

DOE/OHEP – MIE Project Steps

This document describes the procedures for the fabrication of Major Item of Equipment (MIE) projects. The rules for MIE's are somewhat different from the rules for Line Item Construction (LIC) projects. MIE's are a special designation for large capital equipment projects that is used only by the Office of Science, and designed to be more flexible than LIC projects in order to accommodate the unusual needs of the technology projects that Science generally supports. However, since they are a special case, budget and policy rules for MIEs are not well spelled out in DOE manuals. All procedures below are meant to be consistent with DOE Order 413.3A. In some cases OHEP has added additional procedures to enhance our ability to oversee the project.

Project types

Major Item of Equipment projects are for Capital Equipment acquisition, with an equipment cost (TEC) of greater \$2 million, **or** any capital equipment project with a Total Project Cost (TPC) of greater than \$5 million. In high energy physics, these tend to be a detector or instrument, or a major part thereof. Capital Equipment is a budget category for any non-expendable equipment that will be used for 3 or more years. Therefore prototypes are typically not considered capital equipment (unless they are incorporated into the final experiment) and are usually funded with operating funds, see below. Questions about whether a particular piece of equipment is considered capital equipment should be addressed to the lab's accounting department.

Line Item Construction (LIC) projects involve civil construction, such as buildings or tunnels. An MIE may have a limited amount of civil construction associated with it, but it must be less than \$5 million **and** less than 20% of the TPC. If either of these thresholds is exceeded the project would be considered Line Item Construction.

The word "construction" is used in several ways at DOE, including for LIC. Therefore we try and use the word "fabrication" when talking about MIE projects.

Funding types:

MIE funds are for fabrication of capital equipment and can include engineering and design of the final instrument, but do not include the R&D. MIE funds are listed in the official DOE budget.

MIE funds = TEC for capital equipment projects, including engineering design.

TPC = TEC + Other Project Costs (OPC)

OPC = conceptual design report and project-specific R&D, prototyping and testing, installation and commissioning/pre-operations before CD-4

The TPC is the carefully tracked and controlled quantity for all projects. DOE expects projects to be completed within the TPC approved at CD-2. It is possible to move funds from OPC to TEC or vice versa, as long as the TPC is not increased. These moves need to be approved according to the change control procedures outlined in the Project Management Plan.

Project Engineering and Design (PED) funds are only called out separately in the budgets for LIC.

The DOE funding is BA (budget authorization), not BO (budget obligated). Funds do not have to be obligated in the year that they were provided. Project obligations and costs have to be tracked by project management and regularly reported to DOE.

As a general rule, DOE-OHEP does not include scientist salaries in the TPC. As noted above, inclusion of commissioning or pre-operations cost in the TPC is generally required, but the definition of project completion sometimes eliminates those costs. For example a subsystem that is delivered to another organization could be considered completed before it is installed and commissioned, depending on the details of the agreement with the receiving party. The GLAST/LAT, and parts of the U.S. LHC projects are examples of this case.

Timeline of Stages and Approvals

Each stage lasts until the applicable CD is approved.

Stage: Preconceptual Planning (lasts until CD-0 approval)

Funds for R&D are in the generic category, not in the TPC.

CD-0 approved — “Approve mission need.”

At this point, we’ve said we want to do this type of project but have not selected the exact implementation. Can request PED funding if applicable (only for LIC).

Stage: Conceptual Design (lasts until CD-1 approval)

R&D funds are used– and will be counted towards that concept’s TPC. The cost of the actual preparation of the Conceptual Design Report should be included in the OPC and therefore the TPC.

CD-1 approved — “Approve alternative selection and cost range.”

At this point, we have picked the concept that we plan to implement. We usually call this an approved project at this point, but it can always be derailed at a later point. Long lead procurements can in principle be approved at this point, but it has been the usual practice in the Office of Science to formally approve these using a CD-3A.

Stage: Preliminary Design (lasts until CD-2 approval)

Funds are a mixture of MIE and OPC. All expenditures must be included in the TPC. MIE funds can be used for engineering design of the final project (i.e. not prototypes) but not for fabrication or buying the final parts until CD-3 has been approved. OPC is essentially everything else

CD-2 approved — “Approve performance baseline”

At this point, the project is baselined in terms of its technical scope, management, cost (the TPC) and schedule specifications. For an LIC project, construction funds can now be requested (not appl. to MIE).

Stage: Final Design (lasts until CD-3 approval)

Funds are a mixture of MIE and OPC. All expenditures must be included in the TPC. Rules as per Preliminary Design phase, above.

CD-3 approved — “Approve start of construction”

The final design should be complete. If it is not complete the project should be able to show that the remaining design work is well enough understood that baseline will not change when it is done. At this point, the project can spend MIE funds on fabrication of the capital equipment. CD-3 approval is often split into 2 stages (-3a, -3b) to allow for early implementation of long-lead procurements on specific items that do not require significant design work. In this case the second stage (-3b) then approves the remainder of the fabrication. CD-3a approval can be done concurrently with CD-2 approval.

Stage: Construction (lasts until CD-4 approval)

Funds are a mixture of MIE and OPC. All expenditures must be included in the TPC. MIE funds can now be used for fabrication of the final instrument (as well as any remaining design work). Funds for installation, commissioning and pre-operations are OPC.

CD-4 approved — “Approve start of operations or project completion”

At this point, the project is complete.

Stage: Operations

Funds in this phase are not part of the TPC.

Acronyms:

CD – Critical Decision

LIC – line item construction

MIE – major item of equipment

OPC – other project costs

PED – preliminary engineering and design

TEC – total estimated cost, but refers only to Capital Equipment expenses

TPC – total project cost

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