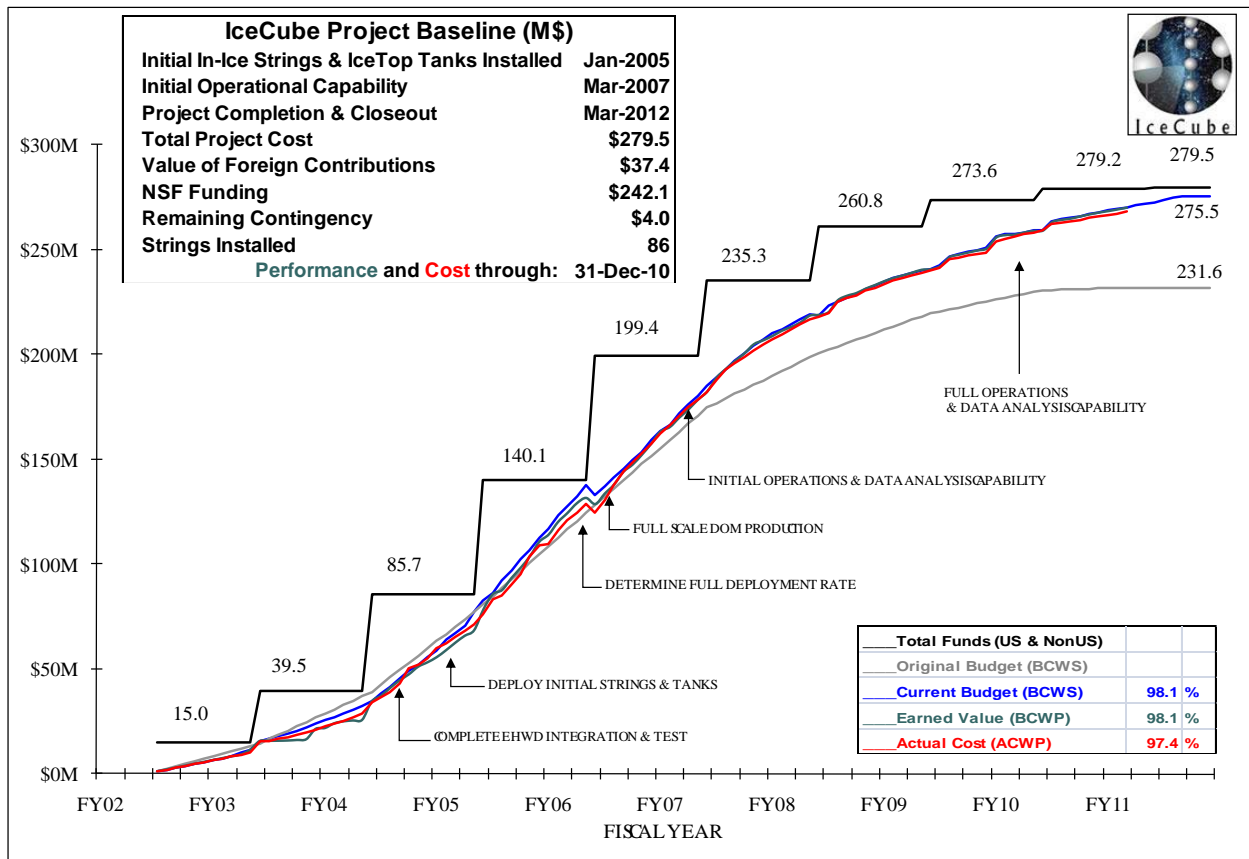


# IceCube Project Monthly Report – January 2011

## Accomplishments

- The strings installed in December were commissioned in January and will be incorporated into the existing IceCube array during the month of February.
- The IceCube population at South Pole was reduced dramatically in January relative to previous years due to the completion of IceCube drilling in December.
- The Enhanced Hot Water Drill components were prepared for winter storage. Two of the three generators were shipped from South Pole and are now Raytheon responsibilities.
- The excitement generated by the completion of IceCube construction led to a number of requests for speakers, interviews, and media contacts during January; over 30 media outlets from around the world featured IceCube during that month.



**Cost and Schedule Performance** – The project is 98.1% complete. Remaining contingency is \$3.997 million. The NSF IceCube MREFC funding of \$242.1 million remains unchanged since the project baseline was established in early 2004.

IceCube Neutrino Observatory Cost Schedule Status Report Reporting Period Ending: 12/31/2010										
							At Completion Note 4	Complete (%)		
Cumulative (AY K\$)							Budgeted AY \$s	Sched	Perf	Actl Cost
OBS Structure L2	Budgeted Cost <sup>2</sup>		Actual Cost of Work Performed	Variance Cost	Risk Contingency <sup>Notes</sup>					
	Work Scheduled	Work Performed			Assigned	% Remain Work				
Project Support	26,824	26,824	26,718	106.2	175	27.1%	27,471	97.6%	97.6%	97.3%
Implementation	45,366	45,366	44,979	387.1	95	6.8%	46,767	97.0%	97.0%	96.2%
Instrumentation	76,811	76,811	76,652	159.0	15	17.9%	76,895	99.9%	99.9%	99.7%
Data Acquisition	33,855	33,855	33,855	0.6	0	0.0%	33,855	100.0%	100.0%	100.0%
Data Systems	26,657	26,657	26,698	-40.8	75	22.6%	26,989	98.8%	98.8%	98.9%
Detector Comm. & Verification	20,587	20,587	20,584	3.6	15	24.4%	20,649	99.7%	99.7%	99.7%
Pre Operations	5,061	5,061	5,032	29.9	50	24.8%	5,263	96.2%	96.2%	95.6%
Subtotal	235,162	235,162	234,517	645.5	425	15.6%	237,889	98.9%	98.9%	98.6%
RPSC SUPPORT	33,938	33,938	32,541	1,396.8	250	10.5%	36,323	93.4%	93.4%	89.6%
NSF	1,226	1,226	1,226	0.0	15	40.0%	1,263	97.0%	97.0%	97.0%
Total	270,325	270,325	268,283	2,042.3	690	13.4%	275,475	98.1%	98.1%	97.4%
CONTINGENCY <sup>Note 3</sup>							3,997			
IceCube Total <sup>Note 2</sup>	270,325	270,325	268,283	2,042.3	690		279,472	98.1%	98.1%	97.4%

Notes: 1 Incorporates approved baseline changes.  
2 Total Budget at Completion includes \$37.4 M  
3 Remaining Contingency is: \$4.0 M  
4 The BAC (Budget At Completion), reflects PY9-10 detailed Baseline Review.  
5 Contingency is assigned based on the remaining Technical, Cost & Schedule risks associated with the approved scope of work.

The cost variance at the end of December 2010 was a favorable \$2.042M, primarily due to Raytheon and New York Air National Guard Fiscal Year 2010 on-ice fuel and labor cost savings.

**Contingency Status and Plans** – No change requests were implemented this month.

12/31/2010

**Change Log - IceCube Total Project Budget Baseline (\$K)**

No.	Description	Approval Date	Total Baseline	Allocated Budget	Allocated Budget Change	Contingency Budget
NA	Status as of October 2010		279,472	275,475	0	3,997
NA	Status as of November 2010		279,472	275,475	0	3,997
NA	Status as of December 2010		279,472	275,475	0	3,997

Reviews of MREFC subsystems continue, and any additional resources necessary to ensure successful completion of these systems are considered in the risk assessment process and will be addressed within the available contingency. The remaining contingency will be adequate to complete the approved scope. A no-cost extension of the project end date from March 31, 2011 to March 31, 2012 has been approved. This will accommodate activities associated with the final disposition of the IceCube Enhanced Hot Water Drill (EHWD); the orderly termination of construction activities; and the preparation of a comprehensive completion report on construction.

## Risk Assessment & Potential Contingency Adjustments

Item	Estimate (\$K)
1. Potential cost exposure on the remaining scope of work based on an evaluation at a detailed level. The evaluation includes a technical, cost and schedule risk assessment.	\$690K
2. Additional computing infrastructure and software development required for the completed array to support data taking, simulations, and distributed analysis.	\$2,100K
3. Estimated cost to prepare the IceCube EHWD equipment stored at the South Pole for shipment out of Antarctica.	\$300K
4. Potential labor cost during the final year of construction and project closeout.	\$300K
5. Additional calibration, reconstruction and simulation software tools that were identified during the internal review of the IceTop surface array subsystem.	\$200K
<b>Total Estimate of Potential Cost Exposure</b>	<b>\$3,590K</b>
<b>Available Contingency as of December 31, 2010</b>	<b>\$3,997K</b>

***Drill Operation and Installation*** – The EHWD systems were partially disassembled in preparation for winter storage; heater stacks and cable trays were removed; a heater was removed and shipped back to the U.S. for coil testing and cleaning procedure development. The main modules of the EHWD and all related equipment were relocated and strategically positioned and surveyed for long-term winter storage. A 3D layout map was developed, along with detailed inventories; these are to be coordinated in the coming weeks. Computers, motor controllers, sensors, and all Do-Not-Freeze equipment were removed from all components and shipped back to Madison for heated storage. Excess spares and supplies, and obsolete equipment were purged and retrograded from South Pole to the U.S. to reduce footprint and clutter. All high pressure hose was removed from the Main Supply Hose Reel, spooled and shipped to McMurdo for warmer temperature enclosed storage.

EHWD Documentation efforts are to resume once lead drillers redeploy from the ice and their well-deserved holidays. Video editing continued through January. A prototype website layout and template was started – the documentation is to be completed in this format.

***Education and Outreach*** – The excitement generated by the completion of IceCube construction led to a number of requests for speakers, interviews and contacts during January. Our winterovers are in touch with an elementary school in Florida to schedule a teleconference as well as a Belgian television station; media contacts came from Science Illustrated Magazine, Virtual Researcher on Call (a non-profit educational outreach program in Canada), the UW alumni association, a local Rotary club, and several elementary schools; and an image request from the New York Times Syndicate. Meanwhile plans for February and later events are beginning, especially the UW Physics Fair and the UW Science Expeditions. Over 30 media outlets from around the world featured IceCube in January. Here are a few highlights:

IceCube was featured in an audio interview on CBC news with Darren Grant, collaborator at the University of Alberta.

<http://www.cbc.ca/technology/story/2011/01/17/antarctica-physics-lab.html>

Washington Post

<http://www.washingtonpost.com/wp-dyn/content/article/2011/02/07/AR2011020703606.html>

PBS Newshour

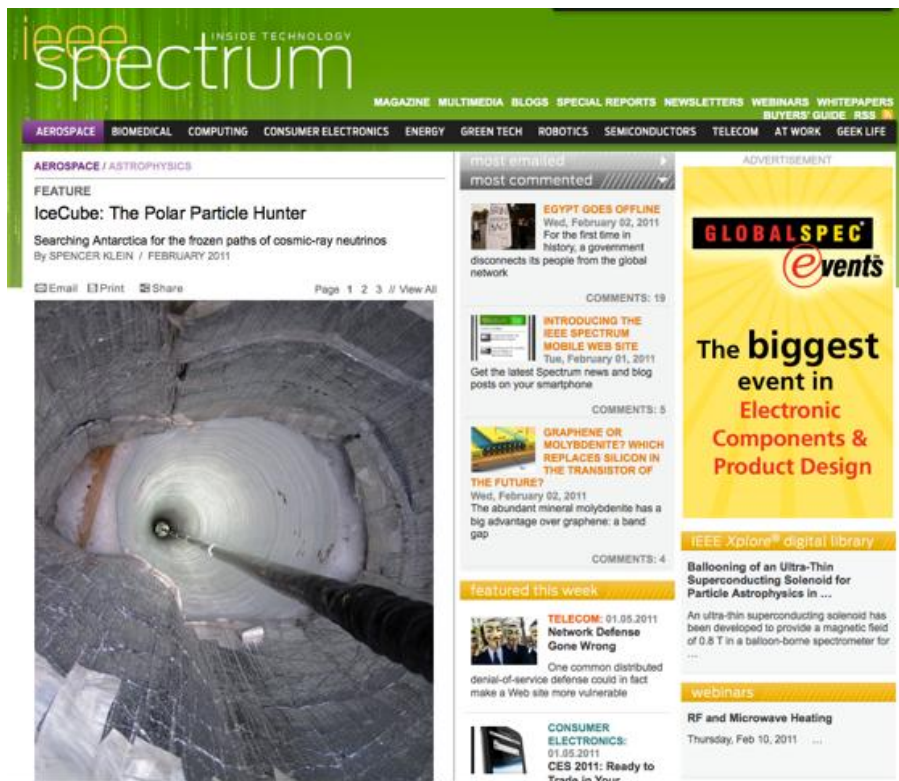
<http://www.pbs.org/newshour/rundown/2011/01/what-is-a-neutrino-and-why-should-anyone-but-a-particle-physicist-care.html>

The Guardian

<http://www.guardian.co.uk/science/2011/jan/23/neutrino-cosmic-rays-south-pole>

IEEE Spectrum

<http://spectrum.ieee.org/aerospace/astrophysics/icecube-the-polar-particle-hunter>



### *Upcoming IceCube Meetings and Events*

IceCube Collaboration Meeting, Madison  
IceCube Detector Completion Event  
IceCube Invites Particle Astrophysics

April 25 – May 2, 2011  
April 28, 2011  
April 29-30, 2011

### *Acronym List*

EHWD      Enhanced Hot Water Drill  
MREFC    Major Research Equipment and Facilities Construction