

## IceCube Project Monthly Report August 2005

### Accomplishments

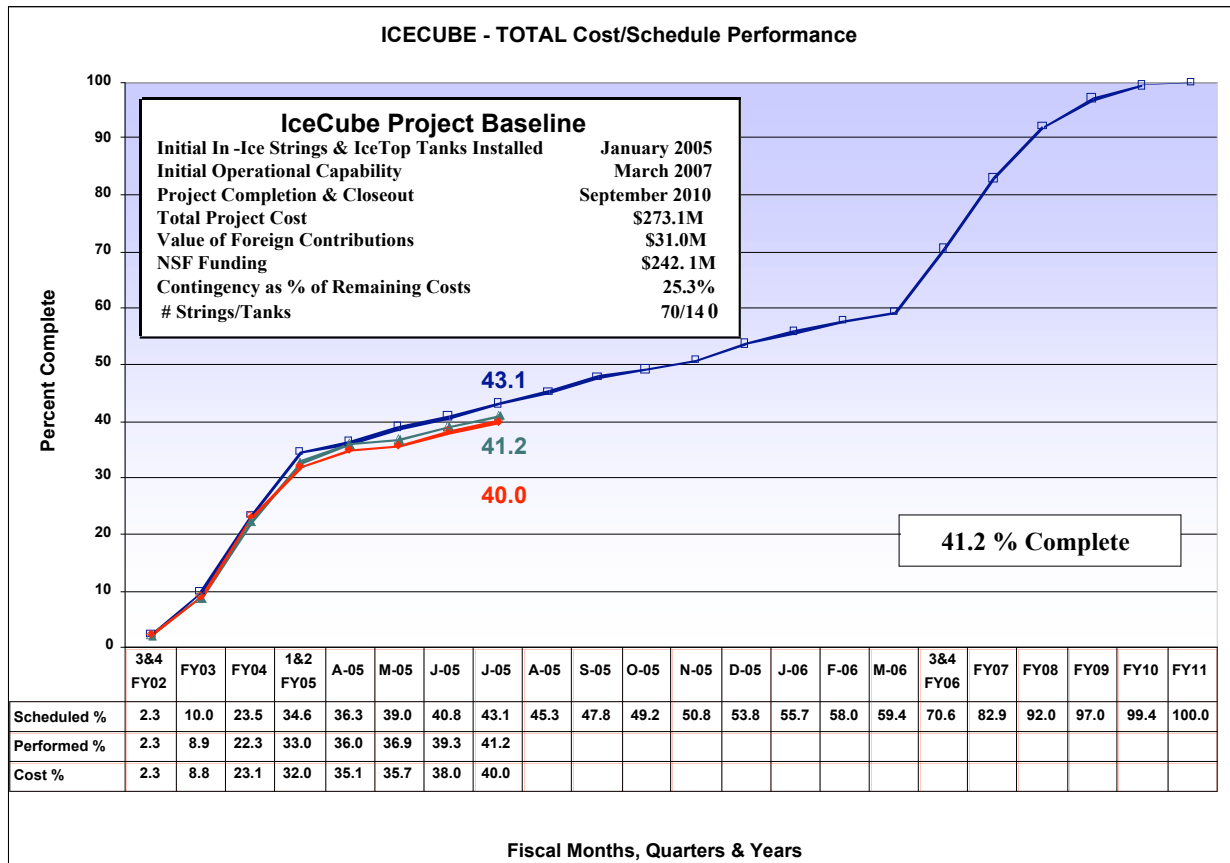
All of the DOMs installed at the South Pole continue to produce physics quality data (60 DOMs on one string in the ice and 16 in eight surface tanks).

DOM production in Sweden and Germany is complete. Production in the U.S. will be completed in September. The percentage of DOMs passing final acceptance testing this year has steadily increased and the long-term goal of yields greater than 90% remain realistic.

The buildup and testing of the South Pole data handling system for the 2005/2006 season is complete and the system will be shipped from UW-Madison in late September.

NSF conducted a safety review of the IceCube safety program in August. The panel was impressed with the overall safety program and supported efforts to further improve the program including additional emphasis on training and procedures.

The training program for IceCube personnel scheduled to work at the South Pole was successfully completed in August with safety incorporated as an integral part of the program.



IceCube Neutrino Observatory Cost Schedule Status Report Reporting Period Ending: 7/31/2005 <sup>1</sup>												
WBS Element	Cumulative To Date (AY K\$)					At Completion (AY K\$)			Complete (%)			
	Budgeted Cost <sup>2</sup>		Actual Cost of Work Performed	Variance		Budgeted AY \$s	Latest Revised Estimate	Variance	Scheduled	Performed	Actual	
	Work Scheduled	Work Performed		Schedule	Cost							
1.1 Project Support <sup>3</sup>	14,253.5	14,205.1	13,188.4	-48.4	1,016.8	30,232.2	29,215.4	1,016.8	47.1%	47.0%	43.6%	
1.2 Implementation	17,351.9	17,142.5	15,810.1	-209.4	1,332.5	32,295.5	30,963.0	1,332.5	53.7%	53.1%	49.0%	
1.3 Instrumentation	44,723.1	42,662.9	42,590.1	-2,060.2	72.8	98,174.3	98,101.5	72.8	45.6%	43.5%	43.4%	
1.4 Data Systems	8,449.9	7,539.6	8,078.8	-910.3	-539.2	24,874.3	25,413.5	-539.2	34.0%	30.3%	32.5%	
1.5 Detector Commissioning & Verification	5,680.2	5,913.8	5,742.8	233.6	171.0	18,770.3	18,599.3	171.0	30.3%	31.5%	30.6%	
1.6 Polar Support Services	11,549.8	9,915.2	9,190.6	-1,634.6	724.7	32,054.5	31,329.8	724.7	36.0%	30.9%	28.7%	
NSF <sup>3</sup>	469.7	469.7	437.3	0.0	32.4	1,263.0	1,230.6	32.4	37.2%	37.2%	34.6%	
Sub Total	102,478.1	97,848.971	95,038.0	-4,629.1	2,811.0	237,664.1	234,853.1	2,811.0	43.1%	41.2%	40.0%	
Management Reserve												
Total Contingency						35,389.2	38,200.2	2,811.0				
Items Outside of Approved Baseline												
IceCube Neutrino Observatory <sup>2</sup>	102,478.1	97,849.0	95,038.0	-4,629.1	2,811.0	273,053.3	273,053.3	0.0	43.1%	41.2%	40.0%	

Notes: 1 Incorporates approved and currently pending baseline changes.

2 Total Budget at Completion includes non-US contributions \$1,283K over the amount in the post Hartill III baseline.

3 Budgeted contingency is 25.3% of the Budgeted cost of work remaining.

**Cost and Schedule Performance** – The project is roughly 41% complete when measured using earned value measurement techniques. The measurement includes all tasks completed to date including design and development, procured materials, and the construction of the infrastructure that supports the current seasonal installation plan, e.g., the hot water drill, cargo shipments, etc.

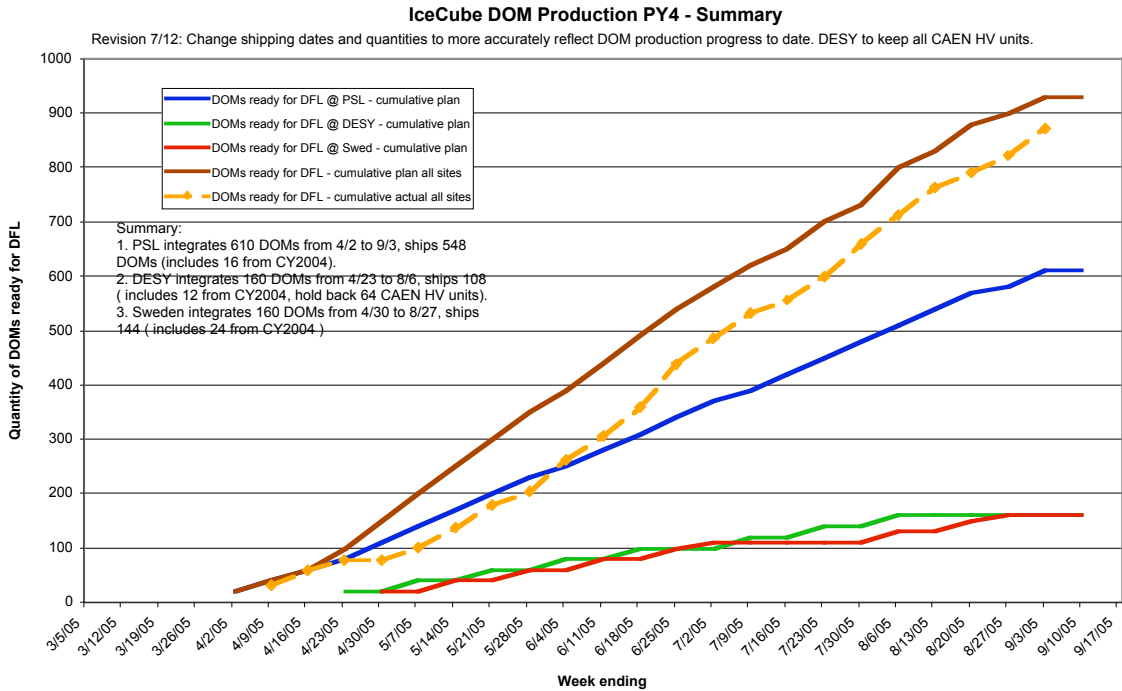
**Drill Construction and Operation** – The hot water drill was operated for the first time at the South Pole in January 2005, successfully drilling one hole to a depth of 1,500 meters and another to 2,500 meters that was used for the first IceCube string. The experience gained during this very short drilling period generated a long list of improvements to the drill that are required to enhance the reliability of drill operations. The design and fabrication work for these improvements is now essentially complete and the equipment is being shipped to the ChristChurch.

The experience gained last season was also used to develop a comprehensive set of standard operating procedures for the drill. The writing of these procedures is still in progress but the final procedures will be available in time for drill operations. The general drilling plan for 2005/2006 includes:

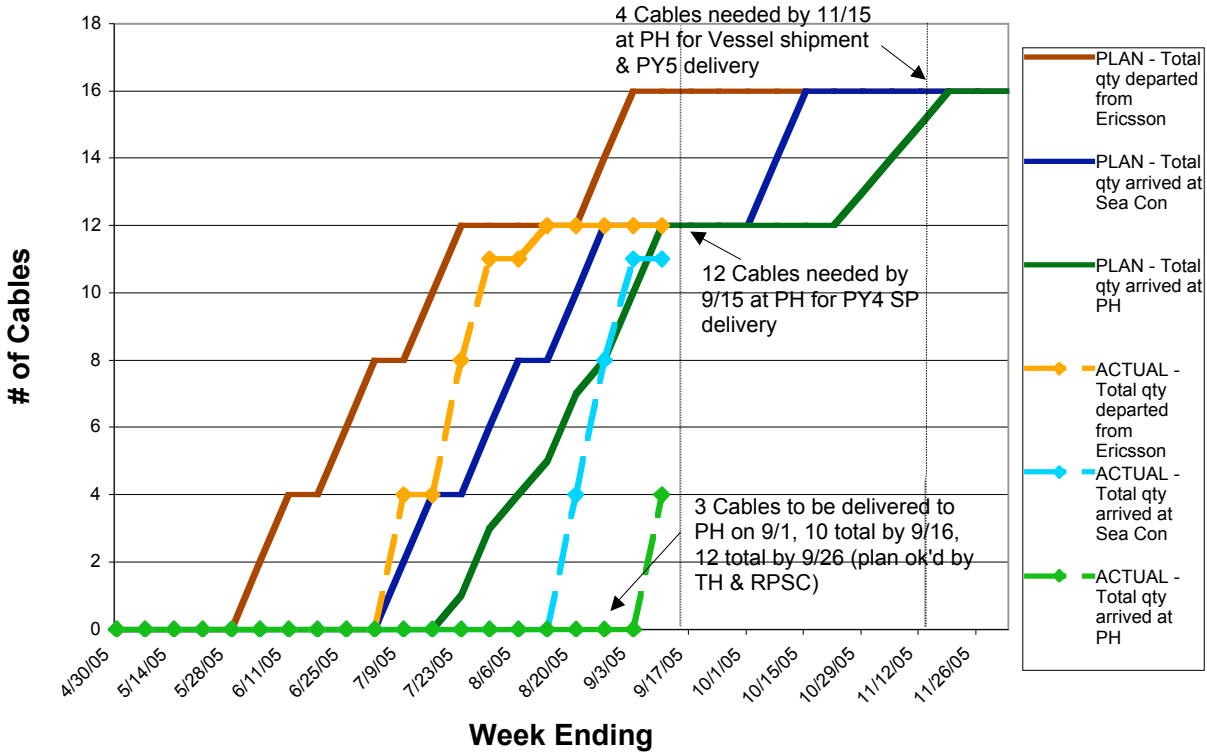
- Set up the drill camp and prepare for the start of drilling by December 10<sup>th</sup>.
- Drill and install strings over seven weeks (December 11<sup>th</sup> – January 28<sup>th</sup>).
- Improve the drilling speed to the original design goals.
- Install 2 strings per week (a total of 12 strings would be possible at this rate).

A concerted effort to improve the drilling speed is planned for next season in order to reduce fuel consumption and increase season production rates. Engineering analysis and consulting support provided a basis for improvements through modifications to the drill nozzle diameter, taper, and weight stack design.

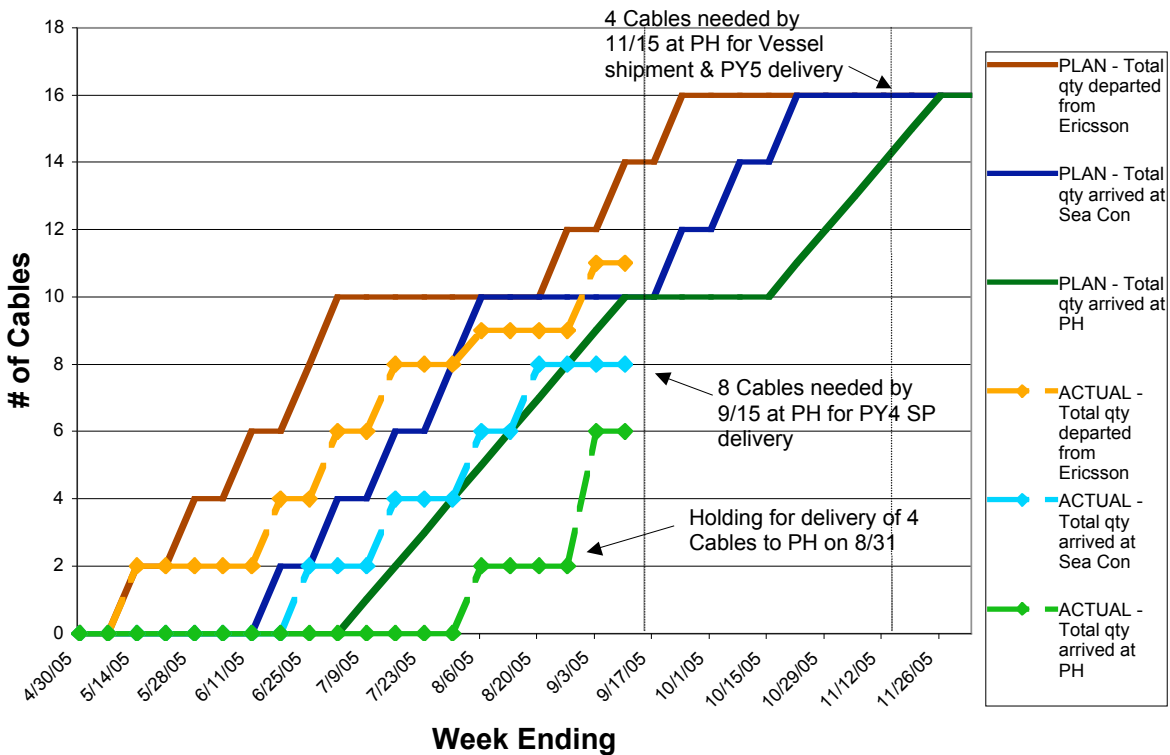
**Instrumentation Production, Testing, and Shipping** – The production goals for this calendar year were to produce 16 surface-DOM cables, 16 surface cables, and 930 DOMs. It is now clear that these goals will be achieved. Cable production and the installation of breakouts on Surface-DOM cables has lagged the baseline plan by a few weeks and therefore the schedule for delivery to Port Hueneme was revised. The revised schedule is acceptable to logistics personnel.



### Surface Cable PY4 Production



### Surface to DOM Cable PY4 Production



*Final Acceptance Testing of DOMs* – The yield of acceptable DOMs from the testing program continues to increase. The yield following final acceptance tests in the Dark Freezers is now in the range of 90% and the goal of routine yields of 90% is realistic.

***String and IceTop Commissioning*** – All 76 DOMs are operating and reading data (60 DOMs on the string and 16 DOMs in 8 surface tanks). Overall, the quality of the data from the first string and IceTop tanks supports is very good and supports the installation plans for this season. The IceCube scientific collaboration is actively engaged in evaluating data from AMANDA and the initial IceCube instrumentation. This analysis will be the subject of several presentations at the IceCube collaboration meeting in September. A recent IceCube event is shown at the end of this report. Personnel supported by the project are working on commissioning plans for the 2005/2006 season when an additional ten strings (600 DOMs) will be installed in the deep ice and 48 DOMs will be installed in twenty-four surface tanks.

***System Testing*** – The South Pole Test System located at the Physical Sciences Laboratory was relocated to the UW main campus. The test system continues to provide a critical test bed for the data acquisition and data handling software. The DOM-Cable test facility at PSL was relocated from to a new warehouse that provides adequate space for the connection of 60 DOMs on an actual, full-length cable plus IceTop hardware. This system provides a test environment for data acquisition software, general system performance testing, and the ability to troubleshoot problems without impacting the instrumentation installed at the South Pole.

***Data Systems*** – The data handling systems required for the 2005/2006 season were procured and tested in UW-Madison and are now being packed for shipment to the South Pole. These systems will be installed in the temporary counting house (future optical module laboratory).

***Quality Assurance*** – No significant issues to report.

***Safety*** – A safety workshop was held in June and an NSF Safety Review of the IceCube Program in early August. The workshop and the review provided an opportunity for the project to discuss the content of the safety program with external experts. The actions and recommendations from the meetings are tracked.

### **Meetings and Events**

NSF Safety Review of the IceCube Project	August 10-11, 2005
IceCube Drill Training	August 15-26, 2005
IceCube String and Cable Installation Training	August 22-23, 2005
Final UW/RPSC Detailed Planning Meeting for the 2005/2006 Season	September 14-15, 2005
IceCube Collaboration Meeting	September 25-29, 2005
International Oversight and Finance Group Meeting @ NSF	October 21, 2005
IceCube Drill Workshop/Project Advisory Panel Meeting	week of March 27, 2006

The monthly reports are posted at [IceCube Monthly Reports](#).

IceCube Event 3356

