

# IceCube Neutrino Observatory

South Pole Operations Support - Coordination  
with NSF and Antarctic Support Contractor

Jim Haugen

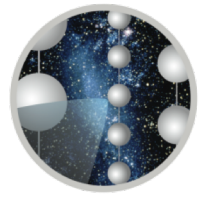


NSF Maintenance and Operations Mid-Term Panel Review  
March 11, 2019 • Madison, WI



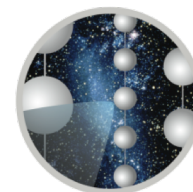
ICECUBE

# What is IceCube Pole Logistics?



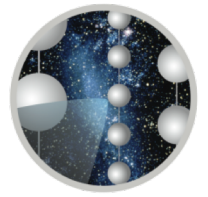
- IceCube M & O Operational Notice – fixed 5 year plan
  - South Pole population planning
  - Cargo planning
  - Task coordination with ASC
  - ASC support planning
- Support Information Package (SIP) submission – new submission each March, guided by Ops Notice
- Research Support Plan (RSP) acknowledgement
- A subset of Pole Operations

# M & O Operational Notice



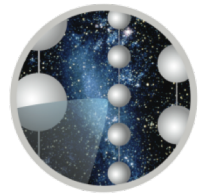
- 5 year agreement that supports work at Pole in the summer seasons from 16/17 to 21/22, revision 21 MAR 2016
- There have been no significant changes since original draft
- Key support items
  - Highest population at 7+ to 9+ for any given time at Pole, depending on season
  - Commercial tickets needed is 8 to 12, depending on season
  - Maintain 2000 sq ft at ICL and 200 sq ft in B2 Lab
  - Limited use of electricians / carpenters for minor changes
  - 3k to 10k pounds of DNF cargo, 6k to 17k total cargo, depending on season
  - 105 GB/day satellite bandwidth for data transmission

# Pole Support – the people



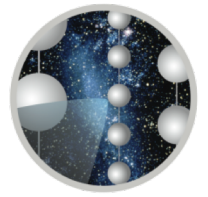
- Jim Haugen (IceCube M&O) - with IceCube since 2003, involved in Polar Ops since 2006 continuously to now, Pole Logistics Lead for IceCube
- John Kelley (IceCube M&O) – with IceCube since 2003, IceCube detector operations manager since 2013, Polar Ops Lead for IceCube
- Leah Street (ASC - Science Project Mgr) – 10 years at RPSC / ASC with the last 8 managing IceCube support at Pole
- Paul Sullivan (ASC – Science Project Mgr) - 24 years at ASA/RPSC/ASC with direct support to IceCube since 2005

# Ops Notice Plan vs Actuals



Pole Season	Commercial tickets planned	Actual comm tickets (self-ticketers)	Pole first – timers (excludes winterovers)	Total cargo planned (lbs)	Actual (lbs)
16/17	8	7 (5)	7	6000	7648
17/18	10	11 (5)	6	10000	7685
18/19	10	8 (7)	9	12000	6549
19/20	12			17000	
20/21	12			17000	

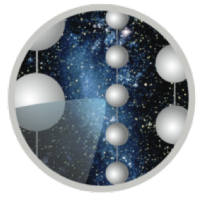
# ASC Support Comments



- In general, support has been good given financial constraints
- PQ process improved for 18/19 season
- Sync'ing with Pipeline is coming late in the process, preferred to be earlier

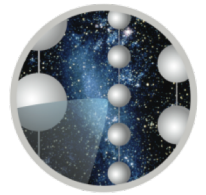


# M & O main Pole activities (Polar Ops)



- Discussed in Detector Operations – talk by John Kelley

# IceCube Upgrade considerations



- IceCube M & O population and tasks have synergy with the Upgrade Project - especially in M&O Integration, computing infrastructure
- IceCube M & O Ops Notice expires the season before the main Upgrade season
  - Consider negotiating a revised 5 year M&O Ops Notice that covers the years of the Upgrade
- Obvious challenges for Upgrade
  - Housing / population
  - Flights (cargo / pax)
  - Traverse usage
  - Heavy equipment / snow machine viability
  - Fuel deliveries