

# **NOvA in the DOE Project Process**

by

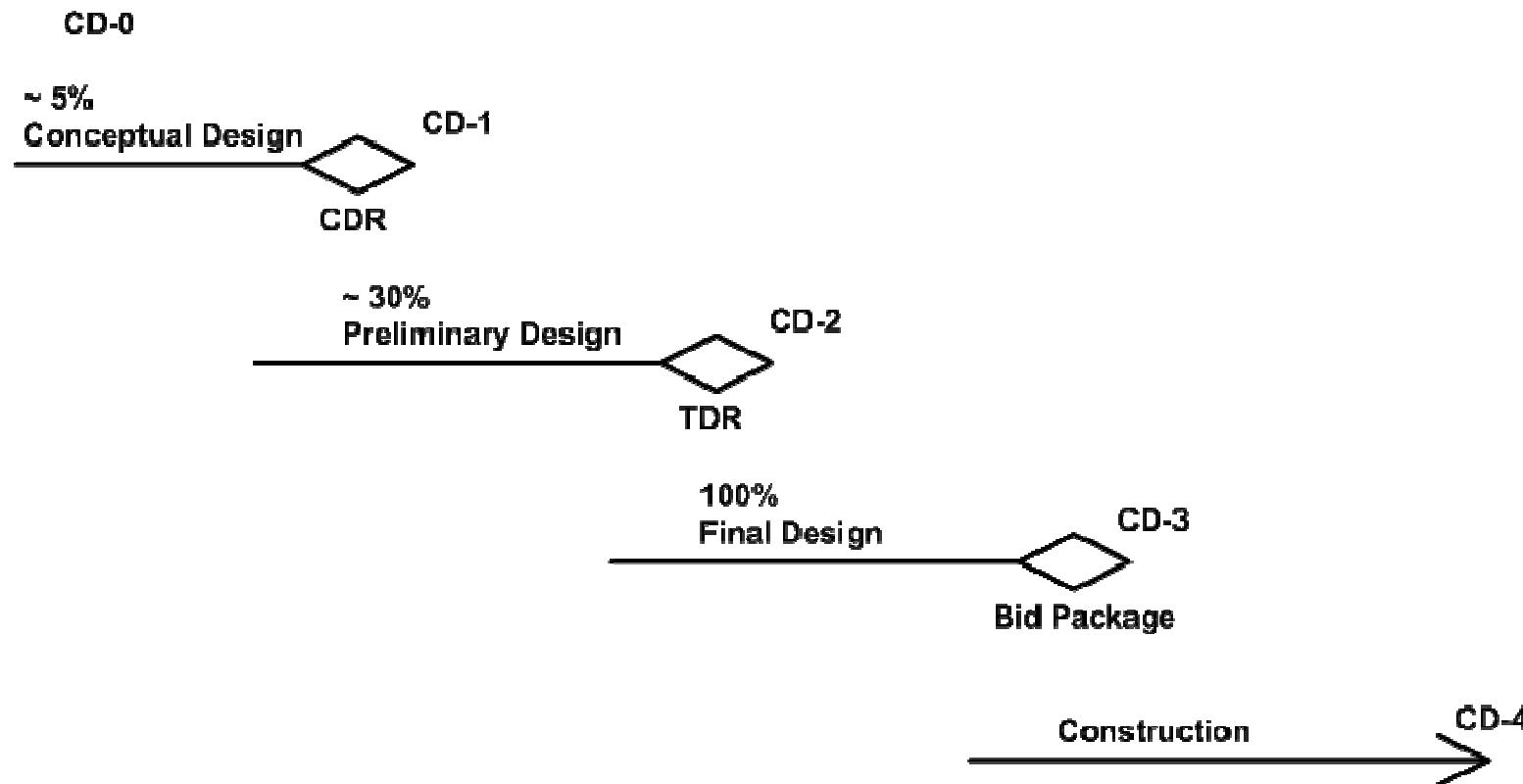
**Ed Temple**

NOvA Collaboration Meeting  
May 5, 2005

# Outline

- Project Phases
- Project Acquisition Process and Critical Decisions
- DOE Order 413.3; Manual & Guide
- Conceptual Design
- Possible NOvA Schedule
- Preliminary Director's Review of NOvA
- Next Steps

# Project Design Phases with DOE “Critical Decision” Overlay



# Project Acquisition Process and Critical Decisions

PROJECT ACQUISITION PROCESS AND CRITICAL DECISIONS					
Project Planning Phase		Project Execution Phase			Mission
Preconceptual Planning	Conceptual Design	Preliminary Design	Final Design	Construction	Operations
• CD-0	• CD-1	• CD-2	• CD-3	• CD-4	
Approve Mission Need	Approve Preliminary Baseline Range	Approve Performance Baseline	Approve Start of Construction	Approve Start of Operations or Project Closeout	
<i>See Page 2 for CDs on Environmental Restoration and Facility Disposition Projects</i>					
CD-0	CD-1	CD-2	CD-3	CD-4	
Actions Authorized by Critical Decision Approval					
<ul style="list-style-type: none"> <li>Proceed with conceptual design using program funds</li> <li>Request PED funding</li> </ul>	<ul style="list-style-type: none"> <li>Allow expenditure of PED funds for design</li> </ul>	<ul style="list-style-type: none"> <li>Establish baseline budget for construction</li> <li>Continue design</li> <li>Request construction funding</li> </ul>	<ul style="list-style-type: none"> <li>Approve expenditure of funds for construction</li> </ul>	<ul style="list-style-type: none"> <li>Allow start of operations or project closeout</li> </ul>	
Critical Decision Prerequisites					
<ul style="list-style-type: none"> <li>Justification of mission need document</li> <li>Acquisition Strategy</li> <li>Preconceptual planning</li> <li>Mission Need Independent Project Review</li> </ul>	<ul style="list-style-type: none"> <li>Acquisition Plan</li> <li>Conceptual Design Report</li> <li>Preliminary Project Execution Plan and baseline range</li> <li>Project Data Sheet for design</li> <li>Verification of mission need</li> <li>Preliminary Hazard Analysis Report</li> </ul>	<ul style="list-style-type: none"> <li>Preliminary design</li> <li>Review of contractor project management system</li> <li>Final Project Execution Plan and performance baseline</li> <li>Independent cost estimate</li> <li>National Environmental Policy Act documentation</li> <li>Project Data Sheet for construction</li> <li>Draft Preliminary Safety Analysis Report</li> <li>Performance Baseline External Independent Review</li> </ul>	<ul style="list-style-type: none"> <li>Update Project Execution Plan and performance baseline</li> <li>Final design and procurement packages (**)</li> <li>Verification of mission need</li> <li>Budget and congressional authorization and appropriation enacted</li> <li>Approval of Safety documentation</li> <li>Execution Readiness Independent Review</li> </ul>	<ul style="list-style-type: none"> <li>Operational Readiness Review and acceptance report</li> <li>Project transition to operations report</li> <li>Final Safety Analysis Report</li> </ul>	<p>After CD-4</p> <p>Closeout</p> <ul style="list-style-type: none"> <li>Project closeout report</li> </ul>

(\*\*) To the degree appropriate to initiate construction as scheduled.

# Conceptual Design

DOE M 413.3

## 5.2.4 Conceptual Design Report

The Conceptual Design Report is developed during the conceptual exploration and design process when the outcome is envisioned as an asset that performs a specific function. When used in this Manual, the Conceptual Design Report refers to the documentation that identifies the requirements and concept for fulfilling those requirements. The Conceptual Design Report is often the first technical document produced during the acquisition process. It is a necessary element in decision making because it presents the results of analysis of requirements, risks, and alternatives to arrive at a recommended solution. The conceptual design or equivalent should clearly and concisely describe the recommended alternative, the requirements and functions that must be performed and the key performance parameters that form the basis of the Performance Baseline. When the purpose of the project is remediation, restoration, or demolishing, other forms of documenting the requirements and alternative(s) may be used.

Common elements of the report may include the following (and other items not listed) as necessary to support the transition from concept to design.

- A description of the recommended alternative (design or characterization) and a synopsis of the development activities. In remediation projects, the report is a combination of applicable regulations and characterization.
- A schedule and cost range (or rough order of magnitude cost) including resources necessary to complete the design and preparation activity. Including identified resources necessary for a Project Engineering Design budget request, when required.
- An alternatives analysis including life-cycle costs, operational considerations, site development considerations, relationships to other site activities, and the comparison of alternatives, the risks, and the determined preferred alternative. Life-cycle costs are to include decontamination and demolition, transition (personnel and equipment moves), utilities, and maintenance including comparisons that incorporate a review of research and development and/or technology development challenges presented by the selected alternative.
- A preliminary Safeguards and Security Plan
- Performance parameters that are responsive to the mission need
- A preliminary Project Execution Plan
- The summary test and acceptance criteria
- The Work Breakdown Structure, which identifies the elements of the end product and dictionary

# Conceptual Design

DOE M 413.3

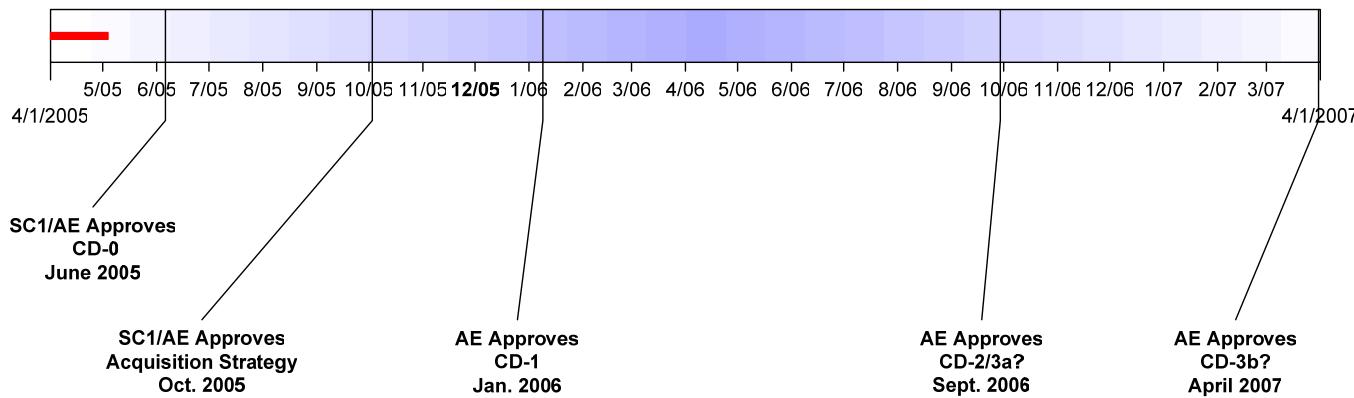
- Condition assessments for the facilities, if the project is upgrading existing facilities. These assessments may confirm the suitability of facilities for the proposed action.
- A waste minimization/pollution identification and prevention plan, and a Waste Management Plan including control, storage, treatment, and disposal commensurate with the type of asset and maturity of the planning
- A draft Decontamination and Decommissioning Plan, if required
- Assessments of and strategy for:
  - *The National Environmental Policy Act (NEPA).* The level of NEPA documentation required and the plan for completing these documents in support of the proposed project schedule.
  - *Safety.* The level of safety documentation required for the project, and the plan for completing these documents in support of the proposed project schedule. An initial Hazards Assessment and/or Preliminary Safety Analysis.
  - *Security Considerations.*
  - *Site Selection.* The application of a coherent, defensible methodology to identify and evaluate site options.
  - *Waste Management.* Decontamination and decommissioning plans where appropriate and applicable; waste minimization efforts.
- Public and/or stakeholder input
- Preliminary interface control documents
- System requirements and applicable codes and standards for design, procurement, construction, or characterization
- Site selection criteria and site surveys/ evaluations
- Anticipated/project products/deliverables (project end-state)
- Known and anticipated project constraints
- Conceptual design drawings/renderings/calculations
- Readiness assessment or readiness review concepts
- A vulnerability assessment

# Critical Decisions (CD)



## DRAFT NOvA Project Timeline for Critical Decisions & Reviews

Updated 29-Apr-05

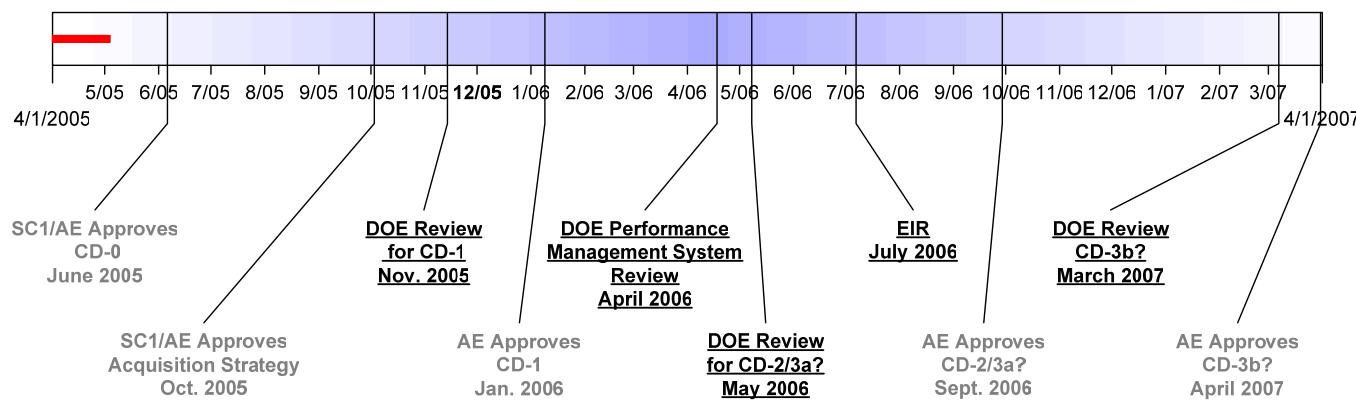


# DOE Reviews



## DRAFT NOvA Project Timeline for Critical Decisions & Reviews

Updated 29-Apr-05

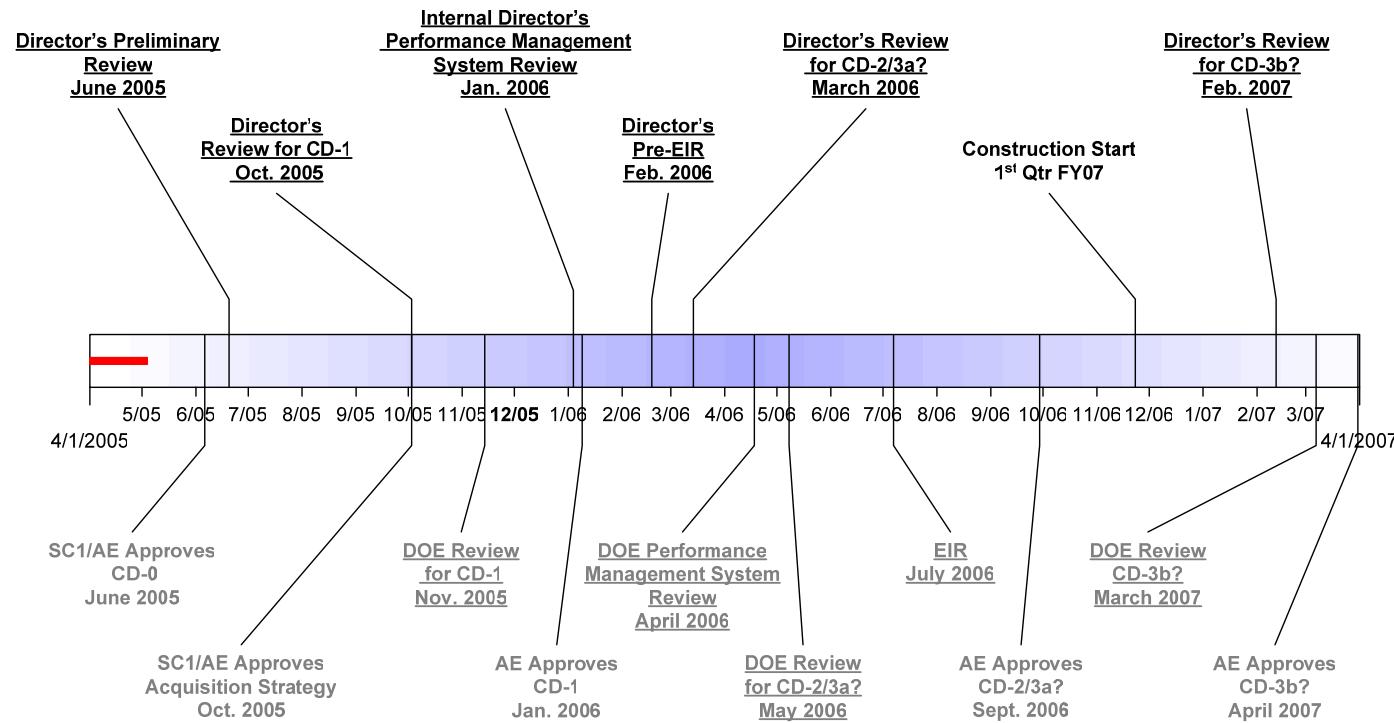


# Fermilab Director's Reviews



## DRAFT NOvA Project Timeline for Critical Decisions & Reviews

Updated 29-Apr-05

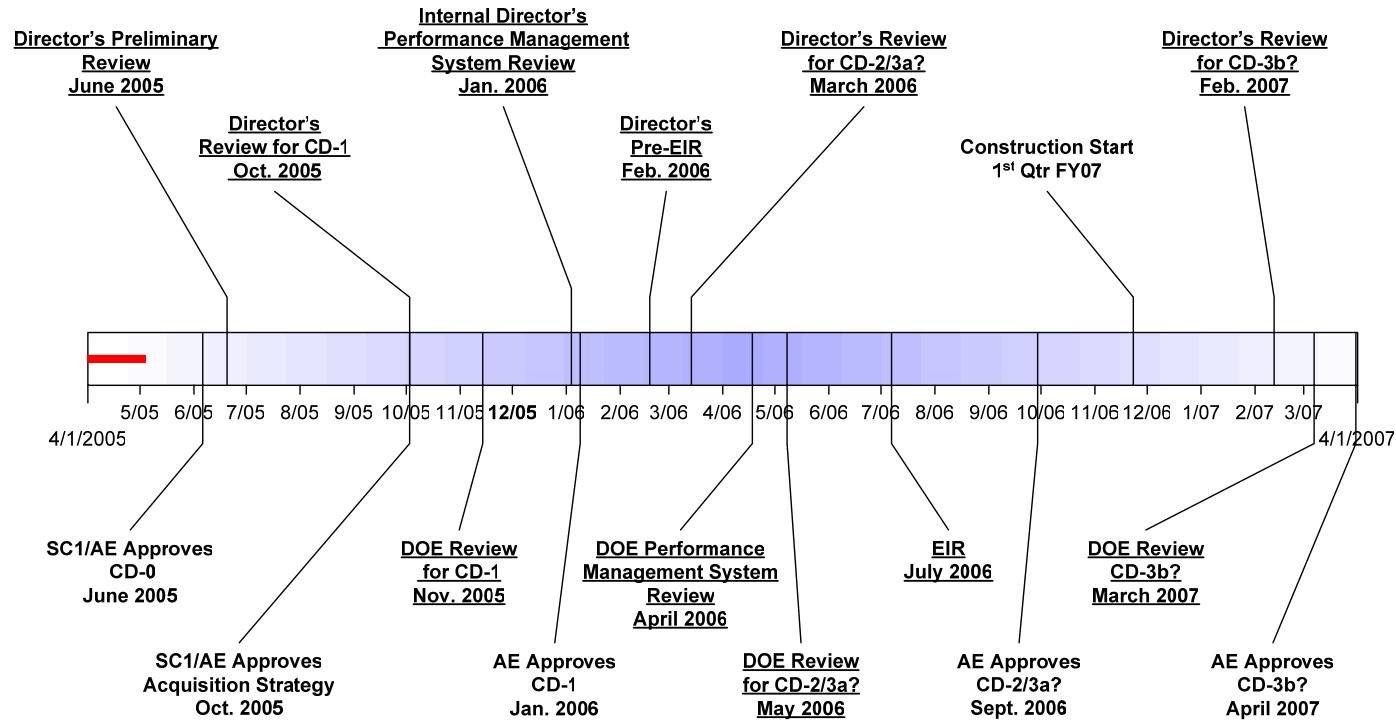


# All CDs and Reviews



## DRAFT NOvA Project Timeline for Critical Decisions & Reviews

Updated 29-Apr-05



# NOvA Preliminary Director's Review

Will the Technical / Cost / Schedule / Management aspects of the “project” to the extent plausible or sensible. It is recognized that this review is being conducted at a very early stage of the NOvA project, thus it is a “preliminary” review and material presented may not (will likely not) be developed to the level of sophistication or detail of a more mature project.

## Technical

- Are the physics requirements stated? One presumes that the physics justification has been (/will be) reviewed and approved by the Fermilab Physics Advisory Committee (PAC). So that is not the question here
- Have these physics requirements been translated into technical performance requirements / specifications?
- Can the design be built? Does the design meet the meet the technical specifications? Is it a reasonable design?

## Cost

- Has a Work Breakdown Structure (WBS) been developed or other listing of cost elements been prepared?
- Do the cost estimates for each WBS (or cost) element have a sound basis and are they reasonable?

# NOvA Preliminary Director's Review

## (Continued)

### Schedule

- Is there a schedule for the project?
- If, so are the activity durations reasonable for the assumed resources?
- Has the schedule been “resource loaded.”

### Management

- Is there an appropriate management organizational structure in place or proposed to accomplish the design and construction?
- Have responsibilities been assigned or have they been proposed?
- Are there adequate staffing resources available or planned for this effort?
- Is there a funding plan available or proposed to meet the resource requirements to realize the detector?

# Next Steps

- Staffing Project Office
  - Project Director (/Manager)
  - Schedule Person & Budget Person
- Begin NOvA Project Management Working Group Meetings (Meet ~ Every Two Weeks)
- Conceptual Design Report
- WBS and Dictionary
- CD-0 – Prepared by OHEP
- Preliminary Director's Review of NOvA
- CD-1
  - CDR
  - Cost Range
  - Schedule Range

# Next Steps (2)

- CD-1 Director's Review
- CD-1 Lehman Review
- CD-2
  - TDR (Technical Design Report equivalent to Preliminary Design)
  - Resource Loaded Schedule with contingency
  - Cost – Detailed Basis of Estimate
  - Many Formal Documents