

IceCube Upgrade Cargo and Population Methodology

Ian McEwen, Implementation Manager
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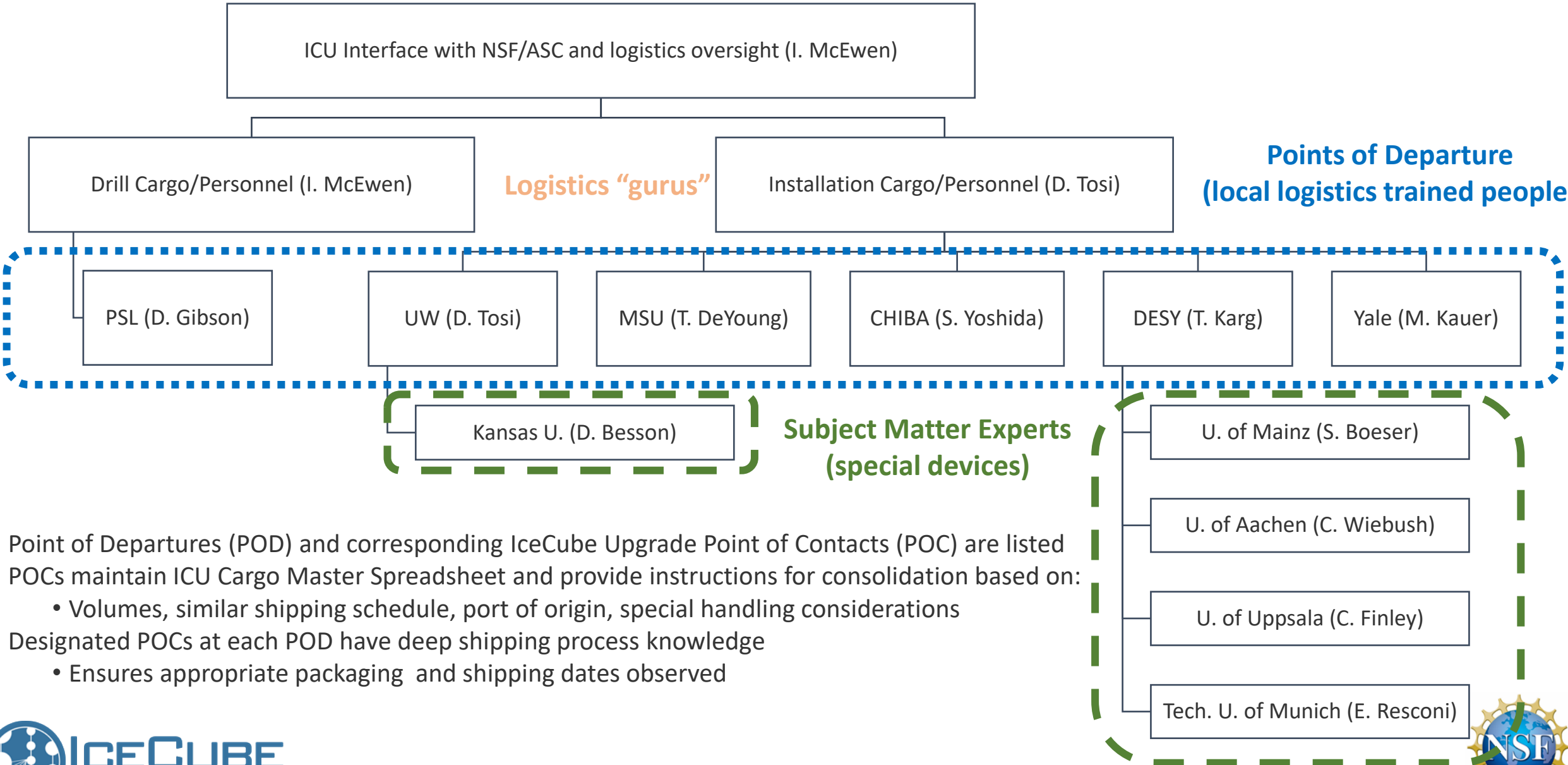
Upgrade Logistics Review
November 3-5, 2021



Overview

- Logistics Org Charts
- IceCube Upgrade cargo summary
- Cargo estimating methodology
 - Installation item example
 - Drill item example
- Population estimating methodology

Logistics support personnel in IceCube Upgrade



- Point of Departures (POD) and corresponding IceCube Upgrade Point of Contacts (POC) are listed
- POCs maintain ICU Cargo Master Spreadsheet and provide instructions for consolidation based on:
 - Volumes, similar shipping schedule, port of origin, special handling considerations
- Designated POCs at each POD have deep shipping process knowledge
 - Ensures appropriate packaging and shipping dates observed



Cargo distribution by leg and field season

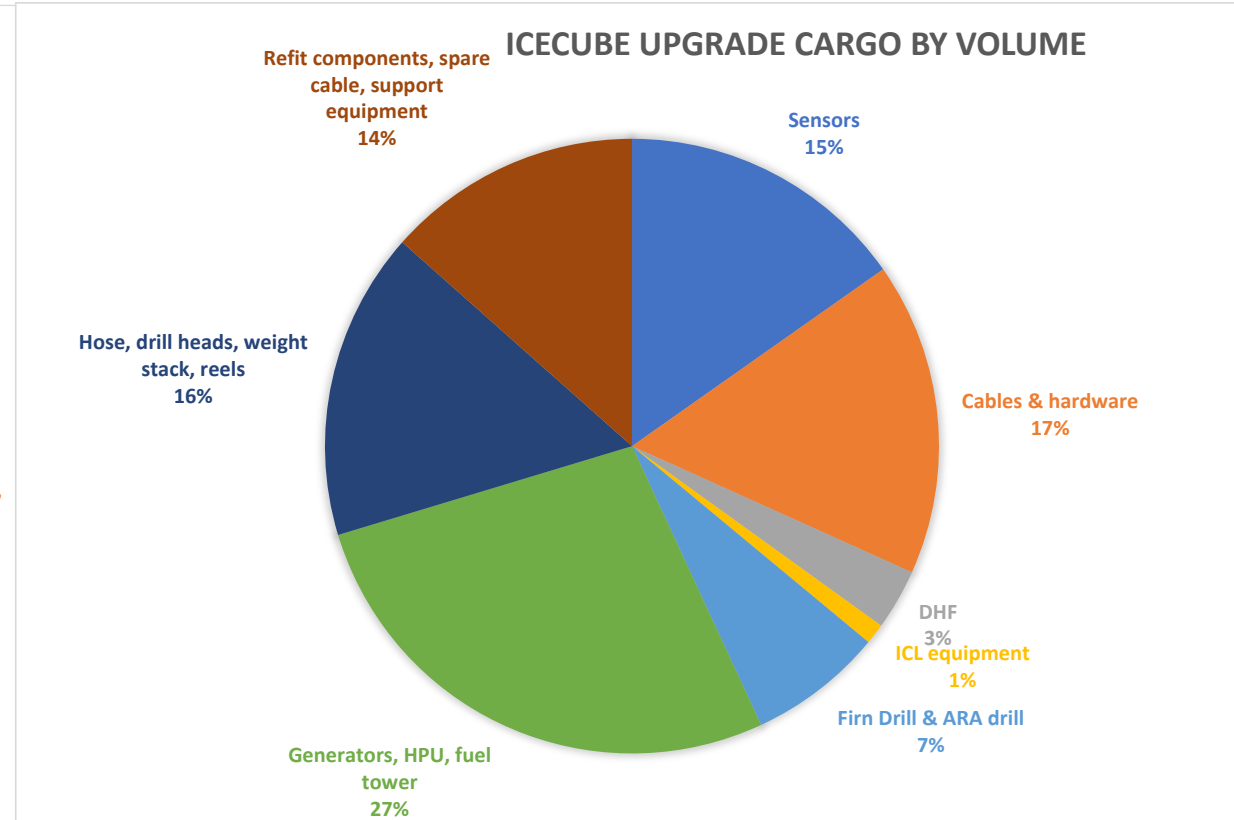
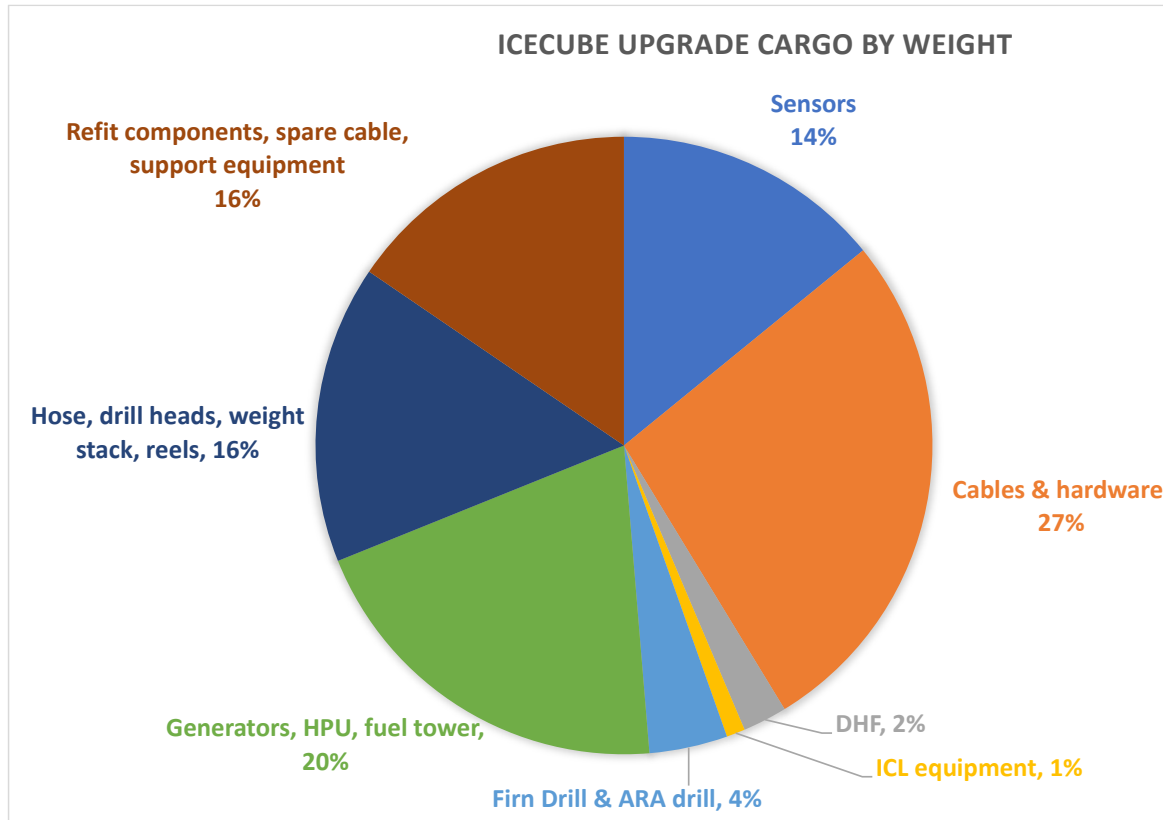
| Intercontinental leg | volume [cu ft] | fraction of volume | weight [lbs] | fraction of weight |
|----------------------------|-------------------|-----------------------|-----------------|-----------------------|
| FY22 intercontinental | 7,247 | 24% | 73,515 | 19% |
| FS1 intercontinental | 9,242 | 31% | 86,857 | 22% |
| FS2 intercontinental | 9,100 | 30% | 179,370 | 45% |
| FS3 intercontinental | 4,445 | 15% | 56,049 | 14% |
| Total | 30,034 | 100% | 395,791 | 100% |
| In McMurdo | 9,962 | | 121,001 | |
| Total cargo project | 39,996 | | 516,792 | |

| Intracontinental leg | volume [cu ft] | fraction of volume | weight [lbs] | fraction of weight |
|----------------------|-------------------|-----------------------|-----------------|-----------------------|
| FS1 intracontinental | 10,687 | 27% | 125,768 | 24% |
| FS2 intracontinental | 20,451 | 51% | 219,613 | 42% |
| FS3 intracontinental | 8,858 | 22% | 171,411 | 33% |
| Total | 39,996 | 100% | 516,792 | 100% |

Cargo distribution by weight and by volume

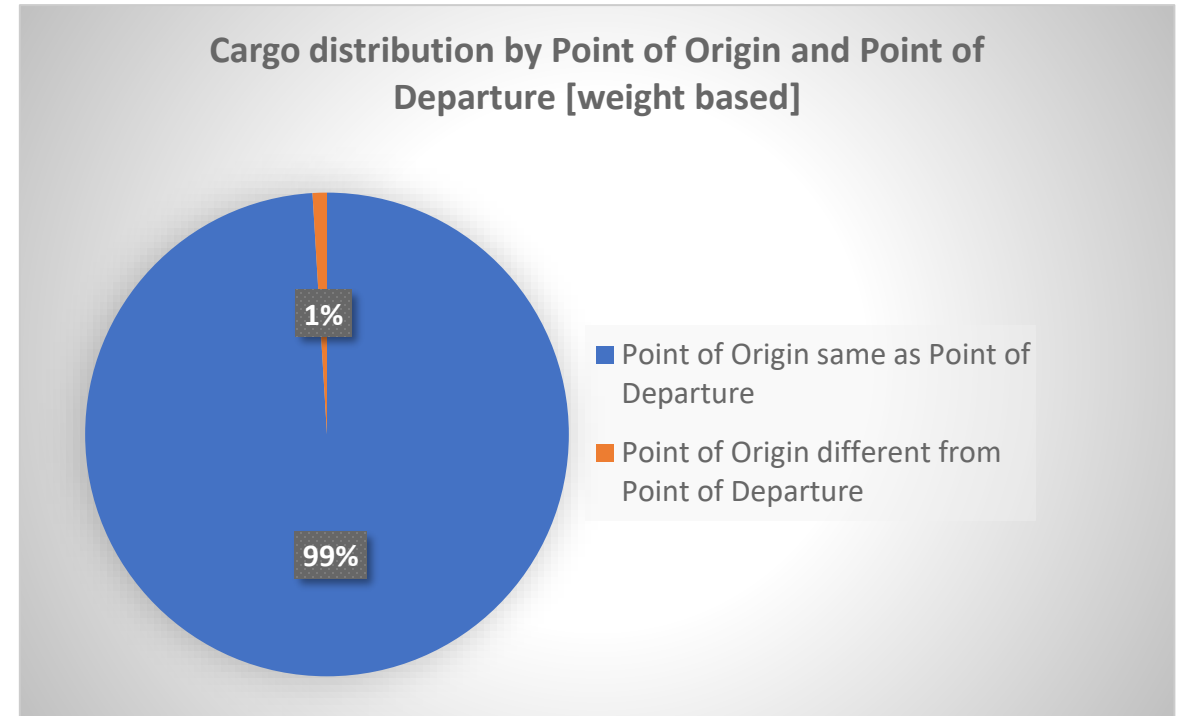
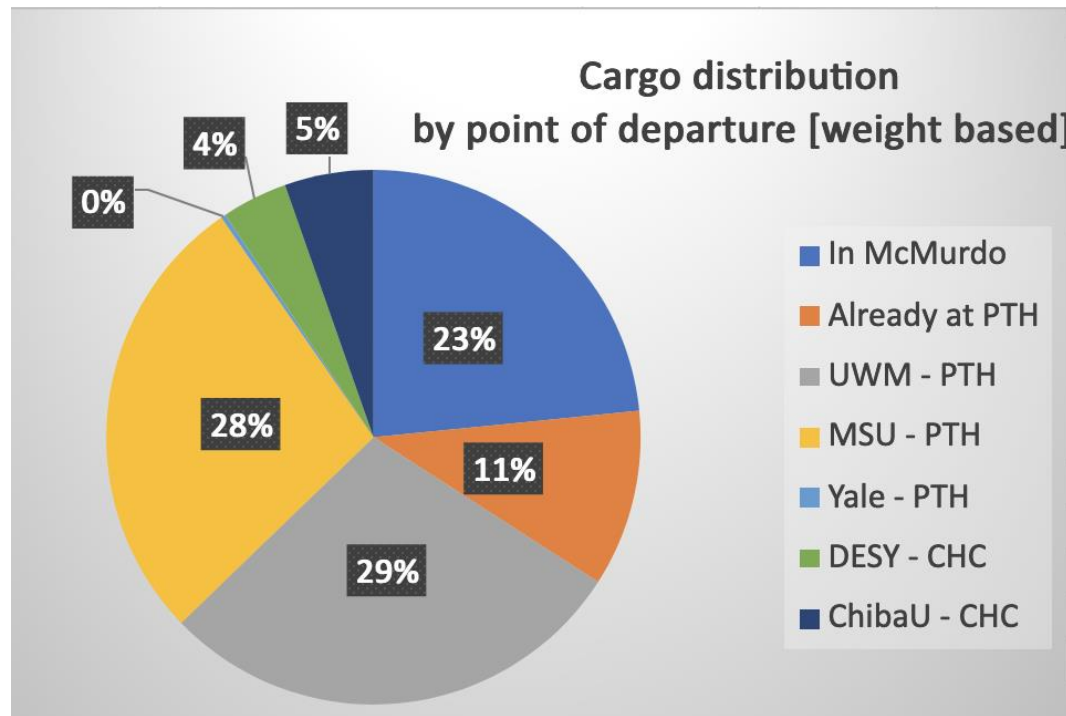
55% drill, 45% installation

64% drill, 36% installation



Cargo distribution by point of departure

- Cargo coming or located in several locations, but 99% is shipped from its origin.
- 4 major points of departures



Cargo planning

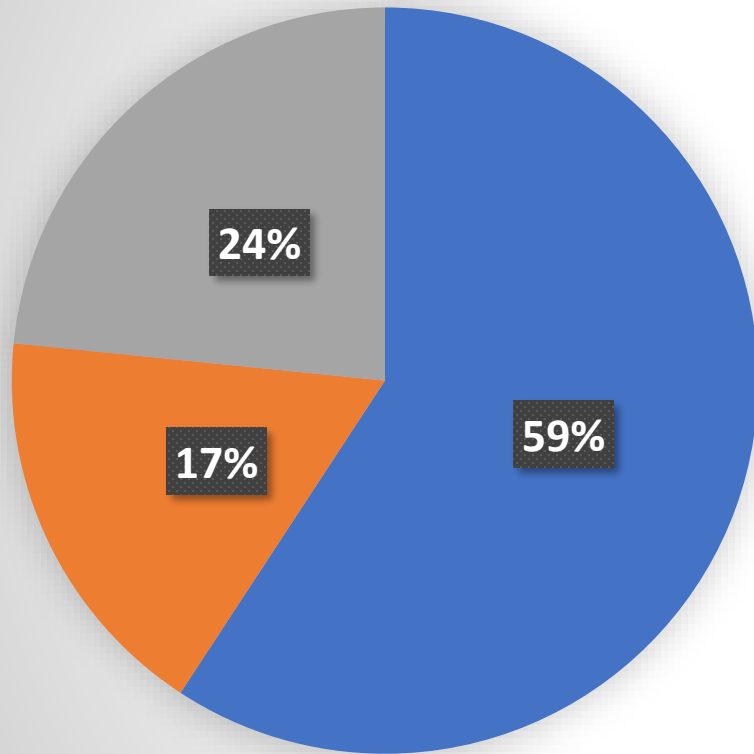
- ICU cargo planning follows the processes and procedures detailed in the USAP Packing and Shipping Manual, TL-MAN-0002
- The seasonal shipments weights and cubes are coordinated with NSF and the USAP contractor and are included in the Support Information Package (SIP)
- Every shipment is accompanied by a USAP Proforma (TL-FRM-0005) and it is entered in the cargo tracking system by the USAP contractor
- No float is added to the ROS date to ensure transparencies on our cargo needs which are determined by activities on the schedule
- Float is added to the leg of the shipment from its point of departure to a USAP cargo entry site (Port Hueneme, CA or Christchurch, NZ)
- To mitigate any potential conflicts (i.e. warehousing) at USAP cargo entry sites, delivery dates are confirmed with the USAP contractor in the same calendar year

Weight and Volume Basis of Estimate

- “Actual”: item exists and weight is known from historical records or can be measured
 - Drill hose
 - mDOMs, D-Eggs
- “Preliminary”: partial design or build, weight is calculated from vendor specs
 - IDP Deep Logging winch for dust logging: loan has not been approved yet
 - Main cable: final design pending load testing
- “Estimated”: expert guess based on similar items
 - Special devices: preliminary design not complete
 - Containers containing a multitude of smaller shipments/items

As shipments move from “estimated” to “preliminary” and to “actual” numbers are updated in the cargo spreadsheet

Cargo distribution by Basis of Estimate



■ actual ■ estimated ■ preliminary

Questions?



Installation cargo example

Shipping date and transportation path for mDOMs strings 87-88

Items departing outside CONUS

**String 87-88
mDOMs
(DESY)**

Date needed at NPX

Define ROS date based on acquisition calendar

Can the item be stored at temperatures lower than -40C?

Space in MCM?

Will item make RDD for USAP Vessel?

Space at NPX?

Adjust production schedule?

Deliver item to CHC by USAP vessel RDD
CHC-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

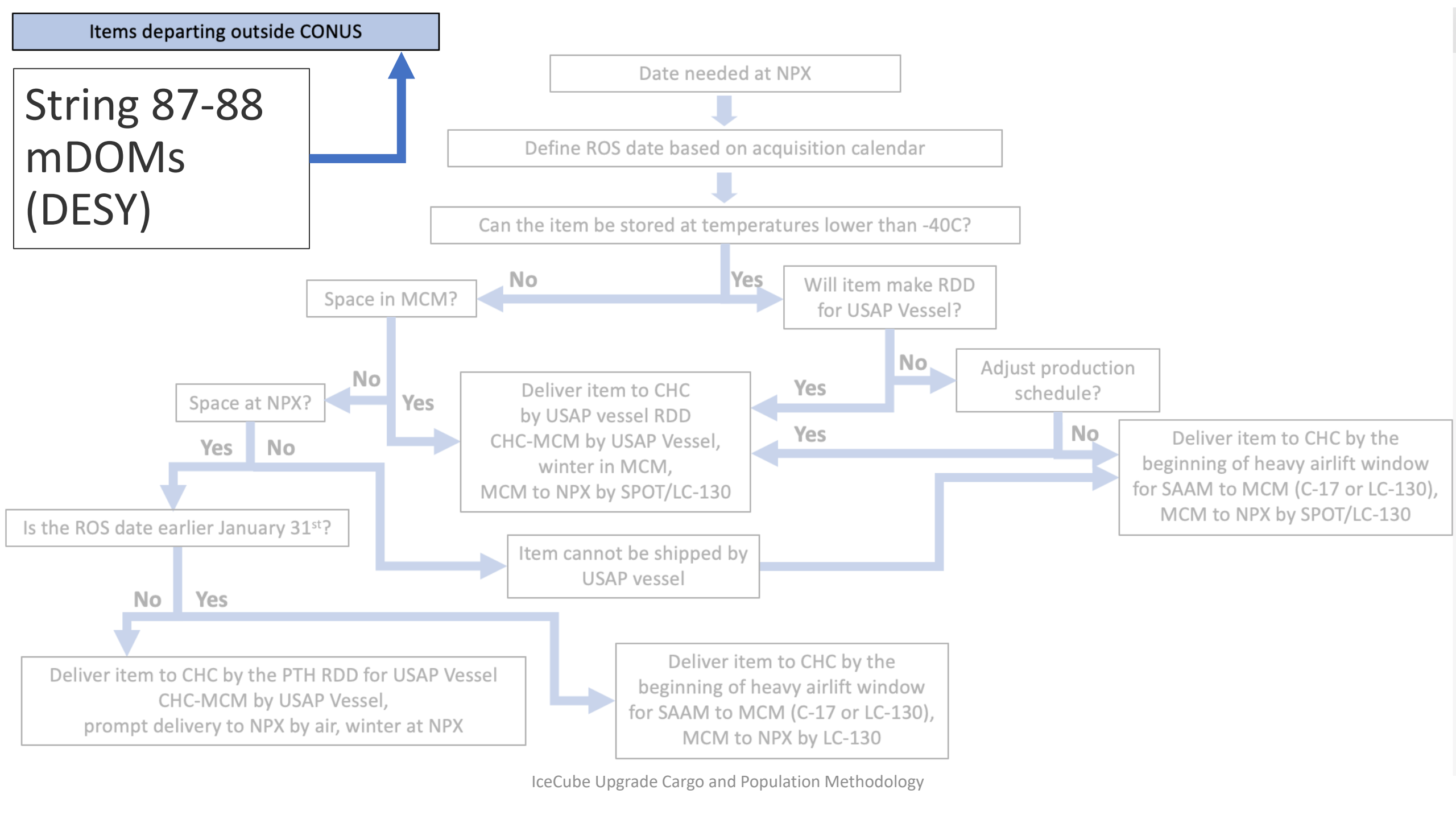
Deliver item to CHC by the beginning of heavy airlift window for SAAM to MCM (C-17 or LC-130), MCM to NPX by SPOT/LC-130

Is the ROS date earlier January 31st?

Item cannot be shipped by USAP vessel

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the beginning of heavy airlift window for SAAM to MCM (C-17 or LC-130), MCM to NPX by LC-130



Items departing outside CONUS

String 87-88
mDOMs
(DESY)

Date needed at NPX

Define ROS date based on acquisition calendar

Can the item be stored at temperatures lower than -40C?

Space in MCM?

No

Yes

Will item make RDD
for USAP Vessel?

Space at NPX?

No

Yes

Yes

No

Adjust production
schedule?

Is the ROS date earlier January 31st?

Yes

No

Yes

No

Deliver item to CHC
by USAP vessel RDD
CHC-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by SPOT/LC-130

Item cannot be shipped by
USAP vessel

No

Yes

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by LC-130

Logistics methodology – mDOMs strings 87-88

| | | | | | | | | | | | | | | | | |
|-----|----------------|---|-------------|----------------|---|---|--|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|------|----------|----------|----|----|
| 1.2 | 1.2.8.6.4 | Cargo | Not Started | 1.2.8.6.4 | P | 5 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 318d | 11/15/22 | 02/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.1 | Early Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.1 | P | 6 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 262d | 11/15/22 | 11/15/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.1.1 | TBD MTLs Arrive NPX | Not Started | 1.2.8.6.4.1.1 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 11/10/23 | 11/10/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.1.3 | 8' Resupply Container Arrives - NPX | Not Started | 1.2.8.6.4.1.3 | C | 7 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/22 | 11/15/22 | 0% | 0% |
| 1.2 | 1.2.8.6.4.1.4 | Refit Component Crate Arrives - NPX | Not Started | 1.2.8.6.4.1.4 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/23 | 11/15/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.1.5 | Cargo Arrival: Computers, Motor Drives, All Hardware | Not Started | 1.2.8.6.4.1.5 | C | 7 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/23 | 11/15/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2 | Mid-Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.2 | P | 6 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 22d | 12/01/23 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.1 | Installation Materials Weights & SPAT Equipment Arrives - NPX | Not Started | 1.2.8.6.4.2.1 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.2 | UNL HPU Arrives - NPX | Not Started | 1.2.8.6.4.2.2 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.3 | Drill Cables (Main Cable and Return) Reels Arrive - NPX | Not Started | 1.2.8.6.4.2.3 | C | 7 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.4 | Camp Hose Arrives - NPX | Not Started | 1.2.8.6.4.2.4 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.5 | Filtration Components: Arrive NPX | Not Started | 1.2.8.6.4.2.5 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.6 | Drill Hose Arrives - NPX (DNDF) | Not Started | 1.2.8.6.4.2.6 | C | 7 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.7 | Weightstacks, Misc Crates Arrive - NPX | Not Started | 1.2.8.6.4.2.7 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/15/23 | 12/15/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.8 | GEN hoods Arrive - NPX | Not Started | 1.2.8.6.4.2.8 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.9 | TU-20 shaft Arrive - NPX | Not Started | 1.2.8.6.4.2.9 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.10 | Surface Cable Arrives, SJB, FieldHub electronics, ICL hardware - NPX | Not Started | 1.2.8.6.4.2.10 | C | 7 | | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.2.11 | DOM Handling Facility Arrives - NPX | Not Started | 1.2.8.6.4.2.11 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/15/23 | 12/15/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.3 | SPOT Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.3 | P | 6 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.3.1 | GEN-1 Arrives - NPX | Not Started | 1.2.8.6.4.3.1 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4 | END-Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.4 | P | 6 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14d | 01/15/24 | 02/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.1 | TBD MTLs Arrive - NPX | Not Started | 1.2.8.6.4.4.1 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.2 | Drill Heads Arrive - NPX (Store in ICL) | Not Started | 1.2.8.6.4.4.2 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 02/01/24 | 02/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.3 | Sensor delivery (Strings 87-88) Arrives - NPX | Not Started | 1.2.8.6.4.4.3 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 01/15/24 | 01/15/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.4 | Installation Hardware (all 7 strings) and Breakout cables Arrives fro str. 87 and 88- NPX | Not Started | 1.2.8.6.4.4.4 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8d | 01/20/24 | 01/30/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.5 | Pressure sensors (7) Arrives - NPX | Not Started | 1.2.8.6.4.4.5 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.4.6 | Combo & Drill Cables Arrive - NPX | Not Started | 1.2.8.6.4.4.6 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 02/01/24 | 02/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.5 | MCM Cargo Arrivals | Not Started | 1.2.8.6.4.5 | P | 6 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2 | 1.2.8.6.4.5.1 | Downhole cables (7) Arrive - MCM | Not Started | 1.2.8.6.4.5.1 | C | 7 | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |

Items departing outside CONUS

String 87-88
mDOMs
(DESY)

Date needed at NPX

01/15/FS2 on schedule

Define ROS date based on acquisition calendar

Can the item be stored at temperatures lower than -40C?

Space in MCM?

No

Yes

Will item make RDD
for USAP Vessel?

Space at NPX?

No

Yes

Yes

No

Adjust production
schedule?

Is the ROS date earlier January 31st?

Yes

No

Yes

No

Item cannot be shipped by
USAP vessel

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by SPOT/LC-130

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
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mDOMs
(DESY)

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Space at NPX?

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Deliver item to CHC
by USAP vessel RDD
CHC-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Yes

No

Adjust production
schedule?

Yes

No

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by SPOT/LC-130

Is the ROS date earlier January 31st?

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USAP vessel

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prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by LC-130

How to use the ASC Continental Area Acquisition Schedule

Continental Area Acquisition Schedule
Version 13, March 2021

Antarctic Support Contract Continental Area Acquisition Schedule for FY22

TL-FRM-0049
Last Reviewed: March 2021

| | | Julian Required On Site (ROS) Date | McMurdo- Calendar Required On Site (ROS) Date | South Pole- Calendar Required On Site (ROS) Date | Maximo Purchase Request Submittal Deadline | Required Delivery Date To PT Hueneme | NOTES | |
|--|--|------------------------------------|---|--|--|--------------------------------------|-----------|-----|
| Heavy Airlift (SAAM) | Start of MCM Heavy Airlift | CONTINENTAL OR CONUS, N O POLE | 1282 | 09/Oct/21 | N/A | 07/Jul/21 | 18/Aug/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1289 | 16/Oct/21 | N/A | 14/Jul/21 | 25/Aug/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1296 | 23/Oct/21 | N/A | 21/Jul/21 | 01/Sep/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1303 | 30/Oct/21 | N/A | 28/Jul/21 | 08/Sep/21 | 1 |
| | South Pole/Field Sites open | CONTINENTAL OR CONUS | 1310 | 06/Nov/21 | 06/Nov/21 | 04/Aug/21 | 15/Sep/21 | 2,3 |
| Heavy Airlift Gap: LC130 service only on CHC/MCM route with limit cargo capacity | Heavy Airlift Gap Period | CONTINENTAL OR CONUS | 1317 | 13/Nov/21 | 13/Nov/21 | 11/Aug/21 | 22/Sep/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1324 | 20/Nov/21 | 20/Nov/21 | 18/Aug/21 | 29/Sep/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1331 | 27/Nov/21 | 27/Nov/21 | 25/Aug/21 | 06/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1338 | 04/Dec/21 | 04/Dec/21 | 01/Sep/21 | 13/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1345 | 11/Dec/21 | 11/Dec/21 | 08/Sep/21 | 20/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1352 | 18/Dec/21 | 18/Dec/21 | 15/Sep/21 | 27/Oct/21 | 2,3 |
| Heavy Airlift (SAAM) | AIRLIFT BLACKOUT PERIOD <<<<<NO SCHEDULED USAP AIRLIFT IN THIS PERIOD>>>>> | CONUS ONLY- AIRLIFT GAP | 1359 | N/A | N/A | 27/Oct/21 | 08/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2001 | N/A | N/A | 03/Nov/21 | 15/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2008 | N/A | N/A | 10/Nov/21 | 22/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2015 | N/A | N/A | 17/Nov/21 | 29/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2022 | N/A | N/A | 24/Nov/21 | 05/Jan/22 | 4 |
| | | CONTINENTAL OR CONUS | 2029 | 29/Jan/22 | 29/Jan/22 | 27/Oct/21 | 08/Dec/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 2036 | 05/Feb/22 | 05/Feb/22 | 03/Nov/21 | 15/Dec/21 | 2,3 |
| | Start of South Pole winter | CONTINENTAL OR CONUS | 2043 | 12/Feb/22 | 12/Feb/22 | 10/Nov/21 | 22/Dec/21 | 2 |
| | | CONTINENTAL OR CONUS, N O POLE | 2050 | 19/Feb/22 | N/A | 17/Nov/21 | 29/Dec/21 | 1 |
| | Final Summer airlift to McMurdo | CONTINENTAL OR CONUS, N O POLE | 2057 | 26/Feb/22 | N/A | 24/Nov/21 | 05/Jan/22 | 1 |
| McMurdo winter flight #1 | CONTINENTAL OR CONUS, N O POLE | 2232 | 20/Aug/22 | N/A | 18/May/22 | 29/Jun/22 | 1 | |
| Resupply Vessel | | Julian Required On Site (ROS) Date | McMurdo- Calendar Required On Site (ROS) Date | South Pole- Calendar Required On Site (ROS) Date | Maximo Purchase Request Submittal Deadline | Required Delivery Date To PT Hueneme | | |
| MCM/SP - VESSEL- TIER 1- LIFE/HEALTH/SAFETY | | 2121 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |
| MCM/SP - VESSEL- TIER 2- CRITICAL | | 2122 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |
| MCM/SP - VESSEL - TIER 3- ESSENTIAL | | 2123 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |

1. South Pole required date for strings 87-88 sensors (from 7yr schedule): 25-Jan (2024)
Date is in the airlift black out period

2. South Pole ROS date: the closest listed that allows the cargo to meet the desired date: 18-Dec

3. Julian ROS date: 1352 (goes on label)



Items departing outside CONUS

String 87-88
mDOMs
(DESY)

Date needed at NPX

01/15/FS2 on schedule

Define ROS date based on acquisition calendar

ROS: 12/18/FS2

Can the item be stored at temperatures lower than -40C?

Space in MCM?

Will item make RDD
for USAP Vessel?

Space at NPX?

Adjust production
schedule?

Deliver item to CHC
by USAP vessel RDD
CHC-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by SPOT/LC-130

Is the ROS date earlier January 31st?

Item cannot be shipped by
USAP vessel

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the
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MCM to NPX by LC-130

Items departing outside CONUS

String 87-88
mDOMs
(DESY)

Date needed at NPX

01/15/FS2 on schedule

Define ROS date based on acquisition calendar

ROS: 12/18/FS2

Can the item be stored at temperatures lower than -40C?

Space in MCM?

No

Yes

Will item make RDD for USAP Vessel?

Space at NPX?

No

Yes

No

Adjust production schedule?

Yes

Yes

No

Deliver item to CHC by the beginning of heavy airlift window for SAAM to MCM (C-17 or LC-130), MCM to NPX by SPOT/LC-130

Deliver item to CHC by USAP vessel RDD
CHC-MCM by USAP Vessel, winter in MCM, MCM to NPX by SPOT/LC-130

Is the ROS date earlier January 31st?

Yes

No

Item cannot be shipped by USAP vessel

No

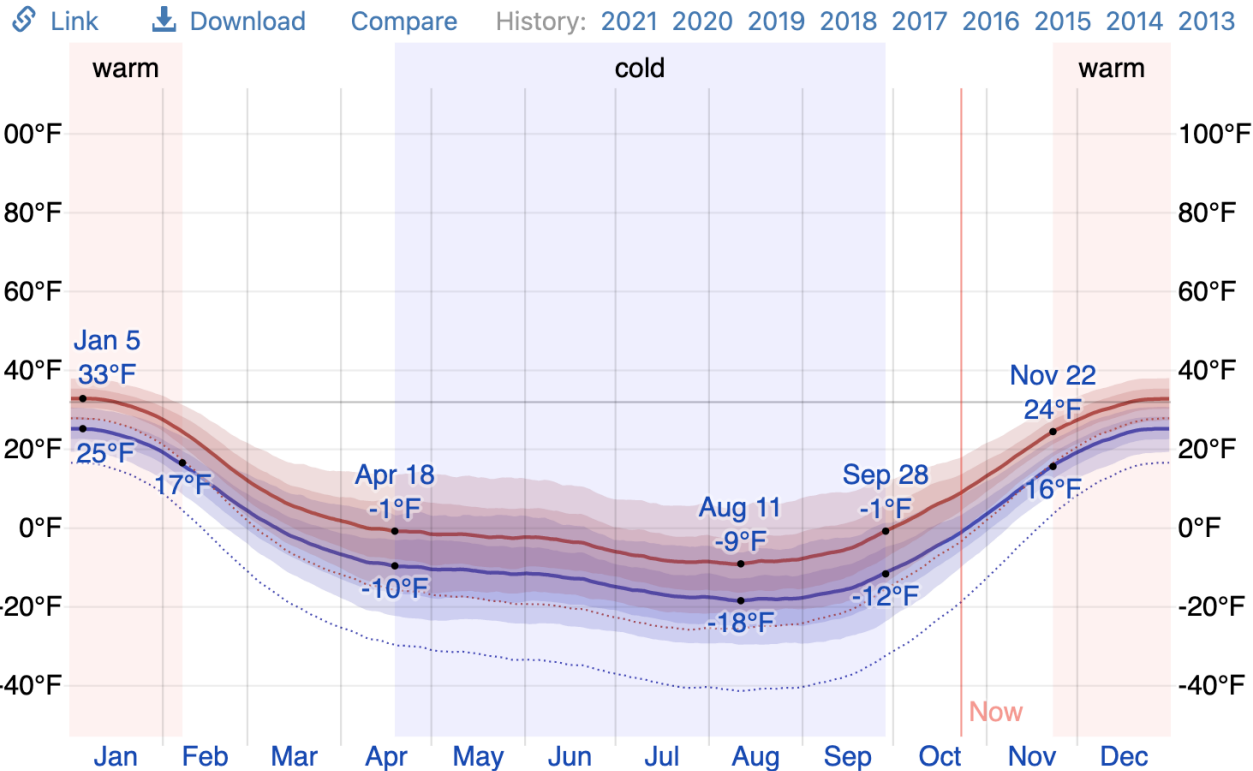
Yes

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel, prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the beginning of heavy airlift window for SAAM to MCM (C-17 or LC-130), MCM to NPX by LC-130

McMurdo winter temperatures

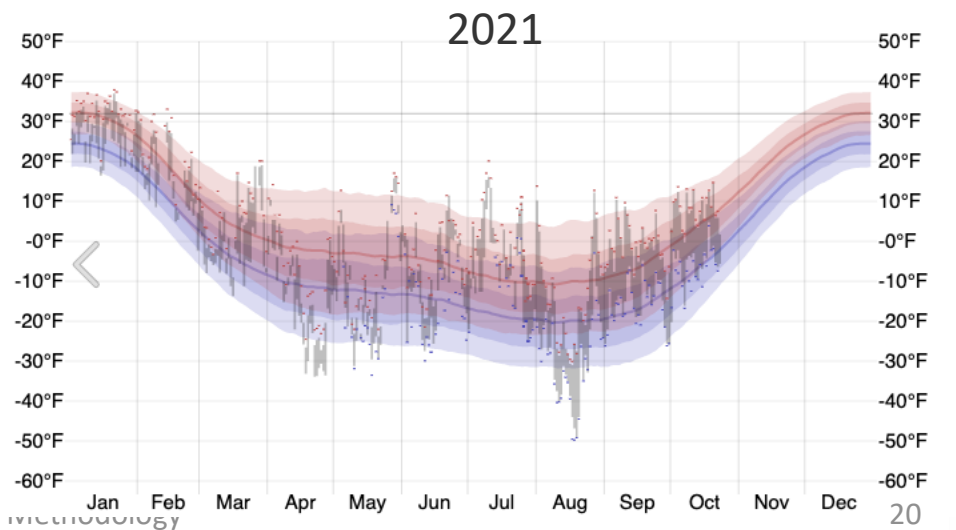
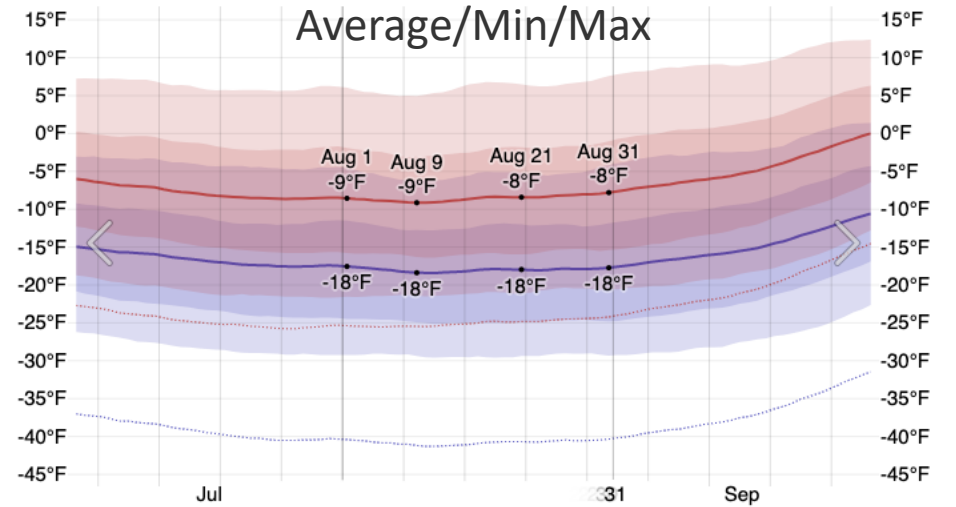
Average High and Low Temperature in McMurdo Station



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

| Average | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---------|------|------|------|------|-------|-------|-------|-------|-------|------|------|------|
| High | 31°F | 20°F | 6°F | -0°F | -2°F | -4°F | -8°F | -9°F | -4°F | 7°F | 21°F | 31°F |
| Temp. | 28°F | 16°F | 1°F | -5°F | -7°F | -8°F | -13°F | -13°F | -11°F | 1°F | 17°F | 28°F |
| Low | 23°F | 12°F | -2°F | -9°F | -11°F | -13°F | -17°F | -18°F | -15°F | -4°F | 12°F | 24°F |

@WeatherSpark



ation.met.no/1006067



Items departing outside CONUS

String 87-88
mDOMs
(DESY)

Date needed at NPX

01/15/FS2 on schedule

Define ROS date based on acquisition calendar

ROS: 12/18/FS2

Can the item be stored at temperatures lower than -40C?

Space in MCM?

No

Yes

Will item make RDD
for USAP Vessel?

Space at NPX?

No

Yes

Yes

No

Adjust production
schedule?

Yes

No

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by SPOT/LC-130

Deliver item to CHC
by USAP vessel RDD
CHC-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Is the ROS date earlier January 31st?

Yes

No

Item cannot be shipped by
USAP vessel

No

Yes

Deliver item to CHC by the PTH RDD for USAP Vessel
CHC-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to CHC by the
beginning of heavy airlift window
for SAAM to MCM (C-17 or LC-130),
MCM to NPX by LC-130

How to use the ASC Continental Area Acquisition Schedule

Continental Area Acquisition Schedule
Version 13, March 2021

Antarctic Support Contract Continental Area Acquisition Schedule for FY22

TL-FRM-0049
Last Reviewed: March 2021

| | | Julian Required On Site (ROS) Date | McMurdo- Calendar Required On Site (ROS) Date | South Pole- Calendar Required On Site (ROS) Date | Maximo Purchase Request Submittal Deadline | Required Delivery Date To PT Hueneme | NOTES |
|--|--|------------------------------------|---|--|--|--------------------------------------|-------|
| Heavy Airlift (SAAM) | Start of MCM Heavy Airlift | 1282 | 09/Oct/21 | N/A | 07/Jul/21 | 18/Aug/21 | 1 |
| | CONTINENTAL OR CONUS, N O POLE | 1289 | 16/Oct/21 | N/A | 14/Jul/21 | 25/Aug/21 | 1 |
| | CONTINENTAL OR CONUS, N O POLE | 1296 | 23/Oct/21 | N/A | 21/Jul/21 | 01/Sep/21 | 1 |
| | CONTINENTAL OR CONUS, N O POLE | 1303 | 30/Oct/21 | N/A | 28/Jul/21 | 08/Sep/21 | 1 |
| | South Pole/Field Sites open | 1310 | 06/Nov/21 | 06/Nov/21 | 04/Aug/21 | 15/Sep/21 | 2,3 |
| Heavy Airlift Gap: LC130 service only on CHC/MCM route with limit cargo capacity | Heavy Airlift Gap Period | 1317 | 13/Nov/21 | 13/Nov/21 | 11/Aug/21 | 22/Sep/21 | 2,3 |
| | CONTINENTAL OR CONUS | 1324 | 20/Nov/21 | 20/Nov/21 | 18/Aug/21 | 29/Sep/21 | 2,3 |
| | CONTINENTAL OR CONUS | 1331 | 27/Nov/21 | 27/Nov/21 | 25/Aug/21 | 06/Oct/21 | 2,3 |
| | CONTINENTAL OR CONUS | 1338 | 04/Dec/21 | 04/Dec/21 | 01/Sep/21 | 13/Oct/21 | 2,3 |
| | CONTINENTAL OR CONUS | 1345 | 11/Dec/21 | 11/Dec/21 | 08/Sep/21 | 20/Oct/21 | 2,3 |
| Heavy Airlift (SAAM) | AIRLIFT BLACKOUT PERIOD <<<<<NO SCHEDULED USAP AIRLIFT IN THIS PERIOD>>>>> | 1352 | 18/Dec/21 | 18/Dec/21 | 15/Sep/21 | 27/Oct/21 | 2,3 |
| | CONUS ONLY- AIRLIFT GAP | 1359 | N/A | N/A | 27/Oct/21 | 08/Dec/21 | 4 |
| | CONUS ONLY- AIRLIFT GAP | 2001 | N/A | N/A | 03/Nov/21 | 15/Dec/21 | 4 |
| | CONUS ONLY- AIRLIFT GAP | 2008 | N/A | N/A | 10/Nov/21 | 22/Dec/21 | 4 |
| | CONUS ONLY- AIRLIFT GAP | 2015 | N/A | N/A | 17/Nov/21 | 29/Dec/21 | 4 |
| | CONUS ONLY- AIRLIFT GAP | 2022 | N/A | N/A | 27/Nov/21 | 05/Jan/22 | 4 |
| | CONTINENTAL OR CONUS | 2029 | 29/Jan/22 | 29/Jan/22 | 27/Oct/21 | 08/Dec/21 | 2,3 |
| CONTINENTAL OR CONUS | 2036 | 05/Feb/22 | 05/Feb/22 | 03/Nov/21 | 15/Dec/21 | 2,3 | |
| Start of South Pole winter | CONTINENTAL OR CONUS | 2043 | 12/Feb/22 | 12/Feb/22 | 10/Nov/21 | 22/Dec/21 | 2 |
| Final Summer airlift to McMurdo | CONTINENTAL OR CONUS, N O POLE | 2050 | 19/Feb/22 | N/A | 17/Nov/21 | 29/Dec/21 | 1 |
| | CONTINENTAL OR CONUS, N O POLE | 2057 | 27/Feb/22 | N/A | 24/Nov/21 | 06/Jan/22 | 1 |
| McMurdo winter flight #1 | CONTINENTAL OR CONUS, N O POLE | 2232 | 20/Aug/22 | N/A | 18/May/22 | 29/Jun/22 | 1 |
| Resupply Vessel | | | | | | | |
| MCM/SP - VESSEL- TIER 1- LIFE/HEALTH/SAFETY | 2121 | 29-Jan-22 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 |
| MCM/SP - VESSEL- TIER 2- CRITICAL | 2122 | 29-Jan-22 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 |
| MCM/SP - VESSEL- TIER 3- ESSENTIAL | 2123 | 29-Jan-22 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 |

1. South Pole required date for strings 87-88 sensors (from 7yr schedule): 25-Jan (2024)
Date is in the airlift black out period

2. South Pole ROS date: the closest listed that allows the cargo to meet the desired date: 18-Dec

3. Julian ROS date: 1352 (goes on label)

4. Required Delivery Date RDD to PTH for ROS date → use the same date for CHC arrival

5. ROS date is in Heavy Airlift Gap period

6. Date at PTH or CHC to be used as target in early planning to guarantee cargo delivery in time for the beginning of the heavy airlift time window

For international shipments we would cross check the specific "RDD to CHC" with the USAP contractor and add float



Item line in ICU cargo master spreadsheet

- SEA FREIGHT: Route: Hamburg - Singapore / Port Klang - Auckland -
- Transit time approx. 50-60 days port - port

| Cargo Item respective WBS Level | Work Package | Item Description | Contents & Comments | Date of expected or <i>actual</i> completion | Expected Route: Owner - PTH or CHC | Date of expected or <i>actual</i> shipment |
|---------------------------------|--------------|----------------------|--|--|------------------------------------|--|
| 1.3 | Installation | String Sensors 87-88 | Optical sensors for 2 strings from Germany (mDOMs) (spares included) - Do Not Deep Freeze | 4/1/2023 | DESY - CHC | 8/1/2023 |

Expected completion date (from production schedule)

Shipping date of August 1st has mDOMs arriving in CHC by October 1st, before the start of the heavy airlift window



Questions?



Drill Hose Example

Shipping date and transportation path for drill hose

Items departing CONUS

Drill Supply Hose

Date needed at NPX

Define ROS date based on acquisition calendar

Can the item be stored at temperatures lower than -40C?

Space in MCM?

Will item make RDD
for USAP Vessel?

Space at NPX?

Deliver item to PTH
by USAP vessel RDD
PTH-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Adjust production
schedule?

Will item make PTH date
for COMSUR shipment?

Is the ROS date earlier January 31st?

Item cannot be shipped by
USAP vessel

Deliver item to PTH by
COMSUR RDD or earlier,
PTH-CHC via COMSUR,
CHC-MCM by air,
MCM-NPX by SPOT/LC-130

Adjust production
schedule?

Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to PTH by COMSUR RDD or earlier,
PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH.
PTH-CHC via COMAIR,
CHC-MCM by air,
MCM-NPX by LC-130

Items departing CONUS

Drill Supply Hose

Date needed at NPX

01/7 (FS2, or 2024 in 7 year schedule)

Define ROS date based on acquisition calendar

Can the item be stored at temperatures lower than -40C?

Space in MCM?

No

Yes

Will item make RDD
for USAP Vessel?

Space at NPX?

No

Yes

Deliver item to PTH
by USAP vessel RDD
PTH-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Yes

No

Adjust production
schedule?

Yes

No

Is the ROS date earlier January 31st?

No

Yes

Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Item cannot be shipped by
USAP vessel

Yes

No

Will item make PTH date
for COMSUR shipment?

Deliver item to PTH by
COMSUR RDD or earlier,
PTH-CHC via COMSUR,
CHC-MCM by air,
MCM-NPX by SPOT/LC-130

No

Adjust production
schedule?

Yes

Yes

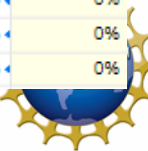
No

Deliver item to PTH by COMSUR RDD or earlier,
PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH.
PTH-CHC via COMAIR,
CHC-MCM by air,
MCM-NPX by LC-130

Logistics methodology - Drill Supply Hose

| | | | | | | | | | | | | | | | | | |
|-----|----------------|---|-------------|----------------|---|---|--|-------------------------------------|--|--|--|--|-----|----------|----------|----|----|
| 1.2 | 1.2.8.6.7 | EHWD: Final Upgrade & Replacement Work | Not Started | 1.2.8.6.7 | P | 5 | | <input checked="" type="checkbox"/> | | | | | 56d | 11/14/23 | 01/30/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.1 | Drill Control Center (DCC) | Not Started | 1.2.8.6.7.1 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 4d | 11/23/23 | 11/28/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.1.1 | Install Racks, Networks, Computers | Not Started | 1.2.8.6.7.1.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 4d | 11/23/23 | 11/28/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.2 | Main Heating Plants | Not Started | 1.2.8.6.7.2 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 10d | 11/17/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.2.1 | Final Upgrade & Replacement Activities | Not Started | 1.2.8.6.7.2.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/17/23 | 11/24/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.2.2 | Final Testing | Not Started | 1.2.8.6.7.2.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 5d | 11/24/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.3 | Pre Heat System | Not Started | 1.2.8.6.7.3 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 10d | 11/17/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.3.1 | Install Filters in H2O System | Not Started | 1.2.8.6.7.3.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 2d | 11/24/23 | 11/27/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.3.2 | Final Upgrade & Replacement Activities | Not Started | 1.2.8.6.7.3.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/17/23 | 11/24/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.3.3 | Final Testing | Not Started | 1.2.8.6.7.3.3 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 5d | 11/24/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.4 | Water Tanks & Handling Systems (VT & Submersible) | Not Started | 1.2.8.6.7.4 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 10d | 11/17/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.4.1 | Install Railing, Ladders, Pumps, Plumbing, Final Upgrades | Not Started | 1.2.8.6.7.4.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/17/23 | 11/24/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.4.2 | Integrate, Verify, Test | Not Started | 1.2.8.6.7.4.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 5d | 11/24/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.5 | HPP | Not Started | 1.2.8.6.7.5 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 10d | 11/17/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.5.1 | Final Upgrade & Replacement Activities | Not Started | 1.2.8.6.7.5.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/17/23 | 11/24/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.5.2 | Pump Testing | Not Started | 1.2.8.6.7.5.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 5d | 11/24/23 | 11/30/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.6 | Shops, MECC (SEW, TOW, OML) | Not Started | 1.2.8.6.7.6 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/14/23 | 11/21/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.6.1 | Final Upgrade/Retrofit Shops, MECC | Not Started | 1.2.8.6.7.6.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 6d | 11/14/23 | 11/21/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.7 | Main Supply Hose Reel (Big Red) | Not Started | 1.2.8.6.7.7 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 28d | 12/10/23 | 01/16/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.7.1 | Final Upgrades & Testing | Not Started | 1.2.8.6.7.7.1 | C | 7 | | <input type="checkbox"/> | | | | | 5d | 12/10/23 | 12/14/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.7.2 | Install Drill Hose on Reel | Not Started | 1.2.8.6.7.7.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 5d | 01/07/24 | 01/11/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.7.3 | Install Blankets, Connect to Power, Heating Control & Test | Not Started | 1.2.8.6.7.7.3 | C | 7 | | <input type="checkbox"/> | | | | | 3d | 01/12/24 | 01/16/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.8 | Winches & Reels | Not Started | 1.2.8.6.7.8 | P | 6 | | <input type="checkbox"/> | | | | | 12d | 12/15/23 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.8.1 | Winches and Reels Final Integration & Testing (TU-20, TU-15, RWCR, RWHR, MCR) | Not Started | 1.2.8.6.7.8.1 | C | 7 | | <input type="checkbox"/> | | | | | 12d | 12/15/23 | 01/01/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.9 | Fuel Storage and Delivery | Not Started | 1.2.8.6.7.9 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 4d | 11/25/23 | 11/29/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.9.1 | Fuel Tower: Commission - NPX | Not Started | 1.2.8.6.7.9.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 4d | 11/25/23 | 11/29/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.10 | TOS/Tower | Not Started | 1.2.8.6.7.10 | P | 6 | | <input type="checkbox"/> | | | | | 11d | 12/31/23 | 01/12/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.10.1 | TOS/Tower Equipment - Retrofit & Testing | Not Started | 1.2.8.6.7.10.1 | C | 7 | | <input type="checkbox"/> | | | | | 11d | 12/31/23 | 01/12/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11 | Computing & Controls | Not Started | 1.2.8.6.7.11 | P | 6 | | <input checked="" type="checkbox"/> | | | | | 45d | 11/22/23 | 01/23/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11.1 | Control Software: System Integration, Verification, Test - NPX | Not Started | 1.2.8.6.7.11.1 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 40d | 11/29/23 | 01/23/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11.2 | Motor Drives: Testing and Programming - NPX | Not Started | 1.2.8.6.7.11.2 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 20d | 11/29/23 | 12/26/23 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11.3 | Motor Drives: Install Retrofit Kits | Not Started | 1.2.8.6.7.11.3 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 45d | 11/22/23 | 01/23/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11.4 | Misc Controls Tasking | Not Started | 1.2.8.6.7.11.4 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 38d | 12/01/23 | 01/23/24 | 0% | 0% |
| 1.2 | 1.2.8.6.7.11.5 | Motor Drives: Conduit Wiring | Not Started | 1.2.8.6.7.11.5 | C | 7 | | <input checked="" type="checkbox"/> | | | | | 45d | 11/22/23 | 01/23/24 | 0% | 0% |



Logistics methodology – Drill Supply Hose

| | | | | | | | | | | | | | | | |
|----------------|---|-------------|----------------|---|---|--------------------------|-------------------------------------|--------------------------|-------------------------------------|-------------------------------------|------|----------|----------|----|----|
| 1.2.8.6.4 | ▾ Cargo | Not Started | 1.2.8.6.4 | P | 5 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 318d | 11/15/22 | 02/01/24 | 0% | 0% |
| 1.2.8.6.4.1 | ▾ Early Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.1 | P | 6 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 262d | 11/15/22 | 11/15/23 | 0% | 0% |
| 1.2.8.6.4.1.1 | TBD MTLs Arrive NPX | Not Started | 1.2.8.6.4.1.1 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 11/10/23 | 11/10/23 | 0% | 0% |
| 1.2.8.6.4.1.3 | 8' Resupply Container Arrives - NPX | Not Started | 1.2.8.6.4.1.3 | C | 7 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/22 | 11/15/22 | 0% | 0% |
| 1.2.8.6.4.1.4 | Refit Component Crate Arrives - NPX | Not Started | 1.2.8.6.4.1.4 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/23 | 11/15/23 | 0% | 0% |
| 1.2.8.6.4.1.5 | Cargo Arrival: Computers, Motor Drives, All Hardware | Not Started | 1.2.8.6.4.1.5 | C | 7 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 11/15/23 | 11/15/23 | 0% | 0% |
| 1.2.8.6.4.2 | ▾ Mid-Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.2 | P | 6 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 22d | 12/01/23 | 01/01/24 | 0% | 0% |
| 1.2.8.6.4.2.1 | Installation Materials Weights & SPAT Equipment Arrives - NPX | Not Started | 1.2.8.6.4.2.1 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.2 | UNL HPU Arrives - NPX | Not Started | 1.2.8.6.4.2.2 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2.8.6.4.2.3 | Drill Cables (Main Cable and Return) Reels Arrive - NPX | Not Started | 1.2.8.6.4.2.3 | C | 7 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.4 | Camp Hose Arrives - NPX | Not Started | 1.2.8.6.4.2.4 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.5 | Filtration Components: Arrive NPX | Not Started | 1.2.8.6.4.2.5 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.6 | Drill Hose Arrives - NPX (DNDF) | Not Started | 1.2.8.6.4.2.6 | C | 7 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2.8.6.4.2.7 | Weightstacks, Misc Crates Arrive - NPX | Not Started | 1.2.8.6.4.2.7 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/15/23 | 12/15/23 | 0% | 0% |
| 1.2.8.6.4.2.8 | GEN hoods Arrive - NPX | Not Started | 1.2.8.6.4.2.8 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 01/01/24 | 01/01/24 | 0% | 0% |
| 1.2.8.6.4.2.9 | TU-20 shaft Arrive - NPX | Not Started | 1.2.8.6.4.2.9 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.10 | Surface Cable Arrives, SJB, FieldHub electronics, ICL hardware - NPX | Not Started | 1.2.8.6.4.2.10 | C | 7 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.2.11 | DOM Handling Facility Arrives - NPX | Not Started | 1.2.8.6.4.2.11 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/15/23 | 12/15/23 | 0% | 0% |
| 1.2.8.6.4.3 | ▾ SPOT Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.3 | P | 6 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.3.1 | GEN-1 Arrives - NPX | Not Started | 1.2.8.6.4.3.1 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 1d | 12/01/23 | 12/01/23 | 0% | 0% |
| 1.2.8.6.4.4 | ▾ END-Season Support MTLs arrival at NPX | Not Started | 1.2.8.6.4.4 | P | 6 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 14d | 01/15/24 | 02/01/24 | 0% | 0% |
| 1.2.8.6.4.4.1 | TBD MTLs Arrive - NPX | Not Started | 1.2.8.6.4.4.1 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2.8.6.4.4.2 | Drill Heads Arrive - NPX (Store in ICL) | Not Started | 1.2.8.6.4.4.2 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 02/01/24 | 02/01/24 | 0% | 0% |
| 1.2.8.6.4.4.3 | Sensor delivery (Strings 87-88) Arrives - NPX | Not Started | 1.2.8.6.4.4.3 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 01/15/24 | 01/15/24 | 0% | 0% |
| 1.2.8.6.4.4.4 | Installation Hardware (all 7 strings) and Breakout cables Arrives fro str. 87 and 88- NPX | Not Started | 1.2.8.6.4.4.4 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 8d | 01/20/24 | 01/30/24 | 0% | 0% |
| 1.2.8.6.4.4.5 | Pressure sensors (7) Arrives - NPX | Not Started | 1.2.8.6.4.4.5 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2.8.6.4.4.6 | Combo & Drill Cables Arrive - NPX | Not Started | 1.2.8.6.4.4.6 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1d | 02/01/24 | 02/01/24 | 0% | 0% |
| 1.2.8.6.4.5 | ▾ MCM Cargo Arrivals | Not Started | 1.2.8.6.4.5 | P | 6 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2.8.6.4.5.1 | Downhole cables (7) Arrive - MCM | Not Started | 1.2.8.6.4.5.1 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |
| 1.2.8.6.4.5.2 | Installation Hardware Arrives - MCM | Not Started | 1.2.8.6.4.5.2 | C | 7 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 13d | 01/15/24 | 01/31/24 | 0% | 0% |

Items departing CONUS

Drill Supply Hose

Date needed at NPX

01/7 (FS2, or 2024 in 7 year schedule)

Define ROS date based on acquisition calendar

12/18 (FS2, or 2023 in 7-year schedule) is the last date available to avoid the Airlift Blackout. Choosing this date would exclude SPoT 2 overland transport, however. Communicate actual date requirement to T&L Representative

Can the item be stored at temperatures lower than -40C?

Space in MCM?

Will item make RDD for USAP Vessel?

Space at NPX?

Adjust production schedule?

Deliver item to PTH by USAP vessel RDD
PTH-MCM by USAP Vessel, winter in MCM, MCM to NPX by SPOT/LC-130

Will item make PTH date for COMSUR shipment?

Adjust production schedule?

Is the ROS date earlier January 31st?

Item cannot be shipped by USAP vessel

Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by SPOT/LC-130

Adjust production schedule?

Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel, prompt delivery to NPX by air, winter at NPX

Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH. PTH-CHC via COMAIR, CHC-MCM by air, MCM-NPX by LC-130

| | | Julian Required On Site (ROS) Date | McMurdo- Calendar Required On Site (ROS) Date | South Pole- Calendar Required On Site (ROS) Date | Maximo Purchase Request Submittal Deadline | Required Delivery Date To PT Hueneme | NOTES | |
|---|---|------------------------------------|---|--|--|--------------------------------------|-----------|-----|
| Heavy Airlift (SAAM) | Start of MCM Heavy Airlift | CONTINENTAL OR CONUS, N O POLE | 1282 | 09/Oct/21 | N/A | 07/Jul/21 | 18/Aug/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1289 | 16/Oct/21 | N/A | 14/Jul/21 | 25/Aug/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1296 | 23/Oct/21 | N/A | 21/Jul/21 | 01/Sep/21 | 1 |
| | | CONTINENTAL OR CONUS, N O POLE | 1303 | 30/Oct/21 | N/A | 28/Jul/21 | 08/Sep/21 | 1 |
| | South Pole/Field Sites open | CONTINENTAL OR CONUS | 1310 | 06/Nov/21 | 06/Nov/21 | 04/Aug/21 | 15/Sep/21 | 2,3 |
| Heavy Airlift Gap: LC130 service only on CHC/MCM route with limit cargo capacity | Heavy Airlift Gap Period | CONTINENTAL OR CONUS | 1317 | 13/Nov/21 | 13/Nov/21 | 11/Aug/21 | 22/Sep/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1324 | 20/Nov/21 | 20/Nov/21 | 18/Aug/21 | 29/Sep/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1331 | 27/Nov/21 | 27/Nov/21 | 25/Aug/21 | 06/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1338 | 04/Dec/21 | 04/Dec/21 | 01/Sep/21 | 13/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1345 | 11/Dec/21 | 11/Dec/21 | 08/Sep/21 | 20/Oct/21 | 2,3 |
| | | CONTINENTAL OR CONUS | 1352 | 18/Dec/21 | 18/Dec/21 | 15/Sep/21 | 27/Oct/21 | 2,3 |
| Heavy Airlift (SAAM) | AIRLIFT BLACKOUT PERIOD <<<<<NO SCHEDULED USAP AIRLIFT IN THIS PERIOD>>>>> | CONUS ONLY- AIRLIFT GAP | 1359 | N/A | N/A | 27/Oct/21 | 08/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2001 | N/A | N/A | 03/Nov/21 | 15/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2008 | N/A | N/A | 10/Nov/21 | 22/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2015 | N/A | N/A | 17/Nov/21 | 29/Dec/21 | 4 |
| | | CONUS ONLY- AIRLIFT GAP | 2022 | N/A | N/A | 24/Nov/21 | 05/Jan/22 | 4 |
| | CONTINENTAL OR CONUS | 2029 | 29/Jan/22 | 29/Jan/22 | 27/Oct/21 | 08/Dec/21 | 2,3 | |
| | CONTINENTAL OR CONUS | 2036 | 05/Feb/22 | 05/Feb/22 | 03/Nov/21 | 15/Dec/21 | 2,3 | |
| | Start of South Pole winter | CONTINENTAL OR CONUS | 2043 | 12/Feb/22 | 12/Feb/22 | 10/Nov/21 | 22/Dec/21 | 2 |
| | CONTINENTAL OR CONUS, N O POLE | 2050 | 19/Feb/22 | N/A | 17/Nov/21 | 29/Dec/21 | 1 | |
| | Final Summer airlift to McMurdo | CONTINENTAL OR CONUS, N O POLE | 2057 | 26/Feb/22 | N/A | 24/Nov/21 | 05/Jan/22 | 1 |
| | McMurdo winter flight #1 | CONTINENTAL OR CONUS, N O POLE | 2232 | 20/Aug/22 | N/A | 18/May/22 | 29/Jun/22 | 1 |
| Resupply Vessel | | | | | | | | |
| | | Julian Required On Site (ROS) Date | McMurdo- Calendar Required On Site (ROS) Date | South Pole- Calendar Required On Site (ROS) Date | Maximo Purchase Request Submittal Deadline | Required Delivery Date To PT Hueneme | | |
| | MCM/SP - VESSEL- TIER 1- LIFE/HEALTH/SAFETY | 2121 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |
| | MCM/SP - VESSEL- TIER 2- CRITICAL | 2122 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |
| | MCM/SP - VESSEL - TIER 3- ESSENTIAL | 2123 | 29-Jan-22 | 12/Feb/22 | 24/Oct/21 | 05/Dec/21 | 5 | |

1. South Pole Required On-Site date January 7 during the Heavy Airlift Gap

2. South Pole ROS date: the closest listed that allows the cargo to meet the desired date

3. Julian ROS date (goes on label)



Items departing CONUS

Drill Supply Hose

Date needed at NPX

01/7 (FS2, or 2024 in 7 year schedule)

Define ROS date based on acquisition calendar

12/18 (FS2, or 2023 in 7-year schedule) is the last date available to avoid the Airlift Blackout. Choosing this date would exclude SPoT 2 overland transport, however. Communicate actual date requirement to T&L Representative

Can the item be stored at temperatures lower than -40C?

This shipment can be stored down to -53C

Space in MCM?

Will item make RDD for USAP Vessel?

Space at NPX?

Adjust production schedule?

Deliver item to PTH by USAP vessel RDD
PTH-MCM by USAP Vessel, winter in MCM, MCM to NPX by SPOT/LC-130

Will item make PTH date for COMSUR shipment?

Adjust production schedule?

Is the ROS date earlier January 31st?

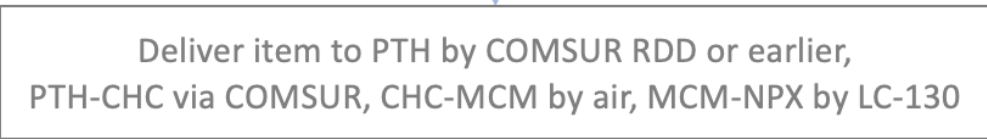
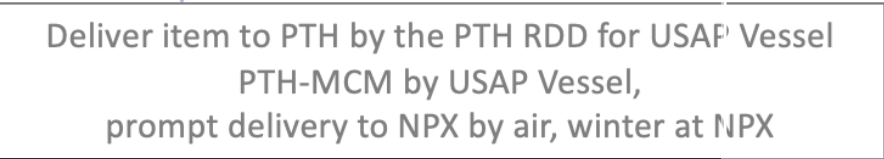
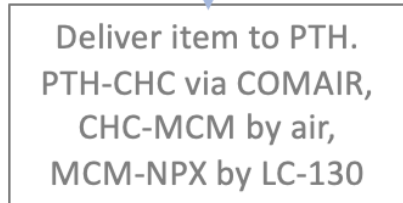
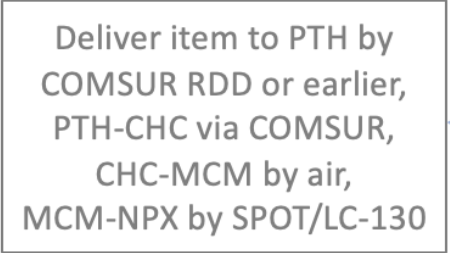
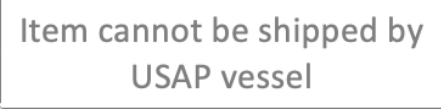
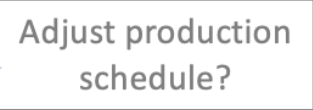
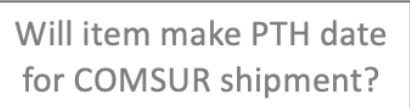
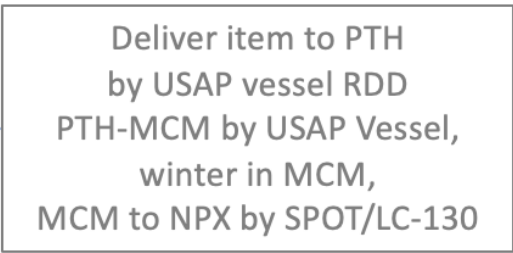
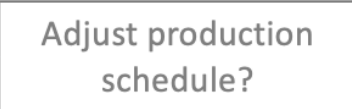
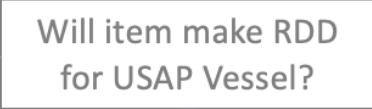
Item cannot be shipped by USAP vessel

Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by SPOT/LC-130

Deliver item to PTH. PTH-CHC via COMAIR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel, prompt delivery to NPX by air, winter at NPX

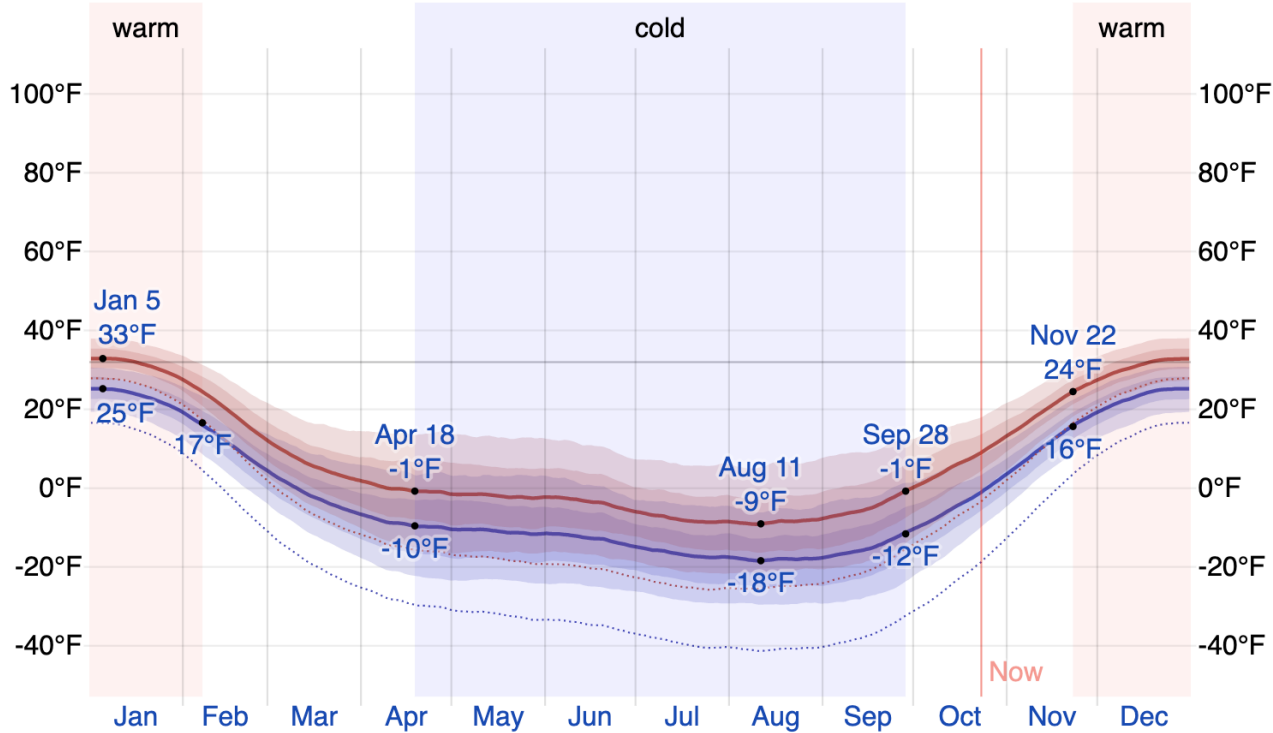
Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130



McMurdo winter temperatures

Average High and Low Temperature in McMurdo Station

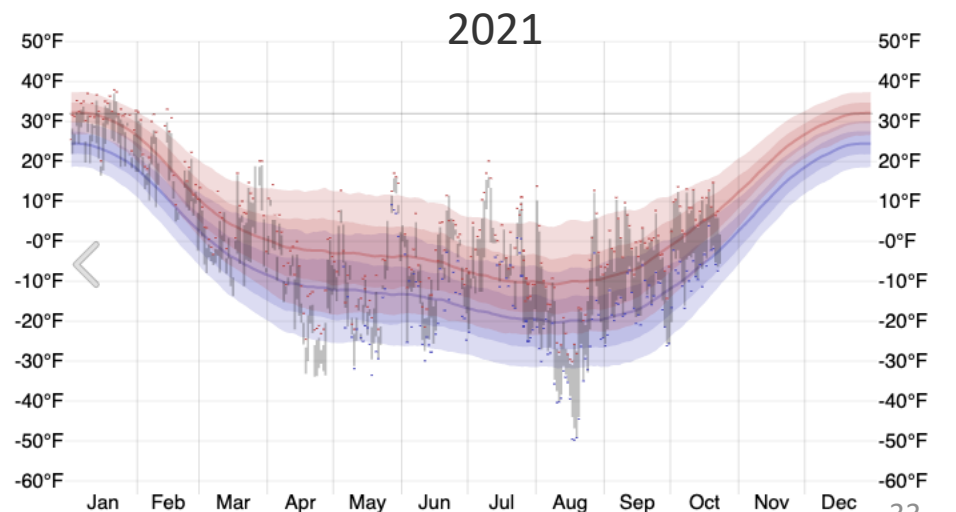
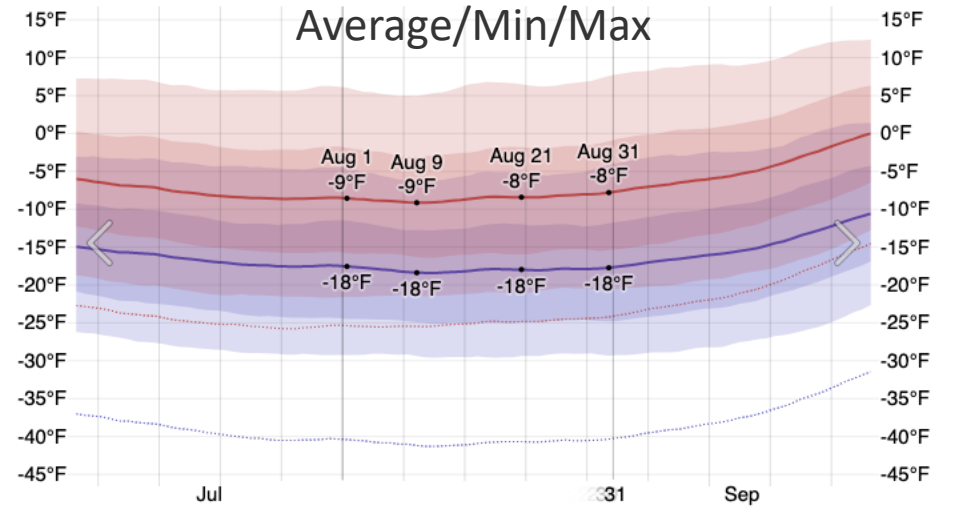
[Link](#)
[Download](#)
[Compare](#)
[History: 2021](#)
[2020](#)
[2019](#)
[2018](#)
[2017](#)
[2016](#)
[2015](#)
[2014](#)
[2013](#)



The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.

| Average | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---------|------|------|------|------|-------|-------|-------|-------|-------|------|------|------|
| High | 31°F | 20°F | 6°F | -0°F | -2°F | -4°F | -8°F | -9°F | -4°F | 7°F | 21°F | 31°F |
| Temp. | 28°F | 16°F | 1°F | -5°F | -7°F | -8°F | -13°F | -13°F | -11°F | 1°F | 17°F | 28°F |
| Low | 23°F | 12°F | -2°F | -9°F | -11°F | -13°F | -17°F | -18°F | -15°F | -4°F | 12°F | 24°F |

@WeatherSpark



ation.met.no/10061067



Items departing CONUS

Drill Supply Hose

Date needed at NPX

01/7 (FS2, or 2024 in 7 year schedule)

Define ROS date based on acquisition calendar

12/18 (FS2, or 2023 in 7-year schedule) is the last date available to avoid the Airlift Blackout. Choosing this date would exclude SPoT 2 overland transport, however. Communicate actual date requirement to T&L Representative

Can the item be stored at temperatures lower than -40C?

This shipment can be stored down to -53C

Space in MCM?

No

Yes

Will item make RDD for USAP Vessel?

Yes. The drill hose is staged in Pt Hueneme

Space at NPX?

No

Yes

No

Adjust production schedule?

Deliver item to PTH by USAP vessel RDD
PTH-MCM by USAP Vessel, winter in MCM, MCM to NPX by SPOT/LC-130

Yes

No

Will item make PTH date for COMSUR shipment?

Is the ROS date earlier January 31st?

Yes

No

Yes

No

No

Adjust production schedule?

Item cannot be shipped by USAP vessel

Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by SPOT/LC-130

Yes

Yes

No

Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel, prompt delivery to NPX by air, winter at NPX

Deliver item to PTH by COMSUR RDD or earlier, PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH. PTH-CHC via COMAIR, CHC-MCM by air, MCM-NPX by LC-130

Items departing CONUS

Drill Supply Hose

Date needed at NPX

01/7 (FS2, or 2024 in 7 year schedule)

Define ROS date based on acquisition calendar

12/18 (FS2, or 2023 in 7-year schedule) is the last date available to avoid the Airlift Blackout. Choosing this date would exclude SPoT 2 overland transport, however. Communicate actual date requirement to T&L Representative

Can the item be stored at temperatures lower than -40C?

This shipment can be stored down to -53C

Space in MCM?

Yes

Will item make RDD for USAP Vessel?

Yes. The drill hose is staged in Pt Hueneme

No

No

Adjust production schedule?

No

Yes

Deliver item to PTH by USAP vessel RDD
PTH-MCM by USAP Vessel,
winter in MCM,
MCM to NPX by SPOT/LC-130

Yes

Yes

Will item make PTH date for COMSUR shipment?

No

Space at NPX?

Yes

No

Adjust production schedule?

Is the ROS date earlier January 31st?

No

Yes

Item cannot be shipped by USAP vessel

Deliver item to PTH by COMSUR RDD or earlier,
PTH-CHC via COMSUR,
CHC-MCM by air,
MCM-NPX by SPOT/LC-130

Yes

Yes

No

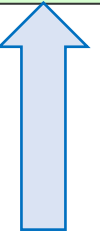
Deliver item to PTH by the PTH RDD for USAP Vessel
PTH-MCM by USAP Vessel,
prompt delivery to NPX by air, winter at NPX

Deliver item to PTH by COMSUR RDD or earlier,
PTH-CHC via COMSUR, CHC-MCM by air, MCM-NPX by LC-130

Deliver item to PTH.
PTH-CHC via COMAIR,
CHC-MCM by air,
MCM-NPX by LC-130

Item line ICU cargo master spreadsheet

| Cargo Item respective WBS Level | Work Package | Item Description | Contents & Comments | Date of expected or <i>actual</i> completion | Expected Route: Owner - PTH or CHC | Date of expected or <i>actual</i> shipment |
|---------------------------------|--------------|--|---|--|------------------------------------|--|
| 1.2 | Drill | Drill Hose - currently staged in Pt. Hueneme | Drill hose - 9 Spools - 348 cf / 3532 lbs each - Shipped from Italy | 7/29/2020 | Already at PTH | 8/15/2020 |



Questions?





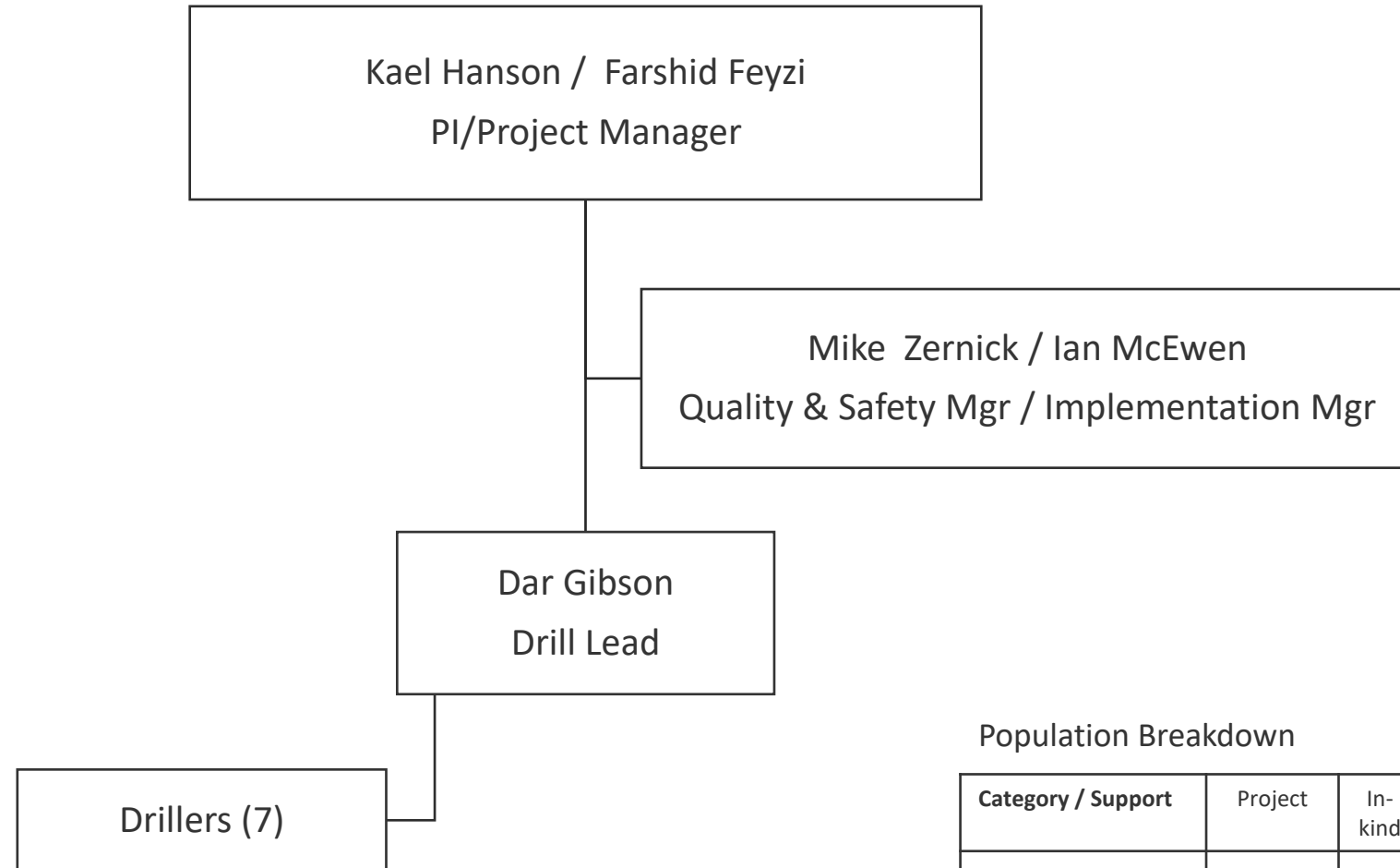
IceCube Upgrade Cargo Master Spreadsheet Tour

Population estimating methodology

Coming up

- Org charts and population profiles for the three field seasons
- Assumption and methodology
- Example

Forecast IceCube Upgrade On-Ice Org Chart – Field Season 1



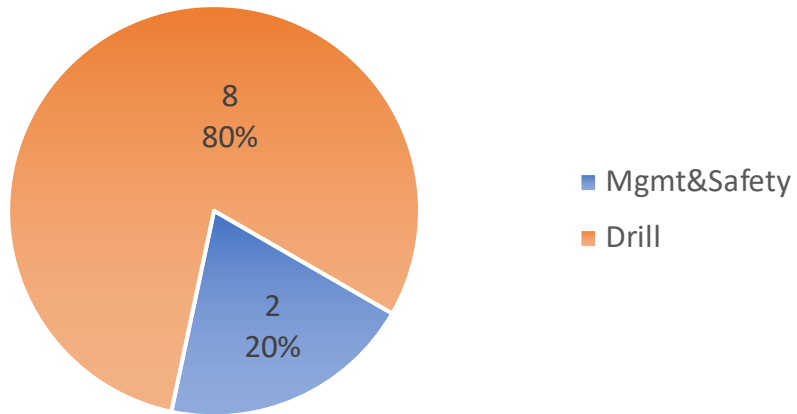
Population Breakdown

| Category / Support | Project | In-kind | Total |
|--------------------|-----------|----------|-----------|
| Management | 2 | 0 | 2 |
| Drill | 8 | 0 | 8 |
| Installation | 0 | 0 | 0 |
| CPT/Eng/SME | 0 | 0 | 0 |
| Total | 10 | 0 | 10 |

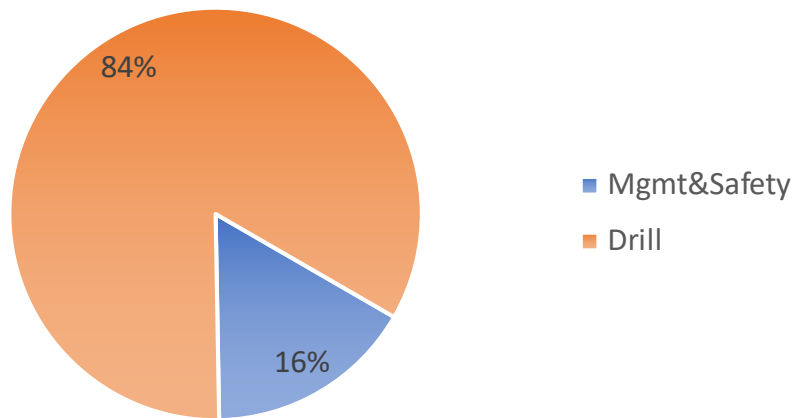
Winter-over and m&o personnel are not included in this chart.

Field Season 1 Population Overview

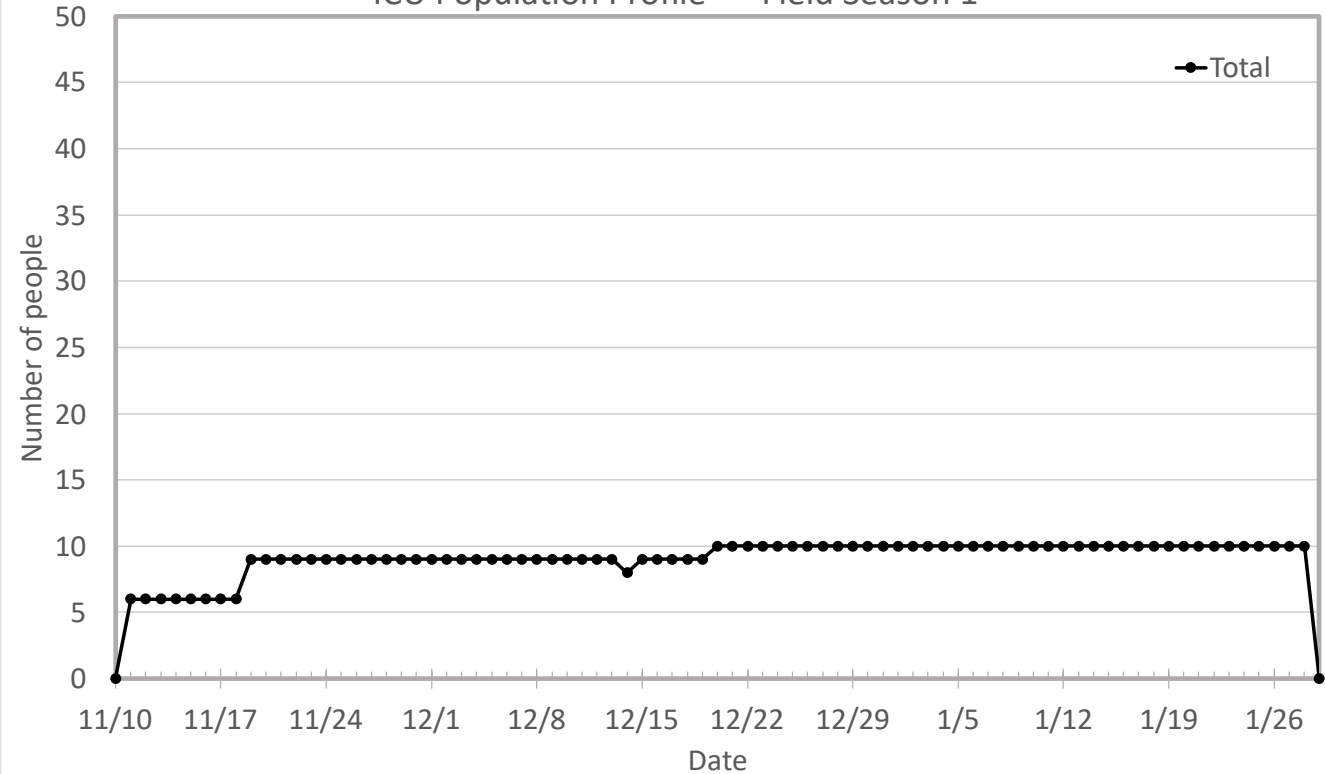
Billets Distribution Field Season 1



Person Days Distribution Field Season 1



ICU Population Profile - Field Season 1

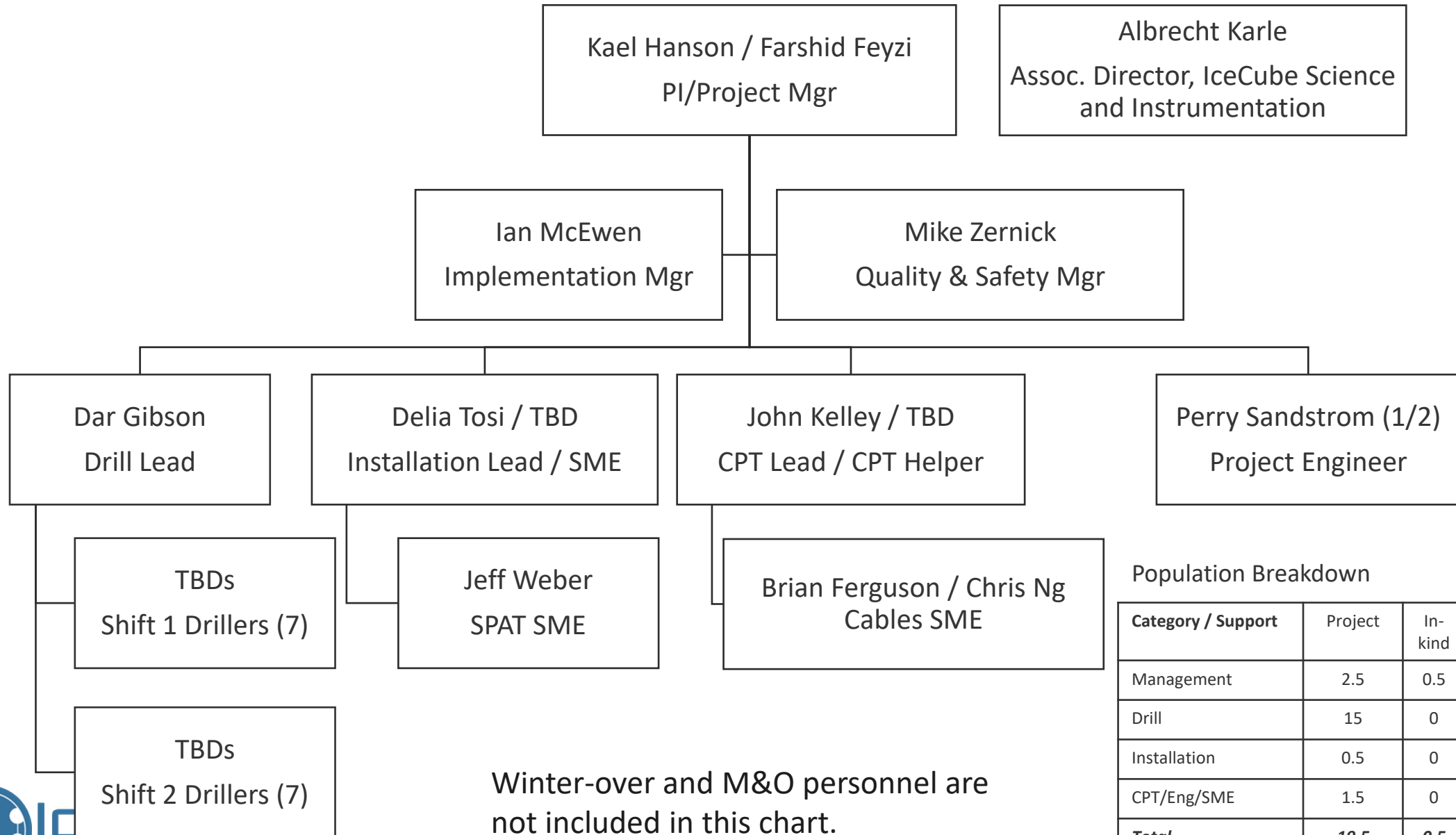


| Area | Billets (beds) | Person days | |
|-----------------------------|----------------|-------------|-----------------------------|
| Mgmt&Safety | 2 | 119 | average days per role |
| Drill | 8 | 607 | |
| Installation | - | - | |
| Comms Power Timing (CPT) | - | - | |
| Subject Matter Expert (SME) | - | - | |
| Integration/Commissioning | - | - | |
| Total | 10 | 726 | |

Winter-over and M&O personnel are not included in this chart.



Forecast IceCube Upgrade On-Ice Org Chart – Field Season 2



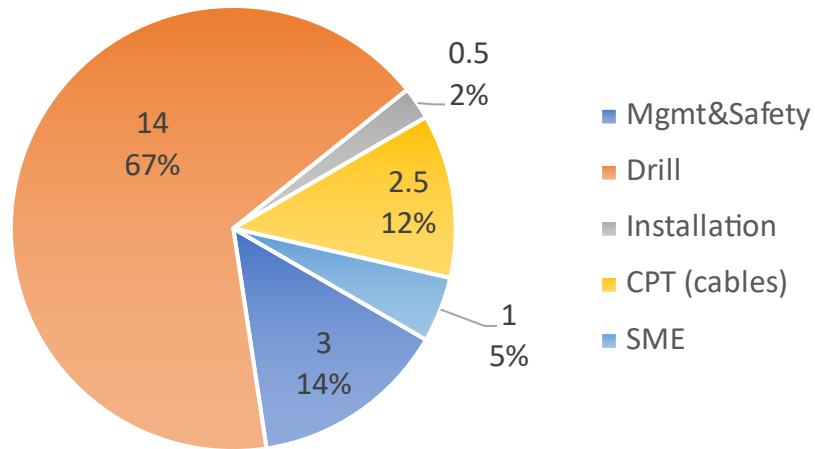
Winter-over and M&O personnel are not included in this chart.

Population Breakdown

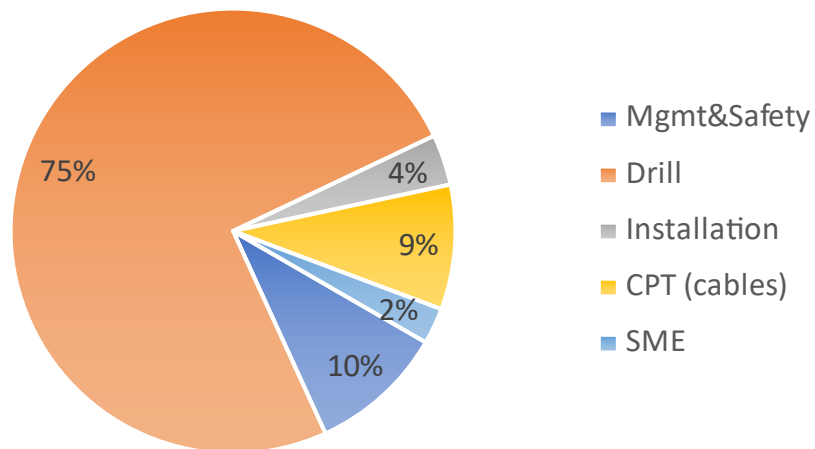
| Category / Support | Project | In-kind | Total |
|--------------------|-------------|------------|------------|
| Management | 2.5 | 0.5 | 3 |
| Drill | 15 | 0 | 15 |
| Installation | 0.5 | 0 | 0.5 |
| CPT/Eng/SME | 1.5 | 0 | 1.5 |
| Total | 19.5 | 0.5 | 20 |

Field Season 2 Population Overview

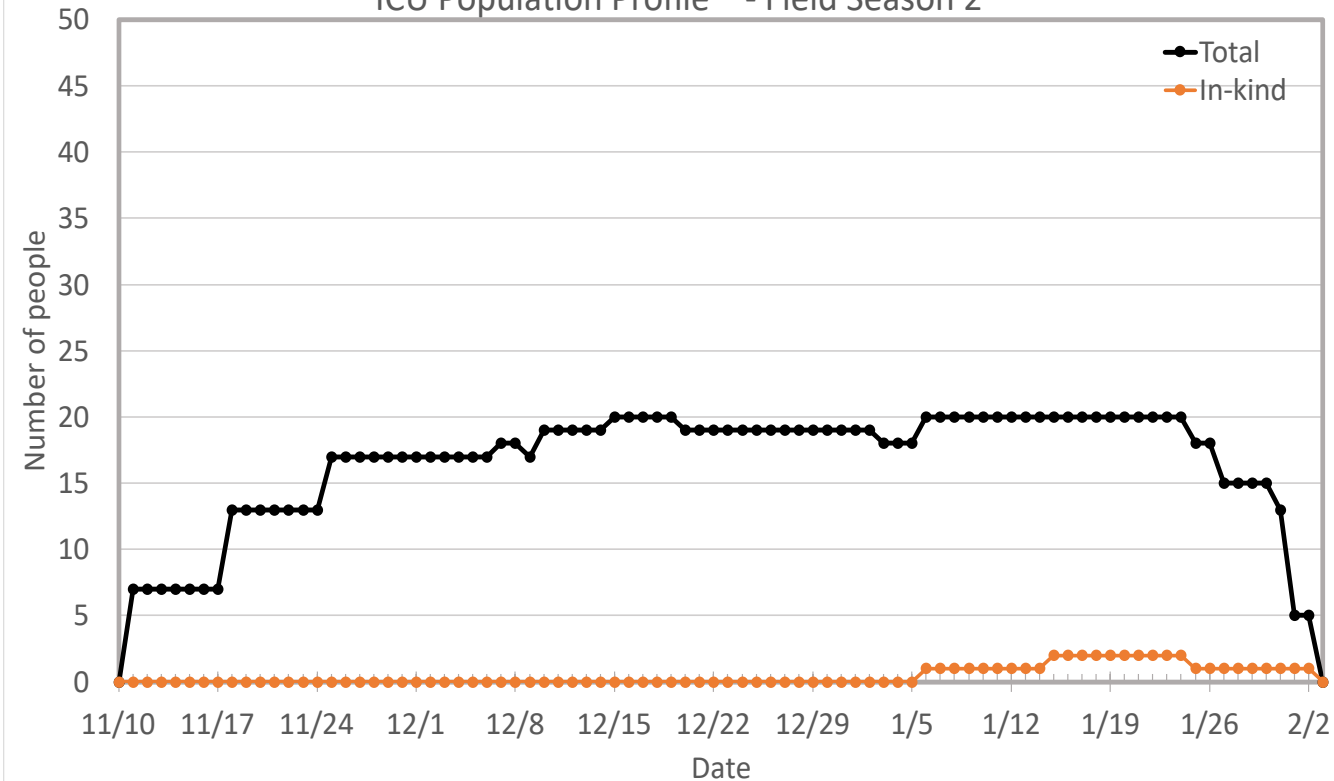
Billets Distribution Field Season 2



Person Days Distribution Field Season 2



ICU Population Profile - Field Season 2

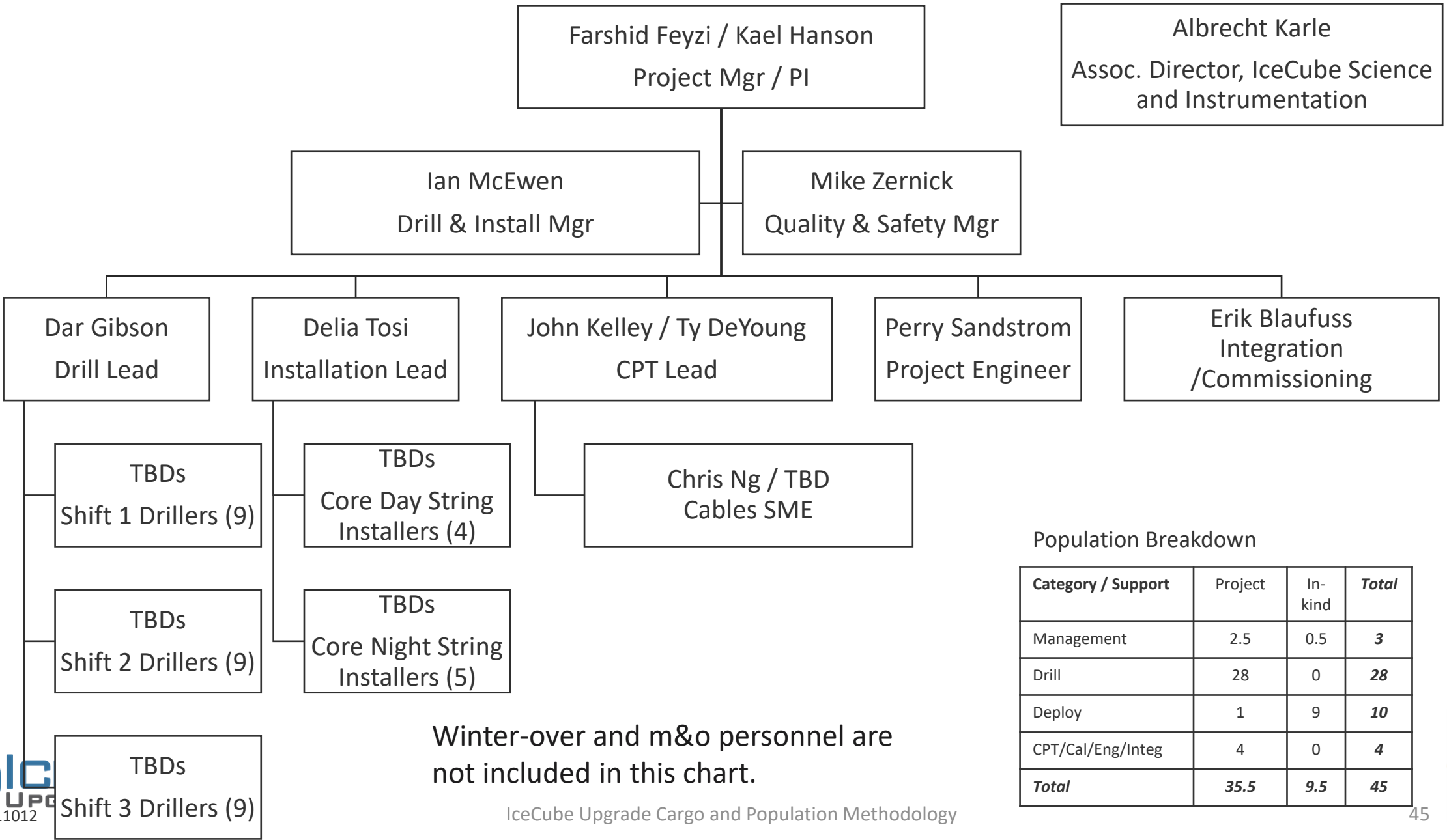


| Area | Billets (beds) | Person days | |
|-----------------------------|----------------|-------------|-----------------------------|
| Mgmt&Safety | 3 | 139 | average days per role |
| Drill | 14 | 1055 | |
| Installation | 0.5 | 52 | |
| Comms Power Timing (CPT) | 2.5 | 128 | |
| Subject Matter Expert (SME) | 1 | 37 | |
| Integration/Commissioning | - | - | |
| Total | 21 | 1411 | 67 |

Winter-over and M&O personnel are not included in this chart.



Forecast IceCube Upgrade On-Ice Org Chart – Field Season 3



Albrecht Karle
Assoc. Director, IceCube Science
and Instrumentation

Ian McEwen
Drill & Install Mgr

Mike Zernick
Quality & Safety Mgr

Dar Gibson
Drill Lead

Delia Tosi
Installation Lead

John Kelley / Ty DeYoung
CPT Lead

Perry Sandstrom
Project Engineer

Erik Blaufuss
Integration /Commissioning

TBDS
Shift 1 Drillers (9)

TBDS
Shift 2 Drillers (9)

TBDS
Shift 3 Drillers (9)

TBDS
Core Day String
Installers (4)

TBDS
Core Night String
Installers (5)

Chris Ng / TBD
Cables SME

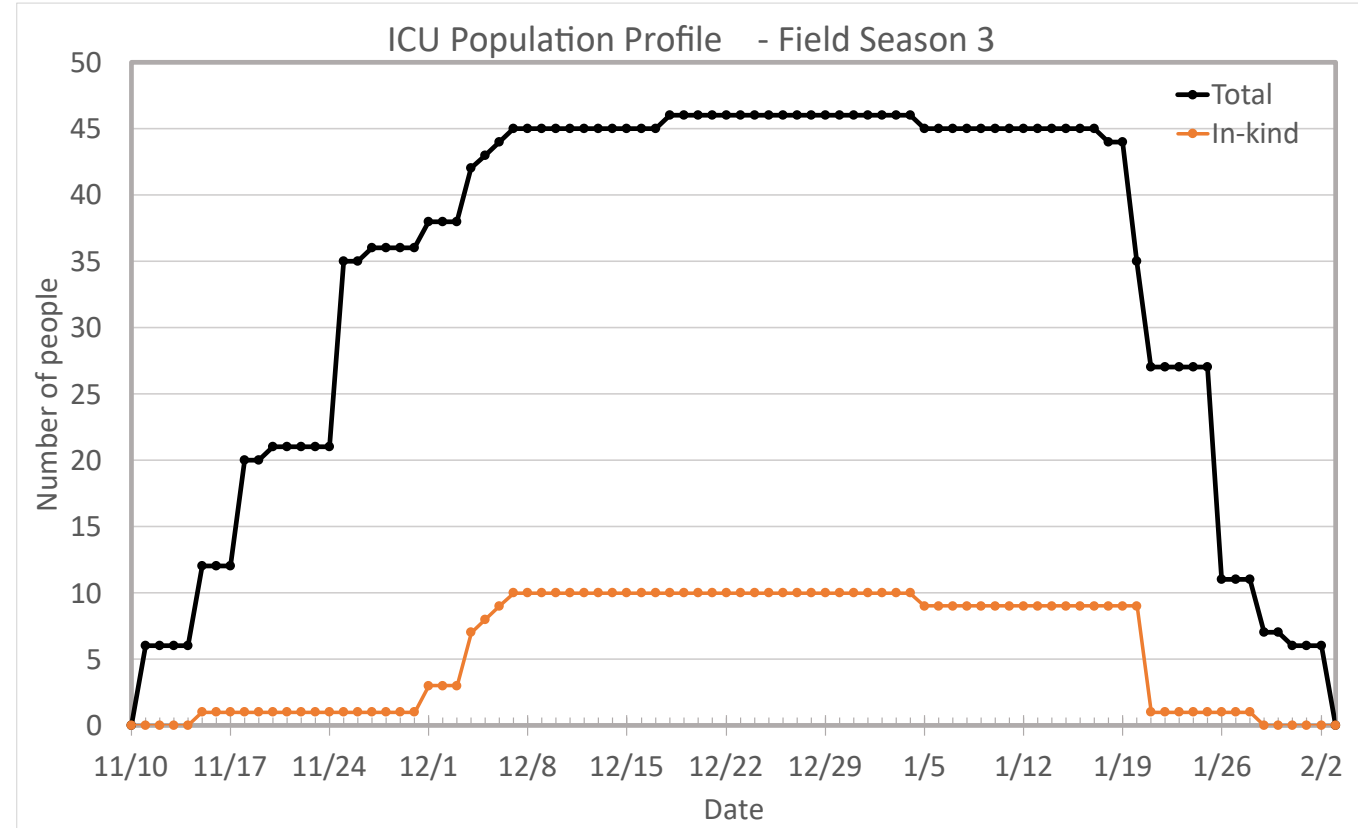
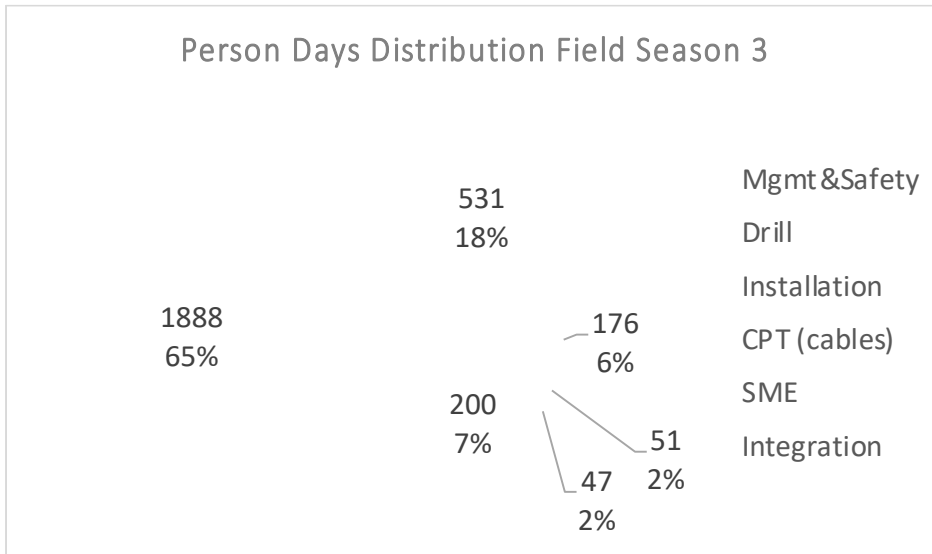
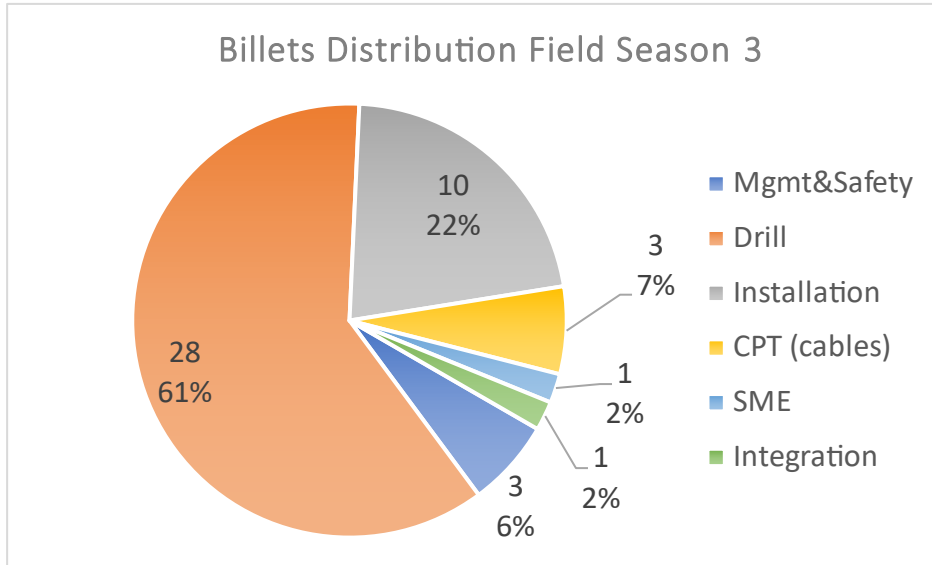
Population Breakdown

| Category / Support | Project | In-kind | Total |
|--------------------|-------------|------------|-----------|
| Management | 2.5 | 0.5 | 3 |
| Drill | 28 | 0 | 28 |
| Deploy | 1 | 9 | 10 |
| CPT/Cal/Eng/Integ | 4 | 0 | 4 |
| Total | 35.5 | 9.5 | 45 |

Winter-over and m&o personnel are not included in this chart.



Field Season 3 Population Overview



| Area | Billets (beds) | Person days | average days per role |
|-----------------------------|----------------|-------------|-----------------------|
| Mgmt&Safety | 3 | 200 | |
| Drill | 28 | 1888 | |
| Installation | 10 | 531 | |
| Comms Power Timing (CPT) | 3 | 176 | |
| Subject Matter Expert (SME) | 1 | 51 | |
| Integration/Commissioning | 1 | 47 | |
| Total | 46 | 2893 | 63 |

Winter-over and M&O personnel are not included in this chart.



Logistics population - assumptions

- Station open Nov 1 – Feb 15
- Preferred window for grantees is Nov 12 - Feb 1
 - USAP contractor has extensive work to open the season after the winter. Support requests more difficult to accommodate during this time
- Gradual ramp up and ramp down of population at the beginning and at the end of the season is preferred to minimize impact on air terminal operations and station operations
- Total South Pole Station bed space is 150 and is shared between grantees and contractors
- Station operates currently on a single shift
- Seasons with multiple shifts/day will require additional station services that need to be coordinated with NSF/ USAP contractor

Logistics population - methodology

- Population currently is compiled from multiple sources
 - Hours estimates and dates in the schedule - drill
 - Project Office management requirements – similar to Gen1
 - Off-project (“in-kind”) labor estimates for tasks such as installation support based from Gen1 support model

Logistics population - Example

| | | | Task Description | | | Start | End | | | | | |
|-----|--------------|---|------------------|---|----|-----------|-----|----|----------|----------|-----|-----|
| 1.2 | 1.2.8.6.1 | C | PSL | START NPX 2023/24 Season - Team Arrives [Comm/WTst/FirnDr] | 0% | Labor Hou | EN | 0% | 11/11/23 | 11/11/23 | | |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) Team (14) | 0% | Labor Hou | TE | 0% | 07/01/23 | 02/05/24 | | |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) (Driller_PSL_Lead) | 0% | Labor Hou | EN | 0% | 07/01/23 | 02/05/24 | 40 | 24 |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) (PSL_Direct_Hire) | 0% | Labor Hou | TE | 0% | 07/01/23 | 02/05/24 | 160 | 96 |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) (PSL_Engineer) | 0% | Labor Hou | EN | 0% | 07/01/23 | 02/05/24 | 400 | 240 |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) | | M & S | | 0% | 07/01/23 | 02/05/24 | | |
| 1.2 | 1.2.8.6.2 | C | PSL | Deployment Travel & PQ Costs (23/24) | | Travel | | 0% | 07/01/23 | 02/05/24 | | |
| 1.2 | 1.2.8.6.5.1 | C | PSL | SES: Fuel Tower: Connect, Test and Make Ready | 0% | Labor Hou | TE | 0% | 11/21/23 | 11/22/23 | 32 | |
| 1.2 | 1.2.8.6.5.2 | C | PSL | SES: Make Ready all SES Modules (DCC, PHS, MHPs, MECC, WTs, All) | 0% | Labor Hou | TE | 0% | 11/14/23 | 11/24/23 | 48 | |
| 1.2 | 1.2.8.6.5.3 | C | PSL | SES: Furnace Checkout & Fire Up (All modules) | 0% | Labor Hou | EN | 0% | 11/14/23 | 11/16/23 | 32 | |
| 1.2 | 1.2.8.6.5.4 | C | PSL | SES: Perform Emergency Incident Drill & Safety Training | 0% | Labor Hou | EN | 0% | 12/08/23 | 12/11/23 | | 112 |
| 1.2 | 1.2.8.6.5.5 | C | PSL | SES: Maintenance Activities | 0% | Labor Hou | TE | 0% | 11/15/23 | 01/31/24 | 56 | 56 |
| 1.2 | 1.2.8.6.5.6 | C | PSL | SES: Site Snow Removal | 0% | Labor Hou | TE | 0% | 11/15/23 | 01/31/24 | | 96 |
| 1.2 | 1.2.8.6.6.1 | C | PSL | Generators/PDM: Charge Generator Batteries | 0% | Labor Hou | EN | 0% | 11/21/23 | 11/29/23 | 1 | |
| 1.2 | 1.2.8.6.6.2 | C | PSL | Generators/PDM: Prime/Commission Fuel System | 0% | Labor Hou | EN | 0% | 11/21/23 | 11/29/23 | 24 | |
| 1.2 | 1.2.8.6.6.3 | C | PSL | Generators/PDM: GEN-1, 2, 3 - Install GEN hoods | 0% | Labor Hou | EN | 0% | 01/05/24 | 01/11/24 | 96 | |
| 1.2 | 1.2.8.6.6.4 | C | PSL | GEN-1, 2, 3, PDM - Repairs & Tests w/Contract Tech Support | 0% | Labor Hou | EN | 0% | 11/20/23 | 12/13/23 | 96 | 48 |
| 1.2 | 1.2.8.6.6.5 | C | PSL | Generator & PDM: Commission & Final Testing | 0% | Labor Hou | EN | 0% | 12/13/23 | 12/14/23 | | 32 |
| 1.2 | 1.2.8.6.6.7 | C | PSL | Generators/PDM: Change from Temporary Power to IceCube Grid | 0% | Labor Hou | EN | 0% | 12/14/23 | 12/15/23 | | 8 |
| 1.2 | 1.2.8.6.7.1 | C | PSL | DCC: Install Racks, Networks, Computers | 0% | Labor Hou | TE | 0% | 11/23/23 | 11/28/23 | 32 | |
| 1.2 | 1.2.8.6.7.2 | C | PSL | MHP: Final Upgrade & Replacement Activities | 0% | Labor Hou | EN | 0% | 11/17/23 | 11/24/23 | 64 | |
| 1.2 | 1.2.8.6.7.3 | C | PSL | MHP: Final Testing | 0% | Labor Hou | TE | 0% | 11/24/23 | 11/30/23 | 32 | |
| 1.2 | 1.2.8.6.7.4 | C | PSL | PHS: Install Filters in H2O System | 0% | Labor Hou | TE | 0% | 11/24/23 | 11/27/23 | 4 | |
| 1.2 | 1.2.8.6.7.5 | C | PSL | PHS: Final Upgrade & Replacement Activities | 0% | Labor Hou | TE | 0% | 11/17/23 | 11/24/23 | 32 | |
| 1.2 | 1.2.8.6.7.6 | C | PSL | PHS: Final Testing | 0% | Labor Hou | EN | 0% | 11/24/23 | 11/30/23 | 32 | |
| 1.2 | 1.2.8.6.7.7 | C | PSL | Water Tanks: Install Railings, Ladders, Pumps, Plumbing, Doghouses - Final Upgrades | 0% | Labor Hou | EN | 0% | 11/17/23 | 11/24/23 | 40 | |
| 1.2 | 1.2.8.6.7.8 | C | PSL | Water Tanks: Install Railings, Ladders, Pumps, Plumbing, Doghouses - Final Upgrades | 0% | Labor Hou | TE | 0% | 11/17/23 | 11/24/23 | 136 | |
| 1.2 | 1.2.8.6.7.9 | C | PSL | Water Tanks: Integrate, Verify, Test | 0% | Labor Hou | EN | 0% | 11/24/23 | 11/30/23 | 64 | |
| 1.2 | 1.2.8.6.7.10 | C | PSL | HPP: Final Upgrade & Replacement Activities | 0% | Labor Hou | TE | 0% | 11/17/23 | 11/24/23 | 32 | |
| 1.2 | 1.2.8.6.7.11 | C | PSL | HPP: Pump Testing | 0% | Labor Hou | EN | 0% | 11/24/23 | 11/30/23 | 32 | |
| 1.2 | 1.2.8.6.7.12 | C | PSL | Shops: Final Upgrade/Retrofit Shops, MECC | 0% | Labor Hou | TE | 0% | 11/14/23 | 11/21/23 | 8 | |
| 1.2 | 1.2.8.6.7.13 | C | PSL | Shops: Final Upgrade/Retrofit Shops, OML, TOW, SEW | 0% | Labor Hou | TE | 0% | 11/14/23 | 11/21/23 | 16 | |
| 1.2 | 1.2.8.6.7.14 | C | PSL | MSHR: Final Upgrades & Testing | 0% | Labor Hou | TE | 0% | 12/10/23 | 12/14/23 | | 48 |
| 1.2 | 1.2.8.6.7.15 | C | PSL | MSHR: Install Drill Hose on Reel | 0% | Labor Hou | EN | 0% | 01/07/24 | 01/11/24 | | 128 |
| 1.2 | 1.2.8.6.7.16 | C | PSL | MSHR: Install Blankets | 0% | Labor Hou | TE | 0% | 01/12/24 | 01/16/24 | | 54 |
| 1.2 | 1.2.8.6.7.17 | C | PSL | MSHR: Install Blankets, Connect to Power, Heating Control and Test | 0% | Labor Hou | EN | 0% | 01/12/24 | 01/16/24 | | 32 |
| 1.2 | 1.2.8.6.7.18 | C | PSL | Winches/Reels: Final Integration & Testing | 0% | Labor Hou | TE | 0% | 12/15/23 | 01/01/24 | | 48 |
| 1.2 | 1.2.8.6.7.19 | C | PSL | Winches/Reels: Final Integration & Testing | 0% | Labor Hou | EN | 0% | 12/15/23 | 01/01/24 | | 96 |
| 1.2 | 1.2.8.6.7.20 | C | PSL | Winches/Reels: Final Integration & Testing | 0% | Labor Hou | EN | 0% | 12/15/23 | 01/01/24 | | 48 |
| 1.2 | 1.2.8.6.7.21 | C | PSL | Fuel Storage/Delivery: Commission Fuel Tower | 0% | Labor Hou | TE | 0% | 11/25/23 | 11/29/23 | 32 | 96 |
| 1.2 | 1.2.8.6.7.22 | C | PSL | TOS/Tower Equipment - Retrofit & Testing | 0% | Labor Hou | TE | 0% | 12/31/23 | 01/12/24 | | 128 |
| 1.2 | 1.2.8.6.7.23 | C | PSL | Computing/Control: System Integration, Verification, Test at NPX | 0% | Labor Hou | TE | 0% | 11/29/23 | 01/23/24 | 250 | 350 |
| 1.2 | 1.2.8.6.7.24 | C | PSL | Computing/Control: Testing and Reprogramming Motor Drives | 0% | Labor Hou | TE | 0% | 11/29/23 | 12/26/23 | 160 | 160 |

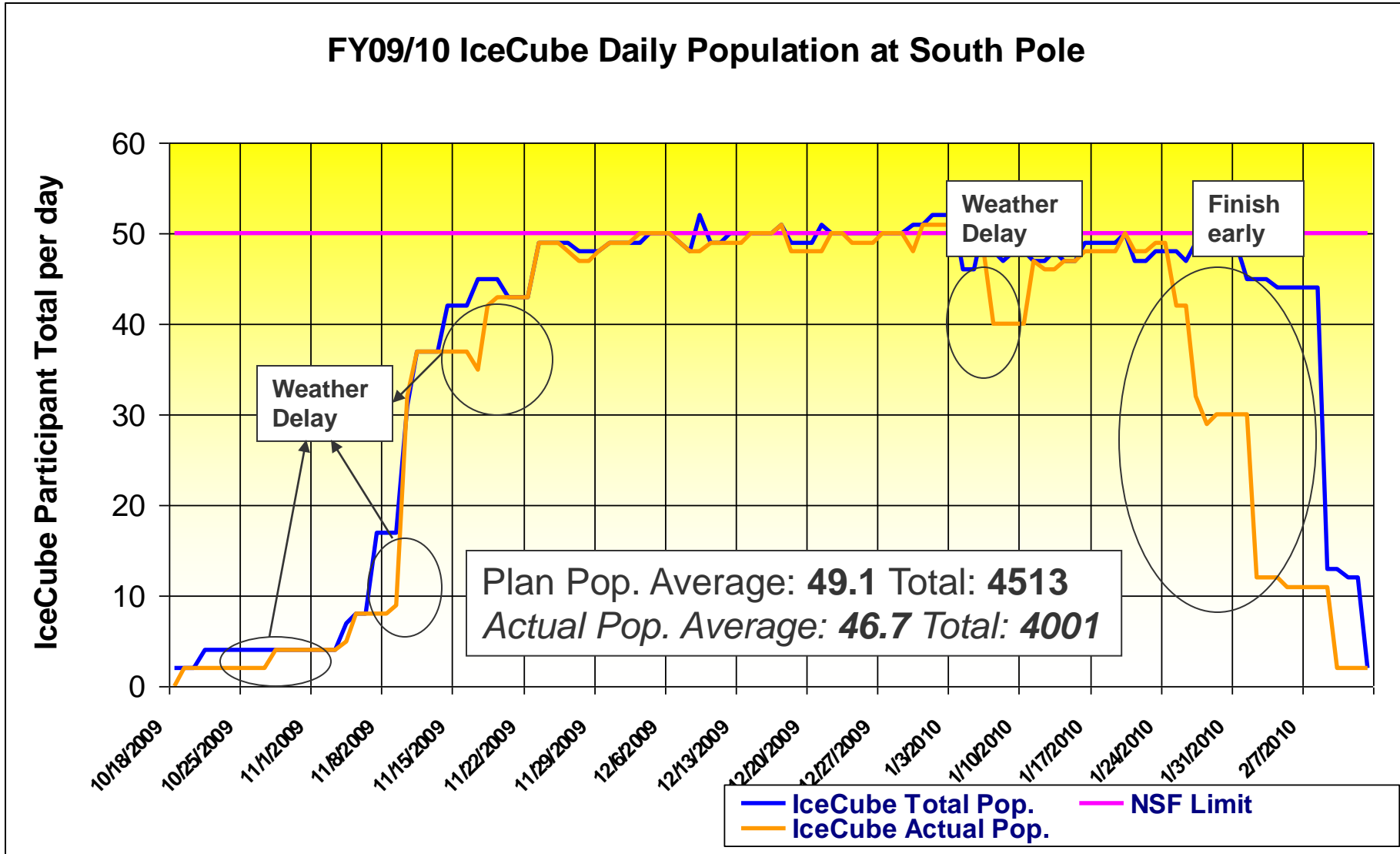


Questions?

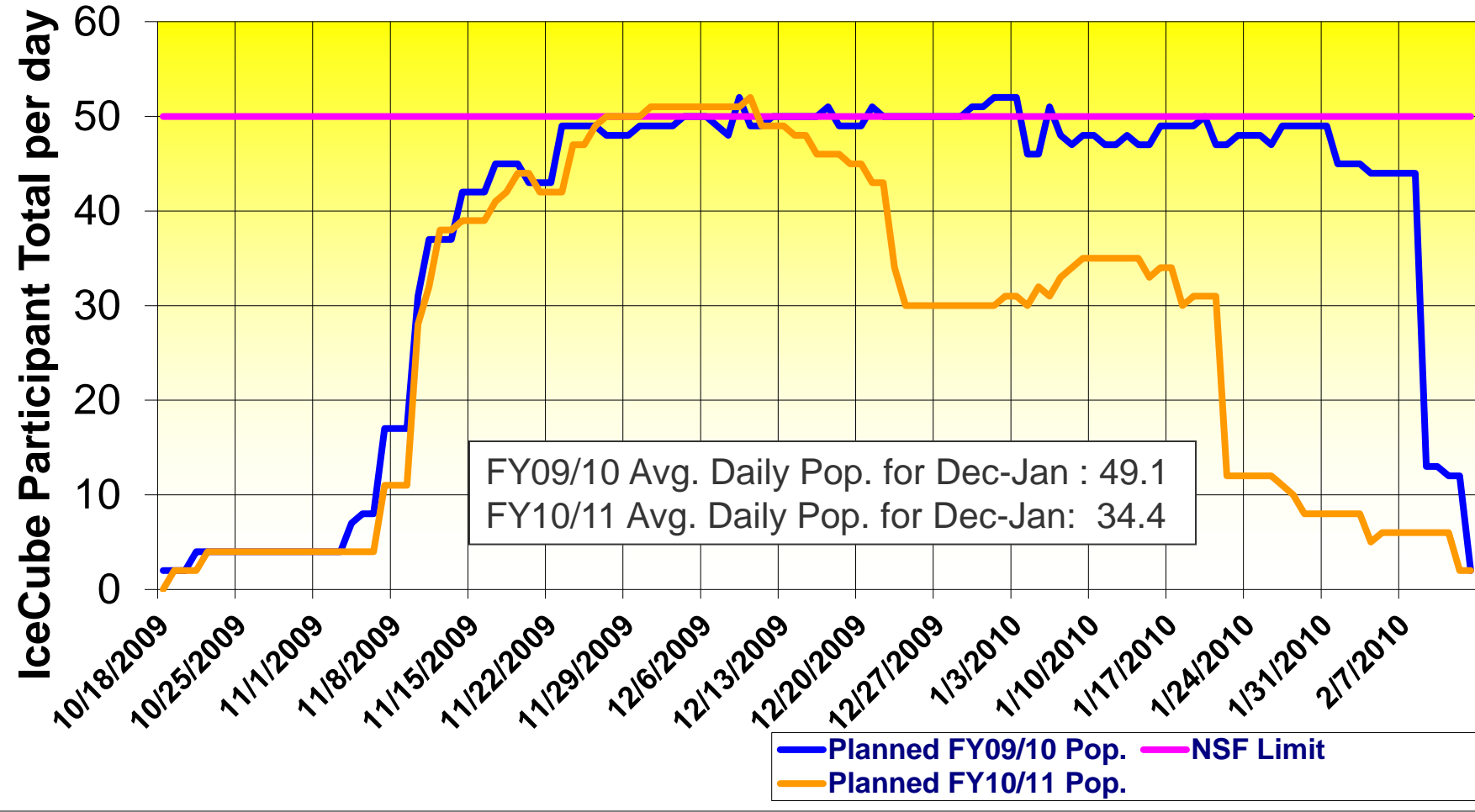


Gen1 population profiles

FY09/10 IceCube Daily Population at South Pole



FY09/10 v. FY10/11 IceCube Daily NPX Population



2010/2011 Season Performance – Planned vs. Actual

| Performance Indicator | Planned | Actual |
|------------------------------------|---------------------------|---------------------------|
| Season Start | November 8 th | November 12 th |
| Start of Drilling | December 3 rd | December 3 rd |
| End of Drilling | December 22 nd | December 18 th |
| Strings Deployed | 7 | 7 |
| Drilling Time/fuel per hole (avg.) | 30 hrs/4,800 gal | 31 hrs/3,986 gal |
| Total drill fuel | 53,420 gal | 41, 812 gal |
| Base fuel | 19,820 gal | 13,907 gal |
| Deployment Time/string (avg.) | 12 hrs | 11.2 hrs |
| IceTop Stations Installed | 8 stations (16 tanks) | 8 stations (16 tanks) |
| Cargo to Pole | 215,000 lbs | 276,000 lbs* |
| Independent Firm Drill holes | 0 | 0 |
| DOM Testing (on-ice) | 480 | 472 |
| On-Ice Person-Days | 3,397 | 3,125 |

* weight variance due to data [system replacements](#)