



Photo by Melanie Conner/The Antarctic Sun



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Workers raise portions of the new elevated station, bringing the silver staircase cylinder and main station back to the same level.

# New station settles in

By Mark Sabbatini  
*Sun staff*

Designers knew the new South Pole station would gradually sink into its snow foundation, but not this quickly. The station, elevated about 14 feet above ground level on support posts, was expected to sink 36 inches during the next 20 years. But measurements from the past two years show the station is currently sinking about five inches a year, which has officials trying to figure out the cause, and if there's a way to slow the pace.

The good news is data collected so far indicates the accelerated pace of sinking may not be a long-term problem, said Dennis Berry, the lead structural engineer for the new station.

"All the indications we've got is it should taper off with time," he said.

It may also be possible to modify the support columns and other parts of the station so it can be raised more than the 12 feet planned in the original design, Berry said. He said modifications may also allow the station to handle larger amounts of imbalance between columns if one is sinking at a greater rate than another, which would be a greater threat to the station's structural integrity than uniform settlement.

"I think everybody realizes there's not a lot of information on building in snow," said Frank Brier, the National Science Foundation project manager for the new station.

The new station will replace the South Pole's landmark dome, which is being gradually buried by snow accumulation. All of the

buildings rest on a foundation of ice about two miles thick, which is slowly, but constantly, shifting.

Workers noticed a platform between the new station and a tower linking it to the dome level structures was uneven, leading to the analysis of the settlement rate, Brier said.

It's likely either the footing of the columns are sinking, or the entire snow field 25 feet below the surface is dropping, Brier said. He said it will likely take another year or two for a team of engineers and other experts to come up with a solid diagnosis of the problem.

"If the footings are sinking into the snow, maybe we can increase the size of the footing and spread the weight around," he said. "If the entire snow field is settling, we will not have many options."

Brier said the new garage and power plant buildings constructed at the same level as the old South Pole station dome are not sinking.

The station's design allows for about three inches of difference between columns, Brier said. Settlement so far has been "very uniform," but a leveling process will occur sooner than planned.

"We always assumed we'd go four to five years without leveling, but we're going to level about half of the columns this year," Brier said.

A new construction schedule and cost projections also factor

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*At left, the footings under the main section of the new station have been settling faster than the staircase tower. Below, workers jack up the station in increments to bring the sections level with each other.*

Photo by Kristan Hutchison/The Antarctic Sun

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in a leveling process every year, he said.

Four to five additional people are working at the Pole for two months this season to ensure the process won't affect other construction activities, Brier said. Some of the summer work may also be shifted to winter if necessary.

Delays in delivery of materials to the Pole during the past two years and an increase in scope to add 40 more bedrooms has resulted in a one-year delay in the station's completion date and a slight increase in its cost, Brier said. Completion is scheduled for fiscal 2007 at a cost of about \$135 million, compared to \$128 million originally estimated.

Nearly 4 million pounds of equipment and materials are scheduled to be shipped to the Pole this summer, Brier said. Shipments, all of which must fit into an LC-130 plane, were short by 1.2 million pounds of cargo last season, due largely to weather.

"In essence, that resulted in a delay of one year," he said.

As of early last week, only 66 of the planned 91 flights had reached the Pole, but Brier said "The success rate this time of year is always low."

A total of 332 missions are planned this season, so the current shortfall is not a significant amount of that total, according to Brian Stone, the National Science Foundation representative at McMurdo Station.

Brier said \$60 million has been spent on construction to date, including all of the building materials. But he said it might still be possible to meet the original cost by using value engineering on remaining work, and maintaining the current high level of construction efficiency. "We still have a lot of opportunities to save money," he said.

A new dining hall and living space for 50 people are scheduled to open in January, Brier said. Winter workers will finish a new medical center and computer lab.

"The plan is for most of the winter staff to live in the new elevated station," he said.



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