

## **Wheeled Runway at South Pole**

The OAC Subcommittee on USAP Resupply recommended that NSF seriously consider construction of a wheeled-aircraft-capable runway at South Pole. Such a runway would address a number of USAP resupply issues by allowing conventional aircraft to directly access South Pole from McMurdo or other locations in Antarctica or off-continent (e.g., New Zealand).

The processed snow foundation for the 10-m telescope at South Pole provides an excellent starting point to address the Subcommittee's recommendation. Monitoring of the snow strength during and immediately post construction, and measurements that will follow during the 2005-2006 austral summer season, will establish the feasibility of creating snow of adequate strength to support the gross mass and the contact pressure of aircraft types that could effectively make deliveries to South Pole.

A sequence of actions is proposed to validate the applicability of techniques used to construct the 10-m telescope foundation to the creation of a hard surface runway at the South Pole. These actions include:

- A snow-monitoring program will be initiated for the South Pole 10-m telescope foundation upon station opening in November. Strength and structure changes over the winter will be documented, and a high-resolution temporal profile of such changes will be developed over the course of the typical air operations period (November until mid to late February).
- Using results from prior snow mechanics studies (including polar snow construction), a runway pavement design will be developed that will specify the strength-thickness profile required to support aircraft of the type likely to operate at South Pole (e.g., C-17, KC-10, B757).
- Construction scenarios will be generated and evaluated with the goal of limiting disruption to operations during construction, cost, project duration, and personnel requirements at South Pole.
- Air operations scenarios will be identified to assess the efficiencies associated with various aircraft types, embarkation points, and types and timing of cargo to be delivered.

It is expected that the above actions can be completed within the year, including external review of the engineering analysis and results. An assessment of feasibility, cost, timetable, and potential return on investment will then be used to determine how best to proceed. If feasibility and utility of the runway prove positive, a validation/verification exercise can be conducted in the McMurdo area.