen to the base.

An important factor of camp life is to keep your feet warm, and that means wearing dry foot wear. Dry foot wear in turn requires careful planning as drying takes time in the cold.

What we have done today:

1. Repaired the snow blower
2. Repaired the hydraulics on the blade of a tracked vehicle.
3. Excavating the skiway groomer.
4. First structure of the NEEM camp erected: A 10' x 10' weatherport.
5. Grooming the skiway.
6. Excavated and hauled the remaining three big sleds up on the surface. We now have access to all cargo stored on the sleds.
7. Continued re-flagging the skiway.

Ad. 3: While excavating the groomer, a small snow blower course was held with particular emphasis on work safety procedures in snow blowing.

Ad. 4: We excavated the weatherport pallet from last year and pulled it to the construction site.

Weather all day: Blue sky, -21°C, 3 m/s winds from 230 M.

The evening was really nice as the wind almost died out. We worked to 22:00, and everybody feels fine. Crew is now tired of pizza for dinner.

Field Leader, J.P. Steffensen

2008-05-10

## A camp is taking shape

*A view from the West of the old camp (right) and the two new weatherports in the new camp area (left). Photo: Thomas Overly, NEEM team.*

Everybody now feels much more acclimatized. People are sleeping well and the cold does not bite as much anymore. The process of making the camp ready to receive 5 flights next week is in good progress. Visible signs are everywhere: Cargo in nice organized piles on the surface, new weatherports, snowmobiles, heavy vehicles and equipment easily accessible, the skiway is now a very visible structure and in the background generators are humming smoothly.

Hard manual labour is still the way forward. Lots of things have to be lifted and moved. The crew of five has found a good working routine and the collaboration between the five different nationalities is working well.

What we have done today:

1. Completing skiway marking.
2. Main drive belts on both tracked vehicles maintained.
3. 12' x 20' Weatherport erected.
4. Cargo-line under construction.
5. Zig-zag grooming on skiway.
6. Fuel sled almost empty

Ad. 1: The skiway now has triple black markings along each side with 400 feet spacing. One set of triple red flags marks the centre of the skiway. Five red flags on each side mark the thresholds. Skiway is 10,000 feet long and 200 feet wide. Approach markers extend 12,000 feet from each threshold. Both taxiways and apron are marked with double black markers. Taxiway entrances marked with single red and black corner flags.

Ad. 2: 20 broken bolts on yellow shovel Flexmobil and 10 broken bolts on black shovel Flexmobil.

Ad. 3: Second structure of NEEM camp now up.

Ad. 4: In order to make the off-loading sled with rollers, we have to empty the fuel sled from last year. As we also have to organize arriving cargo and the cargo from last year, we are now laying out the cargo in a temporary cargo line.

Weather in the morning: High thin clouds, -27°C, 5 m/s winds from 180 M. In the evening: High thin clouds, -19°C, 4 m/s from 230 M.

Saturday night dinner at 21:00 was prepared by Gaël: Steaks with pasta, mushrooms and tomatoes, accompanied by some bottles of red wine. The evening was passed with conversation and a much needed relaxation.

Field Leader, J.P. Steffensen

2008-05-11

## A nice day for cleaning up

*Rollers are mounted on top of a heavy sledge. The sledge will be used for receiving large pallets of cargo on next week's flights. Photo: Thomas Overly, NEEM team.*

On this Whit Sunday we started a bit later than normal, but as weather was so beautiful we accomplished a lot.

Gaël and Thomas spent all day working with shovels and the snow blower. Jim spent another day grooming the skiway, Sverrir maintained and repaired equipment and J.P. spent a day in the office (kitchen) writing reports and setting up a satellite link with telephone and e-mail. Things are beginning to take shape. The skiway is almost ready to receive flights. With all vehicles and heavy sledges ready, we can now focus on excavating the pallets with cargo from last year and the recently arrived pallets and pull them away from the aeroplane area and into camp in a cargo line. When this is complete, the camp will not only look, but also be much more tidy and less chaotic.

The weather has been very collaborative. With little wind and eternal sunshine, people enjoyed working outside.

Once again Gaël treated the crew with his cooking. A very nice one-pot-meal with a beer concluded a good day.

What we have done today:

1. Removed the snowmobile snow cave.
2. Dug out all pallets from last year.
3. Maintenance and oil change on Hatz generators.
4. Repairing the fuel pump.
5. Zig-zag grooming on skiway finished.
6. Grooming of taxiways and apron almost done.
7. Writing reports and setting up satellite link.

Ad.4. The top bearing of the pump rod is bad. We need a replacement.

Weather at 19:00L: -21.3°C, blue sky, 1.5 m/s from 230 M, unlimited visibility.

Field Leader, J.P. Steffensen

2008-05-12

## Preparing for the plane to arrive

*The Flexmobil tracked vehicle drags a planing device, the groomer, behind it. Photo: Thomas Overly, NEEM team.*

We now have a cleaned-up camp.

All the buried pallets with cargo were pulled over to the cargo line, where the pallets were emptied and subsequently stacked in a pile. Nets and straps were collected so that pallets, nets and straps can be returned to Kangerlussuaq for re-use. The deep holes in the snow, left behind by the pallets were then filled in and the flags marking the sites removed. At the end of the day, the camp looked tidier than ever.

The flight operation areas for the Hercules planes: skyway (landing strip), taxi ways, and apron were groomed.

Sverrir opened his own driving school. He had to practice reversing with one of the heavy sledges to be sure he will be able to reverse up behind a parked aircraft to receive cargo which is rolled out the rear of the plane. As target he used two bamboo flag poles.

The weather has been collaborative again. Some wind but sunshine throughout the day, people enjoyed working outside.

Gaël treated the crew with a vegetarian pasta meal. After dinner we exchanged stories and listened to some of Jim’s music.

What we have done today:

1. Cleaning up the whole camp. All pallets now collected.
2. Grooming skiway, taxiway and apron is finished.
3. Practising manoeuvres with a heavy cargo sled.

Weather at 11:00L: -21.9°C, blue sky, 3.5 m/s from 190 M, unlimited visibility.

Field Leader, J.P. Steffensen

2008-05-13

## Another plane arrives: a nail-biting experience

*Cargo has just been rolled onto the new off-load sled and is being dragged away while the plane prepares for departure. Photo: Thomas Overly, NEEM team.*

Today was the day when we received the first aeroplane in a sequence of five that brings in construction material, tools and machines. Not everything went according to plan.

It has been one of those days we don't want too many of. For the Project it is very important that we get our skiway ready and certified by the Air National Guard. We therefore were very anxious of the flight today. For once, Nature was not with us. The wind was 45 degrees off the skiway and we saw that our grooming had not been deep enough. A wavy pattern showed up which made the plane jump up and down so much, it had difficulties taking off. It took 7 attempts and rocket start the get the plane in the air. On a more positive note, our newly refitted heavy cargo sled with rollers really worked well, or rather Sverrir made it work well. Two pallets were rolled out the rear of the aircraft, directly onto the sled. This was an important step, as we expect items this week that are so long they can only be rolled onto a sled. The flight crew told us that our new flags were too high, so Thomas and Gaël spent all afternoon cutting down the height of several hundred flags.

Right now Jim is grooming again. We have attached a drum of fuel to our groomer to provide some extra weight so that it may cut deeper into the snow.

Although the weather was not dramatic, the wind direction created enough drama in itself.

Gaël treated the crew with a good meal again. Apparently, he enjoys cooking because the preparation is accompanied by whistling and singing.

What we have done today:

1. Received Skier 73.
2. Grooming skiway with extra weight.
3. Lowering all skiway flags by 1 m.
4. Mounting of rollers and successful test of new off load sled.

Weather at 10:00L: -18.0°C, blue sky, 6 m/s from 230 M, unlimited visibility.

Field Leader, J.P. Steffensen

2008-05-14

## 2nd plane arrives

We received the second shipment of construction material today. The plane arrived just after noon and it delivered our new Pistenbully tractor.

Although it was rather warm, -13°C, and winds across the skiway, the operation went well, and the plane left after one hour on the ground. Still we have problems with a bumpy skyway, and therefore the 109th cannot certify the skiway for heavy loads. We therefore have a problem with too much cargo in Kangerlussuaq that needs to go up. We will have to use six flights instead of five to get most of the material into camp.

*Illusions of perspective sometimes illustrate wishful thinking. Photo: Jim Hedfors, NEEM team.*

One of our tracked vehicles developed an oil leak. The leak was found, but it is going to be a complicated repair. We'll wait until the garage has been erected.

The weather was nice all day, and we got a lot of work done.

What we have done today:

1. Received Skier 73.
2. Moved our outhouse.
3. Unpacked arriving cargo.
4. Grooming the skiway.
5. Building another weatherport and installing bunk beds in three weatherports.
6. Finding the oil leak in one of the tracked vehicles.

Weather: It was warm today, -13°C, and almost no wind. It was a pleasure to work outside.

J.P. prepared dinner consisting of spaghetti and sausages.

Field Leader, J.P. Steffensen

2008-05-15

## 3rd and 4th plane arrive

We have fought bravely against nature, but we have not been able to remove the bumps on the skiway. This means that the planes cannot land with as much cargo as planned. Those are the conditions, and we have to adjust.

The two planes today arrived with a 1 hour interval. There was hectic activity in camp at this time. On the last plane, three new crew members arrived: Sarah, Claus and Hans Christian. Now we are 8 in camp, and this requires a little more discipline in terms of cleaning up. Gone are the days with five guys living in a den.

*Rockets (so-called ATOs or JATOs) are fired to give an extra push to the air craft to get it airborne. Photo: Jim Hedfors, NEEM team.*

We suffered a strike of bad luck as we were about to mount a 3 ton crane onto the new Pistenbully. With great care we placed the crane behind the Pistenbully and connected the hydraulic hoses to the vehicle. Then we could raise the crane on it's legs and slip the Pistenbully under it. As we pulled the Pistenbully under the crane, we needed to move the hoses from the crane. For reasons unknown to us, the crane suddenly began to move all by itself. Nobody were at the controls of the crane. The result was that the crane arm bent down and smashed the hydraulic control system. Now we have a useless crane until we can repair the damage. Tomorrow we will try to assess the damage. Luckily nobody was hurt.

What we have done today:

1. Received two flights.
2. Welcomed three new crew members.
3. Built weatherport no. 4. This weatherport will be our heated food store.
4. Moved 16 kW generator to kitchen area, and moved a 5 kW generator to the newly erected weatherports.
5. Unpacked arriving cargo and stored non-freeze food in the food store weatherport.
6. Tried to mount crane on Pistenbully.
7. Cleaned up in the kitchen.

Weather: It was ideal for flying: Cold and a good wind. -26°C to -20°C and a 4 m/s wind from SE. Sunshine all day, and in the evening fog.

Sarah, our cook, prepared a nice dinner for us.

Field Leader, J.P. Steffensen

2008-05-16

## The 5th plane arrives

*A New York Air National Guard Hercules LC-130H arrives on the apron at NEEM camp. Photo: Jim Hedfors, NEEM team.*

We were preparing for another day with two flights, but one plane didn't take off due to engine problems. We received fuel and timber on the plane that made it, and the flight conditions were so good, that the plane took off using only half of the skiway and no rockets were needed. We now have enough fuel until the next flight period in 2 weeks. The plane also took empty pallets, straps and chains back to Kangerlussuaq. After the plane departed, we proceeded with mounting the drive belts on the Pistenbully tracked vehicle. This a tough job involving moving 800 kg of rubber and steel and aligning the belts so that the Pistenbully can be rolled onto the them.

What we have done today:

1. Received one flight.
2. Erected last weatherport. We now have 6 weatherports up.
3. Cleaned out and reorganized kitchen.
4. Mounted one belt on the Pistenbully.
5. Writing damage report to Kässbohrer about the crane incident.
6. Installed stationary VHF radio.

Weather: It was ideal for flying and for work outside: Cold and amost no wind. -26°C to -19°C and 2 m/s wind from SE. Sunshine all day, and in the evening fog.

Sarah, our cook, prepared steaks and baked potatoes for us.

Ad.1: The flight captain, Pete Thalheimer, told us that the skiway had improved dramatically in the last two days. He now has good hopes that the skiway will be upgraded for greater payload during the next flight period.

Field Leader, J.P. Steffensen

2008-05-17

## The 6th and final plane arrives

*The Flexmobil pulls arriving cargo from the apron to the camp area. Photo: Jim Hedfors, NEEM team*

Today we received the last plane in this flight period and the last person to join the crew: Sebastian. The snow has not behaved as we wanted, so our skiway was not upgraded this period. However, the weather has been good to us, with lots of sunshine and moderate winds. Ahead of us, we now have 12 days where we can concentrate on construction work. Our Pistenbully is now ready to do some hard work. We have made alternative plans for the damaged crane. We will get the job done.

It is Saturday evening, and camp personnel is preparing a relaxing time in the kitchen tent.

What we have done today:

1. Received one flight.
2. Mounted 2nd belt and blade on Pistenbully. We now have an operational vehicle in camp.
3. Sorting out food and other cargo.
4. Marking the positions of the hills for a red dome tent and a garage.
5. Moving construction material to sites.
6. Celebrating Saturday night.

Weather: Cold, clear and almost no wind. -31°C to -21°C and 2 m/s wind from E. Sunshine all day.

Ad.2: Mounting of the second belt went much faster than the first.

Field Leader, J.P. Steffensen

2008-05-18

## Construction work begins

We now begin to erect tents that are planned to stay up through the winter. The tents are set up on 2 m high snow hills. This way, the tents stay free from snow drifts, and next year when we open camp again, these tents will be readily accessible.

*Claus, J.P., Hans Christian and Thomas are preparing foundations for Red Dome tent no.2.*

The making of snow hills with the Pistenbully is an impressive sight. Sverrir is at the wheel.

After the slow start of vehicles, at -36 C it takes up 30 minutes before the vehicles are warm enough to move, the pushing of snow into small hills went really well. The Pistenbully is a huge improvement in our ability to move snow. After a hill is made, timbers are laid out on the hill and adjusted so they are completely level. Then snow from a snow blower is blown on top of the hill, and this snow is then scraped level to the top of the timbers. Over night, this snow will sinter and harden, so the process is quite similar to casting concrete on pavements. Tomorrow, we will cover the hill top with plywood, which
will be the floor of the tent.

Several weather services have forecasted severe winds in this area, so we have taken precautions by securing all loose items and by marking all cargo on the snow with bamboo poles. So far, however, the severe winds have stayed away and the weather stays fine, albeit cold.

Claus and Hans Christian make sure the floor of the tent will be level.

What we have done today:

1. Built a 2 m hill for Red Dome 2.
2. Built a 2 m hill for Garage 1.
3. Laying out floor foundation for Red Dome 2.
4. Assembling arches for the garage.

Weather: Cold, clear and almost no wind. -36 to -23 C and 2-4 m/s wind from N and NE. Sunshine all day.

FL, J.P. Steffensen

2008-05-19

## Is the storm coming?

*Claus yesterday before the wind came, and today. The effects of the wind is obvious.*

As we woke this morning, it was somewhat windier than we are used to. During the morning, winds increased from 14 knots to 18 knots, and as temperatures were about -27 C, the windchill became lower than -50. It was difficult to keep hands, feet and faces warm, and in the afternoon it was decided, to wait out the wind, instead of doing risky work outside. Only Sverrir, sitting in a heated cabin driving the new Pistenbully, was working. He finished the hill for a garage and began making the hill for another red domed tent.

The wind persisted all day and in the evening the surface snow became agitated. Snow became airborne and began to move. Visibility was reduced to 1 mile.

What we have done today:

1. Finished a 2 m hill for Garage 1.
2. Hill for Red Dome 1 half dome.
3. Waiting for the weather to improve.

Weather: A blusterous day: -31 to -27 C and 12-16 knots wind from N and NE. Sunshine all day.

FL, J.P. Steffensen

2008-05-20

## Blizzard trouble

*Afternoon constructions. The frame for a dome tent is assembled.*

During the night, we could fell the wind picking up. It was windy and gusty. As we woke up at 7.30, snow was everywhere. Our main generator has ceased to work, and our backup generator refused to start. The kitchen tent was without power. After tree hours of work on the main generator in the blowing snow, we finally managed to start it; but it only ran for half an hour before it stopped again. We put up a tent around the generator, and discovered one broken piston push rod and one bent. The main generator was down. In the kitchen we had to run the gas stove and a primus kerosene burner to keep warm. We then rigged our spare generator for the kitchen, and after a period of preheating and re wiring in the blizzard, we managed to start it. Several crew members chose to stay in bed, as work to maintain the basic functions of camp only required a few.

In the afternoon, the wind abated, and all conditions improved. By late afternoon, we were able to work outside again, and all camp installations (except for the broken generator) were working again.

It appears that the date, May 20, has a curse to it (and it is the Field Leaders brothers birthday too). Two years ago, May 20, 2006, some of us had the exact same experience at the North Eastern corner of Greenland on Flade Isblink. In a blizzard there, all generators ceased to work and we had to resort to primus stoves to keep warm.

What we have done today:

1. Trying to start main generator in blizzard.
2. Trying to repair main generator (16 kW MASE), but two piston push rods damaged. Spare parts are ordered.
3. Repairing the Honda 3 kW generator.
4. Rearranging electrical cables and supply. Now one Hatz 5kW at food store and one at kitchen.
5. Establising kerosene stove heating.
6. Finishing the frame for the 20 foot Red Dome 2.

Weather: WIND: -28 C and more than 20 knots (anemometers ceased to work) wind from N and NE, turning towards the E and abating in the afternoon. In the morning visibility was reduced to 50 m due to blowing snow, in the afternoon visibility was several miles.

FL, J.P. Steffensen

2008-05-21

## After the storm

We woke up this morning to a different world. The weather was really nice and we got a lot of work done. Using surveying instruments, the foundations for the garage and the red dome tent were put in and made level within a few centimetre. We took great care attaching the hydraulic tiller behind the Pistenbully for the first time. Step by step we proceeded, consulting the manual all the time. The tiller is a fast rotating cylinder with long sharp teeth, as it is pulled behind the Pistenbully, it mills the surface snow, which will then sinter and harden. It is quite an impressive device. When in action the power output is 135 kW or 150 hp. Boxes, pallets and cables were dug out of snow drifts, and by the end of the day the camp looked clean and nice again.

Sarah cooked us breakfast for lunch (fried potatoes, bacon, eggs and sausages) and we had a nice gumbo (Cajun) dinner.

What we have done today:

1. Doug out Toyota from its winter resting place.
2. The foundation of garage.1 is put in and levelled.
3. Hill for Red dome 1 ready and foundation ready.
4. Cleared off empty pallets and collecting them.
5. Mounting tiller on Pistenbully, testing and adjusting.
6. Sealed weatherports with snow around the bases.

Weather: Beautiful: -23 C, 5 knots wind from E – SE. Sunshine all day.

FL, J.P. Steffensen

2008-05-22

## Another fine day on the ice

Today the skyline of camp changed dramatically. Both red dome tents were finished, each on a snow hill. From the distance you se two tall red domes. We took advantage of the mild wind, and were able to put the covers on the frame without too much trouble. Sverrir had a busy day, repairing generators and overseeing the dome tent construction. We also started grooming the skiway to remove the effects from the recent blizzard, and to prepare the skiway for the tiller.

*A view of the two domes that were not there this morning.*

For dinner: Meatloaf, gravy and potatoes.

What we have done today:

1. Red dome 2 finished.
2. Red dome 1 finished.
3. Zig zag grooming on skiway.
4. Testing and adjusting tiller.
5. Maintaining Hatz generators. A broken fuel pump was repaired, and a spare pump was repaired too. The engine alternator on one Hatz is broken, so we have to charge the batteries all the time. The same Hatz has developed an oil leak around the crank shaft bearings.

Weather: Beautiful: -21 C, 9 knots wind from SE. Sunshine all day.

FL, J.P. Steffensen

2008-05-23

## Building a new kitchen

*Sverrir inspects the work of Claus and Hans Chistian in the new kirchen.*

Inside Red Dome tent 1 there were happy sounds today. Our carpenter, Claus, and the doctor, Hans Christian, have been hammering and sawing the whole day, making furniture for Sarah, our cook so we may move in tomorrow. They also were able to listen to music while at work, as we setup the old NGRIP stereo set for them. The future kitchen tent was previously a metal workshop tent in the earlier project, NGRIP. So on the door is still a sign saying: “No sawdust in this tent”. Well today, this was ignored.

Out on the apron, Sverrir and J.P. were working on the wrecked crane. Armed with a few tips from the crane company, they managed to make the crane move. It is now mounted on the back of the Pistenbully, where it belongs. The damage is not repaired however, it is just fixed by bypassing the electronic servo control.

Gaël, Thomas, Sebastian and Jim have been palletizing empty drums and shuttling food and other items from the old kitchen to the new.

For dinner: Pasta dish with pork.

What we have done today:

1. Doing carpenter work in the new kitchen.
2. Fixing the crane and mounting it on the Pistenbully.
3. Palletizing empty drums.
4. Shuttling food stuffs from the old kitchen to the new.
5. Grooming around new dome tents.
6. Setting up a gas heater in the new kitchen.

Weather: Nice: -21 C, 13 knots wind from SE. Sunshine all day. A bit nippy outside.

FL, J.P. Steffensen

2008-05-24

## Moving onto main street and receiving visitors for afternoon tea

*Dinner in the new dome tent.*

Today was the first big move, as we moved the heart of the camp, the kitchen, from the old 3.7m by 6 m weatherport to the new 7.6 m diameter circular dome tent. As the kitchen moved, so did the communications setup and electrical power. During the day everything was moved to the main street of the real NEEM camp. Three of us, who have been living in a standard tent since arrival, moved to Weatherport 5 on main street. Now, the old kitchen stands all alone and abandoned in its snowdrift. It will eventually be moved to the main street where it will become Weatherport 6.

Then it is Saturday. Sverrir rigged a shower system on the snow inside a small tent. Four persons in need of personal hygiene used this opportunity. Armed with a pot of 10 liter hot water each, they managed a beautiful shower standing on a sleeping mat on the snow. People dressed up for a nice and festive Saturday night in our new spacious kitchen.

Sarah cooked us a lovely dinner and told Claus and Hans Christian that she was very satisfied with the new kitchen.

What we have done today:

1. Moved into new kitchen.
2. Toyota out of its hole and running. Cruising on main street.
3. Broke down and moved the old camp, except for the weatherport, which will be moved later.
4. Received Liz Morris and Martin Hignell, Scott Polar, who came from the North on a two person one month traverse.
5. Mounted shower on snow.

Weather: Nice: -16 C, 3 knots wind from S. Sunshine all day.

FL, J.P. Steffensen

2008-05-25

## Large construction work in progress

*Scene from the construction of the new garage.*

Today was the day for heavy metal, cranes and hard hats, as we raised the arches for our new garage. The fixed crane was a huge asset. While some were busy constructing, others were marking out the outlines of the last but major structures of NEEM camp: The main dome building and the drill and science trenches.

What we have done today:

1. Raised frame for our new garage.
2. Marking out the outlines of the main dome, drilling, and science trenches.
3. Blowing snow along the sides of the drill trench.
4. Assembling of the new snow blower.

Weather: In the morning nice: -17 C, 7 knots wind from SE. Sunshine. In the evening overcast and snow, -10 C and 3 knots wind from S.

FL, J.P. Steffensen

2008-05-26

## A feeling of Christmas

When we woke up this morning, we almost felt like Christmas. Big chunky snowflakes were falling. It was overcast with a slight breeze from S and very warm: -9 C. The snow continued during the day and when it cleared up in the evening a 10 cm fresh layer of new fallen snow was everywhere.

People remained busy however. The construction of the garage is drawing to a conclusion and soon we will have a sheltered workshop. We finished adjusting the new snowblower to aid the other one in digging the trenches for drilling and science, but the very minute the new was ready – the old broke down. Our mechanic is never idle.

We did the first science this year. Sebastian and Thomas setup a stable isotope experiment in the snow some 4 km from camp.

What we have done today:

1. Grarage frame finished. One end mounted.
2. Broke down the old kitchen weatherport.
3. Blowing snow along the sides of the drill trench with new snowblower.
4. Setting up stable isotope experiment.
5. Writing damage report to HIAB on the crane.
6. Fixing problem with BGAN communication (had to use new SIM card).

Weather: In the morning overcast: -9 C, 9 knots wind from S. Snow. In the evening broken ceiling, -11 C and 5 knots wind from S.

FL, J.P. Steffensen

2008-05-27

## Sticky weather

*It was a windy day.*

Our old Hatz generator finally gave up last night. Sverrir was fighting with it from 3 AM to 5 AM and he managed to make it run – just barely. Luckily a few days ago, J.P. found some missing spare parts for our broken MASE generator. So today these spares were used, and we have full power once more.

The morning was windy, overcast, and it snowed. It was also very warm, which made the snow really sticky. We decided it was not possible to continue digging the drill trench, as it would back fill just as fast as we would blow snow. Also putting up more canvas on the garage seem a risky affair in the wind, so we put a lot of effort in keeping the skiway in good order by grooming.

With the repaired MASE generator, we also had enough power to power an electrical stove. We installed it, but due to wrong wiring on the stove from the supplier, a short circuit developed due to overvoltage. What a sinking feeling.

In the evening, the weather seemed to improve, so we began mounting the other end of the garage, but the wind picked up again, and people had to fight mounting the canvas.

What we have done today:

1. The other end mounted on garage.
2. Making shelves in kitchen.
3. Grooming skiway, taxi ways and apron. Grooming continues into the night.
4. Grooming with tiller.

5. Repairing MASE 16 kW generator.

Weather: In the morning overcast and snow: -9 C, 16 knots wind from S. In the evening broken ceiling, -8 C and 10 knots wind from SE.

FL, J.P. Steffensen

2008-05-28

## Sticky weather continues

*The garage this afternoon, just before the wind died, and we got the roof and walls on.*

It's hard for people to keep occupied when most tasks in camp involves a certain amount of good weather. Strong winds, warm temperatures and constantly moving snow are not among the good things in camp right now.

As we are expecting flights to the camp tomorrow, we put a lot of effort into making the skiway really good. A piece of luck blew our way as the wind suddenly abated just after dinner. Sverrir rushed into the kitchen: "Let's go put the cover on the garage". Everybody jumped up, and in two hours the garage was secure and complete. One hour later, wind and snow came again.

What we have done today:

1. Garage complete.
2. Grooming and tilling skiway.
3. Cleaning up in camp in preparation of more snow drifts.

Weather: In the morning: broken ceiling -8 C, 14 knots wind from S. Visibility 1 mile. Drifting snow, snow showers. At 19.00 winds at 4 knots. At 23.00 overcast , -9 C and 15 knots wind from S, snow, blowing snow, visibility ¼ mile.

FL, J.P. Steffensen

2008-05-29

## Bad weather

*Jim walks towards the kitchen across NEEM main street.*

There once were four radar stations across south Greenland. They formed part of the Distant Early Warning line, or DEW line during the cold war. Two of these stations were on the Greenland ice sheet, Dye-2 and Dye-3. In 1981 the T-shirt available in the store at Dye-3 read: “Dye-3, Does the wind blow there? – No, it sucks.” Somehow this phrase stuck in the authors mind, probably because it comes in handy on a day like this at NEEM.

Weather has been really bad, with strong winds and a lot of blowing snow. People could only open the kitchen door with great care to stop the wind from blowing it off the hinges. Some work was done inside the garage, but otherwise it made no sense to stay outside for extended periods. It appears that most of Greenland has been hit by this strong weather. Our FOM told us that the C5 galaxy bringing in joint NEEM and Summit cargo from the US had to attempt landing in Kangerlussuaq twice due to strong winds, and that all civilian traffic was cancelled. Needless to say, that the planned flight to NEEM today was cancelled too.

Three of our departing boys cooked us a lovely dinner: Nasi Goreng, an Indonesian meal.

What we have done today:

1. Waiting for better weather.
2. Keeping basal functions going in camp.
3. Making some preliminary work inside the garage.

Weather: All day overcast, -7 to -4 C, winds at 20-35 knots from S. Poor contrast and visibility up to 200 m. Snow and blowing snow, large snowdrifts forming.

FL, J.P. Steffensen

2008-05-30

## Bad weather ends (hopefully)

*A parked snowmobile next to disappearing food boxes in snow drifts.*

The night was very noisy as the wind was pounding on all buildings. Snow drifts grew over night, and the bad weather continued until noon. We had to cancel the flight to NEEM one more time. In the afternoon the clouds went away, and we saw the sun again. The wind eased off a bit, and we started working. We got quite a bit of work done, as the list below will tell. Now we just hope, the weather will behave the next few days.

What we have done today:

1. Making shelf system in garage.
2. Grooming taxiway and apron.
3. Grooming and tilling the skiway.
4. Revising all flags on skiway and lead-in lines.
5. Digging out all food boxes and cleaning up in camp.
6. Old kitchen Weatherport now erected on Mainstreet.
7. Repaired electrical stove after damage from wrong wiring. All plates working; but oven is busted.

Claus and Sarah cooked a nice Danish dinner: Minced beef steak with onion, brown gravy and potatoes with apple cake for desert.

Weather: Morning overcast, -8 C, winds at 18 knots, from S. Poor contrast and visibility up to 200 m. Snow and blowing snow, large snowdrifts forming. Evening: scattered clouds, -9 C, 18 knots from S-SE, and 5 miles visibility.

FL, J.P. Steffensen

2008-05-31

## We receive a plane

*Digging is completed. Now the crew can go home.*

Finally the weather cleared up a bit. The morning had snow showers, but finally at 10 o'clock we were able to call in a plane. It landed at 2 o'clock, just as the weather changed again, and snow began to fall. Three new NEEMers arrived: Bruce, Blair and Bill. Also, a German T.V. crew of four people came visiting. During the stay of the plane, the weather got worse and warmer. As the plane was about to taxi for takeoff it was stuck to the snow. People and air crew scrambled to dig away some snow under the skis, and at 4 o'clock the plane was able to take off. On the plane back to Kangerlussuaq were Liz Morris and Martin Hicknell from Scott Polar and their cargo. They had spent a full week at NEEM. A very happy thing happened to us, as the air crew certified the skiway to a larger payload. Then we celebrated Saturday night. It was a good evening with 16 people in camp.

What we have done today:

1. Receiving Skier 73, and digging out Skier 73.
2. Sending out Liz and Martin.
3. Setting up shower in garage.
4. Grooming skiway.
5. Blowing snow from drill trench, now 1.5 m deep.
6. Unpacking tools in garage.

Weather: Morning thin overcast, -14 C, winds at 5 knots, from S to calm. Snow showers. Evening: Overcast, -9 C, 6 knots from SW, and 2 miles visibility.

FL, J.P. Steffensen

2008-06-01

## We receive another plane

*It takes a certain courage to dig snow from skis under a 60 tone aeroplane.*

The very doubtful weather from Saturday night continued Sunday morning. We had to cancel the first flight. The weather then cleared unexpectedly – even the forecasters were surprised, so we were able to call in the second plane. It arrived at 14.30, and brought a lot of parts from the dome. We then said good bye to three NEEMers: Jim, Thomas and Hans Christian. Jim and Thomas were part of the original five almost a month ago. The German TV crew also left us. Now we are 9 in camp. After some difficulties in taking off, the plane finally left us at 16.00. The weather really improved, and we got a lot done.

What we have done today:

1. Receiving Skier 73.
2. Sending out Thomas, Jim and Hans Christian and German TV crew.
3. Making hill for main dome.
4. Designing and producing foot plates for main dome foundation.
5. Setting up wireless weather station at skiway. This is working really fine.
6. Changing to a new stove in kitchen.
7. Zig zag grooming on skiway.
8. Making table for new snow melter.
9. Interviews with TV crew.

Weather: Morning thin overcast, -14 C, winds at 5 knots, from S. Light snow. Evening: Blue sky, -21 C, 8 knots from SE, and unlimited visibility.

FL, J.P. Steffensen

2008-06-02

## The weather is fine – we work

Today the weather behaved. We were able to make a small snow hill with hardened snow for the main dome. Tomorrow the feet will be placed and leveled in. The weather allowed for a lot of small tasks to be done, and of course work was done on the three main tasks in camp at this time: Grooming skyway, excavating the drill trench and construction of the main dome. Most people are now fully occupied with these lengthy routine tasks. Now we sincerely hope that the weather will behave during this important construction phase. We are fighting ahead.

*Our new Pistenbully grooming the skiway.*

What we have done today:

1. Grooming and tilling skiway. Grooming taxiways and apron (No new snow, please).
2. Made hill ready for main dome.
3. Drill trench now 2.3 m deep.
4. Installed new SDMO 16 kW generator.
5. Rewired whole western side of camp. The Hatz generator is now reserve.
6. Finished feet for main dome.
7. Maintaining all generators.
8. Installed new stainless steel snow melter.

Weather: Morning blue sky, -16 C, winds at 11 knots, from SE. Evening: thin overcast, -17 C, 4 knots from SW, slight fog and 1 mile visibility.

FL, J.P. Steffensen

2008-06-03

## Todays flight did not land

Weather this morning was marginal for flying. We had some wind and drifting snow, but it seemed o.k. for receiving a plane. The plane flew over head at 12 o'clock, but because the skiway had not been completely certified, the plane did not attempt to land. We were extremely frustrated, as

the plane carried the foundations for the main dome, and as long as we don't have them, we cannot begin construction.


*Number "2" flags on the skiway, From left to right: Sarah, Sverrir, Bruce, Claus, Blair, Sebastian, Gaël and Bill.*

We carried out other tasks, and in the evening we turned the kitchen into a tailor shop as we cut and stitched big number "2"s onto 8 skiway flags with dental floss, so that our skyway could be certified. Job done, we went out for a group photo on the skyway for documentation.

What we have done today:

1. Grooming and tilling taxiways and apron.
2. Sorted cargo out and cleaning up in garage.
3. Excavating drill trench. This had to be stopped at 16.00 due to too much wind and snow drift.
4. Making no "2" flags.
5. Waiting for the plane that didn't come.

Weather: Morning: Broken ceiling , -16 C, winds at 11 knots, from S. 2 miles visibility. Evening: scattered clouds, -17 C, 11 knots from S, unlimited visibility.

FL, J.P. Steffensen

2008-06-04

## Big success and break through

Today we received two flights, one in the morning and one in the evening. The whole operation went like a clockwork. The planes had no difficulties getting off the skiway. In fact, the skiway had improved so much that the 109th upgraded the skiway to receive 22,000 lbs. Two new members of camp team arrived: Peter and Hasse. We are now 11 in camp. The planes brought all the final

sections of the main dome. Now construction can begin in earnest. In the evening, all steel beams for the foundation were laid out, and the foot plates in position.

*Gaël is running the snow blower in the trench – or is it an alien from outer space?*

We also continuously blow snow from the drill trench and we are now operating in two shifts.

What we have done today:

1. Receiving two flights. Everything went fine. Even with complicated loads the off- and on-load time was 35 minutes.
2. Laid out foundation for the main dome. Setting the feet in place.
3. Excavating drill trench in two shifts. Depth is now 3.5 m.
4. Finishing electrical installations in garage.
5. Receiving two new crew members: Peter and Hasse.

Weather: Blue sky all day, -16 to -10 C, 12 knot from S.

FL, J.P. Steffensen

2008-06-05

## Danish Constitution Day, another fine day

*The beginning of the main dome structure.*

Like yesterday we received two flights today, one in the morning and one in the afternoon. Our skiway is very hard after the right treatment with the new tiller. The pilots from the 109th even have a competition going on how short a takeoff they can do. In the last two days, the pilots have only used half of our skiway. Some pilots cheat a little bit; but the whole operations went like a clockwork and in a very pleasant atmosphere. After the two loads today the put-in of this period is completed. The 109th will go home to the U.S. for two weeks, except for one LC-130, Hercules, which will go to the air show in Karup in Denmark on Sunday.

The main dome construction is moving on. Compare the picture from yesterday (see gallery) with the one from today. Snow blowing in the drill trench is also going fine, even though we only have one working snow blower. The spare parts we ordered did not make it to Greenland in time for the last flight.

Today we said hello to Michael, who came on the last plane. We are now 12 people in camp.

What we have done today:

1. Receiving two flights. Everything went fine. We received the last complicated load.
2. Set the basic structure for main dome and the first dome sections.
3. Excavating drill trench in two shifts. Depth is now about 4 m.
4. Maintained generators.
5. Setup a kerosene stove in kitchen.
6. Saying hello to Michael, the last new member of the crew for this flight period.

Weather: Blue sky all day, -16 to -10 C, 17 knots from S-SE. In the evening overcast and 17 knots from S.

FL, J.P. Steffensen

2008-06-06

## Another fine day for working outside

*Sverrir (left) and Blair (right) have a chat in the sun after dinner.*

We mounted new levels on the dome structure today. Weather was really fine and people were eager to work outside. Now the structure is so high, that our scaffold cannot reach anymore. Tomorrow we will only use the crane to mount the next levels. After that, we will lay out the floors inside the dome, and use those as scaffold to mount the structure at the top.

For once, the people excavating the drill trench did not have to bother with drifting snow into the trench. They created their own blizzard however, as the snow from the snow blower sometimes hit the dome construction crew. The snow fan from the blower was caught by the wind and reached as far as the aero plane parking area.

Claus and Michael set up a carpenter shop and cut timbers in preparation of the drill trench roof. The drill trench will be 4.9 m wide, 32 m long and 6 m deep.

What we have done today:

1. Mounted new levels on main dome structure.
2. Excavating drill trench in two shifts. Depth is now more than 4 m.
3. Cutting wood for drill trench roof.
4. Sorting out arriving cargo.

Weather: Blue sky all day, -11 C, 10 knots from S.

FL, J.P. Steffensen

2008-06-07

## Excavating drill trench and building dome

*The dome structure grows*

We mounted new levels on the dome structure today. Weather was o.k. albeit a little windy. The crane came in extremely handy and was used most of the day until close to dinner time, when the Pistenbully developed a fuel problem. This problem was solved Sunday morning.

The excavators in the drill trench discovered another problem, at 4.5 m they encountered a hard layer which required manual labor to break. We believe this is a melt layer from 2002.

Then it was Saturday, and several took the opportunity to take a shower in a tent inside the garage. Saturday night was celebrated in a pleasant atmosphere.

What we have done today:

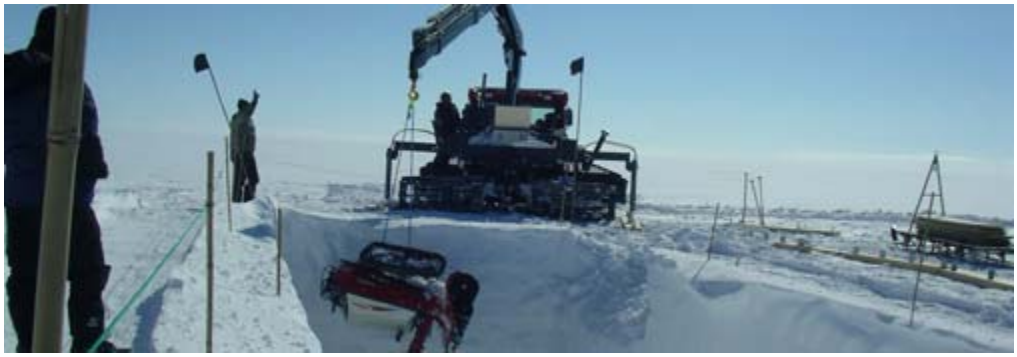
1. Mounted new levels on main dome structure. 39 struts were mounted.
2. Excavating drill trench in two shifts. Depth is now 4.5 m.

Weather: Blue sky, -14 to -10 C, 15 knots from S.

FL, J.P. Steffensen

2008-06-08

## Now the drill trench has a roof



*The snow blower is hoisted up with our crane.*

This morning we received weather forecasts that indicated we would get really windy conditions on Monday. As the drill trench excavating team has been fighting the elements for more than a week, we decided to put all efforts into putting the drill trench roof in place and make it tight. We were finished with the work at 23.30. Everybody went tired to bed. Several individuals have carried more than 6 tons of wood today. Just after Sverrir had solved a fuel problem on the Pistenbully, it was needed.

As we were preparing for the roof of the drill trench, the snow wall gave way, and one of our snow blowers fell into the pit. We hoisted the machine up with the crane, and noted that the damage

was limited. Now the drill trench is covered for the storm tomorrow. We still need 1.5 m to reach full depth of the trench, but we will remove roof sections in both ends for the blower to blow snow out.

What we have done today:

1. Repairing fuel problem on Pistenbully.
2. Laying roof over drill trench. Depth is now 4.5 m.
3. Rescuing fallen snow blower.

Weather: Most of the day, blue sky, -11 C, 16 knots from S. In the afternoon overcast, -9C , 17 knots from S, and snow.

FL, J.P. Steffensen

2008-06-09

## The forecasted storm hit us

*The wind today was so strong and persistent that the frame of the main dome began to lean so much, we had to secure it by strapping it a parked vehicle.*

The forecasted storm hit us last night. Through the night the storm picked up force, and through the day the wind just blew. At the same time we were peppered by new snow and a lot of blowing snow. If we had not covered the drill trench yesterday, it would have been lost. The wind was so strong and persistent, that the main dome steel frame began to lean, and we had to anchor it to sledges and heavy vehicles before it blew off the foundations. On our new meteorological station, the computer display read: “Hold onto your hat!” Boy, that was the truth.

We could do nothing but to hang on, except for Sarah, who cooked us a wonderful meal, Sushi for supper, and the two mechanics, Sverrir and Michael, who worked in the shelter of the garage.

What we have done today:

1. Repairing the snow blower, and maintenance on generators.
2. Securing the main dome structure from falling in the storm.
3. Securing the outhouse from blowing away.
4. Waiting out the storm.

Weather: All day, overcast, -8 to -4 C, 24-30 knots from S and SW. Snow and blowing snow. Visibility down to ¼ mile.

FL, J.P. Steffensen

2008-06-10

## What a difference one good day makes

*Sebastian and Bruce mounting struts for the Main Dome against a blue sky.*

When we woke up this morning, the wind and the clouds were gone. At the breakfast table, everybody was happy and eager to go to work. First, we set the dome foundation in order, and we anchored it to the snow. People split into two teams: One team worked on floor construction for the ground floor of the dome. The other team worked on the dome structure. To take advantage of the good weather, the teams took shifts in the evening, and work continued until 2 AM.

We got a lot of work done. The frame of the main dome is almost complete, and tomorrow the dome will have a ground floor. Sverrir continued his repairs on the snow blower. It should be ready tomorrow. Now we hope for a row of days similar to this one.

What we have done today:

1. Repairing the snow blower.
2. Mounting two more rings (56 struts) on Main Dome.
3. Mounting ground floor beams on Main Dome.

Weather: Blue sky all day, -7 to -12 C, 5-11 knots from S and SE. Visibility: unlimited.

FL, J.P. Steffensen

2008-06-11

## Dome construction

Today we mounted the ground floor of the main dome, and began construction of the 1st floor. Once this floor is in, we can use it as support of our scaffold to mount the very top to the dome structure. The top has been assembled on the ground, and tomorrow we will use the crane to lift it up. For the crane to reach, we have made a snow hill for it next to the dome. The broken snow blower has been repaired, and tomorrow we will continue excavating the drill trench.

*The floor people are laying the beams for the floor.*

What we have done today:

1. Snow blower repaired.
2. Finishing ground floor of Main Dome.
3. Assembled top frame for Main Dome.
4. Cleaning up camp, removing empty pallets.
5. Having a work safety briefing at dinner time.

Weather: All day, blue sky, -8 to -12 C, 8-12 knots from SE and S. Visibility unrestricted. Clouds moved in during the evening.

FL, J.P. Steffensen

2008-06-12

## Dome construction and excavating the drill trench

*The outer panels are arranged at the construction site.*

Construction of the main dome continues. Today we almost finished the 1st floor. A lot of wood had to be cut, handled and nailed down. Soon we will be ready to mount the outer panels, so the dome interior can be sealed off from the elements.

After some small adjustments and repairs, the snow blower now works even better than before the crash. Gaël and Peter are our valiant excavators. They are now deeper than 5 m, and the system of blowing snow through openings in the roof works fine.

We have had contact with the GRIT traverse. This traverse carries cargo from Thule to Summit. Our NEEM camp is on their route and half way for them. We expect them to show up Saturday morning.

What we have done today:

1. Blowing drill trench, now more than 5 m deep.
2. 1st floor of Main Dome almost finished.
3. Small repairs on snow blower.
4. Pulling all pallets with dome panels to construction site, and made panel inventory.
5. Removing material from under snowdrifts.

Weather: Until 16.00, overcast, -7 C, 3 knots from S. Visibility: 3 miles. Thick clouds and snow. After 16.00 blue sky, -12 C, 12 knots from SE, visibility unlimited.

FL, J.P. Steffensen

2008-06-13

## An unusual guest and hot summer weather

*This poor seagull was found behind some timbers.*

Construction of the main dome continues. Today we finished the dome spherical structure. We are now tightening all the bolts to make it a perfect shape. Tomorrow we will mount the top cupola, and the structure is completed. The drill trench excavation goes fine. Depth is now 5.7 m, and we hope to finish this task tomorrow.

The weather today has really brought change. Summer has arrived. We had thick clouds, very poor contrast, snow and hot temperatures. This year's temperature record -2.6 C. Such weather creates problems of a different kind. Even the small amount of solar radiation we got caused the snow to melt on any non-white surface, also the snow becomes really heavy and sticky.

We also found a poor little visitor today. A seagull was found near our cargo. It is so weak, it will hardly survive the night.

What we have done today:

1. Blowing drill trench, now 5.7 m deep.
2. Frame of dome structure almost finished, only cupola needs to be mounted.
3. Making snow hill around main dome.
4. Tightening bolts on dome structure until 23.00L.

Weather: Morning, blue sky, -10 C, 12 knots from S. Visibility: unrestricted. Beginning of afternoon: Thick clouds and snow, -2.6 C "hot!", 10 knots from S and SW, Visibility: 1 mile.

FL, J.P. Steffensen

2008-06-14

## Blizzard – not again!

*Bruce is still able to smile during a blizzard.*

Weather was very strange today. All morning we had moderate winds from SE and S, but it was very warm. At noon, temperatures reached 0 C. It was beginning to snow, and this snow melted all around. We were experimenting with ways to mount the outer wall panels on the main dome, and Gaël was operating the snow blower in the drill trench, as the storm hit us at 12.30. Within 15 minutes the wind turned 60 degrees to SW, picked up from 13 knots to 22 knots, temperature dropped to -7 C and it began to snow heavily. Everybody scrambled to pick up tools before they disappeared and before the freezing water glued them to surfaces. J.P. ran down in the still open drill trench to tell Gaël to get out of there before he drifted in. Gaël was completely unaware of the weather change. When Gaël and the snow blower were out, we covered and sealed the drill trench in 30 minutes. As Peter and Gaël went to the lumber yard to pick up some more plywood to cover the drill trench, they spotted our outhouse tent flying across the apron. They caught it by snowmobile and it was fixed back where it belongs with a snowmobile as anchor. Luckily nobody was inside when it took off.

Just before the storm hit us, the first half of GReenland Ice sheet Traverse, GRIT, arrived. The main tractor with the heavy load was still a few hours behind. Then the storm came, and the tractor had to leave the heavy load behind and had to be guided into camp as visibility was very poor. We now have four visitors in camp: Brad Johnson, Allan O'Bannion, Pat Smith and Jim Lever.

Saturday evening was held in the middle of a blizzard. Everybody got a shower (The GRIT people were first in the shower line).

What we have done today:

1. Blowing drill trench, now 6.1 m deep in some places. Floor needs to be leveled out and walls need to be made straight.
2. Working on panel mounting procedure.
3. Tightening remaining bolts in dome structure.
4. Making staircase for main dome.

Ad.2: The insulated wooden panels have to be mounted on the outside of the steel frame. We have developed a method to lift them with the crane and place them into position.

Weather: Morning, overcast, - 3 to 0 C, 12 knots from SE and S. Visibility: 3 miles, snow. Starting 12.30: Thick clouds, – 11 C, up to 26 knots from SW, Visibility: ¼ miles, snow and blowing snow.

FL, J.P. Steffensen

2008-06-15

## Dome frame complete

*Having bravely worked so long on mounting dome struts, it was only fitting that Sebastian and Bruce got the honor of mounting the final strut.*

The snowy and windy weather did not really want to leave today. This prevented the drill trench crew from finishing their job. We managed to finish the dome frame. Now we are ready to mount the outer panels, we just have to wait for the wind to go down so it will become safe to lift the panels with the crane. Claus was working in the garage on the staircase for the dome, and this afternoon we carried out a test of our Pistenbully by attaching it to the heavy fuel load carried by the GRIT traverse tractor. As the GRIT traverse is a test, we hope this test will give some valuable information for future planning of traverses. We had pizza for dinner together with the GRIT traverse crew.

What we have done today:

1. Finishing drill trench postponed.
2. Main dome frame now complete.
3. Tested Pistenbully for comparison with GRIT traverse CASE tractor.
4. Making staircase for main dome.

Ad.1: The excavation crew was eager to finish the drill trench job, but windy weather prevented them from opening the trench today.

Ad.2: Now the whole structure is complete. All struts are mounted and we are ready to cover the structure with wall panels, windows and doors.

Ad.3: We tested the pulling power of our Pistenbully by dragging a load of 40 ton fuel. It turned out, that the Pistenbully has the same pulling power as the CASE tractor of the GRIT traverse. Both machines have comparable horsepower, but the Pistenbully weighs 8 ton and the CASE 30 ton.

Weather: All day, overcast, - 11 C, 18 knots from S. Visibility: ½ mile, snow showers and blowing snow. In connection with the snow showers, winds reached 22 knots.

FL, J.P. Steffensen

2008-06-16

## The Main Dome gets a skin

This morning we said goodbye to the GRIT traverse crew. They are now heading for Summit camp some 650 km away. They were pleasant company for two days. After they left, we went to work.

First a crew removed the snow drifts from the drill trench to open it. Then most of camp personnel participated in mounting outer panels of the main dome. Although it continued to snow most of the day with poor visibility, the wind was gentle and we got 23 panels mounted. It was a real group effort. Two people hauled panels in the right sequence to the construction site. Then they mounted holders on the panels, and the crane operator lifted them into position. Two climbers on the outside and one inside pushed the panels in position and held them, while two with power tools fixed them with screws. All was overseen by Blair (the dome guy), who handed tools and parts when needed. All this time the snow blower was in action in the drill trench.

*Mounting of the outer panels requires some climbing skills.*

What we have done today:

1. Floor in drill trench almost leveled at 6.1 m.
2. Mounting 23 panels on main dome.
3. Said goodbye to the GRIT traverse team.

Ad.1: After 2 hours of removing snow drifts, the trench was open again, and the final stages of snow blowing are in progress.

Ad.2: Nine people were participating in a very organized operation of mounting the outer panels on the main dome. If weather permits, the dome will soon have an outer wall. 23 of about 130 panels were mounted today.

Ad.3: The GRIT traverse team left us today heading for Summit camp. They left a present: 13,000 liters of fuel. We can use some, but we have promised the traverse people to keep at least 4,000 liters for their return trip. The GRIT traverse is a National Science Foundation (NSF) project, and as NEEMs second largest sponsor NSF has made this contribution to NEEM.

Weather: Overcast, - 11 C, 10 knots from SW. Visibility: ½ mile, snow most of the day.

FL, J.P. Steffensen

2008-06-17

## Panels, panels and more panels

After the first relatively easy rows of panels, the crew today faced some more difficult ones. They now mount panels on the wider and more vertical parts of the dome. However, the crew has developed a routine so that the process went even faster. We now hope the weather holds. There was a yell of joy today, as the excavation of the drill trench was pronounced complete. Immediately thereafter, we began blowing the science trench.

*A game of dart after hours with the main dome as backdrop.*

What we have done today:

1. Excavation of drill trench completed. It is now ready to receive installations.
2. Mounting 31 panels on main dome.
3. Blowing snow for science trench.

Ad.1: The drill trench is completed with a level floor at 6.1 m depth. Hour meter on new snow blower reads 95 hours. If time permits, we will mount the frame for inclined trench, tower and winch. Right now, the main dome takes priority.

Ad.2: Today nine people were involved in the operation of mounting the outer panels on the main dome. Now 54 panels of about 130 are mounted.

Ad.3: We began excavation of the science trench and the connecting trench. The connecting trench will be excavated to 3 m width until 3 m depth. From 3m depth to 6 m depth, the width will be 1.8 m. The excavation of the connecting trench will stop 2 m from the drill trench. When excavation of the connecting trench is complete, it will be covered by a roof at 3 m depth and snow will be put on top. Later, the science and drill trench will be joined by tunneling the last 2 m from 3 m to 6 m depth. This way, we avoid compromising the wall under the drill trench roof.

Comment: We are about 10 days behind schedule. We now focus on getting as many structures up as possible, so that most of the work of the next crew may be done in-door, i.e. independent of adverse weather. We hope this will give fewer delays for the rest of the season.

Weather: Overcast, - 12 C, 10 knots from S. Visibility: ½ mile, snow most of the day.

FL, J.P. Steffensen

2008-06-18

## Panels and snow and snow and panels....

Today was the fifth day in a row with total overcast and snow fall all day. We are grateful that his is not a planned flight week, as we would have to cancel all flights. The fallen snow and the absence of any direct sunlight, caused the surface contrast to be very low. Snowmobile drivers had to use extreme caution while driving as snow hills and pits became invisible. Despite the snowfall the crew went to work and we mounted 16 panels. This is not so much as yesterday, partly because several panels needed additional shaping to fit and partly because radiation heating caused water and ice and icicles to form. The science trench is now taking shape, it is 1 m deep.

*Sebastian, Claus and Peter are listening to an entertaining program while doing the dishes.*

On May 25th we setup three surface reference flags in the undisturbed snow. Control measurements today give a total of 10 cm of new snow has accumulated on the undisturbed surface.

What we have done today:

1. Excavating science trench, now 1 m deep.
2. Mounting 16 panels on main dome. Now a total of 70 are mounted. We are more than half way.

Weather: Overcast, - 5 C to -10 C, 14 knots from S. Visibility: 1/2 mile, snow all day.

FL, J.P. Steffensen

2008-06-19

## Panelling on a good weather day

Today weather was surprisingly good to us. As there was almost no wind, it was a pleasure to be outside. However the mounting of panels is now progressing at a slower speed, as the vertical panels on the widest part of the dome are both difficult to mount and they all have to be trimmed. Soon we will see the end of it, as the vertical section is more than halfway complete. Then we need only the bottom panels and the cupola. Michael spent the day servicing the flexmobile with guidance from Sverrir, and J.P. cleaned snowdrifts away from red dome 2 as this dome will become inhabited next week when camp population is expected to grow. The excavation of the science trench is progressing fine.

*Gaël is trying to juggle beer kegs. They are empty!*

What we have done today:

1. Excavating science trench, now 3.5 m deep.

2. Mounting 17 panels on main dome. Now a total of 87 are mounted.
3. Service on Flexmobile and routine repairs on belts.
4. Removing snow drifts around red dome 2.

Weather: Broken to overcast, - 11 C, 4 knots from W and NW. Visibility: 3-5 miles, very light snow most of the day.

FL, J.P. Steffensen

2008-06-20

## Working in sunshine

*Sverrir is showing Michael how maintenance is done on a generator.*

Today we worked in sunshine all day. That was a pleasure. The final panels of the vertical row were mounted, just as the Pistenbully with the crane had to be taken out of action for repairs. How lucky you can be! The rest of the afternoon at the construction site was spent developing a technique for mounting the bottom row of panels, while the Pistenbully underwent repairs. Sverrir found a broken o-ring in the Pistenbully hydraulic system, and then he was able to find a replacement o-ring in his collection. A leak in the fuel tank was patched up. Empty pallets were removed from the construction site and from the cargo line, and afterwards Mainstreet was groomed to make camp nice and tidy.

What we have done today:

1. Excavating science trench, now 4.0 m deep.
2. Mounting 16 panels on main dome. Now a total of 103 are mounted, and we only have the bottom row and the cupola left to be done.
3. Discovering and repairing fuel leak and hydraulic oil leak on Pistenbully.
4. Cleaning up in camp: Removing pallets and rubbish.
5. Routine maintenance on generators.

Ad.3: We have for a long time tried to locate a tiny leak of hydraulic oil from the Pistenbully. Today while using the crane, the leakage increased and we were able to see where it was. Immediately,

the Pistenbully was taken out for repairs. It turned out that the leakage was due to a faulty o-ring behind one of the proportional valves for the blade. As we have already been in contact with Kaesbohrer regarding these valves, a new set of o-rings is already included in the spare part shipment we expect next week. Just by coincidence a leak in the fuel tank developed at the same time. This leakage is due to faulty welding of the tank. We will order a new tank. In the mean time, the leakage is fixed with sealant and kept under observation.

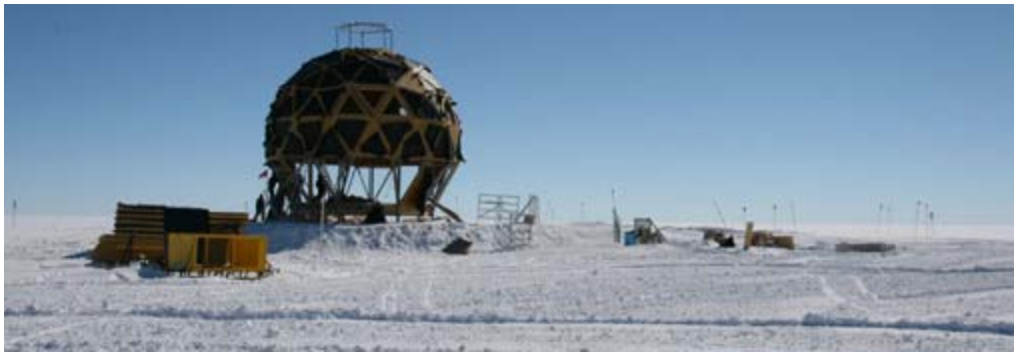
Ad.4: As more and more panels are mounted on the dome, the piles of construction material are dwindling fast. We collected a number of empty pallets to be retrograded to SFJ next week. We also collected rubbish around camp. As we have a lot of empty drums in camp, we open them at the top with a drum opener. Then the drums are filled with rubbish, which is sorted out in different fractions. Several rubbish drums will be returned to SFJ next week.

Weather: blue sky, - 16 C, 4 knots from SE. Visibility: to horizon.

FL, J.P. Steffensen

2008-06-21

## Summer solstice. Greenland national day



*A few piles of panels remain as most of the panels have been mounted on the dome.*

Now the walls connect to the ground floor, in some places.

Again today we worked in sunshine all day. With this good weather here, weather in Northern Europe is bound to become rainy, cool and windy, as Greenland weather most of the time is opposite from Northern European weather. We got some difficult bottom window panels mounted, and at the same time we had two vehicles on our skiway area to prepare it for next weeks flights. As usual for Saturday, Sverrir setup the shower inside the garage, and everybody got a nice wash before Saturday night dinner. Saturday evening was a pleasant relaxing break for all, and we had a good time. We toasted our best wishes in occasion of the Greenland National Day, and we had Icelandic haddock in celebration of Iceland national day on the 17th.

What we have done today:

1. Excavating science trench, now 5.2 m deep.
2. Mounting 12 panels on main dome. We have almost half of the bottom row done.
3. Grooming taxi-ways and apron with Flexmobile and beamgroomer. Tilling skiway with Pistenbully tiller.
4. Maintenance and repairs on 2nd Herman Nelson.
5. Saturday evening.

Ad.2: The mounting of panels today was slow going, as most of the panels will contain large windows and therefore need a different way of attachment. Most of the window panels are now mounted.

Ad.3: The snow fall of the past week has given us a new layer of snow to work with on the skiway. This is good, as the tiller now can make a new ice sole on top of the old one without ripping the old one up. We have decided only to use the tiller on the skiway. The apron and taxiways were groomed with the beam groomer, and here we will use the tiller along the center line as a guide for taxiing aircraft. Lead-in flags in both ends of skiway were checked and straightened.

Ad.5: This was the last Saturday evening in camp for many residents, and we all had a pleasant evening.

Weather: blue sky, - 17 to -9 C, 6 knots from SE and S. Visibility: to horizon.

FL, J.P. Steffensen

2008-06-22

## Sunday, a bit slow but we mounted some difficult panels

Today was clearly a Sunday. People began work a bit later than usual; but soon people were working at their different tasks. As we are fitting the final panels at the bottom of the dome, we have to spend more time mounting them right. We are beginning to prepare for the big exchange of personnel next week. Plans are made of who arrives and who leaves in the coming days. We got a bit of good news from Kangerlussuaq as we were told that the ship had arrived, and that some of our cargo will be available for this flight period. This is indeed good news.

*A line up of hard working men in the excavation for the science trench.*

What we have done today:

1. Excavating science trench, now 5.5 m deep.
2. Mounting 6 panels on main dome.11 bottom panels to go.
3. Grooming of skiway and apron completed. All flags revised.
4. Maintenance and repairs on 2nd Herman Nelson.

Ad.2:The final panels need some reshaping to be mounted on the dome. We hope by tomorrow to have the bottom complete.

Weather: some scattered clouds, - 11 to -9 C, 9 knots from S. Visibility: to horizon.

FL, J.P. Steffensen

2008-06-23

## Today we finished excavating the science trench - now we need to put a roof on

*Gaël and Bruce in a chat in white on white. Where is the horizon?.*

Today was the day when Gaël finally finished his job of excavation, and tomorrow he is scheduled to leave. He has shown great persistence, and as he says, quoting Napoleon Bonaparte:

“Impossible is not a word in the French language”. The science trench is ready to get a roof on. As weather forecasts are good, we should have time to cover it without the almost panic situation we had when we covered the drill trench. On the main dome, we finished mounting the bottom row of panels, now only the cupola needs panelling. We mounted the first window today, so soon the dome will be tight and ready for interior work. The first plane this week is expected tomorrow, and five persons are scheduled to leave camp. This has influence on the evening conversation, as quite a few are exchanging photographs and talking about their time together here. Sverrir had to give up completing the hill for garage 2, as a leak in the hydraulic system on the Pistenbully developed again. The plane tomorrow should bring the necessary spare parts.

What we have done today:

1. Completing excavation of the science trench.
2. Mounting all panels on main dome in lower level. Now only the cupola needs to be panelled. One window mounted.
3. Snow hill for Garage 2 is half done.

Weather: overcast, - 9 to -5 C, 5-9 knots from W. poor contrast. Visibility: 3 miles, snow.

FL, J.P. Steffensen

2008-06-24

## No plane, so building continues

*Apart from the look-out tower, the cupola is complete.*

Today’s flight was cancelled due to weather, so we continued mounting windows, floors and panels on the top of the main dome.

The flight was cancelled due to overcast and warm weather. The wind was not a problem today. It took a little while for people to adjust to the fact that there was no flight, but after that we had a good day of work in and around the main dome. Sverrir got an extra day to teach Michael all the tips of the mechanic trade, and Blair and Bill got a chance of showing how the cupola panels

should be mounted. Peter, Sebastian and Gaël developed into a Velux crew, and they mounted all of the Velux windows. Sarah was as usual spoiling the crew with good food and the plenty of her hobby: Baking cakes. We finished the day by celebrating Danish mid-summer, Sct. Hans, one day delayed, as we had expected a new crew today.

*A group photo of camp crew before the big exchange tomorrow. From left to right: Peter, Sebastian, Michael, Blair, Sarah, Bruce, Hasse, Gaël, Sverrir, Claus and Bill (J.P. took the picture).*

What we have done today:

1. Mounting 5 Velux windows in main dome. Now all Velux windows mounted.
2. Laying floor in cupola. Half done.
3. Mounting two top panels on cupola roof.
4. Tilling center of skiway and taxi and parking area.
5. Snow hill for Garage 2 is done. Needs to be levelled.
6. Celebrating a delayed Sct. Hans evening (Danish mid-summer celebration).

Weather: Most of the day: Overcast, - 7 to -5°C, 4-2 knots from SW. Poor contrast. Visibility: 3 miles, snow. After 16:00L clearing up. At 20:00L: blue sky, -8°C, 4 knots from SE, visibility unrestricted.

FL, J.P. Steffensen

2008-06-25

## Crew change

Today weather was perfect for flights there was an exchange of personnel at NEEM.

It was decided to plan a flight mission very early in the day with departure from Kangerlussuaq at 04:30 so the skiers would reach the NEEM camp at 07:00 while the temperatures still were cold. This turned out to be a great success and the temperature was -13°C at 07:00 when the skier came to camp. 6 persons left camp and 9 arrived so the camp population at NEEM is 15 today. The remaining day was used for the newcomers to adjust to camp and camp activities and for the

overlapping doctors, cooks and mechanics to exchange information. With 2 cooks in camp, the food was overwhelming including sushi, lasagne, 2 cakes, and chocolate strawberries. Thanks!

*Sarah baking cakes on her last day at NEEM. Sarah, you have done miracles in camp. Thanks from everyone at NEEM.*

What we have done today:

1. Receiving skier 73 at 07:00.
2. Tilling and broadening parking area and tilling skier tracks from taxi area and skiway.
3. Mounting remaining top panels on cupola roof.
4. Cutting beams in size for science trench roof.
5. Unpacking food and other goods.
6. Preparing plan for pilot hole drilling.

Weather: blue sky, -14 to -5°C, 10 knots from SSW, visibility unrestricted.

*The dome (or globe?) with roof on the cupola.*

Ad 1. The skier barely made tracks on the skyway and parking area. When parked the front ski could be lifted free of the surface. The skier had the frontski up after 1/3 of the skyway and was airborne before halfway down the skyway.

Ad 6. We propose to drill the 100 m pilot hole and ream it before furnishing the drill trench so the HT drill will be ready for the surface gas programmes after July 10th.

FL, Dorthe Dahl-Jensen

*Dome builders observing the mounting of the roof cupola. Old and new staff discussing.*

*Zoom-in on the cupola roof builders in action.*

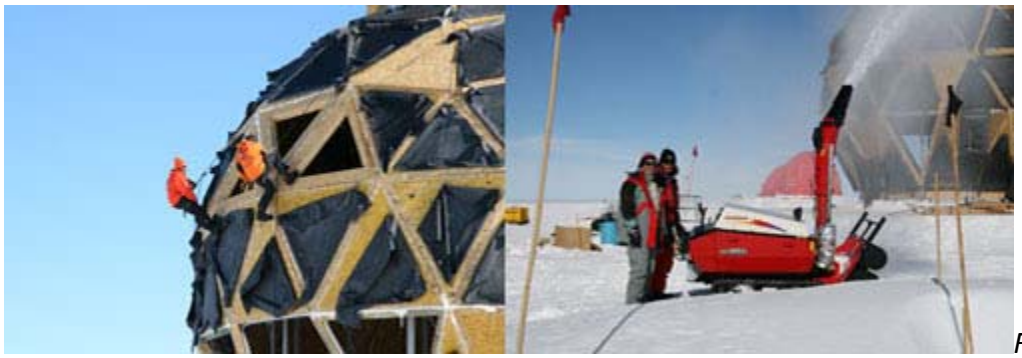
2008-06-26

## Another flight mission and lots of activity

*Camp activities: snow blowing and moving the heavy casing tubes down into the drill trench.*

Again a beautiful day with a flight mission and also high activity in camp.

The weather today was quite similar to the weather yesterday and again a mission was planned in the early morning. Three left camp, Sarah, Bruce and Blair, and four arrived, Valerie, JiWong, Timothy and Fabian. The skier left camp at 8:15 and after breakfast the surface exploded with activities. Sigfus, Steff, Hans Peter and JiWong opened an inclined entrance to the drill trench; Claus, Peter, Marianne, Mark, Fabian and Timothy worked on sealing the outside of the dome; Valerie and Dorthe blew snow around the science trench; Henrik and Dennis prepared beams for the science trench roof; Louise organized all the fresh food that arrived with the skier and Michael repaired the fourth skidoo and supported all activities with the Pistenbully crane. We are 16 persons in camp now.



*Fabian and Timothy rappelling the dome to seal the dome with screws and foam.*

What we have done today:

1. Receiving skier 73 at 07:15.
2. Tilling parking area and tilling skier tracks from taxi area and skiway.
3. Unpacking pallets and storing fresh food.
4. Cutting beams in size for science trench roof.
5. Sealing the dome shell with screws and foam between the panels.
6. Expanding the 1st floor floor to the dome shell.
7. Opening inclined entrance to drill trench.
8. Moving casing down into drill trench.
9. Removing snow around science trench.
10. Repairing the fourth snowmobile.

Weather: blue sky, -17 to -5°C, 7 knots from SW, visibility unrestricted.

Ad 1. Again the skier barely made tracks on the skiway and parking area. When parked, the front ski could be lifted free of the surface. The skier had the front ski up after 1/2 the skyway and was airborne after 2/3 of the skiway. No ATOs were used.

FL, Dorthe Dahl-Jensen

2008-06-27

## The main task of the day was to build the science trench roof. While building we received guests.

*Receiving Pete and Pete arriving on ski to NEEM.*

Friday was a day with warm temperatures. In the morning we had high overcast and low winds. We received skier 73 and received the last cargo for this week. We got the first of the 3 fuel tanks to camp together with the fuel pump and we are looking forward to use the fuel system. The main task of the day was to build a roof on the science trench and the whole camp worked on this task. During the afternoon we suddenly saw 2 persons on ski watching us! Pete and Pete from Finland have been skiing from South Greenland passing the research stations Raven, Summit and NGRIP before reaching NEEM. What a surprise. They stayed in camp overnight before they continued to Quarnaq. Read more about their expedition on www.expedition.fi/greenland2008.

*Building the first half of the science trench roof*

*The building team*

What we have done today:

1. Received skier 73 at 07:50
2. Tilled parking area and tilled skier tracks from taxi area and skiway.
3. Build half of the science trench roof.
4. Searched for the NEEM 2007 shallow borehole.

Weather: Overcast in the morning clearing to blue sky, -17 to -3 C, wind 4 knots from S, visibility unrestricted.

Ad 1. Again the skier barely made tracks on the skiway and parking area. When parked the front ski could be lifted free of the surface. The skier had the front ski up after 1/2 the skiway and was air born after 2/3 of the skiway. No ATO's where used. Like yesterday the double pallets were offloaded on the sledge. Thanks to the crew on the skier for a very smooth operation.

FL, D. Dahl-Jensen

2008-06-28

## Again the roof building was the main camp task. And of course: It was Saturday night.

*Construction of the bridge part of the roof. Peter is secured to the crane.*

Most of the team continued the work with the drill trench roof. Today we bridged the pass way between the science trench and the drill trench using the crane to support Peter placing the beams over the pass way. Fabian and Tim started their radar survey by GPS mapping the region. Mark, Valerie and Dorthe cooked for Saturday night: snacks for appetizer, hot curry, fruit salad with cream and Greenlandic coffee. Mark used 5 cargo straps to secure the inventory in the kitchen for dancing and it was tested.

*Saturday night dancing with the oven secured with a cargo strap.*

What we have done today:

1. Continued the science trench roof construction.
2. Survey for BAS radar program
3. Shower construction in garage
4. Continued searched for the NEEM 2007 shallow borehole.
5. Repaired belt on Toyota

Weather: Blue sky, -15 to -6 C, wind 4-14 knots from S, wind picking up during the day and low wind during night, visibility unrestricted.

Ad 1. The roof construction was more complicated today because the roof needed to bridge the pass way between the science and drill trenches.

Ad 2. The BAS team, Fabian and Tim started the survey with the Toyota but due to problems with a belt, they needed to shift to a snowmobile.

Ad 3: Henrik improved the shower facility so all 16 in camp could enjoy a real warm water shower.

Ad 5: We need to order new spare belts for the Toyota

FL, D. Dahl-Jensen

2008-06-29

## The position of the deep ice core borehole was marked in the drill trench.

*The hanging screwdriver marks the position of the NEEM borehole.*

The weather in camp is still clear with blue sky and it is a pleasure to work on the surface. The roof on the science trench is finished and sealed with snow on the edges. On the dome the panels on the cupola was mounted and we have continued the work on the shell. The drill equipment has been located on pallets and moved into the drill trench. Windows have been mounted in the drill trench roof and the position of the deep ice core borehole marked from roof to floor. Logging equipment has been located and we hope to start the drilling Monday.

*Coffee on the roof to celebrate that it is finished.*

What we have done today:

1. Finished the science trench roof construction.
2. Mounted top panels in the dome cupola and continued the work placing screws on the dome shell.
3. BAS: Finalized the GPS survey and started the stationary radar measurements.
4. Placed polycarbonate windows in the drill trench roof.
5. Located drill equipment on pallets and moved it down in drill trench
6. Marked the drill postion.
7. Fuel inventory

Weather: _Blue sky, -12 to -2 C, wind 10 knots from S, visibility unrestricted.

Ad 1. The opening of the inclined entrance will be kept while the weather is good so we can move equipment down into the trench.

Ad 5. 13 drums JetA1 + bladder JP8; 6 drums Mogas, 100l glycol.

FL, D. Dahl-Jensen

2008-06-30

## The camp celebrated the very first NEEM ice core

*Drilling the first NEEM ice core.*

Again a day with perfect weather. The new team at NEEM has been blessed with good weather and no snow fall. Today the work on the outside of the dome continued and insulation was placed on the groundfloor. In the drill trench the set up of the shallow drill was finalized and intermediate facilities for logging the 3 inch ice core was made. Drill started after celebrating Hans Peters birthday with cake.

*Hans Peter with his birthday cake.*

Drill depth: 11.36 under 5 May 2008 snow surface (bag 21, 36 cm)
Daily core length: 3.08m in 3 runs;
Total core length: 3.08m

What we have done today:

1. Covered the passway between the science- and drill trench with snow
2. Continued the work placing screws on the dome shell.
3. Covered the ground floor of the dome with 3 layers of insulation material
4. Maintenance on the Pisten Bully crane
5. BAS: Stationary radar measurements
6. Installed the 3 inch shallow drill and intermediate logging facility in drill trench
7. Drilled the first 3 NEEM ice cores.
8. Celebrated Hans Peters Birthday with cake and birthday song.

Weather: blue sky, -12 to -2 C, wind 6-10 knots from S visibility unrestricted.

Ad 7. The reference for the depth of the NEEM ice core was established in the following way: A theodolite was used to level the top of the roof of the drill trench to the level of the undisturbed snow surface 5 May 2008 marked on three flags placed in a triangle around the drill trench at the beginning of the 2008 field season (62cm,60cm,65cm). The roof was 62 cm above the 5. May 2008 snow surface. The distance between the bottom of the inclined drill trench to the top of the roof was measured using a laser distance tool to 790cm. The top of the first ice core thus is 790-62 = 728cm. The top of the first ice core is placed 13cm into bag 14.

FL, D. Dahl-Jensen.

2008-07-01

## The dome is in progress and we plan the interior.

No reason to mention that we had good weather. In the dome, the floor on the ground floor is finished with plywood above the insulation material. The wok on the dome shell continued and work was also done finishing the gabs around the top panels. Drilling went well and a final depth of 50.63 m was reached. The 3 inch cores are packed in foam boxes and will be processed later. The second garage snow hill was finished and the top levelled so we are ready to set the second garage tent up.

*Camp life: planning and building the dome and of course drilling*

Drill +logging depth: 50.63 under 5 May 2008 snow surface (bag 93, 3 cm)
Daily core length: 39.27m in 34 runs;
Total core length: 43.35m

What we have done today:

1. Drilled with the 3 inch shallow core for NEEM main core pilot hole.
2. Continued the work placing screws on the dome shell.
3. Covered the ground floor of the dome with the final plywood floor
4. Worked on fitting the top panels in the dome cupola.
5. Finalized the snow hill for the second garage.
6. BAS: Stationary radar measurements + GPS survey
7. Maintenance and ordering of spare parts for the Pisten Bully.

Weather: blue sky, -13 to -2 C, wind 8-10 knots from ESE visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-02

## The first fuel tank is on sledge

*Work in camp: windows in main dome and fuel tank on sledge.*

Good weather with slightly higher winds than the previous days. Ground floor windows have been mounted in the dome and the staircase is halfway up. The front door has been prepared to be mounted. The first fuel tank has been mounted on its sledge and we will start testing the fuel pump in a few days. Drill goes on steadily with a few hours of generator problems during the morning. The team still had energy to play Meyer (dice game) at midnight.

Drill depth: 80.17m under 5 May 2008 snow surface (bag 146, 42 cm)
Daily core length: 29.54m in 30 runs;
Total core length: 72.89m

What we have done today:

*Enjoying the evening sun outside the kitchen dome.*

1. Continued drilling the NEEM pilot hole.
2. Mounted ground floor windows in the main dome.
3. Worked on mounting the staircase between ground and first floor in the main dome.
4. Prepared the front door for mounting in the main dome.
5. BAS: Stationary radar measurements.
6. Placed the first fuel tank on its sledge and tested its ability to be pulled on its sledge.
7. Built small shelves in order to free the ice core boxes for the drilled ice cores.
8. Inventory and updated lists of the medical equipment in camp.
9. Preparing camp for 32 pax by expanding the bed facilities in the weatherports.
10. Blowed snow on the passway and around the science trench to seal it.

Weather: blue sky, -21 to -3 C, wind 10-15 knots from SSE, visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-03

## The drilling of the NEEM pilot hole was finalized at the depth 106.16m

A good and windy day with blue sky. Construction of the main dome continued and the highlight was afternoon tea on the stair in the dome. 8 persons worked on the dome in 4 teams: the stair and door team, the first floor outer ring team, the first floor support beam team and finally the

dome shell team placing screws in the panels on the outside of the dome. Great progress - but very time consuming with all the 'round' angles.

*Drilling*

The drillers and logger reached the final depth of the pilot hole. The ice cores are of good quality, in average each run has produced 1 m of ice core in 1 piece. The drillers started to localize the equipment needed to ream the hole to a greater diameter.

*Afternoon tea on the just finished stairs in the dome*

Drill depth: 106.16 m under 5 May 2008 snow surface (bag 192, 46 cm)
Daily core length: 25.99 m in 27 runs;
Total core length: 98.88 m

What we have done today:

1. Finalized the drilling of the NEEM pilot hole.
2. Worked hard on the main dome
3. Repaired Hartz generators 2 and 3 for drilling
4. BAS radar program

Weather: blue sky, -6 to -10 C, wind 12-16 kn from SSW

FL, D. Dahl-Jensen

2008-07-04

## A very successful day for the BAS radar team, Fabian and Tim

*Radar team in action*

A good and very windy day with blue sky. The day started very early for Michael and Dorthe with the main camp generator on strike at 2 am. The day was much like Thursday with focus on the dome, but with a small team working on the trenches and reaming instead of drilling. Today was Valeries unlucky day: in a few hours she managed to cut the power cable from the generator with the snowblower, 10 min later to get the snowblower stuck in a loose snow hole. Finally she cut her hand with a breadknife (after several days with no accidents nailing thousands of nails in the science trench roof). She decided to use the rest of the day assembling IKEA bunkbeds.

*The hardworking rappelling team on the dome shell*

Reaming diameter: 135mm
Reaming depth: 53m

What we have done today:

1. Started reaming the NEEM pilot hole from the diameter 104mm to 135mm
2. Worked hard on the main dome
3. Changed battery during night on the old MASE generator

4. BAS radar program
5. Service on SDMO generator and old snowblower
6. Repaired Hartz generator 1 by changing it to 12V
7. Assembled the main camp power cable

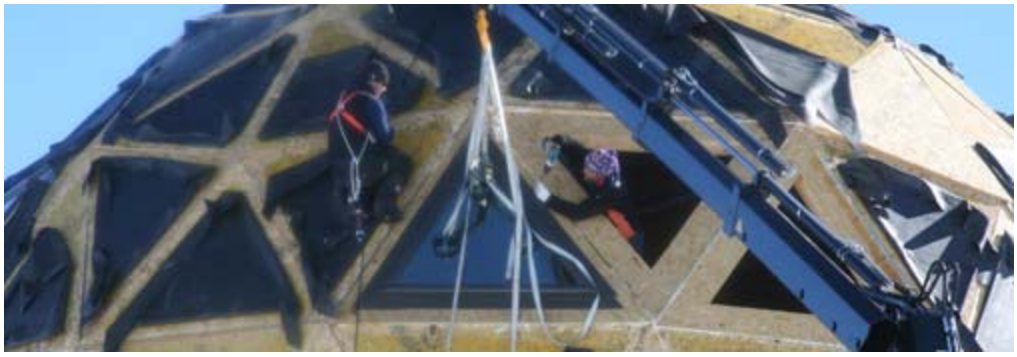
Ad 4 BAS Radar with Fabien Gillet-Chaulet and Tim Burton Since our arrival the weather has been fantastic, the hospitality great and we had a successful GPS Topo survey of the region in order to decide on the radar lines (with thanks to Louise and Marianne for their patience whilst driving at a not very exhilarating 12mph!) However, the Radar has been very frustrating. Sometimes it worked, sometimes it didn´t. Four days of on and off, stop and go but finally the problem was solved yesterday by Hans Peter with his skilled use of a soldering iron - thanks!! The first line was completed today with 33 radar and 24 high resolution GPS points. So now to the other line in time for our departure next week on Thursday. Fabien will be busy tomorrow – after radar action in the morning he is joining Valerie (another French member of camp) and creating a French Feast. Tim has volunteered to chop garlic, drink red wine and hang some onions around his neck…

Weather: blue sky, -6 to -10 C, wind 12-16 kn from SSW.

FL, D. Dahl-Jensen

2008-07-05

## The day when the moles broke through between the science and the drill trenches



*Placing first floor windows in main dome.*

One more good day with blue sky and wind. Today the first floor windows could be placed in the dome. This included rappellers, PistenBully crane and a floor to stand on the inside. After carefully measuring directions a team equipped with motorsaw managed to break through after 5 m digging between the science and drill trenches. It was ‘Saturday night’ so Henrik used the afternoon as bath master and all 16 got a good warm shower. We had a French evening with a French meal cooked by Valerie and Fabian and all dressed in ‘French style’ polar clothes.

*Careful planning of direction and distance to dig between science and drill trenches.*

Reaming diameter: 135mm
Reaming depth: 78m

What we have done today:

1. Continued reaming the NEEM pilot hole from the diameter 104mm to 135mm
2. Worked on the first floor and placed first floor windows in dome
3. Started the corridor between the science and drill trenches.
4. The second snowblower is repaired and ready to use.
5. BAS radar program
6. Showers and Saturday night.

Ad 6. Our bartender Mark has found a technique to avoid too foaming beer by careful temperature control.

Weather: blue sky, -3 to -12 C, wind 10-14 kn from SW, visibility unrestricted

FL, D. Dahl-Jensen

2008-07-06

## A flight period is coming up and the new fuel system is being prepared

*Dome construction reflected in sunglasses.*

A day with high broken overcast and the work just continues. In the dome the construction of the first floor continued and we have begun placing walls on the ground floor. The passage team broadens the passage between the science and drill trenches. They have the pleasure of being supported by Fabian and Tim – thanks! A motor saw is used to remove blocks. They are placed on a Nansen sledge and pulled to the surface with a skidoo. Reaming continues with small problems with fine ice chips sticking to the reamer. Michael and Claus used the afternoon inspecting the fuel system. The box with fittings is still in Kangerlussuaq and we will have to wait for them before we can test/use the fuelling system.

*The breakthrough between the drill and science trenches.*

Reaming diameter: 135 mm Reaming depth: 96 m

What we have done today:

1. Continued reaming the NEEM pilot hole from the diameter 104 mm to 135 mm.
2. Worked on the first floor and started placing walls on the ground floor.
3. Broadened the corridor between the science and drill trenches.
4. Inspection of the fuel pump.

Weather: Overcast, -4 to -14 C, wind 6-14 knots from NNE, visibility unrestricted.

2008-07-07

## A beautiful day with no winds and sunshine in the evening

*Camp enjoying the evening meal outdoors in sunshine and no wind.*

The camp is preparing to be expanded from 16 to 32 people. We expect to move the intermediate kitchen to the main dome on Wednesday. So the dome is being sealed to be weatherproof. The outer walls towards the area for toilets, showers and washes have been made and preparations are made to close the cupola. The pass way between the science and drill trench is finished. The reaming with the first reamer is finished. There is 3 m of fine chips in the bottom of the hole that were attempted to be moved with a shorter reamer and with the shallow drill with no success. Preparations where made to change to the second reamer.

Reaming diameter: 135mm
Reaming depth: 103 m

What we have done today:

1. Finished reaming the NEEM pilot hole from the diameter 104mm to 135mm
2. Finished the floor on the first floor.
3. Sealed most of the main dome and worked on finishing the cupola.
4. Started plumber installations in dome
5. Finished the pass way between the science and drill trenches
6. Maintenance on the Pistenbully.
7. Cleaned the surface and build retropallets

Weather: overcast clearing in the evening to blue sky, -2 to -13 C, wind 0-6 knots from SW, visibility unrestricted

2008-07-08

## More people arriving tomorrow

Everybody in camp is busy preparing the camp for the increase of people from 16 to 32 tomorrow. The dome is being cleaned from saw dust and the first sinks are being placed (without water for now). In the cupola the top hatch has been made and placed. The reaming of the borehole goes very well and the reaming with the second reamer was finished in just one day. In the science

trench the first two 6.5 m long table are installed. In Kangerlussuaq the group of 21 people from Europe and skiers arrived. We are all ready!

*Foam is placed in the panel connections to seal the dome.*

Reaming depth: 102 m
Reamer 2 diameter: 185 mm

What we have done today:

1. Reamed the NEEM pilot hole with reamer 2 from 135 to 185 mm.
2. Made and placed a top hatch in the cupola.
3. Worked on the installation of water pipes in the dome.
4. Placed two long tables in the science trench.
5. Moved boxes from pallets to the camp.

Weather: broken overcast, -7 to -13 C, wind 13-18 knots, visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-09

## An eventful day

*Goodbye to good friends (Marianne waves goodbye).*

Today was the day where the exchange of the NEEM team started. Marianne left us and Jakob, Sverrir, Anders, Simon, Henry, Thomas, Thomas Doc and Trevor arrived. For the first time this year we had ground fog in the morning that lifted just 5 min before the skier arrived. As soon as the skier was airborne we started the big move from the kitchen tent to the dome. Lunch was in a very cold dome at 1 am. At 2 am the GRIT traverse arrived and during the afternoon we used our new pumping system for the first time. In 15 minutes we pumped 11.356 l of fuel into our fuel tank. We had a fun evening playing Meyer with the traverse guys and marking the last evening for Tim, Fabian and Peter. And the reaming went well too.

Reaming depth: 65 m
Reamer 3 diameter: 215 mm

*Transformation of the kitchen dome to sleeping quarters.*

What we have done today:

1. Reamed the NEEM pilot hole with reamer 3 from 185 to 215 mm.
2. Received skier 72.
3. Moved from kitchen dome to main dome.
4. Received the GRIT traverse.
5. Pumped fuel from GRIT bladder to NEEM tank.
6. Moved boxes from pallets to the camp.

Ad 2: The operation went really smooth. We unloaded 2 loads on the sledge. Thanks to the crew of Skier 92 for great support.

Ad 3: The dome is not tight and during day and night we struggled to keep the temperature above freezing.

Weather: blue sky with ground fog between 3 and 8 am, -9 to -13 C, wind 10 knots from S, visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-10

## The camp drowns in cargo

*Cargo on the surface next to the dome.*

The second mission this week was planned for today. No passengers and a full load of cargo. This is the days where all our wishes come true. Louise drowns in food, the dome overloads with goods and we have big piles everywhere. The camp is busy with arranging the cargo and we hope the good weather will continue for a few days before we have arranged all the goods.

*Storing goods over the entrance door in the dome.*

In the dome, Henrik placed the first shower (no water still) and the roof over the entrance door is made so we can store goods here. Henrik, Valerie and Dennis work on sealing the dome with Rockwool on the inside and foam on the outside. It helps a lot and the temperature in the dome is

now between 12 and 20 C. The generator is placed on the floor of the Viessmann hut on a big German sledge. It is our vision to have the generator running for Saturday night. The reaming is now in 2 shifts and so fast that the teams were out of work at 5 pm: the last reamer will arrive with the next load of cargo.

Reaming depth: 102 m
Reamer 3 diameter: 222 mm

What we have done today:

1. Finished reaming the NEEM pilot hole with reamer 3.
2. Received skier 72 and worked on the fueling system between the skier and the NEEM tank.
3. Stored the non-freeze surface gas cargo in the dome.
4. Arranged food.
5. Pumped more fuel from GRIT bladder to NEEM tank.
6. Moved boxes from pallets to the camp.
7. Sealed the dome, placed shower, improved staircase and made a roof above the entrance door.

Ad 2: The operation went really smooth again. We are honored by the visit of Col German and Col Basile. Again thanks to the crew of Skier 72 for a great operation.

Weather: blue sky, -7 to -16 C, wind 10 knots from S, visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-11

## Success with the fueling system

*Workspace on the first floor of the Dome.*

Friday we received the last 13 people in NEEM for this flight period and said goodbye to Claus. We are now 32 in camp – a very high load with the still rather primitive camp we have. During the

flight mission we tested the fuel pumping system and after some misunderstanding on which direction to pump we succeeded in pumping fuel into the Skier. The opposite was not tested because it would require exchanging of the pipes. We will work on a system where both ways can be done without exchanging pipes.

*Fuelling the Skier.*

The Viessmann building was build around the generator standing on the sledge. Unpacking of cargo continued. Reaming started with reamer 4 but during the afternoon the reamer was stuck in a depth of 38.4 m. 30 l of glycol was poured into the hole and during the evening the reamer was free again. In the dome a bench was made along the round wall. For the first time we could see that it IS possible to be 32 dinning together in the dome.

Reaming depth: 45 m
Reamer 4 diameter: 255 mm

What we have done today:

1. Reamed the NEEM pilot hole with reamer 4 with from 222 to 255 mm.
2. Received skier 72 and successfully pumped fuel from the NEEM tank to the skier.
3. Building the Viessmann building around the main generator on a sledge.
4. Worked on leveling the floor for the second garage.
5. Selected the site for the gas pumping program.
6. Moved boxes from pallets to the camp and science trench.

Ad 2: The operation went really smooth again and we are grateful for the ground time allocated for testing the fuelling system. Again thanks to the crew of Skier 94 for a great operation.

Ad 5: The selected site is situated at:
EU (N77 26.020’; W51 06.720’)
US (N77 25.996’; W51 06.161’)
which is 1500 m in the direction 220 T from the deep NEEM borehole.

Weather: blue sky changing to high scattered clouds, -3 to -16 C, wind 0-8 knots from S, visibility unrestricted.

FL, D. Dahl-Jensen

2008-07-12

## Main Generator moves into camp

*The main generator is pulled into camp.*

The weather Saturday was very windy but the sky was mainly blue. Reaming with reamer 4 continued until 20cm before the bottom. Why? – Steff had to use his slot in the very busy shower list for Saturday evening. The generator was moved from the cargo area to the main dome with the Pistenbully and placed near the main dome. The generator was successfully started and cables pulled to the dome and the 2 red sleeping domes. Great success! We had a very good Saturday night with Korean food prepared by JiWoong. Outstanding! And – it was Louises birthday – which was celebrated with birthday cake, many birthday songs from different nations and entertainment through the night. A great evening to mark the first Saturday Evening in our main dome.

Reaming depth: 91.84m
Reamer 4 diameter: 255 mm

What we have done today:

1. Reamed the NEEM pilot hole with reamer 4 from 222 to 255mm.
2. Moved the main generator to camp and turned it on.
3. Changed the power on the south side of camp to the main generator.
4. Moved equipment to the firn-air site.
5. Put up the first Viessmann lab at the firn-air site.
6. Moved boxes from pallets to the camp and science trench.

Ad 5 It turns up that all four Viessmann houses are missing all the panels with doors and windows. Panels for the 2 warm labs have been used to create one Viessmann and a plywood sheet used to make a door.

Weather: blue sky changing to high scattered clouds, -10 C, wind 15-17 knots from E, visibility unrestricted

2008-07-13

## The first snow the last 3 weeks


*Power cable activities in camp*

Believe it or not – we had several very happy scientists in camp because we got overcast with snowfall. The sampling of snow started together with monitoring of the weather. We had a very busy day pulling cables in the camp. The snowblower was used to make a trench dividing the camp in a west and east end for the power and LAN cables to cross the camp. In the dome plumbing continued together with carpenter activities. Outside the dome we started to glue the rubber panels on the dome again. Half of the panels have fallen totally off and this causes a problem because the glue we have is latex and meant to glue rubber on rubber. In the science trench the installation of the swiss saw and the ecm began. A bandsaw was installed a few days ago by a professional (Thomas). We are ready for the ice cores from the firn-gas program!. The MASE generator was moved to the firn-gas site where preparation still is going on. Because we only have one Viessman building at the site a big dome tent has been set up for the US activities. The last 20cm of reaming with reamer 4 was done and modifications of the new reamer 5 began.

Reaming depth: 92.04m

Reamer 4 diameter: 255 mm

*Gluing the rubber panels on the outside of the dome.*

What we have done today:

1. Reamed the NEEM pilot hole with reamer 4 from 222 to 255mm

2. Pulled power cables in the camp. North side of the camp is now also powered by the main generator
3. Placed the second fuel tank (tank 2) on it's sledge, pumped some fuel in the tank and moved it to the main generator site. 7500l of fuel was pumped from tank1 to tank 2. Of this fuel 1200l was pumped into the generator daytank.
4. Continued plumbing and creating an insulated box to be able to pull water into the dome
5. Begun the task of gluing the black rubber panels on the dome again.
6. Moved MASE generator to the firn-air site and continued preparations at the site.
7. Put up the first Viessmann lab at the firn-air site
8. Prepared science trench for the shallow ice cores from the air-gas program.

Weather: overcast, low clouds, snow fall, -6 - 10 C, wind 10 kn from SW, visibility unrestricted

2008-07-14

## The first monitoring of greenhouse gasses.

The gas groups are ready to sample and as a test air from the surface have been sampled. A fast and primary measurement of the surface air showed a CO2 concentration of 381 ppm, a value representing the annual minimum concentration on the north hemisphere. In camp the science trench is prepared to receive the ice cores from the holes needed for the firn gas program. Cables are being drawn everywhere in camp and trenches made for the cables. The surfer team finished gluing the lower ring of rubber to the dome and continues with the rubber on the cupola. The frame of the second garage goes up and the end wall covers are mounted. Before the main cover can be placed wind picks up to 15 knots and it is decided to wait with the last garage cover.

Reaming depth: 50m
Reamer 5 diameter: 281 mm

What we have done today:

1. Reamed the NEEM pilot hole with reamer 5 from 255 to 281mm.
2. Pulled power cables in the camp. The whole camp except the trenches are powered by the main generator.
3. Built the frame of the second garage and mounted the two end wall covers.
4. Made shelves in dome and started building a floor over the bathroom region.
5. Glued the black rubber panels on the lower ring and the cupola of the dome.
6. Prepared science trench for the shallow ice

*Reaming the borehole with the big reamer 5*

cores from the air-gas program.
7. Installation of firn-gas completed.

Weather: overcast, low clouds, snow fall, -6 - 9 C, wind 10 knots from SW picking up to 18 knots during night from W, visibility unrestricted.

*Building the second garage*

2008-07-15

## A windy day - but all activities continue

*European firn-gas samling site*

A windy day with winds up to 23 knots. There is severe drifting snow and it is decided to seal the science trench by closing the inclined entrance with a plywood wall. The surface patrol was active all day collecting pallets and cleaning the surface to avoid that any items would disappear in drifts. The power cable installations, dome constructions, water and heating installations continued and the snowmelter was moved into camp. The firn gas programs continued and 2.5m and 5.0m values of firn gas was

sampled. The cores where sampled for O18 on the site. Preparations for the traverse to NGRIP began with the emptying of the sledges to be brought on the traverse.

*Closing the science trench*

Reaming depth: 90 m
Reamer 5 diameter: 281 mm

What we have done today:

1. Reamed the NEEM pilot hole with reamer 5 from 255 to 281mm
2. Pulled power cables in the camp.
3. Built walls in the dome
4. Installed radiators in main dome and continued the preparation of the water system
5. Closed the science trench
6. Cleaned the surface by collection all small items and flagged all on the surface

   Firn-gas pumping successfully operating. S3 (US) depth: 5m, S2 (EU) depth 2.5m

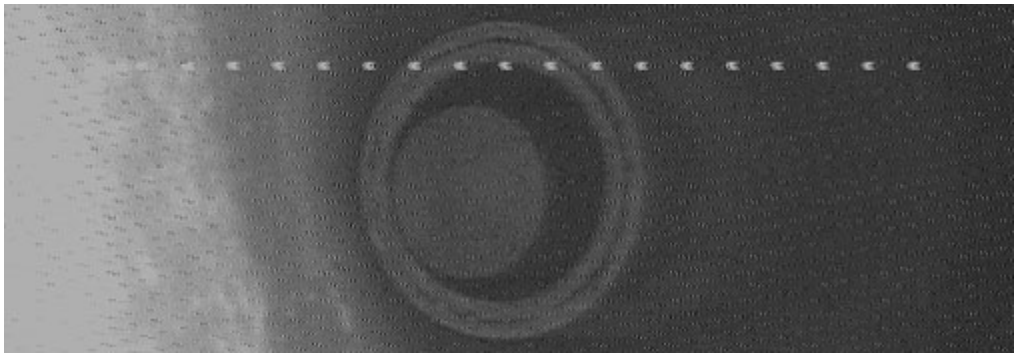
7. Traverse preparations – train with PistenBully and sledges prepared

Weather: overcast, low clouds, snow fall, -16 - 7 C, wind up to 23 kn from WSW, visibility ½ mile

*US firn-gas sampling site*

2008-07-16

## Reaming was finished and a camera showed the bottom of the 92m deep hole



*Picture from the bottom of the borehole*

Today we finished reaming the borehole to a diameter of 281mm. A camera was lowered down to the bottom of the hole to see the bottom before the casing tubes are placed in the hole. In the science trench we started installing an elevator to have a second entrance to the trench system after the inclined entrance to the science trench was closed yesterday. The firn-gas program continues with good success and the depth of 7.5m and 10m are reached by the teams.

Reaming depth: 92 m
Reamer 5 diameter: 281 mm

What we have done today:

1. Finalized the reaming of the NEEM pilot hole with reamer 5 from 255 to 281mm
2. Pulled power cables in the camp.
3. Built walls in the dome
4. Installed radiators in main dome and continued the preparation of the water system
5. Installed elevator in science trench
6. Placed cover on the second garage
7. Cut 2.5 cm O18 samples of the first 7.5 m of the ice cores from the firn-gas site.
8. Firn-gas pumping successfully operating. S3 (US) depth: 10m, S2 (EU) depth 7.5m
9. Traverse preparations – train with PistenBully and sledges prepared

Ad 1 the Pictures shows the edges of the reamings with reamer 3,4 and 5 and the ice chips in the bottom.

Ad 6 Wind after lunch was only 12 knots and we decided to go ahead and pull the central cover over the second garage. Weather: overcast with light snow fall, -16 - 11 C, wind 14 knots from S, visibility 0.5 mile

2008-07-17

## Firn-gas program comes into routine and the new kitchen is under construction

*The international flag line.*

The shallow drill is now operational at the firn gas site. It is shifted back and forth between the two boreholes drilling to the depths requested by the two firn-gas pumping teams. When the requested depths are reached the gas pumping team lowers their equipment into the holes and pump air from the bottom of the borehole. The ice cores are brought back to the science trench where 2.5 cm isotope samples are cut and the electrical conductivity (ECM) are measured along the cores. The main part of the two ice cores will be shipped back to NEEM partners (Severinghaus and Kipfstuhl have asked for them). The drill trench was prepared for casing. In the dome the intermediate kitchen is removed and the permanent kitchen elements are placed. There is power in the dome, the radiator heating is turned on and we hope for water running on Saturday.

S2 (Mainly used for the European Gas Programs)
Gas pumping at 10.1m and 14.8m
Processed ice core: bag 18 (depth: 9.90m)

S3 (Mainly used for US Gas Progams)
Gas pumping at 19.3m
Processed ice core: bag 33(depth:18.15m)
(S3a: a borehole was aborted at the depth 13.2m due to a speedmarker dropped in the borehole. This core is stored in bag 13-24 (7.15-13.20m) while the detailed 2.5cm isotope sampling is from the surface)

What we have done today:

1. Prepared the drill trench for casing
2. Pulled power cables in the camp.
3. Started construction of the permanent kitchen
4. Started the radiator heating in the dome
5. Worked on the snowmelter system
6. Placed electrical heating and insulation on water and glycol pipes
7. International flagline in place
8. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores
9. Firn-gas pumping successfully operating. S3 (US) depth: 19.3m, S2 (EU) depth 14.8m
10. Traverse preparations

Weather: overcast with light snow fall, -16 - 11 C, wind 14 knots from S, visibility 0.5 mile

2008-07-18

## The traverse to NGRIP departs

The big event of the day was the departure of the surface traverse to the previous drill camp NGRIP 340 km away. The PistenBully pulls three sledges, the first with the small red round building (the tomato) used as sleeping and kitchen quarter followed by two sledges with fuel, equipment and a snowblower. The hours of departure were like preparing a family for a camping holiday – Sverrir, Lars and Anders kept running back and forth after this and that! The traverse departed at 10:30 and in the evening at 21:00 the traverse reported back that they had made 100km and spent the night at waypoint 53. In camp the permanent kitchen had reached a point where we moved downstairs again for the meals. Preparations of heating and water systems continued. The firn-gas program and the ice core processing continued. In the drill trench the long casing tubes, to be placed the first 80m in the borehole, was lowered one by one using a cable from the beams in the roof to carry the weight.

*The traverse departs*

S2 (Mainly used for the European Gas Programs)
Gas pumping at 19.75 and 27.54m
Processed ice core: bag 39 (depth: 21.45m)

S3 (Mainly used for US Gas Progams)
Gas pumping at 34.8m
Processed ice core: bag 63(depth: 34.65m)

What we have done today:

1. Cased the borehole.
2. Worked on the exchange system of heat from the generator to the snowmelter
3. Continued the construction of the permanent kitchen
4. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores
5. Firn-gas pumping successfully operating. S3 (US) depth: 34.8m, S2 (EU) depth 27.45m
6. Traverse departs
7. Leveled the floor and placed the Viessmann cabin for the drill workshop in the drill trench
8. Moved the lathe and other heavy equipment down into the drill trench

*Casing the borehole*

Weather: overcast, -12 - 6 C, wind 10-17 knots from S, visibility unrestricted

2008-07-19

## High winds stops camp activities and all snug in preparing Saturday evening

*The drifts in the trenches*

Winds picked up in the morning hours from 20 kn to 28kn and before noon we had to call the firn-gas team back from their site 1.4 km from camp. The high winds gave a cold and drafty dome and some time was spent foaming the holes around the windows and between the panels. In the science trench it was decided to start processing the main NEEM ice core from the pilot hole in lack of S2 and S3 cores. The inclined entrance to the drill trench drifted badly in and it was quiet a swim to enter or exit.

The chefs Trevor and Thomas

We have several sick people in camp – probably a French bug brought to camp during the last flight period. One of our head chefs for the Saturday evening meal – Simon – was sick, but with the help of several volunteers we had a perfect three course meal: spiced shrimps, marinated lamb with vegetables and crepes with berries and whipped cream. Thanks to Trevor, Thomas and volunteers!

S2 (Mainly used for the European Gas Programs)
No gas pumping today
Processed ice core: bag 42 (depth: 23.1m)

S3 (Mainly used for US Gas Progams)
No gas pumping today
No ice core processed ice core

S1-Main NEEM ice core Processed ice core: bag 16(8.80m) – 33(18.15m)

What we have done today:

1. Continued casing the borehole

2. Worked on the exchange system of heat from the generator to the snowmelter
3. Continued the construction of the permanent kitchen
4. Cut 2.5 cm water isotope samples and measured ECM on S2, S3and S1 main core ice cores
5. Reduced firn-gas pumping program due to high winds
6. The traverse moved 130 km and stayed overnight at waypoint 30. Opposite the NEEM camp they camped under a blue sky.

Ad1: We did not manage to get running water in the dome as we had hoped. The heat exchange system in the generator needs to be changed to one working in a different temperature regime. This exchange is planned to happen Sunday. As an emergency solution in the storm – showers were taken with a jar of heated water in the shower – the toilet was opened without water and smoking was exceptionally accepted in the bathroom area.

Weather: scattered clouds, drifting snow, -7 - 9 C, wind 20-28 kn from S, visibility 100m

2008-07-20

## The main generator heat exchanger is replaced and - the heating system with the snowmelter works!

*The meltlayer from 1889 from S3 ice core*

After a windy night the wind gradually dropped during Sunday and all activities started again around lunch. The firn gas program continued the processing of ice cores continued. In S2 a big melt layer is found at the depth 43m and recognized as the meltlayer from the warm years around 1889 some years after the Krakatu volcanic eruption in 1883. Henry used the snow blower to clean the inclined entrance to the drill trench so more heavy drill equipment could be moved down. The traverse moved steadily on and makes 105 km reaching waypoint 9, 45 km from NGRIP.

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depth 34.7m
Processed ice core to bag 55 (depth: 20.25m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depths 49.7m and 57.5m
Processed ice core to bag 88 (depth: 48.40m)

What we have done today:

1. Worked on the drill workshop
2. Main generator close down 14:00 – 17:00 and 23:00 – 23:30
3. Installation of a new heat exchanger while the main generator was closed during afternoon
4. Generator maintenance while main generator close down in evening
5. Moved snow from inclined drill trench entrance
6. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores
7. Firn-gas pumping program successfully continued
8. The traverse moved 105 km and stayed overnight at waypoint 30.

Weather: overcast with snow and drifting snow, -15 - 7 C, wind 0-16 kn from S, visibility ¼ mile

2008-07-21

## Dishwasher, toilet with flushing water, indoor shower, handwash with water - the camp is one big smile.

*Dome golfing*

Water in the system, heat in the radiators. A very big day for the camp. Just to watch people exit the bathroom area with a smile from ear to ear. After 77 days at NEEM.! The firn-gas programs continued and are reaching the pore close off depth, the ice core processing is keeping up with the drilling. In the drill trench the drill workshop has been furnished with a table and a lathe and the floor is being prepared for the long central beams. In the science trench the elevator is operational so we are ready to take ice core boxes up for retro on Wednesday. The HF radio has been installed in the main dome to be ready for flight operations on Wednesday.

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depth 55.0m
Processed ice core to bag 78 (depth: 42.9m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depths 62.0m and 64.0m
Processed ice core to bag 111 (depth: 61.05m)

What we have done today:

1. Placed table and lathe in the drill workshop and moved drill tool to workshop.
2. Started water and heat systems in main dome.
3. Successfully finalized installation of elevator in science trench.
4. Successfully prepared system for receiving fuel from airplane to tank and giving fuel from tank to airplane.
5. Groomed skiway with Flexmobil and beam groomer.
6. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores.
7. Firn-gas pumping program successfully continued.
8. The traverse arrived to NGRIP at 13:30 and reported all is well. Winds of 35 kn caused further work to be postponed.

Weather: overcast with snow and drifting snow in the morning clearing to blue sky during afternoon, -17 - 10 C, wind 0-18 kn from S, visibility ¼ mile

2008-07-22

## The day is spiced with preparations for the flight the next day, Wednesday

*Sverrir approaching the nearly buried NGRIP dome.*

Besides from the normal work in camp (firn-gas program, ice core processing, drill trench preparations) the movement of equipment from garage 1 to garage 2 starts. The intention is that garage 2 will be the mechanical workshop while garage 1 will be for storage and carpenter workshop. Return pallets are prepared including a pallet with 15 ice core boxes. In the evening

Christian Morrell entertained us with the most excellent slide show of his NEEM pictures. Outstanding!

*Bo, Valerie and Carina at the finished icebox pallet.*

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depths 65.5, 66.9, 68.3 and 69.8m
Processed ice core to bag 102 (depth: 56.10m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depths 66.0m xx
Processed ice core to bag 120 (depth: 66m)

What we have done today:

1. Levelled the drill trench floor and used snow blower to prepare the lowered area for the big central beams.
2. Build shelves in main dome
3. Started the process of moving equipment from garage 1 to garage 2
4. Build retro pallets for mission next day (used elevator to get ice cores boxes up)
5. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores
6. Firn-gas pumping program successfully continued
7. The traverse has started the main generator in the buried NGRIP dome. The CAT is checked in the Lucht kastel. Anders has hand drilled a 5.5 m deep ice core.

Weather: high scattered clouds, some drifting snow, -7 - 14 C, wind 22 kn from SE, visibility unrestricted

2008-07-23

## Flight day with goodbyes and welcomes

The weather today is good and weather reports for the flight starts at 03:30. The Skier arrives in camp at 08:10 with Thomas St, Trine, Jens Peter, Laurin and Ramon. Many hugs and farewells to Mark, Henrik, Dennis, Henning and Christian M. The pallets are ripped apart and long waited items and spareparts are immediately found. Activities continued in the camp and was followed with a very quiet evening due to early camp activities.

*Newcomers exiting skier 71.*

*NEEM cargo and fuel teams standing by.*

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depths 62.0, 64.0 and 66.0m
Processed ice core to bag 108 (depth: 59.40m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depths 71.4 and 72.05m
Processed ice core to bag 132 (depth: 72.60m)

S1 (NEEM main core)
Processed ice core from bag 34 to 66 (depth: 18.70m to 36.30m)

What we have done today:

1. Received skier 71
2. Placed the solid central beams in the drill trench
3. Made tables and shelves in the main dome
4. Continued the process of moving equipment from garage 1 to garage 2
5. Unpacked pallets and moved food and non-freeze goods to the warm rooms
6. Cut 2.5 cm water isotope samples and measured ECM on S1, S2 and S3 ice cores
7. Firn-gas pumping program successfully continued

The traverse has managed to get the CAT on the traverse sledge and dug the fuel drums left at NGRIP year ago free. The snowblower has proved to be very valuable

Ad1: Again a very smooth operation. The skiway, groomed by the Flexmobil and beam groomer, was rougher than our usual standard, but the skier got air born using ¾ of the skiway without the use of jato's. Compliments to the crew!

Weather: blue sky snow, -7 - 14 C, wind 18 kn from SE, visibility unrestricted

2008-07-24

## The cooks snowmelter and sodamachine is installed

*Cooks snowmelter under construction.*

Camp life went back to normal after a successful flight day yesterday. In the dome a cooks snowmelter was installed with improvised material. When running drink water was ready the sodamachine was brought into the dome to be installed. It turned out that the machine had been in use in Copenhagen and all tubes including a 15l water container was full of water and extract – frozen off course. No wonder it was so heavy! After two man days work all the leaks from frost damage where repaired and the sodamachine ready for use. A rather expensive sodamachine – so we hope it will be eagerly used.

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depths 68.0 and 70.0m
Processed ice core to bag 124 (depth: 68.20m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depths 73.8m and 75.6m
Processed ice core to bag 136 (depth: 74.80m)

S1 (NEEM main core)
Processed ice core to bag 103 (depth: 56.65m)

What we have done today:

1. Finalized floor in drill trench and moved the tower foundation down into the trench
2. Found the last Viessmann parts from the cargo that arrived the day before and placed door and window sections in the drillers workshop.
3. Made shelves and cooks snowmelter in dome
4. Continued the process of moving equipment from garage 1 to garage 2
5. Cut 2.5 cm water isotope samples and measured ECM on S1, S2 and S3 ice cores.
6. Firn-gas pumping program successfully continued
7. The traverse finalized the uploading of goods from NGRIP and they will depart NGRIP early Friday morning.
8. The seismometer placed in 2007 is digged out by Trine and the surface patrol. The equipment is buried in 3 m depth.

Ad 8 The seismometer has recorded data from 6. August to 5 October 2007 .

Weather: blue sky snow, -7 - 14 C, wind 23 kn from S, visibility unrestricted

2008-07-25

## The big snow removing day - and Laki found for the third time this year!

*Snow moving in the trenches.*

Today the trenches have reached the stage were new digging projects start. In the science trench the drift at the closed inclined entrance is moved - unfortunately removing the cute penguin cut the day before by Valerie. In the drill trench the ambitious 8m deep trench for the deep drill is initiated and the first 3m are made by a very hard working team. In addition blocks of snow are removed from the wall where the drill cabin is to be partly embedded. In the science trench the very distinguished volcanic eruption Laki (Iceland 1785 AD) is found by ECM in S1 and S2.

*Happy faces when Laki shows up in the ECM*

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depths 72.0m and 74.0m
Processed ice core to bag 127 (depth: 69.85m)

S3 (Mainly used for US Gas Programs)
Gas pumped at the depth 75.0m for MPI
No ice core processed

S1 (NEEM main core)
Processed ice core to bag 157 (depth: 76.35m)

What we have done today:

1. Started to dig the inclined drill trench. Depth 3m
2. Started removing snow on the side of the drill trench where drill cabin is to be
3. Moved snow drift in science trench
4. Made insulation box on cooks snowmelter
5. Moved between garage and started change of matrax on the Toyota.
6. Maintainence on main generator
7. Exchanged Mase generator with SDMO generator at firn-gas site due to power problems with the Mase
8. Cut 2.5 cm water isotope samples and measured ECM on S1 and S2 ice cores.
9. Firn-gas pumping program successfully continued
10. The traverse left NGRIP and made 101 km and stayed overnight at waypoint 20. The velocity of the traverse with the uploaded sledges was still 12 km/h. Lars spent most of the day on the snow mobil measuring the GPS points on the route. They plan to reach NEEM Monday 28 July.
11. Made small cage for seismometer in the science trench

Ad 8: The depth of Laki in the various NEEM shallow ice cores: 2007 core: 69.2m, 2008 S1 NEEM main core: 69.7m; 2008 S2: 70.2m and 2008 S3: 70.6m

Weather: overcast, -7 - 14 C, wind 14-18 kn from SW, visibility changeable

2008-07-26

## Saturday evening and Bo's 30 year birthday

A busy digging snow day again. In the drill trench the inclined drill trench was 4 m deep and the hole in the wall for the drillers cabin was 1m. In the science trench the floor was leveled with the

help of Henry's expertise. At the firn-gas site there were problems with the drill both due to warm temperature icing and power problems. In the main dome walls and handrail for the staircase were made. The theme for Saturday night was celebration of Bo's 30 year birthday. Carina and Bo prepared a most excellent Indonesian meal followed by ice cream cake with candles. Tent mates and friend surprised Bo with a big peber mill in front of Dome 1.

*Bo's 30 year birthday*

*Fixing the rubber panels on the roof*

S2 (Mainly used for the European Gas Programs)
Gas pumped at the depth 76.0m and 78.0m
Processed ice core to bag 133 (depth: 73.15m)

S3 (Mainly used for US Gas Programs)
Program successfully finalized
Processed ice core to bag 147 (depth: 80.85m)

What we have done today:

1. Continued digging the inclined drill trench. Depth 4m
2. Moved snow on the side of the drill trench where drill cabin is to be
3. Prepared a flat floor in the science trench for ice core box storage and ice core buffer.
4. Made walls in bathroom and handrail on staircase in main dome.
5. Toyota running on new matrax
6. Theo and Vas started attaching the loose rubber panels on the roof of the main dome
7. Cut 2.5 cm water isotope samples and measured ECM on S2 and S2 ice cores.
8. Firn-gas pumping program successfully continued
9. The traverse moved 115km and stayed overnight at waypoint 43. All is well and Anders, Lars and Sverrir celebrated Saturday evening with lambchops in the big tomato on one of the traverse sledges
10. The seismometer is installed now and powered with sun panels and batteries. Measurements are started again.

Weather: changing overcast with snow and blue sky, -4 - 12 C, wind 5-15 kn from SW, visibility changeable

2008-07-27

## Work continues in camp

*Digging the hole in the drill trench wall for the drillers cabin*

After a slow Sunday morning work continues in camp. Digging in the trenches, construction of the core buffer, shelves in the dome, final drilling and gas pumping at the firn-gas village…

S2 (Mainly used for the European Gas Programs) No sampling Processed ice core to bag 138 (depth: 75.90m)

S3 (Mainly used for US Gas Programs)
Program successfully finalized
Processed ice core to bag 160 (depth: 88.00m)

S4(Mainly for MPI)
Gas pumped at the depths 5.0m and 10.0m
Ice core not saved

What we have done today:

1. Continued digging the inclined drill trench. Depth 5m
2. Moved snow on the side of the drill trench where drill cabin is to be
3. Built ice core buffer
4. Continued attaching the loose rubber panels on the roof of the main dome
5. Cut 2.5 cm water isotope samples and measured ECM on S2 and S3 ice cores.
6. Firn-gas pumping program successfully continued
7. The traverse moved 95km and stayed overnight at waypoint 62, 55 km from NEEM.

Weather: overcast, -6 - 12 C, wind 12 kn from SW, visibility unlimited

2008-07-28

## The traverse is back at NEEM

The work in camp continues and all are waiting for the traverse to return. Just before lunch Lars's happy voice is heard in the main dome: "No lunch was served for me on the traverse so I will try the next kitchen". Lars had finished the GPS measurements by snow mobil and could outrun the heavy traverse train. At 14:00 the whole camp greeted Anders and Sverrir welcome back to camp.

*The traverse back at NEEM*

S2 (Mainly used for the European Gas Programs)
No sampling
Processed ice core to bag 150 (depth: 82.50m)

S3 (Mainly used for US Gas Programs)
Program successfully finalized

S4(Mainly for MPI)
Gas pumped at the depths 20.0 and 29.7m
Ice core not saved

What we have done today:

1. Continued digging the inclined drill trench. Depth 7m
2. The drillers cabin is placed in the drill trench
3. Ice core buffer is finished with place for 240 core troughs
4. Continued attaching the loose rubber panels on the roof of the main dome
5. Cut 2.5 cm water isotope samples and measured ECM on S2 ice cores.
6. Firn-gas pumping program successfully continued, including packing
7. The traverse arrived at NEEM at 14:00 local

Weather: overcast, -6 - 12 C, wind 12 kn from SW, visibility unlimited

2008-07-29

## The 3 ton heavy winch has been moved down in the drill trench

A mayor effort today was to move the winch down into the drill trench. We used the crane of the PistenBully as a contra weight so the winch would not slip from us and slide into the trench. After some hours (and some swearing mostly in Switzerdeutch) the winch was in place on the two strong beams in the trench. A second big victory was that the final depth of 8.2m was reached in the inclined drill trench.

*Winch being moved down in drill trench.*

What we have done today:

1. Finished digging the inclined drill trench. Depth 8.2m
2. Moved winch down into drill trench
3. Finalized the drilling and air sampling for MPI in S4 (depths 29.7m, 39.3m, 48.6m)
4. Ice core trough holders cut in wood for the ice core buffer.
5. Continued attaching the loose rubber panels on the roof of the main dome
6. Worked on the winch control
7. Packing boxes in firn-village
8. Unpacking goods from the traverse sledges
9. Finalizing the GPS measurements near NEEM

Weather: overcast, -5 - 9 C, wind 9-14 knots from SW, visibility unlimited

2008-07-30

## The fight period with the DV visit is coming close and the day is a big cleaning day in the camp

Just like at home – you clean before the guest arrive – the camp was busy cleaning goods from the surface, removing tools from the main dome and making order in the trenches. While the equipment was packed by the firn gas groups a final experiment of pouring drill liquid and some biological trace material in the S3 borehole was attempted. Unfortunately too much drifting snow had made it into the borehole and it was not possible to drill an ice core covered with the liquids as intended.

*The main dome is covered with the black rubber when viewed from the west side.*

What we have done today:

1. Prepared drill tower by drilling holes for the bolts connecting the old and new sections.
2. Started widening the drill trench on the sides.
3. Started making the steps down into the 8.2 m deep inclined drill trench.
4. Worked on the winch control.
5. Repaired power control on the shallow drill.
6. Packed and palletized the air-gas sampling equipment.
7. Cleaned in the science trench.
8. Continued attaching the loose rubber panels on the roof of the main dome.
9. Removed tools and plywood from dome and cleaned the dome.
10. Unpacked goods from the traverse sledges.
11. Prepared pallet with drill equipment and ice core boxes.
12. Prepared pallet with garbage and pallets.

Weather: overcast, -5 - 9 C, wind 9-14 knots from SW, visibility unlimited

2008-07-31

## The big DV day.

*DV's (distinguished visitors) including the Danish minister of climate and energy Connie Hedegaard and IPCC chairman Pachauri listening to science presentations in the NEEM main dome.*

The day arrives where the skier is back in camp. Sad goodbyes to 10 friends from NEEM and a busy day guiding our 16 guests around at NEEM. The day went fast spiced with a difficult take off for the skier and problems with the shallow drill. As the deep drill was not operational we drilled some ice cores with the shallow drill in the S4 borehole, where the core was not intended to be stored. In the Science trench we had saved the last S1 main core for processing today and used this opportunity to tell stories on past volcanic eruptions as seen in ECM and what stable water isotopes tell about the past climate.

What we have done today:

1. Received Skier 72 with 16 DV's
2. Goodbye to 10 pax from NEEM
3. Continued making the steps down into the 8.2m deep inclined drill trench
4. Worked on the winch control
5. Tour for the DV's including drilling in firn-village and processing ice cores in science trench
6. Processed the last of the S1 NEEM main core (bag 193 – need to check)
7. Continued attaching the loose rubber panels on the roof of the main dome
8. Science presentations for DV after dinner
9. Unpacked pallets with fresh food
10. Prepared pallet with shallow drill equipment
11. Tilling skiway in the afternoon and evening

Ad 1:
A retro-load of 13.500 lbs was prepared but 2 pallets where drifted so the final retro-load was 8.300 lbs. 600 lbs of fuel was tanked from the skier. After the first take off attempt one pallet was drifted. After the second take off attempt a second pallet was drifted and the skier fuelled with 1000lbs from camp. The skier departed in the third attempt using the full skiway but not ATO's.

Ad1:
Name list for DV's

- Minister for Climate and Energy, DK; Connie Hedegaard
- Minister for Infrastructure, Climate and Environment, GL; Kim Kielsen

- Director of Danish National Research Foundation, DK; Thomas Sinkær
- Chairman of the Danish National Research Foundation Board, DK; Klaus Bock
- Chairman, FN Panel on Climate Change, Dr. Rajenda K Pachauri
- New York Times, Thomas and Ann Friedman
- Times Magazine, Bryan Walsh and Håkan Ludvigsson
- Dean, University of Copenhagen, Faculty of Science, Nils and Jette O Andersen
- Pro Dean, U. of Copenhagen, Faculty of Science, Katherine Richardson
- Dean, University of Kansas, School of Engineering, US; Dr. Stuart Bell
- Chancellor, University of Kansas, US, Dr. Robert Hemenway
- India news, Raj Chengappa
- New York Times, Ian Parker

Ad4:
Simon was not able to get the winch control running. Simon will contact the company and we will continue to troubleshoot it in the coming period.

Weather: blue sky, -5 - 9 C, wind 9-14 knots from SW, visibility unlimited

2008-08-01

## 97% solar eclipse at NEEM

*97% solar eclipse at NEEM at 07:30*

After a night only a few hours long for most camp personal we enjoyed watching a 97% solar eclipse at 07:30 while palletizing the last pallet and following the skier en route to camp. The skiway tilled the evening before had improved significantly and the operations went very smooth. Goodbye to 12 bodies from NEEM and 16 DV's. We truly have enjoyed the DV visit. Thanks for taking the time to visit us! We had the pleasure of welcoming the Kansas radar team, Liz our new doc and Tim. The plane departed at 10:11 and the camp collapsed until lunch at 13:00. Work as usual in the afternoon and NEEM was back in the usual mode again.

What we have done today:

1. Recieved Skier 72 with 5 pax for NEEM
2. Goodbye to 16 DV's and 12 pax from NEEM
3. Solar eclipse at 07:30
4. Continued making the steps down into the 8.2m deep inclined drill trench
5. Continued widening the side walls in the drill trench
6. 6 lights mounted in the roof of the drill trench
7. Camp slept from skier take off at 10:11 to lunch at 13:00
8. Continued attaching the loose rubber panels on the roof of the main dome
9. Placed the third fuel tank on sledge
10. Unpacked pallets
11. Piled free pallets on cargo line ready for retro

Ad 1:
A retro-load of 14.400 lbs was lifted from camp without use of ATO's. The full skiway was used. Thanks to all the 109th in Greenland this week for good operations.

Weather: overcast, -5 - 9 C, wind 9-14 knots from SW, visibility unlimited

*NEEM camp watching the eclipse*

2008-08-02

## The last traces of the firn village are removed.

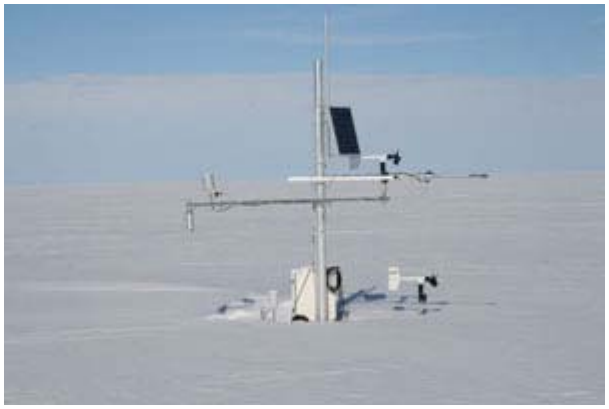
*Digging boxes free in front of the drill trench in the warm sunny weather.*

Todd's tent was taken down at the air gas site and all bamboo poles NOT marking the boreholes to be kept where removed. In camp the CReSIS radar team took over the red dome both for sleeping and as a working space for the radar activities. A strange gadget of a radar transmitter/receiver is collected on the snow in front of the red dome.

What we have done today:

1. Continued making the steps down into the 8.2m deep inclined drill trench
2. Continued widening the side walls in the drill trench
3. Placed pile of boxes in front of drill trench on drums
4. Repaired matrix on Toyota
5. Continued attaching the loose rubber panels on the roof of the main dome
6. Worked on leakage in CAT fuel filter
7. Removed tent and bamboo poles in firn-village. S2 is marked with an alu-pole and a bamboo pole with a black flag. S4 is marked with a bamboo pole with a red flag.
8. Located Koni Steffens wx station and prepared for download of data. Waiting for instructions from Koni
9. Placed a tent over science trench elevator to avoid drifts on elevator
10. Kansas radar team installed in Dome 2 where the radar antenna is being collected in front of the weatherport.
11. Saturday evening with Indian curry prepared by Liz and Tim. Wonderful. Turban in any size recommended.

Weather: blue sky changing to overcast, -4 - 9 C, wind 4-10 knots from SW, visibility unlimited



*The partly buried wx station.*

2008-08-03

## Small projects finished

After a slow start Sunday morning work continues. Many of the long lasting activities like making stairs in the inclined trench and gluing rubber to the main dome are nearly finished. We are looking forward to packing the glue away tomorrow and to terminate the hard work rappelling on the outside of the dome.

What we have done today:

1. Continued making the steps down into the 8.2m deep inclined drill trench
2. Continued widening the side walls in the drill trench
3. Removed all boxes in front of main dome
4. Emptied floor in garage 1 and started moving fresh snow in on floor
5. Finished attaching the loose rubber panels on the roof of the main dome
6. Finished unpacking traverse sledges
7. Prepared plastic bags for a 10m hand drilled core just beside drill trench (Start of S1 main core)
8. Organized all the food in the food tent (seven-eleven)
9. CReSIS radar team has computers running, BGAN system too and GPS ground station. Testing radar system placed outside dome 2.

Weather: overcast, -4 - 9 C, wind 4-14 knots from SW, visibility unlimited

2008-08-04

## The most wonderful weather today

*The glue team provides the field leader with some welcome distractions.*

Today we had no wind, -3 C and sunshine so we used the opportunity to work as much as possible on the surface. We decided to see a movie (Office Space) upstairs in the evening and the whole camp watched together – with popcorn of course.

What we have done today:

1. Finished placing the steps in the 8.2m deep inclined drill trench
2. Finished widening the drill trench
3. Started the floor with gratings in the drill trench
4. Finished gluing rubber on the main dome
5. Taken weatherport 1 down
6. Started repairing the floor in garage 1
7. Started drilling a 10m core from the surface close to the drill trench
8. Repaired the fuel filter in the CAT
9. Started moving the radar equipment from the dome tent to the Toyota

*Floor constructions in the drill trench*

Weather: High clouds clearing to blue sky, -15 - -3 C, wind 2-5 knots from SE, visibility unrestricted

2008-08-05

## Finally the top windows are in place

*Happy faces through the windows in the pentagon.*

Finally the day came where we could place the top windows in the dome. While the work on the outside of the dome was going on the window holes have been used to climb in and out the dome. As a result plywood plated had been intermediately placed over the holes in the evening. This made the dome rather cold indoors especially when the wind was blowing. Now we are looking forward to a pleasant warm dome! Louise and Liz had prepared a drink for us and all 15 from camp gathered in the pentagon to celebrate before dinner.

What we have done today:

1. Placed ventilation tube in inclined trench and continued the floor in the drill trench
2. Placed the 5 windows in the top of the main dome
3. Finished floor in garage 1 and placed shelf system on a plywood floor
4. Found and distributed windows to Viessmann cabins and placed the window in the driller's workshop.
5. Made fuel station for Toyota
6. Made the first test runs of the radar from the Toyota

*Dragging the last top window up the ladder to the pentagon in the top of the dome.*

Weather: blue sky, -4 - -13 deg C, wind 10-15 knots, SSW, visibility unrestricted

2008-08-06

## Finishing Dome constructions 2008

*Dome seem from skies.*

Today we placed a ring of plywood around the base of the dome so it is sealed at the base. This is the last mayor construction in the dome this year. Next year the stairs to the top and shelves at the top will be built. The 10m surface core drill earlier was processed for stable water isotopes and the deepest part for ECM too.

What we have done today:

1. Finished the floor central parts of the drill trench.
2. Put lights in the science trench.
3. Made roof above shelf system in garage 1.
4. Placed the four windows in the drillers cabin.
5. Tried to download data from the Parca weather station.
6. Prepared for the grid and made the final test run with the radar.
7. Made snow hills for winter storage.

Weather: blue sky, -4 - -19 deg C, wind 6-10 knots, SSW, visibility unrestricted

2008-08-07

## Drill tower in place.

*Trevor operating the tower controls as the drill tower is being raised for the first time.*

The drill tower was placed today in the drill trench. The tower parts where attached with 80 bolts and the tower base was adjusted so the drill will be centered over the borehole. After the tower was assembled the linear motor was attached. Here we were in for a surprise as the top hole in the two linear motors where different and only one fit the NEEM tower base. The usable one was connected and when raising the tower the second surprise was that the tower 'went through the roof'. The snow blower has not been quiet capable of making a deep enough trench for the drill. The roof parts where remove so the tower could be placed in vertical position and a final adjustment of the base was made. The inclined trench only needs few adjustments to allow the tower to tip from vertical to horizontal position. Next year we will build a top building (submarine) so the tower fits under the roof.

What we have done today:

1. Assembled the tower.
2. Exchanged the linear motors for the tower.
3. Placed the base of the tower (no permanent screws before next year).
4. Worked on the ventilation system in the drill trench.
5. Took two weatherports down.
6. Downloaded data from the Parca weather station 6.
7. Radar measurements in the 10km by 10km grid around the drill site.
8. Tested glycol in vehicles and radiator system (glycol in radiator system needs to be changed).
9. Maintenance on main generator.

Ad 8. The water pump in the main generator is leaking. It will be exchanged next year.

Weather: blue sky, -8 -19 deg C, wind 7-10 knots, SSW, visibility unrestricted

2008-08-08

## Many of the projects are reaching the end

*A view downstairs in the dome.*

The season is reaching the end and in camp we can see the end of many of the major projects. In the drill and science trenches we are finalizing the trenches and on the surface we have started to prepare for the winter storage.

What we have done today:

1. Placed slush pans on the tower.
2. Adjusted the steps so the tower can pass done in the inclined trench.
3. Processed weather data.
4. Placed core holders on the core buffer.
5. Maintained the snow blower.
6. Cleaned the surface.
7. Worked on the ventilation system in the drill trench.
8. Radar measurements – problems with noise.
9. Placed security equipment in camp

Weather: Overcast, -15 to -5 deg C, wind 0-12 knots from W, visibility unrestricted

2008-08-09

## Saturday evening with an American Buffet.

A good working day continuing most of the projects. The Saturday meal was cooked by the Americans in camp and we all enjoyed it. We had a good evening with talk, fun and dance.

*A moment in the camp.*

What we have done today:

1. Finished the core buffer.
2. Packed the ECM equipment.
3. Cleaned the surface.
4. Maintained the snow blower.
5. Changed glycol on the radiator system.
6. Made box for electrical and water connection outside the dome.
7. Started making the drillers pull out table.
8. Worked on ventilation and snot station in drill trench.
9. Successful radar measurements

Weather: overcast, -8 to -5 deg C, wind 5-10 knots from W, visibility mostly unrestricted

2008-08-10

## A Toyota break down stopped the radar measurements for the day

*Dennis and the broken mattrax on the Toyota and Bo and Carina with the perfect ice core buffer.*

After an “early” start Sunday morning the CReSIS team needed to make a call for help over the radio just after 10:00. It turned out that a bearing was broken on the right back mattrax and the

Toyota had to be placed on pallets and pulled 5 km back to camp. The radar equipment was transferred to a flexmobil and the CReSIS team was ready for measurements the next day. As always – all accidents happen on Sundays….

What we have done today:

1. Packed in the science trench.
2. Levelled floor in the science trench.
3. Worked on the ventilation system in the drill trench.
4. Worked on the snot station (drill liquid mixing and ice chips centrifuge) in the drill trench.
5. Turned the horizontal Swiss saw 180 deg in science trench.
6. Toyota rescue mission.
7. Took retro boxes up especially from the drill trench.
8. Vehicle maintenance.
9. Organized food for winter storage

1. Weather: overcast, -15 to -5 deg C, wind 5 to 12 knots from SW (true), visibility unrestricted

2008-08-11

## The floor where the Viessman cabins are to be placed was carefully levelled following Henry's method.

*Making floor in science trench.*

Levelling floors involves moving snow (as most other activities in camp) and the ongoing fight with the frozen motor of the elevator used to move the snow from the trench to the surface continued. In the drill trench the solid pull out table made by Thomas got the final touch!

What we have done today:

1. Tables where placed along the walls in the drill trench.
2. Full lists of retro cargo prepared.
3. Packed the cargo sledges.

4. Cleaned on the surface
5. Vehicle maintenance.
6. Levelled floor in science trench.
7. The final finish on the pull out table.

Weather: -5 to -8 deg C, wind 3 to 16 knots from SW (true), visibility variable

*Final touch on pull out table*

2008-09-11

## The NEEM camp is ready for ice drilling – almost

***The last people have left NEEM for this year. Since May, 60 people from Holland, USA, England, Australia, Southkorea, Iceland, France, Switzerland, Germany, Greenland and Denmark have worked hard to construct the camp. By the end of the season, camp construction is almost finished. NEEM is ready for the next 3-4 years of research into the climate of the past***

The barren inland ice was what met the first people arriving at the NEEM site in May this year. The construction of the NEEM camp started from scratch, and during the summer the camp has taken shape. Scientists from Centre for Ice and Climate and the international NEEM partners have worked with the construction of the camp together with mechanics, electronic engineers, plumbers, carpenters, cooks, and doctors. The main dome has been completed, containing all the common facilities (bath, toilet, kitchen and laundry), living space, and the office. Two garages and two big tents for accommodation have been raised. For the scientific work, 6.5 meters deep science and drill trenches have been excavated and covered with a wooden roof.

The plan was that the deep drill, which is going to drill 2500 meters through the icecap, should have been installed as well, but because of problems with the control system the installation has to wait until next year. But everything is ready for the deep drill, and with a smaller drill the first 100 meters of ice core has been retrieved. The uppermost 80-100 meters of the ice sheet consists of the porous firn-layer. To prevent the drilling liquid, which is necessary for the deep drilling operation, to flow out into the firn, the hole is lined with a casing. The retrieved ice cores have been logged, and samples have been cut for isotope-measurements. Moreover measurements of the electrical conductivity of the ice have been made. In the drilling trench, a control cabin has been build and the drill tower has been raised. An 8.5 meters deep inclined trench, into which the drill tower turns when sending the drill into the hole, has been excavated. The deep drill is constructed by engineers, mechanics and glaciologists from the Niels Bohr Institute.

## The first scientific work at NEEM

The first season at NEEM has not only been about construction of the camp, there has also been time for research. In addition to the first 100 meters of ice cores from the deep drilling operation, another three 80 meter-ice-cores have been extracted. These drill holes have been used by European and American researchers for sampling the gas trapped between the snow crystals. On the surface of the ice sheet, radar experts from CReSIS in Kansas, USA, have made a 10 by 10 km net of measurements around the NEEM site. The measurements make it possible to determine the age of the ice, the movements of the ice, the depth of interne layers and the bottom of the ice sheet.

The construction of the main dome was more difficult than expected and therefore the building was finished in August instead of as planned in the end of May.

A weather station was located near NEEM, and has been moved closer to the camp. The data about the weather conditions around NEEM for the last three years was downloaded. With these data the researchers can get a picture of the current climate conditions and compare them with the data from the newly retrieved ice cores.
Moreover, a seismic station operated by the Geological Survey of

Denmark and Greenland was placed near the camp. The station has been checked and moved to the science trench. The seismic data have been downloaded, and will provide information on the bedrock conditions under the ice sheet.

## Closing down for the winter

After the intensive work all summer in the camp, the last 15 people left the NEEM site on August 19. Before then, the camp was closed down for the winter: All vehicles were driven into the garages. The science trench and drilling trench were closed with chip boards to prevent snow from getting in. The generator was towed away from the main dome to limit snowdrifts. The entrance to the main dome was closed with chip boards, and all water systems in the building were drained to prevent frost cracking of the pipes. All electronic systems were taken down and moved to the science trench because they cannot stand the cold. In main dome the temperature during the winter may reach - 60oC, but in the science trench the temperature will "only" reach -30oC because of the insulation by the snow. The two smallest accommodation tents were taken down while the small fiber glass domes - the so-called "Tomatoes" - together with fuel and other cargo were towed up on artificial snow hills to prevent them from being covered by snow drifts. Everything left in the camp was documented so it can be registered in the logistic database. Now the winter is on it's way and the work with the NEEM project will continue at Centre for Ice and Climate. Before the NEEM camp reopens next summer, the deep drill is going to be repaired and tested. The scientific work is going to be prepared, so the glaciologists are ready to perform measurements on the many hundred meters of ice core that are going to be retrieved next year. From the three 80 meter ice cores, 10.000 isotope samples have already been cut. With the isotope measurements the researchers are able to date the ice cores and determine the climate history at the NEEM site for the last 300 years. These measurements should be ready before the researchers return to NEEM in May 2009. These 300 years of climate history represent the beginning of the more than 130,000 years of climate record that the NEEM project will produce - a record waiting for us 2500 meters further down in the ice sheet.