

Mawson's Huts Conservation Expedition 2006



January 2002 (above)

December 2006 (below)



Expedition Report

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Western Australian Museum

For the

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&
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MAWSON'S HUTS CONSERVATION EXPEDITION 2006

EXPEDITION REPORT

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MAWSON'S HUTS EXPEDITION 2006

1. Executive Summary



Photograph by Simon Mossman

The 2006 Mawson's Huts Foundation expedition boarded *L'Astrolabe* on the evening of 20 October 2006 and returned on the private ship *Sarsen* on 4 January 2007 after a highly successful expedition.

Thick pack ice slowed the journey south and stopped *L'Astrolabe* when she was approximately 70 kms from Cape Denison. Helicopters were then used to deploy the expedition team, supplies and equipment. These operations commenced on the evening of 29 October and were completed on 31 October. The helicopter flight in to Cape Denison showed that most of the roof of the living quarters of the Main Hut was covered with snow and ice, with the Magnetograph House completely buried. The latter did not emerge for the duration of the trip.

Despite the extensive snow coverage the team was able to achieve the major objective of the Works Plan, that being over-cladding of the living quarters roof. This was a major challenge due to the huge amount of snow that covered the building. An underlying fear was that ice and snow removal from the roof could easily be undone by subsequent blizzards. In an attempt to minimise this risk, snow blocks removed from the roof planes were used to construct a snow wall on the southern side of the Main Hut. This tactic was successful and despite many days of strong winds and wind-borne snow, very little snow was deposited in the trenches that were excavated to expose the

roof planes. In total, approximately 80 m³ of snow and ice were removed from the roof planes. Weather forecasts provided by the Casey and Davis meteorological teams (Scotty Carpentier, Malcolm Downing and Graham Oakley) were critical to our success, allowing us to plan our activities to coincide with appropriate weather windows. Their service was impressive, remarkably accurate and a godsend to the team.

In addition to successfully over-cladding the roof, the team also removed the original flagpole from the apex of the living quarters roof and installed a replica in its place. The replica was made to the estimated dimensions of the original. The fragile nature of the original pole and its possible loss in strong winds prompted this action. The original pole was carefully packed and returned to Australia for conservation.

There was no evidence of recent snow/ice ingress other than that recorded during the 2005 expedition. This is most likely due to the extensive snow coverage that has effectively sealed the building and prevented further snow from entering through previously identified entry areas. Unfortunately, while this heavy snow coverage prevented additional snow ingress during 2006, it also prevented the team from undertaking remedial work to seal areas that are known entry points for drift snow, such as the junctions between the roof planes and walls in the workshop and Main Hut verandahs.

Snow and ice were removed from many locations in the living quarters including Webb's bunk in the south-west corner, above Mawson's cubicle (exposing the 'skylight' in his room and allowing natural light to enter this space for the first time in many years), the south-east corner ('Hyde Park Corner'), Laseron's bunk, the north-east corner (including what is likely to be Murphy's bunk) and from some of the kitchen shelves. A number of interesting artefacts, including personal items and sledging supplies were exposed during these excavations.

In order to determine whether over-cladding has any impact on the interior environment of the Main Hut, the following electronic and corrosion monitoring work was undertaken:

- Stored data was downloaded from the logging system.
- Redundant and damaged temperature and relative humidity sensors were removed.
- Viable sensors were calibrated and relocated so that environmental conditions could be compared in corresponding locations in the living quarters and the workshop.
- Previously exposed corrosion monitoring cells were removed and new cells installed so that the effects of the internal environment on corrosion rates can be compared (pre and post over cladding) with that of the external environmental conditions.

Four objectives of the works program were not achieved. The extent of the snow coverage prevented access to the interface between the walls and the roof planes, thereby preventing work being undertaken to seal previously

identified areas of snow ingress into the building and to over-clad the south wall of the Main Hut. No attempt was made to excavate ice to floor level from the entrances/doors to the workshop. As all areas of snow ingress had not been sealed, this action was considered premature. A fourth objective was also not realised, that being to make an outgoing call from the satellite phone connected to the environmental monitoring system. This was attempted in order to allow the system to be recognised by the Iridium network and therefore allow external access to the environmental data as it was being collected. The environmental monitoring system will continue to accumulate data but this will not be available until it is downloaded during the next expedition to the site.

Additional work undertaken included:

- The installation of vibration sensors to monitor any movement in structural timbers over the coming year.
- Sampling of mould outbreaks noted on artefacts (food, paper objects) and timber panels.
- Relocation of the timber stack from in front of the Granholm Hut to a site adjacent to the Sorensen Hut.
- Replacement of the single barrel lock on the workshop door with two locks (top and bottom) to reduce distortion and assist in reducing snow ingress.
- Improving the amenity of the Sorensen Hut by extending the decking and installing a set of stairs.

The team also hosted visits to the site by expeditioners from the *Spirit of Enderby* and the *Sarsen*. Tours through the hut were given as was shelter in the Sorensen and Granholm Huts when blizzard-like conditions arose during a visit by the *Spirit of Enderby* expeditioners.

This report recommends that future work at the site be directed towards:

- Monitoring and remediation work in areas of snow ingress with particular attention to wall/ceiling junctions.
- Over-cladding of the south wall of the Main Hut in the longer term.
- Removal of more snow and ice to reveal interior spaces and artefacts.
- Continuation of the monitoring program.
- The development of an interpretation plan to guide conservation processes for the interior of the Main Hut (artefacts and fittings such as shelves etc) and to take into account the possible eventuality of fuller exposure of the floor (and associated artefacts) in both the workshop and the living quarters as the hut is better sealed and ablation continues in the future.
- Prioritisation of artefacts for conservation treatment and commencement of an active program designed to stabilise corroding and deteriorating artefacts.
- Documentation of the transit hut, absolute magnetic hut and magnetograph house.

- Improvements in the visual protection zone, including painting of the Granholm Hut to reduce the effects of its presence in this zone, while major works continue at the Main Hut and while it is still considered an important on-site refuge. Note that this recommendation is at odds with the recently issued draft management plan and will be the subject of further discussion. Building and packing materials should be removed from this zone when they emerge from the snow and ice.

With respect to the logistics and comfort of future expeditions, it is strongly recommended that:

- Expeditions occur over the summer period (December/January) to reduce down time due to poor weather conditions
- Helicopter operations be used whenever possible to optimise operational efficiency.
- The amenity of expeditioner accommodation, living/work arrangements and equipment be reviewed and upgraded. Specific recommendations are made later in this document (see p 24, Recommendations for Future Expedition Planning)

In conclusion it is worth noting that the delayed return to Australia was a mixed blessing for the team and the program of works. The longer time on the continent meant that all hands were available initially to assist with vital snow and ice removal work without jeopardising other components of the overall works plan. Once this critical aspect of the works plan was achieved the work focus then changed, with sufficient time still available to allow other tasks to be completed. Despite the disappointment of not returning to Australia in time to celebrate Christmas with family and loved ones, morale remained high at all times, a testament to the personal and professional qualities of the team members.

2. FIELD LEADER'S REPORT

Dr Ian Godfrey

2.1 Introduction

I preface this report by stating how honoured I was to take on the role of Field Leader for the 2006 expedition. With Rob Easter coordinating the overall project, the pre-departure preparations, planning, logistics and team selection were all handled wonderfully well.

Prior to the arrival in Hobart of other expedition team members, Marty Passingham and Christian Gallagher put in a lot of hard work, with great assistance from Australian Antarctic Division staff. The thought and effort put into these preparations put the expedition on a very sound footing from the start.

The expedition report as a whole describes all aspects of the expedition with limited discussion of collected data and associated research investigations. This section, the Field Leader's Report, gives an overview of the whole project from the leader's perspective only. Individual members of the expedition team have commented on their specialist fields, with their reports included later in this document. While the observations, conclusions and recommendations recorded in individual team members' reports stand alone, there will obviously be some overlap between the specialist reports and the Field Leader's Report. Recommendations made at the end of this section are based on comments from all members of the expedition team.

Before commenting formally on the many aspects of the expedition it is important to compliment the team on their achievements and professionalism. The early start to the expedition was always going to be a challenge, one that was compounded by the unusually large snow dumps that resulted in most of the roof of the Main Hut at Cape Denison being buried. This was an additional obstacle that had not been anticipated when planning the expedition. Indeed the opposite situation had been expected; that is, one in which there was a hazard associated with 'working at heights' on the roof. After digging and excavating the roof planes however, the potential hazard then became one of falling onto the roof from the surrounding snow banks! The fact that this extra challenge was met and overcome is a testament to the temperaments, talents and commitment of the expedition team.

It is also important to formally acknowledge the wonderful support given to the team by the Mawson's Huts Foundation (David Jensen and Rob Easter), staff of the Australian Antarctic Division, in particular Tom Maggs and Bruce Hull, the Casey and Davis meteorology teams (Scotty Carpentier, Malcolm Downing and Graham Oakley) and our families and friends who kept us grounded with news and events from the 'real' world. The value of the assistance, support and simple contact with these groups of wonderful people cannot be overstated.

2.2 Expedition Team:

2.2.1 Team Composition

Rob Easter	Expedition Manager
Ian Godfrey	Field Leader, conservation scientist
Ted Bugg	Deputy Field Leader, carpenter
Martin Passingham	Carpenter
Christian 'Psycho' Gallagher	Carpenter, medic
Simon Mossman	Cook, communications, photographer, journalist
Angus MacDonald	Artist, photographer (until October 31, 2006)

2.2.2 Antarctic Experience

The team was highly experienced, with only one Antarctic 'novice' among those who stayed for the duration of the expedition, a factor that undoubtedly contributed to the success of the expedition.

Ian Godfrey	10 th Antarctic trip, 3 rd to Cape Denison
Ted Bugg	4 th trip to Cape Denison
Martin Passingham	3 rd trip to Cape Denison
Chris Gallagher	veteran of 3 Antarctic winters, 5 summers, 1 st trip to Cape Denison
Simon Mossman	1 st trip to the Antarctic
Angus MacDonald	1 st trip to the Antarctic

2.2.3 Team Performance

As stated above all members of the field party worked together extremely well to achieve the main goals of the conservation works plan. While team members had clearly defined roles, all were prepared to assist others without hesitation. Examples of this were many and varied, with a few listed below:

- All members of the team worked together to remove snow and ice from the roof planes to facilitate the carpenters' prime task of over-cladding the roof planes of the living quarters of the Main Hut
- Ted, Marty and Christian (Ian on rarer occasions) regularly took over evening cooking duties to give Simon a break
- Domestic duties were shared without the need for rosters with all team members willingly washing/drying dishes, refuelling generators, collecting snow for water etc.

2.3 The Conservation Works Program:

2.3.1 Overview

The major achievements are as described in the Executive Summary, in the detailed reports of individual team members that follow this section and as further summarised below:

- Approximately 80 m³ of snow and ice were removed from the roof planes of the living quarters to allow over-cladding to be undertaken.
- The roof planes of the living quarters of the Main Hut were over-clad with Roofshield® membrane and Baltic pine tongue and groove timber.
- The Campbell Scientific environmental monitoring system was modified to remove redundant and/or damaged sensors and to relocate sensors to the most appropriate locations.
- Vibration and stand alone temperature/relative humidity data loggers were installed in and around the building
- Corrosion cells were installed inside the building and in the external environment to monitor corrosion rates so that the impacts (if any) of the changes to the roof structure can be determined.
- Small amounts of snow and ice were removed from areas in the living quarters of the Main Hut to reveal more of the fabric, artefacts and structures.



The roof of the Living Quarters as first observed by the team on their arrival at Cape Denison, October 2006

A few objectives of the Works Plan were not achieved during the expedition. Areas of possible snow ingress had been previously identified during the 2002 and 2005 expeditions. It was known, for instance, that drift snow still penetrates the building at some of the junctions between the roof and the walls in both the workshop and the living quarters and it was hoped to undertake remedial work to seal these areas during this expedition. Unfortunately the unusually high snow coverage did not allow external access to these areas, thereby preventing work being done to seal these breaches and to over-clad the south wall of the Main Hut. No snow was removed from areas of recent ingress however, apart from where it had entered via the roof, leaving the recent build-ups to act as defacto 'seals' to continued ingress of drift snow. No work was done to excavate ice to floor level in the area of swing of the entrance doors to the workshop, something that was considered premature at this stage and could not have been completed in the time frame of this expedition.

A fourth unachieved outcome related to the environmental monitoring system. In order to allow the system's Iridium satellite phone to be recognised by the Iridium network, an outgoing call needed to be made via the modem. This could not be done, an outcome that restricts data retrieval during the year. Whereas it was hoped to be able to call into the Iridium phone at Mawson's Hut at regular intervals to retrieve data, this will not be possible this year. The environmental monitoring system will continue to accumulate data but this will not be available until it is downloaded during the next expedition to the site.

2.3.2 Adherence to the program

The clear priorities in the works plan and delineation of expeditioner duties meant that there was little deviation from the overall program during the expedition. As the main task was to over-clad the roof of the living quarters of the Main Hut this was the focus of all initial activities. No work was undertaken on the environmental monitoring system for instance, until roofing activities were completed.

With respect to compliance with the works plan, the following points should be noted:

- Recently installed, modern cover battens were identified and removed prior to the over-cladding work.
- Existing flashings and existing ridge capping were left in place, under the over-clad sections.
- All fixings and techniques used were in accordance with the works plan.
- Recent areas of snow ingress were noted and recent accumulations were removed except at the wall/ceiling junctions. Where remedial work could not be undertaken to prevent future ingress, snow banks were left in areas of past build-up.
- While no new black plastic sheets were laid to monitor ingress, existing sheets were replaced after removal of recent accumulations.

- No ice was excavated at the entrance to the workshop to allow the doors to operate.
- A small amount of ice was removed from the shelves in the kitchen area, from above Mawson's cubicle, the SW and SE corners, on the eastern wall and the NE corner (see Marty Passingham's report for more details).
- No artefacts were fully excavated as part of the ice removal process, with exposed artefacts left with adherent ice attached *in-situ*. Excavated areas were photographed in detail to reveal the locations of objects but condition reports were not prepared because encapsulating ice prevented a full examination of partially excavated artefacts. Bottles partially exposed on a sloping kitchen shelf were left encased in hard ice with their necks tied with string to prevent damage in the unlikely event of a prolonged thaw.
- No ice was removed from the floor areas.
- Monitoring programs continued as per the works plan with one exception. Contradictory instructions in the 2006 Works Plan and the instructions issued by the Australian Museum for the thermocouples saw these sensors removed. I accept responsibility for this as I acted on the instructions contained in the Australian Museum guidelines without adequately consulting the Works Plan as prepared by Adrian Welke. Note that of the 6 thermocouples that were removed, only 3 were operational with the others either severed during previous ice removal work or not embedded in the subfloor ice (see section 6.1.2 for details).

As stated previously, the unusually high snow coverage prevented work to seal other breaches in the external skin of the building and to over-clad the south wall of the Main Hut. When roofing activities had been completed, the focus of the team's work then shifted to that which could be completed inside the Main Hut (environmental and corrosion monitoring, snow/ice removal), in the visual protection zone near the Main Hut (removal of the wood stack from near the Granholm Hut) and at the Sorensen camp (extension of the decking and construction of stairs). These latter activities, while not specified in the in the Works Plan, were undertaken to either improve the aspect in the Mawson's Huts visual protection zone or to improve the general amenity of the Sorensen field camp.

2.4 Resources and Training

The expedition team was very well resourced with very regard to food (except for the lack of vegetable varieties), good quality tools, electrical equipment, spares, gas heaters, computers, cameras and communication equipment.

As there was no doctor in the team it was incumbent on all team members to exercise the greatest of care in all activities. While we had the benefit of Chris's vast experience in the field and advanced training in paramedical matters and the presence of Senior First Aiders (Ted and Ian) in the team, it would have been more comforting if helicopter assistance had been available from Dumont D'Urville should an emergency situation have developed. If

similar teams are selected in the future, timing of the expedition should be examined not only with regard to the likely effects of weather on the work programs but also with regard to the availability of helicopter transport from the French station.

Depending on the composition and experience of future teams, it is advisable that pre-departure training sessions are held for team members in which maintenance and trouble-shooting are covered for the quads and generators.

2.5 Compliance with Environment Protection and Biodiversity Conservation Act 1999:

All activities were conducted in accordance with the requirements of the Environmental Protection and Biodiversity Act 1999 and the Mawson's Huts Historic Site Conservation Management Plan 2001 (adopted by the Commonwealth Government in 2002). They were also consistent with Australia's obligations under the Antarctic Treaty 1959 and the Protocol on Environmental Protection to the Antarctic Treaty 1991 (the Madrid Protocol).

Over-cladding the living quarter's roof, while changing the weathered appearance of the hut and therefore having an impact on its aesthetic values, was essential to ensure maximum preservation of the external building fabric and the artefacts contained within the building. Each year battens and fabric (remnants of sailcloth, canvas and rope) were being blown from the roof and subsequently lost from the building. Over-cladding the roof has ensured that all of this remaining evidence of Mawson's attempts to 'snow-proof' the building will be retained and protected.

Removal of the flagpole from the apex of the building and its replacement with a replica, a temporary measure while conservation options are being considered for the original, has given the whole roof a more uniform appearance that will age gracefully to develop a weathered patina over time. While the repatriation of the flagpole was not envisaged in the original works plan, the decision to remove it for essential conservation work (with a view to returning it to the historic site) was taken during the course of the team's work, and is documented on file. The decision was taken under permit condition number 6, which required activities to be consistent with the relevant Antarctic Treaty management plans. These management plans state that structures and artefacts may be removed if removal is essential for conservation purposes and require the AAD to be informed if any item is removed.

In November, the works team informed the AAD of the precarious condition of the flagpole and requested instructions on what action to take in order to conserve it. The AAD received advice from Adrian Welke, the heritage architect responsible for the works plan, who recommended returning the flagpole to Australia for assessment and appropriate conservation action. Subsequently, on 4 December 2006, Dr Press agreed that the pole should be removed and instructed that it should be delivered to the AAD for assessment and conservation.

While great care was taken to avoid any damage to the original timbers of the building during ice and snow removal activities, small nicks were observed in a couple of places on the southern roof plane of the living quarters. These were documented. In order to minimise this sort of damage, ice removal was undertaken using the following regime:

- A probe was used to determine the depth to the ridge capping (non-original materials). This was used as a gauge for the depth to which chain saws could be safely used to cut ice/snow blocks for removal.
- Shovels were used to remove snow to a depth approximately 10-15 cms above the roof plane.
- Wooden wedges and gently percussion were used to remove the remaining snow and ice.
- Where necessary, gentle brushing was also used to remove fine snow adherent to battens etc

Kitchen and other wastes were bagged and returned to Australia (RTA) for disposal, human wastes (urine and faeces) and grey water were disposed of into the sea according to protocols developed prior to the expedition and all operations were conducted so that there was no interference with wildlife and the environment in general.

... ..

Work programs involving the use of power tools and quad operations were conducted so as to minimise disturbance to the animal species that inhabit Cape Denison over the spring/summer period. Thus breeding colonies of Adelie penguins, storm and snow petrels, South Polar skuas and resting Weddell seals were unaffected by the team's operations during the expedition.

The work undertaken also had no effect on soil and vegetation at the site. The unusually high snow coverage ensured that rocks and associated lichens were well protected. Exposed boulders and rocks were not in areas in which work operations were conducted and were therefore unaffected by these activities.

No melt streams developed for the duration of the expedition and the high snow coverage meant that activities did not impinge on the melt water lakes that are usually present at Cape Denison. There was also therefore, no possible contamination of the marine environment via transportation of pollutants from the land to the sea via summer melt streams. Refuelling of the quad bikes was undertaken at the Sorensen Hut while refuelling of generators took place at both the Sorensen Hut and adjacent to Mawson's Main Hut. The refuelling locations were neither in the catchment areas of lakes or melt streams nor at the ice edge. There were no spillages of fuel at either location and therefore no potential contamination of melt streams (none present), lakes or the ocean.

Removal of the timber, previously stored adjacent to the Granholm Hut, to a new storage site north of the Sorensen Hut, significantly improved the aesthetic value of the visual protection zone of the Main Hut valley.

2.6 Logistics:

2.6.1 Timing of the Expedition:

Previous experience of an October arrival at Cape Denison (2002 expedition), led to concerns being raised prior to the expedition about the timing of the 2006 expedition. It was considered that low temperatures and poor weather would affect the ability of the team to complete the works program by restricting work opportunities and increasing the levels of discomfort associated with external work programs. Strong winds and a blizzard only a few days after arrival, coupled with the unusually high snow coverage on the site, confirmed these fears.

In addition to the more difficult working conditions associated with an early arrival at Cape Denison, lower temperatures led to higher gas consumption, to difficulties in maintaining the quads in operational condition (they didn't like the cold that much either!) and problems with the disposal of urine and grey water, the latter of which froze inside their containers if strong winds delayed their emptying for short periods of time. These frozen blocks of waste could only be emptied after time was spent thawing the perimeters of the drums to 'free' them from their containers.

Timing of the expedition was therefore less than ideal. The early start to the season also meant that there was little opportunity for the winter snow build-up on the huts to ablate, a factor that increased the workload for the team.

2.6.2 Pre-departure preparation and planning

Apart from input into the Works Plan, I had minimal involvement in pre-departure planning and preparation. It was obvious when I arrived in Hobart a week prior to departure however, that pre-departure activities had been very well coordinated. Rob Easter's vast experience in expedition logistics and preparation, the past experience of team members, the presence of Chris and Marty in Hobart in advance of the rest of the team and wonderful support from AAD staff ensured that most necessary arrangements had been taken care of well in advance. Pre-departure briefings in the final week, about the policy framework, operational requirements of the project and a detailed examination of the Works Plan, further emphasised essential aspects of the expedition and prepared team members for the forth-coming tasks.

2.6.3 Shipping Operations

The expedition team travelled to within 70 kms of Cape Denison aboard the French Polar Institute vessel *L'Astrolabe* before being flown by helicopter to the final destination. Accommodation on *L'Astrolabe* is basic but comfortable and the meals were of a high standard. There was very little storage in the

cabins for valuable equipment and personal effects however and of the 6 small cupboards available for the expedition team in our cabin, only 4 could be used - one did not have a door and another door was held closed with gaffer tape. This posed some problems during periods of pronounced rolling experienced during the trip.

The French team are highly experienced and the Master, Voyage Leader (VL) and crew were cooperative at all times, attempting to facilitate our operations as much as they could within the constraints of their own operational priorities. Despite the good relationship that was established with the VL, closer collaboration would have ensured a smoother disembarkation of the expedition team and of our cargo.

As *L'Astrolabe* was not available for the return voyage, the team travelled back to Australia aboard the privately-owned ship *Sarsen*, something that was very much appreciated by all team members. It is a very comfortable ship, with excellent facilities including single cabins for all team members. As this was its maiden voyage to the Antarctic however, cargo operations were problematic. Cage pallets previously loaded in readiness for helicopter operations (on the basis that RTA was to be aboard *L'Astrolabe*) had to be unloaded and all cargo then individually transported to the *Sarsen*. As it was not possible to load the empty cage pallets on the *Sarsen* they were towed back to the helicopter fly-off area for repatriation in a subsequent expedition. The expedition team raised concerns about some aspects of the cargo handling processes and environmental standards for both shipping operations and the AAD have undertaken to follow these up with the respective operators.

2.6.4 Helicopter Operations

Standard briefings were held with the expedition team and the Australian pilots prior to helicopter operations commencing. Following these briefings the pilots were given copies of the Cape Denison Flight Path and Bird Colonies map. Interestingly the only GPS data the pilots had for 'Mawson' pertained to Mawson Station and not to Cape Denison (would have made for an interesting flight!). Cape Denison's approximate coordinates were supplied to the pilots.

The expedition team was deployed prior to the commencement of cargo operations, with Ted, Marty, Chris and Angus on the first flights. Ted, Marty and Chris's prior experience with helicopter operations meant that appropriate sites were chosen for cargo operations, that these operations were as safe as they could be and that unloading operations were able to take place concurrently at 2 sites (main valley and Sorensen Hut). Cargo operations were completed over the ensuing 2 days as and when the wind eased sufficiently to allow helicopter operations.

As long as there is appropriate pre-deployment consultation with the VL, helicopter operations are a very efficient way of delivering cargo to locations as close as possible to where it will be needed. As previously stated however, (see Shipping Operations), consultation with the VL was not as good as it

should have been, leading to a somewhat ad hoc loading operation. Despite this, most items were delivered to their preferred locations with timber being taken to the main valley and food, gas cylinders etc taken to the Sorensen Hut. Because of the long fly-off distance and the VL's preference for internal loads, some of the cage pallet loads were broken down and transported internally. Thus, although unloading zones had been previously specified for particular pallets, mixing of items in the internal loads meant that some were delivered to the wrong destinations, causing additional work for the team.

The delivery of cargo in marginal and gusty wind conditions also compromised the team's safety. Despite cautions previously expressed regarding the use of cord rather than cable ties (Expedition Report 2002)¹, the latter were still used for some nally bins resulting in one lid flying off and being lost during unloading operations. This, combined with team members having to handle containers from internal loads in windy conditions adjacent to helicopters that had not shutdown, contributed to a less than ideal environment for safe cargo operations. Of additional concern were flights over water without the provision of immersion suits for passengers. At the earliest opportunity our pilot flew to the plateau to minimise the risk should the helicopter be forced down.

2.6.5 Field Camp:

The Sorensen Hut is well equipped and, under most circumstances, is spacious enough for 6-8 expeditioners. The dining/working area does become very crowded however if most of the team needs space to work using computers or other equipment and the general comfort level should be improved for prolonged stays. Some of these aspects are highlighted below:

- Storage space is limited for food/drink that cannot be stored externally and for clothing, packs etc.
- Seating arrangements must be improved. Low stools without backs are uncomfortable, are likely to contribute to back and neck pain and should be replaced with better quality seating.
- The mattresses are at the end of their use-by-date and should be replaced, preferably with something that will not suffer as much as the current mattresses should they become wet and then freeze.

The provision of gas heaters that could be used to melt snow and ice was an excellent move that assisted in helping to keep the interior at a more comfortable temperature while simultaneously producing much needed water for the team. Gas supplies were only just sufficient for the duration of the expedition. Five 9 kg cylinders were on site when the team arrived, 24 of the same were delivered and only 4 remained when the team departed. The cold start to the season and the delayed pick up contributed to the higher than anticipated gas usage. The use of the 9 kg cylinders allowed for easy handling and accurate monitoring of the rate of gas usage, a potentially critical issue should unintended delays occur in repatriation (as occurred during the 2006 expedition).

The electrical wiring system is substandard, potentially dangerous and needs urgent attention. Work was done to allow the cable from the generator to pass through an inlet in the kitchen wall, rather than via the door to the Sorensen. This earlier arrangement was obviously unsafe and also allowed drift snow to more easily enter the building during windy and blizzard conditions. Attention to this and to the rest of the cables that run through the building is necessary to ensure that the wiring system complies with relevant safety standards and does not pose a risk to expeditioner safety.

Minor improvements were made to the Sorensen base during the current expedition – the platform was extended along the full length of the hut to create more external storage space, stairs were constructed at the entrance to the Sorensen Hut and improved seals were installed on the toilet and Apple doors.

Simon did a very good job and has provided a comprehensive report detailing all aspects of the running of the camp. It is worth reiterating the need to provide a more extensive range of vegetables (frozen is obviously appropriate) to allow for greater variety in meal choices.

Sleeping arrangements were acceptable with 3 of the team opting to sleep in tents, one in the Apple and one in the Sorensen. This arrangement ensured that someone was present in the Hut at all times to monitor the communications equipment while still giving all members of the team some privacy and a space in which to retreat should they need some quiet time. The second bunk in the Sorensen was used for food storage.

Consideration should be given to extending the Apple platform to accommodate another Apple for future expeditions. This will provide another more comfortable accommodation option for those not particularly partial to tent-dwelling.

2.6.6 Field Equipment:

The quads and trailer are essential for efficient operations at Cape Denison. Some difficulties were experienced in keeping the quads fully operational in the early part of the season, with the lower temperatures affecting starting and consistent running. Provision of new batteries and spark plugs each season (including spares) and quad servicing and maintenance training for expeditioners may improve their reliability.

Ted, Marty and Chris used the RMIT sleds as the basis for constructing a large sled ('The Spirit of Denison'). This proved invaluable in transporting the timber from the Granholm to its new location just south of the Sorensen Hut and for moving large quantities of cargo during RTA operations. It is recommended that this sled be kept in its current configuration and that additional RMIT (or similar) sleds be taken to the site for the next expedition.

With the exception of the large diesel generator, all power supplies performed quite well, albeit with the necessity to frequently 'deblizz' those used at the

Sorensen Hut. It may be worthwhile considering the construction of a permanent box and a better location for the Sorensen generator(s) to reduce on-going maintenance requirements. The current blizz box arrangement is acceptable but does not prevent the build up of ice in the generator, makes refuelling difficult in windy conditions and leads to damage to the outer plastic housing of the generator when using the starting rope. It is also recommended that fuel decanters be provided that match the capacity of the generator tanks. These can be filled, ready for use, when the generator runs out of fuel. This will inevitably reduce the time spent refuelling and substantially reduce the possibility of fuel spills that are more likely when refuelling from 20 litre containers in often windy conditions.

Michael Staples made numerous recommendations in his report (2002 Expedition Report)¹ and I strongly urge that these be followed up as a priority when the next works program is organised.

Communications were generally good, but there is room for improvement. As mentioned in Chris's report, improved aerals for the VHF and the satellite phone systems are needed to improve reliability and quality.



'Spirit of Denison' sled (version 1.1) with Sorensen Camp in the background showing the new stairs and extended platform (photograph by Simon Mossman)

2.7 Occupational Safety and Health:

As there was no doctor on the expedition team, safety was stressed at all times and the team were aware of the importance of safe practices regardless of the nature of the activity. To reinforce this aspect Chris, the team medic, conducted first aid and search and rescue workshops for the team whenever

windy conditions prevented external work being undertaken – this was a frequent activity for the early part of the expedition! These sessions not only refreshed the first aid skills of the team but also acted as a constant reminder of the potential dangers and isolation of Cape Denison.

Fortunately Chris's services were only called upon on a few occasions. Ted suffered an injury to his patella after a fall on rocks near the Sorensen hut, most of the team were affected by pins and needles in the hands and forearms after hard physical work in the early part of the expedition (diagnosed as Hand Arm Vibration Syndrome - HAVS) and Ian did a Bon Scott/Mamma Cass impersonation by attempting to choke on a Panadol tablet and later on some gristly beef! The latter incidents were carefully monitored by Chris but required no intervention on his behalf. Warmer weather and less hard physical work eased the HAVS symptoms and Ian learnt to chew his food more thoroughly!

During over-cladding activities a trench approximately 1.9 m deep had to be dug to expose the southern roof plane, with shallower trenches on the eastern and western planes. A safety fence was constructed on the deeper eastern and southern sides.



Safety fence on the southern side of the Main Hut

Good quality clothing was provided by the AAD. Despite this there were still numerous zip failures and occasional tears in new clothing (Chris's freezer suit being one such classic example). The provision of Sorells and Glacier boots allowed these to be alternated for drying, giving additional comfort to all. The AAD provided a large range of quality clothing, something that gave the

team options to deal with both the weather changes experienced over the duration of the expedition and with changes in levels of physical exertion.

Down or lambs' wool (Ugg) boots were particularly effective for indoor wear, providing the necessary warmth for expeditioners when they were not particularly active.

2.8 Tourist Activity:

Cape Denison was visited by two tourist ships over the expedition period, the *Spirit of Enderby* (17-19 December) and the *Sarsen* (27-28 December).

The first visit was one of complete contrasts. Rodney Russ and his team delivered food and additional supplies on the 17th December, but deteriorating conditions prevented passengers from disembarking on that day. While the next day started out promisingly the conditions deteriorated quite markedly after approximately 40 tourists had been put ashore. Heavy snowfalls and 25 knot winds made conditions quite unpleasant for many of the tourists. The Granholm Hut proved its worth on this occasion with many of the elderly tourists (and the not-so-elderly) sheltering there and in the Sorensen Hut until the numbers of those waiting to tour the Main Hut diminished.



Visit to Cape Denison by tourists from the Spirit of Enderby (photograph by Simon Mossman)

The 19th was quite magnificent in comparison, a balmy, calm and sunny day that allowed the visitors to freely roam the area in complete safety and comfort. The team gave a few more tours of the hut to those who either missed out the previous day or who simply wanted to spend more time soaking up the ambience.

The *Sarsen* arrived on Boxing Day but conditions did not allow visitors ashore until the 27th December. Tours of the hut, for about 30 tourists and crew, were run concurrently with RTA cargo operations and final 'winterising' of the quads, the Sorensen Hut and finally of Mawson's Main Hut itself.

All tours were conducted in accordance with the AAD guidelines and the tourists complied with instructions regarding access to the hut and with respect to the maintenance of appropriate distances from native fauna. The extreme snow coverage meant that there was no risk to the artefact scatter north of the Main Hut.

2.9 Recommended future works:

Over-cladding the roof of the living quarters of the Main Hut was the last major building project associated with the stabilisation of the historic buildings located at Cape Denison. Its completion is a significant milestone in the long-term protection of this icon of Australia's Antarctic heritage. There is more work that must be done in the coming years to stabilise other buildings, to prevent snow ingress into the Main Hut and to conserve artefacts and structures inside the buildings. Some of these, including tasks not completed during the 2006 expedition, are listed below (in no particular order of priority).

2.9.1 Reduction of snow and melt-water ingress:

While the roofs of the workshop and living quarters will now prevent snow ingress via these routes, it is known that snow still penetrates the building at other points. To reduce this build up, to maintain the spaces revealed in the interior and to protect and conserve internal artefacts and structures, future work at the site should involve the following:

- Recording of recent snow/ice ingress
- Investigation of possible sources of ingress with special attention to the wall/ceiling connections in both the workshop and the living quarters
- Removal of all recent accumulations (unless these are to be left to prevent future ingress)
- Sealing, with highest priority given to external surfaces, using accepted techniques of cover battens and compressive sealing strips
- Protection of artefacts in areas where future ingress may occur
- Monitoring of future ingress using black plastic sheets
- Investigation of the option of freeing both doors to the entry of the workshop in order to provide a better seal to this area. This investigation should include an assessment of the risk of snow or melt-water restricting the opening and closing of these doors. See the Mawson's Huts Historic Site Works Plan 2006² for a more complete discussion of this aspect of future works.

2.9.2 Over-cladding of the south wall of the Main Hut:

Over-cladding of the south wall of the Main Hut is deemed necessary because some of the boards on this wall are abraded to the point that they are on the verge of failure, cover battens attached to this wall are being lost and importantly, openings in the south wall contribute to the ablation of the snow bank that has built up in the verandah. This snow bank is considered important because it provides a buffer to the internal hut environment and a thermal mass to the whole building.

Despite recommending that over-cladding be undertaken in the future it should not be commenced until work has been completed on sealing the inner wall-ceiling junction, an area of known snow ingress. By delaying over cladding it may increase the rate of ablation in this area, thereby allowing easier access to the wall-ceiling junction, reducing the workload associated with snow/ice removal and also minimising the risk to the fabric of the building during this process.

The scope of this work is as outlined in the 2006 Works Plan².

2.9.3 Continuation of the monitoring program:

The monitoring program is designed to provide information that guides conservation management decisions. It is important that the program continues. Currently the following parameters are being monitored:

- Temperature and relative humidity
- Vibration of structural components
- Corrosion of ferrous objects

Monitoring of temperature and relative humidity, in correlation with corrosion studies, provides clear evidence of any changes that may occur, or have occurred, in the internal environment as a result of changes to the external fabric or because of ice removal from interior spaces. While it is anticipated that the recent over cladding of the roof of the living quarters of the Main Hut will not affect the internal environment it is important to record the internal conditions so that current data can be compared with that measured prior to changes to the roof structure.

Vibration data, obtained from data loggers attached to structural timbers in both the workshop and the living quarters provides important information regarding any movement of the building during high wind periods. This is important in light of continued ice removal from the internal spaces which some consider may impact on the structural integrity of the building.

2.9.4 Ice removal/artefact excavation in the Main Hut

Continued ice removal will reveal more of the internal spaces, significant fabric and artefacts inside the Main Hut. It has been demonstrated that the removal of substantial amounts of snow and ice from the Workshop and living

quarters has not affected the internal environments of these spaces thus far. It has been recommended that either a 200 mm (2006 Works Plan) or 600 mm (EPBC Act approval) layer of ice be retained on the floor of both areas. Retention of this layer will maintain the thermal mass of the sub-floor and physical mass assisting in the holding down of the structure and protect both embedded artefacts and those that will inevitably be found at floor level.

As continued ice and snow excavation is likely to reveal many previously undocumented artefacts, archaeological and conservation input is required during this process. Prerequisites to the removal of ice have been described in the Conservation Management Plan of 2001³ and in the 2006 Works Plan². Ice and snow removal must only take place under the guidance of a conservator and/or archaeologist and among other things should take into account the following:

- Employment of an appropriate mix of techniques to safely release embedded artefacts (see below).
- Monitoring of the internal environment during ice removal procedures.
- Thorough archaeological and conservation documentation of exposed/excavated artefacts (descriptions, location, condition etc).
- Ice removal must not proceed in an area if there is any risk of damage to embedded artefacts. The snow/ice should be left to naturally ablate, a process that has been observed elsewhere in similar situations.

Techniques that have been used with success elsewhere include percussion hammer drills with a chisel bit (eg Dynadrill - highly recommended for most areas but must not be used near embedded glass), manual tools including ice saws, ice picks, chisels etc, solar melting and artificial heat sources including hot air guns and possibly mini gas torches. Note that the choice of technique and equipment will be determined by the nature of the snow/ice to be removed, the nature of any embedded artefacts and the potential risks to artefacts and the building fabric. Any ice excavation technique must be endorsed and supervised by a conservator or archaeologist before it is applied. Naked flames cannot be used in any internal spaces.

Research conducted at Wilkes over the period 1995-2003 has clearly demonstrated that if snow ingress is stopped, snow and ice in a building will slowly disappear over time (Ambrose and Godfrey, paper in preparation)⁴. Embedded artefacts at Wilkes were freed without damage when the ice was left to naturally ablate from a small sealed building. This approach is therefore strongly recommended if ice removal poses a risk to embedded artefacts.

Related to the above observation is the issue of retention of either a 200 or 600 mm layer (see above) of ice on the floor of the Main Hut. It is likely that, if the building can be completely sealed against snow ingress, the floor level ice layer will slowly diminish over time, with obvious implications for embedded artefacts and for objects at floor level. This should be taken into account when considering future access and movement through the Main Hut.

2.9.5 Development of an interpretation plan for the interior of the Main Hut:

In order to formalise and clearly define how the interior of the Main Hut is to be interpreted it is important that an Interpretation Plan is drawn up for the building. It appears to be generally accepted that the interior of the Main Hut will not be restored to a state that resembles the more 'museum-like' interiors of Shackleton or Scott's huts and numerous statements have been made regarding interpretation and conservation. In the draft document *Mawson's Huts and Mawson's Huts Historic Site: Management Plan 2007-2012*⁵ for instance, the following statements are made:

".... it is desirable to reveal significant fabric and spaces by removing snow and ice from the internal rooms of the Main Hut to restore it to its original configuration." (p 55-56)

"Movable objects will be conserved and interpreted in situ wherever possible." (p 59) and

"Cultural heritage objects which do not have an association with the site will not be introduced for the purposes of interpretation." (p 59)

It is important to define, in one place, how the interior of the hut is to be interpreted and to state this unambiguously. The plan should also take into account the likely eventuality of full exposure of the floor (and associated artefacts) in both the workshop and the living quarters with consideration of how interior access is then to be managed.

Future conservation work will necessarily be guided by this plan and interpretation will be simplified. For instance, the above statement re restoring the hut to its 'original condition' is open to interpretation itself. Is the original condition that which prevailed during the period that Mawson and his team were living in the hut, as it was when they left the building in 1914 or as it was after Mawson's BANZARE visit when more items were removed from the interior of the hut?

Once decisions have been made regarding interpretation of the interior of the Main Hut, based obviously on significance assessments, the implications for internal conservation and restoration processes will be clearer. The following recommendation for future conservation work for instance, is based on the assumption that interpretation of the interior will not include a component designed to show the 'passage of time' aspect, particularly that associated with the damage done to internal structures by snow and ice over time. This recommendation for future conservation work should only be followed therefore once an Interpretation Plan has been prepared and endorsed.

2.9.6 Reinstatement of damaged internal fittings:

It is recommended that where it is clear that internal fittings have been damaged by snow ingress or ice build up, that the fittings be conserved and

reinstated (if possible), subject to this complying with the endorsed Interpretation Plan for the interior.

This recommendation applies particularly to shelves, many of which have been damaged by accumulated snow and ice buildups. Care is needed with this work as many damaged shelves still hold artefacts embedded in ice and snow (eg above Mertz's bunk, in the workshop etc).



Damaged and sloping shelving in the south east corner of the Workshop

2.9.7 Conservation of artefacts on site at Cape Denison:

Where possible artefacts should be treated at a conservation facility to be established adjacent to the Sorensen Hut. This recommendation is based on the experiences of the teams that have worked on artefacts from Shackleton's Huts at Scott Base in the Ross Sea. While there are obvious and important differences in the infrastructure, logistics and support systems available at Cape Denison compared to Scott Base, on balance the advantages of on-site conservation appear to outweigh the disadvantages. Work during the 2007/08 season should focus on the following:

- Establishment of the on-site conservation facility, testing of equipment and preparation of a functional layout for commencement of full conservation operations in 2008/09.

- Determination of treatment priorities for already excavated/available artefacts based on previous condition reports and an examination of recently exposed artefacts in the Main Hut.
- Review of the chemical and equipment requirements needed to commence a full conservation treatment program in 2008/09 based on the identified treatment priorities. It is obviously critical that all necessary equipment and materials are available on site and that there is back up for critical items.
- Determination of optimal packing and transportation arrangements to ensure that artefacts are not damaged in transit to and from the Main Hut.
- Preparation of guidelines for laboratory practices and procedures to ensure that work flow is optimized, wastes are managed appropriately and that all operations comply with OH&S standards.

There are also some potential occupational health and safety issues in the Main Hut that must be considered prior to the next expedition. Mould samples have been taken from timber and artefacts and the results of this testing will be known before the next expedition. The presence of asbestos cladding and an assessment of any risks associated with numerous chemicals (labeled and unlabelled) needs to be addressed during the coming season. Hence the following recommendations:

- Exposed asbestos cladding should be assessed to determine the risk of fibres becoming air-borne. Unless it appears to be extremely friable the asbestos should be left undisturbed.
- Representative samples be taken from the dust and detritus on the darkroom roof and on adjacent kitchen shelves to determine the presence or otherwise of asbestos fibres.
- Snow and ice removal from the areas described in kitchen and darkroom areas not be undertaken until the results of asbestos testing are available.
- Analytical samples be taken from unlabelled containers, including broken ones, to determine the nature and composition of their contents.

View to the kitchen, showing asbestos sheets on the kitchen/outer darkroom wall



Broken chemical jar, darkroom floor

2.9.8 Documentation of the Transit, Absolute Magnetic Hut and Magnetograph House:

If, unlike the 2006 season, all of these buildings are visible during the 2007/08 season, it is recommended that they be inspected and recommendations made regarding possible stabilization work.

Only a small part of the Transit Hut was visible during this expedition but it was obvious that the timbers have deteriorated markedly and there is a significant risk that some of the planks will break and be blown away in the near future.

Unfortunately because most of the Transit Hut was buried, timber thicknesses could not be measured in areas that had been previously measured in 2002. However some indication of the rate of abrasion was gained from measurements taken of the backing board attached to the replica memorial plaque on Azimuth Hill. Timber loss averaged almost 1 mm per year from January 2002 to December 2006. This incredibly high loss of wood substance does not bode well for structures that are already designated as being 'standing ruins' (Transit Hut and Absolute Magnetic Hut).

2.9.9 Improvements within the Visual Protection Zone:

In order to improve the aesthetics of the Visual Protection Zone the following recommendations are made:

- Relocate the timber stack, currently buried south of the Main Hut, to the newly established timber storage area near the Sorensen Hut.
- Ensure that the 4 cage pallets left at the helicopter landing site are returned to Australia sometime during the 2008/09 expedition.
- Paint the Granholm Hut in colours and in a style that will allow it to blend into its rocky background.

The first two recommendations are straight forward but the latter is a little more problematic. The Granholm Hut has clearly demonstrated its usefulness as both a storage area for tools, equipment and supplies and as a refuge for visitors and expeditioners alike. Thus in order to minimize its impact in the visual protection zone, it is recommended that it be painted in colours sympathetic to the landscape and in a style that will allow it to blend in with its surroundings. In this way the benefits of the Granholm Hut can be maintained while minimizing its impact on the heritage values of the Mawson's Huts Historic Site for the period that the building is still considered important as an on-site refuge and storage area.

2.10 Recommendations for future expedition planning:

Recommendations specific to the 2006 expedition are outlined below. In order to ensure that the best outcomes are achieved for future expeditions these

should be read in conjunction with the detailed recommendations previously compiled by Diana Patterson in the 2002 Expedition Report¹. Unfortunately many of these earlier recommendations were not implemented but as the situations that prompted these earlier recommendations still exist, they should also be considered as part of the planning process for the next expedition.

2.10.1 Pre-departure planning and preparation

General:

- *Expedition schedule:* While expedition timing is necessarily constrained by shipping schedules, it should be determined by the nature of the work programs and the availability of helicopter transport from Dumont D'Urville. This latter point is critical, particularly should a medivac situation arise and if a doctor is not included in future expedition teams. It is strongly recommended therefore that expeditions occur over the summer period (December/January).
- *Lead time:* It is essential to ensure that there is sufficient time available for the acquisition of goods and equipment, particularly if other voyages are programmed for similar times. This will be important if future teams leave in December, as recommended.

Packing:

- Fuels and gas must be packed separately to general goods.
- Daypacks, including sleeping bags, must be available to expeditioners at all times, particularly for travel when disembarking.
- Pallets must be loaded in reverse order of priority to ensure that high priority goods and equipment are accessible for the earliest possible fly-off.

Catering:

- *Vegetables:* Of the fresh vegetables taken to Cape Denison, only the carrots and garlic lasted well into the expedition. Packs of assorted frozen vegetables are strongly recommended for future trips.
- *Condiments:* Assorted spices and herbs and the following condiments are needed for future expeditions - packet sauces and recipe bases; tomato paste; Tabasco sauce; tomato sauce; BBQ sauce; Chilli Sambal sauce; Vegemite; Maple syrup
- *Kitchen equipment:* The following items are recommended - a set of good steel knives, a casserole/oven dish, two or more plastic or metal spatulas, large pasta bowls, various-sized plastic storage containers and a few fresh tea towels, an extra can opener, an electric kettle and highly recommended is a small microwave oven.

Training:

- Courses in small engine operation and maintenance, quad servicing/trouble-shooting and the basics of gas/electrical appliances (for the upkeep of stoves, heaters and electrical equipment)
- Some of the team members should either possess Senior first aid or wilderness first aid level qualifications or be given that level of training so that there is some back up for the designated medico (doctor or medic).
- Depending on the background of the expedition team and the nature of ship to shore operations, team members should be given basic instructions with respect to helicopter cargo operations in the field.

2.10.2 Ship to shore operations:

- It is strongly recommended that helicopter operations be used whenever possible.

2.10.3 Sorensen Hut

Electrical/lighting system

- Needs urgent attention to the cabling and connection to the power supply
- Install a weather-proof external connection point and circuit breaker (circuit breakers on the blizz boxes did not work and had to be bypassed) to improve connection to the generator and overall safety.

Generators and Blizz boxes:

- The circuit breakers did not work on both blizz boxes and must be attended to.
- The generators used during the 2006 expedition used quite a bit of oil and need a thorough service.
- A protective plate is required over the plastic casing of the generator to reduce damage to the casing.
- A suitable, sheltered location needs to be found for the generators.
- Refuelling needs to be simplified, by either arranging it so that the generator can be connected to a larger capacity external fuel tank (outboard hose type arrangement?) or having a filler tank with a capacity that matches that of the generators.

General Amenity

- Space is limited, particularly for longer expeditions where larger quantities of food/drink cannot be stored externally, and for clothing, packs etc.
- Seating arrangements must be improved. Low stools without backs are uncomfortable, contribute to back and neck pain and should be replaced with better quality seating, preferably with adjustable height settings.

- The mattresses are at the end of their use-by-date and should be replaced, preferably with something that will not suffer as much as the current mattresses should they become wet and then freeze.
- Consideration should be given to adding another apple or a melon either at the existing tent platform or as an extension to the existing apple hut platform.

2.10.4 Communications and electronic equipment:

- Improved aeriels are needed for the VHF (whip aerial needed) and the sat phone systems (dedicated fixed external antennae for both phones).
- Recommend the use of throat microphones and ear pugs for communications in 40-knot winds.
- An investment in Garmon Rhinos is also recommended – they are personal, hand held location devices that have the potential to enable every user to locate every other team member in the area. They have a built-in UHF radio and GPS and are very useful for SAR.
- Unless a male to male adapter is provided, the laptop to be connected to the monitoring system must have a male serial port to allow it to be connected to the logger.
- While the Motorola iridium satellite phones and the UUPlus email system worked very well, it may be worthwhile considering an alternative specialist product for future expeditions. In short, Human Edge Tech's solar-powered South Pole expedition package includes satellite phone handset, airtime, digital camera, PDA, all cables, all installations, software and expedition email, lightweight solar panel and pelican case, for \$US4,927 (\$A6,240) - available from www.humanedgetech.com. This product was recommended by Eric Phillips (tour guide on the *Sarsen*).

2.10.5 Quads

- All quads need a service and an oil change, something that should be able to be done on site.
- A full set of new tyres is needed for one quad.
- Repairs are needed to 2 seats
- A new tow hitch is needed for one of the quads as one was used for the draw arm on the Spirit of Denison sled

2.10.6 Medical

- Need for either a SKED stretcher (most preferable) or at the very least one or two RMIT or similar sleds to replace those used to make the larger Spirit of Denison sled. This would assist greatly in the event of a Cas-vac back to the hut or for patient transfer to either chopper or zodiac.
- Oxy Viva – more cylinders are needed to allow multiple jobs to be undertaken if needed.
- Stabilisation: Supplementation of the remote first aid kits with a Penthrane inhaler and the inclusion of a lightweight 4-season tent with the SAR gear would allow stabilisation of a casualty on site for a prolonged period.

- A local area SAR plan needs to be written and procedures understood for future teams at Cape Denison.
- Having an experienced FTO or mountaineer on these trips is very useful and should be compulsory on every trip. Chris had a full pack with survival and rescue gear ready to go at all times.

2.10.7 Tools and equipment:

- More chaps are required, in bigger leg sizes (large) with fastex buckles (not zips) to fasten around the leg.
- Two new helmets are needed (one for each saw on site)
- More silicone leads are also required as these are the only suitable leads for the site.
- Purchase ice excavation equipment to trial during the 2007/08 season, including a percussion hammer drill, with chisel bits (Dynadrill) so that ice excavation techniques can be tested.

3. HERITAGE CARPENTER'S REPORT 1

Martin Passingham

The following is a report on the extent of work carried out at Cape Denison during the 2006 expedition. All work was carried out as per the works plan (Troppo Architects)² and in accordance with decisions made on site by Dr Ian Godfrey.

3.1 Ship-to-shore operations

On arrival at Cape Denison ship-to-shore operations were carried out by crew aboard *L'Astrolabe* and the Mawson's Huts Foundation (MHF) expeditioners. The use of helicopters was extremely successful, with efficient transport of all our materials and supplies.

Ship-to-shore operations on the return voyage were carried out by inflatable boats, an often risky option, although successful in this instance. Unfortunately we were forced to leave behind four cage pallets and some minor items, as they would not fit in the IRB. Use of IRB's requires extremely good weather and a willing crew for the operation to be safe and efficient.

3.2 Over cladding of the main roof

It was overwhelming to see the quantity of ice and snow engulfing the buildings at Cape Denison on our arrival. Unusually high levels of ice made only twenty percent of the roof planes visible. The first job to be undertaken was excavation of the roof planes from where an estimated 80 cubic metres of ice was removed. This was achieved by digging with shovels and cutting the ice into manageable blocks for easy removal. Fortunately, the lack of blizzards during this excavation period allowed us to achieve the goal of uncovering the roof planes ready for over cladding.

The northern plane, being the smallest and most protected, was chosen as the starting point. The over cladding was carried out as per works plan which started with a layer of 20mm battens, then the membrane fitted with an appropriate lap, followed by the second layer of battens and finally the tongue and groove boards. The battens were fitted with a 100 mm 10 gauge screw which penetrated both battens through the original fabric and into the structural member of the hut roof. The cladding was fitted to the battens with a 50 mm class 3 coated Robertson type screw. Every fourth cladding board was fitted with a 100 mm class 3 coated Robertson type screw for extra bonding to the original plane. The quality of the Baltic pine tongue and groove appears to be expectable, as no major movement or shrinkage was observed after installation.



Under battens – north roof plane



Roofshield® applied to under battens



Battens attached to Roofshield® membrane



Over cladding with Baltic pine tongue and groove timbers

The three other planes were over clad in the same manner, followed by re-fitting of the skylights and hatches. A weather-proof membrane was fitted between the skylight and the new roof plane to minimize snow ingress. This was backed up by a Sikaflex bead.

Ridge caps were folded and cut in Australia and matched the material type and dimension of the ridges already installed. The ridge cap was fitted over the new cladding and provided an exceptional seal due to the new even surface of each plane. Prior to the installation of ridge caps, the ridge line was sealed between where both planes meet. The cladding on each plane were fitted to each other allowing a small gap for expansion and contraction and this gap was sealed with Sikaflex (Sikaflex allows for small amount of movement).

With these processes in place the risk of snow ingress penetrating the building via the roof planes would be extremely low and possibly even non existent. It can be noted that an inspection was carried out during a moderate blizzard and zero snow ingress was observed. The buildings were covered with ice beyond the wall-roof junction therefore making this observation somewhat insignificant as the ice acts as a sealer to the possible points of ingress.

Never the less the new over cladding must act as a very successful barrier to snow ingress and add integrity to the structure.



Completion of over cladding and installation of replica flagpole at the apex of the Living Quarters

3.3 Ice Removal

Ice removal was carried out inside the main hut in several locations. The removal of new ice, that is ice that has penetrated in the previous years i.e. since 2002, was the first to be excavated. The two largest portions were to be found in the south-western and south-eastern corners of the main hut. These formations were to be found hanging from the ridge beams and finishing on top of the bunks in both corners. An estimate of the amounts of ice that was removed from these corners would be approximately 3 cubic metres.

Ice was removed from on top of Mawson's cubical that had also accumulated since 2002. This ice quantity would amount to approximately 2 cubic metres and was removed to the level of the plastic sheet that was installed in 2000. This plastic sheet is an indicator and separator of old to new ice layers. The extraction of this ice will give a clear indication of future ice ingress and therefore a measure of success of the over cladding. It is evident that the wall-roof junction (the inside verandah wall) is still a major point of ingress. The sealing of this junction will need to be undertaken in future visits and could not be attempted this season due to the very high ice levels and lack of access. The methods to be used in this process are stated in the 2006 Works Plan².

Old ice was removed from the eastern side of the main hut, exposing more bunks and artefacts upon these bunks. Approximately 4 cubic metres of old ice was removed from this section which uncovered artefacts not seen since work began in the 1970s. A small amount was also removed from the shelves in the kitchen (northern wall, living quarters). This removal exposed many bottles and other fragile artefacts. Special methods were used for extraction and more discussion must be undertaken before commencing future excavation.



Exposed artefacts under Laserson's 1912 bunk



Bottles exposed on upper kitchen shelf

Clearly the two main issues with ice inside the huts can be defined as old ice, and its method of removal, and new ice, which needs monitoring and also prevention of further ingress. The artefacts and fixtures inside the hut are clearly suffering due to ice ingress. The forces created by this ever moving formation of ice are contorting shelves and the artefacts found on them.

3.4 Removal of flagpole

The decision was made to remove the flagpole after inspection of its structural integrity. The base of the Oregon pole had ablated away to less than half of its original dimensions and observing substantial movement, it was agreed that failure was imminent.

Two main bolts fastened the pole in place and after much effort to ease these bolts the decision was made to cut them. This then allowed the easy removal of the existing pole and the installation of the new. The bolts were cut in such away that repair is possible without any visible effect and therefore allows the possibility of reinstallation. The corrosion of these bolts was very low matching the results from the 2002 investigation of fixings¹.

The new pole was installed in an identical manner and was made to matching dimensions. Two pieces of brass rod which were placed in matching positions to the original brass wire guides to give a true interpretation of the original pole.

3.5 Sorensen & Granholm Huts

The Sorensen Hut was found to be in good order, having its usual small amount of snow ingress. All guys and fastenings were checked and adjusted. An extension of the outside deck was carried out as was a set of stairs for access to this deck.

For the first time, the in-house electrical wiring was used and although trouble-free, some changes should be made. A weather-proof outside connection point to the generator should be installed, as should be a circuit breaker. We were relying on the generator circuit breaker and earth wire for safety.

Granholm Hut was also found to be in good condition. All plant (tools) and materials left on-site were accounted for and undisturbed. All guys and fastenings were checked and adjusted and a new lock fitted to the front door. This lock makes for easier entry to the designated shelter.

The loss of this hut would be detrimental to any work party staying at Cape Denison. Its close proximity to the working sites makes it a must for storage and shelter against ever-changing weather. There were many examples of this during the recent expedition. One such example was seen when a tourist operator transported thirty passengers ashore only to be engulfed by an extreme blizzard for the next four hours. Due to the lack of visibility a retreat to the ship was not possible. These tourists were happily contained inside the Granholm and Sorensen Huts and safety was not compromised. Work parties and tourist operators currently rely on Granholm Hut and its removal would be an impediment to safety.

The timber pile from the Granholm site has been removed and relocated 15 metres north of Sorensen Hut.

3.6 Materials & plant equipment

All materials used on the huts were of satisfactory quality and appropriate species and dimensions. All of the Baltic pine tongue and groove was used in the over-cladding process. Only previous tongue and groove remains on site (see timber list 2005)⁶. The timber pile at Sorensen has an array of dimensions and sizes that will be valuable on future visits. Unfortunately the supply of tongue and groove delivered by the French in 2003 was not visible due to high ice and drift levels and remains well north of the main historical site.

Tools and plant were in very good order and future trades people will be well kitted for most tasks. An inventory was taken of fixings and tools and will be published with this report (Appendix 1). Some small maintenance issues will be required for some tools that were RTA.

The possible inclusion of some more tools will only be assessed when the method of ice excavation has been discussed.

3.7 Recommendations

- The sealing of wall-roof junction and application of wall over cladding.
- Continued ice removal and excavation.
- Conservation of artefacts.
- The relocation of timber shelves that have been torn away by ice forces.
- The retention of the Granholm Hut.
- For efficiency, expeditions should arrive in December and return in January.
- Work parties should not exceed more than eight.
- If possible, helicopter operations for transporting of goods and people.

4. HERITAGE CARPENTER'S REPORT 2

Ted Bugg



(photograph by Simon Mossman)

"..... a 10 year vision and plan realized, arguably the most important aspect of conserving these huts to date. It's stopped the roof from being breeched and the whole lot blowing away, like the proverbial pack of cards"

Personal diary entry
Thursday, Nov 30, 2006
Day 42

4.1 Summary

It was a real pleasure to work and live with such a great bunch of blokes. The combinations of skills and experience impressed me, and I knew we had the winning combination, at pre- departure.

Marty and Chris did sterling work, purchasing tools, equipment, packing, labelling, liaising with AGAD staff and the myriad of things required, to ensure we had everything we needed. My input was only of a couple of days. Most of that time was trying to play catch-up with these blokes, and trying to be a help, instead of just getting in their way.

The *L' Astrolabe* was pretty cramped, all 6 of us crammed into one cabin, with all our packs, computers, camera gear and other personal stuff, sliding around the deck, but fortunately, the seas were fairly benign. The thought of a team member being sea sick would have set the lot of us off. We remained free of this trauma ... thankfully!

Getting bogged in the pack for a while, stirred the possum with various government officials, from both countries, and it gave the media something to write about. We all thought it a bit of a storm in a teacup though.

The 'ship to shore' operations were not up to the standard at which I usually operate. Specific comments in this area have been forwarded to the AAD for their information and action so that future operations will be conducted as efficiently and safely as possible.

The Sorenson Hut was in a good condition, although some ice had got in the usual suspect spots. I sealed these with Silastic later in the season

Marty constructed a set of steps from the rocks below and I finished cladding the deck, finishing the job which I started 9 years ago! This provided the ideal spot for keeping our 40 odd, 9kg LPG gas bottles, required for heating and cooking.

The gas heaters were a boon with a large saucepan balanced on top, melted ice and therefore provided our limited water supply. The melt lake, 100 metres behind the hut, didn't, during our stay.

The Apple Hut was partially full of snow and ice, as expected. I camped in this for the duration and fitted a new door seal early in the piece. I think with a little effort, another timber bearer could be fixed and another Apple secured next to the existing. They can comfortably fit 2 bods, but on a longer expedition, like this one, it was good to have somewhere to hide from our communal world.

The tent platforms had the quads tied down on them, so was a few days getting organised before the tents could be erected.

Hats off to Dougies men who slept, ate, worked and played in such a small space of the shack, for a winter and 2 summers.

Reports on the other stuff has been ably and capably dealt with by Chris and Marty. I fully agree with all the recommendations, especially the retention of Granholm Hut. I would fight tooth and claw for it to remain. It is a critical safe bolt hole, not only for the conservation teams, but also for the punters, who often rock up in marginal weather conditions and I observed a lack of suitable Antarctic gear worn by a lot of these visitors.

If heritage professionals have a problem with the hut, being in the *visual catchment* of the valley of Dougies Shack, a professional artist could be engaged to paint it into the landscape and thus make it disappear. This would seem the logical and practical compromise.

The main hut roofworks have been comprehensively reported on by Marty, so I am not going to repeat it here. However, the gods smiled upon us. We were all crest fallen and disheartened to see the sheer volume of drift on the roof.

At the early stages, I raised my concerns and doubts we could pull off the job. To his credit, Ian goaded us into trying, and he worked harder than any of us, Chris, Marty and myself sharing the chainsaw work, and all of us digging out the cubes and hauling them away in the RMIT sleds.

Hard labour, and casting anxious eyes southwards, we dug deeper to eventually expose the roof we had come to over clad. The blizzards stayed away, for the 2 weeks this amazing excavation was open, allowing us to finish the roof work. Sheer luck!

Ironically, I had previously thought of erecting scaffold around the sidewalls, to allow safe and efficient roof access. Instead, Chris bashed star pickets and strung it with rope to prevent us lurching, or being blown into the pit!

We didn't bring enough tongue and groove boards with us, but after sanding off the Intergrain finish of the excess 97-98 stack, it matched perfectly. The stack of Baltic pine, delivered by the French a couple of years back, remains entombed in the ice a couple of hundred metres south of the hut.

Of the other huts on site, only the top half a metre of the Transit Hut was evident and both the Magnetograph and Absolute Huts were absolutely buried, unless they had blown away between visits - unlikely.

To reiterate, I fully agree with the recommendations made by both Chris and Marty; we had excellent communication and understanding with each other both on the ice and subsequently.

Many thanks go to the supporters back home, the Legendary Project Manager, Rob Easther, (the Division won't find another bloke of this calibre in a hurry.)

David J, we did it!! A vision shared.

Tom and Bruce and their Team of Champions who drove the EPBC through the mire of Federalism, all our sponsors; the 20 minutes of calls a week kept us all sane, ... relatively; Tasmanian Parks and Wildlife Service who extended me leave to do this a 4th time, and all the friends and family who supported us in so many ways ... you are all stars!

Finally, to my friends and colleagues, Ian, long may your hulks grow barnacles, Simon, more peas or corn? Marty and Chris, you are both diamonds, brothers.

5. HERITAGE CARPENTER/MEDIC'S REPORT

Chris 'Psycho' Gallagher

5.1 Introduction:

I was contacted by Rob Easter in the middle of the year regarding the possibility of inclusion in the up and coming expedition to Mawson's hut. We discussed the possibility of a multi skill role of medic and carpenter and I decided that it would be an honour to be able to take part in such an interesting trip. I have a particular interest in conservation due to my career as a Ranger, which has seen me study cultural and natural heritage as part of my university studies. I have also been lucky enough to take part in 3 winter and 5 summer expeditions to Antarctic Division stations including Mawson station in 2000 as both a carpenter and field-training officer.

5.2 Pre-departure:

The lead up of the trip found me training a few times a week to gain my level one volunteer Ambulance qualifications as I believed that this would be the most challenging role for me to play on this expedition. It was also very helpful to me to have a fellow Ranger and friend, Ted, in the Parks and Wild Life Service to guide me in the right direction.

The packing up of gear went well but there are a few points that could be handy for future trips:

- Always pack gas and fuels separately to general goods. Place them in a separate cage pallet for delivery to the Macquarie 1. Don't rely on the Division staff to do the packing and checking of gear at Macquarie 1. We need the ability to change packing arrangements if necessary to fit in with the preferences of the ship that we are using.
- As fresh food can lead to quarantine complications, frozen bags of vegetables would be a useful addition to the expedition in the future.
- Consider possible de-canting of gas from a larger cylinder (say 45kg in liquid form) to save space (up to one whole cage pallet).
- Allow more lead time for preparation. Acquisition of goods and equipment from the different departments of the Antarctic Division takes weeks due to: other voyages leaving at the same time, finding the particular specialist we require, ordering the required equipment if they don't have it, delivery times needed to get the gear to the Division and then packing time.
- Training. One or more of the tradesmen should do a small engine course, a quad-servicing course and possibly a gas and electrical basics course (run by the Division). This would help with servicing small engines, the quads and the general upkeep of stoves, heaters and electrical equipment at Cape Denison.
- Higher level medical training for the whole team would be very beneficial for the accompanying doctor or Medic. A wilderness first aid level course that is run for 3-5 days would be most suitable.

- There are some electrical issues at the hut that need to be looked at. Possibly need a tradesman with electrical training who can run cables and conduit for the internal power and lighting at the Sorenson Hut.

5.3 Ship to shore operations

5.3.1 Chopper flights in

The ship to shore operations were substandard in comparison with my usual Antarctic experiences. We were lucky enough to have a very experienced team that could operate under harsh conditions and stay safe when all around goes pear shaped. Landing choppers in 40 knot winds is fine but unloading gear and equipment is very dangerous for crew and machines when they are landed and still have power on. Much of our equipment was taken out of cage pallets and had to be manhandled to safe distances from the aircraft. Several times loose items flew off towards the tail rotor of the aircraft. Of particular concern were fish bin lids, which in future, must be tied with cord not cable ties.

5.3.2 Zodiac trips out:

The team very much appreciated the opportunity to return to Australia on the *Sarsen*, at a much earlier date than would have been possible with the *L'Astrolabe*. The ship to shore operations however, were less than satisfactory with this operator. Details of these operations have been forwarded to the AAD for consideration when planning future expeditions.

Our workload while the *Sarsen* was at Cape Denison was very high and could have led to safety problems if the team had not been as experienced as ours. In addition to giving tours of the Hut and winterize the Sorensen and associated equipment, the team was required to unload all of our cage pallets, load the cargo onto the Zodiacs and, for the larger items, unload them at the *Sarsen*.

5.4 Accommodation

The Sorenson is an excellent hut and we had many happy times there. Future accommodation could be extended by adding another apple or a melon either at the existing tent platforms or as an extension to the existing apple hut. I like sleeping in tents and am used to long periods of time in them. Sleeping habits amongst our group were varied with one sleeping in the Sorensen, one in the apple and the rest in tents. If the lengths of expeditions were to be shorter and maybe more intense, a good sleep inside the hut or an Apple, instead of in tents, will see expeditioners in better shape by day 3 or 4 than if they were tent dwellers.

Another problem associated with the tents is that after a long period of time on the platform the melt freezing process creates solid ice around the snow skirts and the inner floor levels of the tents. This makes the breaking down of tents very difficult and inevitably leads to small tears in the fabric.

5.5 Mechanical

5.5.1 Quads.

We had trouble with the quads flooding in the first weeks of work at Cape Denison. We couldn't put it down to anything in particular apart from the fact that they do become very difficult to start when it's below -20°C . Spark plugs were regularly changed and this would fire them up. They need a service and an oil change and we should be able to do this down there. We need another full set of new tyres for one quad, which would give us 2 new sets on site and then possibly another set could be brought down on the following expedition.

5.5.2 Generators:

While the 1kva brief case gensets are beauties, they did have problems with burning of sump oil and need a good service. The blizz boxes are good but a few points need to be made about them:

- The circuit breaker on both boxes didn't work. This had to be bypassed and needs to be fixed before the next trip.
- A protective plate is required over the plastic casing of the genset above the pull cord as it tended to cut into the plastic.
- Use of an external fuel tank, say a 20 L container with an outboard hose and connector would save refueling of the genset during the day. This would reduce the number of fills to one per day rather than the 2 to 3 that we had to do.
- A suitable location is required for the gensets. A possibility may be under the deck of the Sorensen.

5.6 Medical

5.6.1 Overview

It was a real privilege to be asked to be the medic on this trip. I spent the second half of 2006 training to be a volunteer ambulance officer to help get my skills up for this trip and I think it paid off. We had a very professional crew that was very safe and careful both in the field and back at the hut. Of some concern was the management of risk due to the extra workload applied by the hut being buried. This meant that the team was exposed to more manual labour and chain saw work than expected. This required more concentration and planning to be safe. I spent a lot of time using the chain saw and I really had to concentrate to make sure I didn't slip up when using it. The trauma associated with a chain saw injury, especially if the medic is the casualty, would be horrific.



Chris, on the chain saw, preparing snow blocks for removal (photograph by Simon Mossman).

There were a few incidents that are worth mentioning:

- An expeditioner injured his knee, possibly fracturing his patella, something that caused me great concern. This required a few days with the nurse hat on and the application of pain relief.
- Hand Arm Vibration Syndrome (HAVS). After discussion with Division staff of the Polar Medicine section, I believe that our team was suffering from HAVS, especially the Tradesman. Many nights were spent wrestling with pins and needles in hands and forearms after a hard day of chainsaw and ice removal work. As caffeine and cold exacerbate the symptoms we tried to minimise their effects and found that towards the end of the expedition, particularly after the dig out phase, that the symptoms went away.
- Need for a stretcher. We had the option of using one of the RMIT sleds as a stretcher for most of our expedition but these were both used to build the large Spirit of Denison sled that is still on location at the Sorensen. Another sled or possibly a SKED stretcher would be a very beneficial addition to the medical gear. This would help with a Cas-vac back to the hut and also would mean that patient transfer to either chopper or zodiac would be much more suitable.
- Discussion with tourist ship operators and the doctors/nurse on board brought me to the conclusion that our medical gear is of a much higher standard than that of any ship that visited us during our stay. As a Medic I was relying on a Casvac to a ship in the area if necessary and believe that we would be using much of the equipment that we have with us on site on the medivac back to Australia.

- Oxy Viva. More cylinders are needed to allow multiple jobs to be undertaken if needed. I think the high probability times for which more medical assistance may be needed is when tourist ships are in the area.
- A better plan is required and leadership from people at Cape Denison to lead tourists when they hit the ground and visit the hut. Guiding in the hut itself was very well managed, but the surrounding area had many tourists spread all over the place. Each group should have a tour leader with radio comms and a schedule of times for ship to shore ops etc.
- Diet. While our cook Simon did a great job in the kitchen there was a need for more fruit and vegetables with our meals. This can be done through purchasing frozen packs of vegetables.

5.6.2 First aid training:

I ran several lessons on first aid and everyone took in a large amount of information. This gave me peace of mind and made the whole group feel better prepared for medical emergencies.

5.6.3 Search and Rescue (SAR)

I ran a few lessons on SAR and we discussed what we would do if we had to deal with such a situation. Some points to consider:

- *Location:* Communications were a problem and a better set up is needed. We need throat microphones and ear pugs for comms in 40-knot winds. Garmon Rhinos are personal, hand held location devices that have the potential to enable every user to locate every other team member in the area. They have a built-in UHF radio and GPS and are very useful for SAR. They should be used at Cape Denison. With small group sizes there can be 5 people in different areas all at the same time with not one person knowing the whereabouts of the others.
- *Access:* The glacier rescue kit is located in the Granholm Hut and will serve the area well if required. It will be very useful if rope access is required at a rescue site. Better ice screws are needed however and the use of instep crampons is limited. The Granholm Hut should be kept in place due to its purpose as a safety hut and survival refuge for expeditioners, tourists and sailors. A Garmon Rhino would be very useful in a search for a lost person.
- *Stabilisation:* The remote first aid kits are good. I supplemented mine with a Penthrane inhaler and everyone had a lesson on how to use it. The possible inclusion of a lightweight 4-season tent with the SAR gear means we could stabilise someone on site for a prolonged period, which would be handy.
- *Transport:* As quads with a sled would be best option for transporting an injured person, another RMIT or a SKED should be obtained for the site.
- A local area SAR plan needs to be written and procedures understood for future teams at Cape Denison.
- Having an experienced FTO or mountaineer on these trips is very useful and should be compulsory on every trip. I had a full pack with survival and rescue gear ready to go at all times.

5.7 Heritage Carpentry Work

Digging out the hut:

This was difficult work but I can only praise the whole expedition team for the work and support in removing the snow and ice to allow the roof to be over clad. The support shown to the trades' team by Ian and Simon was outstanding; it was a hard slog and we got it done under difficult circumstances.

Placement of the roof:

Special mention must be made of Marty and Ted here as their past experience and top quality trademanship were invaluable for the placement of the roof.

Battens:

The first row of battens went on without any problems, as did the second row, which was trenched out to allow for drainage.

Roofshield®:

This was easy to work with and place and the foil tacks made fixing straight forward. Some small holes presented after blizzards before we had time to place the Baltic pine on one roof plane, but these were easily repaired using small patches of Roofshield® and Sikaflex.

Baltic pine roof boards:

These also placed pretty easily, with only a small amount of waste due to damaged tongues and grooves.

Flashings:

A drop in the southwestern corner of the hut made the flashing kick up slightly, but this wasn't a major issue. The joining of flashings at the apex was a neat job, but wasn't lapped so this will need annual maintenance to res silicone as required.

5.8 Artefact excavation:

Some work was done uncovering artefacts.

5.9 Spirit of Denison sled:

This large sled, made using 2 smaller RMIT sleds and an oregon frame, was used to transport timber from the Granholm to the Sorensen Hut. This worked really well after version 1.3 and we need to order a new tow hitch for the quads as we used one for the draw arm on the Spirit.

5.10 Tools and equipment:

- More chaps are required, in bigger leg sizes (large) with fastex buckles (not zips) to fasten around the leg.
- Two new helmets are needed (one for each saw on site)
- More silicone leads are also required as these are the only suitable leads for the site.
- All electrical gear should be tagged and plugs changed to outdoor connections.
- The diesel gen set was useless and had no grunt. There must be a problem with the alternator, but we didn't use it much. The blizz box was handy but we still bagged the engine before we closed the box. The box should be lapped to stop blizz.

5.11 Communications.

Communications can be difficult from Cape Denison but overall I would say that it was poor.

5.11.1 Satellite phones:

- These should have dedicated fixed external antennae. There should be two of these and the phone should be plugged in and charged 24/7. As a medic I was heavily reliant on comms back to Australia. This would not have been possible on many occasions due to poor aerials, lack of charged batteries and shadows of poor reception even with 5 bars showing on the phones.

5.11.2 VHF:

- A whip aerial is needed at Sorenson to get good coverage back to the hut from outer areas at Cape Denison.
- The personal radios we used were fine but the chargers that we had did not indicate when the batteries were charged. The batteries would be flat and when placed into their cradle showed green. This happened across the board with every charge we made with the batteries.

5.12 Back home again.

We received a good welcome back at Hobart and I would like to commend the Mawson's Hut Foundation for its support to the expeditioners on our return and also to our wives and loved ones. This trip was my 7th trip to Antarctica and also my shortest stay, but was by far the most supportive. Thanks goes to David Jenson and the Mawson's Hut support team. Particular note must be made of Rob Easter, as he is an outstanding project manager and has an uncanny ability to pick suitable characters for expeditions to Antarctica, which he again did on this trip.

6. MATERIALS CONSERVATION REPORT

Dr Ian Godfrey

6.1 Environmental and Structural Monitoring:

Although the over cladding technique used during this expedition was designed to minimise changes to the internal microenvironment inside the living quarters of the Main Hut, additional buffering provided by new air spaces, the new membrane and another layer of tongue and groove timbers could potentially alter the internal environment. In order to determine any effects that may be attributed to changes to the roof structure, continued environmental and corrosion monitoring is essential.

6.1.1 Installation of stand-alone temperature/relative humidity loggers:

The Australian and Western Australian Museums supplied Tiny Tag Ultra and Tinyview data loggers to monitor the external climate at Cape Denison and the internal environment in the Main Hut located at that site. Loggers supplied by the Australian Museum collected data for the duration of the current field trip while those of the Western Australian Museum were left on site to continue to collect data for either 422 or 368 days. All loggers were programmed to commence logging at 19.00, 23 November 2006 and were in place by that time and date. The WAM loggers 35, 36 and 38 were subsequently removed from their original positions and used to check the calibration of *in-situ* Vaisala loggers under ambient conditions and when in a low relative humidity environment created using silica gel. They were subsequently reprogrammed to collect temperature and relative humidity (RH) data for the coming year. Logger information and logging positions are given in Table 1 below. Data was downloaded from all loggers immediately prior to the end of the expedition and the loggers reprogrammed so that the maximum logging period would be available for all loggers left *in-situ*.



Tinyview logger under ventilator eave



Vaisala and Tiny Tag loggers in Workshop

Table 1: Stand alone temperature/relative humidity data loggers

Logger code (serial number)	Location	Logging interval (minutes)	Logger duration (days) -finish
WAM 35 (328719)	Electroscope housing	40	(i) 23/11/06 – 4/12/06* (ii) 422 days: 23/12/06 -17/02/08
WAM 36 (328473)	Hurley's darkroom -	40	(i) 23/11/06 – 4/12/06* (ii) 422 days: 23/12/06 – 17/02/08
WAM 38 (326735)	(i) Workshop (suspended from centre collar tie) (ii) External – under eave of ventilator roof	40	(i) 23/11/06 – 4/12/06* (ii) 422 days: 24/12/06 – 17/02/07
CD 1 (147284)	2 nd highest shelf on outer wall of Mawson's cubicle	66 70	(i) 23/11/06 – 23/12/06 (ii) 391 days: 23/12/06 – 17/01/08
CD 2 (149248)	(i) Lower shelf in Mawson's cubicle (NE corner) (ii) Central collar tie in workshop	66 70	(i) 23/11/06 – 23/12/06 (ii) 391 days: 23/12/06 – 17/01/08
Aust Mus #1 (147240)	2 nd highest shelf on outer wall of Mawson's cubicle	30	23/11/06 – 23/12/06
Aust Mus #4 (164281)	Hanging from the platform, main hut living space	30	23/11/06 – 23/12/06
Aust Mus #27 (166071)	Attached to dormer on Workshop roof	30	23/11/06 – 23/12/06

* From 4 – 23 December, WAM 35, 36, 38 were used in calibration checks of Vaisala sensors at ambient and under low RH conditions.

6.1.2 Campbell Scientific/Australian Museum CR10X monitoring system:

The Campbell Scientific CR10X monitoring system consists of a CR10X data logger with 1 Mb of memory, a 25 channel multiplexer (AM25T), a terminal block, a data logger battery, an Iridium 9500 Satellite Data Module with power supply and a separate battery for the Iridium. The system has been designed specifically for use in research at Mawson's Hut to collect information provided by a variety of environmental sensors and to transmit this information back to Australia via a satellite phone from which it is downloaded by staff of the Australian Museum.

In 2002 six thermocouples and eight Vaisala temperature/relative humidity (RH) sensors were installed in a variety of locations in and around the workshop and living quarters of Sir Douglas Mawson's main hut at Cape

Denison. Subsequent to these installations data logging requirements have changed and in addition some sensors and/or sensor cables have been damaged. The main objectives of this work sub-program were as follows:

- Download data from the system
- Send a new program (MH200609A) to the data logger
- Remove existing redundant or damaged sensors
- Test, calibrate and reconnect the best 5 Vaisala HMP45C temperature/RH sensors
- Relocate sensors to the most appropriate, ice-free areas in and external to the hut
- Install new data logger and Iridium batteries
- Set up the Iridium phone and make an outgoing call from the phone to allow the system to be recognised by the Iridium network
- Dry the desiccant packs and check the battery voltages

(i) Downloading of CR10X Data:

A major problem was encountered with the first task associated with the environmental monitoring system. Although tools, equipment, hardware and software requirements were listed prior to the expedition no precise specifications were given with respect to the nature of the 9 pin serial port to which the data logging system is to be connected. Unless a male to male adapter is provided, the pc to be connected to the monitoring system must have a male serial port to allow it to be connected to the logger. This major failing meant that, although the WA Museum laptop taken for this purpose had the required software (PC208W and Hyperterminal) installed, because it only had a female serial port it could not be physically connected to the CR10X data logging system. This had the potential to prevent all work being done on the system – a basic, but potentially very serious flaw in the instructions and specifications.

It was fortunate that another member of the expedition team had a laptop with a male serial port. Copying and installation of PC208W and Hyperterminal programs onto this computer then allowed most tasks to be completed. The importance of this point should not be overlooked – of the 3 laptops among the expedition team, only 1 type had both the requisite male serial port!

After overcoming this problem all data (~173,000 kb) stored in the CR10X data logger was downloaded and stored before any other work was done on the system.

Data was also collected from the system on Christmas Eve (7963 kb).

(ii) Downloading of the new program:

Program MH200609A was successfully sent to and installed on the data logger.

(iii) Removal of redundant/damaged sensors:

All thermocouple leads (x6) were disconnected from the AM25T multiplexer, with 3 of the thermocouples removed from the positions in which they had been installed. Three thermocouples could not be completely removed because of the amount of snow and ice coverage or, as in one case, because it could not be dislodged from the ice in which it had been embedded. Thermocouple numbers are those previously assigned by Linda Clark and Mike Staples (Expedition Report 2002, pp 4-5, Materials Conservation Report)¹. Thermocouple locations are described in the 2002 report¹. In summary:

- Thermocouples 3 (8), 4 (9) and 6 (11) were removed totally. Thermocouple 6 (11) was removed without the necessity of melting any ice from around the thermocouple tip, indicating that, at the time of removal at least, it was not embedded in ice. Measurements for this sensor may not therefore be a true reflection of sub-floor ice conditions.
- Thermocouples 1 (6) and 2 (7) could not be removed completely due to the extensive snow and ice coverage in and around the workshop verandah. The cable to sensor 2 (7), embedded in ice below the verandah trapdoor had been cut previously when ice was removed to gain entry to the hut during the 2005 expedition. These cables should be removed in subsequent expeditions when there is greater thawing of snow and ice in and around the workshop.
- Despite attempts, using a syringe and hot water, to melt the ice surrounding the tip of the thermocouple, a short lead and the tip of thermocouple 5 (10) could not be removed from its location in the NW corner of Hurley's darkroom. It was subsequently snipped off about 2 cms above floor level (see below) The cable to this thermocouple had been previously cut (2005 expedition) during ice removal in the kitchen area of the Main Hut.

Eight Vaisala temperature/RH sensors were installed in a variety of locations during the 2002 expedition. Of these, two (#5, #7) were severed during the 2005 expedition when ice was removed to gain entry to the Main Hut via the workshop door. These sensors had been located at the NW corner of the workshop in order to monitor external climatic conditions. As a result of the damage to these sensors, T/RH sensor #2, formerly located on the west wall workbench in the workshop was relocated to an external position (December 2005)⁶, mounted on a timber pole to the left of the entrance door to the workshop, with the sensor tip protected in a radiation shield about 400 mm above the edge of the roof. Unfortunately, despite its newly elevated position, this sensor was embedded in snow and ice during 2006. When excavated it was found to have been severely damaged, presumably by the pressure of the covering snow and ice. The radiation shield and sensor were bent, almost at right angles to the post, movement that broke the sensor in half, irreparably damaging the sensor. The cable and sensor were removed from this location.



Damaged sensor housing located above the Workshop door

Sensors #5 and #7 were still deeply buried and could not be recovered from their original locations. The cables attached to these sensors were cut just inside the western wall of the verandah, the cables traced back to the logger box and disconnected while the residual cable and sensors were left for future removal during a time of greater thaw. Sensor #2 and its associated cable were removed in toto and disconnected from the multiplexer terminal block.

(iv) Testing, calibration and relocation of Vaisala temperature/RH sensors:

The relationship between sensor numbers and locations for the 2002 and 2006 expeditions are given below (Table 2):

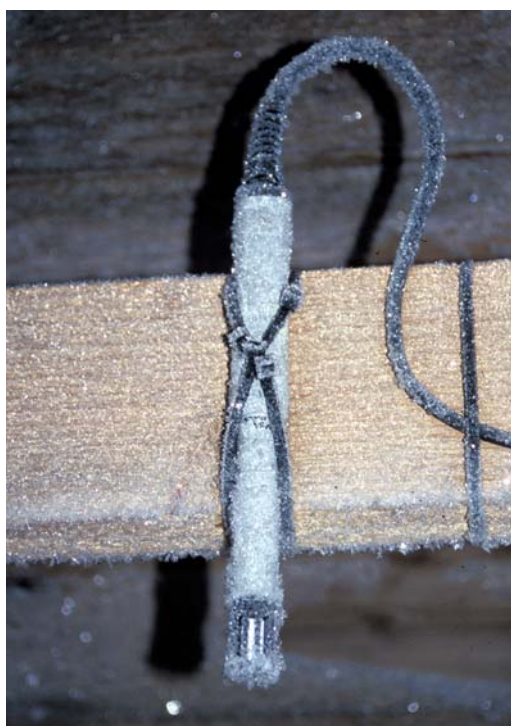
Table 2: Vaisala sensors – 2002 and 2006 locations

2002 number	sensor	2002 location	2006 sensors in order of attachment to multiplexer	2006 location	sensor
1		Workshop - NE	1	Workshop - centre	
3		Main hut - platform	2	Main hut – platform	
4		Workshop - SW	3	Workshop – apex	
6		Main hut apex	4	Main hut – NW platform	
8		Main hut – bookshelves	5	Main hut - apex	

As the works program called for the best 5 sensors to be installed and reconnected to the logging system, there were no decisions to be made as to which comprised the best 5 sensors as there were now only 5 apparently undamaged sensors. These sensors were reconnected to the AM25T terminal

block for testing and calibration. In order to be able to compare sensor performance from year to year, the numbers given to particular sensors during the 2002 expedition were retained with the sensors then connected to the multiplexer in ascending numeric order.

The results of testing and calibration are provided in Appendix 2. When first inspected, 3 of the 5 functional sensors (#3, 6 and 8) were found free of snow and ice while 2 sensors (#1 and 4) were covered with hoar frost, #1 lightly covered and #4 heavily covered with hoar frost. In order to gain an indication of the performance of all Vaisala loggers, new Tinyview data loggers were placed next to the Vaisala sensors and readings compared for both logging systems. As the Vaisala loggers that were covered with hoar frost gave inconsistent readings, surface hoar frost was carefully brushed from them and the sensor tips were placed in a sealed plastic bag containing silica gel and a Tinyview data logger. In addition to allowing the sensors to be dried out, response times and final temperature and RH data could also be compared. This process was applied to the 5 remaining sensors. These data are presented in Appendix 2.



Sensor #4 with hoar frost cover



Drying and calibration check of Vaisala sensor

After approximately 3 days of drying in the low relative humidity environment created by the silica gel filled, sealed plastic bags, all sensors appeared to be functioning well, with this prolonged drying being particularly beneficial for sensors #1, 4 and 6.

In all cases the Vaisala loggers gave readings that were slightly higher than those given by the Tinyview data loggers. Even though the Tinyview loggers were new and calibrated, they were then placed in the same plastic bag,

sealed and left for 11 days so that their respective performances could be evaluated. In general, Tinyview WAM 35 gave RH values that were approximately 2-3% lower than for WAM 36 and WAM 38. This was not a consistent trend however. Temperatures agreed closely for all loggers. In conclusion it can be stated that although all Vaisala loggers respond much more slowly to changes in RH conditions than did the Tinyview loggers, the readings given by the sensors are quite accurate within the tested range (12 – 98% RH).

In order to obtain measurements for external ambient temperatures and relative humidities, sensor #4 was moved from its location in the SW part of the workshop to the pole fixed to the workshop door. After some periods of blowing snow this sensor was inspected and found to be coated in ice crystals with moisture present in the solar shield as well. When its performance was checked, it gave impossible readings (RH values ranging from 212 to 9999% and temperatures of 41 to 180 °C) indicating that the presence of ice on the sensor tip was causing problems. The sensor was removed from the pole and dried overnight in a sealed plastic bag containing silica gel. As placement back in the same location would inevitably lead to similar problems, the sensor was relocated to the apex of the workshop and its performance checked (see Appendix 2). The performance of this sensor (#4) was compared with that of sensor #1 that was also located in the workshop, albeit at a lower position on one of the central collar ties, and with the sensor (#6) located at the apex in the Main Hut. Although the initial RH readings appeared a little low for sensor #4, later checks indicated that the sensor was operating well (see Appendix 2).

Of concern however was the performance of sensor #6. Although earlier indications were that drying with silica gel had improved its performance, later data from that particular sensor was nonsensical. Sensor #6 connections to the multiplexer were checked and found to be good and therefore not the cause of the inappropriate readings being given by the sensor. Because of the lack of time to fully re-evaluate the performance of sensor #6 it was replaced at the apex by sensor #8. Sensor #6 was moved to a position attached to the platform just south of the stove.

In order to ensure that external ambient data was collected for comparison with the internal environment of Mawson's Huts, a Tinyview data logger (WAM 38) was screwed to the underside of one of the roof timbers that cover the ventilator in the workshop. This position is substantially shielded from the sun and is protected from moving drift snow. Tiny Tag logger (149248) was moved from Mawson's cubicle to the centre of the workshop to provide data to supplement that of the Vaisala loggers in the case of the latter being adversely affected by hoar frost or snow ingress during the year.

The final locations of all Vaisala and Tiny Tag temperature and RH loggers are given above (Tables 1,2).

(v) Installation and checking of batteries for data logger and iridium phone:

The old batteries were disconnected and new batteries connected to the system. Two problems were encountered in installing the batteries. Firstly, the leads from the logger battery were too short to allow it to be connected to the CR10X logger, necessitating joining of wires cut from the old battery to give sufficient length for a connection to be made. Secondly, despite the recommendation made by Michael Staples (Expedition Report 2005)⁶, regarding the maximum dimensions that the battery boxes should occupy, the supplied battery boxes were too big to fit comfortably into the logger box without harshly compressing the wires attached to the multiplexer, something that would have jeopardised the integrity of these connections.

The logger battery was subsequently placed outside the logger box, with the battery leads entering the logger box via holes drilled in the side of the box. These holes were subsequently sealed with carpenters' putty in order to help maintain a low RH environment inside the logger box.

Voltages for the new data logger and iridium phone batteries were 14.45V and 14.89V respectively. The entire electrical system was checked and it was confirmed that appropriate voltages were being delivered to all components of the logging and iridium systems. In order to facilitate future work on the logging system, schematics and photographs of the current wiring arrangements for the logging and Iridium system are presented in Appendix 3.

(vi) Make an outgoing telephone call from the Iridium phone:

In order to allow the Iridium phone to be recognised by the satellite network and therefore allow incoming calls, it was necessary to initiate an outgoing call from the Iridium phone that is connected to the environmental logging system. Problems were encountered in what should have been a straightforward task. Although all aspects of the Hyperterminal program appeared to operate as they should, all settings were as specified and appropriate voltages were delivered to all components, an outgoing call could not be initiated. When the laptop was connected, no successful attempts were made to type in the required AT command that was necessary to initiate the dialing process.

Despite extensive advice from Alex Thomas of Campbell Scientific no changes could be made to the system that would allow an outgoing call to be made.

(vii) Drying the dessicant packs:

The desiccant packs were dried in the Sorensen oven at 110 °C for 24 hours. These were then sealed in plastic bags containing silica gel until being placed back in the logger box at the completion of work on the system and final sealing of this box.

6.1.3 Installation of vibration data loggers:

The Australian Museum, Western Australian Museum and the Australian Antarctic Division supplied Tiny Tag Plus data loggers to monitor vibration levels in the Main Hut and workshop at Cape Denison. Loggers supplied by the Australian Museum were used to collect data for the duration of the current field trip while those of the Western Australian Museum and the Australian Antarctic Division were left on site to continue to collect data for a further 447 days. All loggers were programmed to commence logging at 19.00, 23 November 2006 and were in place by that time and date. Logger information and logging positions are given in Table 3 below.

Tape and cable ties were used to attach loggers to original building fabric while screws were used to attach loggers to non-original building materials.



Vibration, Vaisala and Tinyview data loggers at the apex of the living quarters

Some of the vibration data collected during the expedition period is likely to have been compromised by over cladding and flagpole removal activities. Dates on which hammering may have affected data have been recorded as have been the ambient wind speeds for the duration of the expedition. These will be correlated when analyses are made of all the vibration data. An initial examination of this data indicated that the only significant vibrations were recorded when the replica flagpole was being installed, indicating that the vibrations were therefore due to hammering and not a reaction to strong winds. It is anticipated that the vibration loggers located near the electroscope housing will be the only ones affected by work-related activities.

Table 3: Vibration data loggers

Logger code (serial number)		Location (original/non-original fabric)	Logging interval (minutes)	Logger duration (days) -finish
WAM (239668)	V1	Queen post in Main Hut, just above the kitchen shelf (original) Moved and screwed to non-original timber attached to the Queen post (23 Dec)	40	447 - 13 Feb 2008
WAM (310425)	V2	Collar tie near kitchen (E-W) in Main Hut (non-original)	40	447 - 13 Feb 2008
AGAD (319484)	V1	Structural timber near apex of Main Hut (original) Moved and screwed to base of replica flagpole (23 Dec)	40	447 - 13 Feb 2008
AGAD (319483)	V2	Central collar tie in workshop (non- original)	40	447 - 13 Feb 2008
Aust (204243)	Mus	Structural timber near apex of Main Hut (original)	2	Stopped on 23 Dec 2006
Aust (159168)	Mus	Collar tie in workshop (non-original)	3	Stopped on 23 Dec 2006

6.1.4 Corrosion cells and experimental artefacts:

Corrosion cells and experimental artefacts, previously installed in December 2002 were located and removed from the Main Hut and environs as per the details given in Table 4 below (Expedition Report 2002)¹. These materials were exposed to different microenvironments during the time of their exposure as evidenced by the state in which they were found (eg covered in snow, embedded in solid ice or in a snow/ice free state) and by their varying states of deterioration. All experimental artefacts and corrosion cells were removed on 24 November 2006 except the corrosion cells from Anemometer Hill and the workshop roof (removed 26 November)

As it is important to gather quantitative information regarding corrosion rates after changes to the roof on the living quarters, copper/steel corrosion cells and CLIMAT bolts were installed in most of the positions from where they were removed during this expedition. Additional cells and bolts were installed on a kitchen shelf in the Main Hut and buried under snow and ice in the workshop. Burial of a set of copper/steel coupons and CLIMAT bolts under snow and ice will allow corrosion data to be compared with that gathered for cells and bolts in different microenvironments, particularly those in snow and ice-free locations.

The complete burial of the Magnetograph House prevented the removal of corrosion cells and experimental artefacts that had been installed there in 2002.

Table 4: *Experimental artefacts and corrosion cells*

Object(s)	2002 Code	Location	State when found	2006 objects
Paper/leather	MH1A	Mawson's cubicle, lower shelf, NE corner	Snow and ice free	
Corrosion cells	2703/1165		Snow and ice free	1125/1014
Paper/leather	MH2A	Hurley's darkroom, shelf, NE corner	Snow and ice free	
Corrosion cells	2704/1167		Snow and ice free	1123/1112
Paper/leather	MH3A	Outer N wall of Mawson's cubicle, 2 nd shelf from the top	Snow and ice free	
Corrosion cells	2705/		Snow and ice free	1121/1091
Paper/leather	MH4A	Main hut, centre of E wall above upper bunk (CL 1912)	Snow and ice free	
Corrosion cells	2706/		Snow and ice free	1131/1111
Paper/leather	MH5A	Hurley's bunk (JFH 1912), shelf above bunk, N end of W wall	Snow and ice free	
Corrosion cells	2707/1172		Snow and ice free	1119/1092
Paper/leather	MH6A	Workshop, W side, on ice shelf, ~ 0.3m above the vice	Embedded in ice	
Corrosion cells	2708/		Snow and ice free	1138/1113
Paper/leather	MH7A	Workshop, W end of S side	Snow and ice free	
Corrosion cells	2709/		Snow and ice free	
Corrosion cells	2702	Workshop roof	Snow and ice free	1118/1110
Corrosion cells	2701	Anemometer Hill	Snow and ice free	1126/1115
Corrosion cells		Workshop, NE corner, covered with snow/ice		1139/1116
Corrosion cells		Main Hut, lower shelf next to workshop door		1117/1109
Paper/leather*	MH8	Magnetograph House, shelf, NE corner		
Corrosion cells	2710/			
Paper/leather**	MH9A	Workshop, ice shelf, ~ 1.2m above floor level, N side		
Paper/leather	MH10A	Workshop, on logger box, ~ 1m above floor level, SE corner	Sprinkles of hoar frost on both	
Paper/leather	C1A	Main hut, on JGH 1912 bunk, centre of W wall	Embedded in thick ice – this was chipped out and air dried (	
Paper***	C2A	Main hut, ice platform, in kitchen area, ~ 2m below ceiling	Found on wooden shelf, immediately below the platform	

* Not located due to complete burial of Magnetograph House at time of the expedition

** Not located due to extensive snow ingress on northern side of workshop

*** Not located initially, possibly misplaced during intervening ice removal in this area (2005)

6.1.5 Moisture testing:

The moisture contents of internal timbers were determined using a Protimeter Mini C moisture meter with crude data recorded in Appendix 4. Data included in this report is uncorrected and should be adjusted to give accurate values for the wood type being measured (Baltic pine and oregon). In many cases extensive hoar frost coverage prevented measurement of moisture contents. In general the readings this season were all slightly lower than those recorded

in January 2001 for the same timbers. This may have been due to the lower ambient temperatures experienced this season (ice present in the wood rather than moisture). In summary, moisture contents of:

- planks on the walls of Hurley's bunk were in the range 18-22%
- structural bunk timbers were in the range 18-22%
- panels on the dark room door were in the range 18-22%
- the planks on the NW outer corner of Mawson's cubicle were in the range 19-23%
- the planks on the outer NE corner of Mawson's cubicle were in the range 21-26%
- original timbers in the platform (average of 5 measurements for each of the posts and rafters) were in the range 19-22%
- replacement timbers in the platform (average of 5 measurements for each of the rafters) were in the range 15.5-16.5%
- the eastern wall, FBH bunk were in the range 20-23%
- The eastern wall, upper bunk (CL 1912) were in the range 18-22%

6.1.6 Mould sampling:

The living quarters and workshop were inspected to identify areas and artefacts that appeared to be affected by mould or bacteria. Where mould or bacteria appeared to be active, samples were taken in order to:

- Determine the presence of microorganisms on sampled materials
- Identify any microorganisms found
- Determine whether identified microorganisms are potentially dangerous to human health and/or damaging to artefact material types

Samples were taken using a sterile swab (Transwab® for aerobes and anaerobes) supplied by Professor Tom Riley of the University of Western Australia. Sample descriptions and locations are given below (Table 5).



Artefact tray showing mould growth

Table 5: Mould samples taken from the Main Hut:

Sample Number	Description and location from where sample was taken
1	sample boxes used for experimental artefacts and corrosion cells
2	wooden boxes (sledging rations) under CL 1912 bunk
3	5 th plank up from the floor, outer NE corner of Mawson's cubicle
4	Pages of the book (The Crimson Sign by Keightley) on the 2 nd top shelf, outside Mawson's cubicle
5	Trousers hanging below the acetylene plant
6	Seal blubber (?) on the shelf above the entrance to the workshop from the Main Hut
7	Part of the contents of the rustiest tin on the shelf in McL 1912 bunk
8	Label on the apple syrup containers, top shelf of McL 1912 bunk
9	Paper label (Antwerp/Amsterdam) on the lower shelf, McL 1912 bunk
10	Potato on the floor below FJH 1912 bunk
11	Boards on the wall of FJH 1912 bunk

6.1.7 Timber abrasion - thickness monitoring:

Timber thicknesses were measured using digital vernier callipers during the 2000/01 and 2002 expeditions. While it was planned to remeasure the same timbers during the current expedition, the extensive snow coverage prevented this for all but the plaque attached to the Memorial Cross. These data are provided in Appendix 5 as are those of the 2000/01 expedition.

Despite the small time interval between corresponding measurements, It is clear from the data that very significant abrasion has occurred. The backing board for the plaque has abraded to the point where it has virtually worn away at its extremities. The only areas in which the timber thickness is unaffected are those afforded physical protection either by fastenings, rocks or the memorial cross itself. While it is acknowledged that the rate of abrasion will vary with location over the Cape Denison historic site, the rate of loss of wood substance from this elevated position is very high. In exposed areas abrasion rates ranged from about 0.6 mm/year to nearly 1.3 mm/year.

These data provide compelling evidence of the destructive effects of wind-borne particles.

6.2 Flagpole removal, documentation and packing:

The stake at the apex of the Main Hut, referred to hereafter as the 'flagpole' or 'pole', was well documented in the Material Conservation Report, contained within the 2002 Expedition Report¹. In this earlier report it was noted that the flagpole was "...very fragile and visibly moves in medium and strong winds".

An *in-situ* examination of the flagpole revealed severe abrasion of the timbers, primarily on the windward side and particularly in the region at which it protruded from the ridge capping/flashing. Years of abrasion by wind-borne snow and ice had taken a heavy toll of the wood, leaving a corrugated, 'splintery' surface that runs the full length of the pole from its tip until the point at which it enters the Main Hut. This has arisen by preferential erosion of the less dense earlywood fibres. At its narrowest point, just above the roof, the pole has lost more than half of its thickness and its surface is characterised in

places by fine splintery areas that are at risk of being lost due to increased vibration and abrasion. An area of recent loss at the top of the pole provides evidence for this type of damage (see Appendix 6, SE face of pole).

The flagpole was observed to vibrate in moderate winds (20 – 25 knots). This motion was exacerbated by the presence of copper alloy bolts higher on the pole that made it even more 'top heavy' and increased its instability. In order to reduce this instability, these bolts were removed while permission was sought to remove the flagpole as a whole so that it could be returned to Australia for conservation. After a full examination of all options, informed decisions can be made regarding its return to the site.

6.2.1 Removal of the flagpole:

While details of the flagpole's removal are described in Marty Passingham's report, some additional details are provided here.

Initial attempts to remove the two bolts attaching the pole to the apex of the roof were unsuccessful, with iron corrosion products effectively 'gluing' the bolts in place. As the use of percussive methods to free the bolts carried the risk of damage to the upper, abraded section of the pole, after communicating with Adrian Welke (consultant heritage architect) the decision was made to cut the bolts. The good condition of the bolts and the tightness of the join between the pole and the structural timbers complicated the procedure in which a hacksaw blade was slid between the pole and the timbers to which the pole was attached. Despite the tightness of the join, minimal damage was done to the base of the flagpole during its removal.

Once the bolts were cut, the flagpole was gently lowered into the Living Quarters. During this process, some green fibres from the Roofshield membrane were ensnared in the fibrous surface of the pole.

6.2.2 Condition report following removal:

While some aspects of the general condition of the flagpole are given above, further information relating to the condition of the flagpole is provided below and in Appendix 6 (images and sketches).

The condition of the exposed part of the pole is in stark contrast to that of its base which was protected inside the apex of the building. The base of the pole retains its original dimensions, a feature that allowed a replica to be made for installation while decisions are made about the future of the original pole. The base is quite heavily stained, presumably from exposure to grease and smoke during the hut's occupation while the exposed portion of the pole has the appearance of fresh timber, a product of the constant abrasion that has removed worn and weathered surfaces.

The presence of staining around holes (small and large) indicates the former presence of metal fastenings. Fastenings still attached to the pole include a tack, screw and the remains of the bolt that was sawn through to free the

pole. The former fastenings, found at the junction where the pole left the building were presumably used to hold the flashing in place. Small amounts of silicone are also present at the point where the pole met the roofline, evidence of the attempts made to reduce the ingress of drift snow. Also present in this region are grey-white deposits, possibly lead corrosion products from the lead flashing that was installed during conservation work undertaken in 1978.

Large fittings attached to the pole, such as the various bolts used to attach wires to the electroscope, acted as physical barriers to the abrasive wind-borne snow and ice. This is clearly shown by the increased timber thicknesses in these regions (see Appendix 6), again demonstrating that physical protection is the best form of protection for the wooden buildings and associated fittings in this particular environment.

6.2.3 Packing for return to Australia:

As there were limited materials available to pack the pole for its transport back to Australia, let alone appropriate archival materials, compromises had to be made in this process. The materials and techniques used to pack the pole are summarised below:

- A pine box was constructed to hold the pole.
- The base of the box was lined with foam cut from a standard 'roll mat'.
- Two pieces of roll mat were cut to fit the box, with the central part of each of the mats cut to match the profile of the pole. This allowed the pole to be supported while restricting any lateral movement. These mats were glued in the box using silicone (acetic acid cure).
- Small roll mat blocks were cut and glued in the base of the box and to its lid. These were designed and cut to thicknesses such that they fitted snugly, just above the surface of the pole, to prevent its movement should the box be tipped upside down.
- The lid was screwed closed, using Robinson screws, with a driver bit secured in the lid of the box.



Flagpole packed for RTA, showing abrasion at the roof line junction point

The box was delivered personally to the ship by inflatable boat and stored on a padded surface in a cabin for the duration of the trip back to Australia.

6.3 Occupational safety and health issues:

6.3.1 Overview

As future conservation activities will focus on internal artefacts and structures an inspection was conducted to determine whether there were any substances or building components present that may pose potential risks to conservators, archaeologists and heritage carpenters working on these materials. As this inspection was conducted in a very short period of time at the end of the 2006 expedition it is indicative, rather than prescriptive, providing details of some but not all materials and structural elements that may pose risks to the health and safety of expeditioners. With the exception of recently uncovered objects, more details of these containers and substances may be obtained from the Artefact database that is available at <http://aadcm-aad.gov.au/aadc/artefacts>.

More potentially hazardous materials may be exposed as melting, evaporation, sublimation and physical removal of snow and ice exposes more artefacts and structures.



Chemicals and condiments on McLean's 1912 bunk

The presence of snow and ice and lack of time inhibited a more thorough examination. As a result, while many containers were observed, it was not always possible to determine if they were empty or still contained residues of their original contents. Bearing this in mind, materials that were noted during this survey include the following:

- Asbestos cladding on the outer eastern wall of the darkroom (adjacent to the kitchen)
- Dust and detritus on the surface of the ice above the darkroom and on ice on the upper, adjacent kitchen shelves. Although there is a very low chance that these deposits may contain asbestos fibres they should be checked.
- Batteries on the shelf above the bunk on the north eastern wall (LW 1912, RB 1913) and a very smelly substance that is contained in a large rusty tin stored on the same bunk.

Shelves on the NE corner of the outer wall of Mawson's cubicle:

- 4 bottles and 1 tin on the top shelf (labels not visible)
- 2 empty bottles (1 unreadable label, 1 = pure acetic acid); a smaller bottle containing a white solid (unlabelled); bottle containing dried fountain pen ink; Williams Imperial Ruby Birds Eye Twist (contains a sticky, orange coloured paste) – all on the lower shelf

Top shelf on the N outer wall of Mawson's cubicle:

- powdery material on a plate (possibly soap)
- bottle labelled chloroform (Wellcome) but containing a solid substance

Mawson's cubicle:

- Bottle of hydrochloric acid and what appears to be a sulphuric acid bottle (similar shape to others) – on the shelf immediately to the right inside the doorway
- Unlabelled small (~ 100 ml bottle), stoppered bottle under the bunk

Middle shelf of the former McL 1912 bunk (western wall):

- Hydrochloric acid (500 ml bottle)
- Sulphuric acid (pure, 2 x 500 ml)
- Soda sulphite crystals (x2 ? – same shaped bottles but one label is very difficult to read)
- 'Ung Acid Boric' – label is detached from the bottle
- Ceramic container with orange contents
- Elliman's Royal Embrocation (for sprains, rheumatism, sore throats etc) – 2 bottles which both contain solids
- Ether (no cap)
- Chrome alum ('paper' stopper)
- Tinct: ferriperchlor
- Ol: Olivae Opt (olive oil – solidified)

Darkroom floor:

- Broken bottle (~ 1 litre) with spilt contents (clear glass, white powder)
- Unbroken, unlabelled and sealed bottle (~ 1 litre)
- Small bottle (~ 100 ml) of Azol developer

Darkroom shelves: (chemical types only listed, not all containers)

- Soda bisulphite (x2) – small containers (50-100 ml)
- Tubes (small and larger) containing Pyro-metol developer (powder)
- Small bottle of Reytol accelerator
- Sulphuric acid
- Pyrogalllic acid
- 'Revelateur'
- Solution C

- 'Mixed Herbs'
- Rytol universal developer
- 'Mint'
- Hydrochloric acid

There were more chemicals in the dark room but time ran out before a full inventory was completed.

6.3.2 Recommendations:

- Exposed asbestos cladding should be assessed to determine the risk of fibres becoming air-borne. Unless it appears to be extremely friable the asbestos should be left undisturbed.
- Representative samples be taken from the dust and detritus on the darkroom roof and on adjacent kitchen shelves to determine the presence or otherwise of asbestos fibres.
- Snow and ice removal from the areas described in 2. not be undertaken until the results of asbestos testing are available.
- Analytical samples be taken from unlabelled containers, including broken ones, to determine the nature and composition of their contents.

7. CAMP, COMMUNICATIONS, PHOTOJOURNALISM REPORT

Simon Mossman

7.1 Food

The expedition's food supplies and menu were planned on the basis of a 60-day expedition, with about 25 per cent extra (15 days approx.) in foodstuffs as a reserve in the event of any delay. The food supplies were amply supplemented by a considerable amount of existing dried and tinned foodstuffs and other staples already in storage in the Sorensen Hut.

Expedition planners strongly advised using as much of the existing food supplies as possible, partly to save so much going to waste, but also because much of the stock was still in good, edible condition. Excellent use, therefore, was made of existing items, including: tea bags, coffee, milk powder, sugar, orange tang drink mix, bread pre-mix, butter, vegemite and other spreads and preserves, tinned fish and tinned meats, pasta, lasagna sheets, rice, Deb potato and dried vegetables, crackers and biscuits, porridge oats and other cereals, in addition to the foodstuffs ordered for this expedition.

The providores for this expedition were Purdon & Featherstone, of Hobart, and on behalf of the team I would like to compliment them on the quality of the food supplied. In particular, the fresh meat provisions made for very tasty and hearty meals, and the team members often commented on the excellent quality of the meat. Surplus meat was offered to the *Sarsen* on our return.



Original AAE cooking and kitchen condiments

Some of the fresh vegetables, while also welcome, did not fare so well. In particular, and as anticipated, the potatoes spoiled within two weeks of landing at Cape Denison and had to be stored for RTA. Fresh garlic and carrots, however, lasted for the entire expedition, and helped supplement the dried vegetables which formed part of most meals. Future expeditions would be advised to take supplies of frozen fresh vegetables and items like frozen potato wedges or potato gems so as to avoid so much fresh produce going to waste. This was certainly an idea backed by the team members, given the ease and convenience of caching frozen food supplies in a snow bank behind

the Sorensen.

Certain meals proved quite popular including shepherd's pie, lasagna, roast beef or lamb, spaghetti bolognaise and tuna or salmon pasta (when we needed a break from over-indulging on rich meats), though generally any meals that were hot, hearty and filling were always winners.

Freshly-baked bread also proved popular, especially for light lunch meals of sandwiches or with soup, as a herb or garlic bread dinner entrée or as a pizza base. The existing wholemeal bread pre-mix was very tasty and on average, two or three loaves of bread were baked every second or third day. Additionally, we benefited from a generous donation of frozen French baguettes from *L'Astrolabe*, which stayed fresh for two weeks right up until that supply was exhausted. Thanks to Rob Easter for sourcing the baguettes.

Several food items were not as popular as previous expeditions, namely tins of oysters, sardines and anchovies, jars of jam, honey and peanut butter and old muesli bars, so consequently there is a substantial amount left behind in the Sorensen, either for future use or for eventual trashing/RTA.

Despite making good use of existing food supplies, a substantial amount of dried and tinned foodstuffs remains at the Sorensen. About half way through the expedition, general consensus among most team members was that some items that were way past their use-by date should be disposed of and so initially I undertook to sort through all supplies with a view to RTA-ing the oldest items (some items had use-by dates of 2001 and 2002).

This also entailed sorting through old ration packs in six nally bins, which were stored in the adjacent Apple Hut. Not only did these rat-packs contain food items past their use-by date, but many had been plundered of some goodies, like chocolate or other convenience foods and snacks. So, I sorted like with like (eg. all packets of Deb potato in the same nally bin; all packets of Surprise vege together, and so on) and prepared the oldest stuff for RTA.

Upon learning of our delayed evacuation and likely change of plan as far as cargo loading operations were concerned, the food items initially prepared for RTA were resorted for storage inside the Sorensen kitchen (again, storing like with like), either for future use or for RTA/trashing. This at least allowed for the foodstuffs to be condensed and so do away with surplus nally bins which were only half full. A complete list of existing foodstuffs, along with their use-by dates, is attached to this report.

Aside from that, I was left wanting for nothing except perhaps a selection of jars of spices and herbs to make meals more interesting. Future expeditions would also be advised to consider taking the following food items and condiments to supplement their menus - packet sauces and recipe bases; herbs and spices; tomato paste; Tabasco sauce; tomato ketchup; BBQ sauce; Chili Sambal sauce; Vegemite; Maple syrup

Finally, I am grateful to all the chaps for stepping in to cook on occasion,

which gave me at least one night a week off. Ted, in particular, certainly delivered with Sunday roast lamb dinners while Marty and Psycho also helped with several meals, but as with any aspect of expedition life it was a team effort.

7.2 Kitchen

The Sorensen has a well-equipped kitchen which is sufficiently big enough to cook in without any dramas. Ian Godfrey opted to use the top bunk bed, leaving me free to use the bottom bunk as additional storage space for food nally bins. Equipment-wise, there is a decent selection of cooking utensils, pots and pans but future expeditions would do well to consider taking a set of good steel knives, a casserole/oven dish, two or more plastic or metal spatulas, large pasta bowls, various-sized Tupperware containers and a few fresh tea towels while an extra tin opener or two wouldn't go amiss. There is absolutely **no need** for any more potato/vegetable peelers. Given the power supply, an electric kettle would also be an inexpensive and wise investment, as would a small microwave oven. Existing equipment and utensils include:-

- 4x non-stick bread loaf tins;
- 1x aluminium mixing bowl;
- 1x colander;
- 1x 12x muffin tin;
- 3x plastic measuring jugs;
- A good assortment of different-sized frying pans and other pots and pans;
- 3x baking trays/oven dishes
- A good assortment of utensils (wooden spoons, pasta spoon and soup ladles, potato mashers, tongs, cheese grater, sieve)
- Bread knife, large general purpose kitchen/carving knife and small serrated kitchen knife
- Potato/ vege peelers
- Coffee plunger
- Stove-top coffee cafetiere (temperamental, and would be wise to buy another one in future)
- Stove-top stainless steel kettle

For this expedition, the Foundation bought and left behind at the Sorensen the following equipment: four different-sized plastic chopping boards, a set of metric measuring cups/spoons, sink plugs, an oven thermometer, another aluminium mixing bowl and a whisk.

7.3 Communications

The expedition took two Motorola 9505 Iridium satellite phone kits, each comprising a handset, AC power charger, in-car cigarette socket charger, a 'throw' aerial extension and data kit, which were provided by Renta2way in Melbourne. Each kit cost \$11 per day with a one-off \$44 connection fee,

including GST for each phone unit. The call cost was \$4.40 (inc. GST) minimum for the first minute then \$2.20 per 30 seconds thereafter. According to the final phone bills and rental cost of both satphone kits, the total bill for the expedition ended in the region of \$10,186. The communications bill was generously covered by the expedition's main sponsor, Kordia (formerly AAPCS). Kordia also kindly supplied two Dell laptops to assist with the communications as well as documentary and photography requirements.

The phone units proved to be very reliable with an excellent, constant signal once we found the best location for the aerial extension, which we ran through a hole in the western wall of the kitchen to the outside and onto the lip of the roof. This also worked well when it came to sending emails with little or no drop-out. We used the UUPlus email program which, apart from some confusion over missed emails early on, proved to be a great program and I would have no hesitation in recommending it for future expeditions. A single month's account cost \$US35 (\$A44); a three-month account \$US90 (\$A129) and I must thank Dave Killick for helping to source and set up the UUPlus program and arranging the satellite phone rental, among many other things.

In the first two weeks of the expedition, phone use was quite high on account of having to familiarise ourselves with the phone and email system and establishing approximate duration times for sending emails and photos. For example, on the voyage down it was often difficult to establish a strong enough or long enough signal, and so necessitated two or three attempts at dialling the satellite for one email drop. Likewise, for the first week or so at Cape Denison, we experimented with different locations in which to place the 'throw' aerial extension and consequently experienced some problems trying to establish a good enough signal. After just a few seconds, the line would drop out and so necessitate a few more attempts to connect to the satellite just to send one batch of emails. On some occasions when the weather allowed, I took the laptop and satphone outdoors to send emails, standing to the north in the lee of the Sorensen Hut where the satellite signal proved to be strong enough to make a single data call.

Once we'd established the best locations for the aerial, we were able to keep the duration of basic data calls to around two minutes or under. Sending a small image – 400 pixels along longest edge, 40kb approx. – for use on the website only took two or three more minutes, so the average data call when sending such pictures was five minutes or under.

To send larger images for publicity use or newspaper publication, I used a freeware file-splitting program called HJSplit (as used successfully on previous expeditions) to break up image files before attaching the fragments to separate emails and then sending. However, given the average total size of such images (300kb or more), the resultant data calls were at times as long as 30 minutes.



For the most part, we used only one of the two phones for the vast majority of phone and data calls, with the second one being kept in reserve and used to charge the spare batteries, though it was used for personal phone calls when the other phone unit was tied up.

One problem experienced with the laptops was the cold, especially first thing in the morning! Quite often, both needed to be propped up in front of the Sorensen's portable foot heaters to warm up before they would operate satisfactorily. Also, some members of the team had their own laptops on which to write their emails before transfer to the Dell UUPlus laptop for uploading, but all team members were able to access the laptop to write their emails. Most often, they would take the opportunity to write their emails while I was preparing dinner so all emails were ready for uploading later in the evening. As a general rule, uploading to the satellite in the evening worked well as we always had a good satellite signal at that time, and were also able to download a nightly AAP news bulletin at the same time. Attempts to email earlier in the day were sometimes hampered by a lack of a good signal.

Returning home on the *Sarsen*, tour guide Eric Philips mentioned a US data communications package (available from www.humanedgetech.com) that he suggested might be worth considering as a more economical product for future Foundation expeditions. In short, Human Edge Tech's solar-powered South Pole expedition package includes satellite phone handset, airtime, digital camera, PDA, all cables, all installations, software and expedition email, lightweight solar panel and pelican case, for \$US4,927 (\$A6,240).

7.4 Photography and media coverage

In addition to members' own personal cameras and equipment, Sony Australia provided the expedition with one of its new Alpha 100 10-megapixel digital SLR cameras plus a Cybershot 7-megapixel camera for stills photography work, both of which were well employed by team members including artist Angus McDonald. Sony also generously provided two HDV

video cameras and accessories to assist in documenting the works program.

7.4.1 Photography & Videography

Around 13,000 images were taken during the expedition, which included many duplicates and bracketed images, as well as individual bodies of work. For example, I was asked to photograph, when possible, a close-up view of the individual roof planes and walls of Mawson's Hut with multiple overlapping images showing in detail the weathered fabric of the building. This individual task alone, which I repeated on different days and in different lighting conditions, generated several hundred images which contributed to the overall figure.

Sponsorship photography was also a key requirement and hundreds of images were taken of sponsors' banners, clothing patches and equipment as per the sponsor photography schedule, as well as hundreds more images showing incidental sponsors' branding. A DVD disc copy of each of the sponsors' portfolios was supplied together with a general selection of images documenting the expedition and works program.



Once culled down to the most relevant, I ended up with around 3,500 images of the hut, the works program and general expedition life. Additionally, a few thousand photographs were taken of Antarctic life in general – wildlife, landscapes, seascapes and life on the outbound and return voyages – and again, many images were bracketed or multiple exposures taken of the same or similar subjects so as to ensure good coverage.

The photographs have been compiled onto several unedited DVDs and a selection provided to the expeditioners for their personal use. Additionally, discs of all relevant images have been provided to Ian Godfrey for inclusion in his report and copies will also be made to the Antarctic Division for their archives.

Approximately, 13 hours of video footage was also shot, chiefly documenting the works program and environment, as well as footage of sponsor banners, clothing and equipment.

7.4.2 Media coverage

A number of news stories and articles were filed from Cape Denison and issued by AAP, some of which were picked up by different media outlets. The

ABC and WIN Nine Network also used some of the video footage of the works program in news reports immediately after our arrival back in Hobart.

7.5 Thanks

I wish to thank the Foundation, David Jensen and Rob Easter for selecting me for this expedition. It was an immense privilege and a great and unique opportunity for which I am very grateful. I must also thank Dave Killick, without whom I would never have been a part of this expedition. I was heavily reliant on his past expedition experiences and knowledge, especially in planning the food and catering and the communications, not to mention the professional support he provided the expedition team overall. Thanks to Bruce Hull, Tom Maggs and everyone at the Division who supported and assisted our expedition team. Finally, thanks a million to Ian, Ted, Marty, Chris and Angus. It was a privilege and a pleasure to work with you and to assist the team and works program.

8. APPENDICES

APPENDIX 1: TOOLS AND EQUIPMENT INVENTORY

Not included in this copy.

APPENDIX 2: TESTING AND CALIBRATION OF TEMPERATURE AND RELATIVE HUMIDITY SENSORS

Date/time	Sensor #1 (1)	Tiny View WAM 38	Sensor #3 (2)	Tiny View WAM 38	Sensor #4 (3)	Tiny View WAM 35	Sensor #6 (4)	Tiny View WAM 35	Sensor #8 (5)	Tiny View WAM 36
4/12/06										
14.03 ¹					28.09	12.0				
14.04					28.41	12.0	170			
14.11 ²					81.05					
14.22 ³			56.96	47	86.3					
14.29			40.81	24.5	86.07					
14.39			34.42	21.5	86.9					
15.30 ⁴			28.23	19.0	94.35					
15.50			27.3 (- 2.5°C)	19.0 (- 2.0°C)			6.52	61.5	87.9	51.5
16.15									77.9	40.5
17.06	96.7		24.4	18.0	95.02		165.11	50	64.98	33.5
17.10			24.03	18.0			22.06		64.01	
17.11							16.47			
17.12							63.6			
17.13							63.2			
17.14							4.84			
17.15	97.14		23.97 (- 1.95°C)		95.83		2.42 (- 36.5°C)		62.65 (- 2.89°C)	
7/12/06										
14.46	88.6		14.69 (- 4.3 °C)	12.5 (- 5 °C)	88.06		18.36 (- 3.4 °C)	16.0 (- 3.0 °C)	17.18 (- 5.4 °C)	13.5 (- 3.4 °C)
10/12/06										
12.39 ⁵	17.9 (- 3.68 °C)	15.5 (- 4.0 °C)	94.85 (- 3.99 °C)		14.56 (- 3.65 °C)	14.0 (- 4.0 °C)	101.85 (- 5.03 °C)		96.74 (- 5.06 °C)	
24/12/06										
14.32 ⁶	90.25 (- 1.75 °C)				78.9 (0.54 °C)					
14.38	84.85 (- 2.01 °C)				64.7 (2.68 °C)		1.21 (- 39 °C)			
14.43	86.65				72.0 (1.45 °C)		0.94 (- 39 °C)			
16.09	83.74 (-2.25 °C)				81.34 (-0.44 °C)		1.946 (- 39.5 °C)			
16.32	82.01 (- 1.89 °C)				81.34 (- 0.13 °C)		3.76 (- 39.5 °C)			
16.46	72.8 (0.3 °C)				79.6 (- 0.24 °C)		3.53 (- 39.5 °C)			
17.23	79.01 (- 1.18 °C)				80.79 (-0.48 °C)		127.27 (-7.00 °C)			

¹ Sensor tip of #4 (3) and Tiny View logger were left overnight in a sealed plastic bag containing silica gel before measurements were taken.

² After sensor was removed from the silica gel bag

³ Sensor tip of # 3 (2) and Tiny View logger WAM 38 were placed in a sealed plastic bag containing silica gel at 14.15.

⁴ Sensor tips of # 6 (4) and # 8 (5) were placed in sealed plastic bags containing silica gel at 15.30.

⁵ Sensor tips of # 1(1) and #4 (3) were placed in sealed plastic bags containing silica gel at about 15.00 on 7/12/06. The bags were removed about 17.40 (AEST – non-daylight saving time)

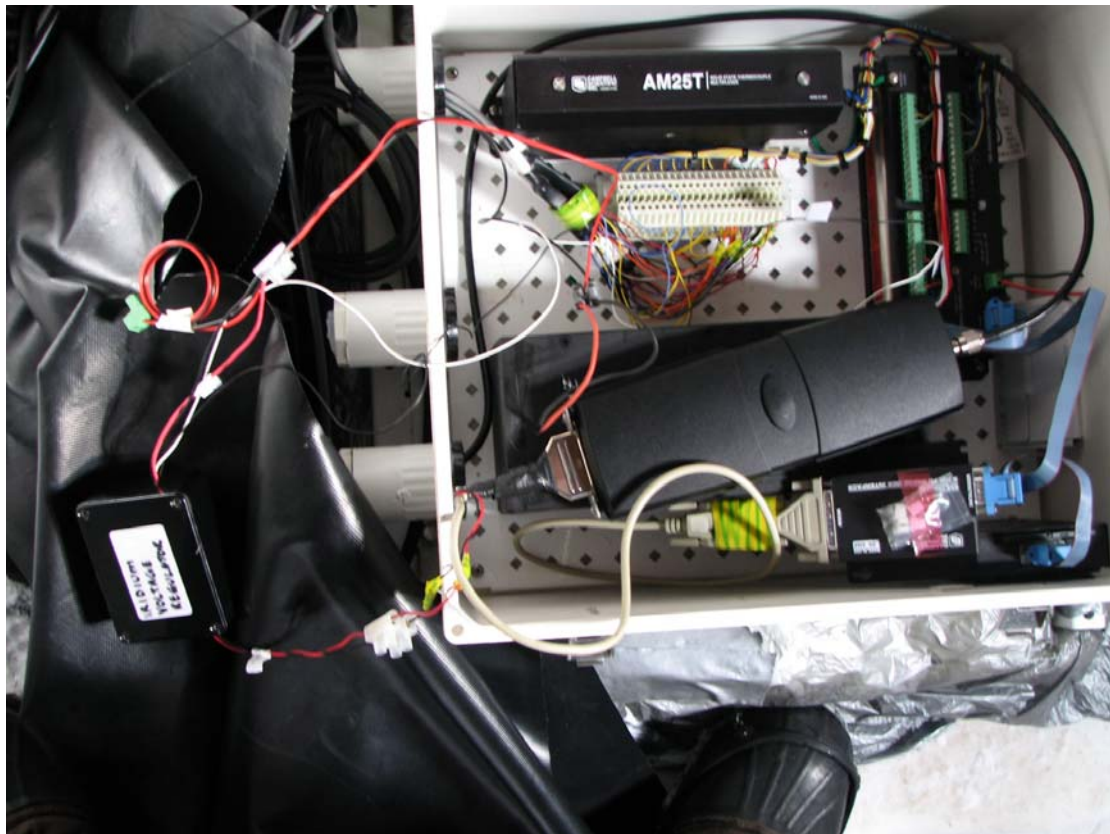
⁶ Data obtained after drying sensor #4 (3) overnight in a sealed plastic bag containing silica gel

Unless otherwise specified, the data in the table above refers to relative humidity measurements.

APPENDIX 3: CR10X ENVIRONMENTAL MONITORING SYSTEM

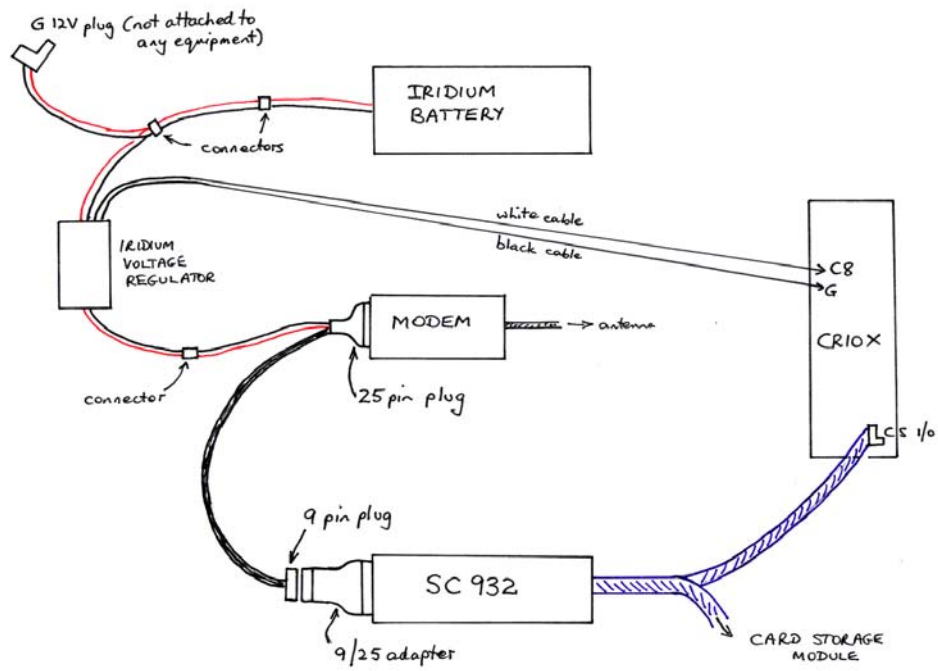
In order to assist planning and documentation for future trips, a sketch and images of the current logging set up were prepared to show the relationships between the individual components of the CR10X logging system (see sketch and images below).

Note that because the box for the logger battery was too big (see Michael Staples recommendations in the Expedition Report 2005⁶) it could not fit inside the logger box without compressing the leads attached to the multiplexer. It was therefore placed outside the logger box and leads ran through the side of the box (sealed with carpenters' putty).



Logger box, satellite phone, multiplexer and wiring for the CR10X system

Schematic of the wiring arrangement for the environmental monitoring system



APPENDIX 4: MOISTURE MONITORING:

Unless otherwise specified, moisture contents were measured using the central, longitudinal surfaces by direct contact with the surface until a stable reading was obtained. Care was taken to leave only pin-prick size holes in the surface.

Because the walls were covered by snow it was not possible to measure the moisture contents of external walls of the Main Hut.

1. Western Wall – Hurley's Bunk:

A series of readings were taken of the wall timbers, from the bottom of Hurley's bunk to the board immediately below the upper bunk. Board numbers (1 - 6) refer to boards from the lowest to the uppermost. As hoar frost was present over much of the bunk timbers, readings were taken in areas substantially free of frost. This meant that readings were not necessarily taken in a vertical line.

<i>Board Number</i>	<i>Moisture content (%)</i>
1	22
2	21
3	21
4	22
5	22
6	18
7	21
8	Plank was completely covered in hoar frost

Structural timbers of the bunk (Oregon)

Upright – south post, outer surface	22%
Beams	18/19%
Bookshelf	covered in hoar frost
Pine plank with name on	19/20%

2. Bunk immediately above Hurley's

Side rail board (A McL 1913, PEC 1912)	20%
--	-----

3. Dark room door

Measurements were taken over the length of each panel (top, middle x2, bottom) with the range of values indicated below. In all cases the higher

readings were obtained from higher positions on the door (possibly indicating more melt in these areas).

1 (nearest handle)	18-19%
2	18-20%
3	19-22%
4	19-21%

4. Outer wall of Mawson's cubicle – NW corner, bookshelf wall

Boards on this corner were the most exposed. Moisture contents were recorded from the lowest exposed plank to the top. It was interesting to note pencil scribbles on the 6th plank (sugar w..... of material?) and near the upper bracket on the NW corner.

1.	22%	2.	22%	3.	19%	4.	21%
5.	19%	6.	21%	7.	22%	8.	22%
9.	22%	10.	22%	11.	23%	12.	23%
13.	19%						

5. Outer wall of Mawson's cubicle – NE corner, below chemical storage

Moisture contents were recorded from the lowest exposed plank to the top. Mould samples were taken from the 5th plank up from the bottom. Possibly modern graffiti was also noted on the 6th board up from the floor (Arnie 24/4, arneme 13/5).

2.	24%	3.	21%	4.	26%	5.	27%
6.	23%	7.	22%	8.	22%	9.	22%
10.	22%	11.	22%				

6. Platform

NW post ice level 19%, midway 21%, immediately below 1st rafter 22%
NE post ice level 19%, midway 20%, immediately below 1st rafter 20%

Lower W rafter (original) average (of 7 readings) = 22%
Lower E rafter (original) average (of 5 readings) = 21%

Higher rafters (from W to E) average values of 4-5 readings for each

1. replacement timber	= 16.5%
2 replacement timber	= 17%
3. original timber	= 18.5%
4. original timber	= 19%
5. replacement timber	= 16%
6 replacement timber	= 15.5%

7. Southern wall

AJH bunk (lower) all wall planks were completely covered in fine hoar frost

ENW (upper) Name board, ave = 19%
all wall planks were also covered in fine hoar frost
Name board, ave = 20%

8. Eastern wall

Hoar frost was present on many of the boards. Measurements were taken in ice-free areas.

FBH bunk

1. 20%	2. 22%	3. 23%	4. 22%
5. 22%	6. frost	7. frost	8. 21
9. 22%	10. 22	11 onwards = frost	

CL 1912 bunk (upper)

Planks are numbered from the floor up, with the lowest plank on Laseron's bunk being No 9.

9. frost	10. 21%	11. 22%	12. 20%
13. 20%	14. 20%	15. 20%	16. 18%

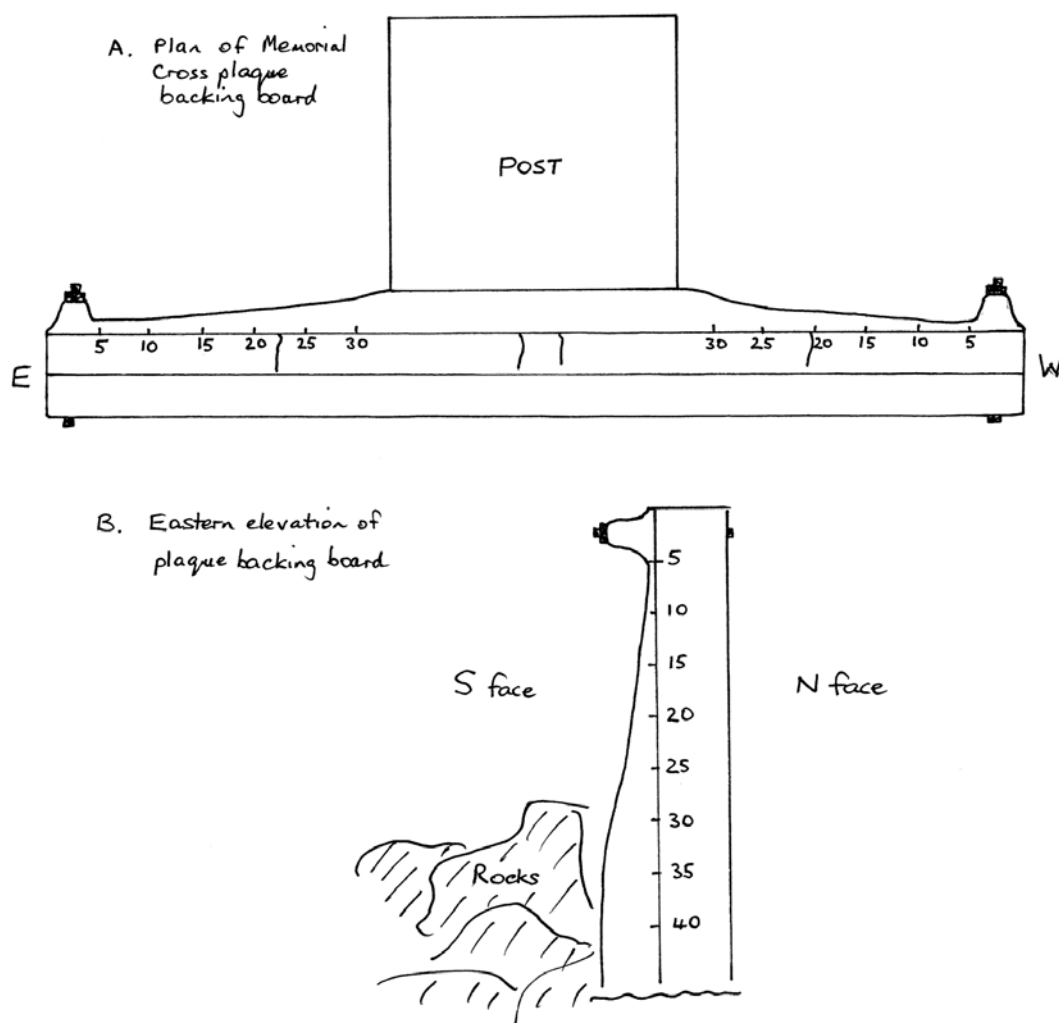
9. Ceiling profile from plate height to skylight

Complete coverage of boards by hoar frost prevented moisture measurements on these timbers.

APPENDIX 5: TIMBER THICKNESS MONITORING

Timber thicknesses (mm) were measured using a set of digital vernier callipers (DigiMax) at regular intervals along the most southerly facing side of backing board attached to the replica memorial plaque. Points at which timber thicknesses were measured are shown in the sketch below.

Schematic of timber thickness monitoring points (2000/01 and 2006)



Data for both the 2000/01 and 2006 expeditions is provided in the accompanying table. The data clearly indicates the severe abrasion that occurs above the level of the rocks placed around the pole and plaque. Designations A and B refer to the above sketch.

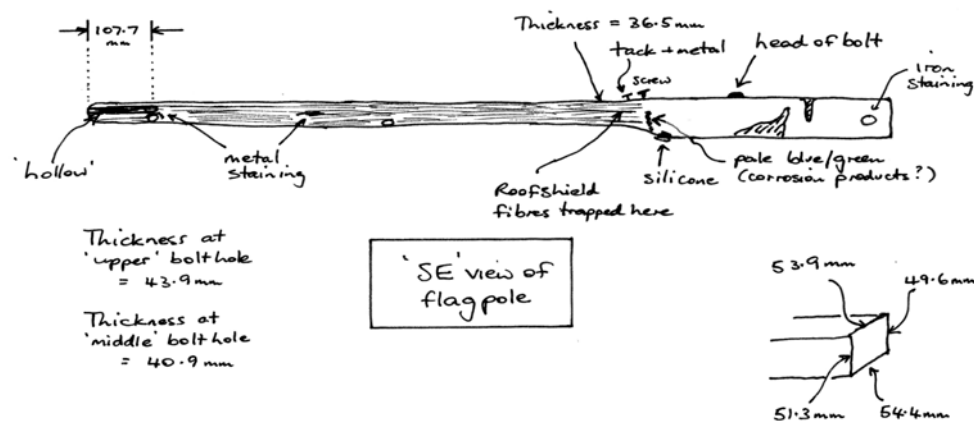
Table: Timber thickness of the memorial plaque backing board as measured in 2000/01 and 2006

A - plan	0	5	10	15	20	25	30	35	45
East end									
2000/01		6.22	5.80	4.97	7.08	14.95	20.81		
2006	1.1	0.4	0.6	0.5	0.6	11.6	20.7		
Wood loss		5.82	5.20	4.47	6.48	3.35	0.11		
West end									
2000/01		7.16	6.91	5.92	5.87	11.68	20.71		
2006	1.0	2.2	1.8	0.8	0.4	8.7	20.4		
Wood loss		4.96	5.11	5.12	5.47	2.98	0.31		
B - elevation									
East elevation									
2000/01	5.17	8.49	10.58	10.91	16.73	18.62	20.36	20.85	22.36
2006	0.6	4.1	5.8	5.5	15.4	16.7	19.3	20.2	22.2
Wood loss (mm)	4.57	4.39	4.78	5.41	1.33	1.92	1.06	0.65	0.16

APPENDIX 6: FLAGPOLE DOCUMENTATION

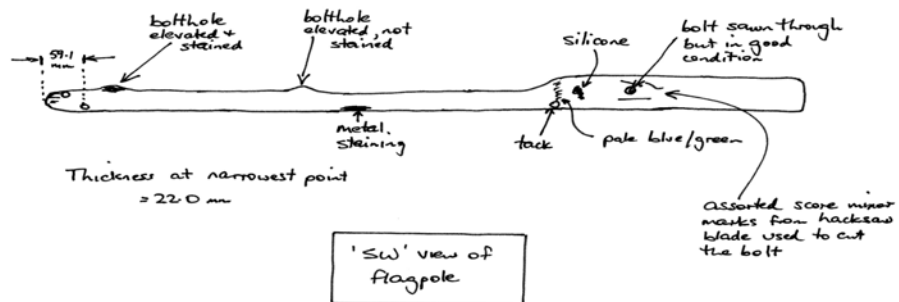
The following sketches and images represent the condition of the flagpole as it was immediately after its removal from the apex of the living quarters of the Main Hut at Cape Denison.

Southeast face:



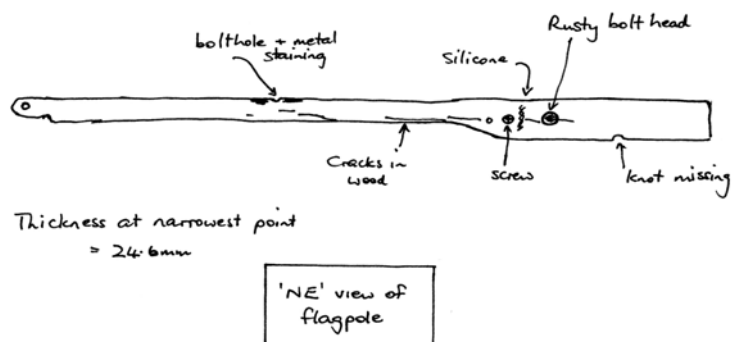
Flagpole showing areas of recent loss and abrasion from SE face

Southwest face:



SW face of the flagpole showing the extent of wood loss at the roof line junction and the physical protection afforded by the former metal fitting at the upper part of the pole

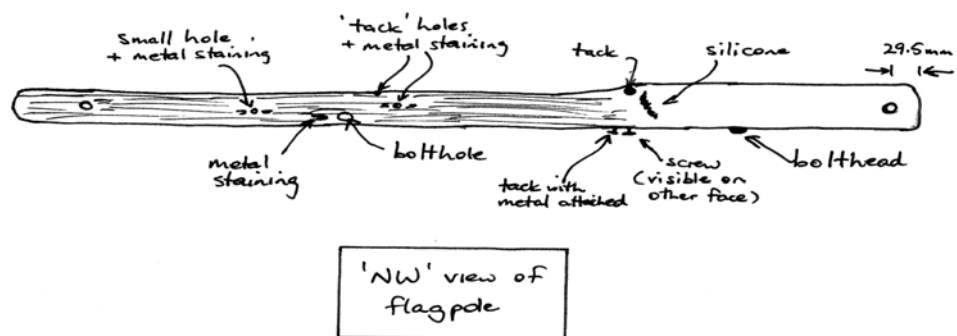
Northeast face:





NE face of the flagpole showing historic and modern fastenings (tack and screw respectively) used to attach flashing at the apex

Northwest face





NW face of the flagpole showing abrasion and upper bolt hole

APPENDIX 7: SORENSEN FOOD STOCKS

Product & Size	Quantity	Best Before
Deb Potato granules 115g	43	2004, 2008
Surprise Vege 100g	80	2004, 2008
Vegemite 115g	4	June 2003
Peanut Butter 200g	21	2003
Honey 250g	18	
Jams, preserves, spreads 250g	10	2004
Butter 454g	29	February 2004
Breadmix 5kg	5	2007
Cornflour 300g	4	July 2007
Custard 350g	4	July 2005
Olive Oil 4 litre	2 litres	July 2003
Soup 65g = 1 litre	60	2004
Cup-a-Soups (4 serves)	15	2008
Lasagne pasta sheets 250g	14	
Pasta (spaghetti & other) 500g	8	2004
Rice 1kg	12	2004, 2008
Two-Minute Noodles (5 per packet)	2	2007
Lemon Squeeze 250ml	9	May 2007
Pancake Shake mix 375g	7	June 2007
Weetbix 375g	20	2003
Porridge Oats 500g	13	2003, 2006
Tea (50 bag) 90g	11	2002, 2004
Coffee (plunger & instant) 250g	16	
Sugar 1kg	14	2002
Milk Powder 750g, 400g	25	2001, 2004, 2007
Tang 45g	26	January 2003
Biscuits 500g	37	2003, 2007
Gravy granules	6	2007, 2008
Parmesan Cheese 250g	7	2003
Flour 1kg	3	2007
Tabasco 60ml	1	2011
Tomato Sauce 560g	1	2008
Maggi Beef Stock (25 cubes)	1	2003
Maggi Chicken Stock (25 cubes)	1	2003

Product & Size	Quantity	Best Before
Baked Beans 420g	7	
Tinned Tuna 95g	67	
Tinned Salmon 105g, 415g	36	2003
Tinned Vegetables 410g	15	
Jar olives 235g	8	
Jar anchovies 80g	20	2007
Tinned oysters 85g	37	
Tinned sardines 106g	32	Up to 2009
Tinned Corned Beef 340g	12	
Tinned Ham 450g	15	
Split Peas 500g	4	2007, 2008
Salada Crackers 250g	27	
Vita-weat Crackers 250g	58	2003, 2007
Jatz Crackers 250g	15	2007
Thickened Cream 1litre	1	2006
Cheesecake Mix 315g	2	2003
Choc. Mousse Mix 205g	1	2007
Instant Pudding (6 Serve) 100g	2	2008
Sponge Pudding Mix (2 serve)	3	
Dried Fruit, Nuts	Selection	
Chocolate Bars	Selection	
Muffin Mix (12 serve) 500g	3	2007
Popcorn 375g	11	2002, 2008
Instant Meal Pouches	40	
Oxo Beef Stock (12 cubes)	2	2008
Black and White Pepper 40g	3	
Salt 750g	3	
Herbs and Spices (small selection)	3	
Soy Sauce 750ml	1	2008
Kan-Tong base sauce (4 serve)	1	2007
Beef Stroganoff recipe base (4 serve)	1	2008
Yeast Satchets	17	

APPENDIX 8: EXPEDITION LOG

DAILY AND WEEKLY REPORTS – MAWSON'S HUTS EXPEDITION 2006-7 – EXPEDITION LOG

We have been motoring along pretty well and I have just been told that we will be in port tomorrow evening – Guy just told me that the pilot has been booked for 7 pm tomorrow (3rd Jan). Good to be in port earlier but a slight bummer for Psycho, Simon and me with Georgie and Inger only arriving at the airport at 9.00pm and Leanne not arriving until the morning of the 4th. Still it will be nice to have solid ground underfoot!!

Fred is putting on a BBQ for the guests and our team this evening – starting with drinks in the Happy Hour bar at 5pm. Should be good, especially as it is starting to warm up nicely now.

We all appreciate the effort that both of you have made to get us back as soon as possible and in bringing partners to meet us. Thanks so much for that and for all of the many things that you have done to make this trip so successful.

Rob, I understand that you will be picking up Georgie tomorrow night on the 9 o'clock flight – as that is the same one that Inger arrives on, it is possible to give her a lift into town as well. If you can get back to me, I can get in touch with my mate Mukka if other arrangements need to be made. Thanks.

Now for today's details.

Sit Rep – 2 January 2006

The Sarsen is powering along at a great rate of knots (literally) – 10.6 knots to be exact and with our arrival in Hobart now confirmed as Wednesday night. The pilot has been booked for 19.00. Assuming customs and quarantine will take a little time, we expect to be back on dry land sometime around 21.00 (around the same time that some of our partners arrive in the big silver bird from Melbourne).

The Sarsen is currently (15.30 AEST - daylight saving time) at 47o 35' S and 146o 33' E bearing 7o true. The ship is cruising along in slight seas with an almost non-existent swell, at 10.6 knots with the wind at 20 knots from the NNW. The smooth sailing made for ideal sleeping conditions last night and great sailing today.

Fred and his team are putting on a BBQ for his guests and for the Mawson's Huts Team, starting with drinks in the 'Happy Hour Bar' at 17.00. Will be a nice way to toast our imminent arrival.

We are all looking forward to that first smell of the Tassie bush when we near the coast!!!
Yeee haaa.

That's pretty much it from an incredibly benign Southern Ocean. Best wishes from all the team.

All the best

Ian

Sit Rep – 2 January 2006

Slightly slower than expected progress has delayed the arrival of the Sarsen until Thursday morning (4th January). The ship will anchor somewhere for the night, probably in Cloudy Bay, before steaming to meet the pilot at 08.00. It is expected to be alongside Macquarie wharf at about 09.00 tomorrow.

The Sarsen is currently (15.00 AEST - daylight saving time) at 44o 01' S and 147o 12' E bearing 7o true. The ship is cruising along in slight seas with a slight swell, at 8.9 knots with the wind at 22 knots from the NNE and an outside temperature a balmy 17 oC. Good sailing conditions gave all passengers another pleasant ride during the night.

Fred Moir and his team hosted a BBQ for guests and for the Mawson's Huts Team yesterday evening. It was a very enjoyable affair with the mild weather allowing us to dine on the back deck. Fred's hospitality was exceptional with thick, tender steaks accompanied by quality wines and beer.

The Mawson's Huts team finished off the night with cranberry vodka cocktails, prepared with ingredients sent on the Sarsen by the 6th member of the team, Angus MacDonald. We toasted his generosity warmly.

Land was sighted at about 3 pm this afternoon, bringing a flurry of activity, excitement and the first appearance of mobile phones!

That's pretty much it from a still benign ocean. We are looking forward to one more night of gentle movement before seeing our loved ones and setting foot on solid ground again tomorrow morning.

Best wishes from all the team.

All the best and look forward to catching up on dry land tomorrow morning!!

Ian

HAPPY NEW YEAR from all of the team on board.

We had a quiet but enjoyable night last night. The highlight for me really were the calm seas that made sleeping so wonderful - I must be getting old!!

Anyway, as you are probably aware the ship's ETA constantly changes with small changes in the ship's speed. Today it has varied from 1.30 on the 3rd to 7.30 at night on the 3rd. When I checked at 18.00, we were only cruising at 9.3 knots in essentially smooth seas which gives me the impression that they are aiming at an evening arrival on the 3rd rather than a mid-afternoon job. As we had been travelling at higher speeds in worse conditions I think that the decision may have been made to slow down a little to ensure an evening arrival - just my gut feeling and not based on any real knowledge!

Anyway here is the day's sit rep - a bit more terse than usual as I have just found that my computer has picked up a virus from the ship's music system and I feel a bit flat, just wondering what the worm virus is going to do to my hard drive and all of the work that I have got on the system. Fingers crossed that it is a benign virus as I had put a lot into the expedition report already!

Sit Rep - New Years Day 2007

Happy New Year from all of the Mawson's Huts Expedition team. The team had a subdued New Years celebration in the Happy Hour Bar on the Sarsen. Champagne and beers toasted in the New Year and we were all very happy to be celebrating this event on board a ship heading back to Hobart rather than still being on the ice, awaiting our repatriation.

At the time of writing (18.00, AEST, daylight saving time) the Sarsen was cruising at 9.3 knots, into a 15 knot northerly breeze and with an outside temperature of + 11C (a veritable heat wave). The seas are smooth with only a very slight swell of 1-2 metres, our present position is latitude 51 12 S and 145 48 E and our bearing is 7.7 degrees true. Our current ETA in Hobart, based on existing conditions and ship speed is 19.30 in the evening of 3 January.

We are all looking forward to seeing our loved ones and friends on the wharf in Hobart in a couple of days!!

Best wishes to all

Ian

Nothing much to report from here. Leanne mentioned that her team would prefer to have a quiet night tonight, with celebrations reserved for when the Sarsen is in the Derwent on Wednesday sometime (calmer waters I suppose). She has supplied the lads with a carton of full strength beer the other night, something that is in pretty short supply apparently, as well as a couple of bottles of red per night - all very much appreciated. We will be cracking a bottle of champers anyway but will be discreet about it!

Our messages will cross tonight and so if there are any issues that I need to deal with immediately, I will do another email drop as soon as possible.

Now for today's details.

Sit Rep - 31 December 2006

The Sarsen continues to make good progress in what are now good conditions, with light winds and sunny skies. The Sarsen is currently (17.00 AEST - daylight saving time) at 55o 19' S and 144o 52' E bearing 70 true, and due to pass the Antarctic Convergence fairly soon. The ship is cruising along in slight seas with a low swell, at 10.6 knots with the wind at 10 knots from the NW and an outside temperature of 4 oC.

The forecast for tomorrow is even better, with winds initially variable to 10 knots, then freshening to 15 knots and swinging to the NW. Seas will be below 1.5 m on a decreasing 3 m swell.

It sounds brilliant for tonight and tomorrow - a very nice change after conditions last night that made sleeping extremely difficult. There were some very tired, and a few sick, people around the ship today. We are all looking forward to a more comfortable sleeping conditions tonight. The ETA in Hobart, based on the current sea and weather conditions, is still late on January 3.

The team is travelling well, despite a few of us developing colds - a small price to pay for coming back in contact with a larger population!

That's pretty much it from a now mellow Southern Ocean. Best wishes from all the team.

All the best

Ian

Nothing much to report from here. Simon is better today and all the rest of the team is up and about, eating well and relaxing on board. Team America has received another screening!

We hadn't had any news about the cricket until today when we heard that Australia had won the 4th Test (no other details supplied in the Navy news). Now for a clean sweep!!

Now for today's details.

Sit Rep - 30 December 2006

The Sarsen continues to make good progress in overcast conditions. We have now left the screaming sixties and into the realm of the furious fifties. The Sarsen is currently (16.00 AEST - daylight saving time) at 59° 07' S and 143° 58' E bearing 30 true. The ship is cruising along in slight to moderate seas with a low swell, at 9.4 knots with the wind at 26 - 28 knots from the NNW and an outside temperature of 4 °C. It is likely to be a bit sloppier tomorrow with winds expected to increase and swing more westerly. Seas will be in the range 2 - 3 metres with a north-westerly swell of 4 - 5 metres. The ETA in Hobart, based on the current sea and weather conditions, is still late on January 3.

The team is travelling well and enjoying the facilities on board, including a very comfortable video lounge and tasty freshly prepared meals.

That's pretty much it for me Rob. Best wishes from all the team.

All the best

Ian

Sit Rep - 28 December

The Sarsen is currently (17.30 AEST - daylight saving time) at 66° 11' S and 141° 53' E bearing 023°, heading towards the large iceberg that we encountered on our way south with the L'Astrolabe. The Sarsen is cruising along in smooth seas at 10.2 knots with the wind at 20 knots from the NNE and an outside temperature of 1 °C (we must be heading north!). It will be interesting to see if any of the pack ice that we encountered on the way past the large iceberg is still around.

All members of the team are travelling well and are getting acclimatised to the warm conditions on board and the extreme darkness at night when the cabin door is shut. The sauna has just been fired up and most are looking forward to a session later this evening. The food on board is very good and the predominantly Thai crew has been both very friendly and helpful.

We are all looking forward to calm seas, smooth sailing and an arrival in Hobart in early January.

Best wishes from the team

Ian

PS: Once we are past the big berg we will get a good idea of our ETA in Hobart - apparently we are going to hang around it for a short period while one of the ship's boats is launched so that it can take a photograph of the Sarsen with the berg in the background. The pool in the stern of the ship has also been filled to get photos of people bathing with the berg as a backdrop!

Gidday Rob and Robb

I hope that you both had enjoyable Christmases (what is the plural for that!) with your families and friends. As I mentioned in the earlier sit rep, ours was a little subdued after the somewhat wild Christmas Eve (impromptu parties are often the most enjoyable). We are currently sitting at anchor, somewhere towards DDU awaiting word from the French as to whether or not we will be allowed to call in for a visit. I will put all of the details of the past couple of days in the Sit Reps below.

Sit Rep - Boxing Day 2006

Morning weather obs 08.30 1/8, cirrus

Temp: - 6.4 oC
Wind chill: - 18.3 oC (average value) with a minimum - 19.0 oC
Wind: Maximum gusts to 30.5 knots with an average wind speed of 26 knots from the S
RH: 62 %

The wind was pretty steady for most of the day, dropping very slowly from mid to late afternoon. It was about 5 - 10 knots for a short period, from about 18.00 until 19.30 but then picked up again, blowing to 25 - 30 knots. It was a bit unusual for the wind to die but then pick up again after such a short period.

The Sarsen got to Cape Denison on Boxing Day at 8 in the morning. The team was awakened by the crackling of the VHF radio and the dulcet tones of one of the ship's officers announcing their arrival at our home. It was then a bit of a scramble to finish packing and getting things organised to leave. The morning and afternoon winds were too strong for ship to shore operations and so for most of the day it was a waiting game. The winds eventually dropped sufficiently at about 1800 in the evening but at that time the crew were having dinner and so we had to wait until about 19.15 before we had word that boating operations were about to commence. In true Murphy's Law fashion, as soon as boating operations started the wind unexpectedly sprang up again, gusting in the range 25-30 knots. Fortunately we managed to get all of our personal belongings and equipment on board in one trip, leaving the cargo for the next weather window. This was possible because the Sarsen had positioned itself quite close to Boat Harbour, along from Azimuth Hill, a position similar to that used by the Sir Hubert Wilkins a few years ago.

The Sarsen is a very well appointed ship and each of us has our own cabin. This is quite a luxury compared to the situation on the way down here when 6 of us shared a cabin. The first thing we did when we got on board was to have a HOT SHOWER - it was fantastic to again have clean hair and to put on 'normal' clothes. It took all of us a bit of getting used to the heat in the cabins and other rooms, with most turning it off.

The people on board were very welcoming - after the shower we were treated to beers, wine and fresh fruit and cheeses in a beautiful dining room. It was pretty special and eating fresh fruit after having none since the end of October was wonderful. We kicked on until just after midnight, enjoying the hospitality offered by Fred Moir and his team.

Sit Rep - 27 December 2006

The wind in the morning was blowing strongly from the south at 45 - 50 knots and didn't ease until about 15.00 when it fell right away, allowing boating operations to commence. It was still relatively calm (10-15 knots) until late in the evening (22.00) when we were picked up and returned to the ship.

Once on shore the team split, with Ted and Simon, taking visitors on tours of the hut while Marty, Psycho and Ian moved and loaded cargo. Cargo operations were slightly more complicated than earlier anticipated due to the inability of our chain saws to cope with cutting out a landing close to the cage pallets (I think they were worn out from cutting so much ice and snow during the roof excavations!). A new natural landing (and hauling out point for Weddells) was found about 150 m along the west arm of Boat Harbour. The Spirit of Denison sled came into its own, allowing large loads to be moved in quick time. The cage pallets were then moved up towards the plateau, to the designated helicopter pick up point, out of the immediate vicinity of the Main Hut and the visual catchment area.

The Spirit of Denison also gave some of the visitors to the site joyrides that they will long remember - the squeals of delight from adults and kids alike as they were gently towed around the site and over to the Sorensen were testament to the fun had to finish off the day's activities. Once the quads were 'put to bed', the skylight covers fixed and the Thai crew given some guide to the finer points of sliding on their bums down snow slopes, it was time to farewell our home of the past 2 months.

There are always mixed feelings at times like these. It is sad to leave, not knowing if it will be for the last time. Thoughts of heading home to loved ones and the joy of those special

embraces after months of absence more than compensates for those occasional melancholy thoughts!

That's it for today

Best wishes

Ian

Hope that Sydenney is treating you kindly Rob - my daughters, Jane and Tess, are there at the moment, staying with my ex in-laws for Christmas (Gayle's sister and husband) at Pittwater. It is a lovely place but unfortunately I am not invited anymore!

Today was an absolute pearler of a day. It started out quite windy and I had to spend about an hour and a half digging my way back into the hut, with drift swirling around in the bottom of the pit. When the wind died a bit later though it was toasty. The bummer for the day was that Simon lost his wedding ring somewhere. We had a bit of a look around without luck but still hold hope that it may appear in the coming days. Don't let that bit of info get out yet though!!

David Jensen called yesterday to get details of partners' contact numbers etc so that he could give them a call for Christmas. A nice gesture. I asked him to give Jane and Tess a call because I am sure that would give them a big buzz.

No other major news from here. We are all hoping for a repeat of today's weather tomorrow.

Sit Rep - 23 December 2006

Although the snowfalls and drift had eased off when I did the weather observations last night, they came back strongly, dumping quite a bit of snow until the early hours of the morning. From then on the winds were moderate but with clear skies and no blowing snow. When the wind died in the early afternoon it turned on a stunner of a day - calm and hot (as you can see with the weather obs for this evening).

Morning weather obs 10.00 1/8, altocumulus

Temp: - 2.2 oC
Wind chill: - 12.6 oC (average value) with a minimum - 13.0 oC
Wind: Maximum gusts to 29 knots with an average wind speed of 24.5 knots from the SSW
RH: 60 %

Evening weather obs. 21.00 0/8, clear sunny skies

Temp: + 5.5 oC
Wind chill: + 4.5 oC (average value)
Wind: Variable to 0.8 knots - couldn't really give it a direction!
RH: 54 %

Achievements for Saturday:

- Work continued on the environmental and vibration logging systems - all Australian Museum Tiny Tag loggers were stopped, data down loaded and loggers removed for RTA. The external Vaisala sensor was removed for possible relocation but was found to be full of snow and ice. It is being dried and will be checked before possible relocation to the workshop roof. WA Museum loggers were downloaded and reprogrammed for the next 12 months.
- Corrosion coupons and CLIMAT bolts were installed in various locations in and around the hut.
- The hut was inspected to determine the extent of unidentified chemical spills or breakages These were sampled for analysis in Australia.
- New seals and latches were fitted to the workshop door. Hopefully this will reduce snow ingress and facilitate future entry to the building.
- Continued preparations for RTA

Proposed work for Sunday:

Good weather forecast for Sunday should see the following activities tackled:

- Checking of the environmental logging system. The external sensor will be relocated if it is found to still be in an operational state.
- Sampling of wood from the new roof planes to allow baseline analyses to be undertaken (for future deterioration monitoring)
- Completion of moisture content monitoring
- Continued preparation for RTA

That's it for today

Best wishes
Cheers

Ian

Hope that you had a good flight to Sydney and have settled in by now. It was another cabin-fever day today with no outside work done. The forecast is more promising for Saturday and Sunday and so I hope to break the back of the remaining internal hut work then. I could quite easily have gone to the hut today but it would have meant digging into the bloody place and then having to do the same again tomorrow. I am not sure if it is called laziness or efficiency but I took the attitude that I really only wanted to do it once (today was a good writing day after all).

Here is the official, sanitised version of the day's activities: - pretty drab reading in reality (more so than usual) - has to be that way when the weather is the highlight! By the way, the Met fairies (Casey and Davis) are now providing forecasts for the Sarsen so that they will know what they will be heading into when they get a bit closer to us. It was very good of them to provide this service not only to us but also to the Spirit of Enderby and now to our taxi service - it has been invaluable to us and obviously will be a great boon when planning cargo ops etc when the Sarsen is here. Is there some way that we can officially thank the BOM people for this - I am happy to draft a letter to come from the Division and/or the Foundation to that effect if you consider that is the way to go.

Sit Rep - 22 December 2006

The day started in similar fashion to yesterday with some light falling snow and a bit of drift being blown around the place. The snowfalls continued for most of the day, but by the time of the evening obs, had ceased as had the blowing snow.

Morning weather obs 10.30 8/8, mainly stratus and a bit of altostratus

Temp: - 0.2 oC
Wind chill: - 8.7 oC (average value) with a minimum - 10.0 oC
Wind: Maximum gusts to 29 knots with an average wind speed of 20 knots from the S with light snow falls and wind-borne snow.
RH: 76 %

Evening weather obs. 18.00 8/8, stratus (mainly) and stratocumulus

Temp: +0.2 oC
Wind chill: - 8.2 oC (average value), minimum - 8.9 oC
Wind: Max gust of 25 knots with an average of 21 knots from the S - very little snow is now being blown around or falling.
RH: 72 %

Achievements for Friday:

- Continued documentation of the conservation works program
- Continued inventory of food and supplies at the Sorensen
- Radio interview with Tracy Holmes, ABC Sydney drive program

Proposed work for Saturday:

A more promising forecast should allow the following work to be undertaken on Saturday:

- Installation and documentation of all corrosion coupons and CLIMAT bolts in the Main Hut
- Sampling of unknown chemicals for analysis
- Sampling of wood from the new roof planes to allow baseline analyses to be undertaken (for future deterioration monitoring)
- Completion of moisture content monitoring
- Continued preparation for RTA (particular activities are weather dependent)

That's it for today

Best wishes and hope that the Christmas card that Simon sent on our behalf came through OK

Cheers

It was good to have a chat today - I hope that you have a great time in Sydney and enjoy the break. After a couple of lovely days, the wind and drift returned today, reducing activities

markedly. It was a good day to catch up on writing and reports! So here are a couple - today's sit rep and last week's weekly report.

Sit Rep - 21 December 2006

Strong winds and drifting snow kept outdoor activities to a minimum today. Conditions today highlighted the importance of the effort that the team put in yesterday to get as much work done as possible in preparation for the arrival of the Sarsen in a week or so.

Morning weather obs 10.00

8/8, altostratus

Temp: - 2.4 oC
Wind chill: - 12.2 oC (average value) with a minimum - 13.5 oC
Wind: Maximum gusts to 35 knots with an average wind speed of 24 knots from the SSE with moderate amounts of drifting snow.
RH: 68 %

Evening weather obs. 8/8, stratus and altostratus

Temp: - 1.1 oC
Wind chill: - 10.3 oC (average value), minimum - 11.4 oC
Wind: Max gust of 30 knots with an average of 23 knots from the S
RH: 69 %

Activities for Thursday:

- Tools and equipment were reorganised at the Granholm
- Reports were prepared and a start made to documentation for the final expedition report

Planned activities for Friday:

- Installation and documentation of all corrosion coupons and CLIMAT bolts in the Main Hut
- Sampling of unknown chemicals for analysis
- Sampling of wood from the new roof planes to allow baseline analyses to be undertaken (for future deterioration monitoring)
- Completion of moisture content monitoring
- Continued preparation for RTA (particular activities are weather dependent)

WEEKLY REPORT - MAWSON'S HUTS EXPEDITION 2006

11 - 17 December 2006

Health:

All members of the team are in good health. Ian, with his throat apparently still sensitised from last week's Panadol episode, got a lump of gristly beef stuck in his throat for a short while. As with the Panadol there was no problem in dislodging it with no threat to the airway or breathing. The gannet has to learn to chew his food more thoroughly!

Morale:

Morale is very good. We again had a very good run with the weather this week with some superb sunny days with light, variable winds. The whiteout mid-week was in stark contrast to the generally warm, mild days. Spirits remained high as the team awaited the arrival of passengers from the Spirit of Enderby. The first boats to arrive were welcomed with open arms, literally as they delivered additional supplies including food and Christmas treats.

Environment:

Morning temperatures were generally higher than last week, ranging from - 0.5 oC to - 2.5 oC and associated wind chills ranging from - 3.1 oC to - 12.3 oC. We recorded another couple of 'above zero' temperatures this week (+ 0.1 and + 0.4 oC, Saturday and Sunday evenings). Average wind speeds varied from 2 to 30 knots. In all cases, generally milder conditions were recorded in the evenings.

Safety:

No safety issues arose during the week.

Achievement against works plan:

- The large sled, christened The Spirit of Denison, was given a thorough workout during the week, carting numerous loads of timber from the Granholm Hut to a site adjacent to the Sorensen Hut.
- A temperature/relative humidity sensor was relocated from the NE corner to the centre of the workshop and the fittings on the external sensor post were adjusted to give it more resistance to large dumps of snow should similar dumps occur this coming year.
- Tinyview loggers, used to check the Vaisala readings, were placed in similar environments to check their precision and accuracy.
- Packing of the flagpole was completed - it was left unsealed this week so that it is available for viewing by interested visitors from the tourist ship, Spirit of Enderby.
- Snow and ice was removed from above Mawson's cubicle (exposing the skylight in his cubicle), from the SW corner of the Main Hut, from Laserson's bunk and that immediately below, from the NE corner of the Main Hut (likely to be Dyce Murphy's bunk - we are hoping to find one of his frocks) and in the kitchen area. Interesting artefacts were revealed including 3 candles, a matchbox adjacent to one of the candles, food supplies including fabulous intact ration boxes, food cans, cloth bags (probably containing sledging rations), tins of metal polish and 5 bottles including a lovely bottle of Mackinlays malt whisky (empty unfortunately).
- Moisture readings were obtained for representative timbers inside the Main Hut and of the new roof. The former will be compared with similar measurements taken in 2000/01 and 2002. The new roof timbers were very dry.
- Thickness profiles were determined for the upper and western most edges of the backing board of the replica memorial plaque - the upper edges of the timber are effectively worn away, being less than 1 mm thick on that edge.
- Mould samples were taken from areas in the Main Hut including timber planks, food stuffs, clothes and paper-based objects.

Additional Activities:

- The expedition team photo was taken and printed for mounting in the Sorensen Hut along with those of previous expedition teams.
- Simon took quite a bit of video of the ice excavation activities.
- Food stocks were thoroughly examined and old stocks put aside, pending advice from the Antarctic Division.
- Following the whiteout and heavy snow falls, the team put in a big effort to debuzz a lot of equipment and buildings. The Sorensen toilet, the quads, the Spirit of Denison sled, the entrance to the Main Hut workshop and the Granholm Hut all required a lot of shovelling to clear them. A new stairway had to be dug to gain entrance to the workshop as the snow was again above roof height.
- Preparations were also made for the anticipated arrival of visitors from the Spirit of Enderby - the Granholm and inside of the Main Hut were tidied up with tools and equipment organised to separate the tool storage and refuge areas in the former hut and excavated snow and ice, tools and other distracting materials removed from the interior of the Main Hut. A new latch was fitted to the Granholm door.
- An ice staircase was cut into the sea ice in Boat Harbour, mooring points were prepared for the IRBs, a rope handline installed to assist passengers using the ice landing stairs and the Mawson's Huts Foundation banner was erected at the landing point. The ice staircase was promptly tested by the local Adelie's who welcomed an easier exit from the waters!
- A powerpoint presentation was prepared for the Spirit of Enderby visitors.

General Comment:

The arrival of the first tourist ship of the season heralded a new phase in the expedition, the opportunity to showcase the conservation work undertaken this year and to welcome the first visitors to see the new roof. It is an occasion that we have all been keenly awaiting.

Dr Ian Godfrey
Field Leader
21 December 2006

Here are a couple of reports, for yesterday and today.

We all had a great time showing the people around the place yesterday and the day before. I will let the sit reps give the details.

Sit Rep - 19 December 2006

Weather obs were only done in the morning due to the team visiting the Spirit of Enderby in the evening.

Morning weather obs 09.00

4/8, altocumulus

Temp: - 4.6 oC

Wind chill: - 14.9 oC (average value) with a minimum - 15.5 oC

Wind: Maximum gusts to 25 knots with an average wind speed of 21 knots from the S.
RH: 65 %

Cape Denison turned on a stunner today. It was such a stark contrast to Monday with clear sunny skies and virtually no wind. The katabatic dropped off about 11 and winds were light and variable after that. The visitors from the Spirit of Enderby thoroughly enjoyed the opportunity to walk easily around the site and to savour the sun. It was interesting that many of them commented that they enjoyed the previous day as much, if not more, because of the feeling of being part of an authentic Home of the Blizzard experience. The Mawson's Huts team had a great time showing people over what has been our home for the past 8 weeks, meeting and talking with an incredibly diverse group of visitors.

The team was invited on board the Spirit of Enderby where they were kindly given the opportunity to sauna and shower off the accumulated grime from nearly 8 weeks without running water. The evening meal provided by the ship was very tasty. Following dinner Ian gave a presentation to the passengers, highlighting aspects of the site that were not visible because of the snow coverage and the work done by the 2006 team.

Sit Rep - 20 December

Morning weather obs 10.30 1/8, stratocumulus on the horizon

Temp: - 1.8 oC
Wind chill: - 8.6 oC (average value) with a minimum - 9.1 oC
Wind: Maximum gusts to 10 knots with an average wind speed of 8 knots from the S.
RH: 60 %

Evening weather obs. .00 7/8, cirrus, stratocumulus and stratus

Temp: - 2.5 oC
Wind chill: - 8.1 oC (average value), minimum - 9.0 oC
Wind: Max gust of 10 knots with an average of 7.4 knots from the E
RH: 68 %

It was another lovely day today, with the katabatic dropping very early today. The fine weather gave the team the opportunity to get a lot of work done. Some of the work achieved included:

- Moving the cage pallets from the helicopter pick up point to Boat Harbour
- Completion of the move of all timber from next to the Granholm hut to the new site near the Sorensen
- Grinding off of all rock bolts that had been used to anchor the wood pile at the Granholm
- A picture frame was made with photographs of all Mawson's Huts teams from 97/98 to the present included.
- Checking of the voltage and all connections in the data logging system. Despite this an outgoing call could not be made from the system, indicating that there is a fault with the Iridium phone itself.
- Simon also filed a story on the Spirit of Enderby visit.

All the best from all of us

Ian

Thanks for your message - it seems like we missed your phone call today. Not surprising with all of our running around with the Spirit of Enderby visitors today. It was certainly challenging for some of them, with one bloke having had 2 knees reconstructed (could barely make it to the Granholm to get out of the weather), an 89 year old Japanese bloke (sprightly but a very slow walker) and a couple, one of whom needed a walking stick to get around and whose partner had twisted her ankle on Enderby Island!

Ted said to say thanks for the battery for his van and wants to know how much it cost and where to mail the cheque - maybe you can deal directly with him on that one.

We had a lovely meal last night, using the frozen broccoli and beans to add a different dimension to our meal. The lamb as usual was wonderfully tender (in fact even more so than usual).

I assume we will hear tonight about the response from the French with regard to the changed RTA arrangements. I hope that the discussions all went well today. By the way, thanks for putting dry suits on board for us - after seeing the conditions under which the IRBs were operating today, they will be most welcomed.

Here's today's stuff with last week's (better late than never) Weekly Report also tagged on.

Sit Rep - 18 December 2006

Today started off in promising conditions for our prospective visitors on the Spirit of Enderby, with relatively light winds, but within about an hour of their arrival on shore the weather turned a bit nasty with moderate winds of about 20 - 25 knots (as forecast) and quite heavy snow. It bordered on whiteout at times. Heavy snow fell from about 09.00 until about 15.00 (Eastern states daylight saving time). Naturally enough the conditions improved within an hour of all tourists being returned to the ship! Although the conditions meant that some of the visitors felt a little uncomfortable at times they all left with a wonderful impression of Mawson's Huts and of the conservation work being done here. The conditions also gave them a small taste of the type of weather that the Home of the Blizzard is capable of dishing up at very short notice, something that I think added tremendously to their overall on-shore experience.

Morning weather obs 08.00

6/8, nimbo and altostratus

Temp: - 0.7 oC
Wind chill: - 7.3 oC (average value) with a minimum - 8.2 oC
Wind: Maximum gusts to 14 knots with an average wind speed of 11 knots from the S
RH: 73 %

Evening weather obs. 19.00

6/8, alto and stratocumulus

Temp: - 0.7 oC
Wind chill: - 7.8 oC (average value), minimum - 8.6 oC
Wind: Max gust of 17.5 knots with an average of 15 knots from the S
RH: 62 %

Monday's achievements:

All of the team worked wonderfully well to give the Spirit of Enderby visitors a truly memorable experience while on shore. Stairs had to be re-cut in the sea-ice in Boat Harbour, assistance was given to disembarking passengers (some of whom required considerable help), tours were given of Mawson's main hut, shelter was provided in both the Granholm and Sorensen huts and assistance was given to those visitors who struggled to walk over some of the more slippery areas.

This work was carried in marginal conditions that would normally have kept the team cocooned, snug and warm in the Sorensen. With conditions bordering on whiteout at times, none of the team flinched and worked extremely well to give support, help and a memorable experience for all visitors. I felt very proud to be part of this team.

Proposed work for Tuesday:

Visitors are again expected from the Spirit of Enderby. The team will again provide logistic support and guide visitors through the hut and over the site.

The weather is expected to be considerably better tomorrow!

That's all from a now mild Cape Denison.

Best wishes

Ian

WEEKLY REPORT - MAWSON'S HUTS EXPEDITION 2006

4 - 10 December 2006

Health:

All members of the team are in good health. The only minor incident involved the Field Leader who managed to get a Panadol capsule temporarily stuck in his throat, clearing it after a few minutes. There was no serious risk associated with this incident.

Morale:

Morale is very good. We again had a very good run with the weather this week with generally light to moderate winds that allowed outside work on 5 of the 7 days. Fine weather combined with good work outcomes kept spirits high. As the major external work has now been completed, there is not the pressure on the team as in previous weeks because internal ice removal and work on the environmental system can be carried out in even marginal conditions.

Environment:

Conditions varied considerably this week with morning temperatures ranging from - 2.4oC to - 5.6 oC and associated wind chills ranging from - 9.5 oC to - 16.4oC. We recorded our first 'above zero' temperature this week (+ 0.8 oC, Sunday evening). Average wind speeds varied from 10 to 39 knots. In all cases, generally milder conditions were recorded in the evenings. Slightly milder conditions again assisted us in our efforts to reduce gas consumption.

Safety:

No safety issues arose during the week.

Achievement against works plan:

- All ridge, valley and roof apex flashings were completed, providing the finishing touches to the over-cladding job. This was an outcome that looked somewhat doubtful when we first arrived and cast our eyes on the buried building. No ingress was observed through the new roof, skylights and apex flashing after periods of snowfall and blowing snow.
- Testing and calibration continued of the environmental sensors - one of the five 'functional' sensors continued to give erratic readings, despite all connections being checked and solid. After careful drying out with silica gel, all sensors responded appropriately. One sensor was relocated from the workshop to the post erected adjacent to the workshop door to replace the one irreparably damaged by the heavy snow coverage this year. Small plastic 'skirts' were fitted to all internal sensors to minimise ingress of drift, hoar frost or moisture into the sensors. A connection could not be established with Campbell Scientific however.
- Ice removal was undertaken from internal spaces - snow and ice was removed from the SE corner of the Main Hut, re-exposing Hyde Park corner. Plastic sheeting was placed there to monitor future snow ingress.
- Interior architectural photography and artefact documentation was undertaken.
- The workshop's skylight and areas around the ventilator were sealed with silicone to minimise snow ingress, as was the northern skylight on the Main Hut

Additional Activities:

- Mawsons hut worksite was completely cleared of tools and equipment and tools were serviced prior to storage. Tool inventories were updated and gear has been sorted to either gash, RTA or storage in Granholm
- Continued video documentation of works (ice removal in particular) and a video interview with Ian.
- Simon worked on a story to be filed regarding completion of over-cladding of the Main Hut (as a follow up to the press release he prepared for Senator Campbell)
- A press release and photograph of the flagpole were prepared and forwarded and photographs were sent to ANARE magazine (before and after shots of the flagpole - in-situ and after removal)
- Maintenance and additional work was done around the Sorensen camp with a set of stairs being made to access the Sorensen hut (a real boon for us older expeditioners!), all U channels on the Sorensen were sealed, the guys were checked and tightened, tie downs were bolstered and a new door seal was fitted to the Apple.
- Ian was interviewed by Grant Cameron for the Drive Program on ABC radio Adelaide.
- Ted made an appearance on Macca's Australia All Over on Sunday morning.
- A large sled was constructed, using the 2 plastic RMIT sleds as bases. This will be used to transport timber from the Granholm Hut to a site adjacent to the Sorensen Hut.
- A story on the flagpole was filed for release.
- A box was constructed to transport the flagpole back to Australia. Due to no archival materials being available for this purpose, a roll mat was cut to provide cushioning and a shaped support for the flagpole to prevent damage while in transit. The flagpole was thoroughly documented prior to packing
- The main hut site was cleaned up with all scrap materials stored for RTA.
- Cage pallets, the bulk fuel (ATK) and the large diesel generator were all moved up the hill to the helicopter pick up point.

General Comment:

It was another good week, with gradually improving weather and significant progress on all work fronts

Dr Ian Godfrey
Field Leader
18 December 2006

Thanks for your long message yesterday - the Sarsen sounds very impressive, as does the owner. All of us here are relishing the thought of being spoilt and of heading back via whatever route Fred finds interesting! I sent Eric Phillips an email yesterday in response to his,

giving him our sat phone contacts. Having now established that first contact it will be relatively straightforward to keep in touch during their trip south.

We have all discussed the situation regarding the L'Astrolabe and are aware of the sensitivities. We have obviously communicated the Sarsen option with our families but will make sure that it goes no further than that until we get the go ahead from you. Prior to your message I had discussed the possibility with Simon of a story about the Sarsen pick up and RTA. It may be a good way of thanking them for this - a bit of very positive publicity for them that could also be a forum for promoting the Foundation. Naturally it would have to be written with enough sensitivity so as not to cause any problems with the French but this is something that I am confident that Simon is capable of doing. We will wait to hear from you before proceeding down this path however.

Thanks from the FYM down here for getting in touch with their partners back home. Those sort of considerations, even if we have email contact, are very much appreciated. (as there was no one called Mark down here, we have assumed that the FYM is the complimentary version of that acronym).

Thanks also for arranging the delivery of our supplies. Rodney and some of his crew made it ashore this morning and delivered all of our goodies. It was fantastic and we are all looking forward to dinner tonight with some different veges. Much as we love Deb it will be nice to have a little variety. There were also a few additional surprises in the stash from Eddie Firth and Brett (plumber) on Macca - none of which will go to waste!! Unfortunately the winds strengthened not long after Rodney made it ashore and it was not possible for him to get any of his passengers ashore. As I write I am keeping an eye (and ear) on the weather so that I can let him know if and when the wind drops to manageable levels. He said that it doesn't matter if it is 1 am tomorrow morning (fortunately he is still operating on NZ time - translates to only 11 pm our time - no problems with that!).

Here is the official rap:

Sit Rep - 17 December 2006

Today started off in promising conditions for our prospective visitors on the Spirit of Enderby, with relatively light winds. Unfortunately the winds strengthened progressively throughout the morning and early afternoon, to about 30 knots. Some of the crew from the Spirit of the Enderby made it in with our additional supplies but as the winds increased they cancelled further boating operations for the day. At 4pm the wind was gusting to 31 knots with an average of 24 knots from the SSE and small amounts of blowing snow.

Morning weather obs 08.00 7/8, stratocumulus and altostratus

Temp: - 0.5 oC
Wind chill: - 7.1 oC (average value) with a minimum - 8.2 oC
Wind: Maximum gusts to 16 knots with an average wind speed of 11.5 knots from the SSE
RH: 69 %

Evening weather obs. 19.00 6/8, alto and stratocumulus
Temp: + 0.4 oC
Wind chill: - 9.1 oC (average value), minimum - 10.7 oC
Wind: Max gust of 33 knots with an average of 26 knots from the SSE with a small amount of blowing snow
RH: 69 %

Sunday's Achievements:

The team was up early in anticipation of the imminent arrival of visitors on board the Spirit of Enderby. The ice landing at Boat Harbour was checked, mooring points for the IRBs prepared and a rope handline installed to assist passengers using the ice landing stairs. The Mawson's Huts Foundation banner was also erected at the landing point.

While Rodney Russ and some of his crew were able to make it ashore to deliver additional supplies to the team, strengthening winds prevented any passengers getting ashore. While monitoring the wind conditions, Ian took 2 of the crew on a tour of the Main Hut.

Planned achievements for Monday:

Activities will be dependent on the wind and sea conditions. If Spirit of Enderby passengers make it to shore the team will be involved in showing them over the Main Hut and assisting with the landing and departures. Otherwise work will continue inside the hut to check the connections and power supply to the satellite phone in preparation for making an outgoing phone call to allow the phone to be recognised by the Iridium network.

That's it from a content and resupplied team

Best wishes

Ian

I've been pretty slack this week and have only just started on last week's Weekly Report (almost in time to start this week's report!). The Spirit of Enderby has been in touch with us - they arrived last night but it was effectively a whiteout then and so a landing was not possible. This morning was too windy and so they took a trip to the Mertz Glacier. They will again be calling by tomorrow morning to check on the situation but the forecast is not promising. They will be in the area for 5 or 6 days though and so we shouldn't have any problems in eventually getting our goodies from them.

Eric Phillips has also been in contact - I will send him a message tonight. Other than that there is not much else to report other than that which is in the Sit Rep.

Sit Rep - Saturday, 16 December 2006

The whiteout conditions backed off during the night, with the team waking to moderate winds with only small amounts of drifting snow. The new roof was well and truly covered again, with all of our trenches filled in to - there had been a lot of snow dumped over the past 36 or so hours. We are all very glad that we didn't have such a big dump during the period that we were digging out the roof planes!

Morning weather obs 09.30

8/8, stratus, stratocumulus and altostratus

Temp: - 1.2 oC
Wind chill: - 11.0 oC (average value) with a minimum - 11.7 oC
Wind: Maximum gusts to 29 knots with an average wind speed of 24 knots from the SSE with small amounts of wind-borne snow.
RH: 75 %

Evening weather obs. 5/8, altocumulus with stratus on the horizon

Temp: + 0.1 oC
Wind chill: - 7.5 oC (average value), minimum - 8.0 oC
Wind: Max gust of 21 knots with an average of 17 knots from the
RH: 62 %

Saturday's Achievements:

- The milder than expected conditions gave the team the opportunity to deblizz a lot of our equipment and buildings. The Sorensen toilet, the quads, the Spirit of Denison sled, the entrance to the Main Hut workshop and the Granholm Hut all required a lot of shovelling to clear them. A new stairway had to be dug to gain entrance to the workshop as the snow was again above roof height.
- The team also removed excavated snow and ice, tools and other distracting materials from the interior of the Main Hut so that it will look at its best for the visit of passengers from the Spirit of Enderby which is currently in Commonwealth Bay.
- An ice staircase was cut into the sea ice in Boat Harbour - this was promptly tested by the local Adelie's who welcomed an easier exit from the waters!
- A new latch was fitted to the Granholm door

Sorensen Hut clear

Ian

Thanks very much for your detailed and also very reassuring email about the Sarsen. It certainly isn't a Sir Spewbert - anything that has operated in the North Atlantic has got to be a pretty solid ship! The other appealing thing is the refit and a small number of people on board. Could be a great trip back. We all look forward to hearing more about the ship and how cargo etc will be handled. If you and the AGAD endorse the ship and its company then that is good enough for us especially if it means an earlier RTA!!

As forecast by the Casey team, today was a real whiteout. Not only will we have to dig our way back into the main hut, but we will also have to dig out the quads. They are almost completely buried. The winds have varied a bit today but have been enough to send occasional shivers through the Sorensen. It seems that all Rodney has to do is threaten to approach Cape Denison and the weather turns it on! It is meant to ease a little later tomorrow.

Looking at the amount of snow that has been dumped here today, I think that all of our excavations will be more than filled in again. It will give the visitors (if they make it to shore) a bit of an idea of what we had to deal with in order to overclad the main roof

(although the trenches themselves were impressive). Seeing the intensity of this snow fall has made me realise just how lucky we were not to cop this sort of weather during the overcladding process. It would have been frustrating if nothing else.

Here is the official version of the day's activities:

Rep Sit - 15 December 2006

The Casey forecast of whiteout conditions was spot on. It has been so all day with only the wind speed varying occasionally. No weather observations were made in the morning - it was very windy (estimated at 35 knots) and the visibility was about 5 metres. It was a good day to catch up on documentation and correspondence! Even venturing outside to the toilet was an adventure.

Here are the obs for the evening of 15 December:

Evening weather obs. 19.15 it was not possible to discern the type of cloud coverage because of the limited visibility due to blowing snow

Temp: - 2.5 oC
Wind chill: - 12.3 oC (average value), minimum - 13.8 oC
Wind: Max gust of 30 knots with an average of 23 knots from the S
RH: 89 %

Friday's achievements:

- Documentation of work undertaken so far and report preparation
- Preparation of emails for the evening mail
- Preparation of a powerpoint presentation for the Spirit of Enderby visitors whose ship is expected in Commonwealth Bay this evening.

Proposed activities for Saturday:

Activities will be determined by the weather conditions (not promising at this stage). If the poor weather abates then it may be possible to do some of the following:

- Preparation of an ice landing in boat harbour for Spirit of Enderby visitors
- Preparation of an ice staircase and clearing of snow to allow entry to the Main Hut
- Tours of the main hut
- Continued documentation of works undertaken and report preparation

That's about it from the 5 of us, snug in the Sorensen (but not so good for the 3 who have the job in front of them of trying to excavate their way into the tents!). How good is that bed in the Sorensen kitchen when the weather is like this? I think that I may hold a raffle!

Cheers Rob and thanks again for all of your efforts in checking out the best way of getting us home as early and as safely as possible.

Ian

Sorry that I missed your call today. The others have filled me in on the details of your conversation re the Sarcen and I have also spoken at length with David Jensen who also called this afternoon (2 calls in one day is almost unheard of). The earlier arrival back in Oz would certainly be a bonus, as long as the Sarcen is a better option than the Sir Huey!! I understand that you will call again with more details regarding the ship. It is a pity that the L'Astrolabe's travel schedule is so uncertain because, from my perspective, it is a proven performer (even with slightly hotter engine rooms than usually desired) and the short stay at DDU would have been a bonus.

With regard to the Sarcen, could you let us know the specifications of the ship - length and tonnage - and details of the crew etc. I am a little concerned that David reiterated about half a dozen times that they were not cowboys (which made me think immediately that they were). Please don't tell him that (I promise I won't talk to your mum again) but it seemed that he was very keen to emphasise that particular point. He mentioned a Russian skipper but gave no other details of the crew and their experience, the safety systems on board etc. Even though I don't get seasick, after my last trip back with the Huey, I am not particularly keen on travelling back on a something that even remotely resembles that tub.

There are a few other issues with respect to cargo. David indicated that whatever was left behind by the Sarcen wouldn't be picked up by the French. Apart from gash and empty gas bottles, we had planned to RTA the big diesel generator and the 2 smaller petrol generators (the former because it wasn't much good anyway and the other 2 for servicing), 3 chain saws, 5 polar pyramids and the medical boxes (comprising 4 sledging boxes, 1 oxy viva, 2 remote area

first aid kits and 1 Oregon spinal splint) in the cage pallets. What are your thoughts on RTA for these materials?

In a similar vein, we estimate that we would have about 3 - 4 m3 of personal and professional gear (packs, camera gear, personal stuff, scientific equipment etc). Would there be space on board and do their IRBs and crew have the capacity and experience to transport these sort of items safely over whatever distance has to be travelled to their anchorage?

With regard to anchorages here for the Sarcen, I think that Don and Margie McIntyre (Navy?) may be the best bet for charts of the area. I think from memory they had a navy woman doing circuits when they were down here and so they may have the best information on safe anchorages and possible routes to the same. As you know there are a lot of rocky outcrops in the area that pose considerable risks to ships.

Sorry about all of the questions. We really appreciate all that you are doing to get us back as early as possible but (and this is only my personal view) I wouldn't like it to be just a snatch and grab that leaves a mess for future parties to have to take care of.

On a related matter, Psycho will lose about \$400 due to a non-refundable ferry ticket. Could you please alert David to this and other costs that may accrue as a result of the delays to our return. Until we know with more certainty about our likely arrival date back in Oz I can't really outline all of these possible additional costs. I don't think that they will be huge but obviously they are significant to the individuals concerned. Thanks also for taking care of my ticketing arrangements (I am glad that I went for a fully flexible fare now!).

Now here is the official bit of the day's proceedings:

Sit Rep - Thursday 14 December 2006

The wind was quite steady all day. There was a lot of snow obscuring the plateau to the east of here for most of the day. At about 7 pm it started to move down from the plateau here, with wind-borne snow being blown past Mawson's hut. It is not yet whiteout conditions but is building up. Simon is hoping that it continues to build so that he can get some images of intrepid expeditioners braving the elements!!

Morning weather obs 10.30

8/8, stratus, stratocumulus and altostratus

Temp: - 2.4 oC
Wind chill: - 11.4 oC (average value) with a minimum - 12.3 oC
Wind: Maximum gusts to 24 knots with an average wind speed of 18 knots from the south. There was no wind-borne snow.
RH: 68 %

Evening weather obs. 19.15

8/8, stratus

Temp: - 2.5 oC
Wind chill: - 11.1 oC (average value), minimum - 12.3 oC
Wind: Max gust of 22.5 knots with an average of 17 knots from the S
RH: 74 %

Thursday's achievements:

- Snow and ice removal continued with more exposed in the NE corner of the Main Hut and kitchen. More of Dyce Murphy's bunk was exposed and careful hand-sawing has largely uncovered 5 bottles (unfortunately the malt whisky was empty).
- The Granholm and inside of the Main Hut were tidied up a little in readiness for the arrival of visitors in the next couple of days.
- Sorting and organisation of tools continued and separation of the refuge area in the Granholm from the tool storage area

Proposed work for Friday:

Again, depending on the wind and snow conditions (45 knots and whiteout have been forecast) some or all of the following activities will be attempted:

- More timber shifting of timber from the stack at the Granholm to the Sorensen hut site and securing of the stack at the Sorensen site.
- Sampling of contaminated areas and chemical spillages inside the Main Hut and wood from the new roof.
- Further ice removal from the main hut, concentrating on the north-east corner of the central living space and kitchen.

Best wishes

Ian

Thanks for the L'Astrolabe update and for your other comments - all very much appreciated. Here we have taken the view that a Dec 27 pick up is probably unlikely seeing as it is the earliest estimate (also makes it easier to adjust to, I guess, if the ship is a bit slower getting down here). Maybe we should have asked for more beer and wine!!! Regardless, we very much appreciated you letting us know the latest on that and obviously would like to hear any news as soon as it comes to hand.

We will act on all of your comments regarding the other issues and await responses on the others.

Now here is the official bit of the day's proceedings:

Sit Rep - Wednesday 13 December 2006

While the day started off in balmy fashion, with fluky winds that came from all possible directions, the southerly eventually rolled down from the plateau in the early afternoon, blowing steadily for the rest of the day.

The somewhat cooler conditions confined activities to the interior of the Main Hut where ice and snow excavations continued.

Morning weather obs 10.30

8/8, mainly altostratus with some stratus

Temp: - 2.5 oC

Wind chill: - 3.6 oC (average value) with a minimum - 6.7 oC

Wind: The wind was extremely fluky, not blowing steadily in any direction, coming basically from all directions at times during the monitoring period. The strongest gust of 6 knots was from the south and the average wind speed was 2.1 knots with the light breeze interrupted with calm periods.

RH: 62 %

Evening weather obs. 19.30

8/8, stratus and stratocumulus

Temp: - 2.4 oC

Wind chill: - 11.3 oC (average value), minimum - 12.5 oC

Wind: Max gust of 25 knots with an average of 18 knots from the S

RH: 65 %

Tuesday's achievements:

- Snow and ice removal continued with more and more exposed in the NE corner of the Main Hut and a start made in the kitchen area. More food cans, cloth bags (probably containing sledging rations), tins of metal polish, a lovely bottle of Mackinlays malt whisky and other assorted items were exposed. It is incredibly satisfying to see more and more things being exposed that give us gentle reminders of what life may have been like in the huts.
- Simon took quite a bit of video of the day's proceedings - he may have to bleep out some of the commentary from excited excavators!
- Food stocks were thoroughly examined and old stocks put aside, pending advice from the Antarctic Division.

Proposed work for Thursday:

Again, depending on the wind and snow conditions (45 knots and whiteout have been forecast) some or all of the following activities will be attempted:

- More timber shifting of timber from the stack at the Granholm to the Sorensen hut site and securing of the stack at the Sorensen site.
- Sampling of contaminated areas and chemical spillages inside the Main Hut and wood from the new roof.
- Further ice removal from the main hut, concentrating on the north-east corner of the central living space and kitchen.

Best wishes

Ian

Our messages will cross I guess - there are no outstanding issues to report. I will put the weekly report together later today - this will probably be sent tomorrow morning. We were discussing the option of leaving the cold porch of the Granholm as the refuge (complete with sleeping bags, mats etc) and putting a lock on the freezer door compartment but thought that may be more likely to attract attention (and of course for those who like a challenge) I will await your advice but feel that an appropriately written sign in the Granholm asking people to respect the property will probably be enough to do the trick. I think that most visitors to the site aren't really going to be interested in trying to pinch some tools (now

the sleeping bags may be another issue). The most likely culprits would probably be our neighbours rather than tourists or visiting sailors.

Marty has done some great ice removal work and exposed quite a bit of new areas, particularly towards the NE corner – it was wonderful to see little things like a candle, box of matches, little paint brush and other personal items appear out of the snow and ice. He has a well developed sensitivity and careful approach to what he does.

These extra bits of exposure will make the tourist visit this weekend so much more memorable for them

Simon is going to sort through the food stuffs today to put together all of the supplies that are well out of date (up to 6 years in some cases). What is your advice on that with regard to retention here, return for possible recycling (among Deb aficionados)? We realise that most of these supplies will still be quite edible but some of the older stocks are starting to build up. Does the Division have a policy on these sort of matters?

Now here is the official bit of the days proceedings:

Sit Rep – Tuesday 12 December 2006

It was a day of contrasts today – early in the morning (about 3 am) the winds were estimated at 25 – 30 knots with a bit of blowing snow. The wind gradually abated during the morning, as evidenced by the 11 am readings. It was calm until about 5 pm when the wind swung around to the south and strengthened a little, cooling down what had been a very warm day.

Even though the snow falls and blowing snow were only very light it was interesting to note the large amount of snow that accumulated into the trenches excavated around the roof planes. It made us realise the value of the snow wall (largely ablated now) that we had built to stop and deflect wind-borne snow and of our luck in not getting big dumps of snow while these critical works were in progress – good planning and good luck!

Morning weather obs 11.00

5/8, altostratus

Temp: - 0.8 oC
Wind chill: - 3.1 oC (average value) with a minimum - 3.3 oC
Wind: The wind was steady at about 2.1 knots from the NE (barely a zephyr)
RH: 70 %

Evening weather obs. 18.00

8/8, mainly altostratus with some stratocumulus on the horizon to the N, W and E.

Temp: - 0.8 oC
Wind chill: - 5.8 oC (average value), minimum - 7.2 oC
Wind: Max gust of 10 knots with an average of 7 knots from the S
RH: 58 %

Tuesday's achievements:

A range of activities were undertaken today:

- The Spirit of Cape Denison was put to good use today, carting 4 large loads of timber from the Granholm Hut to the new timber storage area adjacent to the Sorensen Hut.
- Snow and ice were removed from the skylight in the ceiling of Mawson's cubicle and from Laseron's bunk and the one below. Interesting artefacts were revealed including 3 candles, a matchbox adjacent to one of the candles, food supplies including fabulous intact ration boxes.
- Moisture readings were obtained for representative timbers inside the Main Hut and of the new roof.
- The thickness of the backing board of the replica memorial plaque was measured – the upper edges of the timber are effectively worn away, being less than 1 mm thick on that edge.
- Mould samples were taken from areas in the Main Hut including timber planks, food stuffs, clothes and paper-based objects.
- Team Australia photo was taken today – for mounting in the Sorensen Hut along with those of previous expedition teams.

Proposed work for Wednesday:

Although moderate winds are forecast, the following activities will be attempted:

- More timber shifting of timber from the stack at the Granholm to the Sorensen hut site and securing of the stack at the Sorensen site.
- Sampling of contaminated areas and chemical spillages inside the Main Hut and wood from the new roof.

- Further ice removal from the main hut, concentrating on the north-east corner of the central living space.
- Filing a story on ice removal from the skylight in the ceiling of Mawson's cubicle, letting in natural light for the first time in many years.
- Sorting of long-out-of-date food stuffs for possible RTA (subject to advice from AGAD)

Best wishes

Ian

Thanks for your message and your many comments. With regard to the tools - the team is happy to leave tools in the Granholm as, apart from the big De Walt saw brought down this year, all tools are in locked boxes and the door to the Granholm is to be closed with batten screws. I am not sure how this fits in with the status of the Granholm as a refuge but there is a hammer left hanging outside should entry be needed in an emergency situation. Is this kosher? My concern, as is obviously yours, is for programs to be jeopardised by missing tools on arrival. We can bring more things back but the general feeling is that the Granholm is pretty secure and the risk of theft is low. I was thinking of leaving a note inside as well (a plea for respect of property etc) but sometimes these things only serve to attract attention to what otherwise might be overlooked. What do you think?

Thanks also for the word on the quads - there were mixed feelings on the best thing to do. As long as a couple of people do the quad maintenance course and batteries in good condition and spares (especially spark plugs). Two of the quad seats are cactus - I assume that it would be OK to RTA these to allow them to be recovered (they are in very bad condition - not just a crack or a split here or there, the fabric is fluttering in the breeze!).

Marty is doing a great job, with a careful hand, in removing snow and ice from the interior of the Main Hut. Once I finish doing my stuff I will give him a hand to try to expose as much of the original fabric as we can. I will also have a good look over the exposed artefacts so that the most appropriate conservation team is chosen if work is to be done on these objects in the coming season.

Thanks for the word on the Sarsen - to be honest I think that we all hope that we won't still be here when it arrives! Nothing against the ship or its company. I am going to send Rodney Russ a message in this drop, offering him whatever assistance we can give him (ice stairs etc, pre-landing presentation or briefing etc) just to open communications with him. I assume that the email address that you used for him will get through.

I also have a quarantine question - in the original works plan I sent through to Bruce Hull, I mentioned that I would like to take some mould samples (of the stuff that is growing on artefacts, timbers etc) to get it identified back in Oz. The WA Museum is an approved quarantine facility for receipt of incoming samples as is the University of Western Australia (where the samples will be cultured and identified). The samples are in sealed containers and shouldn't be any problems but I forgot to check with Bruce regarding quarantine approval for importing these.

A further issue is that of miscellaneous chemicals that adorn the site (eg broken, unlabelled bottles on the floor of the darkroom in particular). I was thinking of taking samples for identification but this is not in the works plan. Is it possible to do this - both the mould and the chemical issues have potential occupational health and safety implications. I'd appreciate your advice on these issues.

On another note, none of us were given copies of our clothing issue and so won't be aware of all the things that we should have and what must be returned. Obviously we know most of these that we can keep but some are in the grey area. Would you be able to check this one up for me.

And finally on a personal level - could you please cancel my Qantas flight home (scheduled for Dec 24 - was I an optimist or what). You can either re-book for around Jan 7 or wait until we have firmer details of our pick up. The ticket is a fully flexible fare and I was due to fly out on QF 1010 at 06.20 on 24 Dec to Melbourne and then on QF 0485 to Perth, departing at 0815 from Melbourne. Other details are as below:

Ticket in name of:	Dr Ian Godfrey
Booking reference:	YN8GF8
E ticket number	081 24527008244

Now here is the official bit of the days proceedings:

Sit Rep - Monday 11 December 2006

It was another lovely day today - we had some fine snow falling about the place for a while. It was only very light but was enough to give the place a bit of a dusting. Although it was

overcast for most of the day, the sun poked its head out around 6 pm and warmed the place up even more. Light, almost non-existent wind for most of the day.

Morning weather obs (morning is used fairly loosely here!!) 12.00 8/8, stratocumulus and stratus

Temp: - 1.8 oC
Wind chill: - 4.0 oC (average value) with a minimum - 4.6 oC
Wind: Max gusts to 2.9 knots with an average of 2.5 knots from the W, with very fine, light snow falling occasionally
RH: 77 %

Evening weather obs. 19.00 5/8, stratocumulus

Temp: - 1.5 oC
Wind chill: - 2.9 oC (average value), minimum - 3.9 oC
Wind: Max gust of 2.5 knots with an average of 2.1 knots from the S
RH: 73 %

Monday's achievements:

A range of activities were undertaken today:

- The large sled, christened The Spirit of Cape Denison, was given a workout today, carting 3 loads of timber from the Granholm Hut to a site adjacent to the Sorensen Hut. As the day warmed up and the snow softened two quads were used to get the load through some of the more difficult areas.
- More tweaking of the environmental system - a sensor was relocated from the NE corner to the centre of the workshop and the fittings on the external sensor post were adjusted to give it more resistance to large dumps of snow should similar dumps occur this coming year. All that remains to do is to check the power supply to the satellite phone (awaiting a battery from the Spirit of Enderby for the multimeter) and to try to make a call out - this has been attempted but without success.
- Tinyview loggers, used to check the Vaisala readings, were placed in similar environments to check their precision and accuracy.
- Packing of the flagpole was completed - it will be left unsealed this week however, so that it is available for interested visitors from the tourist ship, Spirit of Enderby, to view.
- Snow and ice was removed from above Mawson's cubicle and from the SW corner of the Main Hut.

Proposed work for Tuesday:

Forecast good weather Tuesday will again see a range of activities in and around the Hut, including:

- More timber shifting of timber from the stack at the Granholm to the Sorensen hut site and securing of the stack at the Sorensen site.
- Sampling of mouldy and contaminated areas and chemical spillages inside the Main Hut
- Documentation of timber thicknesses on available areas (memorial cross plaque, Transit Hut). No work is possible on the hut walls because of the snow coverage
- Collection of mould samples from affected areas inside the main hut
- Further ice removal from the main hut

Best wishes from a sunny and calm Cape Denison (Home of the Blizzard - phoeey!!!)

Ian

I hope that you have recovered from the lengthy message that I sent the other day. Today's is pretty light by comparison. I haven't had a chance to look at the 5 year plan in detail yet. Please let me know if there is any urgency to do so, because at the moment I keep pushing it to the bottom of the pile when other things crop up.

Now here is the official bit of the days proceedings:

Sit Rep - Sunday 10 December 2006

A lovely mild day today, though overcast for most of it. Snow fell (so unusual was just being blown around the place) from about 8pm and was still falling gently when bed called at about 12.30 am. It gave the landscape a nice white dusting.

Here are the obs for 10 December

Morning weather obs 10.00 8/8, stratocumulus

Temp: - 2.8 oC
Wind chill: - 9.1 oC (average value) with a minimum - 9.5 oC
Wind: Max gusts to 10 knots with an average of 8.5 knots from the S
RH: 65 %

Evening weather obs.20 30 8/8, stratocumulus, light snow falling - very pretty flakes

Temp: - 1.5 oC
Wind chill: + 0.1 oC (average value), minimum - 2.4 oC (I don't quite understand the average chill value - seems anomalous, could the breeze blowing from the ocean have anything to do with that?)
Wind: Max gust of 2.1 knots with an average of 1.8 knots from the E
RH: 74 %

Sunday's achievements:

A range of activities were undertaken today:

- A large sled was constructed, using the 2 plastic RMIT sleds as bases. This will be used to transport timber from the Granholm Hut to a site adjacent to the Sorensen Hut.
- Work continued on the environmental monitoring system - all sensors were again tested and are now working well after drying of the sensor tips with silica gel. One sensor was relocated from the workshop to the post erected adjacent to the workshop door to replace the one irreparably damaged by the heavy snow coverage this year. Small plastic 'skirts' were fitted to all internal sensors to minimise ingress of drift, hoar frost or moisture into the sensors.
- Another roll mat layer was cut, shaped and fitted into the flagpole storage box. The box is almost ready to accept the flagpole for its RTA for conservation work.
- Recent snow ingress was removed from the SE corner of the Main Hut, re-exposing Hyde Park corner. Plastic sheeting will be placed here to monitor future snow ingress.
- The workshop's skylight and areas around the ventilator were sealed with silicone to minimise snow ingress as was the northern skylight on the Main Hut
- Continued video documentation of works (ice removal in particular) and a video interview with Ian.

Proposed work for Monday:

Very good weather forecasts for Monday and Tuesday will again see a flurry of activities in and around the Hut, including:

- Removal of the timber stack from the Granholm to the Sorensen hut site.
- Completion of packing of the flagpole for RTA
- Calibration checking of data loggers used to monitor Vaisala sensors.
- Collection of mould samples from affected areas inside the main hut

Best wishes from a balmy Cape Denison (it was still 8 C in the Sorensen this morning when I surfaced - amazing!)

Ian
Sit Rep - Saturday 9 December 2006

It was a bit of an average day here - started off windy and continued in the same vein for most of the day. There were isolated periods with small amounts of wind-borne snow in the early morning but mainly just wind. The wind kept up for most of the day, easing at about 17.30 and dropping to only a few knots by 20.00.

Morning weather obs 10.00 7/8, stratocumulus

Temp: - 4.2 oC
Wind chill: - 16.4 oC (average value) with a minimum - 16.9 oC
Wind: Max gusts to 39 knots with an average of 35 knots from the SSE to SE with occasional periods of light wind-borne snow
RH: 72 %

Evening weather obs.18 30 7/8, stratocumulus

Temp: + 0.1 oC
Wind chill: - 5.7 oC (average value), minimum - 7.1 oC
Wind: Max gust of 17 knots with an average of 12 knots - the wind was quite fluky, blowing quite strongly, predominantly from the south, but also with an occasional bit of SSW in it.
RH: 46 %

Saturday's achievements:

It was too windy to do any external work and so work focussed on continuing photo and written documentation of parts of the roof fabric that had been recovered from some of the excavated snow blocks (parts of the roof fabric that had blown into the snow and been retained therein) and transcription of notes taken on site to computer records.

Proposed work for Sunday:

As the forecast is promising for Sunday the following activities are likely to be tackled:

- Relocate an internal temperature/relative humidity to an external location to replace the sensor damaged by snow and ice over the winter period.
- Complete packing of the flagpole for RTA
- Continued architectural and artefact documentation inside the main hut

Over and out

Ian

We had a good game of cricket last night, finishing up right on the stroke of midnight! Re the tools and equipment - unless instructed otherwise we would prefer to store most of it here in the Granholm (as happened last year), locked in tool boxes and with the Granholm made reasonably secure (batten screws). There will be approximately 150 kg of tools and equipment coming back - these will be the things that need some form of maintenance (chain saws etc).

We were also thinking of RTA'ing one quad for it to be given an overall service plus an extra seat to be reupholstered. I would appreciate your thoughts on this one - the idea of repatriating one quad is with the intention that once serviced it is put aside for use on the next expedition and travels down with the team. That way there is always one quad off-loaded in an operational conditional. All of the quads would benefit from a service on a rotational basis. Our concern with this plan is that the serviced quad may not make it back down here. An alternative would then be for at least one expeditioner to do the quad servicing course at the Division and to service the quads that are left down here. What do you reckon?

Here's the official rap.

Sit Rep - 8 December 2006

It had been a lovely day right through until about 9.15 pm, starting off with light winds which then eased right off, leaving us with basically calm conditions from about 11am to 8 pm. The wind picked up a little bit from about 8pm with very light snow falls. Now there is a fair bit of blowing snow and the winds have picked up to an estimated 25-30 knots. It is good to be inside the Sorensen now.

The fine early weather did allow the tent dwellers to air and dry some of their mattresses and other bedding.

Morning weather obs 10.00

5/8, altostratus with stratus on the horizon

Temp: - 3.8 oC
Wind chill: - 12.5 oC (average value) with a minimum - 13.4 oC
Wind: Max gusts to 16 knots with an average of 13 knots from the S, no blowing snow
RH: 56 %

Evening weather obs. 20.30

8/8, stratus

Temp: - 2.8 oC
Wind chill: - 9.5 oC (average value), minimum - 11.3 oC
Wind: Max gust of 16 knots with an average of 11 knots from the SSE
RH: 54 %

Friday's Achievements:

- Interview with Grant Cameron for the Drive Program on ABC radio Adelaide..
- Continuation of interior architectural photography and artefact documentation.
- The flagpole was thoroughly documented and a start made on building a support for the flag in the box that has been made for its RTA.
- A story on the flagpole was sent today and presumably released.
- A set of stairs was made to access the Sorensen hut, a real boon for us older expeditioners!

- Maintenance work was undertaken on the Sorensen and the Apple - all U channels on the Sorensen were sealed, the guys were checked and tightened and the tie downs bolstered
- A new door seal was fitted to the Apple

Proposed work for Thursday:

As always the program will be dictated by the prevailing weather conditions. The forecast is not promising for tomorrow however and activities at the Main Hut will undertaken if safe access is possible.

- Relocate an internal temperature/relative humidity to an external location to replace the sensor damaged by snow and ice over the winter period.
- Complete packing of the flagpole for RTA
- Continued architectural and artefact documentation inside the main hut

That's it for now.

Cheers

Ian

It was a lovely day today - started off a little breezy but settled down about 2pm when the katabatic died. It was just perfect weather after that, probably as balmy as you could expect for this spot.

With regard to cargo for Patrice - there will be 4 cage pallets (returning the 4 that were dropped off here in October) - these will contain the following:

- Empty gas bottles
- Polyweave bags of gash
- Other rubbish/hardware
- Personal gear, packs, boxes etc

There will also obviously be 5 of us with all of our personal gear (cameras, etc) and a 1.8 m box containing the flagpole.

Here is today's sit rep

Sit Rep - 7 December 2006

Morning weather obs 10.00 8/8, altostratus

Temp: - 5.6 oC
 Wind chill: - 16.3 oC (average value) with a minimum - 17.0 oC
 Wind: Max gusts to 26 knots with an average of 22 knots from the S, no blowing snow
 RH: 58 %

Evening weather obs. 20.00 6/8, altostratus and altocumulus

Temp: - 2.0 oC
 Wind chill: - 5.6 oC (average value), minimum - 6.5 oC
 Wind: Max gust of 5 knots with an average of 4 knots from the N
 RH: 58 %

Thursday's Achievements:

- Continued documentation and checking of the environmental monitoring system - after careful drying out, all sensors are now operating as they should. A connection could not be established with Campbell Scientific however.
- Press release and photograph of the flagpole were prepared and forwarded
- Photographs were sent to ANARE magazine (before and after shots of the flagpole)
- Interior architectural photography and artefact documentation.
- Mawsons hut worksite was completely cleared of tools and equipment
- Gear has been sorted to either gash, RTA or storage in Granholm
- Contents of all toolboxes have been documented (updated from 2005 inventory)
- Timber piles have been sorted for RTA and assessment for new sites (eg move to Sorensen)
- There was also a Big Brown Brother's run to take care of accumulated slops etc that have mounted up over the past couple of days.

Proposed work for Friday:

As always the program will be dictated by the prevailing weather conditions.

- Relocate an internal temperature/relative humidity to an external location to replace the sensor damaged by snow and ice over the winter period.
- Pack the flagpole for RTA
- Continued architectural and artefact documentation
- Make a set of stairs at the Sorensen Hut
- Go fishing!!!

That's it for now - the cricket set it out!! Time to go.

Cheers

Ian

It was again fairly average today. It started off OK and I made my way over to Dougie's shack to work on the environmental system. The small blizz that we had yesterday morning had put a bit of snow in the workshop entrance that had to be cleared but it was good inside (no leaks at all from the new roof - the skylights, around the replica flagpole etc were all drift free as we all had expected). I had to head back to the Sorensen to grab another computer and by that time it started blowing a bit of drift about (continued until about 6 pm). The others headed over to the hut and tackled as much as they could in trying conditions. Tomorrow should be a better day.

Had a call from David Jensen today - it was good to hear from him. I passed on his best wishes to the rest of the team and also his word that the L'Astrolabe was still on schedule for a 25 Dec pick up. Good news. When he asked if there was anything that he could do for us, I put the question of extra phone time for Christmas for us. He said that we could have an extra 5 minutes of phone time - probably needed a bit more really but it will still be good to have that extra time to call loved ones.

Here is today's sit rep

Sit Rep - 6 December 2006

Morning weather obs 10.00 8/8, stratus and altocumulus

Temp: - 3.6 oC
 Wind chill: - 14.7 oC (average value) with a minimum - 15.7 oC
 Wind: Max gusts to 37 knots with an average of 27 knots from the S, no blowing snow
 RH: 58 %

Evening weather obs. 19.00 8/8, mainly altostratus

Temp: - 2.4 oC
 Wind chill: - 12.2 oC (average value), minimum - 12.6 oC
 Wind: Max gust of 27 knots with an average of 23 knots from the S, no wind-borne snow
 RH: 68 %

Wednesday's Achievements:

- Continued documentation of the environmental monitoring system
- Monitoring of the interior of the Main Hut to check on any snow ingress following prolonged periods of wind-borne snow - as expected there was no ingress through the new roof, skylights and apex flashing)
- Marking of tool locations with blizz poles (for later recovery)
- Maintenance of tools prior to storage
- Examination of the top of Mawson's cubicle with a view to eventual ice removal to expose the skylight in his room

Proposed work for Thursday:

As always the program will be dictated by the prevailing weather conditions.

- Attempt to establish a connection between the environmental monitoring system and Campbell Scientific
- If suitable for outside work, efforts will focus on removing non-essential tools and equipment from the Main Hut site, removal of the polar pyramid and tool maintenance.
- If inside work is required, work will focus on ice and snow removal from internal spaces (as per the works plan).

That's it for the day - hope all is well back home. I do feel a bit for Kimbo too but agree that Kevin (even though he is probably even more right wing than Kim) will have a better chance of knocking off Johnny Rotten! Fantastic result against the Poms too!! We were all so wrapped last night because, while discussing it during the day, we had predicted (without even

knowing the 4th day scores) that the Poms would fold under a bit of pressure and that we would win the match!!

Cheers

Ian

Overall it was a pretty crappy day - I took the opportunity to write up a lot of the environmental data that I had accumulated over the past few days. It certainly wasn't much of a day for outdoor activities.

Is there any word on our French water taxi and what is the latest on the Aurora's woes? The boys are obviously interested in the status of the standby option too!!

Look forward to hearing from you - here is today's sit rep and the Weekly waffle.

Sit Rep - 5 December 2006

Morning weather obs 09.00 8/8, mainly stratus with some stratocumulus

Temp: - 4.8 oC
Wind chill: - 15.9 oC (average value) with a minimum - 16.9 oC
Wind: Max gusts to 38 knots with an average of 31 knots from the S with a lot of wind-borne snow (white-out conditions at times)
RH: 82 %

Evening weather obs. 18.00 8/8, mainly altostratus with some stratus

Temp: - 1.9 oC
Wind chill: - 12.3 oC (average value), minimum - 12.9 oC
Wind: Max gust of 34 knots with an average of 29 knots from the S with no wind-borne snow
RH: 69 %

Tuesday's Achievements:

Strong winds prevented any work being undertaken at the Main Hut site. Work at the Sorensen focussed on documentation of recent work at the Main Hut while Simon worked on a story to be filed regarding completion of over-cladding of the Main Hut (as a follow up to the press release he prepared for Senator Campbell yesterday).

Proposed work for Wednesday:

As forecast conditions are similar (in fact a little worse) to those experienced today it is likely that Wednesday will also be a documentation and relaxation day.

WEEKLY REPORT - MAWSON'S HUTS EXPEDITION 2006

27 November - 3 December 2006

Health:

All members of the team are in good health.

Morale:

Morale is very good. We had a brilliant run with the weather this week with generally light to moderate winds that allowed outside work on 6 of the 7 days. Fine weather combined with good work outcomes have kept spirits high.

Environment:

Conditions varied considerably this week with morning temperatures ranging from - 3.3 oC to - 8.6 oC and associated wind chills ranging from - 8.6 oC to - 20.1 oC. We recorded our first 'above zero' temperature this week (+ 0.8 oC, Sunday evening). Average wind speeds varied from 36 to 10 knots. In all cases, generally milder conditions were recorded in the evenings. Slightly milder conditions again assisted us in our efforts to reduce gas consumption. The warmer evening temperatures were reflected in the increasingly slushy snow and ice underfoot.

Safety:

No safety issues arose during the week.

Achievement against works plan:

The run of very good weather gave the team the opportunity to work on the Main Hut for 6 days this week, allowing this phase of the works plan to be effectively completed (only the ridge, valley and apex flashings remain).

- An access way (shaft!) was excavated to the door of the workshop. Further snow and ice removal allowed full access to the Main Hut via the workshop door. This obviously assists interior work programs and will facilitate access by tourists expected later in December.
- The western roof plane was over-clad, completing the over-cladding process for all roof planes.
- All of the tongue and groove timbers were trimmed off, gaps were sealed between roof planes and about 50% of the ridge capping was fixed to the roof.
- The flagpole was removed for conservation treatment in Australia and a replica flagpole was made and fixed to the roof - it looked fantastic, especially with an Aussie flag attached and fluttering in the breeze.
- Roofshield membrane has been trimmed from all leading roof edges.
- A clean-up of the site commenced, with all visible modern materials (nails, screws, off cuts etc) being picked up and bagged for RTA.
- Fuel was transferred from the 200 L drums to jerry cans and a start was made on organising and packing tools and toolboxes.
- Ice removal was undertaken to expose some of the sensors attached to the datalogging system in preparation for calibration of the temperature and relative humidity sensors and the removal of redundant sensors.
- Data was downloaded from the satellite environment monitoring system and a new program installed. Six thermocouples and three temperature/relative humidity sensors were removed from their locations and disconnected from the logging system.
- Operational sensors were reconnected to the system and calibration checks commenced using the data from stand alone loggers for comparison. These are still on-going.
- Data logger and satellite phone batteries were changed in the environmental monitoring system and all connections were checked between the various components of the logging system. Because of its size, one of the new battery boxes had to be located external to the logger container. This was necessary to minimise compression of connections between the sensors the terminal block.

Additional Activities:

- The final promotional photographs and video footage were taken for Foundation sponsors.
- A press release was prepared for Senator Ian Campbell re completion of over-cladding of all roof planes of the Main Hut.

General Comment:

The spell of very good weather has ensured that the team will complete all of the main objectives of the works plan. The team is looking forward to the arrival of the tourist ships later this month. The site will be cleaned up to allow the Main Hut to be seen at its best (what is above snow level at least!). We may be able to point out where the Absolute Magnetic Hut and Magnetograph House are usually found!!

Dr Ian Godfrey
Field Leader
5 December 2006

The roof is completely finished!!!! It looks fantastic and is a credit to the skills of the carpenters in the team. The efforts of all team members in digging out the snow and ice to facilitate the over-cladding has made this a true team effort.

We had another plus day today (0.7C) at 6pm and light winds which gave us the conditions to finish off the roof. So all is good here - now for my stuff!

Sit Rep - 4 December 2006

It was a beautiful summer day today and the light winds and warm temperatures gave the team the opportunity to complete the over-cladding of the roof. It looks fantastic and should be as tight as a drum!

Morning weather obs 09.00
altostratus and altocumulus

2/8, on the horizon - appeared to be a mix of

Temp: -2.4 oC
Wind chill: - 11.9 oC (average value) with a minimum - 12.9 oC

Wind: Max gusts to 31 knots with an average of 23.9 knots from the S
RH: 54 %

Evening weather obs. 18.00 7/8, altocumulus with possibly some stratus on the horizon

Temp: + 0.7 oC
Wind chill: - 3.6 oC (average value), minimum - 4.9 oC
Wind: Max gust of 9 knots with an average of 6.8 knots from the N
RH: 63 %

Monday's Achievements:

- All ridge, valley and roof apex flashings were completed, finishing the over-cladding job completely. This was an outcome that that looked somewhat doubtful when we first arrived and cast our eyes on the buried building.
- A box was constructed to transport the flagpole back to Australia
- The main hut site was cleaned up with all scrap materials stored for RTA
- Cage pallets, the bulk fuel (ATK) and the large diesel generator were all moved up the hill to the helicopter pick up point
- Testing and calibration continued of the environmental sensors. One of the five 'functional' sensors still continues to give erratic readings, despite all connections being checked and solid.

Proposed work for Tuesday:

- Consolidation of the tools and equipment, including maintenance of the tools prior to packing away.
- Continued cleaning up of the site
- Continue calibration of the environmental sensors and attempt to call out from the environmental monitoring to allow it to then be contactable from Australia in the future.

That's it from a summery Cape Denison

Cheers

Ian

Hope that all is going smoothly back there - we had our first plus day for the season (+0.8 C) - whooooo!! The ice and snow were noticeably slushy underfoot. We continue to make good progress on all fronts - slow and steady and with the extra time available to us, with no panic!!

Here is the day's official rap.
Sit Rep - 3 December 2006

Morning weather obs 09.00 1/8, on the horizon - appeared to be a mix of altostratus altocumulus

Temp: -4.4 oC
Wind chill: - 16.3 oC (average value) with a minimum - 16.9 oC
Wind: Max gusts to 36 knots with an average of 31 knots from the S
RH: 59 %

Evening weather obs. 19.30 5/8, altostratus and altocumulus

Temp: + 0.8 oC
Wind chill: - 7.1 oC (average value), minimum -8.0 oC
Wind: Max gust of 22.5 knots with an average of 19.5 knots from the S
RH: 56 %

Sunday's Achievements:

- Data was downloaded from the environmental monitoring system to check sensor operations. The wiring from one sensor required re-connecting (loosened due to cramming by oversize battery boxes!). All operational sensors gave reasonable readings apart from the relative humidity sensor at the Apex of the main hut.
- One battery box was removed from the logger container and re-connected via holes drilled in the logger container (to minimise compression of connections between the sensors the terminal block).
- Ambient temperature and relative humidity conditions were measured by the Vaisala sensors and compared with data provided by a stand-alone Tinyview datalogger.
- A replica flagpole was made and fixed to the roof - it looked fantastic, especially with an Aussie flag attached and fluttering in the breeze.
- Roofshield membrane was trimmed from all leading roof edges.

- The site is slowly being cleaned up with all visible modern materials (nails, screws, off cuts etc) being picked up and bagged for RTA.
- Fuel was transferred from the 200 L drums to jerry cans and a start was made on organising and packing tools and tool boxes.

Planned work for Monday:

The work program will be determined by the weather. Possible activities include:

- More work on the roof planes to finish sealing the Main Hut (if light winds) - ridge capping and flashing.
- Further testing will be conducted to determine the response of the environmental sensors to low RH conditions.
- Site clean up and organisation in preparation for RTA and arrival of the first batch of tourists

Cheers Rob

Ian

Hope that you are well. Thanks for all of your messages (re the food and grog order with Rodney). I hope that he has a sense of humour as I see in one of the messages that you sent him, you simply forwarded my wish list which also included a couple of waitresses!! We have heard (our sources are impeccable down here) that there are 3 netball teams on the ship - maybe some of them could be conned into the roles!

The second day of summer was pretty warm but reminded me of Perth with the Freo doctor howling in. It was too windy for the lads to do any more work on the hut but I wandered over and did some more work on the environmental system. It is a little frustrating at times though - despite what Mike Staples put in his 2005 report about battery sizes and cable lengths they have sent down bigger batteries and cables that are too short to do the job. I bastardised the old batteries for the cables but think that the only way that I can be sure the connections inside the logger container won't be compromised will be to put one of the batteries external to the case (simply drill a hole for the connections). The windy weather gave the rest of the team a well-deserved break.

Here is the day's official rap.
Sit Rep - 2 December 2006

Morning weather obs 10.00
altocumulus

6/8, some cirrus, altostratus (mostly) and some

Temp: -3.3 oC
Wind chill: - 13.5 oC (average value) with a minimum - 13.9 oC
Wind: Max gusts to 32.5 knots with an average of 24 knots from the S
RH: 50 %

Evening weather obs. 18.00
in

8/8, mainly altostratus with a bit of stratus tossed

Temp: - 1.0 oC
Wind chill: - 10.4 oC (average value), minimum -11.1 oC
Wind: Max gust of 30 knots with an average of 24.5 knots from the S
RH: 52 %

Saturday's Achievements:

- Data logger and satellite phone batteries were changed in the environmental monitoring system and all connections were checked between the various components of the logging system.

Planned work for Sunday:

The work program will be determined by the weather. Possible activities include:

- More work on the roof planes to finish sealing the Main Hut (if light winds)
- Modification of the environmental system to accommodate the larger batteries. Possible testing of the system and sensor calibration (dependent on power availability also)

Otherwise we would be tempted to have some choir practice but as supplies are low

Cheers Rob

Ian

Hope that you are well – the first day of summer was another good one for the team down here. Got more work done on the roof, the flagpole out and some more work on the monitoring system. Crap weather is forecast for the next couple of days but the roof is pretty tight – we have definitely been favoured by the weather gods. I don't think that any of us will be bothered now by whatever is dished up!

Here is the day's official rap.
Sit Rep – 1 December 2006

Morning weather obs 10.30 8/8, altostratus

Temp: - 4.3 oC
Wind chill: - 13.8 oC (average value) with a minimum - 15.0 oC
Wind: Max gusts to 19 knots with an average of 14 knots from the S
RH: 52 %

Evening weather obs.20.45 6/8, basically a mix of almost everything – some cirrus to the SE, altocumulus above us, stratus and altostratus providing the rest of the canvas

Temp: - 3.1 oC
Wind chill: - 11.7 oC (average value), minimum -12.5 oC
Wind: Max gust of 21 knots with an average of 16.5 knots from the S
RH: 48 %

A continuation of fine weather, with moderate winds gave the team the chance to complete more work to make the roof planes tight enough to deal with forecast bad weather that is expected for the next couple of days.

Friday's Achievements:

- All of the tongue and groove timbers were trimmed off, about 50% of the ridge capping was fixed to roof and gaps between planes were sealed.
- The flagpole was removed for RTA for conservation treatment. A temporary seal has been put in place until a replica flagpole is installed.
- Leads from all working temperature and relative humidity sensors were connected to the multiplexer to allow for testing and calibration of the system.

Planned work for Saturday:

- As strong winds are forecast activities are likely to be restricted to those that can be undertaken inside the Main Hut (as long as safe travel to and from the hut is possible). Such activities would include reconnection and calibration of temperature and relative humidity sensors.

That's it from a very pleased and satisfied team

All the best

Ian

It was a little windier in the morning than forecast but the breeze abated during the day giving us another great working day. There are now tongue and groove boards on all roof planes and some Sikaflex in the ridges (ridge capping still to be put on). As the next couple of days are not likely to be very good it was fantastic to get to this stage. A true team effort.

Here is the day's official rap.
Sit Rep – 30 November 2006

Morning weather obs 09.30 1/8, altostratus (N and NW) and stratocumulus (N and E) – both on the horizon.

Temp: - 8.6 oC
Wind chill: - 20.1 oC (average value) with a minimum - 20.5 oC
Wind: Max gusts to 24 knots with an average of 19.5 knots from the S
RH: 58 %

Evening weather obs.20.30 8/8, altostratus with stratus on the horizon to the N and E

Temp: - 4.8 oC
Wind chill: - 10.1 oC (average value), minimum -11.8 oC
Wind: Max gust of 10 knots with an average of 6 knots from the S/SE

RH: 47 %

A continuation of fine weather allowed the team to complete a variety of tasks in and around the Main Hut. It was a very productive day.

Morning weather obs 10.00 5/8, cirrus directly above Cape Denison with stratus and altocumulus to the N, NW and E.

Temp: - 7.2 oC
Wind chill: - 16.1 oC (average value) with a minimum - 17.2 oC
Wind: Max gusts to 19 knots with an average of 13 knots from the S
RH: 61 %

Evening weather obs.21.00 1/8, alto and stratocumulus to the N and E

Temp: - 4.9 oC
Wind chill: - 6.9 oC (average value), minimum - 9.7 oC
Wind: Max gust of 4.1 knots with an average of 2.9 knots from the S
RH: 57 %

Thursday's Achievements:

- The western roof plane was over-clad today, the final roof plane to be finished. It has been a wonderful team effort to get to this stage.
- A further 4 thermocouples and 3 damaged temperature and relative humidity sensors were removed and disconnected from the logging system

Planned work for Friday:

- As strong winds are forecast activities are likely to be restricted to those that can be undertaken inside the Main Hut (as long as safe travel to and from the hut is possible). Such activities could include calibration of the remaining temperature and relative humidity sensors, ice removal and/or photo documentation of the interior.

That's it from a very pleased and satisfied team

All the best Rob

Ian

PS 1. Forgot to thank you for sending on my postcards and letters - much appreciated PPS Could you please have a word to David about increasing our free phone time so that we can call family at Christmas. Thanks.

As you predicted Adrian was happy for us to cut the bolts if it allows us to get the pole out unscathed. A good result. I have also taken the liberty of screwing the ADAD loggers in place - so they will be there for the duration now! It was a lovely day today - too hot in fact. I had to peel most of my gear off while walking back to the Sorensen for lunch!

Things are progressing very well - the environmental system won't be as much work as I thought it may be. Vinod wanted the best 5 loggers used - have found that there are only 5 that are now connected and operational! Two exterior sensors were deaccessioned previously by chain saw (2005 ?) and the repositioned exterior one (above workshop roof level) was trashed by the heavy snow coverage this year. It is always nice when decisions are made for you. I will still check the calibrations on the remaining loggers so that there accuracy can be taken into account when the data is examined. After that I hope to tackle some of the other conservation issues that are on my list - some of which will be dependent on a quick ablation (I have had enough of the shovel for a while!).

Needless to say, I am very pleased with the overall progress that has been made.

Here is the day's official rap.
Sit Rep - 29 November 2006

Mild conditions allowed the team to complete a variety of tasks in and around the Main Hut. It was a very productive day.

Morning weather obs 10.00 5/8, cirrus directly above Cape Denison with stratus and altocumulus to the N, NW and E.

Temp: - 7.2 oC
Wind chill: - 16.1 oC (average value) with a minimum - 17.2 oC
Wind: Max gusts to 19 knots with an average of 13 knots from the S

RH: 61 %

Evening weather obs.21.00

1/8, alto and stratocumulus to the N and E

Temp: - 4.9 oC
Wind chill: - 6.9 oC (average value), minimum - 9.7 oC
Wind: Max gust of 4.1 knots with an average of 2.9 knots from the S
RH: 57 %

Wednesday's Achievements:

- Battens, Roof shield membrane and tongue and groove boards were fixed to the western roof plane. About 1/3 of the roof is now over-clad and the promise of relatively light winds tomorrow should see the over-cladding completed then.
- Data was downloaded from the satellite environment monitoring system and a new program installed. Two thermocouples were removed from their locations and disconnected from the logging system. All temperature and relative humidity sensors were documented to show the impacts of localised environments on the sensors. Of the 8 sensors that were installed in 2002 only 5 are now in operational condition.
- Sponsor photographs and videos were completed today.

Planned work for Thursday:

As long as the forecast good weather arrives tomorrow the following work will be undertaken:

- Completion of over-cladding of the western roof plane
- Removal of thermocouples and redundant temperature/relative humidity sensors and relocation of remaining sensors.

Look forward to hearing from you re the extra supplies and progress with L'Astrolabe repairs.

All the best

Ian

Thanks for the spate of messages. Re the flagpole. I have spoken to the team and we have all read Adrian's message. Marty and Ted had a look at it today and can get the nuts off the 2 bolts that hold the pole to the top collar tie and spacing block in the apex of the main hut. The bolts are free on the flagpole but are rusted quite firmly into the collar tie. Firm tapping did not dislodge the bolt. It is possible to easily cut the bolt between the spacer block and the flagpole, allowing the bolts to then be removed from this, freeing up the pole for removal. There do not appear to be any other substantial fittings by which the pole is attached to the building. It is likely that there may be some tacks used to attach the biscuit tin capping to the pole but these should not pose a risk to the fabric of the pole. A hacksaw blade could be passed around the edge of the pole and out above the external cladding without striking any impediments.

So, the long and short of it is, do we have permission to cut the bolts to free the pole? Ted is sure that once the pole and spacer block are freed from the bolt, the bolt will be able to be knocked out from the collar tie, thereby allowing existing bolt holes to be used to reattach the replica pole. I have cc'ed Adrian in on this sit rep so that he is aware of the situation. Could you and Adrian please liaise and then get back to me so that we know in which direction we should proceed. Thanks. I will not include the work done in today's sit rep

By the way, I sent Bruce Hull a message a few days ago requesting that the AGAD vibration loggers be left down here for the coming year. As I understand from your message that he is away, is that something that you could chase up for me. I will be leaving a couple of WA museum loggers here as well. If the AGAD loggers can stay there will then be 4 in place to log vibrations associated with a queen post in the Main hut, collar ties in the Main Hut and workshop and a small structural timber in the apex of the Main Hut. It will give us a good overall picture of the impact of strong winds on the structure over the next year. I assume that it should be possible to correlate these readings with wind data from the AWS.

Thanks for the word on the supplies - some frozen veges are the highest priority for me and I think that Marty is hanging out a bit too. I am not a vego but do feel a bit like I am becoming too much of a carnivore at the moment - beer is the highest priority for the others. If the beer can only come down on the later of the 2 tourist voyages (depending on progress with the L'Astrolabe) then it is not so much of a priority because we will only have a short period to await the French and to be honest I wouldn't want the last few evenings to have the potential to become a swim-through. I am sure that you have a good handle on what would be an appropriate allocation! I would appreciate it if you would keep these comments on grog confidential though. Thanks.

Here is the day's official rap.

Sit Rep - 28 November 2006

Good conditions allowed the team to complete a variety of tasks in and around the Main Hut.

Morning weather obs 10.30 8/8, stratocumulus

Temp: - 3.4 oC
Wind chill: - 11.2 oC (average value) with a minimum - 11.5 oC
Wind: Max gusts to 15 knots with an average of 12 knots from the SE
RH: 66 %

Evening weather obs 7/8, mix of stratocumulus and stratus

Temp: - 3.2 oC
Wind chill: - 5.3 oC (average value), minimum - 7.0 oC
Wind: Max gust of 3.5 knots with an average of 4.5 knots from the NNW
RH: 73 %

Tuesday's Achievements:

- Battens were fixed to the western roof plane in preparation for attachment of the membrane and overbattens.
- The Main Hut can now be accessed via the workshop door, following removal of loosely packed snow from the veranda.
- Ice removal was undertaken to expose some of the sensors attached to the datalogging system in preparation for calibration of the temperature and relative humidity sensors and the removal of redundant sensors.

Planned work for Wednesday:

Forecast good weather should allow the following work to be undertaken:

- Attachment of membrane and overbattens to the western roof plane.
- Downloading of data from the central environmental monitoring system and calibration/rationalisation of the sensors.

Look forward to hearing from you re the flagpole and the vibration loggers.

All the best

Ian

Here is the second message of the day - Monday's sit rep and the weekly report for the period 20 - 27 November. Thanks for the word on the flagpole - the decision makes a lot of sense. Until the ultimate fate of the original flagpole is decided, a replica will certainly fit in better with the new roof.

Sit Rep: 27 November 2006

Milder than forecast conditions allowed the team to work at the Main Hut site today. Although fluky winds prevented long periods on the roof the team made the most of their time on site.

Morning weather obs 10.30 7/8, stratocumulus

Temp: - 3.5 oC
Wind chill: - 8.6 oC (average value) with a minimum - 9.7 oC
Wind: Max gusts to 10 knots with an average of 7.5 knots from the SE
RH: 61 %

Evening weather obs 20.00 8/8, stratocumulus and altostratus

Temp: - 4.3 oC
Wind chill: - 13.0 oC (average value), minimum - 13.7oC
Wind: Max gust of 19 knots with an average of 14 knots from the S
RH: 61 %

Monday's Achievements:

- An access way (shaft!) was excavated to the door of the workshop - about 5 m3 of snow had to be removed to allow safe access to the door. Further work will be needed, to remove snow and ice from the verandah, before the workshop can be accessed via this route.

- Some battens were fixed to the western roof plane in preparation for fixing of the membrane.

Proposed activities for Tuesday:

Activities will be dependent on the strength of the winds. Over-cladding of the western roof plane will take priority if the conditions are suitable for work on the roof. Otherwise more snow and ice removal will be undertaken to allow easier access to the interior of the Main Hut. This will be of great assistance to both Simon and Ian's programs and will obviously assist visits by tourists, planned for mid to late December.

WEEKLY REPORT - MAWSON'S HUTS EXPEDITION 2006

20 - 26 November 2006

Health:

All members of the team are in good health.

Morale:

Morale is very good. Although the weather only permitted work on the roof for 3 days, completion of over-cladding of another 2 roof planes during this period of good weather helped to keep spirits high. The slowly increasing temperatures and periods of fine weather have also contributed to a feeling of well-being among the team.

Environment:

As for last week, conditions varied considerably this week with morning temperatures ranging from - 2.3 oC to - 7.3 oC and associated wind chills ranging from - 10.5 oC to - 21.0 oC. Average wind speeds varied from 11 to 41 knots. In all cases, generally milder conditions were recorded in the evenings. These conditions were much milder than the previous week, helping considerably our efforts to reduce gas consumption. Summer nudges ever closer as evidenced by these conditions and the first sightings of Wilson storm petrels.

Safety:

No safety issues arose during the week. Christian Gallagher briefed the team on ropes, knots and anchors and gave us all plenty of practice at a variety of useful knots.

Achievement against works plan:

Calm conditions on 3 consecutive days allowed snow/ice removal and over-cladding operations to be undertaken during the week. In summary the following works were undertaken:

- the southern roof plane was over-clad with tongue and groove boards.
- the eastern roof plane was similarly over-clad
- the western roof plane was completely cleared of snow and ice in preparation for over-cladding.
- temperature, relative humidity and vibration data loggers were installed in the Main Hut and workshop.
- Experimental artefacts and corrosion cells were documented in-situ prior to their removal. All corrosion cells were removed from inside the Main Hut and workshop, from the roof of the workshop and from Anemometer Hill.

Additional Activities:

- A telephone link with the Mawson's Huts Foundation lunch in Sydney gave the team the opportunity to let supporters know of the conditions here and the significant progress that has been made with regard to preserving the Main Hut.
- More promotional photographs and video footage were taken for Foundation sponsors.
- A press release was prepared for Senator Ian Campbell re over-cladding of the critical southern roof plane.
- A general news article was prepared re vibration monitoring in the Main Hut and workshop
- Celebrations were held for Christian's birthday - he wore a stunning blue and black frock (Aunty Jack style, minus the boxing gloves) for the occasion of our Ashes cricket match on the snow at the front of the Sorensen Hut.

General Comment:

Forecast good weather for the mid-week period has given the team confidence that the final roof plane will be over-clad this week. The focus will then shift to fitting of ridge capping

Dr Ian Godfrey
Team Leader
27 November 2006

Ian

If there is any possibility of extra supplies being brought in on a tourist ship then the following would be good - 3 gas bottles (to make sure that we leave a few here for any future party), Tabasco sauce (x2), tomato sauce, black pepper, Johnson's baby powder, some fresh veges (potatoes, pumpkin, broccoli and beans - alternatively frozen broccoli and beans would suffice if fresh is a problem), Jiff couple of boxes of Wet Wipes and if Christmas here is likely maybe some ham, English mustard, mince pies, champagne and Twix chocolate bars. A couple of nice waitresses would also be appreciated.

By the way there is a rumour circulating around Cape Denison that there may be an Old Onion amongst the incoming vegetables on the tourist ship. Any truth to that one? There is after all a spare bunk here in the Sorensen and a spare bunk in our cabin on the L'Astrolabe for the return journey. Possible??? We would love to have you down here for a while on this trip.

Sit Rep: 26 November 2006

Today was a bit of a mix, with the winds fairly erratic during the day - windy initially (estimated but not measured at 25 - 30 kts), then dying off (about the time of the morning weather observations) strengthening in the middle of the day and then easing again later. The lighter than forecast winds gave the team hope of more work at the Main Hut today. More promotional photos and videos were taken before the wind strengthened to the point that a retreat to the Granholm for a warm cuppa was needed. These winds persisted into the afternoon and so little was done at the Main Hut site. Forecast good conditions for Tuesday and Wednesday are likely to allow the team to tackle the remaining roof plane on these days.

Balmy late evening conditions gave the team the opportunity to get in the Ashes spirit with a game of cricket out the front of the Sorensen. All were in good form, with Psycho in particular, wearing a frock that would have done Auntie Jack proud, showing fine touch with the bat. The match will resume when winds are light enough to allow the batsman to hit the ball back into the wind.

Morning weather obs 10.45 8/8, altostratus

Temp: - 4.4 oC
Wind chill: - 12.0 oC (average value) with a minimum - 13.3 oC
Wind: Max gusts to 16 knots with an average of 12 knots from the S, interspersed with calm periods
RH: 45 %

Evening weather obs 20.00 8/8, altostratus with a bit of what appeared to be
nimbostratus tossed in.

Temp: - 3.8 oC
Wind chill: - 9.7 oC (average value), minimum - 10.3 oC
Wind: Max gust of 10 knots with an average of 7.6 from the SSE from the S
RH: 58%

Sunday's Achievements:

It will be good to have some visitors to the place - I think that by then we will be looking forward to some new faces!! We had a bit of a chat about the possibility of any supplies coming in with Rodney Russ - the general view is yes, if at all possible. By then the beer and wine supplies will be pretty low and we would also appreciate some veges to go with all of the meat that we still have to plough through (even frozen veges would be good). Let us know if it is possible and we will then put together a wish list! Thanks for thinking of us.

I will have a look around for missing artefacts, based on my recollections and comparisons with some of the photos that I have with me. Having a look around today though, there is nothing that sticks out as being missing.

Here's the official bit of the proceedings.

Today turned out to be another glorious balmy day - light winds from the south initially, which died, swung to the north, around to the east, died again and then late in the evening came in again from the south. Long calm periods during the day made for wonderful working conditions and again a lot was achieved today.

Evening weather obs 20.30 1/8 - altocumulus

Temp: - 1.8 oC
Wind chill: - 11 0oC (average value), minimum - 11.8 oC
Wind: Max gust of 23 knots with an average of 20 knots from the S
RH: 52%

It was a very productive day on many fronts.

- . Overcladding of the eastern roof plane was completed today.
- . Further vibration data loggers were installed today.
- . All of the corrosion cells and half of the experimental artefacts were removed from the Main Hut today and documented photographically. The corrosion cells were also heated to dryness prior to storing for analysis.
- . More sponsor photograph and video sessions were conducted (Enhance Group, Wright Forest Products, Foundation, WA Museum and Glenfords – on the completed southern roof plane and on the original western roof).

Forecast light winds should allow commencement of over-cladding work on the western roof plane and possible excavation of an access tunnel to the workshop door.

That's pretty much it from here The unofficial news from the luncheon sounds very promising, especially if long-term planning is accepted - so much better to be able to plan and move forward in a coordinated fashion rather than in the somewhat ad hoc way that has happened in the past. All good news (as was the cricket!!!) We haven't heard how it went today but are all optimistic!!

All the best from the happy campers at Cape Denison

Ian

Thanks for your long and informative email - I am pleased that your Mum sends her regards! I wish that I could kid myself that I am a young fellow but I think that the healthy ageing is already too late for me!! I certainly felt my lack of flexibility while clambering around on the platform in Dougie's shack!!

I passed on all of your comments to the rest of the team who were pleased with that. Ted's knee is not a new injury - is the same one as reported a week or so ago. Unfortunately, although it is not stopping him from working or clambering around the roof he has lost some flexibility (bending). I thought it important to mention it as something that has dragged on for a while in case there are any long term consequences (which we initially didn't foresee). I shudder to mention those words 'workers compensation' but it may come to that if it doesn't come good. We were lucky that we had some poor weather just after he hurt it, otherwise we may not have been able to get him to rest it even then!

Today was just delightful - balmy, warm and essentially windless - as you can see from the weather obs. We had another great day, with some tongue and groove boards put on the eastern plane, the western plane completely freed of snow and ice and the commencement of the environmental monitoring side of the works program. All that in addition to a team effort to chain saw out a better freezer (some of our meat has started to thaw!). On that score, gas usage continues to be monitored (we have 12 full cylinders left), with 4 on the go (including 1 at the Granholm) - with 12 already emptied. As the warmer weather approaches I feel confident that these will last but would prefer to leave 3 or 4 behind for any party who gets dumped here (as we did) with no supplies etc. The food will certainly last, as long as we can keep the meat frozen. The grog is going well now, with all of the team sticking to the quota of 1 can and 1.5 glasses of wine per day. It was calculated to see us through until the 15 Dec and so it may be a bit of a dry argument after that - although, Simon and I did ferret away a carton of beer and 2 casks of wine for a rainy day before calculating the 'rations' and so we have very small amount of leeway!!

Here's the official bit of the proceedings. Will look forward to news on the fate of the flagpole.

Sit Rep: Thursday, 23 November 2006

Today turned out to be a gloriously balmy day - almost too hot to work! A lot was achieved in a range of areas - the team will be having a reasonably early night to capitalise on forecast good conditions early tomorrow.

Morning weather obs 10.00 8/8, stratus

Temp: - 4.8 oC
Wind chill: - 12.4 oC (average value) with a minimum - 13.3 oC
Wind: Max gust of 14 knots with an average of 11 knots from the S
RH: 61 %

Evening weather obs 20.00 3/8 - quite a bit of cirrus above Cape Denison with stratocumulus on the horizon to the north and east

Temp: - 2.3 oC
Wind chill: - 4.8 oC (average value), minimum - 5.1 oC
Wind: Max gust of 3.1 knots with an average of 2.5 knots from the NW
RH: 64%

Thursday's Achievements:

It was a long and productive day on many fronts.

- Work commenced on the eastern roof plane - bottom battens, Roofshield membrane, top battens and some tongue and groove boards were fixed. Approximately ¾ of the roof plane is over-clad, a huge effort in one day. Forecast good weather tomorrow should see that plane completed.
- All of the snow and ice was removed from the western roof plane, leaving this now ready for over-cladding.
- Environmental monitoring commenced today with programming and installation of temperature, relative humidity and vibration data loggers in the Main Hut and in the workshop.
- Previously installed corrosion cells and experimental artefacts were photographed in-situ in preparation for removal and full documentation.
- A larger freezer was cut into the ice bank to the south of the Sorensen to ensure that the meat supplies remain frozen.

• Simon prepared a press release for Senator Ian Campbell regarding completion of over-cladding of the critical southern roof plane (and also prepared a lovely roast beef dinner).

Planned work for Thursday:

Forecast light winds should allow over-cladding work to be completed on the eastern roof plane.

As long as mild weather lasts, more photographs and video will be completed on behalf of Foundation sponsors.

Work will also commence on the Australian Museum environmental monitoring system.

All the best from the happy campers at Cape Denison

Ian

I assume that you will shortly be back at the Division, if not already there. It has been very slow going over the past few days, with strong winds that gave all of us the shits. Frustrating but we now have good window for 2, possibly 3 days. Had a bloody great day as you will see below.

I was just wondering if you had heard anything about the flag pole. It is still there, quivering whenever a strong wind blows but if it is to be removed and a replacement installed it would be easier for the team to tackle this sooner rather than later. Over to you. Here's the official bit of the proceedings.

Sit Rep: Wednesday, 22 November 2006

Morning weather obs 11.00

7/8, bordering on 8/8 - stratus

Temp: - 5.8 oC

Wind chill: - 15.6 oC (average value) with a minimum - 16.5 oC

Wind: Max gust of 23 knots with an average of 19 knots from the SSE

RH: 50 %

Evening weather obs 21.00

4/8 - alto and stratocumulus with a trace of cirrus

directly overhead

Temp: - 5.1 oC

Wind chill: - 12.2 oC (average value), minimum -13.2 oC

Wind: Max gust of 12 knots with an average of 10 knots from the S

RH: 56 %

Wednesday's Achievements:

It was a long and productive day.

• The tongue and groove boards were fixed to the southern roof plane. Where nails had penetrated the membrane over the past 4 windy days, small patches were attached (made of Roofshield membrane and adhesive)

• Most of the leading edge of the western roof plane was exposed after a long day on the shovel. Another 4-5 hours work should see this roof plane also completely exposed and ready for over-cladding. When this face is completely exposed, the excavation part of the program will be completed, leaving all roof planes free of snow and ice.

Planned work for Thursday:

Forecast light winds should allow over-cladding work to be done on the eastern roof plane and for completion of snow and ice removal from the western roof plane.

Work will commence on the environmental monitoring system, with entry to the building most likely to be via the workshop skylight. Contact was made with Vinod Daniel (Australian Museum) to obtain copies of a program that was needed to communicate with the data logger.

That's it for now - fingers crossed that the weather does what the Casey boys have promised (their forecasts have been very good so far).

Had a chat with Greg Holland via a phone link-up with the Sydney Foundation lunch today - the crowd sounded like they were getting into it.

Windy again today but with the likelihood of better weather over the next few days.

Here is the official version of the day's activities, with the weekly report also tagged on.

Sit Rep: Tuesday, 21 November 2006

The team awoke to the usual katabatic blowing, though not as strongly as for the past few days and with promise of slowly easing winds over the next couple of days. Yesterday's warm evening, - 3.5 oC (wind chill of only - 15.3 oC) and the snow/ice that is slowly softening underfoot were signs of the coming summer weather that will be welcomed by all. This warmer weather is also important for the general comfort of the team. With the expected 10-12 day delay to our pick up by the L'Astrolabe, gas usage has been rationalised sharply to ensure that supplies last for at least that period (and beyond, in case of any further changes that may occur with RTA plans).

Morning weather obs 10.00

0/8 - clear skies

Temp: - 6.3 oC
Wind chill: - 19.5 oC (average value)
Wind: Max gust of 48 knots with an average of 38 knots from the S
RH: 49 %

Evening weather obs-20.00

1/8 - stratus

Temp: - 6.0 oC
Wind chill: - 18.7 oC (average value)
Wind: Max gust of 39 knots with an average of 32 knots from the S
RH: 48 %

Tuesday's achievements

A telephone link with the Mawson's Huts Foundation dinner in Sydney gave us the opportunity to let guests know the nature of the work that was being done here and the progress that has been made despite the difficult circumstances that confronted us on our arrival.

Strong winds prevented any work being done at the Main Hut for most of the day. A visit was made to the main hut in the late afternoon. Despite the windy conditions, a cage pallet was moved up the slope to the helicopter pick up point and tools, equipment and the southern plane of the roof were inspected to ensure that all would withstand any increase in wind strengths.

Planned activities for Wednesday 22 November:

Forecast lighter winds may allow over-cladding with tongue and groove boards on the southern plane.

Wilson storm petrels were spotted for the first time today and skuas are active around all rookeries.

WEEKLY REPORT - MAWSON'S HUTS EXPEDITION 2006

13 -19 November 2006

Health:

All members of the team are in good health. Ted's knee was sore for a few days but recovered sufficiently for him to take advantage of the good weather days later in the week.

Morale:

Morale was on a high after 3 days of relatively good weather that allowed significant progress to be made with respect to ice removal and over-cladding of the southern roof plane. Although news of problems with the L'Astrolabe and likely delays to our RTA significantly dampened these spirits, the team responded as I expected they would - accepting the delayed departure as something out of their control and something that they would attempt to make the best of.

Environment:

Conditions varied considerably this week with morning temperatures ranging from - 8.8 oC to - 12.8 oC and associated wind chills ranging from - 14.7 oC to - 28.0 oC. Average wind speeds varied from 52 to 8 knots. In all cases, generally milder conditions were recorded in the evenings. Summer appears to be on its way.

Safety:

Christian Gallagher provided another medical/safety briefing to team members, this week covering secondary surveys - monitoring the condition of a patient after initial first aid has been given. Included in this session was practical work using the stethoscope and blood pressure apparatus.

Achievement against works plan:

Calm conditions on 3.5 days (total working time spread over the week) allowed snow/ice removal operations to be undertaken and preparations for over-cladding to be made. In summary the following works were undertaken:

- the southern roof plane was cleared of all snow and ice and battens and the Roofshield membrane were secured to the roof plane. Strong winds have since prevented final over-cladding with tongue and groove timbers. The membrane has stood up to a bit of a battering from strong katabatic winds, with some nail penetrations but no tears in the fabric (over 4 days at the time of writing this report)
- the eastern roof plane was also cleared of all snow and ice and is ready to be over-clad once work is completed on the southern roof plane. Despite strong winds and some wind-borne snow, this excavation has not filled with snow.
- A new anemometer was installed on the automatic weather station on Anemometer Hill.
- More promotional photographs were taken for Foundation sponsors (Enhance Group and Wright Timber Products) with additional shots taken with the Mawson's Huts Foundation banner on the Main Hut.

General Comment:

The whole team is now hoping for good weather conditions in the coming days (forecast is promising for mid to late this week) to allow completion of over-cladding of the southern plane.

Spirits were lifted considerably by the news that the team is likely to be picked up by the L'Astrolabe earlier than had been earlier indicated (25 - 30 Dec).

Gas usage has been rationed and is being carefully monitored in order to ensure that supplies will last until beyond the projected RTA dates (to cover any other contingencies that may arise). Approaching warmer weather and extra layers of clothing while in the Sorensen are expected to be adequate to cope with reduced heating levels in the hut.

Dr Ian Godfrey
Team Leader
21 November 2006

Sit Rep: Monday, 20 November 2006

Strong winds (40 - 50 knots) prevented any work being done at the Main Hut in the morning but a short period of light winds allowed a visit to the site later in the day. The team were heartened to hear of the quicker than expected repairs to the L'Astrolabe that may see the team picked up from Cape Denison sometime during the period December 25 - 30.

Morning observations 10.00 1/8 cirrus

Temp: - 7.3 oC
Wind chill: - 21.0 oC (average value)
Wind: Max gust of 56 knots with an average of 41 knots from the S
RH: 45%

Evening observations 21.00 0/8 - clear skies

Temp: - 3.5 oC
Wind chill: - 15.3 oC (average value)
Wind: Max gust of 42 knots with an average of 38 knots from the S
RH: 48 %

Monday's achievements

Strong winds prevented any work being done at the Main Hut in the morning.

Psycho conducted another session on ropes, knots and anchors - covering the double figure of 8, clove hitch, Alpine butterfly and Italian hitches, anchors, angles and safe loadings on ropes.

A brief period of lighter winds in the afternoon allowed the team to inspect the Main Hut - the battens and exposed membrane had stood up very well to 2 days of strong winds. A few nails had penetrated the membrane but there were no tears evident. Battens that had been previously

nailed in place were fixed more firmly with screws, further securing the membrane. Nail penetrations will be sealed prior to installation of the tongue and groove timbers.

Planned activities for Tuesday 21 November:

Strong winds are again forecast, conditions that are likely to again preclude any work on the roof of the Main Hut.
There will be a live telephone link between the Mawson's Huts Foundation luncheon and Cape Denison.

Thanks for your message from SA - I hope that you passed on my regards to your mum - are there any things that she shouldn't know, I feel like making a few phone calls? We all realise that David is pre-occupied right now but he did send through an email yesterday letting us know that he is concerned and will do all that he can to get us back home as soon as possible. Thanks for your continuing support and encouragement.

Robb - thanks for your call and email today. It was good to hear from you. Yes, as you and I thought, there really was no decision to be made. The team would prefer to be picked up on the way to DDU rather than on the way out. I am confident that the works programs will be finished well in advance of the projected Dec 25-30 pick up and so a change of scenery would be much appreciated by all. Fingers crossed now that the French continue to make good progress with repairs to L'Astrolabe. Needless to say your news was very well received.

I will forward the weekly report (13 -19 November) tomorrow.

Here is the official version of the day's activities.

Sit Rep: Monday, 20 November 2006

Strong winds (40 - 50 knots) prevented any work being done at the Main Hut in the morning but a short period of light winds allowed a visit to the site later in the day. The team were heartened to hear of the quicker than expected repairs to the L'Astrolabe that may see the team picked up from Cape Denison sometime during the period December 25 - 30.

Morning observations 10.00 1/8 cirrus

Temp: - 7.3 oC
Wind chill: - 21.0 oC (average value)
Wind: Max gust of 56 knots with an average of 41 knots from the S
RH: 45%

Evening observations 21.00 0/8 - clear skies

Temp: - 3.5 oC
Wind chill: - 15.3 oC (average value)
Wind: Max gust of 42 knots with an average of 38 knots from the S
RH: 48 %

Monday's achievements

Strong winds prevented any work being done at the Main Hut in the morning.

Psycho conducted another session on ropes, knots and anchors - covering the double figure of 8, clove hitch, Alpine butterfly and Italian hitches, anchors, angles and safe loadings on ropes.

A brief period of lighter winds in the afternoon allowed the team to inspect the Main Hut - the battens and exposed membrane had stood up very well to 2 days of strong winds. A few nails had penetrated the membrane but there were no tears evident. Battens that had been previously nailed in place were fixed more firmly with screws, further securing the membrane. Nail penetrations will be sealed prior to installation of the tongue and groove timbers.

Planned activities for Tuesday 21 November:

Strong winds are again forecast, conditions that are likely to again preclude any work on the roof of the Main Hut.
There will be a live telephone link between the Mawson's Huts Foundation luncheon and Cape Denison.

Sit Rep: Sunday, 19 November 2006

Strong winds (40 - 50 knots) prevented any work being done at the Main Hut today.

Morning observations 09.50

0/8 cloudless sky

Temp: - 9.7 oC
Wind chill: - 25.0 oC (average value)
Wind: Max gust of 52 knots with an average of 41 knots from the S
RH: 54%

Evening observations 19.00

0/8 - clear skies

Temp: - 6.5 oC
Wind chill: -19.5 oC (average value)
Wind: Max gust of 41 knots with an average of 34 knots from the S
RH: 51 %

Sunday's achievements

Strong winds prevented any work being done at the Main Hut today.

Psycho conducted a session on the Glacier Rescue Kit, including demonstrations and practices of commonly used knots. This training will be continued during periods when work at the Hut is not possible.

Planned activities for Monday 20 November:

Strong winds and the likelihood of drifting snow are forecast. If these eventuate no work will be done at the Main Hut site.

Sit Rep: Saturday, 18 November 2006

Although it was a bright sunny day, moderate winds were too strong to allow any work to be done on the southern roof plane.

Morning observations 10.30

1/8 stratocumulus to the east

Temp: - 10.3 oC
Wind chill: - 21.3 oC (average value)
Wind: Max gust of 25 knots with an average of 18 knots from the S
RH: 63%

Evening observations 21.00

0/8 - clear skies

Temp: - 8.5 oC
Wind chill: - 18.3 oC (average value)
Wind: Max gust of 20 knots with an average of 15 knots from the S
RH: 44 %

Saturday's achievements

Moderate winds prevented any work being done on the southern roof plane today. The membrane and battens were inspected to ensure that they are secure and will withstand projected strong winds (40 - 50 knots that have been forecast for Sunday and Monday).

Planned activities for Sunday 19 November:

Strong winds and the likelihood of drifting snow are forecast. If these eventuate no work will be done at the Main Hut site.

Thanks for your message regarding the L'Astrolabe that we picked up this morning.

The team understands the situation and regardless will make the best of it - we are in the process of reviewing gas, food and fuel supplies. There are a few issues however that may have financial implications that we would appreciate you taking up with David Jensen. Most can probably be resolved by the individuals themselves and they will be obvious among the list below.

- Marty has a flight booked to Kununurra (spelling??) on January 8 - there may be some costs associated with changing his flight details
- Psycho - was due to start work on January 2 and had a ferry booked for 18 December (Devenport - Melbourne) - again there may be some costs associated with changing tickets. Psycho will deal directly with his employer regarding his delayed start to his new job.
- Simon - had a ferry booked (Melbourne - Devenport) and there may be some costs associated with cancellation of this booking (or changing of dates)

- There are obvious personal issues involved as you will be well aware - the most significant of which will be missing Christmas celebrations with loved ones. In Ted's case it will also be very difficult to explain to young James just why he won't be home when he said that he would (he did the jelly bean thing with him too!). All of us had a variety of activities planned with our families that will also be canned (eg Psycho a series of dinners and then a road trip to Tenterfield, Simon and Leanne a holiday around Tassie, me a camping holiday with my daughters at the beginning of January etc).

Here is the official version of the day's activities.

Although it was a bright sunny day, moderate winds were too strong to allow any work to be done on the southern roof plane.

Temp: - 10.3 oC
Wind chill: - 21.3 oC (average value)
Wind: Max gust of 25 knots with an average of 18 knots from the S
RH: 63%

Temp: - 8.5 oC
Wind chill: - 18.3 oC (average value)
Wind: Max gust of 20 knots with an average of 15 knots from the S
RH: 44 %

Moderate winds prevented any work being done on the southern roof plane today. The membrane and battens were inspected to ensure that they are secure and will withstand projected strong winds (40 - 50 knots that have been forecast for Sunday and Monday.

Strong winds and the likelihood of drifting snow are forecast. If these eventuate no work will be done at the Main Hut site.

On the score of our RTA, the team has obviously discussed a lot of options – the favoured one, one unfortunately that you mentioned was not possible, was to jump on the Aurora and travel to Hobart via Casey – it would be a big bonus for Ted, Marty and Simon to see the station and both Psycho and I would also be very happy to see our old hunting ground! Is there any chance at all of this option – we are pretty self-sufficient as you know and would sleep anywhere.

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to spending the extra time here!! Over to you on that one. The team is happy to accept most options for an early return to Oz (with the exception of the Sir Spewbert!!).

Today was another very good day with the battens and roofshield attached to the southern plane. Simon and Psycho also installed a new anemometer on the AWS.

Here is the official version of the day's activities.

Sit Rep: Friday, 17 November 2006

It was another beautiful day with light winds and bright sunny skies. The team completed ice and snow removal from the southern and eastern planes and then commenced work on the southern roof plane.

Morning observations 10.30 1/8 stratocumulus

Temp: - 8.8 oC
Wind chill: - 14.7 oC (average value)
Wind: Max gust of 12 knots with an average of 8.2 knots from the SSE
RH: 56%

Evening observations 20.00 2/8 stratocumulus

Temp: - 8.4 oC
Wind chill: - 15.6 oC (average value)
Wind: Max gust of 9 knots with an average of 8 knots from the S
RH: 52 %

Friday's achievements

Southern roof plane

All of the snow and ice was removed from this plane and over-cladding of the roof commenced. Battens and the Roofshield membrane are in place on the roof with only the tongue and groove timbers to be added (hopefully tomorrow)

Eastern roof plane

All of the remaining snow and ice was also removed from the eastern roof plane. This plane is now ready to be overclad, once the southern plane is completed.

Automatic Weather Station

Simon and Psycho installed a new anemometer on the automatic weather station, appropriately located on Anemometer Hill.

Advantage was taken of the mild conditions to take more promotional photographs for Foundation sponsors.

Planned activities for Saturday 18 November:

As long as the forecast moderate winds are delivered tomorrow the team will complete over-cladding of the southern roof plane.

Work will commence on the environmental and corrosion monitoring systems.

Thanks for all of your news from the past couple of days. The team was very pleased with the response to our concerns about the flagpole - we will await the final word on its fate with interest as we will with regard to the L'Astrolabe.

It was also good to get such positive feedback from you about the ABC interview - I didn't get a chance to put in any plugs (for C'wealth Govt funding, Ant Div and Foundation support etc) but may do so in the future - the producer was interested in following the story up in about a week to check on our progress.

We had another good day and have all but cleared the southern and eastern roof planes. There are some small areas of snow and ice that require careful work to ensure that the fabric is not damaged during the removal process. Another couple of days of good weather and the planes will be ours for the taking!! Fingers crossed. The team is naturally buoyant after these 2 days of fine weather and considerable progress.

Here is the official version of the day's activities.

Sit Rep: Thursday, 16 November 2006

It was another beautiful, if somewhat cool, day with light winds and bright sunny skies. The team got stuck into more snow and ice removal on the southern and eastern roof planes. A big day's work.

Morning observations 11.00

1/8 stratocumulus

Temp: - 12.3 oC
Wind chill: - 23.1 oC (average value)
Wind: Max gust of 20 knots with an average of 16 knots from the SSE to SE
RH: 55%

Evening observations 21.00

2/8 stratocumulus

Temp: - 10.3 oC
Wind chill: - 22.3 oC (average value)
Wind: Max gust of 20 knots with an average of 15 knots from the S
RH: 43 %

Wednesday's achievements

Southern roof plane

Almost all of the snow was removed from the roof plane and as was most of the solid ice attached to part of the leading edge of the roof. Weather permitting, this roof should be ready for over-cladding after approximately 4 more hours of work. Interestingly, prior to leaving Hobart the team was discussing the possible need for scaffolding to allow for safe access to the roof planes. Today, a fence was erected to reduce the risk of team members falling onto the roof from the snow banks that surround the roof planes and excavated areas!

Eastern roof plane

A very solid day's work has cleared most snow from this roof plane. Small areas remain to be carefully removed so that the original fabric is not damaged during the process. A further 12 m3 of snow was removed from this plane today.

Planned activities for Friday 17 November:

The forecast of moderate winds tomorrow should allow completion of snow and ice removal from the southern and eastern roof planes in preparation for over-cladding during the next bout of fine weather.

Needless to say the recent days of good weather and incredibly hard work by all members of the team has seen considerable progress made in readying the S and E roof planes for over-cladding.

The Casey met boys have promised 3 good days in a row (unheard of so far on this trip) and today was the first of them. Although it took a while (mid afternoon) before it was warm enough to contemplate being splattered with ice from the chain saw, we had a very good day, working on the south, east and west faces. There is still some work to be done on the south face (I will tackle that tomorrow - to remove or shave down at least the last of the snow and ice on the lower reaches of the plane). We put more effort into the eastern plane because of the more predominant SE breezes but obviously hope to get all roof planes done before we leave. All we need is the weather gods to be on our side - maybe Dave K can do the opposite to his wind ceremony and conjure up some still days for us.

We heard about the trouble on the Astrolabe from Angus - have you heard anything regarding the extent of the problem? We gathered that because they were able to make their way to Hobart, albeit on one engine, that the problem is probably only relatively minor.

Here is the official version of the day's activities.

Sit Rep: Wednesday, 15 November 2006

Today was a most welcome change from the past few - lighter winds and bright sunny skies and the hope of a productive day ahead. Ted volunteered to be the camp boss today, giving Simon the opportunity to earn Associate status (of the United Brotherhood of Carpenters and Joiners of Antarctica, Commonwealth Bay Chapter) by joining the rest of the team in working around the Main Hut (adding a bit of grunt in the ice removal process). Ted stayed at camp and cooked up a lovely roast lamb dinner for the evening meal.

Morning observations 11.00

2/8 cirrus

Temp: - 10.7 oC
Wind chill: - 22.9 oC (average value)

Wind: Max gust of 25 knots with an average of 21 knots
RH: 55%

Evening observations 20.30 1/8 cloud cover - cirrus over Cape Denison and stratocumulus to the north

Temp: - 9.8 oC
Wind chill: - 18.0 oC (average value)
Wind: Max gust of 11.5 knots with an average of 9.5 knots
RH: 40 %

Wednesday's achievements

Southern roof plane

A working platform was cut from the snow and ice, just below the roof line to allow the team to be able to access the roof without having to get onto the roof itself. There is now only a small area of snow and ice to be removed from the southern roof plane - removal of the last remnants will be much slower than the bulk removal however because of the presence of adherent solid ice in patches among the remaining snow. The excavated pit is now about 2 metres deep in places.

Eastern roof plane

The junction was located between the workshop and the Main Hut, allowing the extent of the eastern roof plane to be delineated. Following this approximately 12 m³ of snow was removed from the roof. As the snow build up slopes down from S to N, there should be a little less snow to remove from this plane compared to the southern plane.

Planned activities for Thursday 16 November:

The forecast of moderate winds tomorrow should allow more ice to be removed from the southern and eastern roof planes in preparation for over-cladding during the next bout of fine weather.

Sit Rep: Tuesday, 14 November 2006

The team awoke to a mixed sort of day, with bits of blue and grey in the heavens and winds to 46 knots (somewhat fluky - dying away occasionally and then coming back with a vengeance!)

10.30 Observations: 5/8 altostratus and altocumulus cloud cover

Temp: - 12.8 oC
Wind chill - 28.0 oC (average)
Wind Winds gusting to 46 knots with average speed of 37 knots from the S
RH: 73 %

19.30 Observations: 3/8 cloud cover - not sure of cloud type - alto or stratocumulus?

Temp: - 9.5 oC
Wind chill - 22.6 oC (average)
Wind Winds gusting to 35 knots with average speed of 27 knots from the S
RH: 78%

Tuesday's achievements

Strong winds prevented any work being undertaken at the Main Hut today.

Psycho presented a medical/safety session on secondary surveys - monitoring the condition of a patient after initial first aid has been given. Included in this session was practical work using the stethoscope and blood pressure apparatus.

A team meeting discussed issues associated with over-cladding the southern roof plane, in particular issues of protruding nails that may compromise the integrity of the membrane and long-term options for the fragile flagpole.

Planned activities for Wednesday 15 November:

Lighter winds (30 - 40 knots, easing to 15 - 25 knots in the afternoon) are forecast for Wednesday, conditions that should allow further snow and ice removal to be undertaken on the southern and eastern roof planes.

Basically we are playing a bit of a waiting game - frustrating unfortunately but one day soon

Hope that things are going well for you back in town – the weather sounds almost as crummy there as it is here though!

Bummer about the line dropping out this morning – would have been good to have had a yarn with both you and Angus. The problem with email links is that we will usually be a day out of sync with each other.

I spoke with Madeline from the ABC this afternoon – she will have a yarn with the production team and will call at either 7.50 tomorrow morning. If I haven't heard from her by 7.55 she asked if I try to call the Sydney office. I assume that will be OK – should I be cheeky enough to suggest to them that they might get a phone bill from the Foundation if this happens?

The fickle weather has turned again (hopefully only temporarily) with quite strong winds and high wind chill factors. Stronger winds are forecast for tomorrow but a little better conditions on Wednesday. As I have been taking twice daily obs for the Casey met fairies I will include both lots in this and subsequent emails. As with all of the content, please feel free to delete, edit as you see fit.

Had a yarn with Simon and the rest of the team about a media note regarding over-cladding of the north face and we all agreed that, while it is a significant first step, it would be better to wait until we get the southern face done. As this is the most degraded face and the most important to over-clad we thought it would be better to wait until that was done. I think it would also make a better story, particularly as it really highlights the challenges that the team had to overcome to get to that stage – images of the over-cladding could also be accompanied by images of the huge amount of ice that had to be excavated just to expose the roof and of the pit in front of the roof plane. It is interesting that prior to our departure from Hobart, the team was talking about the risk of falling from the roof, of the possible need for scaffolding etc and the reality here is that there is a much greater risk of falling from the snow onto the roof (or at the very least into the pit at the leading edge of the roof!).

Anyway, here is the official version of the day's activities.

Sit Rep: Monday, 13 November 2006

The team awoke to a grey day with winds to 35 knots and small amounts of blowing drift snow, conditions that initially precluded work at the Main Hut site.

10.30 Observations: 8/8 altostratus cloud cover

Temp: - 12.0 oC
Wind chill - 25.2 oC (average)
Wind Winds gusting to 35 knots with average speed of 25 knots from the S
RH: 66 %

19.30 Observations: 8/8 altostratus cloud cover

Temp: - 8.9 oC
Wind chill - 22.4 oC (average)
Wind Winds gusting to 34 knots with average speed of 30 knots from the S
RH: 53 %

Monday's achievements

Only a couple of hours work was possible at the Main Hut today because of the strong winds – work concentrated on clearing a working platform clear of the leading edge of the southern-most roof plane. This will allow the team access to the roof without having to walk on the original fabric, some of which is highly deteriorated and easily damaged. Because of the presence of solid ice, no further snow/ice removal was attempted from the lower parts of the southern roof plane.

Planned activities for Tuesday 14 November:

Tuesday's weather forecast indicates that we are to expect stronger winds than today, conditions that are likely to preclude work at the Main Hut. If however these conditions do not eventuate, the team will continue ice and snow removal on the southern and eastern roof planes.

While awaiting a drop in the wind, Psycho will give the team another medical/safety briefing.

Directly below is my weekly report – apparently sending it as part of an email compresses it more than sending it as an attachment.

WEEKLY REPORT – MAWSON'S HUTS EXPEDITION 2006

5 -12 November 2006

Health:

All members of the team are in good health. Strong wind and slippery conditions led to a couple of minor spills, with Ian hitting the deck in front of the Sorensen while attempting to take weather observations and Ted taking a dive while getting from the Sorensen to the Apple. Apart from an initially sore wrist (Ian) and a grazed knee (Ted) there have been no on-going repercussions.

Morale:

The onset of some early summer weather not only brightened spirits (which were good anyway) but also gave the opportunity for the team to get a lot of work done. This in itself gave morale an additional boost. Being able to start work on the huge task of removing 75 to 100 m3 of snow, while daunting has given the team a focus.

Environment:

Considerably milder conditions prevailed for most of this week with temperatures ranging from - 5.7 to - 13.5 oC with associated wind chill temperatures of - 9.8 to -29.8 oC. Winds varied from calm in the evenings to 50 knots during the early parts of the day.

Safety:

Christian Gallagher continued to provide medical/safety briefings to team members. Topics covered this week included

- first aid for a choking patient
- use of Pentrox/Penthrane inhaler for pain relief and emergency contacts
- fractures of all kinds, including use of the Donway traction splint, neck and back brace
- use of the oxy-viva and the auto external defibrillator
- treatment of shock and hypothermia
- search and rescue procedures

Achievement against works plan:

Calm conditions on 3.5 days (total working time spread over the week) allowed over-cladding and snow/ice removal operations to be undertaken. In summary the following works were undertaken:

- the northern roof plane was cleared of all snow and ice and over-clad with the Roofshield membrane and tongue and groove timbers
- approximately 30-35 m3 of snow was removed from all roof planes, with the major effort focussed on the southern plane.
- The leading edge of the southern roof plane was located, to the delight of the team who can now see some of that proverbial light at the end of the tunnel!
- Snow was also removed from the western and eastern roof planes to build 'ramps' along those edges to funnel wind and drift in these directions and thereby minimise snow retention in the Cape Denison 'super pit' excavated on the southern, windward side of the Main Hut.

General Comment:

The whole team is now hoping for good weather conditions (reasonable weather forecast for Wednesday) to allow completion of snow and ice removal from the southern roof plane and for continued ice removal from the other roof planes. The discovery of solid ice in some of the lower areas of the southern face will delay over-cladding until favourable weather conditions allow it to be removed without damaging the original fabric.

Dr Ian Godfrey
Team Leader
13 November 2006

That's it for the formal part of the report Rob - will see what damage I can do in a live interview tomorrow (just kidding - just have to be able to get through a few minutes without swearing or!!)

Had a yarn with Psycho today - Georgie has been trying to call him a couple of times without any luck so far. It made me think about the interview with the ABC next week as they are likely to have similar problems (and as you have experienced first hand yourself). It might be

worth checking with them re an alternative plan should they fail to get through. It could be that if I haven't heard from them by say 7.15 on a particular day then I call them - as the phone records the length of any conversation the Foundation could then simply bill the ABC for the cost of the call!

Today wasn't anywhere near as good as yesterday - with full grey stratus cloud cover and medium strength winds which fortunately weren't too strong to prevent more ice removal work to be undertaken.

Sit Rep: Sunday, 12 November 2006

Saturday evening was a delightful, almost balmy affair warming up to - 5.8 oC, allowing the team to enjoy a couple of beers outside the Sorensen Hut while soaking up the sun. Sunday was different in appearance, with grey overcast skies but very similar conditions to those that prevailed on Saturday morning.

11.00 Observations:

Temp: - 8.3 oC
Wind chill - 19.8 oC (average)
Wind Winds gusting to 25 knots with average speed of 21 knots from the S
RH: 58%

Sunday's achievements

The day's activities were restricted to ice removal - great care had to be taken when exposing the final stages of the southern roof plane. About half of the leading edge was exposed but solid ice precluded complete exposure of the roof plane. This was left to soften naturally while further ice removal was undertaken on the eastern roof plane. In summary

- The southern roof plane is almost completely uncovered but solid ice needs to be carefully removed to prevent damage to the underlying timbers.
- More snow and ice was removed from the eastern roof plane.
- Psycho led a discussion on search and rescue procedures appropriate for the Cape Denison locality.
- Psycho and Simon relocated the meat freezer to an ice bank on the southern end of the Sorensen Hut.

Planned activities for Monday 13 November:

- Depending on the extent of softening of hard sheet ice, it is hoped to completely expose the southern roof plane in readiness for overcladding.

All from me Rob - will await your advice on the ABC thing.

Thanks for your messages - there is a good chance that Inger and I would be available next year but it could only be if there was a late November or December start as I have promised my daughter to be around in November for her final year high school exams. I think that would probably fit in with your thoughts about expedition timing (and most definitely those of the team here) that an October start is really not appropriate - too many lay days and, as we have found, the possibility of a smothered building.

About the interview - there is no problem with any time next week but mornings, as they require anyway, are by far the best for me. I am always awake by 7 am each day and so a live cross is OK if that is preferred. As we often don't get a start until late morning because of the katabatics I am usually around the Sorensen anyway (and I don't mind giving these ageing muscles an extra hour or so respite from the shovel anyway if the day turned out to be good early!). Simon will be getting another aerial on the roof and so we should have a more reliable connection by then - regardless it may be worthwhile warning them of the possibility of the line just dropping out.

Here's today's sit rep - today was a damn good - awoke to clear sunny skies and relatively light winds (always a bonus). We were able to head to the hut by late morning, a positive start to the day and a most pleasant change from recent days. Another few days like this would be bloody marvellous!!

Sit Rep: Saturday, 11 November 2006

There was very little wind-borne snow overnight and relatively light winds (estimated 25 - 30 knots). The team awoke to a beautiful sunny day with winds gusting to 25 knots and some wispy cirrus clouds overhead (1/8 coverage), working conditions in the morning at last!! The day got better and better, ending up with almost calm conditions by the early evening. To take full advantage of the good conditions work continued until 8.00 pm.

10.30 Observations:

Temp: - 7.1 oC
Wind chill - 18.5 oC (average)
Wind Winds gusting to 25 knots with average speed of 21 knots from the S
RH: 57%

Saturday's achievements

The whole team put in a solid effort all day, getting as much done as possible in excellent working conditions. While the initial katabatic winds restricted activities to snow and ice removal, their abatement in mid-afternoon allowed Ted, Marty and Psycho to get stuck into the northern roof plane while Ian continued working on the southern roof plane. In summary

- Overcladding of the northern roof plane was completed - looks fantastic!
- More snow and ice was removed from the southern roof plane, exposing the leading edge of the roof for the first time. Although there is still about 5 m³ snow and ice to be removed before the whole plane is exposed it was so good to see the light at the end of the tunnel (for this roof plane at least!).

Planned activities for Sunday 12 November:

- Complete snow and ice removal from the southern roof plane

General Comment:

A balmy day at Cape Denison was appreciated by all

Well that is all from me - look forward to your next message. Simon will send a pic of the completed northern roof plane.

Here's today's sit rep - again a really mixed day. Beautiful and calm at 5 am and then blizzard-like conditions from 7 am onwards. The wind abated enough by 4 pm to allow us to get over to the Main Hut - a relief for all.

Sit Rep: Friday, 10 November 2006

Moderate winds blew throughout Thursday evening and night, culminating in a delightful, calm and sunny period at about 5 am. By 7 am however the weather had reverted to type with blizzard-like conditions - very strong winds accompanied by a lot of wind-borne snow. Visibility varied from 10 to 100m. The wind and drift snow abated slowly during the day, until about 16.00 when the conditions were good enough to allow work to be undertaken at the Main Hut.

10.30 Observations:

Temp: - 9.8 oC
Wind chill - 25.6 oC (average)
Wind Winds gusting to 46 knots with average speed of 37 knots from the S with a lot of wind-borne snow, bordering on blizzard conditions.
RH: not recorded

Friday's achievements

- Strong winds prevented any work at the Main Hut site until 16.00. The sudden drop in wind allowed Ted, Marty and Psycho to commence overcladding the northern roof plane. They made very fast progress until just after 18.00 when strong winds and snow drift pouring down from the plateau forced an end to the day's work. About half of the roof had been overclad at that stage.
- Ian continued to remove snow and ice from the southern roof plane while the overcladding was in progress.
- Psycho's briefing today covered the treatment of fractures, including the use of the various splints available in the medical kits.
- The team returned to the site when the winds temporarily abated to erect a tent that will be used to temporarily house power tools etc during changes in the weather.

Planned activities for Saturday 11 November:

Forecast strong winds are likely to restrict activities in the morning and early afternoon. Depending on the extent of wind abatement the following activities will be undertaken.

- Completion of overcladding of the northern face of the Main Hut if winds abate sufficiently

- Snow and ice removal from the Main Hut roof planes.
- Psycho will be presenting a session on search and rescue procedures.

General Comment:

We would all love to have more than a couple of hours to get stuck into the work at the Hut. Seeing how much we have achieved in the small weather windows that we have had so far has given all of us a sniff of the possibilities if we get a few days of good weather.

Well that is all from me - look forward to your next message.

Sit Rep: Wednesday, 8 November 2006

Strong winds have continued from Tuesday evening, strengthening this morning to the value indicated below with no wind-borne snow at Cape Denison. Further to the east, wind-borne snow is clearly evident, obscuring views of the eastern ice cliffs. Otherwise, clear sunny skies.

10.00 Observations:

Temp: - 12.5 oC
 Wind chill - 29.8 oC
 Wind Winds gusting to 48 knots with average speed of 41 knots from the S. No wind-borne snow at present at Cape Denison but is clearly visible blowing from the plateau slightly to the E.
 RH 60 %

The above observations are consistent with the forecast provided by the Casey Met team (a much appreciated service).

Tuesday's achievements

- Strong winds prevented any work at the Main Hut site.
- Christian gave another medical/safety briefing, demonstrating management of a broken leg and with Ted as a patient, the use of the Donway traction splint.
- Ian inspected the Main Hut site. The membrane was still firmly in place and there was minimal ingress of snow into the main excavated trench area. The snow/ice wall that had been build to minimise ingress appears to have done a good job, apart from at the SE corner where there was a significant blizz tail which filled ¾ of a small excavated area. The wall was reshaped (from a curve to a straight line with a tapered end) to see if this affected future accumulation.

Planned activities for Wednesday 8 November:

Strong winds are likely restrict activities to those that can be conducted within the Sorensen hut. Planned activities include:

- Psycho will be demonstrating the use of the auto-external defibrillator
- The team will be polishing up their sewing skills and attaching the remaining sponsors logos to their clothing.

General Comment:

Strong winds are forecast to continue at least until Thursday evening unfortunately. In the meantime, the team will be organising equipment and tools so that maximum advantage can be taken of any suitable weather windows.

Sit Rep: Tuesday, 7 November 2006

An erratic start to the day, weather-wise with quite variable winds accompanied by occasional bursts of quite thick, wind-borne snow. Otherwise, clear sunny skies.

11.00 Observations:

Temp: - 7 oC
 Wind chill - 13 oC
 Wind Erratic winds varying from 5-10 knots during quieter moments and up to 10 - 25 knots at other times. Earlier in the morning there were katabatic gusts of 40-50 knots with wind-borne snow.
 RH 70%

Since the above were recorded, the weather has changed to be pretty much in line with that forecast by the Casey met team - 25-35 knots with wind-borne snow.

Monday's achievements - an overcast but relatively still day allowed all planned activities to be achieved. The light winds allowed work to be done on the north plane of the Main Hut roof. After setting up a professional looking outside work station, Ted, Marty and Psycho put battens on the original roof plane, lapped Roofshield membrane on top of these battens and then fixed the membrane with cover battens. It looked a treat and we are all confident that once the over-cladding is completed it will be a snow-proof structure.

While the roofing work was going Ian continued with ice removal from the southern and eastern roof planes, with a further 4-5 m³ of snow and ice excavated. The removed snow blocks were used to extend the 'barrier' wall in a curving shape to give a little more protection from SE winds.

Simon provided much appreciated support, delivering lunch and later, afternoon tea, to the team working at the Main Hut.

Planned activities for Tuesday 7 November:

- Completion of over-cladding of the northern roof plane of the Main Hut (dependent on wind conditions which continue to be variable in strength)
- Continuation of snow removal from the southern and eastern roof planes (the extent of this work will be dependent on roof-over-cladding activities)

General Comment:

The Casey meteorology office provided us with a 4-day forecast which indicates that there is only a low chance of being hit with blizzard conditions. Unfortunately however, increasing winds (to 50 knots) have been forecast over the coming days, conditions that will limit the team's ability to work on the roof planes and probably also restrict snow/ice removal. As this latter activity involves excavation to approximately 2 m depth, care and good conditions are needed to ensure the safety of all personnel on the site.

Sit Rep: Monday, 6 November 2006

Temp: - 6 oC
Wind chill - 12 oC
Wind 7 knots from the south-east
RH 70%

Sunday's achievements - a balmy day allowed all planned activities to be achieved. The millpond calm conditions allowed a significant dent to be made in the amount of snow covering the Main Hut. All snow was removed from the northern roof plane and from the upper reaches of the western (formerly was completely covered) and eastern roof planes. Probing along the lines of the non-original ridge capping allowed the boundaries of the main hut roof to be delineated. Trenches were then dug to expose the top of the ridge capping along the north and south eastern ridges. The team then worked extremely hard, under warm conditions, to remove approximately 15 m³ of snow from the ridges and from areas in front of the southern roof plane. A chain saw was used to cut blocks that were lifted and used to build a wall in front of the main hut. The hope being to construct an appropriately shaped wall that will minimise filling of excavated areas with new drift snow.

Removal of the snow from the northern plane allowed the skylight on that roof to be lifted, allowing sufficient light into the Main Hut for a preliminary inspection to be made of the interior. There had been little additional snow ingress in the building since the last inspection in December 2005. This is not surprising in view of the extensive snow coverage of the external building fabric.

The balmy conditions allowed further photographs to be taken for Foundation sponsors. All in all, it was a very productive and satisfying day's work. Unfortunately there is a huge amount of snow/ice still to be removed before work can commence on any of the E, W or S roof planes. Simon came to the party, delivering afternoon tea to a very grateful work team at the site and then cooking a tasty Moroccan lamb dinner, followed by lemon cheesecake.

Planned activities for Monday 6 November:

- Organisation of work equipment, tools and infrastructure at the Main Hut with a view to commencing over-cladding of the exposed northern roof plane of the Main Hut (weather dependent)
- Continuation of snow removal from the southern roof plane (the extent of this work will be dependent on roof-overcladding activities)

General Comment:

The Casey meteorology office has agreed to provide the Mawson's Huts team with regular forecasts for the duration of our stay. This will significantly enhance our operational

planning, allowing contingencies to be made in the event of predicted unfavourable weather conditions.

WEEKLY REPORT – MAWSON'S HUTS EXPEDITION 2006

Date: 29 October – 4 November 2006

Health:

All members of the team are in good health. There have been no injuries to any team members.

Morale:

Morale is good, despite the disappointment of finding the Main Hut and Workshop covered in very heavy snow well above the verandah-roof interface. The southern roof plane is covered up to the skylight, the western plane is completely covered with a thick layer of snow, the eastern and northern planes, while not as heavily covered as the previously mentioned roof planes, still have most of their surface covered by snow. There was much less snow on the workshop roofs. The heavy snow coverage caused some concern among the team as it was generally felt that the aim of re-cladding all roof planes would not be possible this season. Protracted discussions were held regarding this matter and because of the concern expressed by senior team members, Rob Easter was contacted so that he could alert the Mawson's Huts Foundation and the Australian Antarctic Division to this possibility.

Environment:

The team was flown into Cape Denison in the evening of 29 October in quite good conditions, with winds of about 30 knots. No cargo was able to be flown in that evening however. Although flying conditions were marginal for the next two days, cargo operations resumed when the katabatic winds abated enough for internal and external loads to be delivered to the Sorensen and Mawson's Huts areas. Angus MacDonald was flown out, at very short notice, during the second day of cargo operations.

Temperatures during the week have ranged from - 7 oC to - 20 oC with average wind chills on those days ranging from - 17 oC to - 40 oC and average wind speeds ranging from 20 to 65 knots. A strong blizzard on 2 November produced white-out conditions for extended periods during the day and fine drift late in the evening caused a big build up of snow in the tents, the Sorensen hut, the toilet and in the generators.

Safety:

Despite the windy conditions the team has worked very well and followed safe working practices at all times. Ted Bugg rigged a blizz line from the Sorensen to the apple hut on the first day, a move that proved very important during the blizzard conditions that were experienced during the week.

Christian Gallagher has given 2 first aid briefings this week and will continue to do so, prior to the day's activities, until all basics have been reinforced. The idea behind this is to revise and refresh the first aid training of all team members and to also give a daily reminder of the need to observe safe work practices.

Achievement against works plan:

As the weather has been challenging this week and the priority has been to establish the team in the Sorensen Hut and to get all of the equipment relocated to appropriate work sites and functioning well, no progress has been made against the works plan. A small amount of snow and ice was removed from the north and west roof planes of Mawson's main hut. While this demonstrated that snow could be removed without risk of damage to the roof fabric, the sheer quantity and depth will be problematic in exposing all of the roof surfaces and the issue of re-deposition is ever present.

General Comment:

Despite the extensive snow coverage of the Main Hut and the poor weather conditions that existed this week, I am hopeful that, given more favourable weather conditions, the team will be able to achieve a significant amount of the work described in the works plan. Time will tell.

Dr Ian Godfrey
5 November 2006

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PLEASE DO NOT SEND ATTACHMENTS

9. REFERENCES:

1. Patterson, D., (2003), Mawson's Huts Conservation Expedition 2002, Expedition Reports, Australian Antarctic Division.
2. Troppo Architects, (2006), Mawsons Huts Historic Site Works Plan 2006, prepared for the Australian Antarctic Division, August 2006.
3. Godden Mackay Logan (2001), Conservation Management Plan, Mawson's Huts Historic Site, Cape Denison, Commonwealth Bay, Australian Antarctic Territory, prepared for the AAP Mawson's Huts Foundation, July 2001.
4. Ambrose, W. and Godfrey, I.M., The Wilkes Hut Project 1995-2003, paper in preparation.
5. Mawson's Huts and Mawson's Huts Historic Site, Management Plan 2007-2012, Exposure Draft (in preparation, under section 324S of the EPBC Act)
6. Bugg, T., (2006), Mawson's Huts Conservation Expedition 2005, Australian Antarctic Division and the Mawson's Huts Foundation