

# What is needed for CD-1?

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# Why this question?

- DOE OHEP has prepared the “in house” documentation requesting CD-0 (Mission Need) for a Long Baseline Neutrino Experiment (LBNE)
- This documentation has not been made public yet
  - It proposes that the project will include a new neutrino beam aimed from Fermilab to DUSEL
  - It should cost in the range of \$300M - \$400M....
- When CD-0 is approved we move from the *Project Initiation Phase* to the *Project Definition Phase*
- We have been charged by the DOE to prepare a plan for achieving CD-1
  - Time scale : 1 – 2 years (max)
- We have not been asked to produce a beam design (yet)
- The first design we will need to produce is a **Conceptual Design**
  - This is achieved by defining requirements and evaluating alternatives

# On-going Activities

- DBWG at FNAL
  - Primarily NuMI “Lessons Learned”
  - Some discussions started for the new beam (Mary)
- Project Establishment
  - CD-1 Plan for Pier (Gina, Dec.08)
  - FY09 Budget
    - Plans for engineering
  - MOUs, SOWs, etc.
  - CD-1 Plan for DOE (Gina,et. al.,Mar 09)

Once plan is approved,  
need to transition from DBWG presentation format to real work “on-project”

# The “Plan” to date : WBS

## 1.1 Technical Components

- 1.1.1 Primary Beam

- 1.1.2 Target Hall Components

- 1.1.3 Decay Tunnel and Absorber

- 1.1.4 Radiological Shielding and Control

- 1.1.5 Infrastructure and System Integration

## 1.2 Civil Construction

- 1.2.1 Site Preparation

- 1.2.2 Tunnels and Halls

- 1.2.3 Service Buildings and Outfitting

## 1.3 Beam Instrumentation and Near Detector

- 1.3.1 Specification and Design

- 1.3.2 Construction

- 1.3.3 Installation

*See separate document that is in preparation*

# Defining Requirements

- Technical
  - Interfaces with other project choices
- Constructability
  - Cost
  - Schedule
- Operational
  - Safety
  - Lifetime Cost

# Evaluating Alternatives

- Given an option to solve a particular problem, evaluate impacts on :
  - Technical performance – physics results
  - Long term operations
  - Cost & construction schedule
- Pick one, as the “most preferable” for one of the reasons, then compare the other options to it
- Pick a criteria for making a “choice” for moving forward to develop a preliminary cost and schedule ; other options can be used to assign a contingency

# Alternatives To Date

- Primary beam energy
  - 60 – 120 GeV
- Target Hall depth and z-location
  - Rock cover, avoiding existing facility components
- Target Hall
  - Space for component handling
- Target/Horn configurations
- Beam plug
- Decay pipe length

# Remember

- Multi-dimensional, multi-parameter problem
- Needs to be solved by iteration
- Engineering studies need to be chosen carefully – they cost real money

# What CD-1 is *not*

- CD-0 to CD-1 is NOT the detailed design phase
- CD-1 should be achieved with modest expenditures on engineering studies
  - Range of options needs to be explored
  - Concepts should be plausible
  - *Models* for costing should be chosen
    - It doesn't mean that is the final solution or design choice
  - Different aspects of the project planning need to proceed in parallel
    - Broad brush rather than narrow consideration of specifics