Fermilab | U.S. DEPARTMENT OF ENERGY | Office of Science

# Introduction to Neutrino Beam Instrumentation: Cost and Schedule

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Neutrino Beam Instrumentation Preliminary Design Review

11 May – 12 May 2022

# Outline

- Agenda and charge
- Overview of NBI and where it sits in LBNF
- Schedule and Cost for NBI
- Review Committee is encouraged to ask questions anytime
- After each technical talk there is 15 minutes for discussion
- Entire review is being done via Zoom
  - Please turn off video to save bandwidth
  - Please keep muted when you are not talking

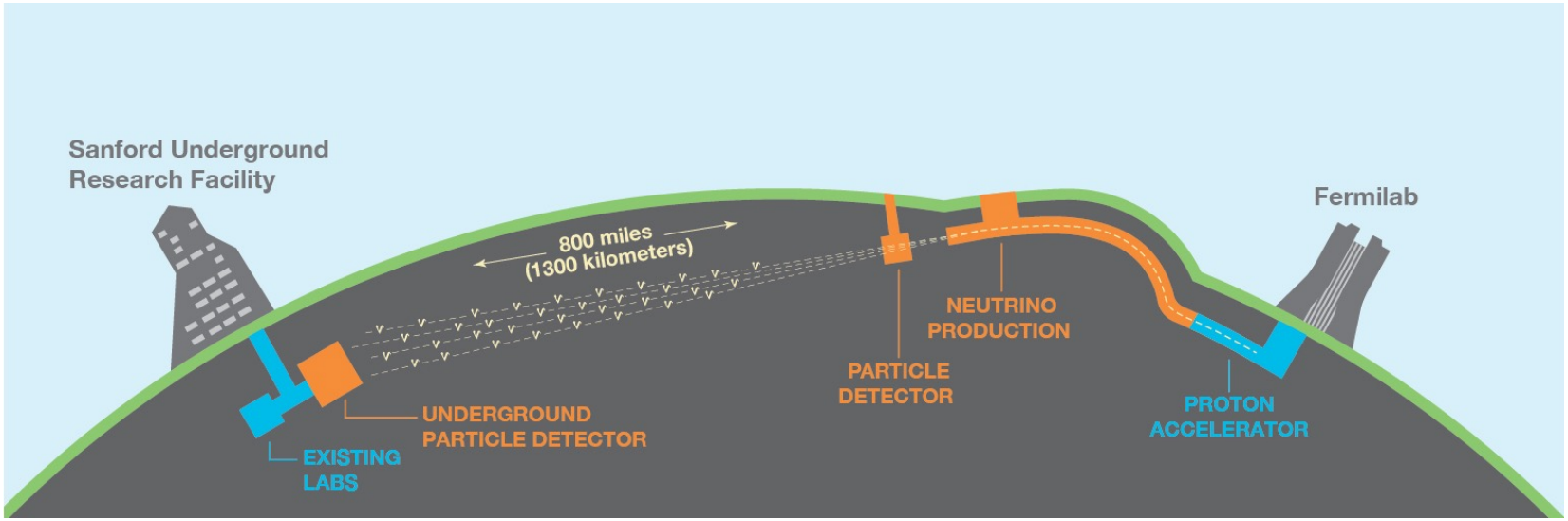
# Agenda

- Introduction talks
  - General overview
  - NBI specific requirements, ES&H concerns
- Detector Talks
  - Crosshairs/TPT (Target Hall)
  - HLS (Target Hall)
  - HADeS/MuMS (Absorber Hall)

# Charge

1. Does the NBI preliminary design meet the functional requirements identified?
2. Is the design maturity presented for the NBI, interfaces, and ancillary systems at a level appropriate for a Preliminary Design?
    a. Based on acceptable progress for a Preliminary Design to be 50 to 70% complete, with 100% meaning ready for procurement.
    b. Are areas where components are awaiting forthcoming development well understood?
3. Have suitable engineering analyses been performed and documented, and reviewed/peer reviewed and approved, where applicable?
4. Are the appropriate codes and standards adequately applied to the design?
5. Are there any significant ES&H issues been identified and analyzed appropriately?
6. Have potential design, manufacturing, and installation risks and challenges been identified within the scope of work, and has it been adequately planned to address these during the final design? Are difficult design features and possible prototyping issues identified?
7. Is the level of integration with other LBNF beamline entities appropriate for this stage of the work?
8. Are there any issues concerning the schedule for the NBI?

# DUNE & LBNF

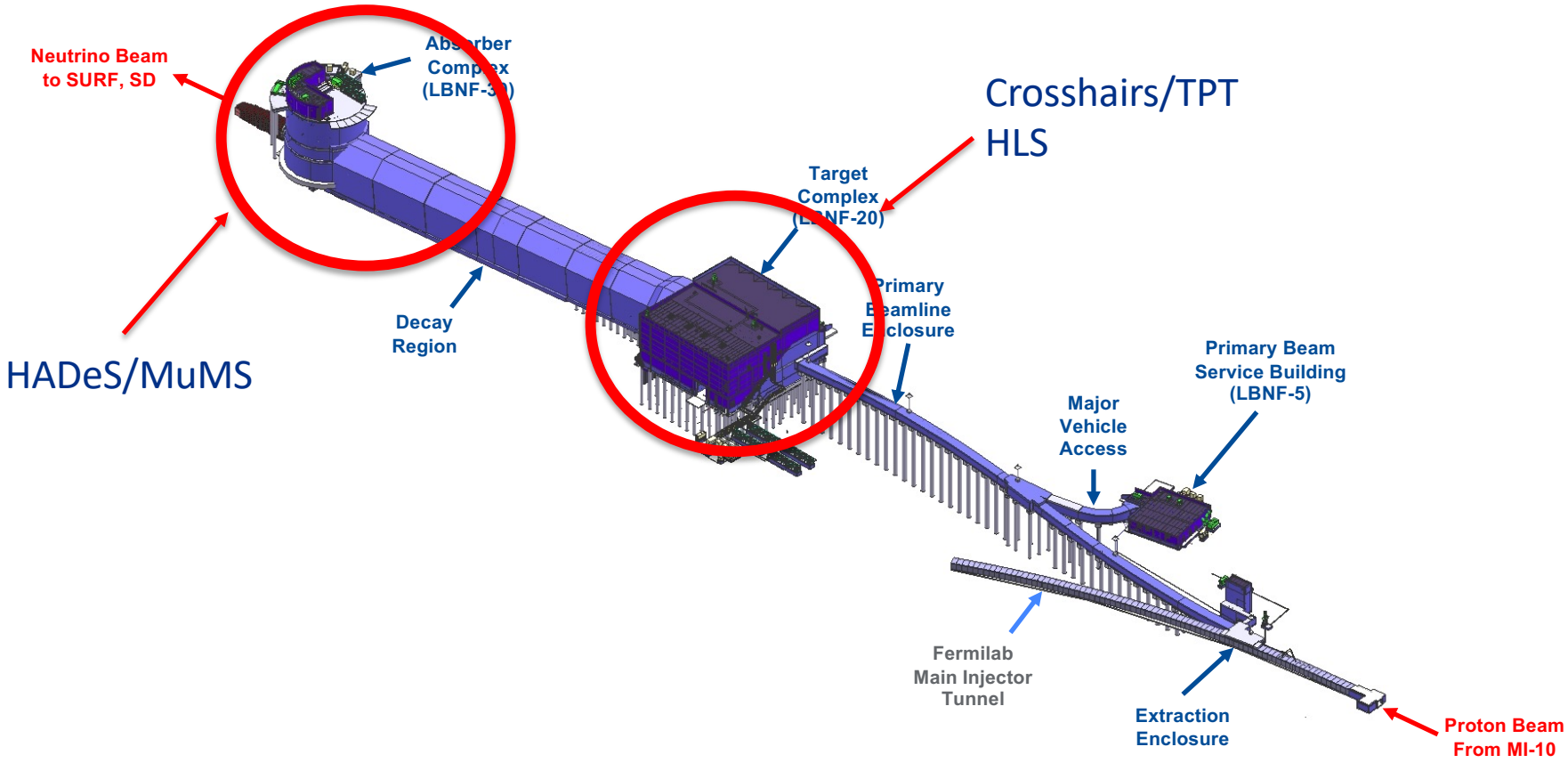



**The Deep Underground Neutrino Experiment will be a world-leading experiment for neutrino science, potentially transforming our understanding of why the universe exists as it does.**

**The Long-Baseline Neutrino Facility is the infrastructure necessary to send a powerful beam of neutrinos 800 miles through the earth, and measure them deep underground at South Dakota's Sanford Underground Research Facility.**

**DUNE/LBNF project will be the first internationally conceived, constructed, and operated mega-science project hosted by the DOE in the U.S.**

# LBNF Beamline



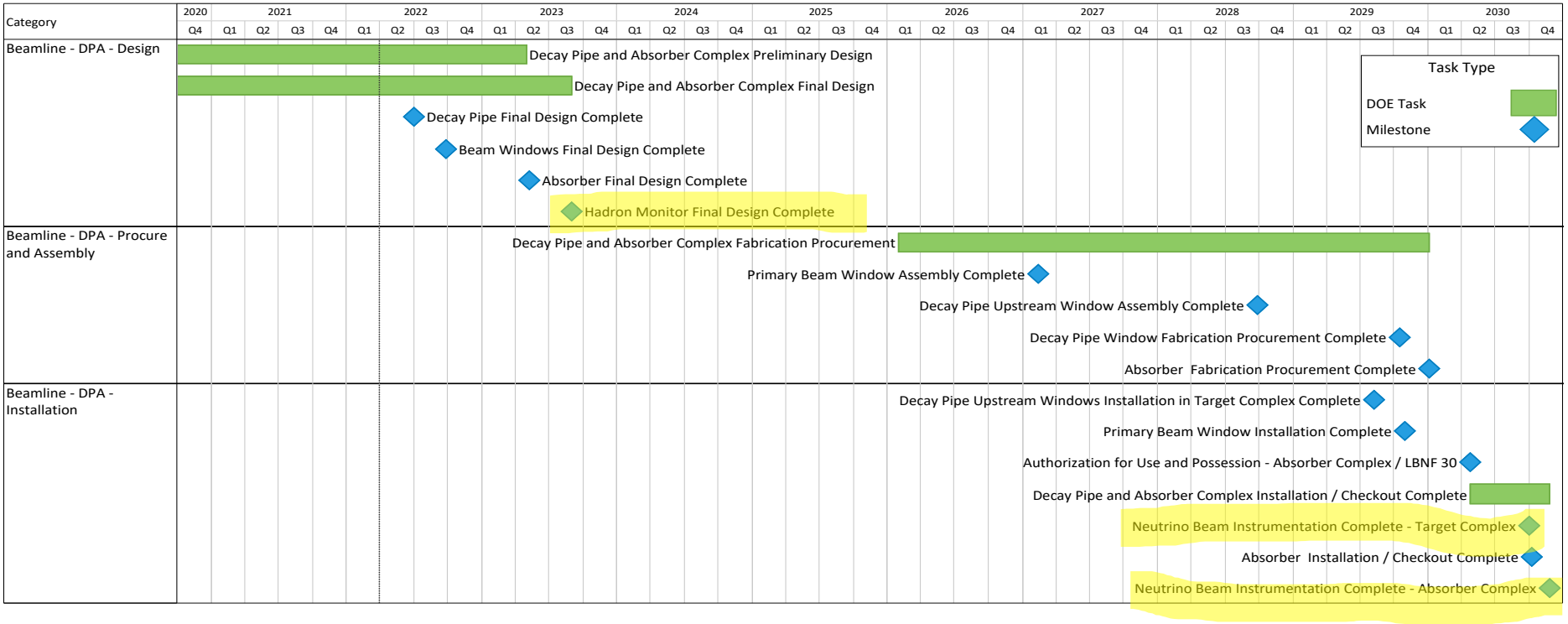

5/11/22

# Intro to Neutrino Beam Instrumentation

- Used for beam-based alignment and monitoring neutrino beam
  - More information in Jon's talk
- Consists of the following systems
  - Target Hall: Crosshairs/TPT, HLS
  - Absorber Hall: HADeS/MuMS

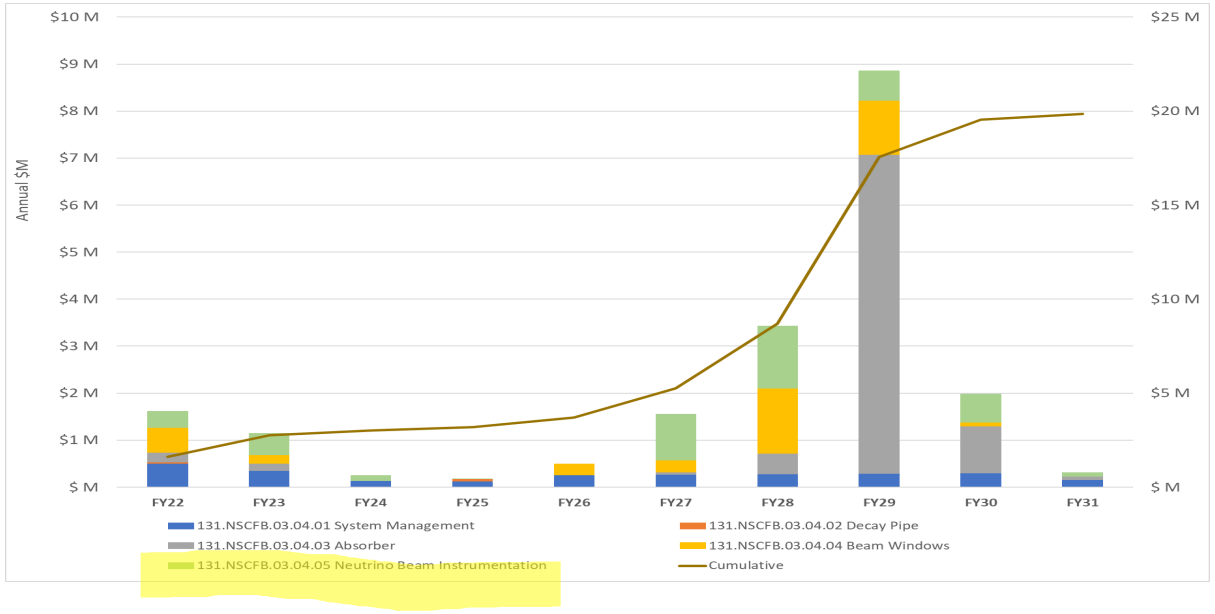
# Schedule

## Decay Pipe & Absorber Complex Summary Schedule



# Cost

| WBS | Actuals thru Mar-22 | Budget-at-completion (BAC) | Estimate-to-completion (ETC) | Contingency (EUC) | Contingency % on ETC | Total Cost |
|---|---|---|---|---|---|---|
| 131.NSCFB.03.04.01 System Management | $.5 M | $3.1 M | $2.3 M | $.3 M | 12% | $3.1 M |
| 131.NSCFB.03.04.02 Decay Pipe | $.1 M | $.2 M | $.1 M | $.03 M | 34% | $.2 M |
| 131.NSCFB.03.04.03 Absorber | $.8 M | $9.6 M | $8.7 M | $3.5 M | 41% | $13.0 M |
| 131.NSCFB.03.04.04 Beam Windows | $.9 M | $4.3 M | $3.8 M | $1.5 M | 41% | $6.2 M |
| 131.NSCFB.03.04.05 Neutrino Beam Instrumentation | $.3 M | $5.7 M | $4.7 M | $1.8 M | 39% | $6.8 M |
| **Total** | **$2 M** | **$23 M** | **$20 M** | **$7 M** | **37%** | **$29 M** |



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# Next Steps

- Series of technical talks the rest of today
- Question and Answer session tomorrow morning
- Closeout around 11:30
  - Present in the Finding/Comment/Recommendation format