LBNF Project partners:
US/DOE
Brazil/FAPESP-UNICAMP
CERN
Poland/WUST
Switzerland/SERI, and
UK/UKRI-STFC

plus the DUNE international collaboration and consortia

FDC project guidance to contractor activities at SURF

Marzio Nessi, Deputy Project Director for Far Detector & Cryogenics

SURF, 08-29-2023 CERN Bidder Conference

30 August 2023

Who am I – Marzio Nessi

- Current Role :
  - **LBNF/DUNE Deputy Project Director for Far Detectors and Cryogenics**

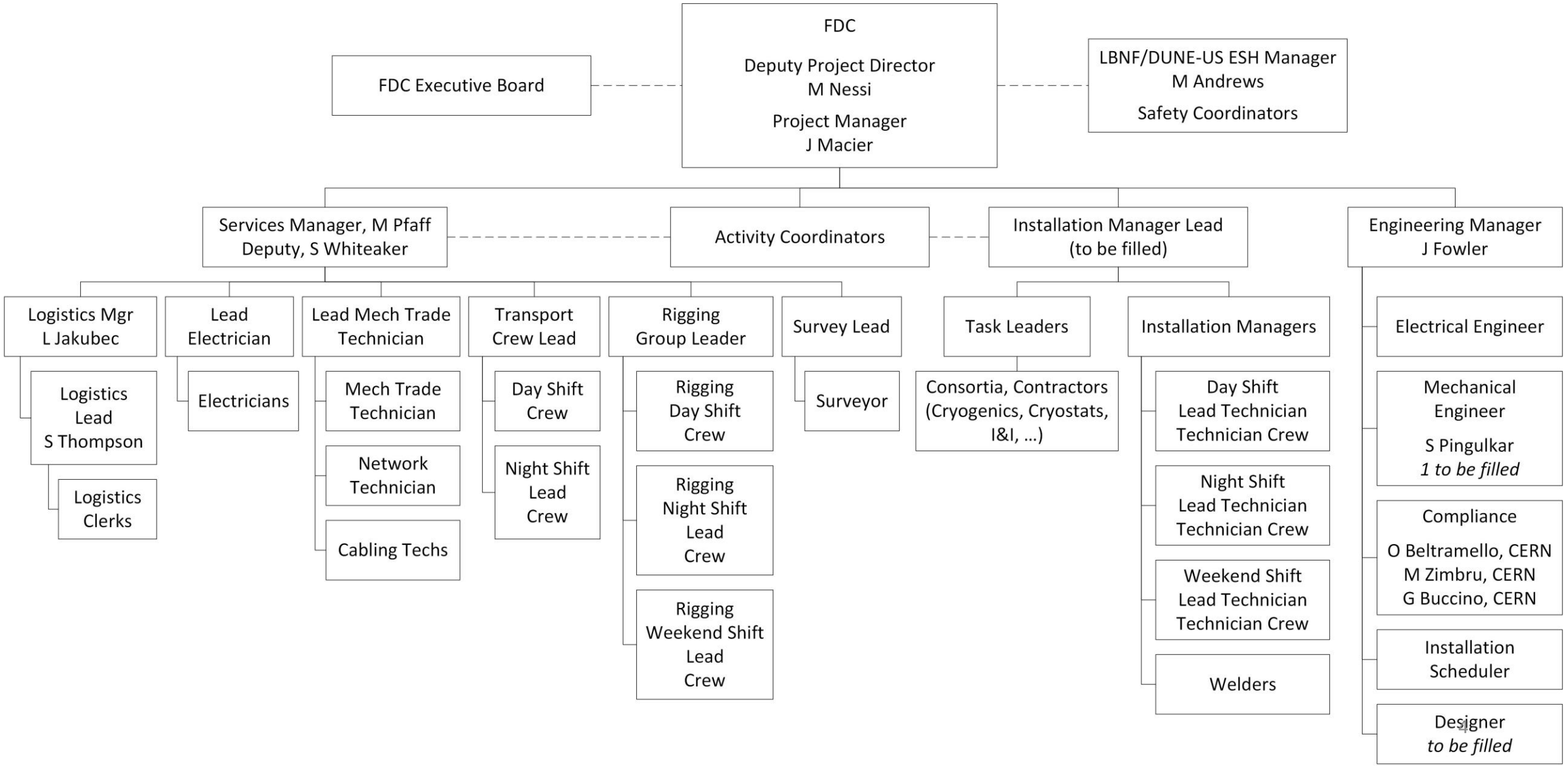
- Previous/other Experiences :
  - Technical Coordinator of the ATLAS LHC Project at CERN during construction and run1 operation.
  - Experience includes 25 years as project manager and technical leader of several very large projects. Large experience on detectors and complex systems.
  - Education as a Particle Physicist (Ph.D.). Physics Professor at the University of Geneva. At CERN, senior staff as Principal Research Physicists in the Research Sector (RCS).
  - Leader of the CERN Neutrino Platform
  - Liaison between CERN and FNAL on Neutrino Projects (Short and Long Baselines)
  - LBNF/DUNE Director for all FS detectors installation activities
  - Darkside-20k Construction Director
  - JINST Journal Director

Content

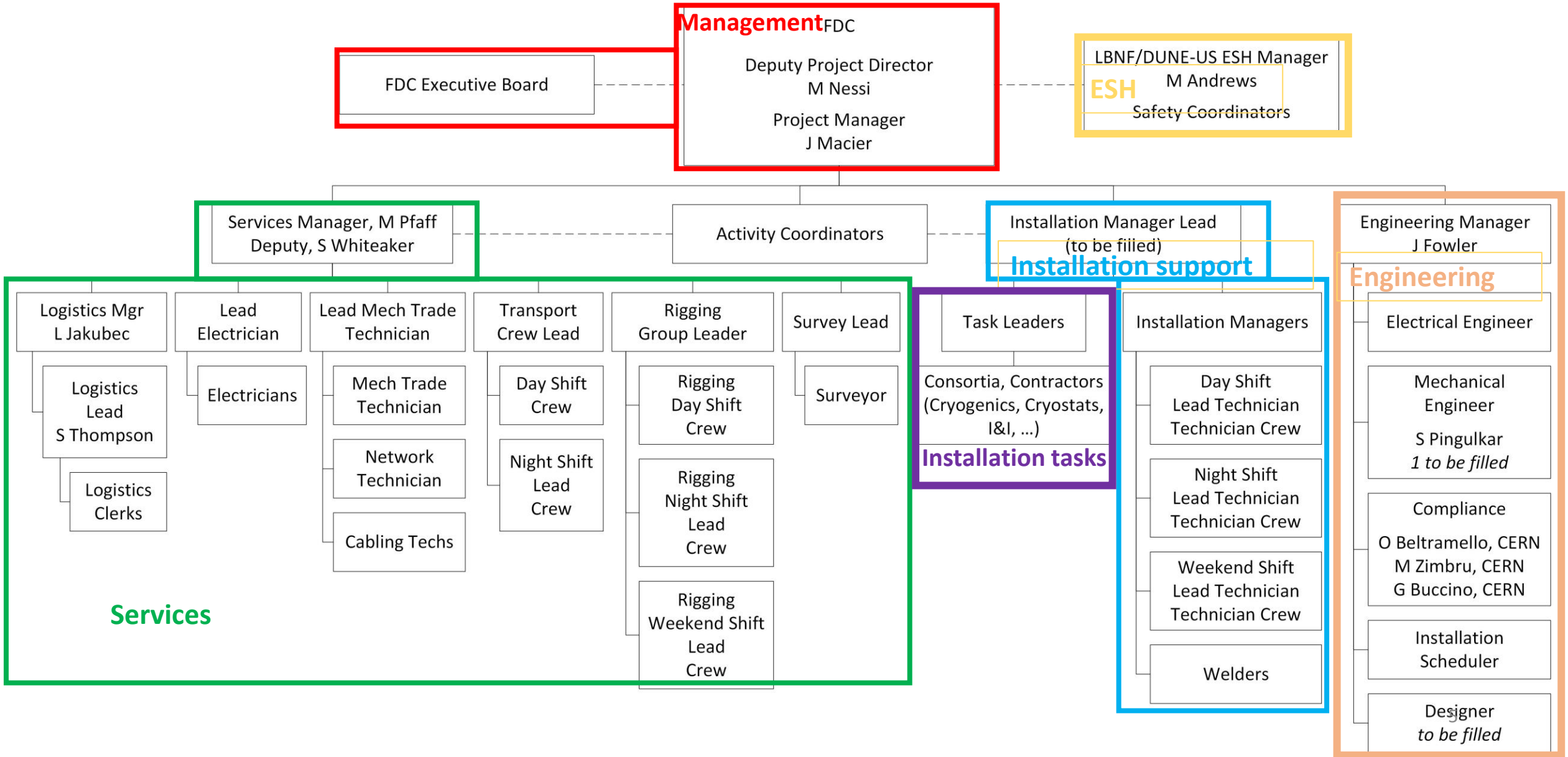
- Project Organization hosting the various tasks
- LBNF/DUNE logistic
- Material delivery and surface storage
- Our support and services
- Access to the Lab on surface and underground

FDC = LBNF/DUNE Far Detector project
SURF = Laboratory at Lead (SD)
FNAL = Fermilab Host Laboratory
DOE = US department of Energy
SDSTA = SURF Lab organization
LBNF = Project Facility
DUNE = Neutrino physics experiment
DPD = FDC Project Director
PM = FDC Project Manager
ESH = Safety
Ross Shaft = Shaft to access underground
4850= Level in feet underground of LBNF
4910= Level of the floor of the det. cavern

FDC Organization and support personnel



FDC Organization and support personnel



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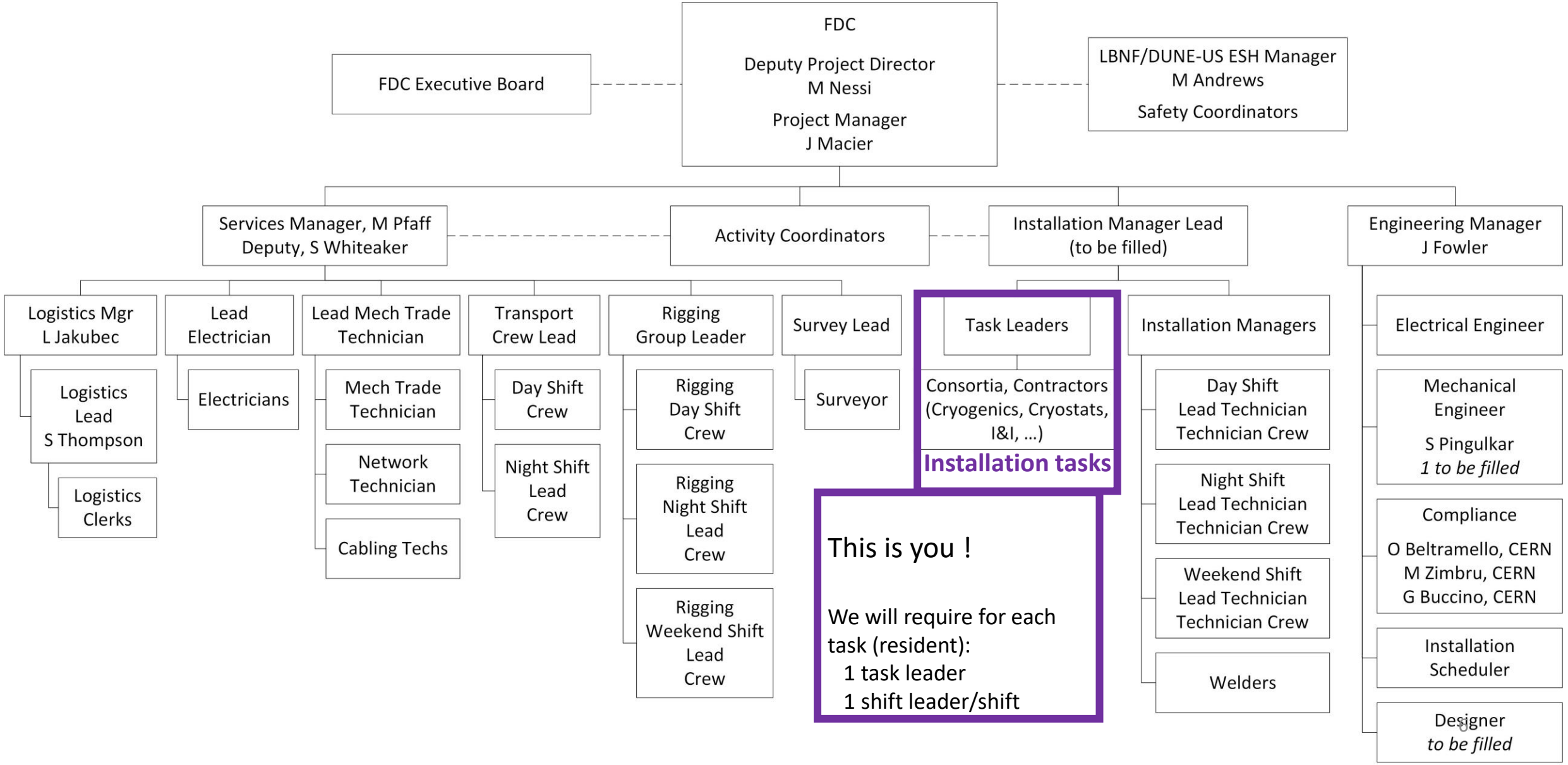
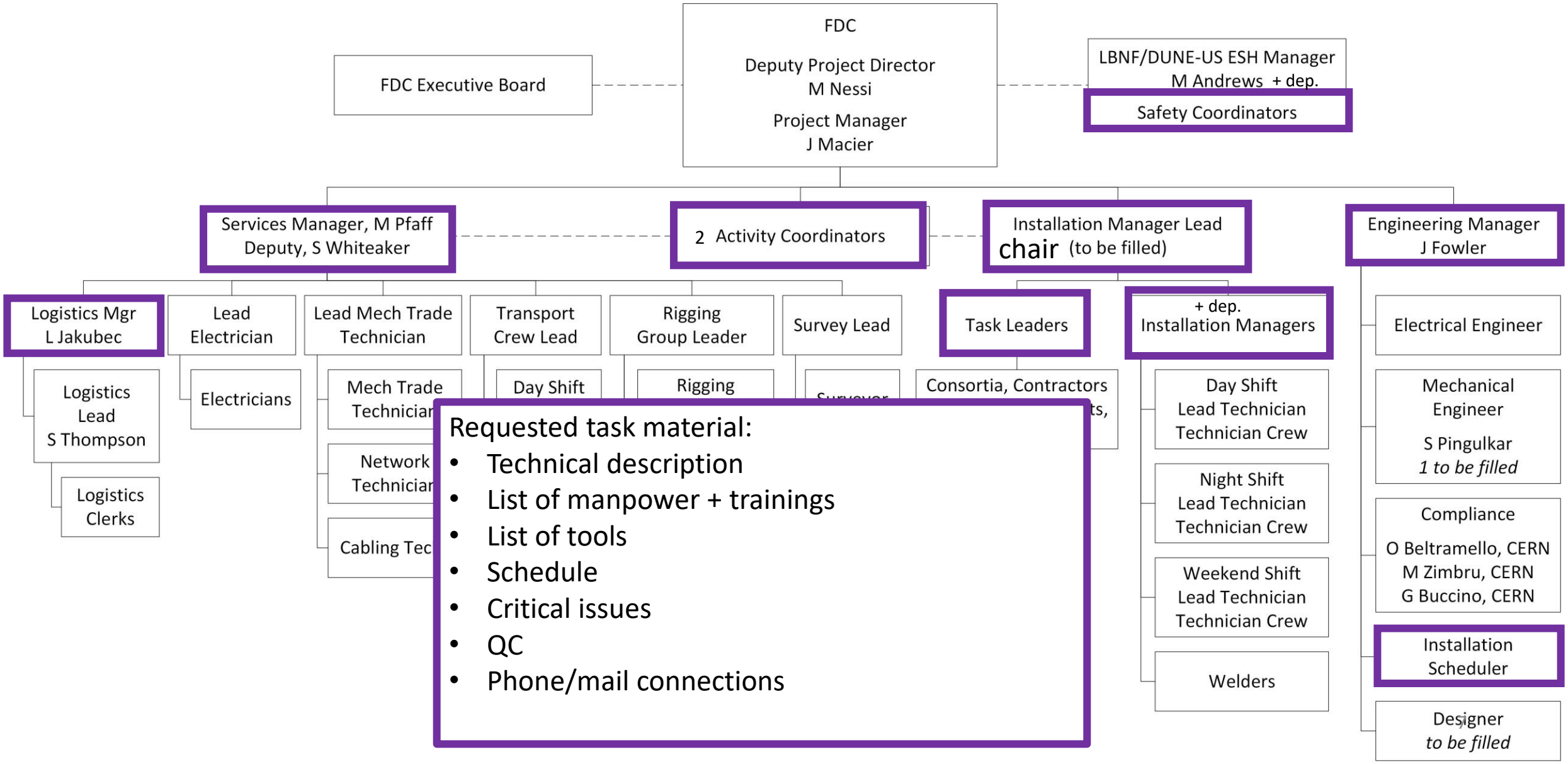


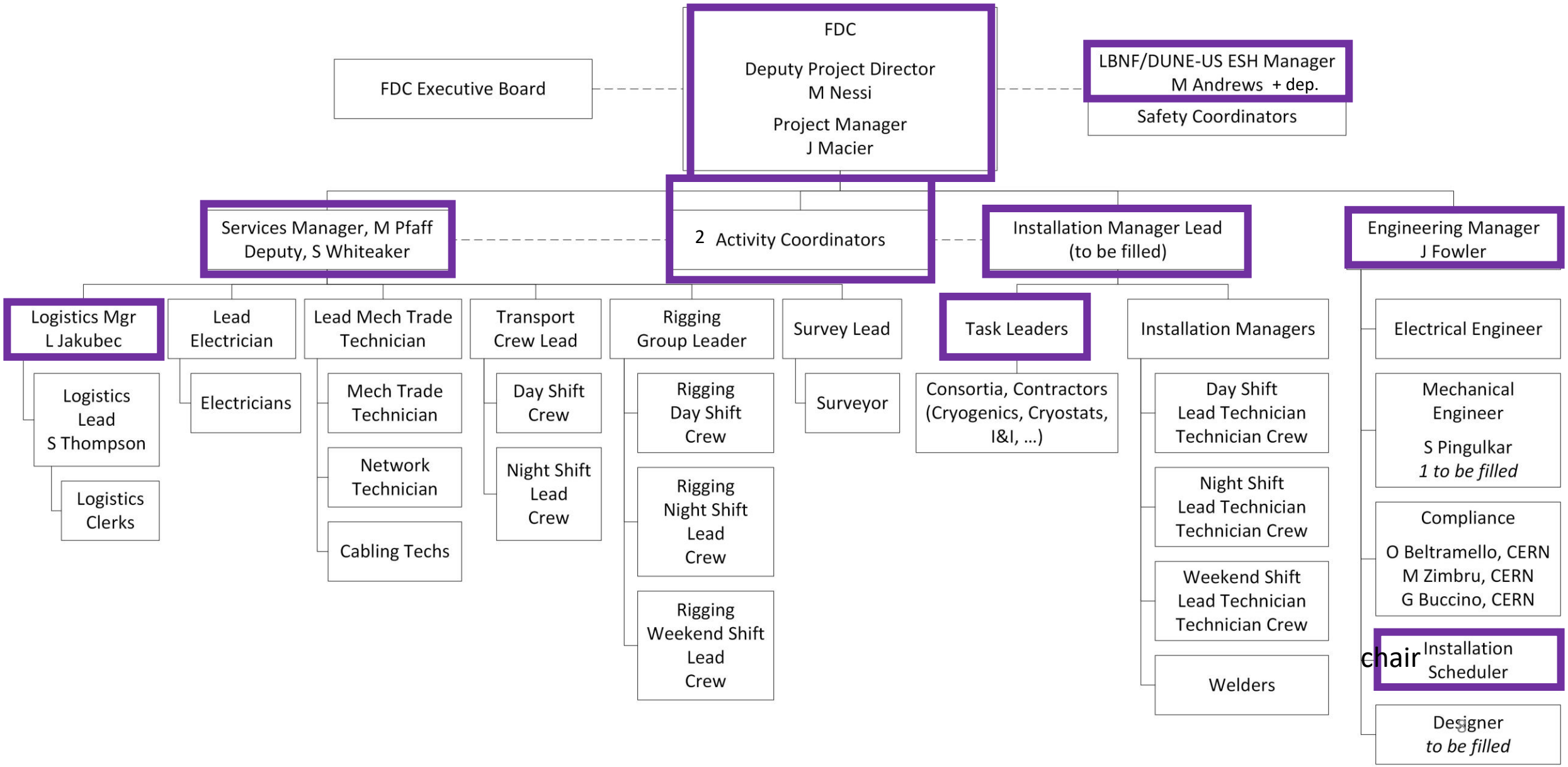
Each task will have to be presented and described in writing and analyzed by these people and can start only when the Installation Manager has sign it



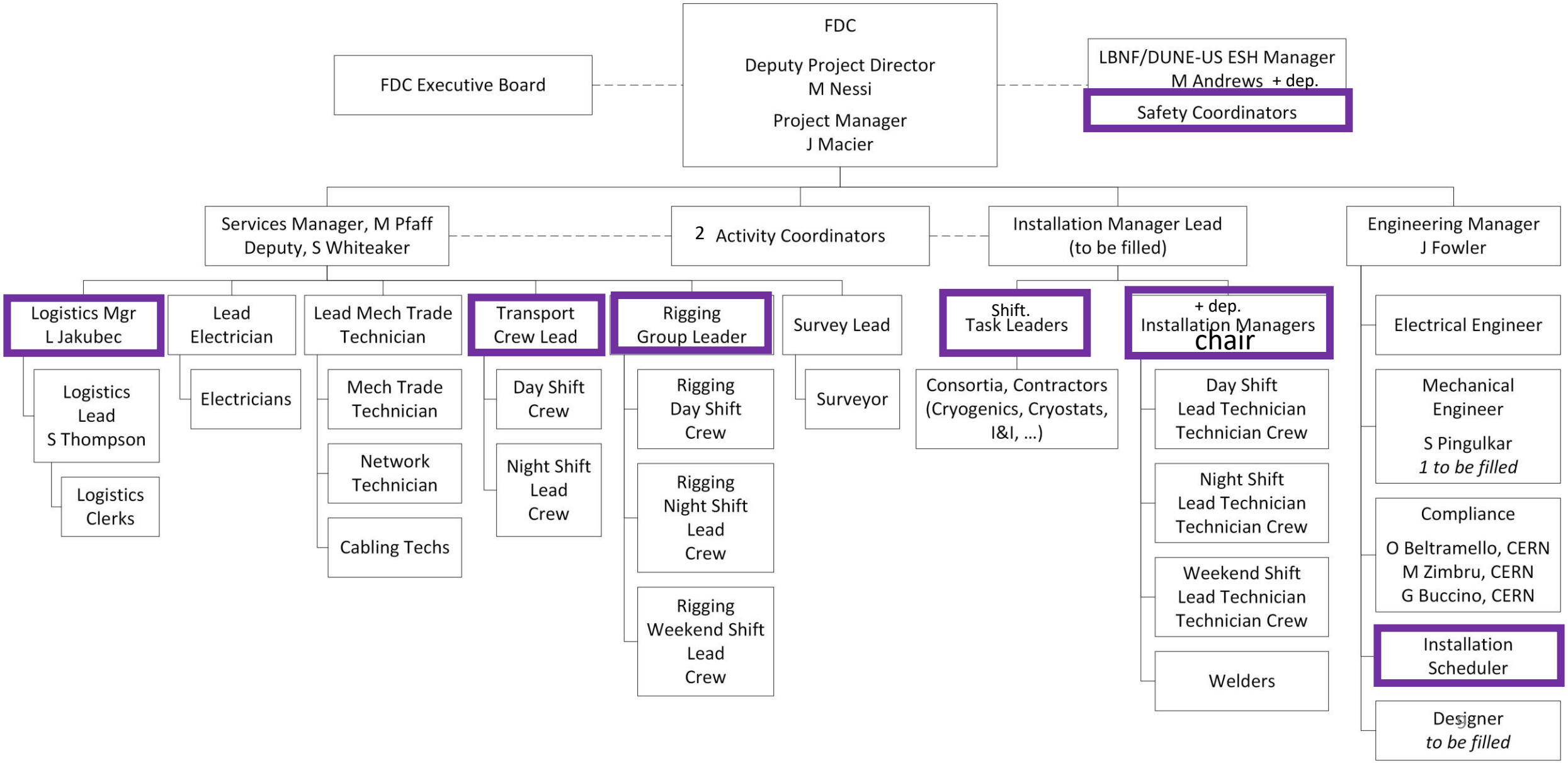
Requested task material:

- Technical description
- List of manpower + trainings
- List of tools
- Schedule
- Critical issues
- QC
- Phone/mail connections

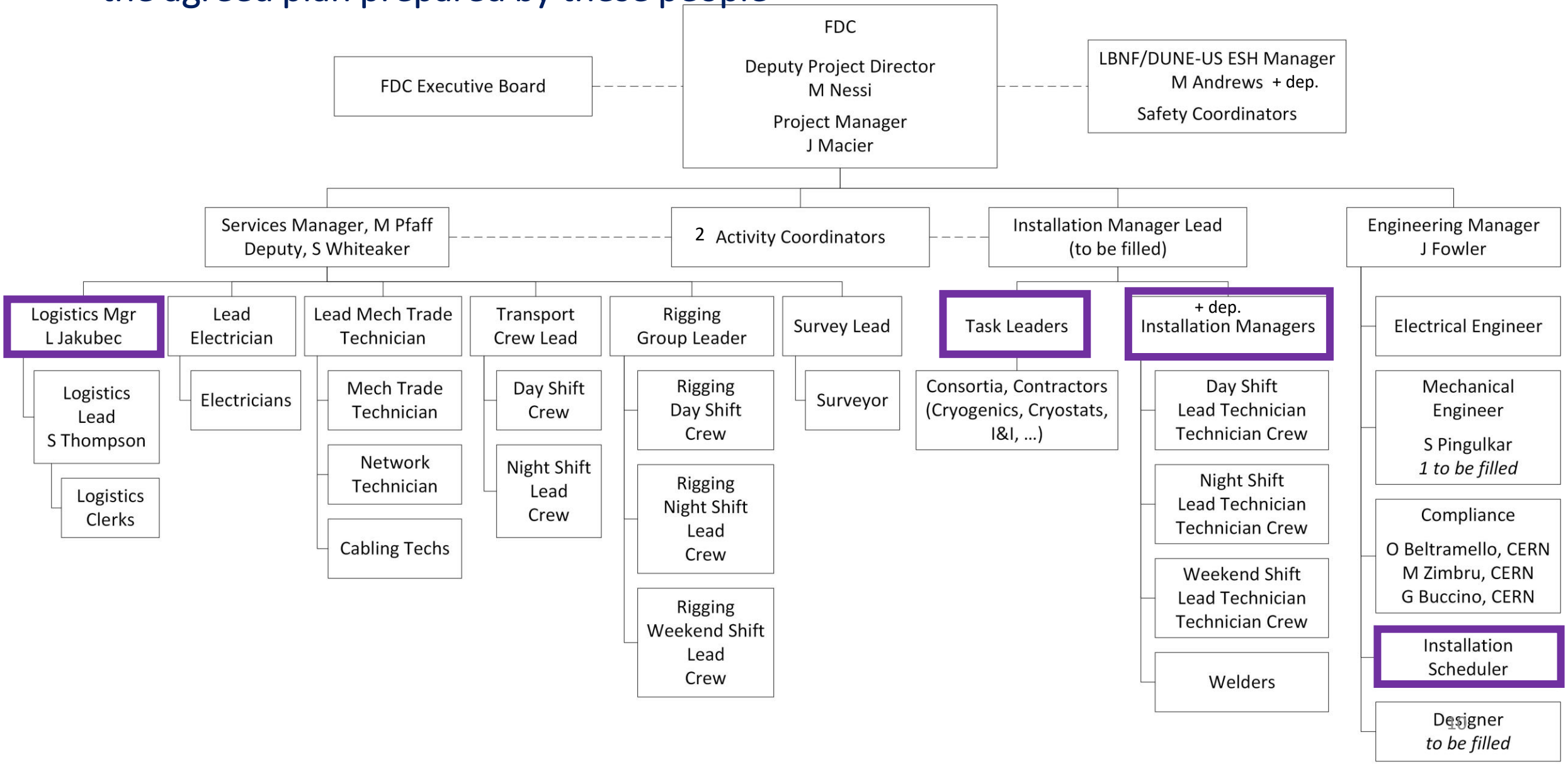
We expect these people to meet once per week to define the plans for the next two weeks and to raise problems and solutions



We expect these people to meet during the morning/evening shift overlap to verify the work to be done in the next 2 days and the requested services

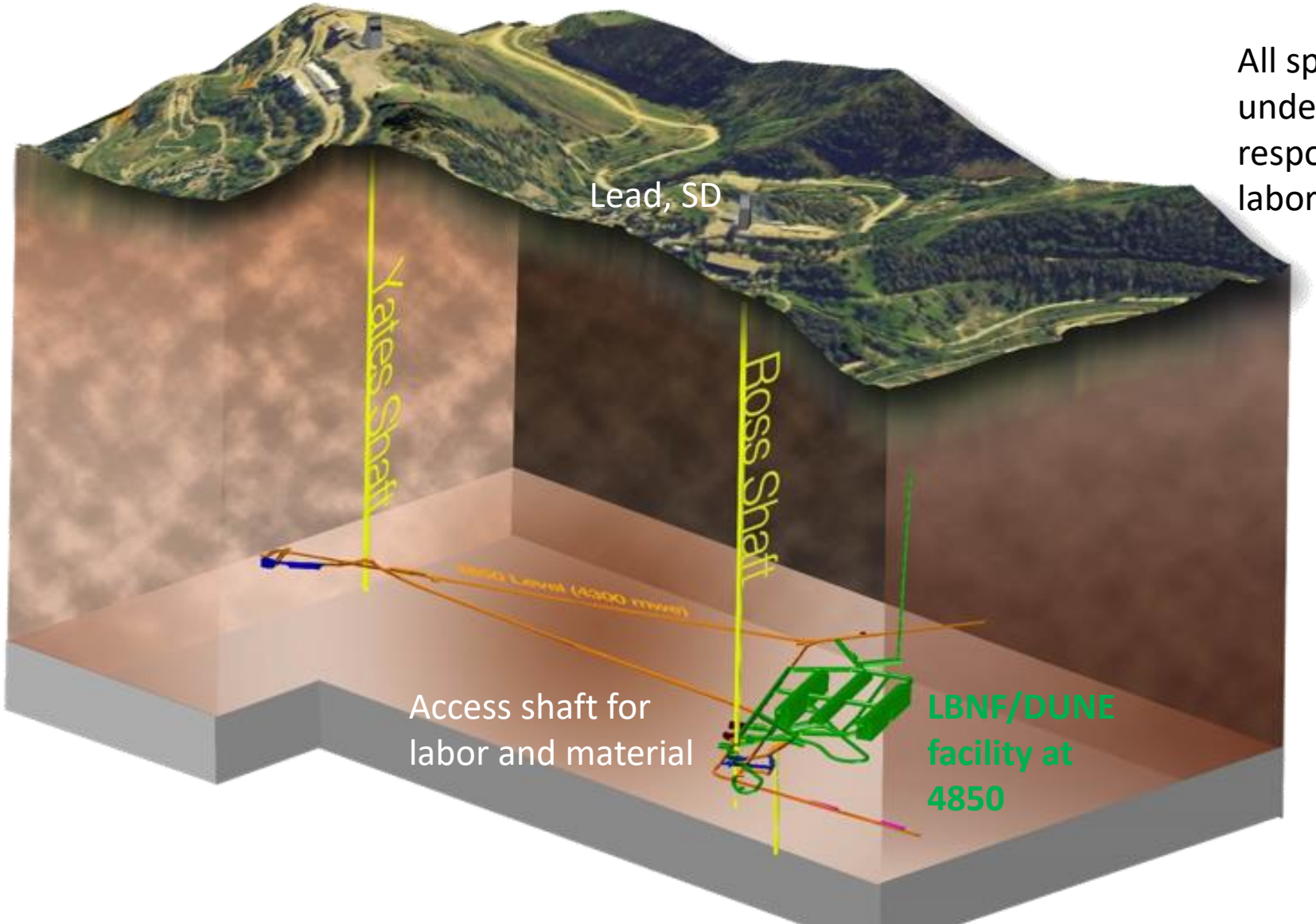


Material transfer requests from the surface storages must be presented to the Logistic Manager one week before it is needed. Plan to refill the buffer zone should be part of the agreed plan prepared by these people



More details in : edms-2777646

Logistic at SURF



FDC access at the Ross shaft

All space on surface and underground is on the responsibility of SDSTA, FDC labor is just allow to transit

All FDC tasks are taken place in FNAL leased space where FDC activities are allowed

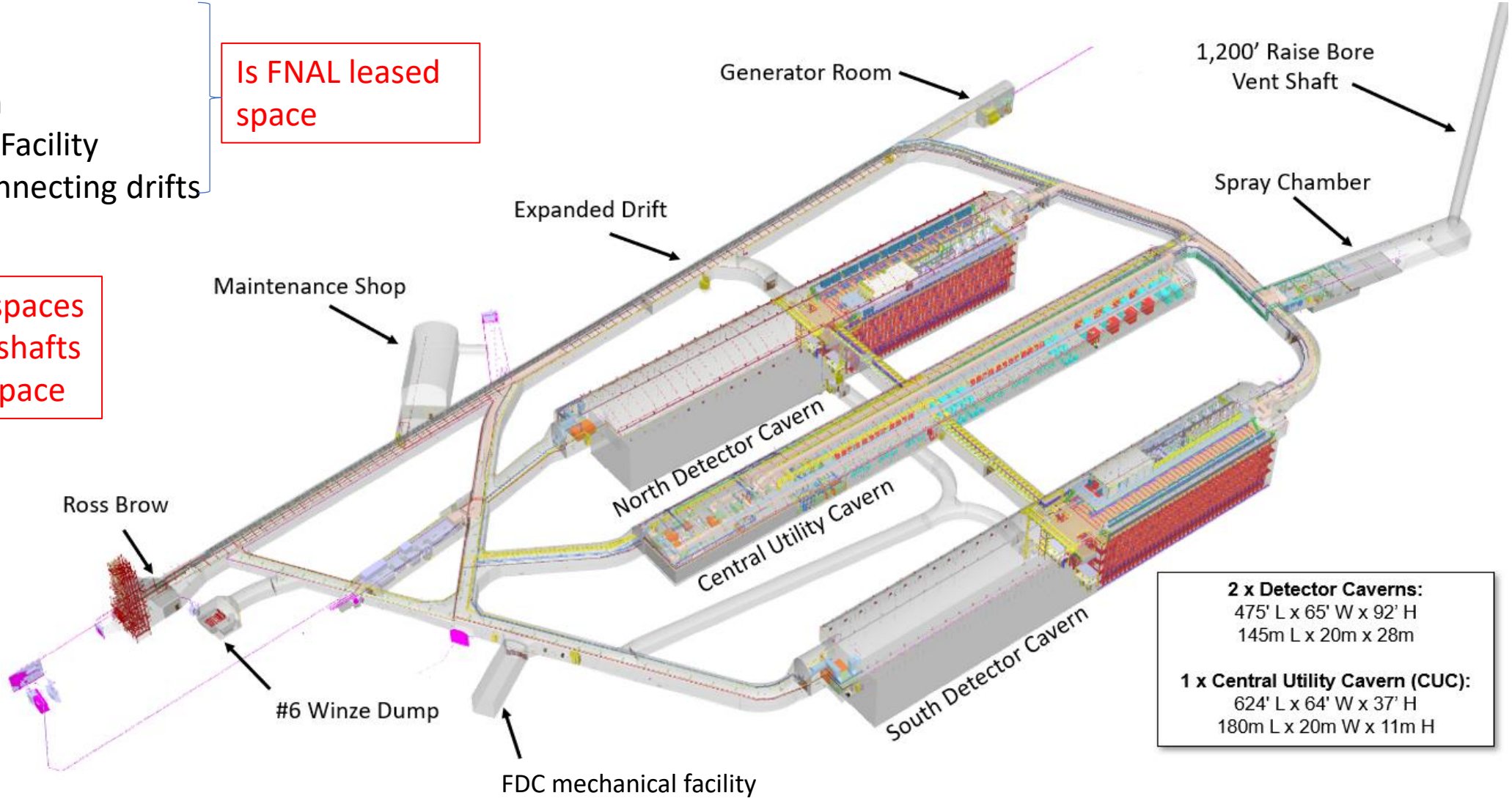
Logistics underground

All access to SDSTA space is controlled
All access to the FNAL leased space is controlled

N-cavern
S-cavern
CUC cavern
FDC mech. Facility
Caverns connecting drifts

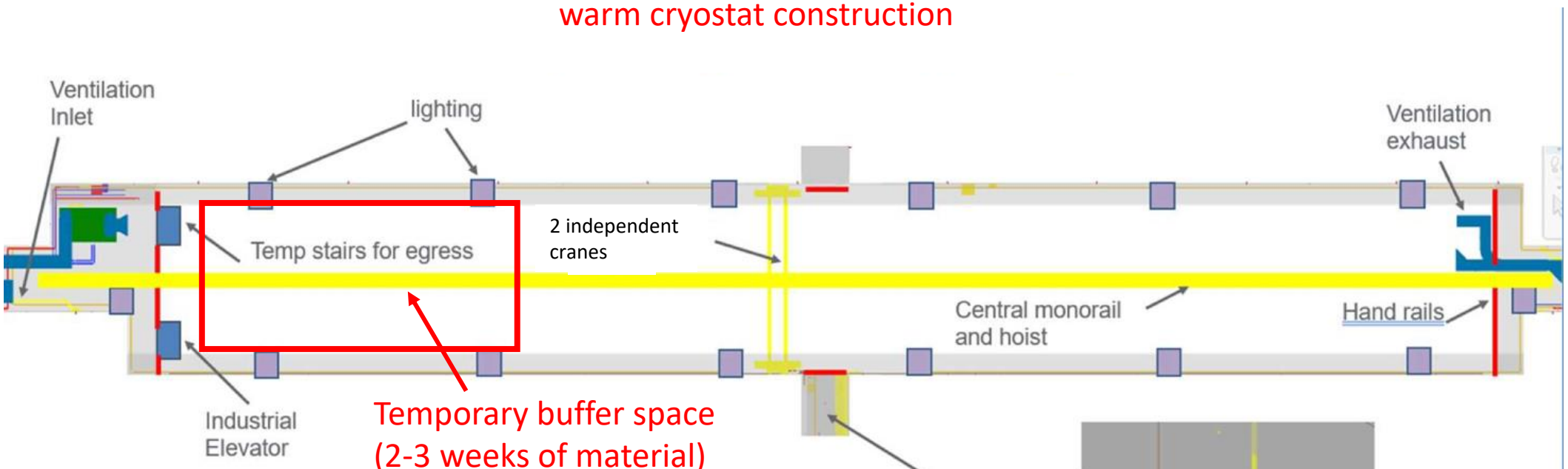
Is FNAL leased space

All other spaces including shafts is SDSTA space



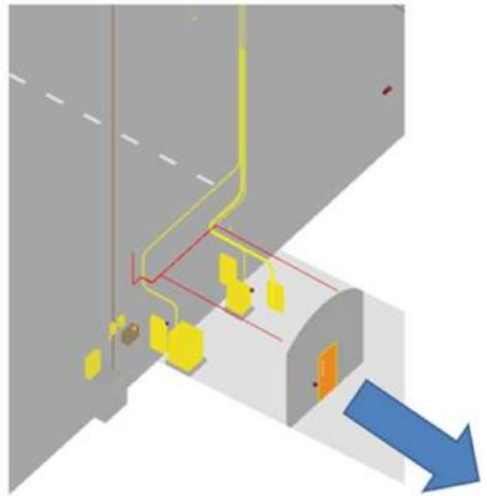
N-Cavern ready for cryostat construction

Once AUP of this cavern then we are alone inside for the warm cryostat construction



- *Ventilation inlet and exhaust (temp for extended period)*
- *Cranes and central hoist*
- *Temp stairs*
- *Industrial elevator*
- *Hand rails at cavern ends*
- *Lighting*
- *4910 Alcove instrumented + secondary egress*

4910 Alcove where the power panels are located for distribution and a secondary egress path for evacuation



Material delivery and surface storage

- All material needed for the installation, including the necessary tools is expected to arrive to the FDC storage area at least 3 months before it is needed for the installation
- FDC will provide from May 2024 a layout yard in SD where steel material can be stored
- FDC logistics office will help and advice for all tax and custom formalities
- When the material arrives, with an agreed procedure (visual inspection, delivery of the related material QC results, list of non conformities, ….) the property of the material will be transferred to DOE after a signature from both parties
- FDC following the requests by the FDC logistics manager, will transport the requested material to the Ross Shaft when is necessary
- FDC will via SDSTA move the material underground and will bring it to the cavern at the 4850 level
- FDC crane drivers and rigging manpower will store the material in the floor of the cavern, in agreement with the concept of a temporary buffer zone or on a special request of the installation team

Our services to you

- material transport to the caverns (4910 level)
- 3 crane drivers/riggers per crane per shift
- 1 rigging group leader
- a survey team (1 leader + 1 surveyor) on demand (to be planned)
- a mechanical intervention team (24/7) (4 technicians)
- an electrical intervention team (24/7) (4 technicians)
- a team of cabling technicians
- a network technician

Organized by the Project

- Training
- drinking water distribution underground
- waste disposal
- restroom and janitorial services
- medical support facility (on surface)
- Intervention team for health problems
- user office, badging facility (on surface)
- help to find housing, offices

Organized by FNAL as Host Laboratory

Our technical teams

- transport team through the shaft (via SDSTA personnel)
- transport team from the bottom of the shaft to the caverns
- 1 installation manager underground / shift
- 1 safety coordinator underground / shift
- a team of technicians (mostly mechanical) / shift, assigned to support particular activities

    - Our QC verification
    - Orphans jobs
    - Support to detector installation activities
    - Installation of infrastructure (on top of the cryostat, below the floor of the cryostat)
    - Special requests
    - …..

Organized by the Project

the amount of people in such teams will evolve with time

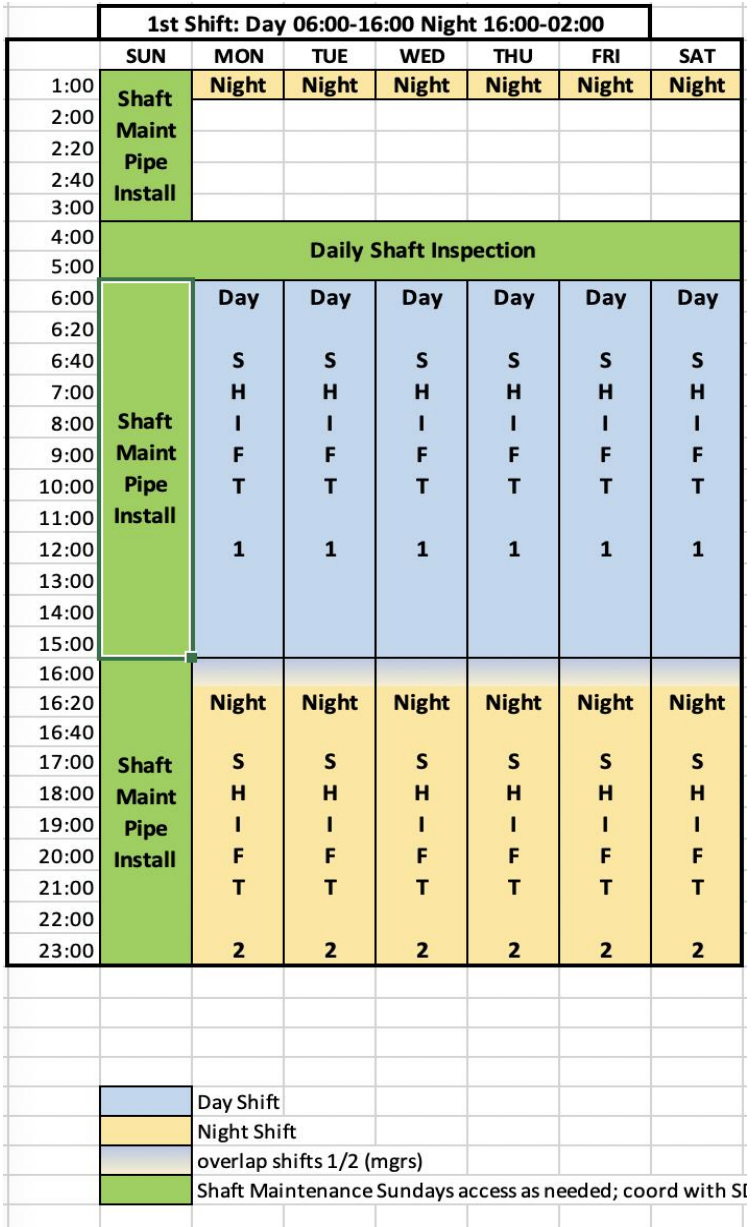
Common tools provided by the project

- temporary power on request
- temporary lights
- temporary stairs to 4910
- industrial elevator to 4910
- Rigging tools and equipment
  - Over Head Cavern cranes, straps, chains, etc.
- Fork lifts
  - Surface, 4850ft level for material movement
- Lifts
  - Scissor lifts, various heights (25’ to 47’/7.5m-14.5m)
  - Articulated lift (82’/ 25m)
- Transport carts/material moving devices
- Refuse compactor

Organized by the Project

needs to be specified by the contractor

Shifts and off days schedule



	1st Shift: Day 06:00-16:00 Night 16:00-02:00						
	SUN	MON	TUE	WED	THU	FRI	SAT
1:00	Shaft Maint Pipe Install	Night	Night	Night	Night	Night	Night
2:00							
2:20							
2:40							
3:00							
4:00	Daily Shaft Inspection						
5:00							
6:00	Shaft Maint Pipe Install	Day	Day	Day	Day	Day	Day
6:20							
6:40		S	S	S	S	S	S
7:00		H	H	H	H	H	H
8:00		I	I	I	I	I	I
9:00		F	F	F	F	F	F
10:00		T	T	T	T	T	T
11:00							
12:00		1	1	1	1	1	1
13:00							
14:00							
15:00							
16:00							
16:20	Shaft Maint Pipe Install	Night	Night	Night	Night	Night	Night
16:40							
17:00		S	S	S	S	S	S
18:00		H	H	H	H	H	H
19:00		I	I	I	I	I	I
20:00		F	F	F	F	F	F
21:00		T	T	T	T	T	T
22:00							
23:00		2	2	2	2	2	2

Day Shift
Night Shift
overlap shifts 1/2 (mgrs)
Shaft Maintenance Sundays access as needed; coord with SI

- We plan to work 2 shifts per day
- 10 hours shifts
- Mon, Tue. Wed, Thu = 40 h/w
- Fri and Sat shifts can be organized
- Sun shifts are on special demand (SDSTA maintenance period)

Different shifts periods can be discussed ! (ex. 6 days x 12h/day)

It should be part of the answer you give to the CERN tendering process!!

SURF ACCESS

The SURF site is closed for major holiday and no installation activities shall occur, unlessspecifically approved by the FRA Installation Coordinator, on these days:

1. New Year's Day – January 1st
2. Dr. Martin Luther King Jr. Day – 1st Monday after January 15th
3. President's Day – 3rd Monday in February
4. Memorial Day – Last Monday in May
5. Independence Day – July 4th
6. Labor Day – 1st Monday in September
7. Native American Day – 2nd Monday in October
8. Veterans Day – November 11th
9. Thanksgiving Day – 4th Thursday in November
10. Day After Thanksgiving – Friday after Thanksgiving 11.
11. Christmas Eve (1/2 Day) – December 24th
12. Christmas Day – December 25th
13. New Year's Eve (1/2 Day) – December 31st
14. Plus, any administrative holidays proclaimed by the Governor of South Dakota(typically, days before or after official holidays leading into or out of weekends)

If any of these holidays occur on a weekend day, a weekday will be used for the holiday.

Seven (7) weather closures days (14 shifts) shall be planned for per calendar year limiting all site access.

Thirty (30) days of inclement weather shall be planned for per calendar year impacting work at the surface.

Access to the Lab on surface and underground

- People can access the lab just if the have a valid FNAL ID and badge
- Badging activities will be organized by FNAL at SURF
- Safety trainings will be centrally organized
- List of individual PPEs will be presented by M. Andrews
- Safety Organization see presentation by M. Andrews