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THE DEPARTMENT OF ENERGY
PROJECT MANAGEMENT SYSTEM HANDBOOK

U.S. DEPARTMENT OF ENERGY
OFFICE OF THE CONTROLLER

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CHAPTER I

THE DEPARTMENT OF ENERGY
PROJECT MANAGEMENT SYSTEM

CHAPTER I

THE DEPARTMENT OF ENERGY PROJECT MANAGEMENT SYSTEM

A. PURPOSE

The purpose of this handbook is to provide guidance to all appropriate personnel for implementation of DOE Project Management Policy. It sets forth the principles and requirements which govern the development, approval and execution of DOE's outlay programs as embodied within the Project Management System (PMS). Its primary goal is to ensure application of sound management principles providing a disciplined, systematic and coordinated approach resulting in efficient planning, organization, coordination, budgeting, management, review and control of DOE projects. The provisions of this manual are mandatory for the Department's Major Systems Acquisitions (MSA's) and Major Projects and will be used for other projects to the extent practicable. (See Appendix A for a description of the method for selection of MSA's and Major Projects. Appendices B and C, in turn, represent the currently designated MSA's and Major Projects respectively; these lists will be updated at least annually as described in Appendix A).

B. BACKGROUND

The magnitude of the Department's project management task is formidable, currently well over 250 projects, with a total estimated cost in excess of \$24 billion at completion. This diverse array of project activities requires a broad spectrum of scientific, engineering and management skills to assure that they meet planned technical and other objectives and are accomplished on schedule, within cost and scope, and that they serve the purposes intended. In recognition of these requirements and the Department's ever-increasing magnitude of responsibilities, an interim DOE Project Management System was established and has been in use for over a year. This handbook constitutes an update of the System based on the experience gained and lessons learned during this initial period.

C. ORGANIZATION

Although there is no clear line of delineation, in general the DOE Headquarters concentrates on program management while the field organizations are concerned primarily with project management. Implementation of the Project Management System involves both a "line" chain of authority and responsibility and necessary participation and coordination by various "staff" elements in accordance with their specific areas of cognizance.

The line chain begins with the Secretary and Deputy Secretary and flows through the Under Secretary, who is the DOE Acquisition Executive, exercising the authority and responsibilities assigned for all Major Systems Acquisitions (MSA's). It then progresses through the Program Assistant Secretaries/Director of Energy Research, the DOE Headquarters program organizations, Field Office Managers and finally, to the Project Manager,

the single individual who has full responsibility for detailed planning and execution of all project activities. "Staff" participation and coordination begins with project inception and carries through to project completion.

D. OBJECTIVES

The overall objectives of the Project Management System are to aid in achieving and sustaining excellence in program and project management, minimizing procedural and paperwork requirements, and fostering the concepts of objective setting, accountability, stewardship and performance assessment.

The specific objectives of the Management System are summarized as follows:

- Ensure that all significant projects and activities have clear subobjectives that relate to program objectives.
- Ensure proper coordination by all appropriate "line" and "staff" elements beginning with program/project inception.
- Relate program/project and activity objectives to National Energy Act, National Energy Policy and related plans and legislation, where possible.
- Provide for determining priorities among programs and projects, and in turn, relate these to various levels of resource availability.
- Promote project execution which achieves technical, schedule and cost objectives.
- Avoid commitment of major resources prior to adequate project definition.
- Provide key program and project managers with a clear view of related program and project objectives and plans.
- Provide visibility on all key decisions and timely feedback for all levels of management.
- Maintain accountability through and across all levels of the organization with minimal amount of procedure and paperwork.
- Ensure monitorship of program/project progress in relation to specific effectiveness measures.

E. PRINCIPLES

The guidelines and procedures in this document have been established in adherence to the following general principles of management:

- Centralization of authority for program/project approval and for allocation of resources.

- Decentralization of authority for program/project execution and the utilization of resources in that execution.
- Minimum reports and paperwork in general consistent with adequate monitorship of program/project activities.
- Provision of competent personnel resources throughout the management structure.

F. DECENTRALIZATION

DOE project management policy requires decentralization of all Major System Acquisitions and Major Projects unless an exception is granted by the Under Secretary. Decentralization in this context simply means assignment of project management responsibility to Federal organizations outside DOE Headquarters (usually DOE Operations Offices, although NASA and the Corps of Engineers have been assigned responsibility for some specific projects). The Project Management System described in this handbook is supportive of and consistent with this policy.

APPENDIX A

DESIGNATION OF MAJOR SYSTEM ACQUISITIONS AND MAJOR PROJECTS

A. MAJOR SYSTEM ACQUISITIONS CRITERIA

- National urgency
- Dollar value - normally those systems or projects which have a total estimated government share cost in excess of \$50 million in the advanced development phase of the acquisition process or \$200 million over the life of the system or project.
- Recommendations by Secretariat officials

B. METHOD OF DESIGNATING MAJOR SYSTEM ACQUISITIONS

Projects that fulfill the prescribed MSA criteria will be formally designated and promulgated in DOE Order 4240.1 using the following procedures:

1. Annually, when Congressional action on the next year's budget (BY+1) is essentially complete and after the Department's internal budget (BY+2) is complete, the Controller will develop a "candidate" list of MSA's. The budgetary data above and any known program modifications which affect projects are used to make up the "candidate" list. The "candidate" list is provided to each Assistant Secretary and the Director of Energy Research for any additions or deletions.
2. When all comments are received, a change to DOE Order 4240.1, "Designation of Department of Energy (DOE) Major Systems Acquisitions" is prepared and approved by the Acquisition Executive. Appropriate notification is made to the Office of Management and Budget and the Office of Federal Procurement Policy, OMB, of the changes or additional designations.

C. MAJOR PROJECTS CRITERIA

The Major Projects listing includes Major System Acquisitions above plus other significant or major projects. The purpose of the listing is to permit focused management attention on the most important projects in the Department.

Criteria

- Total Project Cost (TPC) of the project
- Importance of project to program objectives
- Size and complexity of the project

- Degree of DOE control required
- Visibility of the project
- Clarity and stability of the project
- Recommendations by Assistant Secretaries or Director of Energy Research

D. METHOD OF DESIGNATING MAJOR PROJECTS

The list of Major Projects will be updated at the same time as MSA designation using similar procedures.

APPENDIX B

CURRENT LIST OF MSA AND MAJOR PROJECTS

CONSERVATION AND SOLAR ENERGY
Major System Acquisitions

1. Advanced Automotive Heat Engine Systems Development Project (MSA) Expense Funded, Project Number 006, TEC, (DOE) \$225M.
2. 10 MWe Central Receiver Solar Thermal Pilot Plant (MSA) Barstow, CA. (76-03-B), Project Number 058, TEC \$108M. Other Related Project Funding, \$24.9M, Total Project Funding (DOE) \$132.9M. Non-DOE - \$15.3M; Total Project \$148.2M.
3. Ocean Test Facility (OTEC-1) (MSA) (76-01-A) Project Number 052, TEC \$33.0M. Other Project Funding, \$12.2M; Other Related Funding \$29.6M. Total Project (DOE) \$74.8.
4. Solar Energy Research Institute Permanent Facility, Golden, Colorado (79-01-Q), being defined, Project Number 119, TEC (DOE) \$98M (MSA).
5. Electric Vehicle Commercialization Project (MSA) Project Number A114, TEC \$139.5M.
6. Hybrid Vehicle Commercialization Project (MSA) Project No. B114, TEC \$114.7M.
7. MX Renewable Energy System (MX-RES) Project (MSA) Project No. 120, TEC (TBD).
8. Ocean Thermal Energy Conversion (OTEC) Pilot Plant Project (MSA), Project No. 121, TEC Approx \$200M (under study).

Major Projects

1. Near Term Electric Vehicle Batteries, Expense Funded, Project Number 045, TEC (DOE) \$63.9M. Non-DOE \$26.2M - Total Project \$90.1M.
2. SPE Electrolyzer for Hydrogen Production, MA., Expense Funded, Project Number 048, TEC \$10.7M; Capital Equipment \$.3M; Total Project Funding (DOE) \$11.0M; Non-DOE \$8.3M; Total Project \$19.3M.
3. Total Energy Experiment Shenandoah, Georgia (77-SE-93); Project Number 059, TEC \$13.5M (D&C) R&D \$3.8M; Operations \$1.5M; Direct Support \$1.2M; Total DOE \$20.0M; Non-DOE \$1.6M; Total Project \$21.6M (under study).
4. Model 2 (300 ft/2.5 MWe) Wind Turbine, 78-SE-02); Project Number 055, TEC \$27.3M (D&C), R&D \$11.9M; Operations \$.9M; Direct Costs 42.8M; Total Project (DOE) \$42.9M.

5. Biomass ThermoChemical Gasification Experimental Facility, TBD, Expense Funded, Project Number 064, TEC \$12M (D&C) R&D \$1.6M for Operating \$6.0M; Total DOE \$19.6M; Non-DOE \$15.0M; Total Project \$35.6M.
6. Small Community Applications Experiment I, (79-SE-01) Project Number 112, TEC \$24.6 (D&C) R&D \$1.8M; Operations \$1.2M; Direct Support \$10.4M; total Project (DOE) \$38.0M.

DEFENSE PROGRAMS

Major System Acquisitions

1. High Energy Laser Facility (NOVA) (MSA) LLL, (78-04-A) Project Number 137, TEC (DOE) \$136M (under study).
2. Fluorinel Dissolution Process and Fuel Receiving Improvements (MSA) (77-13-A) Project Number 086, TEC \$150M. Other Project Funding \$40.1M; Total Project (DOE) \$189.7M.

Major Projects

1. High Energy Laser Facility (Antares) LASL (75-03-8) Project Number 011, TEC (DOE) \$62.5M.
2. Weapons Complex Upgrade Project, Project No. 122, TEC - \$647M.
3. Nuclear Materials Production Upgrade Project, Project No. 123, TEC - \$405M (expected to increase).

FOSSIL ENERGY
Major System Acquisitions

1. Solvent Refined Coal Demonstration Plant (Solids) SRC-I (MSA) Newman, Kentucky (78-2-D) Project 030, TEC \$1,232M (D&C), \$184M OPEX (cost sharing TBD).
2. Solvent Refined Coal Demonstration Plant (Liquids) SRC-II (MSA) Morgantown, W.VA, (79-1-R) Project 021, TEC \$1,115M (D&C) \$218M OPEX (under study) (cost sharing TBD).
3. Ebullated Bed (H-Coal) Pilot Plant, Catlettsburg, Kentucky, Expense Funded (MSA) Project Number 022, TEC (DOE) \$258.0M; Non-DOE \$38.1M; Total Project \$296.1M.
4. High BTU Synthetic Pipeline Gas Demonstration Plant (A) , (CONOCO) (MSA) (76-01-B) Project Number 024, TEC (DOE) \$360M; Non-DOE \$230M; Total Project \$590M (under review).
6. Low/Medium BTU Fuel Gas Demonstration Plant (A) W.R. Grace (MSA), (76-1-C) Project Number 026, not authorized.
7. Low/Medium BTU Fuel Gas Demonstration Plant (B) Memphis (MSA), (76-1-C) Project Number 027, not authorized, TEC - \$620M (under study).
8. MHD Engineering Test Facility (MSA) (not authorized) Project Number 037, TEC (DOE) \$288M (preliminary).
9. HYGAS Demonstration Plant (MSA), Project Number 124, (will be deleted).
10. Atmospheric Fluidizing Bed Direct Combustion Demonstration Plant (MSA) Project Number 034 (will be deleted).

Major Projects

1. Donor Solvent (EDS) Pilot Plant, Baytown, Texas (77-FE-13) Project Number 23, TEC \$61.3M; Project Funding \$88.5M; Total Project (DOE) \$150.8M; Non-DOE \$150.8M; Total Project \$301.5M.
2. Atmospheric Fluidized Bed Combustion Component Test and Integration Unit, METC (77-FE-10) TEC \$49.8M; Other Project Funding \$29.0M; Total Project Funding (DOE) \$78.8M.
3. MHD Component Development and Integration Facility, Butte, Montana, Expense Funded, Project Number 035, TEC \$37M (D&C) Other Projects Funding \$263.3M; Total Project Funding (DOE) \$300.3M.
4. Gasification Multi-Test Facility (80-FE-4), Project Number 030, TEC - \$.
5. Catalytic Gasification Pilot Plant (78-FE-02), Bruceton, PA, Project Number 113, TEC - \$.

ENERGY RESEARCH

Major System Acquisitions

1. ISABELLE (Proton-Proton Coilliding Beam Intersecting Storage Accelerator) (MSA) BNL (78-10-B) Project Number 017, TEC \$276.8M; Other Project Funding \$146.7M; Total Project Funding (DOE) \$423.5M.
2. Postiron Electron Project (PEP), (MSA) LBL, (75-06-c) Project Number 018, TEC (DOE) \$78M.
3. Mirror Fusion Test Facility (MSA), LLL, (78-03-A) Project Number 038, TEC \$94.2M; Other Project Funding \$40.1M; Total Project (DOE) \$136.8M.
4. Tokamak Fusion Test Reactor (MSA) Princeton, (76-05-A) Project Number 041, TEC \$281M; Other Project Funding \$146.3M; Total Project Funding (DOE) 4427.2M.
5. Fusion Materials Irradiation Test Facility (MSA), Richland, Washington, (78-03-B) Project Number 42, TEC \$94.1M; Other Project Funding \$47.6M; Total Project Funding (DOE) \$141.8M.

Major Projects

1. National Synchrotron Light Source, BNL, (78-13-A) Project Number 013, TEC \$24.0M; Other Project Funding \$6.3M; Total Project Funding (DOE) \$30.3M.
2. Tritium Systems Test Assembly, LASL, (77-MF-05) Project Number 040, TEC \$13.5M; Other Related Funding Requirements - \$15.5; Total Project Funding (DOE) \$29.0M.
3. Large Coil Test Facility, Oak Ridge, TN (77-MF-04) Project Number 039, TEC \$26.4M; Other Project Funding \$13.2M; Total Project Funding (DOE) \$39.6M.
4. Energy Saver, FNL, (79-09-B) Project Number 019, TEC \$46.6M; Other Project Funding \$42.9M; Total Project Funding (DOE) \$89.5M.
5. National Superconducting Cyclotron Laboratory, Michigan State University (80-FS-5) TEC \$30.0M.
6. Tevatron - Phase I - Fermi Lab - (81-E-218) TEC \$26.0M.

NUCLEAR ENERGY

Major System Acquisitions

1. Transuranic Waste Treatment Facility, (MSA) Idaho (81-DWM-04) Project Number 116, TEC \$58.5 ASE only. Other Project Funding \$28.8. Total - A&E only \$87.3M (total project cost, (DOE) Project Plan Draft \$556M).
2. Away from Reactor Storage Facility - SR (MSA) Project Number 111 (not authorized) TEC (DOE) (not established).
3. Facilities for National Waste Terminal Storage (MSA) (81-DWM-94). Project Number 79, TEC \$55M. A&E only. Total Project (DOE) \$6B (Preliminary).
4. Defense Waste Processing Facility, Savannah River, (MSA) Project Number 085, TEC \$49M, PE&D only. Total Project Funding (DOE) \$198.6M (does not include estimated construction costs of \$2.8B - probable \$3.2B).
5. Waste Isolation Pilot Plant, New Mexico (MSA) (77-13-f) Project Number 080, TEC (DOE) \$440.0M.
6. Fuels and materials Examination Facility (MSA), Richland, Washington (78-06-F) Project Number 72, TEC \$170.6M; Other Project Funding \$74.6M; Total Project (DOE) \$245.2M.
7. AIST Engineering Development Facility (MSA), OR (not authorized) Project Number 068, TEC (DOE \$100M) (under study).

Major Projects

1. New Waste Calcining Facility, Idaho (75-01-C) Project Number 083 TEC (DOE \$81M (under study)).
2. Static Outer Planetary Project, Expense Funded, Project Number 066, TEC (DOE) \$104M.
3. Safety Research Experimental Facility (SAREF) - Phase I - Treat Upgrade ANL-W (78-06-C) Project Number 073, TEC \$27.7M; CP&D \$1.5M; Other Project Funding \$17.5M; Total Project (DOE) \$46.7M.
4. Fuel Cycle R&D Integrated Equipment Test Facility, ORNL (78-5-D) Project Number 078, TEC \$16.0M; Operating Expense Equipment. Inventory \$14.7M; Other Project Funding \$2.1M; Total Project (DOE) \$32.8M.
5. Fuel Storage Facility, HEDL, (77-04-D) Project Number 077, TEC \$30.3M; Other Project Funding \$2.6M; Total Project (DOE) \$32.9M.

NUCLEAR ENERGY (Cont'd)

Major Projects

6. Gas Reactor In-Pile Test Loop (GRIST-2), Inel, (79-BR-01) Project Number 074M; Total Project (DOE) \$34.1M.
7. Core Flow Test Loop, Oak Ridge, Tennessee, Expense Funded, Project Number 074; Total Project (DOE) \$14.6M.
8. High Level Waste Storage Facilities, Savannah River, (78-18-B) Project Number 081, TEC \$42M; Other Project Funding \$.8M; Total Project Funding (DOE) \$42.8M.
9. Shippingport Decontamination and Decommissioning, RL, Expense Funded, Project Number 118, TEC (DOE) \$"8.5 - \$43.5M.

RESOURCE APPLICATIONS

Major System Acquisitions

1. Enriched Uranium Production Facilities, Portsmouth, Ohio (MSA) (76-08-G) Project Number 087, TEC (DOE) \$5.1B (FY 80).
2. 50 MWe Geothermal Demonstration Power Plant (MSA), Valles, Caldera, New Mexico (77-GE-02) Project Number 060, TEC \$54.5M (D&C); Other Project Funding \$15.5M; Total (DOE) \$70.0M; Non-DOE \$70.0M; Total Project \$140.0M.
3. Strategic Petroleum Reserve (250-500 mmbbls) (MSA) Project No. 127 TEC \$.

Major Projects

1. Process Equipment Modifications (CIP), OR, (71-01-F), Project Number 089, TEC (DOE) \$990M.
2. Cascade Upgrading Program (CUP), OR (74-01-G) Project Number 090, TEC (DOE) \$423M.
3. Centrifuge Plant Demonstration Facility, OR, (77-09-D) Project Number 091, TEC (DOE) \$60.0M.
4. Naval Petroleum Reserve Facilities Projects (NPR-1) Elk Hills, Expense Funded, TEC (DOE) \$297.7M.
5. 5 MWe Electric Binary Pilot Plant, Raft River, Idaho (77-GE-01) Project Number 062, TEC - \$23.7M; R&D Related \$1.0M; Facility Operations \$7.7M; Direct Support Cost \$5.1M; Capital Equipment \$.6M; Total Project (DOE) \$41M; Non-DOE \$28M; Total Project \$69M.

CHAPTER II

MANAGEMENT ROLES, RESPONSIBILITIES AND AUTHORITIES

CHAPTER II

MANAGEMENT ROLES, RESPONSIBILITIES AND AUTHORITY

DOE Order 5700.1 sets forth the basic responsibilities and authorities for establishing and implementing Major Systems Acquisitions and in turn, the Project Management Policy. This chapter further defines the roles of the various participants in the Project Management System. Responsibilities associated with the Energy System Acquisition Advisory Board (ESAAB) are found in Chapter VI (DOE Order 5700.3) and are not repeated here.

A. OFFICE OF THE SECRETARY

The Secretary has delegated to the Under Secretary the principal responsibility for project management activities within the Office of the Secretary (although the Secretary or Deputy Secretary may elect to participate in specific selected areas and decisions of the project management process). This includes activities such as establishing Departmental project management policies, approving the DOE Project Management System, serving as the Acquisition Executive and Chairman of the Energy System Acquisition Advisory Board (ESAAB) for the Department's MSA's, approving project plans for MSA's, and approving establishment of special Project Offices.

All major decisions on MSA's and certain key decisions on selected Major Projects are reserved for the Under Secretary. These include decisions to enter the acquisition phase, decisions to make transitions between phases (ESAAB decisions) and any decisions which will directly result in commitment of major portions of the project funds. Additionally, the Under Secretary may reserve other decisions on a case-by-case basis.

Lesser decisions on MSA's and all decisions on other DOE Major Projects, are typically delegated to the Program Assistant Secretaries or Director of Energy Research.

B. PROGRAM ASSISTANT SECRETARIES AND DIRECTOR OF ENERGY RESEARCH

Each Program Assistant Secretary or the Director of Energy Research has full responsibility for the planning and execution of his or her program activities, including projects, subject to the constraints of the National Energy Plan; approved Departmental policies and program strategies; enacted budget legislation; approved resource allocations; and the Departmental Project Management System. In general, a Program Assistant Secretary or the Director of Energy Research is responsible for each approval or key decisions not specifically reserved for the Under Secretary. Additionally, he or she is responsible for providing current information on the progress of work, status of resource utilization, major problems encountered and planned corrective actions to the Under Secretary and other Departmental organizations having responsibility for activities which must interface with project activities. Normally, the type and level of detail of the information provided will be the minimum required for the recipient office

to fulfill its responsibilities in those areas which interface with project activities. In general, the information concerning projects, that is provided to the Under Secretary will be that associated with MSA's, although special reviews and reports may be requested on a case-by-case basis.

To avoid any serious bottlenecks that might be caused by the necessity to obtain approvals at the Assistant Secretary or Director of Energy Research level, the responsibility and authority for decision making should be delegated to the lowest organizational level practical. To accomplish this, only approvals and key decisions on MSA's and Major Projects are required at the Program Assistant Secretary or Director of Energy Research level. These approval and key decision points are limited to those associated with entering or making the transition between acquisition phases, those directly resulting in large commitment of funds, or those of unusual national or programmatic sensitivity.

1. Program Organizations

Management responsibility for specific programs is delegated by the cognizant Program Assistant Secretary or the Director of Energy Research to one of his or her DOE Headquarters program organizations. This includes overall responsibility for any projects included in the program activities. The program organizations are responsible for assuring that overall requirements are fulfilled in the areas of environment, technical/performance, scope, safety, quality assurance, cost, schedule, and occupational ES&H. The program organization should also continually evaluate and balance project needs against other programmatic needs and constraints. Unless an exception is granted by the Under Secretary, projects are to be assigned to field organizations for management. The assignment should be made after the necessary initial programmatic decisions (scope, timing, etc.) have been made and the projects approved by the Assistant Secretary or Under Secretary (Mission Need Statement or Project Plan). It is essential that, even before this formal assignment, the field organization be involved in planning the project and developing the Project Charter and Project Plan.

In general, the Directors of the program organizations are responsible for all of the DOE Headquarters approvals and key decisions which are not specifically reserved for the Assistant Secretary, the Director of Energy Research, or the Under Secretary.

Directors of these "line management" organizations are accountable for overall program success. This accountability is supported by DOE Project Management System requirements for formal documentation including Project Plans and Project Management Plans which reflect mutually accepted approvals, key decisions and controlled milestones together with the requirements for reports and reviews. The organizational relationships and authorities documented in the Project Charter also support accountability.

2. AS/DER Staff Organizations

The role of the Program Assistant Secretary staff organizations generally will be limited to an integration or coordination function across the respective programs. Precise delineation between the "line management" and

the "staff" roles is difficult since the staff functions are highly dependent upon overall organizational arrangements; however, examples exist that are useful in clarifying these roles. Examples of staff functions related to project management include:

- Developing, in collaboration with the respective program organizations for Program Assistant Secretary or Director of Energy Research approval, additional project management system requirements or processes which supplement the DOE Project Management System and which are specific to a particular Assistant Secretary's or Energy Research organization. Additional requirements will be minimized, must meet the test of being necessary for management, and in all cases must be consistent with the DOE Project Management System.
- Integrating the activities related to deployment or buildup of project management personnel resources, both for DOE Headquarters and for additional resources assigned to the field to ensure meeting the highest priority needs across the respective program organizations.
- Coordinating financial resource allocation or reprogramming across programs (where permitted by legislation) to ensure efficient utilization of funds for projects.
- Supporting the Assistant Secretary or Director of Energy Research in tracking and analyzing management performance against project baselines.
- Coordinating with both program organizations and the Office of the Assistant Secretary for Environment in the development of guidelines to ensure that environmental, safety, and health requirements are fulfilled by program and project organizations.

C. ASSISTANT SECRETARY FOR POLICY AND EVALUATION (PE)

Policy and Evaluation has three basic roles in the project management system:

1. Issuance of Energy Policy, Programming and Fiscal Guidance - PE has the primary staff responsibility, however, draft guidance is coordinated with Program Assistant Secretaries and the Chief Financial Officer before issuance. This role focuses on the front-end of the project management system, most specifically on the development and promulgation of the Department-wide Planning Programming and Budgeting System (PPBS).
2. Identification, Coordination and Integration of Major Analyses and Strategy Studies - These studies are performed on selected policy and program issues which require the Secretary's priority attention for the formulation of budget and legislative programs.
3. Issuance of Financial Costing Parameters - This issuance provides a standard set of procedures for performing financial cost computations of unit product costs, standard financial parameters, and methods for comparable cost computations in the major analytical studies and budgetary documents.

D. ASSISTANT SECRETARY FOR ENVIRONMENT (ASEV)

The Assistant Secretary for Environment has full responsibility for the planning and execution of project activities under his or her cognizance. The role of ASEV in fulfilling this responsibility is the same as that described for the Program Assistant Secretaries and the Director of Energy Research.

In addition to responsibility for Environment projects, the ASEV has an independent Departmental overview responsibility for NEPA compliance, Operational Environmental, Safety (Occupational and Public), and Health requirements and activities. Thus, ASEV provides an independent review of the conformance of DOE programs and projects to environmental laws, regulations and policies. ASEV also provides assistance to Program Assistant Secretaries to help them meet any obligations under environmental "permitting" statutes, e.g., the Clean Air Act, and will work with the Programs to identify environmental compliance requirements for projects. These compliance plans will identify necessary NEPA and associated reviews as well as required permits and will include schedule for completing the reviews. However, the program organizations are primarily responsible for assuring compliance with the applicable regulations, standards and NEPA.

The ASEV and the Program Assistant Secretaries each have specific responsibilities for fulfilling requirements established in Project Environmental Plans. The nature of the ASEV commitment, which the project environmental plans represent, will be defined through a joint agreement between EV and the responsible program organization—that establishes the environmentally related research and development activities or other requirements which are critical to successful project execution. Assignment of responsibility for implementation of these activities will be agreed to by both organizations and documented in the project environmental plans as critical commitments for the respective organizations. Other activities identified in the project environmental plans will be fulfilled on a "best efforts" basis. Project environmental plans will be updated periodically to ensure that the implementation activities identified are current and relevant. The program organizations have primary responsibility for meeting the necessary requirements in areas of environment, safety, quality assurance, occupational environmental safety and health, etc., as specified by ASEV through DOE policy orders and NEPA requirements. The role of EV in these areas is one of independent overview and audit of the program organizations activities to assure compliance and to participate in or advise procurement bodies (Source Evaluation Boards, Source Review Panels).

E. DEPARTMENTAL SUPPORT ORGANIZATIONS

1. Chief Financial Officer

As the business manager of DOE, the Chief Financial Officer (CFO) is responsible for budget, financial operations, procurement, cost estimating and the development of business related policy:

- a. Assures compliance with laws related to funds expenditure and procurement matters, as well as Executive policy and General Accounting Office procurement protest decisions. Represents DOE in related policy matters.

- b. Evaluates the acquisition process and proposes or implements policy changes, as appropriate.
- c. Assures that business, procurement, acquisition strategy, cost and budgetary issues are in conformance with policy and fully evaluated in preparation for key decision points.
- d. Coordinates Planning Programming and Budgeting System decisions relating to Major System Acquisitions with the advisory board process.
- e. Establishes career programs to train, retain and reward competent project managers.

2. Office of the Controller

While the principal function of the Office of the Controller (CR) is to formulate, present and execute the Department's overall budget and the associated financial accounting and reporting, CR also has a major Departmental cross-cutting staff responsibility in the project management area.

In particular, this includes the primary responsibility for Department wide overview of project activities for the Under Secretary and Chief Financial Officer (CFO). In this role CR has the Departmental lead responsibility for developing, implementing and maintaining Department-wide project management systems for outlay programs and other financial and related business management systems. Specific CR responsibilities in these and other project management areas include:

a. Project Management Systems

- Develops, implements and maintains the Department's Project Management System for DOE Outlay Programs.
- Establishes policies, and procedures for administration of the Department's Construction Program and provides oversight, guidance and evaluation of the construction program.
- Directs the design, development, implementation and control of business management information systems. Provides technical support, as required, to assure their effective implementation.
- Develops, implements and maintains financial and business management support systems such as Financial Plans and automated financial management systems, and uniform contractor reporting guidelines.
- Coordinates and promulgates changes to Project Management Reporting System.

b. Project Control Documents

- Concurs in scope, cost and schedule baselines in project plans for Major System Acquisitions and Major Projects.
- Reviews all Project Charters and provides recommendations.
- Provides inputs for preparation of Project Management Plans; reviews final versions and provides recommendations.
- Coordinates review, concurrence and approval of Mission Need Statements, Project Plans and Project Charters for MSA's and provides similar service as requested on Major Projects.

c. Project Execution

- Concurs in Major System Acquisition Key Decisions proposed by the Program Manager. Completes staff work and coordination to bring decisions to the Under Secretary for approval.
- Provides financial guidance on project special situations, problems and remedial actions.
- Performs independent project assessment at each decision point and presents findings to the decision authority.
- Concurs on all manpower resource allocations across appropriation lines or any added allocations.

d. Analysis and Evaluation

- Tracks MSA cost and schedule execution against baseline project plans and provides independent assessment of project performance against approved baselines and milestones. Provides appropriate recommendations.
- Provides monthly DOE-wide financial project summary reports covering project execution and quarterly project summary status reports.
- Provides recommendations to Assistant Secretaries and Under Secretary for periodic project reviews.
- Conducts Independent Cost Estimates and acts as focal point for development and dissemination of cost estimating data bases and methodologies for the Department.
- Responsible for project validation prior to insertion in the budget.

3. Procurement and Contracts Management Directorate

a. Policy Development

The Office of Procurement and Contracts Management (PR) provides procurement and related business management expertise to support and

assist in the development of Departmental project management control and information systems.

(1) Department-wide Project Management Policy:

PR has both an input and concurrence role to monitor that policies are consistent with OMB Circular A-109 and meet DOE procurement directives and policies.

(2) Management Information Systems:

PR is the action office for development of procurement planning and execution information systems, and a coordinating office for related information systems that capture, process and report procurement data.

(3) Management Control Systems:

PR works closely with CR to insure that business considerations are taken into account in the development of management control systems.

(4) Major Systems Key Decisions:

On the basis of procurement regulation and policies provides the Acquisition Executive and appropriate program officials with recommendations relative to key decisions. These recommendations focus primarily upon the procurement and related business aspects of the acquisition.

b. Project Development

PR, through advisors assigned to program areas, its Major Systems Acquisition Division, Source Evaluation Board (SEB) Secretariat, and other specialists, assists program offices in development and subsequent implementation of procurement matters on projects. These services are mandatory for MSA's and designated Major Projects. PR assists the program/project office in developing the acquisition strategy and concurs in the Project Plan and related documents to ensure satisfactory business arrangements.

c. Project Execution

Headquarters PR has a responsibility to support project execution through its normal functional role in providing necessary oversight and approvals to Department buying organizations. At the same time, procurement has a responsibility for soundness of business decisions, and to advise senior management when major problems are detected. Field and Headquarters procurement organizations provide assistance to project organizations in the planning of individual procurement actions, and carrying out necessary actions to solicit, award, and administer procurements.

(1) Project Execution Support:

Headquarters PR provides routine oversight and special procurement problem support through contracting officer channels, as well as necessary reviews, concurrences, and approvals. Continuing project support and procurement action is provided to project offices via Field and Headquarters procurement offices.

(2) Project Reviews:

PR personnel participates in periodic Headquarters project reviews to stay abreast of projects and to provide HQ program offices procurement and related business management input on both general and special problems. For Acquisition Executive level project reviews, and Energy Systems Acquisition Advisory Boards (ESAABs), Procurement performs independent procurement and business management reviews for input to the Acquisition Executive.

4. Office of Administration

The principal roles of the Office of Administration in the project management area are to provide advice and assistance in developing organizational plans and staffing requirements; arranging for project management training to develop additional resources of personnel with the needed project management skills; and providing of general support and guidance in connection with computer services and telecommunications, contractor industrial relations, real property management and site selection criteria.

5. Office of General Counsel

The principal role of the Office of General Counsel in the project management area is to assure that activities are planned and conducted in accordance with statutory requirements, particularly procurement activities. (Counsel organizations in field offices generally perform the specific "legal" functions necessary for project executions.)

F. OPERATIONS OFFICE MANAGER/ENERGY TECHNOLOGY CENTER DIRECTOR (FIELD OFFICE MANAGER)

Execution responsibility for DOE MSAs and major projects will be assigned to Field Offices unless an exception is obtained from the Under Secretary by the Assistant Secretary or Director of Energy Research. The flow of responsibility and authority for project implementation will normally be from the Program Assistant Secretary or Director of Energy Research (DER) through the program organization (e.g., Program Office Director, Division Director, Program Manager, etc., as defined in the Project Charter) to the Field Office Manager (FOM). The FOM will establish an appropriate project management organization and will delegate appropriate authority to the project manager for management and direction of project(s).

1. FOM Responsibility and Authority

- The FOM has line management responsibility and accountability for overall project implementation as this is the lowest management level with control of all resources necessary to implement project activities.
- The FOM will act within the authority defined in the Project Charter.

2. FOM Tasks

- Participate in the determination regarding assignment of Project(s) to the field office.
- Assist the cognizant Assistant Secretary or Director of Energy Research/Program Office in the development of Project Charter.
- Establish a Project Management Organization and delegate appropriate authority to the project manager for the management and direction of the project(s) within the authority delegated to him.
- On MSA Projects, select the project manager with the concurrence of the appropriate AS or DER. On the other Major Projects, select the project manager after consultation with the appropriate AS or DER or his designated representative.
- Assure satisfactory management of the project in accordance with the Project Plan, Project Management Plan and Project Charter.
- Provide independent assessment on regular reports on project status, progress, problems, variances etc. provided to Headquarters management by the Project Manager.
- Coordinate and integrate all necessary in-house and outside administrative and technical support to meet project objectives and requirements.
- Develop Project(s) Managers and project management capability within the established office.
- Conduct such contractor and subcontractor selections as are required, within the authority delegated to the FOM.
- Within authority delegated, execute and administer contracts, approve changes, etc.
- Assist, when needed, the Contractors or Industrial Partners in efforts to formalize experimental research and development programs to support the assigned project(s).
- Assure safety of the project(s) and compliance with ES&H, NEPA and all other applicable regulations and directives.
- Accept the contractor completed efforts.

G. PROJECT MANAGER

The Project Manager has direct primary responsibility and accountability for the execution and implementation of the project in accordance with the approved Project Plan, Project Management Plan and Project Charter.

1. Authority and Responsibility

The FOM will delegate authority to the project manager to accomplish the project.

2. Tasks

In addition to tasks specifically assigned by the Field Office Manager and the Project Plan and Charter, the Project Manager normally will be the point of contact for information flow to the program organization. Day-to-day activities within the scope and charter thresholds and milestones will normally flow between the field Project Manager and the DOE Headquarters Program Manager. The Project Manager will usually be dedicated full time to the MSAs or Major Projects: however, for some of the smaller projects the same Project Manager may be responsible for more than one. For MSA's (and Major Projects), the requirements of OMB Circular A-109 to have minimum layering above the Project Manager must be satisfied.

H. SUPPORT TO THE PROJECT MANAGER

On MSA's and other Major Projects, the typical project organization in Field Operations Offices consists of a small, dedicated project office reporting to the Field Office Manager, generally through an Assistant Manager.

For small projects, a single manager may have one or more projects and obtain matrix support for all activities.

Because of the diversity of projects and field organizations, there need not be a standardized project organization, rather there should be flexibility to adapt to varying circumstances to optimize performance by the Field Office.

In addition to federal personnel, utilization should be made of contractor support to extend and strengthen the capabilities of the Government managing organization. This support may come from operating contractor or specialty type contractors. Primary areas for support could include:

- Technical review.
- Cost and schedule control system operation.
- Cost estimating.
- Management and systems integration.
- Quality assurance.

1. Organization/Staffing Criteria

The principal considerations in establishing the Project Management Organization (type and staffing) are:

- DOE priority of the project.
- Availability of personnel resources that can be committed by HQ and/or the Operations Office.
- Established system within Field Offices.
- Degree of DOE control required.
- Size of project.
- Technical complexity.
- Project objective and stage of technology development.
- Kind and number of contract vehicles (if pre-determined).
- Availability of GOCO or other support contractors.
- Availability and possible role of other Federal agencies' personnel (DOD, NASA, MARAD).
- Source and availability of technical and other special expertise unique to the project.
- Visibility of project.
- Clarity and stability of project.
- Institutional complexity.
- Geographical location of Project Office relative to Operations Office.
- Type of cost sharing arrangement.

2. Organizational Options

The managing Field Office, designated in the Project Charter, will evaluate these considerations and develop a proposed project organization. The organization will be summarized in the Project Plan and detailed in the Project Management Plan.

These project offices should be staffed with the following kinds of personnel:

- Project Manager
- Engineer(s) or scientists with disciplines appropriate for the Project

- Control Systems Specialist
- Clerical
- Business Management Specialist (mandatory for MSA's, optional for Major Projects)

The Field Office may provide matrix support to the project office in the Procurement, Finance, Budget, Legal/Patent, Industrial Relations, Safety, Environmental Review, QA, and other support areas as required.

The engineer(s) or scientists responsible for design and configuration should be knowledgeable in the technology of the project (solar, thermal, coal gasification, etc.). The engineer(s) responsible for construction or fabrication should have experience in managing similar types of construction or fabrication activities. A business management specialist should be knowledgeable of procurement practices, the budget cycle, and other typical business functions. The control systems specialist should be knowledgeable of the various systems used for controlling changes to cost, schedule, configuration, and contingency against established baselines and implementing reporting systems thereon.

3. Key Government Functions

In any field organizational arrangement, provision must be made for DOE performance of those Government responsibilities that cannot be delegated to contractors. These responsibilities are:

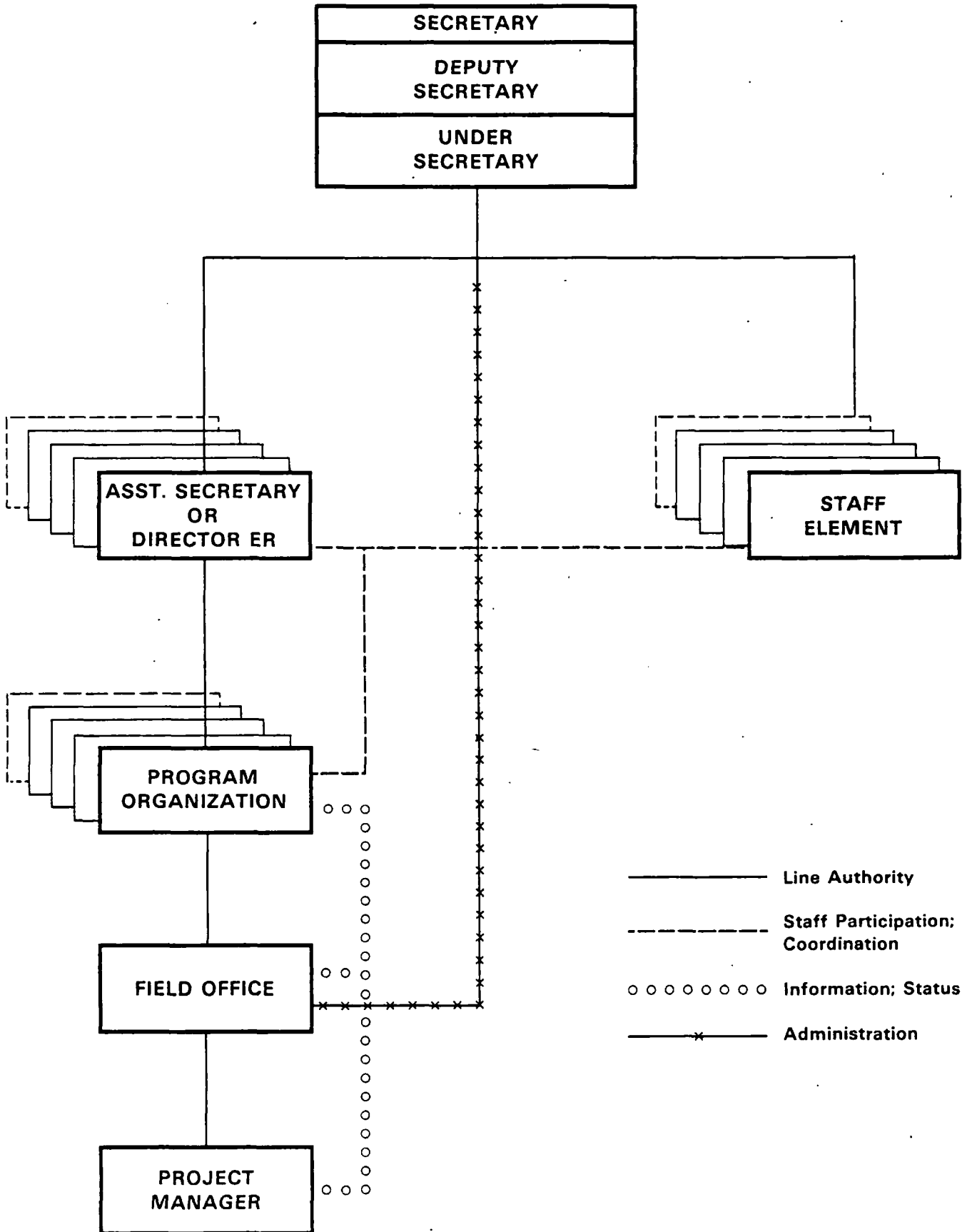
- Determination of project and contract scope.
- Establishment of the Project Management and Contracting approach.
- Selection, award and administration of prime contracts for work.
- Determination of satisfactory contractor performance and acceptance of completed work.
- Assurance of project execution within agreed upon objectives.
- Direction and supervision of government employees.
- Distribution and accountability of government funds.
- Assuring project Cost, schedule and technical performance.

I. SPECIAL PROJECT OFFICES (SPO's)

For special large projects, a SPO, separate from the existing Field structure, may be established to manage the project upon the recommendations of the Assistant Secretary or Director of Energy Research, with approval by the Under Secretary. This SPO may report to the Program Office, Assistant Secretary, Director of Energy Research or Under Secretary.

The types of personnel required for a SPO are similar to those required for a project office established within a Field Office plus those types of personnel normally provided by matrix support within the Field Office. Because this arrangement imposes the heaviest burden on the Department in terms of Government personnel and does not utilize established Field management organizations, exceptional justification is required to support a recommendation to establish a SPO.

Project Management System Relationships



APPENDIX B

PROJECT EXECUTION ACTIVITIES

A. MANAGEMENT ASSIGNMENTS

1. Project Management Assignment

Responsibility for project management will generally be assigned to the Field Office with the greatest expertise in the program area under which the project falls. An agreement on the project management assignment will be reached jointly by the cognizant Program Manager and the Field Office Manager and will be embodied in the Project Charter. The Charter will be issued by the Cognizant Assistant Secretary or Director of Energy Research. If no single Field Office has major exclusive expertise in the program or project subject area, the Program Manager will identify an appropriate Field Office for project management on the basis of staff experience and availability. The Program Manager and the Field Officer Manager (or his equivalent in the case of non-DOE office, e.g., NASA) will reach a tentative agreement on the project management assignment. Request for approval of the project management assignment will be submitted to the Under Secretary by the cognizant Assistant Secretary. After approval, a Project Charter will be executed.

2. Establishment of Special Project Office

A Special Project Office (SPO) may be established for management of a project which requires such an office because of the magnitude of the project or other special circumstances. A recommendation for a SPO shall originate with the cognizant program manager, program director, or outlay Assistant Secretary or Director of Energy Research. The recommendation will be coordinated with CR, PR, AD, and the appropriate Operations Office, and will be submitted to the Under Secretary for approval.

B. MANPOWER ALLOCATIONS

1. Between Assistant Secretaries

A staff position transfer between Assistant Secretaries (including DER) will be accomplished upon the joint recommendation of the involved secretarial officers, concurrence of CR and AD, and approval of the Under Secretary.

2. Within an Assistant Secretarial Office (Including DER)

A staff position transfer within an Assistant Secretarial office will be accomplished upon the recommendation of the Assistant Secretary.

3. Between an Assistant Secretarial Office and a Field Operations Office

A transfer of staff positions between an Assistant Secretarial office and a Field Operations Office may be accomplished upon the joint recommendation of the Assistant Secretary and the FOM, concurrence by CR and AD, and approval by the Under Secretary.

4. Within a Field Operations Office

A transfer of staff positions within a Field Operations Office may be accomplished upon the approval of the FOM.

C. PROJECT EXECUTION

1. General

Execution of a project will be the responsibility of the designated DOE project manager and will be carried out in accordance with the Project Plan, Project Management Plan, Project Charter and this Handbook.

2. Technical Support

Technical support for the project manager may be provided as appropriate by technology centers, laboratories, or contractors. Technical support services generally will be procured directly by the Project Officer, but may alternately be provided by contract from the Program Manager.

3. Environmental, Safety and Health

The Project Manager shall be responsible for assuring that all project activities are carried out in compliance with Federal, state and local regulations for protection of the environmental and the safety and health of employees and the public. The Project Manager shall procure support services as necessary to achieve such compliance.

In achieving NEPA compliance, the Project Manager will obtain guidance from the EV Office of Environmental Compliance and Overview.

4. Quality Assurance

The Project Manager will be responsible for instituting accepted quality assurance procedures in the management of the project. In carrying out this responsibility he will be guided by DOE Order(s) on Quality Assurance.

5. Administrative

The Project Manager will be responsible for administrative matters associated with his project. The FOM will provide necessary support to the PM to fulfill these administrative responsibilities.

6. Procurement

The Project Manager will initiate all procurement actions necessary for execution of the project. The FOM will provide necessary support to the PM to fulfill these procurement responsibilities.

7. Financial

The Project Manager will be responsible for management of project finances. Finances management support will be provided by the FOM.

8. Test Plan

The Project Manager will initiate a complete test plan to ensure full execution of the project. The FOM will provide necessary support to the PM to fulfill these test plan responsibilities.

D. PROJECT REVIEW

1. Day-to-Day

Responsibility for day-to-day review of project status and application of corrective actions within his authority resides with the Project Manager. The FOM will maintain cognizance of the project status, giving special attention to problem areas, and will direct that corrective actions be taken as appropriate. In the event that a change in project cost or schedule thresholds or technical performance goals occurs beyond those defined in the Project Plan, the FOM will use the change procedures in Chapter V.

2. Periodic

The responsible Program Manager will maintain cognizance of project status through review of monthly and quarterly Project Manager Status Reports supplemented by special briefings as required. He will take corrective actions within his authority as necessary to maintain project cost and schedule and technical performance within baselines.

CHAPTER III

PROJECTS, CATEGORIES OF WORK EFFORT AND
RESEARCH AND DEVELOPMENT OR ACQUISITION PHASES

CHAPTER III

PROJECTS, CATEGORIES OF WORK EFFORT, AND RESEARCH AND DEVELOPMENT OR

ACQUISITION PHASES

A. INTRODUCTION

The projects covered by the DOE Project Management Systems are the MSA's and Major Projects. These include all major construction projects as well as other project activities which may be defined in terms of the Category of Work Effort and the Phases of Research and Development or Acquisition. For consistency it should be noted that, in DOE, a project is a unique major effort within a program which has firmly scheduled beginning, intermediate and ending date milestones, prescribed performance requirements, prescribed costs and close management, planning and control. A project is a basic building block in relation to a program which is individually planned, approved and managed. A project is not constrained to any specific element of the budget structure; e.g., operating expense or plant and capital equipment. Construction, if required, is part of the total project. Authorized, and at least partially appropriated projects will be divided into three categories: Major System Acquisitions, Major Projects and Other Projects.

B. CATEGORIZATION

There are two methods of categorizing work effort--operationally and statutorially:

1. Operationally, the full spectrum of outlay program efforts can be divided into three categories:

- Science and Technology Base - Normally 8-12% of the outlay program.
- Projects - Concept and Demonstration Development Projects and Full Scale Development Projects - Normally 20-40% of the outlay programs.
- Supporting Operations - Normally in excess of 50% of the outlay programs.

The total of these three categories constitute an individual program.

2. Statutorially, work effort may be divided into seven phases grouped into three categories:

- Science and Technology Base
 - Basic Research
 - Applied Research
 - Technology or Exploratory Development

- Concept and Demonstration Development
 - Advanced Development
 - Engineering Development
- Full Scale Development
 - Demonstration
 - Commercialization, Production or Operation

Figure 1 shows the relationship of the two categorizations.

OPERATIONAL CATEGORIES STATUTORIAL PHASES OF R&D	PROJECTS			
	Science & Technology Base	Concept & Demo Development	Full-Scale Development	Supporting Operations
Basic Research	X	X		
Applied Research	X	X		
Technology or Exploratory Development	X			
Advanced Development		X		X
Engineering Development		X		X
Demonstration			X	X
Commercialization, Production or Operations	X		X	

Figure 1. Relationship of operational and statutorial categories of work effort.

C. OPERATIONAL CATEGORIES

1. As a general rule, the work effort in the Science and Technology Base is referred to as tasks or work units, managed or performed by personnel designated principal investigators as opposed to the more formal procedures in projects and project management. The work is characterized as being level of effort, and the documentation and management techniques are not as formalized or rigorous as that required for project management. There is an exception to this general rule, namely, the construction of large experimental facilities in the High Energy Physics and Fusion Programs.
2. Projects proceed through several discrete phases, each phase being separated by a decision point. These project phases can be contained within only a single statutorial phase of research and development or they may pertain as the project moves through the various phases of Research and Development (Advanced Development, Engineering Development, Demonstration, etc.). It should be recognized that all projects do not come from the Science and Technology Base and proceed neatly through the Research and Development phases; in fact, very few in DOE take this route.

3. Supporting Operations encompasses all work in an outlay program that is not in the Science and Technology Base or in Projects. It includes Program overhead, personnel, studies, etc., and is generally characterized as a level of effort. Historically, this category of work has received less management attention than any other. When it is considered that it consists of more than 50% of program outlays, it is obviously an area requiring more management attention. The preferred method is to move some of this work into Projects over time.

D. STATUTORY CATEGORIES

Within the Department, research, development, demonstration, and commercialization efforts consists of three statutory general categories as follows:

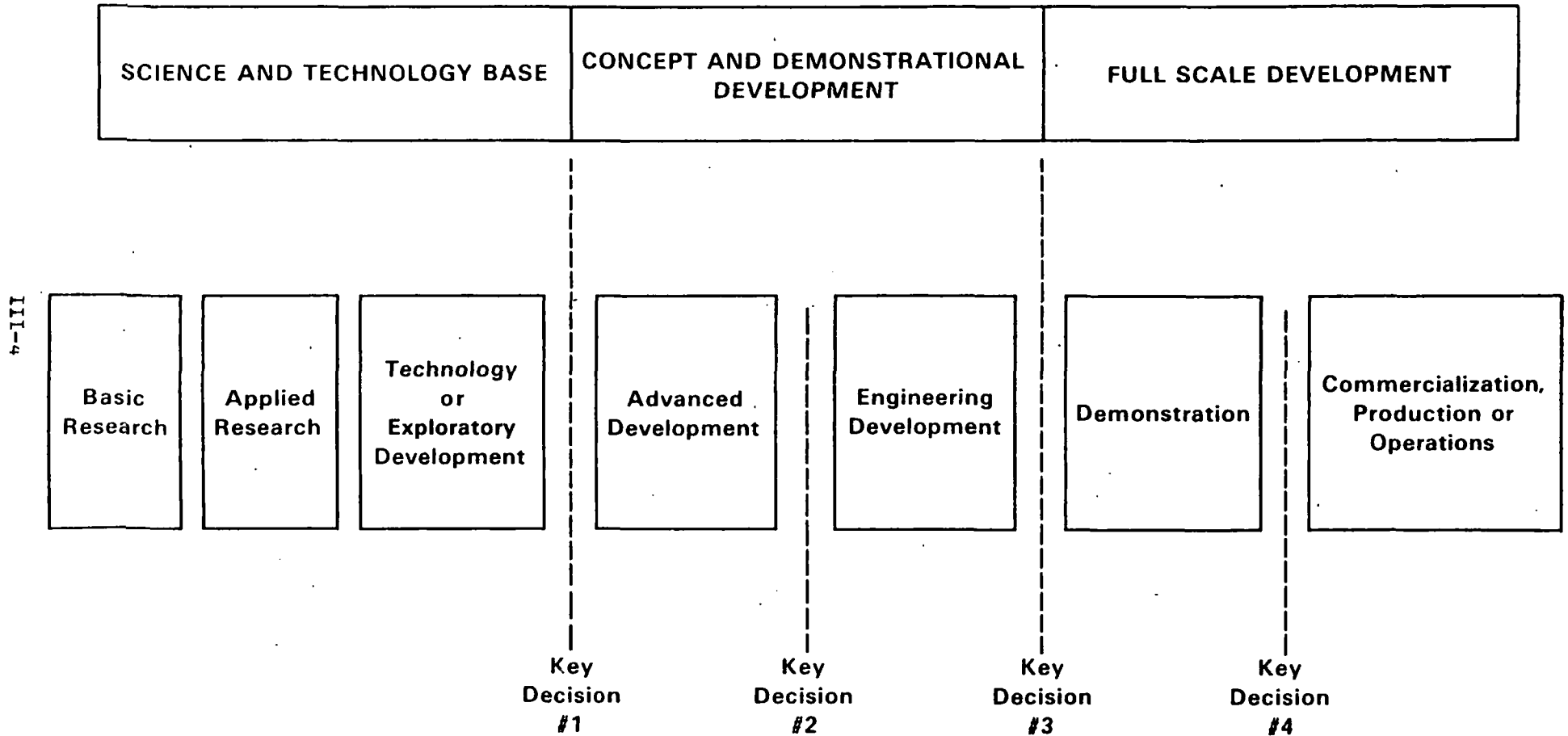
- Science and Technology Base is the total of basic research, applied research and technology or exploratory effort. Normally, for budgetary reporting purposes, research and development facilities and devices completed and capitalized are included in this base (does not include research and development facilities such as Fossil Demonstration Plants). The goal of this effort is to conceive, scope and explore technology options. Through these efforts, a broad research and development base evolves which provides the foundation for the development of specific projects.
- Concept and Demonstration Development is the systematic application of knowledge towards the identification of solutions to meet specific energy requirements, including specific application prototypes and processes. It is composed of advanced development and engineering development. These efforts take place after Key Decision 1 but prior to Key Decision 3 in in Major System Acquisitions. (See Figure 2) Normally, there is a planned commitment to large scale projects.
- Full Scale Development is the systematic application of knowledge towards production of useful materials, devices, systems or methods; including design, development and improvement of equipment and processes to meet specific energy requirements. It is composed of demonstration (if applicable), commercialization, production or operations. These efforts take place after Key Decision 3 in Major System Acquisitions. There is a major commitment of significant resources at this point.

E. RESEARCH AND DEVELOPMENT PHASES

The statutory categories above are further subdivided into research and development phases, the last four of which are also called the acquisition phases. Basic research, applied research, and technology or exploratory development are level of effort type phases. Following this, there is advanced development, engineering development, demonstration and (if

FIGURE 2

Categories of Projects and Research and Development or Acquisition Phases



appropriate) commercialization, production or operations. These latter phases are also called acquisition phases. The definitions of these research and development phases are:

1. Basic Research

Systematic, fundamental study directed toward fuller scientific knowledge or understanding of subjects bearing on National energy needs.

2. Applied Research

Systematic study directed toward fuller scientific knowledge for direct use in fulfilling specific energy requirements. These efforts are directed toward the solution of problems in the physical, biological, behavioral, social and engineering sciences which have no clear-cut applicability to specific projects. This includes the technical means of obtaining the knowledge, understanding and solution.

3. Technology or Exploratory Development

Systematic application of knowledge from research towards proof of technology including development of non-specific application prototypes and processes.

4. Advanced Development

Effort guided by the principle that the work should lead ultimately to a particular application or product. Advanced development can cut across several scientific disciplines and is intended to explore focused innovation in a particular area of one or more energy technologies. It comprises development of engineering technologies, subsystems, planning and analysis studies, energy system concept formulation, comparison of alternative concepts, and development and test of laboratory-scale engineering feasibility models. Additionally, it includes systems analysis studies, preliminary cost benefit studies and environmental studies.

5. Engineering Development

Systematic use of the knowledge and understanding gained from research and technology development to achieve the detailed design, construction, and test for performance, producibility, and reliability of energy system prototypes, pilot plants and research facilities. Detailed design, development and test of energy system prototypes and pilot plants judged to be technically and economically desirable as a means of achieving the principal energy goals. Engineering development may concern itself with processes, preproduction components, equipment, subsystems or systems. This category also includes major system test facilities directed toward specific project development and the preparation of appropriate environmental impact statements.

6. Demonstration

Verification of economic and environmental viability for commercial application, through design, construction, test and evaluation, of large (easily scaled to commercial size) energy systems in operational circumstances.

Final engineering design, assembly, test and evaluation of full-scale energy systems are aimed at providing directly applicable experience in an operational environment so as to demonstrate economic viability for commercial application. Demonstration projects are intended to:

(a) overcome "scale-up" problems; (b) contribute to the understanding of the economics of fabrication and operation; and (c) resolve other questions such as public assistance, institutional and environmental issues. Preparation of suitable environmental impact statements is included in this category.

7. Commercialization, Production and Operation

- a. Commercialization - When the predominant problems become those of bringing the system or project to commercial reality rather than demonstrating technical and economic feasibility, during commercialization:
 - (1) "Scale-up" problems have been overcome;
 - (2) economics of fabrication and operation are understood;
 - (3) public acceptance, institutional and environmental issues resolved; and
 - (4) commercial interest in project is enhanced
- b. Production - When the predominant problems become those of producing the item in quantity, bulk, or other parameters which meet specifically stated requirements.
- c. Operations - When the predominant problems become those of bringing the system or project from prototype or pilot plant operational testing status, to full-scale operational condition to meet stated objectives.

The research, development and commercialization Projects of the Department are diverse. Many were started years ago under different criteria. Many are research tools and several are co-funded with industry. Special consideration must be given to these factors. While it would be desirable for each Project to progress neatly through each of the appropriate research and development or acquisition phases, in fact many do not. Energy Research projects may never go beyond technology or exploratory development and other Projects may never go engineering development.

This emphasizes a point that the several phases of construction activity, where required as part of the Project, may take place within a given research and development or acquisition phase, i.e., technology or exploratory development for energy research Projects; engineering development for Fossil pilot plants and other Projects oriented toward production or operations; or the demonstration phase for Fossil demonstration plants and Projects oriented towards commercialization.

These unusual circumstances can be easily handled by project management if consideration is given to the important principle that approval shall be obtained prior to expenditure of significant resources or commitment to a future approval of significant resources. In addition to approval of research and development or acquisition phase transition, this normally means approval prior to start of construction even if phase transition is not going to be made and it may even include approval prior to the commitment of long-lead procurement on individual Projects. The diverse Projects in the DOE require examination of the Project to make the specific determinations of which approvals by senior management are required and when they are required.

Fossil Energy, while maintaining basic consistency with the R&D acquisition phases and key decision points, employs the following phase definitions:

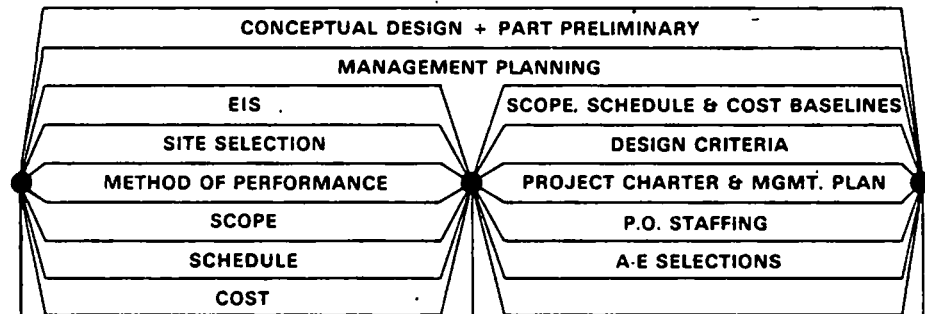
- Phase 0. Preliminary design by both proposers. Deliverables consist of preliminary designs of demonstration projects, a scale up from demonstration to commercial plant size or a "grass roots" commercial plant preliminary design based upon the demonstration plan and state-of-the-art technology, cost sharing proposals, and a market analysis of the products based upon the commercial plant criteria utilized. Normally, a selection can be made between the two proposers at the end of Phase 0.
- Phase I. After one or both proposers are selected, they then proceed into detailed design.
- Phase II. Construction of the demonstration plant(s). (See paragraph G below.)
- Phase III. Test and Operations. Normally a definite period of 3-5 years for operation is specified.

F. CONSTRUCTION PROJECT PLANNING AND EXECUTION

Depending on the particular character of the MSA or Major Project, construction activity may be isolated to a single R&D phase or it may span two or more phases. Within the broader framework of required key decisions in the acquisition process, there are activities, decision points, decision elements and independent assessments specific to construction planning and execution. Figures 3 and 4 illustrate the major aspect of the Construction Management Subsystem described more fully in Chapter XII of this manual.

Project Planning Construction

**PROJECT
ACTIVITIES**



**SPECIFIC
DECISION
POINTS**

**CONCEPTUAL
FUNDING**

**PROJECT
FUNDING**

**PROJECT
INITIATION**

**DECISION
ELEMENTS**

- Mission Need
- Conceptual Cost
- Total Cost
- Program Interfaces

- Mission Priority
- Conceptual Development
- Funding Limitations
- R&D Status
- Final Economics
- Environmental Acceptability

- Project Cost
- Agreed Upon Goals & Baselines
- Adequate Controls
- Adequate Organization & Management

**INDEPENDENT
ASSESSMENT**

- Assure
 - Project Identification
 - Conceptual Planning
 - Conceptual Funding

- Validate
 - Scope
 - Cost
 - Schedule
 - Funding

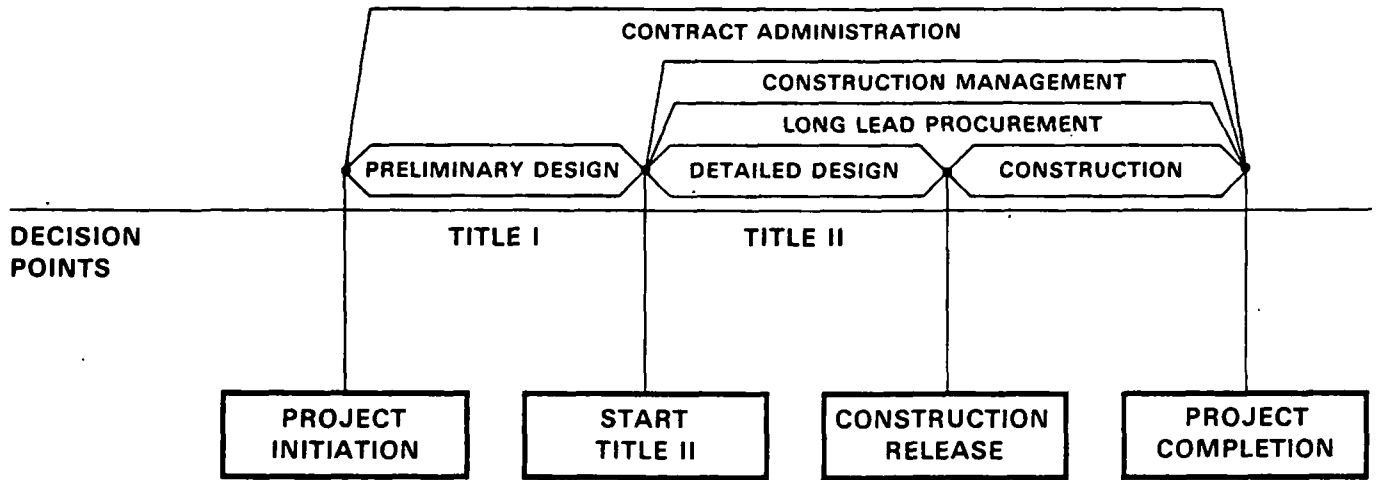
- Project Controls
- Project Organization
- Management Systems
- Force Establishment of Adequate Management
 - Charters
 - Management Plans
 - Baselines
 - Controls

FIGURE 4

Project Execution

Construction

PROJECT ACTIVITIES



DECISION ELEMENTS

- | | | | |
|--|---|---|---|
| <ul style="list-style-type: none"> • Project Cost • Agreed Upon Goals & Baselines • Adequate Controls • Adequate Organization & Management | <ul style="list-style-type: none"> • Project Cost • Design Adequacy | <ul style="list-style-type: none"> • Project Cost • Design Adequacy | <ul style="list-style-type: none"> • Systems Tests • Start Up Tests • Final Inspection |
|--|---|---|---|

INDEPENDENT ASSESSMENT

- | | |
|---|---|
| <ul style="list-style-type: none"> • Force Establishment of Adequate Management <ul style="list-style-type: none"> - Charter - Management Plan - Baselines - Controls | <ul style="list-style-type: none"> • Validate Preliminary Design <ul style="list-style-type: none"> - Scope - Cost - Schedule - Funding |
|---|---|



CHAPTER IV

PROJECT DEFINITION AND DOCUMENTATION

CHAPTER IV

PROJECT DEFINITION AND DOCUMENTATION

A. RELATIONSHIP TO PLANNING PROCESS

The National Energy Plan, or other National Plans, planning and programming guidance, program strategy documents, program decision memoranda and Program Plans establish the general umbrella under which project definition and documentation must be evolved. Program Plans, in particular, include all of the tasks necessary to achieve the stated program objectives, including identification of specific Projects which are essential to the program.

B. PROJECT DOCUMENTATION

Project documentation is necessary to establish approved Project scope and technical/performance requirements, schedules and resource plans, levels of responsibility and authority, implementation plans and accountability. It is needed to ensure to the maximum practical extent, the execution of the project within the approved scope, cost and schedule baselines. It should be concise, and the specific requirements should be determined by the size and complexity of the project. Fundamentally, documentation requested at any level should meet the test, "I use this in fulfilling my management responsibilities." Further, where information needs are common among Project documentation and review requirements, identical presentation formats should be used (see formats in Chapter IX).

Program Plans are not Project documentation per se. They do, however, provide the umbrella under which the project documentation evolves. The Program Plan, which is a derivative of the PPBS Program Decision memorandum, defines the efforts necessary to achieve the stated program objectives, including identification of Projects. Projects so identified must then be defined in more detail through Project documentation, which provides the framework for the accomplishment of project objectives.

The key documents required by the DOE Project Management System are the following:

1. Project Plans

In MSA's and Major Projects, the Mission Need Statement constitutes the initial Project Plan. The Project Plan, proposed by the Program Manager, serves as the overall project baseline and includes specific objectives (e.g., technical and performance), major milestones, resource estimates sufficient for project control purposes, acquisition strategy, ES&H requirements and schedules, commercialization plans (when appropriate), etc. These require approval up through the Under Secretary for Major Systems Acquisitions and the responsible Assistant Secretary or Director of Energy Research for

other Major Projects. It should be noted that no construction funds may be expended on a Project until the Project Plan (MSA) has been approved. They identify Under Secretary and Assistant Secretary decision points. Changes to these documents are permitted only in accordance with formal change control (See Chapter V) procedures. For other projects, when the required information is included in Schedule 44's or 47's, these can, by reference, serve as a major part of the Project Plans in order to avoid unnecessary duplication of documentation.

2. Project Charters

Project Charters, prepared by the Program Manager, clearly delineate management responsibility, authority and accountability for the Project. They establish the operational management relationships between DOE Headquarters and Field project management organizations. These require approval up through the responsible Assistant Secretary.

3. Project Management Plans

These expand the overall project baseline as set forth in the Project Plan, define the Project organization and specific requirements (ES&H and quality assurance program plans, etc.) and establish the Project Control System. These are developed by the Project Manager and approved by the responsible Field Office Manager after obtaining the concurrence of the Headquarters program organization. If required information already exists in documents such as Form 44's or 47's, the information can be referenced rather than repeated.

Guidelines for preparation, submission, review, concurrence and approval are provided in the next section. Document change control, in turn, is discussed in Chapter V.

C. GUIDELINES FOR MISSION NEED STATEMENT, PROJECT PLAN, PROJECT CHARTER, AND PROJECT MANAGEMENT PLAN PREPARATION

These guidelines have been developed to aid Project and Program Managers in the preparation of Mission Need Statements, Project Plans, Project Charters and Project Management Plans for DOE Major System Acquisitions and Major Projects. These guidelines are based on DOE Management needs and experience obtained during the review of existing documentation. The guidelines are intended to fulfill two objectives:

- Aid those preparing project documentation by answering the preparer's questions on content and format, concurrence and approvals;
- Shorten and simplify the review cycle by producing more uniform and complete drafts.

The Project Plan is the implementing document for establishing or changing approved DOE Project baselines. Accordingly, this document should set forth clearly, concisely and unambiguously the essential elements of the Project Execution Plan. This document defines the approved baseline which will be used for measuring overall progress of the Project, its success and the effectiveness of its management.

A Project Plan covers a Project from its initiation, after approval of the Mission Need Statement, through completion. It is an evolving document reflecting the further definitization of the project as it moves through the applicable phases of the acquisition process. In keeping with this concept, the Mission Need Statement constitutes an initial Project Plan. The Project Plan should be tailored to the needs of the particular Project considering the phase of the acquisition process applicable to the Project, size, complexity, sensitivity and other particular characteristics.

The Project Charter clearly defines management responsibility, authority and accountability for the project.

The Project Management Plan expands the overall Project baseline and sets forth how the Project will be managed.

1. Mission Need Statement Guidelines

Mission Need Statement (MNS) is the document for approval of major system initiation, reflecting the determination and identification of DOE mission need(s) based on the reconciliation of continuing analyses of current and forecasted capabilities, technological opportunities, overall priorities and resources involved with achieving DOE's mission, as currently reflected in Section 102 of the DOE Organization Act.

Content

The MNS is a brief (5-6 pages) expression of that need in terms of the following elements:

- Applicable DOE Mission(s)
- Purpose (of the proposed effort)
- Alternatives and Capability (existing and planned)
- Agency Components Involved
- Technical, Schedule and Cost Goals
- Operating Constraints (including time)
- Relative Priority
- Value or Worth of Meeting Need

Since the mission need is independent of any particular system or technological solution, the statement will not express the need in terms of equipment or specifications.

The Mission Need Statement should emphasize the reasons why the Project should be approved by addressing the mission needs, the purpose and priority of the Project in supporting the needs, the value of meeting the needs, and an assessment of the technology. The section descriptions should contain the following:

- a. Applicable DOE Mission - State briefly the applicable DOE mission(s) that the proposed project support. Utilize Section 102 of the DOE Organization Act.
- b. Purpose - Describe how this project will support the DOE mission and program objectives. In this discussion indicate the purpose of the proposed Project and delineate the specific technical, economic or other needs it will fulfill.
- c. Alternatives and Capability - Describe alternative approaches to meeting the mission need and, for each alternative, assess the current state of technology, the extent that existing or known systems can meet the identified needs, and the degree to which the proposed project will meet these needs. This discussion should refer to other related facilities and supporting technology activity, the relationship of this project to them and, when applicable, to the results of pertinent "State of the Art" assessments. The objective of these assessments is to insure that DOE officials have a clear understanding of where a specific energy-related technology stands before initiating any new activity aimed at bringing that particular technology to commercialization, production or operations.

If "State of the Art" assessments have been done, some types that should be referred to in this discussion are those that address such subjects as:

- Status of technology in terms of product costs in the current market and future market.
- Cost reduction goals required to develop a commercially-competitive product or process under varying economic assumptions.
- Government involvement and impact to date. Future government involvement, if any, and impact.
- Gaps in the technology, for example, specific components that are not reliable in an operating environment.
- Environmental problems.
- Current incentives in use and their impact.
- Perception of additional incentives and their impact.
- Remaining significant political and sociological barriers.

- d. Agency Component Involved - Describe the proposed organizational approach for the project in terms of Headquarters and planned Field assignments and responsibilities to the extent that they have been defined. For projects that will be joint ventures, describe what plans have been developed for industry or utility partner participation.
- e. Technical Schedule and Cost Goals - These goals shall include:
- Measurable technical, performance or economic goals.
 - A list of the major project milestones by applicable phase of the acquisition process and expected completion dates for the lifetime of the project.
 - A cost breakdown (BA) for the project showing total project cost estimates for the total project by applicable phase of the acquisition process and by fiscal year for the phase of the project being approved.
 - Identify specific major procurement actions planned during that phase of the project for which approval is being requested.
 - A description of the steps or phases planned for the project with emphasis on the work to be done and types of results expected from that phase of the project for which approval is being requested.
- f. Operating Constraints - Address any operating constraints or risks that exist for the project. These constraints will include such factors as:
- The dependence of other program elements on completion of this project and the potential impact of delays.
 - Factors that can constrain the pace of the project and the impact of them (technical, funding, other projects, environmental, external organizations, etc.).
 - Identification and description of any ongoing supporting development work on which the project is dependent.
- g. Relative Priority - An evaluation of the relative priority of this project in supporting the needs, other projects and/or programs, agency and national goal.
- h. Value or Worth of Meeting the Need - This subsection should contain the following:
- A brief evaluation of the value or worth of meeting the needs supported by the project and the basis for the evaluation.

- An evaluation of the impact of not meeting the needs supported by this project in terms of energy supply shortfalls, economic consequences, environmental concerns and other institutional or regional effects.

Submission and Approval

The signature page for a MSA Mission Need Statement will include only the following:

Submitted by: Program Manager

A paragraph that approves initiation of the MSA project and directs development of a Project Plan:

Approved: Program Director (or equivalent)
Secretarial Officer
Under Secretary

For Major Projects, the Secretarial Officer will typically be the final approving official, except in cases where the Under Secretary reserves approval authority.

Review and Concurrence

- MSA and Designated Major Projects for Under Secretary approval of Mission Need Statements.

The Mission Need Statement, as approved by the Secretarial Officer, should be transmitted to the Under Secretary via Action Memorandum. The concurrence chain on the Action Memorandum should include:

- Assistant Secretary for Policy and Evaluation
- Chief Financial Officer
- Director, Office of Project Management and Field Operations
- Deputy Under Secretary

Attached to the Action Memorandum will also be the concurrence of CR, PR and of RA or CS (where RA or CS has commercialization responsibility for the program area).

- Major Projects

DOE Major Project Mission Need Statements are to be approved by the cognizant Secretarial Officer and transmitted to the Under Secretary via Information Memorandum with a copy to the Chief Financial Officer. The Secretarial Officer should ensure that PE has concurred and that RA or CS have concurred where they have commercialization responsibility for the program area.

2. Project Plan Guidelines

The Project Plan should be a definitive document approximately twenty pages in length (excluding Attachments and Annexes). Specific allocations of the twenty pages cannot be made by subject since the Project Plan is a maturing, evolving document that hardens and deepens as the project moves through technology and engineering development. The initial Project Plan is more focused on objectives, technical plan, management approach, acquisition strategy and obtaining a good cost and schedule baseline. Once the project is well underway, and adjustments made as appropriate to technical plan, management approach and acquisition strategy, these will not normally change during the remainder of the project. You should be able to harden the cost and schedule and focus on technical achievements towards the technical objectives, performance, the test planning for the project and the commercialization annex. A good Project Plan is, in truth, a maturing, evolving document.

The Project Plan format and the information it should contain are described below:

Introduction - Issues and Alternatives

(for ESAAB Meetings at Key Decisions 2, 3 and 4 only)

In advising and supporting the Decision Authority the ESAAB will rely on information presented in the Updated Project Plan that has been expanded to include in this introductory section a discussion of the alternatives and issues relative to the decision that is being requested by the Acquisition Proponent.

a. Mission Need Alternatives

This section should define alternative methods of satisfying the mission need including those which might have evolved or been considered and not selected when the mission need was approved or at later Key Decisions if they are relevant.

b. Execution Alternatives

This section should explain all the viable technical, cost and schedule approaches to executing the next phase of the project. A life cycle cost estimate will also be included where appropriate. Within reason the discussion should not be constrained by current project thresholds. A preferred alternative will be identified by the Acquisition Proponent. Affordability consideration will be discussed in this section.

c. Issues

The issues that arise from alternatives discussed above and from the following concerns should be discussed: National Energy Plan, Strategy Papers, PPBS or other policy and programming changes; potential or actual threshold changes since the last Key Decision; project funding shortfalls or overages. Other significant issues relevant to the decision being requested should also be addressed by the Acquisition Proponent.

Content

a. Mission Need and Objectives

This section provides a summary of the approved Mission Need Statement with regard to the required capability to be achieved, and it outlines technical resource and schedule projections.

- Begin with a statement of the specific programmatic DOE mission that the project supports, indicate the source of the DOE mission assignment and describe what technology or capability the project will provide to support the mission. The source of the DOE mission assignment may be the DOE Organization Act, enabling legislation or Presidential directive.
- Indicate how this project is related to the program in terms of how it supports the broad program objectives and the relationship of this project to other projects or major elements of the program and to major thrusts of the National Energy Plan. Supplement this discussion with the program logic diagram from the approved PPBS Program Memorandum, highlighting this project and its interrelationships.
- Conclude this section with a statement of the specific measurable objectives of the project. These objectives serve as a basis for evaluating overall project success upon completion. The following three types of objectives should be stated:
 - Measureable technical and economic objectives in terms of design criteria or performance capability.
 - Schedule objective in terms of the scheduled date for project completion.
- Cost objective in terms of the total project cost (TPC) for the project. This cost should represent the total investment including related R&D design, procurement, construction, project management support, operations and disposition. Indicate DOE and industry partner's share of total project cost when applicable.

b. Technical Plan

This section should describe what is going to be done and how it will be accomplished.

- Expanding on the technical objectives, briefly describe what is to be developed or constructed. This description should refer to the location (when construction is involved) and the major systems or elements of the Project or facility.

- Describe the status of technology or the "technology readiness" for implementing the project. Include in this discussion a description of any ongoing or planned supporting development work in which the Project is dependent and which, therefore is part of the Project.
- Either integrate into or follow the above discussion with a description of the specific scientific, technological or engineering approaches or processes to be used in meeting the performance objectives. For Projects early in design and development, emphasis should be placed on alternative concepts, design or technical approaches being considered or pursued. For more mature Projects, the development paths, critical and subsystems and test and verification procedures should be described.
- For Projects pursuing alternative design or technical approaches, briefly describe each alternative and the basis for selection of an alternative.
- Describe each phase of the Project including the work to be accomplished and products developed. In this discussion, indicate the major Project events, technical activities and decision points (including the decision authority) that occur during each phase of the acquisition process. This is considered a key element of the technical plan.
- A work breakdown structure chart is mandatory and should be summarized in this section and included as an Attachment. The work breakdown structure should be output oriented and present the products or work elements of the Project down to Level 3.

WBS

Level 1 - Project

Level 2 - Project Elements

Level 3 - Project Sub-Elements

This breakdown of the Project should conform to the manner in which the work will be performed and in which Project cost and schedule are controlled and reported. Further guidance on work breakdown structures can be found in the DOE Uniform Contractor Reporting System Guidelines.

- For complex Projects comprised of several major elements, include a flow or logic diagram that illustrates Project element sequencing and interdependencies.

c. Risk Assessment

This section is an assessment of Project risks that identifies critical systems, subsystems and other factors which require focused work and resolution. Types of risks that should be addressed are technical, schedule and cost, and other risks such as environmental, safety and regulatory, commercialization and institutional impediments that are not covered in other sections.

- In addressing each risk, the following information is required:
 - The assessed level of risk (high, moderate, low)
 - The basis for this assessment (study results, proven or unproven technology, well established or unproven construction procedures, etc.)
 - The critical Project elements contributing to the risk
 - Implications of the risk
 - Activities or alternatives planned to minimize the risk
 - The stage of the Project in which the risk exists (design phase, procurement and construction phase, operations phase, etc.)
- For Projects early in the Advanced Development phase of the acquisition process, a full assessment of these risks may not as yet exist. In this case, the discussion should identify any risks that are evident and indicate when (i.e., during Title I design, etc.,) the risk assessment for the Project will be developed.

d. Management Approach

This section should address the organizational responsibilities, decision delegations, other management arrangement and management control systems under which the Project will be carried out. Emphasis should be placed on the extent of the Project Manager's responsibility for total Project funds and work effort. Accordingly, when Field Office matrix support is used by the Project Manager to review or monitor some aspects of Project funded work, that management relationship should be explained.

- Identify the Headquarters Program Office and Division to which the project is assigned and the Field Office responsible for Project management.
- Identify the Project Manager by name in the text and indicate the actual or planned approval dates for the Project Management Plan and Project Charter. In cases where the Project Manager has not yet been selected, indicate when Project Manager selection is expected to be made and the person responsible for the Project until the selection is made.

- Depict all participating organizations, DOE, major contractors and others, and their responsibilities on a Project organization chart which should be included as an Attachment. Include names of the Headquarters Program Manager and the designated Project Manager on the chart.
- Where there are industry or utility partners, identify the partners and describe the management relationships with them and their role in management and implementation of the Project. Also refer to existing agreements (cost sharing and other) with them or the status of agreements still to be negotiated.
- In discussing the items above, clearly identify decision delegations and the responsibilities of each of the key players and supporting organizations.
- For demonstration Projects, indicate how disposition of the plant, etc., will be determined at the conclusion of the Demonstration Phase of the acquisition process.
- Describe the integrated Project Management Control Systems (e.g., per DOE Order 2250.1) reporting procedures and data systems which will be used by the Project Manager to control costs, schedules and technical performance based on the WBS.

e. Acquisition Strategy

The acquisition strategy is the underlying conceptual basis for a Project and reflects the interrelationship of its mission, technical, business and management objectives. A Business Strategy Group (DOE Order 4210.2) will be used to develop the acquisition strategy. This section should include a description of the means by which the management objectives prescribed for MSAs and Major Projects and the planning considerations will be implemented while ensuring consistency with program and project objectives.

Key parameters supporting an acquisition strategy are the use of functional mission oriented requirements; parallel development; multi-phase contracts; sustaining competition; reliance on private industry. The broadest focus should be considered to ensure that these elements and those referenced above are fully understood and relied on in developing the acquisition strategy.

This section should briefly summarize the acquisition strategy developed for the project and describe the approach for procuring the major items of hardware, software and management support described in the Technical Plan section:

- Begin with a brief summary of the acquisition strategy thus far developed for the project. This summary should describe the management concepts that will be used in directing and controlling the Project to ensure that the systems being acquired will satisfy the approved mission needs.

- Include in this summary a description of how the management concepts relate to technical, business, resource, commercialization and other aspects of the Project.
- Also, clearly describe those major activities to be performed with in-house or out-of-house effort. For example, indicate whether there will be an integrating contractor and the way in which a Laboratory and its GOCO contractor will be used to support or implement such a function under the guidance of the Project Manager.
- For Projects planned to be or being jointly funded by industry or utility partners, describe the cost sharing agreement that exists. Where the agreement is yet to be negotiated, describe non-proprietary and/or non-sensitive aspects of the cost sharing plan and indicate when the agreement is scheduled to be negotiated.
- Follow the above discussion with a brief description of the overall procurement plan developed to implement the acquisition strategy.
- In cases where major contracts have already been awarded, identify each contractor, the work to be performed, the award date, contract amount, contract number and contract type. In cases where major contracts are yet to be awarded, indicate the work to be performed, planned award date, estimated cost, contract type and DOE approving official. When there are several prime contractors, this information should be summarized in a table rather than described in narrative form.
- For partially funded major contracts, indicate the portion of the contract that is currently funded, what options exist to proceed to later phases and the basis on which these options will be exercised.
- Indicate the basis and applicable controls for award of subcontract work (competitive, etc.) and summarize the approach to be employed for subcontract management.

For Major System Acquisitions, the acquisition strategy will address the following items reflecting current planning and their applicability to the current and future phases of the acquisition process (this will include the above information when known):

- Use of contracting process
- Schedule of essential elements in acquisition
- Demonstration, test and evaluation criteria
- Content of solicitations for proposal
- Decisions on whom to solicit
- Methods of obtaining and sustaining competition

- Guidelines for acceptance or rejection of proposals
- Goals for design-to-cost
- Methods of projecting life cycle costs
- Use of data rights
- Use of warranties
- Methods for analyzing and evaluating contractor and Government risk
- Need for developing contracting incentives
- Selection of the type of contract best suited for each stage in acquisition process
- Administration of contracts.

f. Project Schedule

This section should be a short one-paragraph statement that refers to the Project schedule as an Attachment. It should also include any qualifying statements. The schedule attachment must be consistent with the Project work breakdown structure and include as a minimum the schedule for Level 2 project elements. The project schedule attachment should use standard DOE symbology and contain the following:

- Key project activities, by applicable phase of the acquisition process, for the lifetime of the project.
- Key elements of the project described in the Technical Plan Section.
- Identification of all Under Secretary Key Decisions, equivalent Secretarial Officer decisions on Major Projects and other approval points mentioned in the Project Plan.
- Measurable milestones with which progress of the project can be measured, including required environmental documentation.
- The project critical path.
- Milestones for major approval/concurrence/coordination requirements from other Federal or state agencies or officials, e.g., OMB Circular A-95 coordination, Federal Communication Commission or Department of Commerce approvals for use of the electromagnetic spectrum, will also be identified as applicable.

g. Resources Plan

This section should briefly refer to the resource plan as an Attachment, mention any appropriate qualifications of the resource plan, and state

the Total Project Cost (TPC). This section should also indicate the projected total manpower level of the Project Office management staff (DOE, contractor and other personnel) over the life of the Project. In this presentation, indicate what portion of this staff is projected to be DOE civil service personnel. Life cycle cost considerations will be included in this section. The resource chart should be consistent with the WBS and include:

- Estimated funding (BA and BO) for prior years, current year, budget year and annually over the life of the project for each Level 2 project element and the total project.
- Separate Identification of OPEX, Plant and Capital Equipment funding etc.
- A Total Project Cost that correlates with cost stated in Section I and the text of this Section.

h. Controlled Items

Controlled items are cost, schedule and performance. Normally, this section will describe the controlled item such as TEC or schedule and indicate the authorized limits such as +10% or +3 months. As long as the project remains within the limits, no action is required. Performance objectives are not normally given authorized limits. Any change required in performance objectives must be fully explained.

i. Scheduled Decision Points

This section should be a simple tabulation of the Under Secretary and Secretarial Officer decision and approval points for the Project. The format is a three-column table with the following headings: Authority; Description; and Date. This table should include all Under Secretary Key Decisions (and, as applicable, start Detail Design/Title II, Initiate Long-Lead Procurement, Start construction and Termination and/or Disposition of the facility) for MSA's and equivalent decisions for Major Projects.

j. Annexes

The project plan will contain two Annexes; An Annex I - Environmental Issues; and Annex II - Commercialization and Market Development. Annex II is required only for commercially oriented projects. The content of these Annexes is described below:

- Annex I - Environmental Issues: This Annex should identify principal environmental concerns associated with the project, the objectives established for overcoming the problems or issues involved, and a description of the key activities planned or underway to achieve these objectives.

The specific format and content of this Annex have been developed by the Assistant Secretary for Environment (EV). That office has the lead role in developing this Annex. Accordingly, representatives of EV will work directly with the Headquarters Program Managers in the development of the Annex to assure that it contains the appropriate information.

- Annex II - Commercialization and Market Development: This Annex should describe the commercialization strategy for the technology or capability being developed and to be demonstrated by commercialization oriented Projects. As the Project matures this section will be expanded to present a well-defined, comprehensive, and time phased market development plan. Material in this Annex will conform to DOE commercialization and market development plans and strategy.

For the Key Decision 3 Updated Project Plan, a revalidation study will be included in this annex. The revalidation study will include analyses of technical uncertainties still to be resolved, and projections of economic viability and of environmental or market uncertainties which could block successful commercialization of the technology. The study will also include proposed new or revised specific market development approaches to overcome each significant obstacle.

For the Key Decision 4 Updated Project Plan and for the Project Plan for the Commercialization phase, a Market Development Plan will be included in this annex. The Market Development Plan will:

- Identify principal and secondary markets to be developed
- Identify and analyze alternative solutions to each barrier to successful commercialization
- Recommend a preferred marketing strategy
- Provide measureable goals to monitor status
- Propose means for widespread technology dissemination
- Propose disposition of any royalties, fees or patent rights affected by Departmental sponsorship of the technology

Submissions and Approvals

This section is the signature page for the Project Plan. For each MSA Project Plan the signature page will include only the following:

Submitted by:

Project Manager
Program Manager

A paragraph that contains:

- A brief succinct statement of the work that is approved (i.e., Phase I Design, Construction, Operations, etc.)
- Project schedule and total cost thresholds, if different from the PM proposal, and that if exceeded will require the scheduling of an Under Secretary Review or, for Major Projects, a Secretarial Officer Review, and a statement recognizing that any change in technical objectives or scope will require an Under Secretary or Secretarial Officer Review.
- A statement, as applicable, excluding certain aspects of the plan from approval (such as an increase in the TEC until authorized).

Approved:

Operations Officer Manager
Program Director (or equivalent)
Secretarial Officer
Under Secretary

For Major Projects, the Secretarial Officer will typically be the final approving official, except in cases where the Under Secretary reserves approval authority.

Review and Concurrence

- a. MSA and Designated Major Projects for Under Secretary Approval of Project Plans.

The Project Plan, as approved by the Secretarial Officer, should be transmitted to the Under Secretary via Action Memorandum. The concurrence chain on the Action Memorandum should include:

- Chief Financial Officer
- Director, Office of Project Management and Field Operations
- Deputy Under Secretary

Attached to the Action Memorandum will also be the concurrence of EV (on the Project Environmental Plan), PR, CR, and RA or CS (where RA or CS has commercialization responsibility for the program area).

Concurrence and approval can be facilitated if these offices as well as the Director, Office of Project Management and Field Operations, are provided with copies of the Plan for concurrent review before Secretarial Officer approval. In the interest of efficiency, it is expected that the reviewing organizations will take no longer than two weeks to complete their action.

Chief Financial Officer, PR and CR concurrences are defined to mean that the business management, procurement and financial information presented in the Plan are consistent with Departmental business practices and Project requirements. PR concurrence further confirms that the acquisition strategy reflected in the Plan is consistent with applicable Federal and DOE procurement or financial assistance policies and regulations. Further, CR concurrence confirms that the Plan is consistent with applicable OMB and DOE Major System Acquisition policy, directives and circulars. EV concurrence, in turn, confirms that the environmental section of the plan is consistent with DOE environmental policy as well as applicable environmental regulations and will achieve the necessary R&D activities to assure environmental acceptance of the Project.

b. Major Projects

DOE Major Project Plans are to be approved by the cognizant Secretarial Officer and transmitted to the Under Secretary via Information Memorandum with a copy to the Chief Financial Officer. The Secretarial Officer should ensure that PR and CR have reviewed and concurred in the Major Project Plans, that EV has concurred in the Project Environmental Plans and that RA or CS has concurred in the commercialization plans where they have commercialization responsibility for the program area.

c. Review and Approval Coordination and Control

Timely review and approval of MSAs and Major Project Plans are essential to the successful implementation of the DOE Project Management System. In order to provide timely review and approval:

- CR is the focal point for managing the review and approval process.
- CR is responsible for assuring the adequacy of Project Plans relative to DOE policy and implementation guidance, facilitating a responsive review by proper parties, and tracking and reporting the status of review and approval activities. Furthermore, CR will maintain the DOE repository for Project Plans and manage the change control process.

The specific sequential steps in the review and approval of MSA and Major Project Plans are as follows:

- Steps in Review and Approval of MSA Project Plans--Review of Draft.

- Step 1: Program Manager (PM) notifies EV and RA or CS that preparation is beginning on draft Project Plan or update.
- Step 2: PM delivers draft Project Plan with completed Environmental and Commercialization Annexes to Program Office Coordinator (POC) who submits 8 copies of draft Plan to Division of Policy and Analysis in CR's Office of Program and Project Management Assessment.

- Step 3: CR/OPPMA sends copy of draft Plan to Director, Office of Project Management and Field Operations, US (PMFO), Deputy Chief Financial Officer for Projects and Business Management (DCFO), PR, EV, RA, or CS, and other offices of CR for review and comments.
- Step 4: PMFO, DCFO, PR, RA or CS, EV and CR offices submit comments to CR/OPPMA (within 7 work days).
- Step 5: CR/OPPMA reviews comments for conflicts and coordinates conflicts with offices involved (within 2 work days).
- Step 6: CR/OPPMA submits consolidated comment package to POC (within 1 work day) who provides it to PM for action.
- Step 7: CR/OPPMA coordinates meeting with POC to discuss comments with PM if necessary.
- Step 8: PM revises draft in accordance with comments (in coordination with EV, RA or CS as necessary).

- Steps in Review and Approval of MSA Project Plans--Concurrence and Approval.

- Step 1: POC sends 8 unsigned copies of approval version incorporating comments on draft Plan to CR/OPPMA.
- Step 2: CR/OPPMA sends copy of plan to PMFO, DCFO and other offices of CR for quick review, and to PR, EV and RA or CS for concurrence.
- Step 3: PR, EV and RA or CS send concurrences to CR/OPPMA; other offices of CR send either negative report or list of deficiencies to CR/OPPMA; PMFO and DCFO send to CR/OPPMA either written notification that plan is satisfactory and that PMFO and DCFO concurrence will be recommended when signed copy is submitted, or list of deficiencies (within 7 work days).
- Step 4*: If deficiencies exist, CR/OPPMA coordinates with Director, PMFO and with DCFO for their determination of deficiencies considered critical (within 2 work days).
- Step 5: CR/OPPMA sends to POC either concurrences of PR, EV and RA or CS, together with notifications by PMFO and DCFO, or list of critical deficiencies.
- Step 6*: If critical deficiencies exist POC assures plan is corrected to eliminate deficiencies and coordinates with CR/OPPMA to obtain needed concurrences.
- Step 7: Project plan is signed by Project Manager and Program Manager as submitting officials, by Field Office Manager and Program Director as approving officials and is sent to Secretarial Officer (SO).

- Step 8: SO approves project plan and sends it to CR/OPPMA with Action Memorandum.
- Step 9: CR/OPPMA checks project plan and Action Memorandum, records their submission and forwards them to CR for concurrence; CR concurs and sends plan and Action Memorandum through DCFO to CFO for concurrence; CFO concurs and sends plan and Action Memorandum to PMFO for concurrence.
- Step 10: PMFO concurs and sends plan and Action Memorandum to Deputy Under Secretary (D/US); D/US concurs and sends plan and Action Memorandum to Under Secretary (US).
- Step 11: US approves Project Plan; PMFO returns signed copy to CR/OPPMA.
- Step 12: CR/OPPMA sends original of approved plan to SO and copies to PMFO, CFO and cognizant staff offices.

*These steps required only if deficiencies exist.

- Steps in Review and Approval of Major Project Plans--Review of Draft.

Steps in review of draft are the same as for MSA draft except that PMFO and DCFO are not included in the review cycle.

- Steps in Review and Approval of Major Project Plans--Concurrences and Approval.

- Step 1: POC sends approval version of Project Plan to CR/OPPMA.
- Step 2: CR/OPPMA sends copy of plan to RA or CS for concurrence on Commercialization Annex and EV if Environmental Annex is unsigned; CR/PPMA sends copy of plan to PR and other CR offices for quick review and identification of deficiencies.
- Step 3: RA or CS concurs and EV provides signature to CR/OPPMA; PR either concurs or sends list of deficiencies to CR/OPPMA; other CR offices send either list of deficiencies or negative report to CR/OPPMA (within 7 work days).
- Step 4*: If deficiencies exist, CR/OPPMA coordinates them with CR for his evaluation of which ones are critical (within 2 work days).
- Step 5*: CR/OPPMA sends list of critical deficiencies to POC.
- Step 6*: POC assures plan is corrected to eliminate deficiencies and sends copy of corrected plan to CR/OPPMA.

- Step 7: CR/OPPMA obtains CR concurrence if not provided in Step 3 (within 1 work day).
- Step 8: POC submits plan to Secretarial Officer (SO) for approval; SO approves plan and transmits it to US via Information Memorandum with copy to CFO; POC sends copies of approved plan to CR/PPMA.

*These steps required only if deficiencies exist.

3. Project Charter Guidelines

The Project Charter clearly delineates management responsibility, authority and accountability for the Project. It establishes the operational management relationships between DOE Headquarters and Field Project management organizations.

Content

The Project Charter should be signed by the cognizant Secretarial Officer and contain the information outlined below:

- a. A reference to the approved Project Plan which constitutes the approved top level Project baseline, and includes the specific objectives, milestones, schedules and resource estimates.
- b. The responsible managing office (e.g., Special Project Office, Operations Office, Energy Technology Center, Program Office).
- c. The name of, and effective date for, the designated Project Manager.
- d. The scope of work for which the Project Manager is responsible.
- e. The location of the Project Management Office.
- f. The support (including interface coordination) to be furnished to the Project Manager by other participating organizations such as other DOE component(s), Field Offices, national laboratories, or Energy Technology Centers.
- g. The authorities of the Project Manager including appropriate references to DOE Orders, Procurement Regulations, and other guidelines.
- h. The reporting channel of the Project Manager, stated and structured to account for the size, complexity, and importance of the project and to eliminate unnecessary layers of authority above the PM. It should include provisions of reporting of plans and progress to the chartering Secretarial Officer or his designee and to provide information copies to the Controller and Procurement and Contracts Management as appropriate.

- i. Special instructions, or delegations of authority, to the Project Manager for the execution of the approved project.
- j. Special requirements for a transition or termination plan to tentatively outline the conditions under which the Project Management Office will phase out or under which responsibility will be transferred.

Review and Concurrence

In all cases, the Project Charter is to be issued by the cognizant Secretarial Officer and transmitted to the Under Secretary via Information Memorandum with a copy to the Chief Financial Officer. The Secretarial Officer, as a minimum, should ensure that the following concur:

- Project Manager
- Energy Technology Center Director (as appropriate)
- Operations Office Manager
- Program Manager
- Program Director (or equivalent)

Attached to the Information Memorandum will also be the concurrence of CR and PR. Additionally, where the Project Charter specifies support to be furnished by other participating organizations such as other DOE components, national laboratories, etc., the heads of the organization must concur.

4. Project Management Plan Guidelines

The Management Plan is the detailed Project baseline and execution document. The plan shall be developed by the managing organization following the approval of the Project Plan and the Project Charter and approved by the responsible Field Officer Manager or Special Project Office Manager. The Project Management Plan shall reference the Project Plan as the Project definition and overall summary baseline document.

The Project Management Plan will include:

- a. Project organization.
- b. Organizational responsibilities and authority.
- c. Expanded Baseline Schedule, cost estimate and technical performance criteria.
- d. Project Control System which shall include financial management schedule control, technical management and configuration control.

- e. Acquisition strategy.
- f. E, S& H implementation plan.
- g. Reporting procedures and information systems to be used.

The content and extent of detail included in the Project Management Plan will vary in accordance with the size and type of project.

CHAPTER V

PROJECT PLAN CHANGE CONTROL PROCEDURES

CHAPTER V

PROJECT PLAN CHANGE CONTROL PROCEDURES

The change control procedures delineates the responsibilities and authorities for change to approved Project Plans, including Major systems Acquisition Projects, in the DOE Program and Project Management system (PPMS).

The change control procedure is composed of the following elements:

- Routine annual updates
- Updating project plans
- When to submit changes to project plans
- Procedures for changes

A. POLICY AND OBJECTIVES

The DOE Program and Project Management System (PPMS) provides that all Major Projects will be documented in approved plans that provide a baseline against which progress is measured. The PPMS also mandated that up-to-date baselines be maintained. The objective of this chapter is to provide guidance as to when a change to a Project Plan should be made and the formal procedures through which these changes are implemented.

B. RESPONSIBILITIES AND AUTHORITIES

1. Preparing Office - (Project Manager) is responsible for initiating the action to notify the approving official (Under Secretary for Major System Acquisitions and designated Projects; cognizant Assistant Secretary for all others) that approval of a change to the Baseline Plan/Project is requested.
2. Cognizant Secretarial Officials - (Includes Director, ER). For those Project Plans for which the cognizant Secretarial Official is the approving official, the Assistant Secretary is the final authority for decision on actions to be taken and for approving changes to the Project Plan.
3. The Controller (CR) through the Chief Financial Officer (CFO) is responsible for the change control system and to ensure proper staff consideration.
4. The Under Secretary (US) is the final approval authority on all MSA's and those Major Projects designated for his approval; changes to US controlled items must be approved by the US prior to or concurrent with proposed revisions to the plan.

5. Staff Officers are responsible for review, comments and concurrence on proposed changes in their area of expertise.

C. ROUTINE ANNUAL UPDATES: (PROJECT PLANS)

All project plans will be updated annually. In the last quarter of each fiscal year, the Controller's Office will issue a call for updating the approved plans. As part of the call, the Assistant Secretary or Program Offices will be requested to nominate proposed new start additions to the projects and to recommend deletions of projects that have been completed or are being terminated. If on-going projects are proceeding in accordance with the plan, the annual update will consist of: 1) an edit of the plan to assure that the information provided in the various sections of the plan, procurement or acquisition strategy, etc.) is still valid; 2) an updated attachment with the cost and obligations plan for the upcoming fiscal year as provided by the Project Manager, to be supplied by the Project Manager in his September Quarterly Project Report, and 3) updates schedule to show milestones that were completed and scheduled completion dates for the upcoming year and the outyears.

D. UPDATING PROJECT PLANS

The Program and Project Management System (PPMS) places the responsibility for approval of Project Plans with the Under Secretary for Major System Acquisitions and designated Major Projects. The cognizant Assistant Secretaries are responsible for providing copies of the approved plan to the Under Secretary and Chief Financial Officer. The necessity for updating Project Plans is dependent upon the agreements and understandings between the Project Manager and the cognizant Assistant Secretary or Program Manager. Any proposed change in controlled milestones or decisions will require the approval of the appropriate official (i.e., Under Secretary for Under Secretary controlled milestone or decision point contained in a Project Plan for a Major System Acquisition or Major Project or Assistant Secretary for Assistant Secretary controlled milestone or decision). The need for formal change during the execution year in many instances is largely a judgemental matter. The prime consideration for submitting formal changes to the Project Plan is a determination that the planned project execution as baselined in the Plan is no longer an accurate portrayal of the Project execution. When submitting a change, the original baseline should be maintained with the changes shown thereto, and a brief explanation for the change provided.

E. DETERMINING WHEN TO SUBMIT CHANGES TO PROJECT PLANS

1. As discussed in D above, should the Project Manager determine that the data contained in the Project Plan has been overcome by events (changes in organizational structure, etc.) or that unforeseen problems now dictate that the baselined execution schedule in terms of resources, schedule or planned technical accomplishments is no longer realistically obtainable, the Project Plan should be revised and submitted for approval.

In addition to the general judgement considerations mandating change to update Project Plans, there are instances where a formal revision is required. These are shown in 2 through 5 below.

2. Threshold criteria contained in the Approval Section of the Project Plan.

The Approval Section of a Project Plan sets forth any specific limitations to the approval of approving official. In the event that any of the specified limitations are in jeopardy of being exceeded, it is the responsibility of the Project Manager to notify, in a timely manner through his organizational chain of command (recommending officials whose signature appears in the Project Plan), the approving official. As a general rule, this will be done through an action memorandum to the approving official specifying item in jeopardy, the response for the impending breach, and the recommended course of action.

Dependent on the circumstances, the approving official may accept the recommended action, or he may at his discretion call for a detailed Project Review at which all options are discussed and a decision is reached. Once a decision has been reached, the impact of the approved course of action on the Project baseline should be prepared and submitted in accordance with the procedures provided with this chapter.

3. Controlled Milestones. Any proposed change to an Under Secretary controlled milestone or decision point contained in a Project must be approved by the Under Secretary. The required sequence of actions necessary to obtain the approval is the same as that delineated above in the threshold criteria.
4. Changes in Project Resources. Changes to project funding (plan) (reprogramming action, TEC, etc.) must be handled in accordance with existing governing DOE regulations. Proposed changes must have appropriate concurrence and approval (Congressional in many instances). In all cases, such changes must be concurred in by the Approving Official. Once approved, the changes will be processed in accordance with the change procedures provided in this chapter.
5. Major System Acquisition (MSA) Project Acquisition Strategy

The Under Secretary is the approving official for all MSA Mission Need Statements and Project Plans. In addition to change requirements relative to 1-4 above as they apply to MSA's, any change to the acquisition strategy must be approved by the Under Secretary.

F. PROCEDURES FOR CHANGES TO PROJECT PLANS

The above provides general instructions for approval and concurrences regarding changes to approved Project Plans. Once approved, the following procedures will be used to incorporate the changes into the Project Plan.

1. The Project Office will revise the baseline plan to incorporate the approved changes. Each revised page or attachment will provide revision number and the date revised. Changes to the baseline schedule and resources curves will depict the original schedule curves and the changes.
2. Revised plans incorporating the requested changes will be submitted to the Office of the Controller who will process the plan to obtain Chief Financial Officer concurrences and Under Secretary approval.
3. The changes to be incorporated into the plans and evidence of approval will be forwarded to Controller's Office of Program and Project Management Assessment (OPPMA). OPPMA will maintain a control repository for all Project Plans that are updated, and will maintain a list of other than Program Office recipients of the plans and assure that these recipients receive changes.
4. Each Project Plan will provide as an attachment, a project change, will provide the following:
 - (1) The revision number
 - (2) The pages that were revised and the date
 - (3) A very succinct explanation of the reason for the change.

CHAPTER VI

MAJOR SYSTEM ACQUISITION PROCEDURES
(Reference DOE Order 5700.3)

CHAPTER VII

STATE-OF-THE-ART ASSESSMENTS
(To be issued)

CHAPTER VIII

PROJECT REPORTING SYSTEM

CHAPTER VIII

PROJECT MANAGEMENT REPORTING SYSTEM

Introduction. Integral to oversight and management of projects in the Project management process are reports which provide the necessary information on status to the appropriate levels of DOE management. Consequently, Project Managers will provide full quarterly and abbreviated monthly periodic progress reports, on the accomplishments and status of all projects with TEC \$5M or greater with special emphasis on MSA's and Major Projects, whether fully or partially funded by DOE. Deviations or expected deviations from previously agreed goals and thresholds must be reported immediately. Reports must be restricted to the minimum essential and must not divert the Project Manager and contractor from the execution of the project.

The required reports represent the Project Manager's assessment of the project. They integrate all contractor input into single summary-level project reports for use by Headquarters program and staff offices. The Uniform Contractor Reporting System (UCRS) established under DOE Order No. 1330.2 provides a system for contract reporting to the Project Manager for use in controlling and managing projects. These reports will be used to the maximum degree in meeting reporting requirements, but in every case integrated project performance data are required on cost, schedule and technical performance along with the Project Manager's assessment of the total Project. These reports shall be required for the first month after the Project Plan has been approved or for the month after this Order has been promulgated for ongoing projects. Specific reporting formats are outlined in Appendices to this chapter.

- A. PROJECT MANAGER'S MONTHLY STATUS REPORT. This report shall be submitted monthly should reach Headquarters within 20 working days after the end of the reporting month. It shall cover work accomplishment, actual or forecast performance against baseline costs and schedules, problem occurrence and resolution, and an analysis of variance from proposed scope and technical objectives in terms of technical, cost and schedule impact. A fundamental concept inherent in the system is that agreed upon baselines are included in Project Plans and that the reports will provide a means of tracking performance against these baselines. Generally, the same reporting formats will be used throughout all phases of the Project life. The report will be prepared by the Project Manager and submitted through the Operations Office Manager, who is encouraged to provide his assessments to the headquarters program manager and the Controller. In turn, the headquarters program manager (or equivalent) will prepare a top management (Secretary, Deputy Secretary, Under Secretary) summary report for MSA's and Major Projects in accordance with the guidelines in Appendix E. He will submit the report and assessments to the Under Secretary through the Program Director (or equivalent) and Secretarial Officer with a copy to the Chief Financial Officer. The Program Director and Secretarial Officer are encouraged to add their assessments. The report, as initially submitted by the Project Manager, should not be changed as it moves up the line. The Under Secretary should receive the report and assessments 5 work days after it reaches Headquarters.

The Monthly Status Report shall contain as a minimum, the following items:

1. Identifiers
2. Project Manager's Narrative Report of Problems, issues and overall assessment. The project manager will provide an assessment of his project in terms of no problems, minor problems, or major problems; he will further define the specifics and recommend/state the corrective actions necessary to remedy the problems.
3. Cost Status vs. baseline
4. Schedule Status vs. baseline
5. Technical Performance Status vs. baseline
6. Variance Analysis

For MSAs, Major Projects and other Projects estimated at greater than \$10 million a shortened report shall be provided. On projects below the report shall be provided. On projects below \$10 million, all sections of the report may be submitted.

- B. QUARTERLY STATUS REPORTS. ~~On all projects over \$10M from the completion~~ of the Conceptual Design Phase through construction or limited production completion, a report supplementing the Project Manager's Monthly Status Report shall be submitted. This report will be prepared as of the end of December, March, June and September, and they shall be submitted to reach Headquarters by 20 working days following the end of the reporting quarter. The September report shall also include the next year's obligation and cost plan by month. The submission and review requirements for the Monthly Status Report will be followed for this report. The report shall supplement the Project Manager's Monthly Status Report with the following detailed reports, as appropriate:

1. Project Cost and Schedule Summary (Projects over \$10 million TEC)
2. Project Activity Plan (MSA and Major Projects)
3. Manpower Summary (Cost-type Contracts Only)
(Optional)
4. Progress Photographs (Optional depending on physical progress).

- C. INDEPENDENT ANALYSIS REPORTS TO THE SECRETARY, DEPUTY SECRETARY, UNDER SECRETARY AND THE CHIEF FINANCIAL OFFICER.

The Controller will prepare independent analyses of the cost and schedule aspects of Project Reports for use by the Project Review authorities. These analyses will cover all MSA's and Major Projects.

D. COVERAGE

Included herein is an explanation of the Project Management Report System (PMRS) (Appendix A) and instructions covering:

1. Periodic Progress Reports (Appendix B)
2. Quarterly Supplement (Appendix C)
3. General Plant Project Reports (Appendix D)
4. TOP Management Summary Report (Appendix E)
5. Definitions to facilitate report preparation (Appendix F)

APPENDIX A

PROJECT MANAGEMENT REPORT SYSTEM (PMRS)

A. GENERAL

Periodic Project reporting shall cover work accomplishment, actual and forecasted performance against baseline costs and schedules, problem occurrence and resolution, and potential variance from scope and technical objectives. A fundamental concept inherent in this system is that agreed upon cost, schedule and technical performance baselines are contained in Project Plans, and the Project Management Reports provide a means of tracking performance against these baselines. For the co-funded projects, reporting shall be on the basis of total Project costs, however, the amount of Federal and other funds shall be delineated.

Generally, the same reporting formats will be used throughout all phases of the Project life. When data requirements are common with those for project documentation or reviews, the same formats should be employed (Chapter IX). Periodic progress reports will be required on a monthly basis unless otherwise established in the Project Charter. In addition to the Periodic Progress Reports, more detailed quarterly reports, when projects are in the execution phase, are required for construction related projects. These reports will not be required if a Headquarters review of the project is required in that quarter.

~~In an effort to minimize reporting to only that necessary for effective management and oversight, monthly reporting is in two levels. The Periodic Process Reports, (monthly) are required for all projects with TEC over \$5M. However, only a reduced version is required for the projects whose TEC is between \$5M-15M. The quarterly supplement #1 is also required on all projects over \$5M in TEC. In addition, the Program manager will provide a summary project report to the Secretary and Deputy Secretary through the Under Secretary by the 22th working day of each month for MSAs and selected major projects. the guidelines and format are at Appendix E.~~

B. SUBMITTAL REQUIREMENTS

Four copies of each report will be submitted to the responsible headquarters Program Office and four copies directly to the Controller.

C. REPORTING PERIODS

1. All periodic progress reports shall be submitted to reach Headquarters within 20 working days following the end of the reporting period. The TCP Management Summary Report will be forwarded to the Under Secretary within 22 days following the end of the reporting period.
2. Quarterly reporting supplements are required in reports as of the end of December, March, June and September, and the report shall be submitted to reach Headquarters by 20 working days following the end of each quarter.

3. When a designated Project reaches the operational phase, an Operational Report shall be required. This report will be required on a quarterly basis. The reporting periods and submission dates will be the same as for the Quarterly Supplemental Reports.
4. A General Plant Project Report will be required for projects receiving GPP Funds. This report shall be an annual report and no other reports shall be required for projects in this category.

D. REPORTING EMPHASIS

Project reporting is required during the Project planning, execution and operational phases. The reporting emphasis in each phase should be as follows:

1. Project Planning Phase

This is the "definition" or "conceptual" phase of the project. It encompasses the feasibility studies; conceptual design efforts; prerequisite R&D; and the economic, safety, environment and other analysis necessary to enable Department decisions on commitment to the Project. Reporting during this phase must:

- a. Track progress toward completion of project definition activities;
- b. Flag significant findings or problems arising from this work which impacts completion or cost of the definition phase;
- c. Report developments which may significantly change the scope, cost/schedule or viability of the Project being developed; and
- d. Include status of required environmental, regulatory and other permitting activities.

2. Project Execution Phase

This phase involves the highest expenditure of government funds and requires the closest control due to high expenditure rates. In development Projects, it involves the majority of the work towards the objective of the Project. In construction, it involves the design, procurement, fabrication and construction of an experimental installation apparatus or facility. Reports during this phase must track progress against agreed upon cost, schedule and technical baseline plans. Additionally, reports must flag significant management and execution problems with planned corrective

actions and continually forecast overall performance in terms of cost, schedule and technical parameters of the deliverable end item.

3. Project Operations Phase.

This phase involves conduct of experimental operation of the device, system or facility for the purpose of gaining operational experience or experimental performance data for follow-on work on commercialization or production. Reporting during this period must track operational performance levels against planned levels, identify operating problems and report significant technical findings on device, plant or system performance. DOE involvement and direction of work funding the operating phase of Projects may be less than during the execution phase and, therefore, more reliance should be placed on contractor reports. The reports from the responsible DOE office may be supplemented as appropriate with the contractor data.

APPENDIX B

PERIODIC PROGRESS REPORTS

A. GENERAL

This Section delineates reporting procedures to be used or periodic project progress reporting. The basic reporting approach is to provide minimal project status information along with the DOE managing office assessment on a periodic basis and more detailed project status information on a quarterly basis. The specific formats outlined herein cover minimum summary information. For large or otherwise sensitive projects, supplemental and more detailed reporting may be required and the management control documents for that project will specify these additional reporting requirements.

B. COVERAGE

All projects with TEC greater than \$5 million are required to comply with the provisions of this Section from project initiation to project closeout unless specifically excluded. Projects with TEC between \$5M-\$15M should submit the shortened report of Section D.

C. REPORTING REQUIREMENTS

1. Report Initiation

Periodic reports shall be required for the first month after the Project Plan has been approved or for the month after this Section has been promulgated for ongoing projects.

For Projects which do not have an approved Project Plan, reporting will be initiated as follows:

- a. Planning Phase--Upon initiation of Conceptual Design or Engineering Development.
- b. Execution Phase--Upon initiation of preliminary or detailed design on construction project or hardware development on other projects.
- c. Operational Phase--Upon initiation of production operation or experiment.

2. Periodic Reports to the Under Secretary

Prepared by the Program Manager, this report is provided monthly to the Secretary and Deputy Secretary through the Under Secretary. The report is based on the Project Manager's Monthly Status Report.

3. Periodic Progress Reports

This report shall be submitted monthly or periodically as defined in the Project Charter and shall present progress against approved baseline plans (as contained in the Project Plan), and highlight significant developments, problems and forecast end-product deliverables. The report shall contain as a minimum, the following items:

a. Identifiers

1. Project Number and Title
2. Sponsoring DOE Program Organization
3. Managing DOE Field Organization
4. Project Location
5. Performing organization(s) - (Laboratory and major prime contractors)
6. Reporting Period
7. DOE Project Manager and Telephone Number
8. DOE Program Office Point of Contact and Telephone Number

Cost Status

Element	Cum Thru		Current FY		Cum End of Current		Cum Next		Total Project	
	Baseline	Actual	Baseline	Actual	Baseline	Forecast	Baseline	Forecast	Baseline	Forecast
1) Pace Funds By Summary WBS Element or Const. Data Element										
2) Operating Funds By WBS Summary Element on Const. Data Element										
3) Other Funds (including R&D R&D Funds related to Project)										
4) Total DOE Share										

<u>Summary</u>	<u>Baseline/Date</u>	<u>Forecast/Actual</u> (Date of Forecast)
TEC (Design and Const.)	_____	_____
Total DOE Cost	_____	_____
Total Project Cost	_____	_____
Remaining Contingency	_____	_____
Available Cum Appropriations through Current FY	_____	_____
Cum Outstanding Commitments to Date	_____	_____
Cum Outstanding Commitments through Current FY	_____	_____

c. Progress

<u>START DATE</u>	<u>COMPLETION DATE</u>	<u>PERCENT COMPLETE</u>
<u>BASELINE FORECAST/ACTUAL</u>	<u>BASELINE FORECAST/ACTUAL</u>	<u>BASELINE FORECAST/ACTUAL</u>

Design

Engineering

Procurement

Construction

Operations

d. Milestone Log

<u>Baseline</u>	<u>Forecast/Actual</u>
<u>Date</u>	<u>Date</u>

1. Significant Milestone Accomplishment Since Last Report
2. Significant Milestone Open
3. Key Milestones Upcoming (next three months)

e. Cost and Schedule Variance Analysis (cause, corrective action taken, action required, and impact)

f. Technical Performance Parameters (Quantitative)

Baseline

Forecast

g. Significant Problems

1. Closed out this month
2. Unresolved
3. New or Potential

h. HQ Action Items

i. Project Manager's Personal Assessment

The Project Manager will provide an assesment of satisfactory, minor concern or major concerns. If his assessment is minor or major concerns, he will further define the specifics and recommend/state the corrective actions necessary to remedy the problems.

Satisfactory

Minor Concerns

Major Concerns

Cost

Schedule

Tech Performance

j. AMPLIFICATIONS

For Major System Acquisitions, Significant Projects and other projects with TEC greater than \$15 million all sections of the report shall be provided as appropriate.

On projects below \$15 million TEC, the report should be shortened by only submitting:

- a. Identifiers
- b. Cost Summary only
- c. Progress
- e. Variance Analysis
- g. Significant Problems
- i. Project Manager's Personnel Assessment

Following are suggested criteria for project evaluation. Flexibility must be maintained and specific thresholds may be detailed in the Project Plan.

SATISFACTORY

- On baseline schedule + 10%
- Within Obligation/Cost Plans + 10%
- Meeting Performance/Scope Objectives + 10%
- TEC and completion date are holding + 10%/3 months
- Available contingency as % of uncosted balance is Adequate.
- No known Congressional administration or OMB threats to protect
- No current or forecast schedule, cost or scope impacts from external constraints

MINOR CONCERN

- Slightly behind baseline achedule, will not jeopardize program need date
- Behind Obligation/Cost Plans >10%
- Technical/Engineering problems may result in failure to meet Performance/Scope Objectives
- Slight TEC increase or Completion Date slip forecasted >10%/> 3 months
- Available Contingency as % of Uncosted Balance is relatively low
- Potential Congressional, administration or OMB redirection or termination of the project
- Potential schedule, cost or scope impact from external constraints

MAJOR CONCERN

- Seriously behind baseline schedule and anticipate slipping further, will jeopardize program need date > 6 months (unless date critical)
- Significantly behind Obligation/Cost Plans
- Technical or Engineering Problems will result in failure to meet Performance/Scope Objectives
- Significant TEC increase or completion date slip is certain 25% or >

- Available Contingency as % of uncosted balance is alarming low
- Probable Congressional, OMB or administration redirection or termination of project
- Probable or certain schedule, cost or scope impact from external constraints

APPENDIX C

QUARTERLY SUPPLEMENT

A. GENERAL

This Section delineates the reporting procedure to be used for the Quarterly Supplement. This will be submitted in addition to the Periodic Monthly Progress Report.

B. COVERAGE

All construction related projects over \$5M are required to comply with the provisions of this Section from the completion of the Conceptual Design Phase through construction completion. The report supplements the periodic monthly report required in Section II with two or more detailed reports which are:

- Supplement 1 - Project Costs and Schedule Summary (Required on Projects over \$5 million in TEC)
- Supplement 2 - Project Activity Plan (Required on Major System Acquisition and Projects)
- Supplement 3 - Cost and Commitment Summary (Optional at concurrence of program and managing office)
- Supplement 4 - Cost-type contractor Manpower Summary (optional at concurrence of program and managing office)
- Supplement 5 - Progress Photographs (optional depending on physical progress of the project)

C. REPORT INITIATION

1. This report supplement shall be required for the first full quarter after the Project Plan has been initiated.
2. Quarterly Report. This report shall be required as of the end of December, March, June and September of each year and the report shall be submitted to reach the Headquarters program office by 20 working days following the end of each quarter. This report shall not be required when a Headquarters review during the reporting quarter presenting the same information is required. The report shall contain the periodic monthly report plus the supplements as a minimum.

Identifiers

1. Report Number and Title
2. Sponsoring DOE Program Division
3. Managing DOE Field Organization
4. Project Location
5. Performing Organization(s) - (Laboratory and major prime contractors)
6. Reporting Period
7. DOE Project Manager and Telephone Number
8. DOE Program Manager and Telephone

SUPPLEMENT 1 - PROJECT COST AND SCHEDULE SUMMARY

Preparation Instructions:

1. Elements. As a minimum, Titles, I, II, and III Engineering, procurement, and construction, R&D (to complete construction), operations and other Project related costs shall be included as reporting elements. Procurement elements include:

- (a) purchase order placed, and

- (b) orders received.

Additional elements may be shown as appropriate.

2. Current estimate. Financial data (total incurred cost to date and outstanding commitments) shall be consistent with that reporting in the Financial Information System (FIS). Changes in estimates from those previously reported should be noted with an asterisk (*) and explained under Remarks, Item 9, on all Projects requiring quarterly estimate and schedule review, the latest review information shall be included in this quarterly summary and a footnote shown under Remarks, Item 9, as to when and where the last quarterly estimate and schedule review was held. If costs and schedule information from other than the last quarterly review is used, explain under Remarks, Item 9, the reason for using this other data.

- 2a. &

- 2b. Definitions covering the data to be reported in these columns are contained in Appendix F.

- 2c. &

- 2d.

- 2e. These column headings are self-explanatory.

3. Baseline estimate. This is defined in Appendix F, Definitions.

- 3a. Last quarter estimate--self explanatory.

- 4a. &

- 4b. Percentage complete

Engineering. On projects where design is being performed by more than one firm (operating contractor included), show the overall weighted percentages for Titles I and II scheduled and actual. The percentage of Title II need not be shown. Percentages of completion

should be based on man-hours or number of construction drawings and should not be based on dollar ratios. In any event, a statement on how the percentages are developed shall accompany the initial report. When PMS reports are required by the Project, this data should be used as the basis for developing percentages complete.

Procurement. Procurement percentages will reflect the ratio of purchase orders placed and received (in dollars) to the Total Estimated Value of Procurement.

Construction. The percentage of actual physical construction completion will be based on an engineering estimate of labor and material, incorporated in the job plus fabrication work done at the project site and the scheduled percentage developed accordingly. When PMS reports are required by the project, this data should be used as the basis for developing percentages complete. If other methods are used in scheduling and reporting of construction progress, a statement on how schedules have been developed and how progress will be reported shall accompany the initial report.

R&D (to complete construction, Other Project Related Costs and Operations).

- Scheduled percent completed. Based on incurred cost to date versus baseline estimate or $\frac{BCWS}{BAC}$ in PMS
- Actual percent complete. Based on incurred cost date versus current estimate or $\frac{BCWP}{EAC}$ in PMS

5. Dates

- 5a. Scheduled or actual start dates. Under Engineering, show the baseline, forecast and actual starting dates for Title I, II, and III. Under Procurement show the planned or actual dates for purchase order placement. Under Construction, the start dates within the column should be the scheduled or actual data on which work is physically performed at the construction site. Under R&D, other project related costs and operations, show the scheduled or actual dates. If the scheduled date has passed, briefly, but fully, explain the reasons for not meeting the schedule and show the latest realistic scheduled starting date under Remarks, Item 9. A detailed definition of physical construction start, for use in reporting construction progress, is given in Appendix F. Changes in the dates from those previously reported should be noted with an asterisk (*) and explained under Remarks, Item 9.
- 5b. Scheduled completion dates. Scheduled completion dates for engineering and construction should correspond with baseline schedules as reflected in the latest approved Project Plan and need not necessarily agree with the current estimated or actual completion dates shown in column 5c.

Under procurement, the only dates needed are dates for purchase orders placed. Under R&D, other project related costs and operations, show the baseline schedule. If the scheduled date has passed, briefly, explain the reasons for not meeting the schedule date under Remarks, Item 9. Changes in the dates from the previously reported should be noted with an asterisk (*) and explained under Remarks, Item 9.

5c. Current forecast estimated or actual completion. Column 5c requires actual or an estimated completion date. If an estimated completion date is entered, it should be the best estimate available on the date of publication. Changes in the dates from those previously reported should be noted with an asterisk (*) and explained under Remarks, Item 9.

6. Totals. Total should be reflected for columns 2, 3, 4, and the earliest date in column 5a and latest dates in column 5b and c.

Note: Change in Headquarters controlled milestone dates, costs or performance criteria will require a change in the project plan per the change control procedure, Chapter V.

7. Original Congressional TEC. Provide original TEC authorized by Congress. If the project is phased authorized, provide an explanation, and list the planned authorization.

8. Baseline Estimate. Provide estimate data and reference to the basic documentation for the estimate value give in column 3.

9. Remarks. This space should be used for explanatory footnotes or for remarks as appropriate.

Project Cost and Schedule Summary

Project No.: _____

Reporting Date: _____

Project Title and Location: _____

1. DESCRIPTION	2. CURRENT ESTIMATE (x \$1000)					3a.	3.	4. % COMPLETE		5. DATES (MO/YR)		
	a. Incurred Cost to Date	b. Outstanding Commitments	c. Forecast to Complete	d. Contingency	e. TOTAL	Last Qtr. Estimate	Baseline Estimate	a. Sched.	b. Actual	START		COMPLETION
										a. Sched. or (Actual)	b. Sched.	c. Cur. Est. or (Actual)
I. TEC												
Engineering												
Title I												
Title II												
Title III												
Procurement												
Construction												
SUBTOTAL TEC												
II. OTHER PROJECT COSTS												
R&D (To Complete Construction)												
Other Project Related Costs												
Operations												
SUBTOTAL OTHER												
6. TOTAL I AND II												

7. Original Congressional TEC:

8. Baseline Estimate and Date of Baseline (Reference Baseline Document):

9. Remarks:

SUPPLEMENT 2

PROJECT ACTIVITY PLAN

PREPARATION INSTRUCTIONS

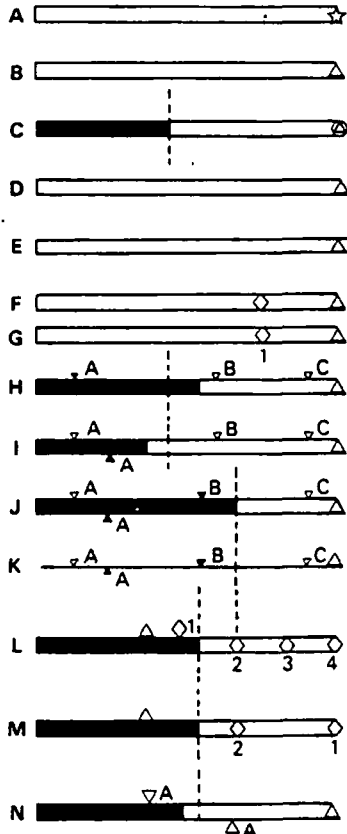
Prepare a complete project milestone plan to show scheduled activity and actual milestone status using the charting information per Attachment #1.

1. In the first column list the key project milestones including decision points.
2. Across the top list the time frame (i.e., months, years, etc.) to show total project time duration.
3. Each quarter update the Activity Plan per attachment #1 by placing a vertical dash line to show the current reporting period cutoff and darkening in the horizontal bar graph to show actual completion in relation to planned completion.

Charting Information

SYMBOLS

- ☆ Departmental Controlled Milestone (Decision by Under Secretary or Above)
- △ Major Milestone (Also Decision by Assistant Secretary/Director)
- ⊙ Major Milestone on the Project Critical Path.
- ▽ Intermediate Event (Deliverable Supporting Milestone or Decision Point).
- ▲ Intermediate Event Completed Early or Late
- ◇ Proposed Scheduled Deviation (Late or Early) for a Major Milestone
- ▭ Activity Bar
- Time Line
- ⋮ Time Now Line



EXAMPLES

- Departmental Controlled Milestone With Activity Bar
- Major Milestone With an Activity Bar
- Time Now and Work Done Event on Critical Path
- Schedule Deviation (Not Yet Approved)
- First Change Approved (Slippage)
- Improvement Not Contractually Implemented. First Change Approved (Improvement)
- Activity Ahead of Schedule
- Activity Behind Schedule
- Late and on Time Completion of Intermediate Events A and B, Respectively
- Same as Example 1, Above, Except That Here a Time Line Is Used in Place of an Activity Bar.
- Original Major Milestone Date and Four Subsequent Approved Changes (All Slippages) to That Date.
- Original Major Milestone Date and Two Subsequent Approved Changes (One Slippage One Improvement to That Date):
- Intermediate Event Schedule Deviation

CONVENTIONS

- 1 – Blacked-in figures or bars are used to show work done.
- 2 – Open figures or bars show work not done.
- 3 – △ (Major milestone) is twice as large as ▽ or ▲ (intermediate event).
- 4 – Under no condition should more than one △ (major milestone) be shown on a single horizontal line. (See Examples E and G for a method of denoting a rescheduled major milestone ◇ ; the number "1" indicates the first rescheduling.) Normally the original symbol △ would be shown with the latest rescheduled date (a ◇ with an associated number). In certain cases, where it is desired to show a complete history of rescheduling, a series of ◇ 's with associated frequency numbers might be shown as in Example L. If it is not desirable to retain the rescheduling history, DOE may request that only the current approved major milestone be shown.
- 5 – Symbols for milestones may be used alone, with an activity bar, or with a time line as the preparer judges best.
- 6 – Intermediate events may be shown only in association with an activity bar or a time line. These event symbols are placed above the bar or line and each is labeled for identification. A description of each intermediate event should be provided in an attachment to the Milestone Schedule and Status Report. One of the two methods is used to show when intermediate events are completed.
 - a – If the event is completed on time, it is blacked-in as shown above (see Example H, Event A).
 - b – If the event is completed early or late, the symbol for the intermediate event is inverted (▲) and shown below the line or activity, identified in the same way as the original. The originally planned completion date above the line is left open (not blacked-in) and the deviation to it (below the line) is blacked-in (see Example I, Event A).

SUPPLEMENT 3

COST AND COST PLUS COMMITMENT CHART (OPTIONAL)

PREPARATION INSTRUCTIONS

1. Enter an appropriate scale in dollars for the horizontal lines in the grid and indicate unit of measure (such as thousands and millions). On the grid formed by the dollar scale and the months of the year, plot planned cumulative costs and cost plus commitment. Plot actual cumulative cost for each month up to and including the month being reported. Then plot a graph extending from the actual cumulative cost and cost plus commitment to indicate a revised estimate. Enter total Obligation Ceiling Line at the top of the graphical representation. The total obligation ceiling is the total available funds to be obligated by the Government. When applicable, reflect changes in obligation ceiling without changing prior month's ceiling.
2. Enter total planned dollar cost and cost plus commitment for each month and year shown.
3. Enter total actual dollar cost and cost plus commitment for each month up to and including the month being reported.
4. Enter the cumulative variance by month. Show minus amounts in parentheses.
5. Enter total planned and actual costs for all prior fiscal years.
6. Enter the current estimate of total costs required for the project. This includes prior year actuals, current fiscal year actuals to date, plus the project manager's estimate of funds required to complete the remaining work on the project.
7. Enter total planned and actual a) cost plus commitment to date b) cost plus commitments through current FY.
8. Enter total available B/A for the project by year.

SUPPLEMENT 4

ENGINEERING, MANAGEMENT AND CONSTRUCTION MANPOWER
FOR COST TYPE PROJECTS (OPTIONAL)

PREPARATION INSTRUCTIONS

A. Current Fiscal Year

1. On the grid formed by the manpower scale and the months plot separate planned manpower graphs for engineering, non-DOE management and construction. Plot separate actual manpower graphs for each month up to and including the quarter being reported. Also provide a graph and table from each of the to date graphs through the end of the fiscal year to indicate an estimate of manpower to be expended for the remainder of the time period shown. If applicable enter the total manpower ceilings line at the top of the graphical representation. The total manpower ceiling is the total manpower funded by the Government plus the contractor's shares, when applicable, reflect changes in manpower ceiling line without changing prior month's changes.
2. Enter total planned manpower, i.e. engineering, management, and construction, for each month.
3. Enter total actual manpower for each month up to and including the quarter being reported.
4. Subtract the actual manpower for each month and including the quarter for each report.

B. Total Project Manpower

1. Enter an appropriate scale in manpower for the horizontal lines on the grid and indicate the unit of measure (such as, manhours or manmonths). On the grid formed by the manpower scale and the quarters, plot separate average per quarter planned manpower graphs for engineering, non-DOE management and construction. Plot separate actual average per quarter manpower graphs for each quarter up to and including the quarter being reported. Also, provide a revised graph and table from each of the to date graphs through the end of the project to indicate an estimate of manpower to be expended for the remainder of the time period shown. If applicable, enter the total Manpower Ceiling Line at the top of the graphical representation. The total manpower ceiling is the total manpower funded by the Government plus the contractors' shares, when applicable. Reflect changes in manpower ceiling line without changing prior month's ceiling. In subsequent fiscal year reports, adjust the graphic scale as necessary to accommodate for cumulative reporting to include total project data.

2. Enter total planned manpower i.e. engineering, management and construction for each quarter through the completion of construction.
3. Enter total actual manpower for each quarter up to and including the quarter being reported.
4. Subtract the actual manpower for each quarter up to and including the quarter being reported and indicate the cumulative variance to date. Show minus amounts (when actual is greater than planned) in parenthesis.
5. Enter the start date for the first quarter (Q1) of the graph. The graph is organized according to fiscal years; therefore, the start date will be 10/1/year.
6. Enter total planned manpower for the project.

SUPPLEMENT 5
(Optional at request of Program Office)

PROGRESS PHOTOGRAPHS OF R&D AND CONSTRUCTION PROJECTS

- a. Progress photographs on all Projects estimated to cost \$15,000,000 or more or on other projects that program divisions or CR may request shall be submitted with the quarterly supplemental progress reports from time to time to show important stages in fabrication or construction progress and unusual features. Except for the larger projects (over \$50,000,000 in cost) or those of unusual interest, one photograph of the site at beginning of construction and 15 or 20 during the fabrication or construction period should suffice to meet these requirements for submission to Headquarters. Usually only a couple views need be submitted for each significant change in experimental device fabrication or construction Project progress. In most cases it will be helpful if those submitted are alternately taken from different viewpoints. A few views of device components or significant elements of interior construction should also be included in the total number submitted during the project execution period. An aerial photograph that shows the relative position of major elements of a dispersed project is desirable.
- b. Three prints (8" x 10" including margins) of each view are to be submitted to the program division and CR.
- c. On the lower right-hand corner of each photograph, the following information will be furnished:
 1. Description (Field Office and location, name and number of project, building, or facility, and any special feature of interest).
 2. Name of principal contractors.
 3. Date photograph was taken and percent of device fabrication or construction completion as of that date.
- d. Field Office managers or Project Managers may require additional photographic coverage of construction progress for Field Office records.

APPENDIX D

GENERAL PLANT PROJECT REPORTS

A. GENERAL

General Plant Projects reports will be limited to a single end to the year annual report which confirms the work accomplished (or started) with the past years' GPP funds. No Headquarters status or progress reporting will be required, unless specifically required by a Program Manager.

B. COVERAGE

This annual report will cover all General Plant Projects being accomplished in DOE. It shall cover GPP work at both single and multiprogram installations.

C. REPORTING REQUIREMENTS

An annual report should be provided which includes the following:

1. For Past Years' GPP

- a. Identify the reporting office, annual GPP total funding in financial plan, and work authorized at end of year
- b. List the projects accomplished over \$50K with program support, title, brief description and TEC identification.
- c. For projects under \$50K they may be lumped under a miscellaneous heading.

2. For Current Year GPP

- a. Identify reporting office, and assumed GPP funding total.
- b. List currently planned projects with the same identification information.
- c. For projects under \$50K they may be lumped under a miscellaneous heading.

It is recognized there may be some substitution during the year and they will be reported in the year end summary.

D. REPORTS DUE DATE

These annual reports shall be submitted by the end of the month following the end of the fiscal year (November 30).

(DP wants quarterly reports to show initiations during quarter and resources to original listings.)

SUPPLEMENT I
INSTRUCTIONS FOR
REPORTING GENERAL PLANT PROJECTS

A. END OF YEAR SUMMARY

1. List all GPP Projects being accomplished with the past years' GPP funding which are greater than \$50,000. Identify Program(s) Supported; give Title, Description and TEC.
2. Lump small GPP projects, tasks costing less than \$50,000, and list under Miscellaneous.
3. Asterisk (*) new projects not included in original plan.

B. UPCOMING YEAR - PLANNED

1. List all GPP projects to be accomplished for the upcoming year, that have costs greater than \$50,000. Identify Program(s) Supported; give Title, Description and TEC.
2. Lump small GPP, those costing less than \$50,000, and list under Miscellaneous.
3. The list is tentative. -- Confirmation of work actually performed, projects worked on, will be described at end of year.

It is recognized there may be some substitution during the year and they will be reported in the year end summary.

C. REPORTS DUE DATE

These annual reports shall be submitted by the end of the month following the end of the fiscal year (November 30).

(DP wants quarterly reports to show initiations during quarter and resources to original listings.)

ANNUAL REPORT FOR GENERAL PLAN PROJECTS

End of Year Summary FY _____

<u>Program Supported</u>	<u>Title</u>	<u>Description</u>	TEC <u>(\$1000)</u>
			TOTAL \$ _____

<u>Program Supported</u>	<u>Title</u>	<u>Description of Planned Projects</u>	TEC <u>(\$1000)</u>
			TOTAL \$ _____

APPENDIX E

GUIDELINES FOR PREPARATION OF PROGRAM MANAGER'S MONTHLY REPORT
TO THE SECRETARY, DEPUTY SECRETARY, UNDER SECRETARY

A. PURPOSE

The purpose of this report is to provide the Secretary, Deputy Secretary and the Under Secretary with monthly highlights on the status and activities of Major System Acquisitions and selected Major Projects. This information will keep the Under Secretary appraised of existing or potential problems and allow him to take such timely follow-up action as he may deem required.

B. DUE DATE

This report, covering activities of the previous month, should be submitted by the Program Manager through the cognizant Secretarial Officer so as to reach the office of Project Management and Field Operations, U/S (PMFO) not later than the 22th day of each month.

C. PREPARATION GUIDELINES

The guidelines that follow describe the information that should be included in each item of the monthly report. The attached example illustrates the format to be used and the application of these guidelines. ~~Assessments by the Operation's Office Manager, Program Manager, Program Director (or equivalent) and Program Assistant Secretary~~ should be appended to this report. The sum of all these assessments should not exceed one page.

ITEM 1. Project Name In addition to the project name, state the location for construction projects.

Project Number State the number by which the project is identified in the DOE budget.

Project Manager Include with the Project Manager's name his location and telephone number.

HQ Point of Contact Provide the name of the Program Manager who has Headquarters responsibility for the Project, together with his program offices and telephone number.

ITEM 2. Project Manager's Personal Assessment - This section should generally not exceed one page in length and should address the following: (The assessment submitted with the Project Manager's monthly report will be included herein verbatim.)

- Status - In a brief narrative statement the Project Manager should provide his assessment of the status and health of the project.
- Significant Problems, Issues or Accomplishments - Address problems or issues of potential interest to top management. Indicate those closed out in the reporting month, new or potential problems/issues that are still open. Also address any significant accomplishments. Describe actions being taken to resolve the current problems/issues. Once a problem/ issue has been indicated, continue to show it as still open until it can be reported Closed Out This Month.
- Other Items of top management Interest - Briefly list any items not addressed elsewhere in this report that may be of interest to the Secretary, Deputy Secretary or Under Secretary.

ITEM 3

Key Events - Next Three Months List the key project events scheduled for the next three months together with the planned/ scheduled date for completion. List only events of interest to top management and/or related to HQ controlled milestones or on the critical path. Show a latest estimate for completion in the Variance column only if the date is different from the planned date. Whenever a new date is entered in the Variance column, it should be asterisked to highlight the change.

Once an event is included in this section, continue to show it, together with its planned date in subsequent reports, until it has been accomplished.

ITEM 4

Cost - Enter the approved baseline Total Project Cost (TPC) Design and Construction Cost (TEC), and DOE Cost in the Baseline column. At the top of the Baseline column indicate the Project baseline approval date.

Note: This does not constitute formal notice of baseline change, nor is this a mechanism to obtain approved for baseline changes. If current estimate is sufficiently firm and exceeds threshold, a request for approval to change the baseline should be made according to change control procedures.

ITEM 5

Schedule - Tabulate the Project completion and all intermediate Under Secretary approval milestones, and indicate the baseline schedule date for their accomplishment.

Show a latest estimate in the Variance column only when it is different from the baseline schedule date. Whenever a new date is shown in the Variance column, it should be asterisked.

ITEM 6

Technical Performance Tabulate the measurable baseline technical objectives for the project as stated in the Project Plan.

Show a latest estimate of technical performance in the Variance column only when it is different from the baseline. Whenever a new entry is made in the Variance column it should be asterisked.

*
**

ITEM 7

Project Manager's Assessment (include the chart from the Project Manager in this package)

The Controller has the responsibility to prepare a monthly Summary Project Report for all Major System Acquisitions and Major Projects. This summary will be based upon the Project Managers Monthly Reports including his assessment of satisfactory, minor concerns or major concerns. The Major System Acquisition section of the Summary Project Report will be provided to the Deputy Secretary and the complete report will be provided to the Under Secretary and the Chief Financial Officer. The Controller's Assessment, if different from the Project Manager's will be included. Attachment 2 shows the format.

ATTACHMENT 1 TO APPENDIX E

PROJECT MANAGER'S MONTHLY REPORT TO THE UNDER SECRETARY

MONTH: December 1978

- | | | |
|----|---|--|
| 1. | <u>PROJECT NAME:</u> 10 MWe Central Receiver Pilot Plant, Barstow, California | <u>PROJECT MANAGER:</u> R. Schweinberg
SAN 213-579-7574 |
| | <u>PROJECT NUMBER:</u> 76-2-b | <u>CS POINT OF CONTACT:</u>
J. Zingesser, CST 376-4109 |

2. PROJECT MANAGER'S PERSONAL ASSESSMENT

Status -

Significant Problems/Issues -

- a. Closed out this Month: SAN has allotted one slot for the Design Engineer.
- b. New or Potential: None
- c. Still Open: Schedule slip of 3-6 months is pending, caused by late initiation of SFDI activities (STMPO by Feb. 15, 1979).

Other Items of Under Secretary Interest -

3.	<u>KEY EVENTS - NEXT THREE MONTHS</u>	<u>PLANNED DATE</u>	<u>VARIANCE</u>
	a. Execution of SFDI contract	9/78	3/79
	b. Revised Project Schedule approval requested	2/79	
	c. SFDE start (or complete) site construction	1/79	6/79*
	d. SAN receive approval for Phase II selection process	2/79	
	e. Explanation of Variance	3/79	

























4. <u>COST</u>	<u>BASELINE (6/78)</u>	<u>VARIANCE</u>
Total Design & Construction Cost (TEC)	108.0M	
Total Project Cost (TPC)	167.8M	
Total DOE Cost	148.2M	
Explanation of Variance		

5. <u>SCHEDULE</u>	
Begin operation (steam to turbine)	Sept. 1981
Complete operation	Dec. 1986
Explanation of Variance	

6. <u>TECHNICAL PERFORMANCE</u>	
Plant Rating	10 MWe from Receiver 7 MWC from Thermal Storage
Explanation of Variance	

Summary Project Performance Report to Senior Management

PROJECT MANAGER'S ASSESSMENT

MSA'S (BY PROGRAM)	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	CURRENT MONTH COMMENT	REFERENCE TAB	CR* ASSESSMENT	CR COMMENT (IF ASSESS. DIFFERS)
1. Project A							Schedule Slip	1		PM does Not Recognize Unfunded Cost Increase Associated With Schedule Slip
2. Project B							Technical Problem Being Handled	2		None Required
3. Project C							--	3		PM Does Not Acknowledge Pending Congressional Decision to Redirect Project
Other MSA's and Major Projects	 Satisfactory						 Minor		 Major	

APPENDIX F

DEFINITIONS

Baseline. Refers to a formally agreed upon official control level for cost, schedule, and scope for a project by headquarters program officials as identified in the Project Plan. This baseline should be consistent with Congressional budget authorization documentation or plans should be under way to notify Congress of any re-baselining. Changes in baseline are permitted only through the formal procedures delineated in the Change Control Section of the Project Management System Handbook.

Beneficial Use of Occupancy Date is the date on which a building or facility, or the last piece of principal equipment, is turned over to operational forces for use in limited operations or functional testing, prior to final acceptance. Nonintegral or subsidiary items may be completed after this date; correction of design inadequacies brought to light by functional testing may be completed after this date. On multiple facility projects, beneficial use of the overall project will be the beneficial use date of the last major building or facility.

Construction Completion. A definition of what constitutes construction completion shall be agreed upon by the Field Office, the program division, and the Assistant Secretary during the development of the Project Plan. Normally, however, a construction completion date should reflect the date on which work normally performed by construction forces (including installation of equipment by operating contractors or others) is provisionally accepted. ~~This includes the completion of all building items~~ and erection and installation of mechanical units and/or processing equipment. Correction of minor deficiencies and exceptions as noted by operating personnel may be accomplished after the recorded date.

Contingency is to cover costs that may result from incomplete design, unforeseen and unpredictable conditions, or uncertainties. The amount of the contingency will depend on the status of design, procurement, and construction and the complexity and uncertainties of the component parts of the Project. Contingency is not to be used to avoid making an accurate assessment of expected cost.

Forecast. Refers to the DOE Managing Offices most current performance projection for cost, schedule, and scope.

Incurred Costs. All costs incurred for a project are reported whether they arise from payments, cost accruals, or transfers of costs from other DOE locations and Federal agencies. At the time costs are incurred by cost-type contractors, the amount will be included in that period. Also include payments made or due to date, including any retained percentages, or lump-sum and unit-price contracts based on payment estimates approved by the Contracting Officer or his designated representative for the purpose of making the progress or final payments on work performed to date. Costs shall not be accrued on the basis of a percentage of physical completion, unless the amounts of such costs are approved by the Contracting Officer or his designated representative as progress or partial payments.

Milestones are dates that have been established for major events for either design, research and development, procurement, construction or environmental requirements that must be achieved to assure timely completion of the project as scheduled.

Key Milestones are dates that have been established for major events for either design, research and development, procurement, construction or environmental requirements that must be achieved to assure timely completion of the project as scheduled.

Major Procurements are those that are critical elements in the projects performance schedule, as established by the Field Office (or its contractors).

Major Project Participants are non-DOE parties that are responsible for a major portion of the engineering, procurement, construction, R&D, and operational project obligations. Examples of Major Project participants are as follows: operating contractor, design organization, construction manager, major construction contracts, major R&D contractors, etc.

Obligations. The term, "DOE Obligations," includes all obligations including operating expenses incurred for the construction, purchase, and transfer of plant and equipment included in construction projects that will be liquidated through payment by the reporting organization, or the transfer of payment (nonreconciling transfer) from another DOE office.

Other Project Costs

- a) R&D necessary to complete construction. The total estimated cost by fiscal year for the following type of R&D will be included: any construction project which requires the conduct of a research and development program directly prerequisite to its specific design and construction features and for which R&D funds are included in the operating expenses appropriation requests. Funds used for conceptual design should be included.
- b) Other project related costs. Any other costs directly related to the project that occur on a one-time basis, such as start-up costs, initial training, termination costs, and decommissioning costs, should be listed. Provide a narrative explaining and justifying each cost.
- c) Operations costs include the costs for operating the plant and/or conducting the experimental program. These costs should only be included in the Total Project Cost where the projects involve a limited experimental or testing phase predicated on abandonment, dismantlement or transfer to others at the end of this period. This operation phase is intended to yield specific results over a definite time period.

Operation Date

- a) **Production Plant.** Refers to the date when operations personnel introduce feed materials into the process equipment of production unit with the intent to produce the design plant product, excluding functional testing. For gaseous diffusion plants, the term "on-stream date" is synonymous with operation date.
 - (1) Initial Operational Date. If the facility is a multiple unit type, "Initial Operation Date" means the date feed materials are introduced into the first of a number of process or production units.
 - (2) Complete Operational Date. If the facility is a multiple unit type, "Complete Operational Date" means the date feed materials are introduced into the last of the process or production units.
- b) **Reactor.** Refers to the date when initial criticality is achieved.
- c) **Accelerators.** Refers to the date when operations personnel inject a subatomic particle into the accelerator and achieve an initial accelerated beam.
- d) **Other.** Normally refers to the date a building or facility is first occupied and functions in accordance with its original purpose. However, on development projects it refers to completion of the first major milestone in output.

Original Schedule Dates refer to dates of design, completion of development construction, and procurement approved in the first official project plan.

Outstanding Commitments includes the unliquidated portions of contracts, subcontracts, purchase orders, work orders, or any other agreements for acquisition of goods or services which have not been received; e.g.:

- a) Open purchase orders which have been approved and issued.
- b) Uncosted portions of lump-sum and fixed-price contracts.
- c) Uncosted portions of uncompleted work order (or job orders) of cost-type prime contracts and cost-type contractors.
- d) Uncosted portions of obligations related to Headquarters Transfer Allotments (HTA's) and minor nonintegrated cost-type contractors.

Physical Construction Start means, for purposes of reporting construction progress, the date on which work at the site on an overall project physically starts, including work on temporary construction and any earth moving. The start date of construction of permanent facilities also should be indicated.

Procurement means all operating contractor purchased items as well as any major procurements by architect-engineering or construction contractors.

Procurement Completion means that data on which the final supply contract or purchase order is placed (not the date of final material deliveries). This definition, pertaining to placement of contracts or purchase orders, is set forth for the purpose of procurement progress reporting.

Procurement Start means the date on which the initial supply contract of purchase order is placed (not the date of first on-site materials delivered).

Reporting Period refers to day, month, and year ending the reporting period.

Start of a Construction Project refers to: (1) the time when the first construction contract (including letter contracts and sub-contracts) for the particular project awarded; or (2) the time of the award of the subcontract to a cost-type contract; or (3) the time of the beginning of physical work at the site, when construction is to be performed by the labor forces of the DOE or by labor forces of a cost-type prime operating contractor or continuing-type construction contractor; or (4) the award of a contract for procurement of material or equipment, if such occurs before any of the above conditions occur.

Total DOE Project Cost refers to the total DOE construction cost (TEC) (see definition) plus Other Project Costs (see definition).

Total Estimated Costs of a Construction Project (TEC) shall be the gross cost of the project including the cost of land and land rights, engineering, design, and inspection costs, direct and indirect construction costs, and initial equipment necessary to place the plant or installation in operation.

Total Project Cost refers to the total DOE project cost plus all non-DOE project costs.

CHAPTER IX

PROJECT REVIEWS

CHAPTER IX

PROJECT REVIEWS

A. OBJECTIVE

The objective of project reviews is to apprise management of:

- The progress of the project
- Problems which require management attention
- Completion of a phase in Major System Acquisitions
- Evaluation of concept and definition effort prior to major resource commitment
- Controlled milestones either threatened or exceeded
- Major changes such as in mission need, budget/financial, redirection, scope, costs timing, management structure, or changes having significant ES&H impacts or implications

Additionally, the objective of a project review may be to seek approval to proceed with proposed corrections or major changes.

B. SUBDIVISIONS OF PROJECT REVIEWS

For convenience, the total Department of Energy projects authorized and at least partially appropriated can be broken down into three categories:

- Major Systems Acquisition - as delineated in DOE Order 5700.1 and 5700.3
- Major Projects - Projects which the Assistant Secretaries agree should receive focused management attention.

These two categories account for approximately 80 percent of the resources devoted to projects in the Department.

- Others - The remainder of the diverse array of projects in the Department.

These categories mirror the appropriate review levels in the Department. The Under Secretary is the Acquisition Executive of the Department of Energy and, as such, he is the reviewing authority for Major System

Acquisitions. It should be noted that the Secretary or Deputy Secretary may elect to be the decision authority and chair the Energy System Acquisition Advisory Board at specific key decisions on selected Projects. The Assistant Secretaries or the Director of Energy Research are the reviewing authorities for the Major Projects which are not Major System Acquisitions, and the Program Office Director or equivalent has the reviewing authority for the other projects within his program.

C. CRITERIA FOR REVIEWING

In order to establish reviews at the appropriate times, the following criteria for Project Reviews are established:

1. Major System Acquisitions and any Major Project which is of special interest to the Under Secretary.
 - Before authorized phase transition
 - To evaluate concept and definition effort prior to major resource commitment
 - When Under Secretary controlled items are threatened or exceeded, i.e., significant project problems
 - At Under Secretary direction
 - Periodic reviews
2. Major Projects
 - Prior major resource commitment
 - When major milestone is threatened or exceeded
 - Periodic reviews
3. Other Projects
 - Prior major resource commitment
 - When identified milestone is threatened or exceeded
 - Periodic review

A matrix showing the kinds of reviews, organizational level of review, frequency and minimum required documentation is attached at Figure 1.

FIGURE I

Summation of the Review System

	KINDS OF REVIEW	ORGANIZATIONAL LEVEL OF REVIEW	FREQUENCY	MINIMUM DOCUMENTATION REQUIREMENTS
MAJOR SYSTEMS ACQUISITIONS	(1) Phase Transition	U/S	As Required	* ESAAB Requirements
	(2) Prior Major Commitment	U/S	As Required	* ESAAB Requirements
	(3) Periodic Reviews	U/S	As Required	Standard Format
	(4) U/S Controlled Item Threatened or Exceeded	U/S	As Required	Full Picture of Background and Proposed Solution
MAJOR PROJECTS	(1) Prior Major Commitment	A/S	As Required	Background Impact and Request
	(2) When Major Milestone Threatened or Exceeded	A/S	As Required	Full Background and Proposed Solution
	(3) Periodic Reviews	A/S	As Required	Standard Format
Other Projects	(1) Prior Major Commitment	Prog. Dir.	As Required	Background Impact and Request
	(2) When Milestone Threatened or Exceeded	Prog. Dir.	As Required	Full Background and Proposed Solution
	(3) Periodic Review.	Prog. Dir.	As Required	Standard Format

IX-3

*Energy Systems Acquisition Advisory Board

D. ORGANIZATIONAL LEVEL OF REVIEW

The Assistant Secretary has the full responsibility for his programs and projects. Normally, because of the stated desire to focus management attention on the Major Projects, including Major System Acquisitions, the Assistant Secretary or the Director of Energy Research will conduct periodic reviews of these projects.

The Under Secretary will conduct reviews of only Major System Acquisitions and selected major projects: before authorized phase transition; to evaluate concept and definition effort prior to major resource commitment; when Under Secretary controlled items are threatened or exceeded; or at the Under Secretary's direction.

Other Project Reviews are at the discretion of the Assistant Secretary or the Director of Energy Research. However, it is recommended that Program Office Managers be responsible for other Project Reviews below Major Projects. The preferred method of review is to have the review conducted by the Operations Office Manager responsible for the project with participation by the Program Office Manager and the Controller, in order to equalize the workload and permit focused management attention on the significant projects.

E. REVIEW STANDARD DOCUMENTATION

The Under Secretary utilizes the Energy System Acquisition Advisory Board (ESAAB) to assist him in the key decisions of Major System Acquisitions. The documentation normally required is:

- Updated Project Plan
- Detailed status and results of work completed
- Specific plans for future work to be authorized
- Cost-benefit analysis
- Updated resource and schedule projections (see standard forms attached)
- Risk assessment, economic analysis or other supporting data necessary
- Impact statement of not continuing the project
- Separate evaluations by the Assistant Secretary for Policy and Evaluation and the Assistant Secretary for Environment in their areas of cognizance

- Variance analysis for all baselines (cost, schedule and technical progress)
- Independent cost estimate
- Independent assessments and evaluations required by previous phase approvals

F. STANDARDIZED CHARTS

Standard charts are established to report, schedule resources, and status at project reviews. The standard briefing charts and guidelines for preparation of project review viewgraphs are shown in Attachment 1. They must be utilized in Headquarters Project Reviews.

G. PROCEDURES FOR SCHEDULING HEADQUARTERS PROGRAM REVIEWS

Projects for review will be selected on the basis of above criteria in the following manner:

1. The Controller, Office of Program and Project Management Assessment (OPPMA) will be develop a Project Review schedule including those Projects which require a management review because of either an MSA/ESAAB decision or that they merit management attention because of problems or other Project developments.
2. This proposed schedule will be furnished to the Under Secretary and the Chief Financial Officer for review and concurrence.
3. Upon concurrence, formal scheduling of reviews will be accomplished by the Controller, OPPMA.

H. PROCEDURES FOR CONDUCTING REVIEWS

The effectiveness of HQ reviews is determined by:

The quality of briefing preparation in terms of focusing on and addressing the issues; a clear and factual briefing; receipt of the briefing by knowledgeable reviewing officials. The Controller has an approach to these briefings that addresses all three of these principal effectiveness determinants. This strategy is composed of the following:

1. A prior review of the project is conducted by the Controller, OPPMA with the managing office and the program division personnel. This review consists of establishing the Project status, overall cost and schedule forecast, problems requiring the attention of Headquarters management and key considerations to be presented to the Under Secretary and CFO.

2. Participation by the Controller, OPPMA staff, in the "Dry-Run" of the presentation or involvement in informal discussions of briefing content with the program office is required. This is aimed at assuring complete and factual material is presented and that it is consistent with the prescribed formats. This also permits clarification of any questions on briefing content and recommendation of appropriate adjustments.
3. A prebrief is conducted for the CFO by the Controller, OPPMA, to assist in preparing him for the briefing discussions. The intent of the prebrief is to inform the CFO of current issues and specific problem areas. Copies of the prebrief material are also forwarded to the Under Secretary for his use.
4. Where appropriate, the Controller, OPPMA, should be prepared to present the CR independent assessment views with regard to the addressed cost/ schedule issues or problems.

APPENDIX A

GUIDELINES FOR PREPARATION
OF PROJECT REVIEW VIEWGRAPHS

These guidelines have been prepared to aid Project Managers in their preparation of viewgraphs for Energy System Acquisition Reviews (ESAR's). Attached is a set of sample charts prepared to illustrate how the charts should be prepared using the prescribed formats. These represent the core charts for ESAR's. It is expected that these core charts will be augmented by such additional charts that the Project Manager feels are needed to describe or illustrate project systems, problems, issues, or other factors pertinent to the presentation of project status.

Each Project Review will have the following five sections:

- Introduction and Background
- Schedule Baseline
- Resources Baseline
- Baseline Status
- Summary

The discussion that follows indicates the purpose of each section and describes the information to be included on the core charts in each section:

Chart 1. Title Page

- Indicate the official name of the project. The presenter should be assigned Project Manager whenever possible. If more than one person presents the material, their names should also be added to the Title Page.

Chart 2. Standard Agenda

- To be prepared and included in the handout but not presented.

Introduction and Background

The purpose of this section is to quickly and briefly orient the Under Secretary by providing fundamental project information in a consistent way. It is not intended that this be a general description, a justification of approach or historical background; rather, it is intended to crisply convey essential data to provide a context for the balance of the briefing. Four charts are specified for communicating the desired information.

Chart 3. Project Identifiers

- Specify the approved estimated total project cost (TPC) and the total estimated cost (TEC) for design and construction. TPC is the "bottom line" representing total investment for technology support, design, procurement, construction, project management support and operations through scheduled project completion.
- If the project is a facility type project, indicate its physical location
- Identify status of Congressional funding action
- Identify the key DOE officials responsible for the Project
- Identify the major contractors/laboratories and their prime responsibilities
- Identify the partners that are sharing the project cost with DOE
- Depending on the nature and purpose of the project express the project end date, e.g., construction completion, operational or availability date, complete operations, etc.

Chart 4. Program/Project Objectives and Technical Baseline

- Succinctly state the key objectives of the program within which the project to be reviewed resides. The key project objectives should also be listed briefly. The relationship between the program and project objectives should be clear. The basic technical baseline requirements for the project should be shown as they were originally planned. These will be addressed later in the presentation.

Chart 5. Cost and Schedule Trends

- In graphic form, plot the changes in total cost estimates and schedule completion dates and briefly explain the reasons for each change. Identify what portion of the cost increases are attributed to escalation.

Chart 6. Problems/Issues

- Significant problems or issues encountered in project implementation should be addressed in the format illustrated in the sample chart. Information should be brief and concise so they can be quickly understood.

Chart 7. Project Manager's Assessment

- This chart should display the Project Manager's assessment of the schedule, funding, technical, management, procurement and overall project health for each of the preceding six months as illustrated on the sample chart. Other factors considered pertinent may also be included. The Comments column is for use in highlighting the specific problems that influenced the assessment in a given category.

Chart 8. Program Summary

- The presenter should briefly explain the technical program strategy to achieve the major goal. Also identify each major program element including the project being reviewed and the timing and resources required for each.

Chart 9. Program /Project Organization

- Depict the participating organizations and their responsibilities in the form of an Organization Chart. More than one chart will probably be necessary. This is the opportunity to depict the manner in which the project is being managed. Laboratory/contractor/partner responsibilities should be identified.

Chart 10. Project Technical Process

- Use a technical process flow chart or similar graphic to provide a summary of how the facility or machine is expected to function.

Chart 11. Technical Accomplishments

- State the significant technical activities, milestones or events that have been completed. These should be items in direct support of achieving the goals and milestones of the project such as testing of key subsystems, analyses of pilot plant experience, delivery and installation of critical scientific components, and solutions to unexpected technical problems.

Chart 12. Technology Commercialization

- This chart should indicate the needs or purpose for commercialization, the projected market(s) that the product is intended to impact (type and size), the currently estimated commercialization readiness date compared to the scheduled or estimated date in the project plan. The commercialization readiness date is defined as the point in time when DOE has completed all activities related to commercializing the technology.
- This chart also should indicate the steps necessary to commercialize the product. This item should include necessary DOE activities with industry or in the marketplace to develop industry and market acceptance of the product. Indicate dates when these activities should occur to meet the scheduled commercialization readiness date. If there are any impediments to commercialization, they should be noted in this item.
- This chart will be omitted for projects that do not have a commercialization objective (i.e., test facilities, nuclear waste facilities and nuclear energy projects).

Chart 13. Status of Management Activities

- Describe the status of required Project Documentation and designated management activities. If not complete, indicate expected date and status under Status/Comments. If completed note date or in the case of on-going projects, note the next update.

SCHEDULE BASELINE

- The purpose of this section is to display the currently approved top level Baseline Project Schedule in a standardized format and specified supporting schedules as appropriate.

Chart 14. Baseline Project Schedule - All Years

- To provide an overview of project activity display the Baseline Schedule for the life of the project. Use standard DOE symbology. Include all Under Secretary decision points (star), other critical decisions and events, major milestones and the critical path for project implementation.

Chart 15. Baseline Project Schedule - Near Term

- This chart is required to highlight the upcoming events, activities and decisions in more detail than the previous schedule.

Chart 16. Near Term Key Events/Milestones/Decisions (Optional)

- This is an optional chart and should be used only for emphasis or focus as necessary; otherwise the necessary points should be made when discussing the Baseline Project Schedule.
- When used, relate to key items from the Baseline Project Schedule and array them in tabular form, showing the expected date and comments as appropriate.

RESOURCES BASELINE

- The purpose of this section is to display the currently approved Baseline Resources Plan in a standardized format, the current year cost plan and status, other specified funding information and project staffing data.

Chart 17. Baseline Resource Plan

- This chart should show the funding authority available and anticipated. Show both cumulative obligations and costs planned by fiscal year over the life of the project. Actual costs and obligations should be shown against these plans and end of the past fiscal year should be highlighted by a note on the chart. All costs and obligations should be denoted in current year dollars.

- This chart should address the Total Project Costs and identify the DOE share if appropriate. It should note the total estimated cost for design and construction.

Chart 18. Project Funding - Obligations

- Show the approved baseline obligation plan for the project. Funding by DOE and others should be indicated separately for prior years, the current year, the next year and the all-year total. This chart should indicate the funding for each of the major project elements used by the Project Manager for cost and schedule control and reporting. All funds should be denoted in current year dollars.

Charts 19 and 20. Current Year Cost Plan

- Display by month the near term planned and actual costs and variances for the project in both graphic and tabular form. The chart will be used to show actuals against plan and to identify and highlight problems.
- When a project utilizes both construction and operating expense funds, separate charts should be used for the two funding sources.

Chart 21. Cost Summary (Optional)

- This chart is optional and would provide a more detailed, tabular breakdown of cost experience and requirements by each project element.

Chart 22. Contingency Funding Status

- The purpose of this chart is to compare the portion of total project funds obligated to date with the portion of contingency funds that have been spent. Accordingly, for each, indicate the total funds allocated in the approved project baseline, and the amount and percent obligated to date.

Chart 23. Project Staffing (Backup)

- This chart must be prepared and be available as backup in case of questions. It may also be included if presenter determines it is necessary. The chart is to provide manpower planned vs. actual-on-board for the DOE/laboratory/operations office/contractor team.

BASELINE STATUS

- The purpose of this section of the presentation is to relate the status of the progress on the project. This should include analysis of the baseline trends, significance of variances that exist between actual vs. plan (for technical, cost and schedule) and discussion of key problems/issues.

Chart 24. Baseline Technical Performance/Design Criteria Status

- This chart repeats the technical baseline parameters shown on Chart 5 and indicates official approved changes that have occurred and the current outlook.

Chart 25. Cost and Schedule Status

- Use two or three charts to present the output of the performance measurement system being used to manage the project. Current variances greater than $\pm 5\%$ should be explained on the chart or in discussion of the chart. The sample charts are for situations where Cost and Schedule Control Systems Criteria (CSCSC) is used. If CSCSC is being installed on to the project, relate the schedule and progress for this effort.

Chart 26. Cost Baseline Variances (Optional)

- This chart is optional and if prepared it should itemize the significant elements of the project and show the variances that exist between the cost baseline and the current estimate.

Chart 27. Status of Major Procurements (Optional)

- This is an optional chart and will only be used when significant procurements have been identified as problems. Under usual circumstances procurement issues or problems can be addressed from the Baseline Project Schedules.
- When used, this chart should itemize the major procurements to be discussed, their planned and actual or latest estimated award dates, planned and actual or latest estimated contract amounts, and contract type.

SUMMARY

- The Project Manager's assessment of the project status is the concluding chart for an ESAR briefing.

Chart 28. Summary of Key Points

- This chart is to be prepared and included in the handout at the ESAR but not presented.

REQUIRED VIEWGRAPHS AND BRIEFING SEQUENCE
FOR DOE ENERGY SYSTEM ACQUISITION REVIEWS (ESARS)

VIEWGRAPH TITLE

No

- 1 Title Page
- 2* Standard Agenda

INTRODUCTION AND BACKGROUND

- 3 Project Identifiers
- 4 Program/Project Objectives and
Technical Baseline
- 5 Cost and Schedule Trends
- 6 Problems/Issues
- 7 Project Manager's Assessment
- 8 Program Summary
- 9 Program/Project Organization (use
2 charts if necessary)
- 10 Project Technical Process
- 11 Technical Accomplishments
- 12 Technology Commercialization
- 13 Status of Management Activities

SCHEDULE BASELINE

- 14 Baseline Schedule - all years
- 15 Baseline Project Schedule - near term
- 16 (Optional) Near Term Key Events/Milestones/Decisions

RESOURCE BASELINE

- 17 Baseline Resources Plan
- 18 Project Funding-Obligations
- 19 Current Year Cost-construction
- 20 Current Year Cost-operating
- 21 (Optional) Cost Summary
- 22 Contingency Funding Status
- 23 (Backup) Project Staffing

BASELINE STATUS

- 24 Baseline Technical Performance/Design
Criteria Status
- 25 Cost and Schedule Status (CSCSC or
equivalent-use 2-3 charts as necessary)
- 26 (Optional) Cost Baseline Variances
- 27 (Optional) Status of Major Procurements

SUMMARY

- 28* Summary of Key points

* To be prepared and included in handout but not presented.



U.S. DEPARTMENT OF ENERGY
ENERGY SYSTEM ACQUISITION REVIEW

FUSION MATERIALS IRRADIATION TEST FACILITY

IX-14

PRESENTATION BY:

L.A. Pasquini

Project Manager, FMIT Project Office,
Richland, Washington

February 6, 1980

Agenda

- **INTRODUCTION AND BACKGROUND**
 - Program/Project Objectives, Organization and Technical Process
- **SCHEDULE BASELINE**
- **RESOURCES BASELINE**
 - Funding/Manpower
- **BASELINE STATUS**
 - Cost/Schedule Trends
 - Variances, Actual vs. Plan
 - Problems/Issues
- **SUMMARY**
 - Project Manager's Assessment

Project Identifiers

- **PROJECT TITLE: FUSION MATERIALS IRRADIATION TEST FACILITY (FMIT) LOCATION: RICHLAND, WA**
- **TOTAL PROJECT DESIGN AND CONSTRUCTION COST: \$105M TOTAL PROJECT COST: \$168.4M**
- **CONGRESSIONAL AUTHORIZATION: FY78 — \$14.4M, FY80 — \$10M, FY81 — \$79.85M (REQUESTED)**
- **CONGRESSIONAL APPROPRIATIONS: FY78 — \$7.5M, FY79 — \$6.9M
FY80 — \$10.0M, FY81 — \$22.6M (REQUESTED)
FY82 — \$50.0M, FY83/84 — \$7.25M**
- **DOE RESPONSIBILITIES:**
 - DIRECTOR, OFFICE OF ENERGY RESEARCH: E.A. FRIEMAN
 - PROGRAM OFFICE — OFFICE OF FUSION ENERGY
 - PROGRAM MANAGER AND DIVISION — M. ROBERTS, PLANNING AND PROJECTS
 - FIELD OFFICE — RICHLAND
 - PROJECT MANAGER — L.A. PASQUINI
- **MAJOR CONTRACTORS:**
 - OPERATING CONTRACTOR AND PROJECT MANAGER — WESTINGHOUSE HANFORD CO.
 - ACCELERATOR DESIGNER — LOS ALAMOS SCIENTIFIC LABORATORY
 - ARCHITECT/ENGINEER — RALPH M. PARSONS CO.
 - CONSTRUCTION COORDINATOR — J.A. JONES, CONSTRUCTION SERVICES CO.
- **PLANT START UP — SEPTEMBER 1984 NEXT NSA MILESTONE: _____**
- **PLANNED OPERATING PERIOD: FROM SEPTEMBER 1984 TO 2004**

Program/Project Objectives and Technical Baseline

PROGRAM OBJECTIVE:

- To understand the basic nature of matter and energy.
- To study the basic forces in nature, the ultimate constituents and structure of matter and the basic transformations between matter and energy.

PROJECT OBJECTIVE:

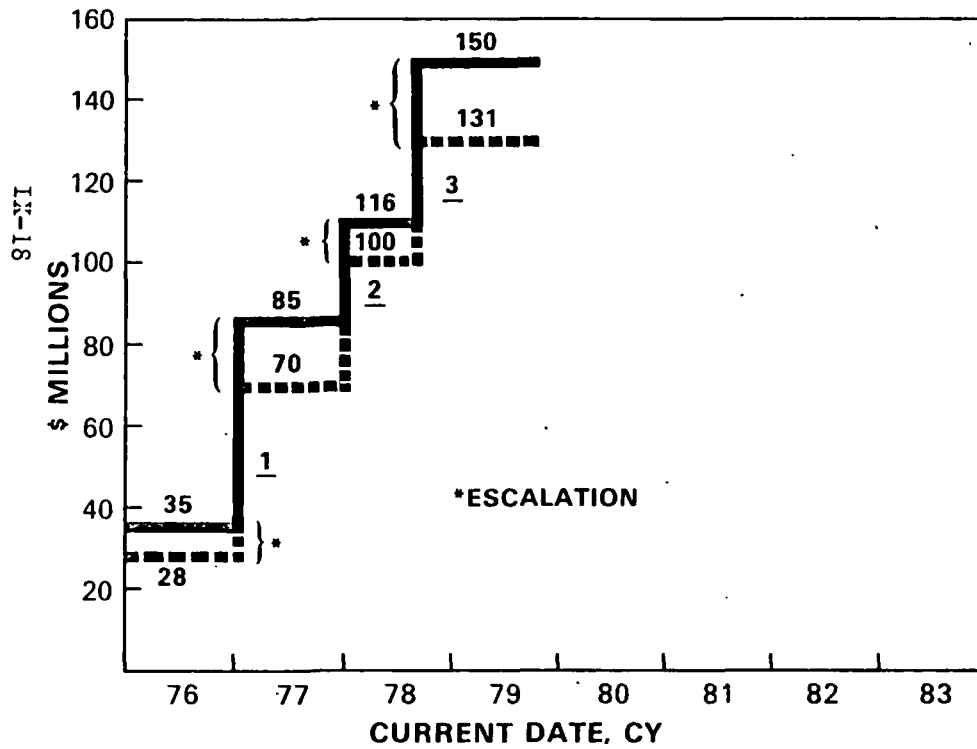
- Precision study of proton-proton collisions at center of mass energies up to 800 GeV.
- New information on the unification of the basic forces.
- Detailed study of the expected family of intermediate vector bosons.
- Observation of new heavier fundamental constituents.
- Studies of high transverse momentum and the jet phenomena which reveal the structure of the proton.
- Possible unexpected discoveries.

TECHNICAL BASELINE REQUIREMENTS/DESIGN CRITERIA:

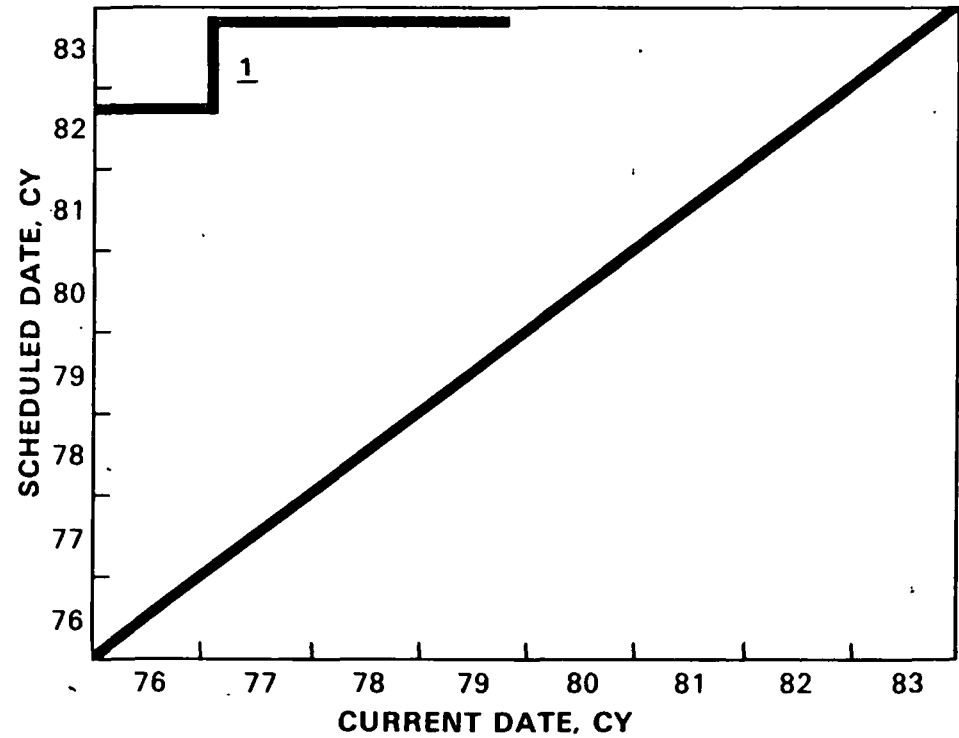
MAJOR ISABELLE PARAMETERS	ORIGINAL BASELINE JANUARY 1978
Top Energy	400 x 400 GeV
Luminosity, Maximum	$10^{33} \text{ cm}^{-2} \text{ sec}^{-1}$
Superconducting Dipole Magnets	732
Superconducting Quadrupole Magnets	348
Vacuum System	$3 \times 10^{-11} \text{ Torr}$
Refrigeration Capacity	23,500 Watts at 3.8°K

Cost and Schedule Trends

**COST TREND
(TEC)**



SCHEDULE TREND



- 1 Cost estimate increased and schedule slipped due to addition of new storage basin rather than upgrading existing basin.
- 2 Cost estimate increased due to combining both processing and storage facilities in integral stand alone facility.

- 3 Cost increased due to material quantity and labor productivity changes, deepening two storage pools and increasing capability for future facility expansion.

Problems/Issues

ISABELLE

PROBLEM: Lack of Effective Quality Assurance Program

DESCRIPTION:

- 1) An effective Quality Assurance program is not in place.

CORRECTIVE ACTIONS TO DATE:

- 1) Appointed Acting Quality Assurance Manager – developed interim QA plan.
- 2) Extended personnel search underway.
- 3) R. Starrett (DOE), working closely with Lab to resolve.

CORRECTIVE ACTIONS REQUIRED:

- 1) Employ a Quality Assurance Manager.
- 2) Complete QA/QC program plan.
- 3) Staff QA/QC group.

IMPACT AND PROGNOSIS:

Corrective actions essential for successful project completion.

Problems/Issues

ISABELLE

PROBLEM: Reference Design of Dipole Magnet

DESCRIPTION:

Failure of dipole magnet to reach central field of 5.0 Tesla required for a 400 GeV x 400 GeV accelerator.

CORRECTIVE ACTIONS TO DATE:

- 1) Extensive R&D activity including hardware modifications.
- 2) Formation of a separate magnet division.
- 3) Re-analysis of all previous magnet test data and history.
- 4) Formation of a BNL R&D panel.
- 5) Formation of an advisory committee (non BNL).

FURTHER ACTIONS REQUIRED:

- 1) Preparation of a revised R&D plan indicating technical activity, schedule, cost and manpower required. Due February 25, 1980.
- 2) Analysis of ensuing R&D plan to determine impact on ISABELLE activities.
- 3) Re-establish full magnet production capability at BNL.

IMPACT AND PROGNOSIS:

- 1) Satisfactory design of the 5.0 Tesla dipole magnet is mandatory to meet current ISABELLE performance criteria of 400 GeV x 400 GeV.
- 2) Some lower magnetic field strength and hence lower maximum beam energy may be acceptable if design value is unobtainable. Date for review October 80.
- 3) Project Costs and Schedule.

CHART 7

U.S. DEPARTMENT OF ENERGY
ENERGY SYSTEM ACQUISITION REVIEW

Project Manager's Assessment

ISABELLE

MONTHS

ITEM	Aug. 79	Sept. 79	Oct. 79	Nov. 79	Dec. 79	Jan. 80
Total Estimated Cost (1)	Major Concern (down arrow)	Major Concern	Major Concern	Major Concern	Major Concern	Major Concern
Completion Schedule	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Technical Performance (2)	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Contractor Performance (3)	Minor Concern	Minor Concern	Minor Concern	Minor Concern	Minor Concern	Better (up arrow)
Funding	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Prerequisite R&D (4)	Minor Concern	Major Concern	Major Concern	Major Concern	Major Concern	Major Concern
BNL Corrective Action (4)	Minor Concern	Major Concern	Major Concern	Major Concern	Better (up arrow)	Minor Concern
HQ Actions/Approvals	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
Conventional Facilities Construction	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
BNL Manpower (5)	Minor Concern	Minor Concern	Minor Concern	Minor Concern	Minor Concern	Minor Concern
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory
	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory	Satisfactory

IX-21

 SATISFACTORY

 MINOR CONCERN

 MAJOR CONCERN

BETTER 
WORSE 

(1) Escalation

(2) Radio Frequency, Cryogenic, Electronics, Vacuum

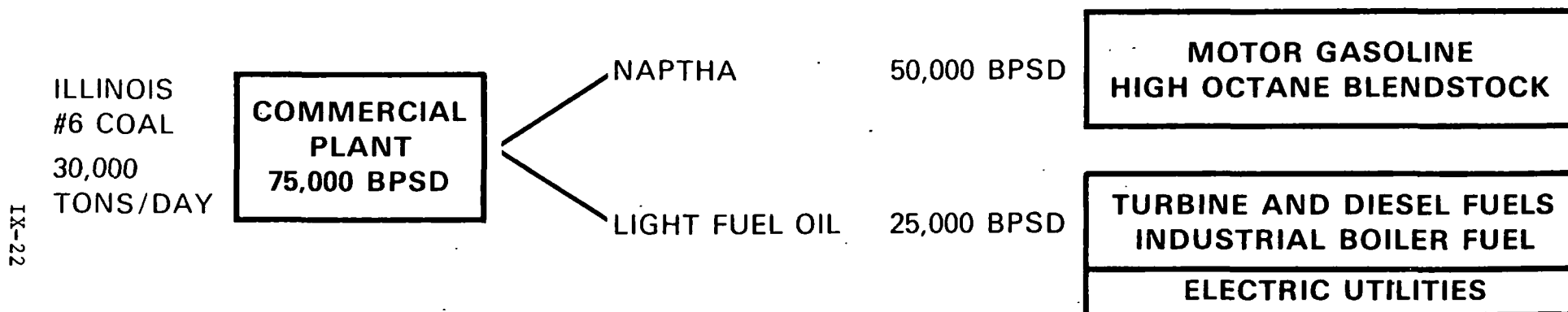
(3) Reporting, Quality Assurance, R&D Plan, Sense of Urgency

(4) Superconducting Dipole Magnets

(5) Engineers – Quality Assurance Manager

Program Summary

COMMERCIAL PLANT

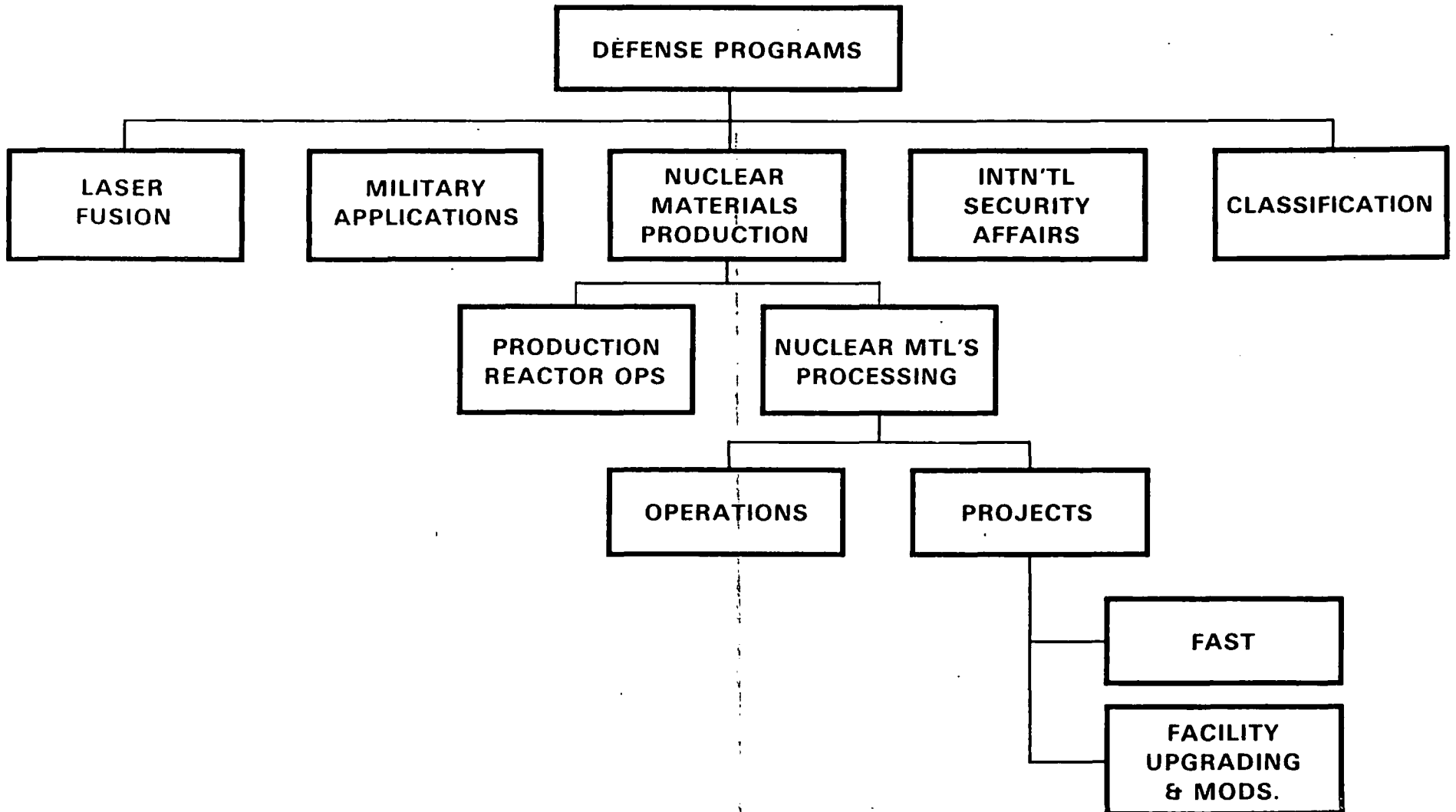


IX-22

PROGRAM ELEMENT	SCHEDULE	COST (MILLIONS)			TARGET PRODUCT COST	
		TOTAL	GOV'T	INDUST.	EDS	COMPLETION
R&D BASE	1966-1975	32.0	—	32.0	—	—
PILOT PLANT	1977-1983	339.0	169.5	169.5	—	—
DEMONSTRATION/ COMMERCIAL PLANT	1981-1988	TBD		100%		

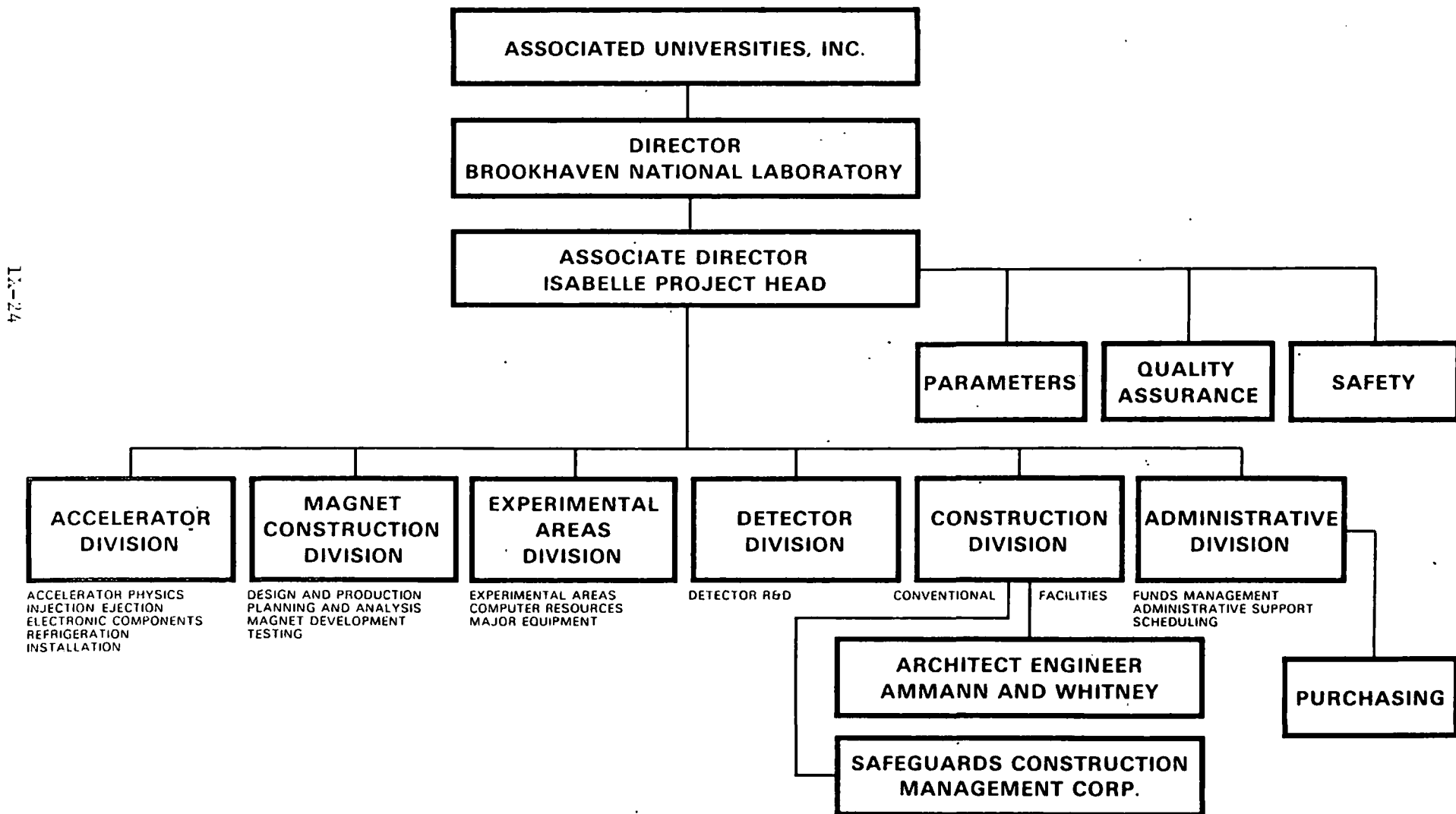
- EXXON WILL MANAGE THE PROGRAM, HOLD TITLE TO PATENTS AND ACTIVELY ATTEMPT TO LICENSE THE PROCESS

Program/Project Organization



11-23

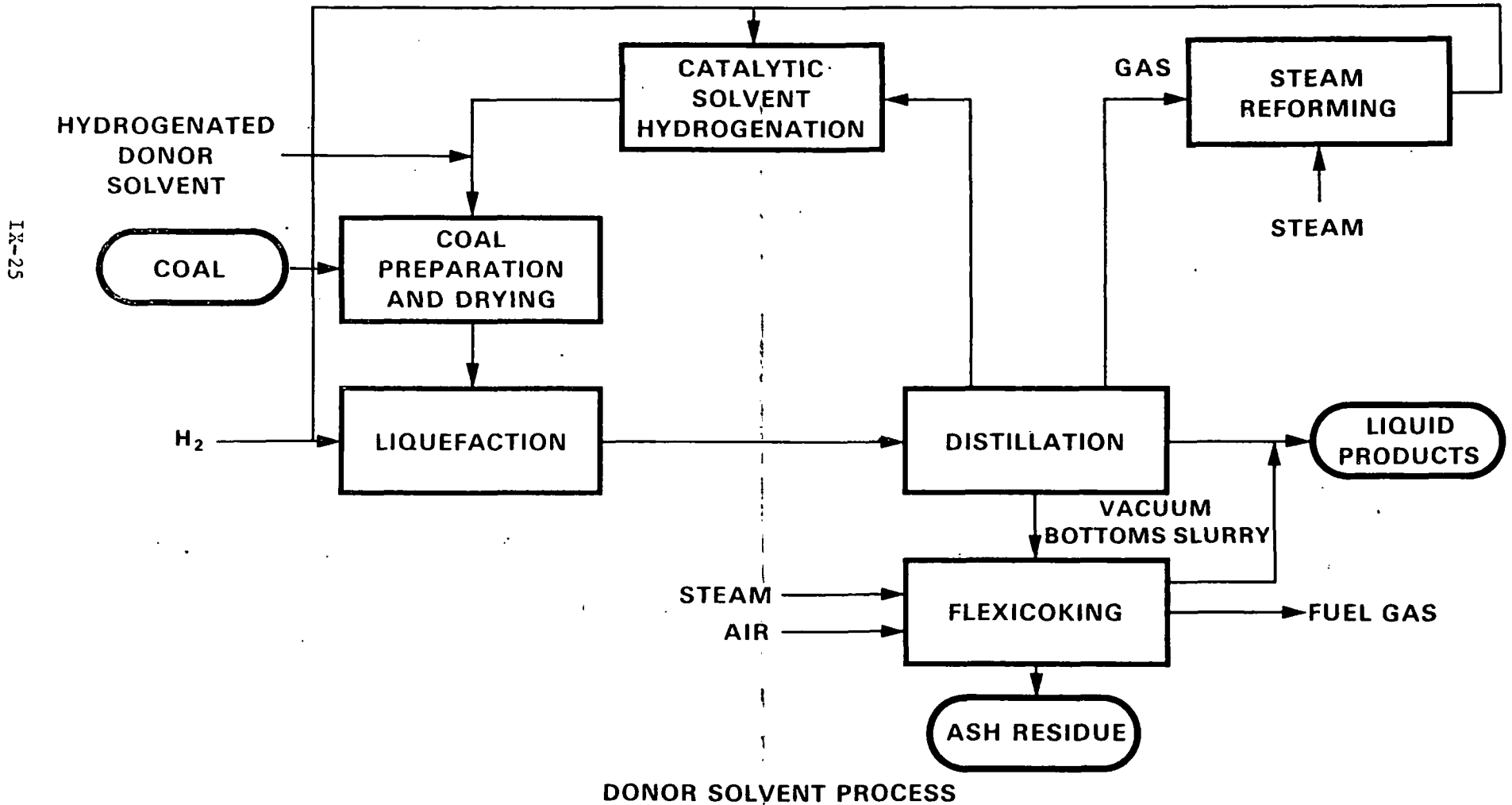
Project Organization/Responsibilities



1A-24

Project Technical Process

DONOR SOLVENT (EDS) PILOT PLANT



IX-25

Technical Accomplishments

Turbine Engine Project

- **3500-hour durability test of alpha sic. exposed to temperatures up to 2500° F completed at AiResearch.**
- **Regeneration cores at Ford completed 77,000 hours at 1470° F and 28,000 hours at 1830° F.**
- **2070° F ceramic nozzle/shroud assembly has been assembled and hot rig testing has begun.**
- **Four turbine-powered Greyhound coaches have been in revenue service since November 1979.**
- **Five transit buses for Baltimore are undergoing acceptance and shakedown tests prior to delivery.**

Technology Commercialization

Low/Med BTU Industrial Fuel Gas Demo Plant "A"

COMMERCIALIZATION NEEDS: SYNTHETIC LOW/MEDIUM BTU FUEL GAS TO REPLACE PETROLEUM PRODUCTS USED FOR INDUSTRIAL PURPOSES

PROJECTED COMMERCIAL MARKET(S): INDUSTRIAL CONSUMERS (i.e., FACTORIES, FOUNDRIES, HOSPITALS, SCHOOLS, ETC.)

	SCHEDULED 1985	CURRENT ESTIMATE 1985	
COMMERCIALIZATION READINESS DATE:			
	COMMERCIALIZED PRODUCT	COMPETITIVE COMMERCIAL PRODUCTS	
COMMERCIAL JUSTIFICATION OR PAYOFF:		NATURAL GAS	FUEL OIL
PRODUCT	LOW/MED BTU GAS		
PRODUCT COST	\$3.76/MBTU	\$_____/MBTU	\$_____/MBTU
PRODUCT CAPABILITY	250-300 BTU/SCF	1050 BTU/SCF	19,000 BTU/LB

NECESSARY STEPS FOR COMMERCIALIZATION:

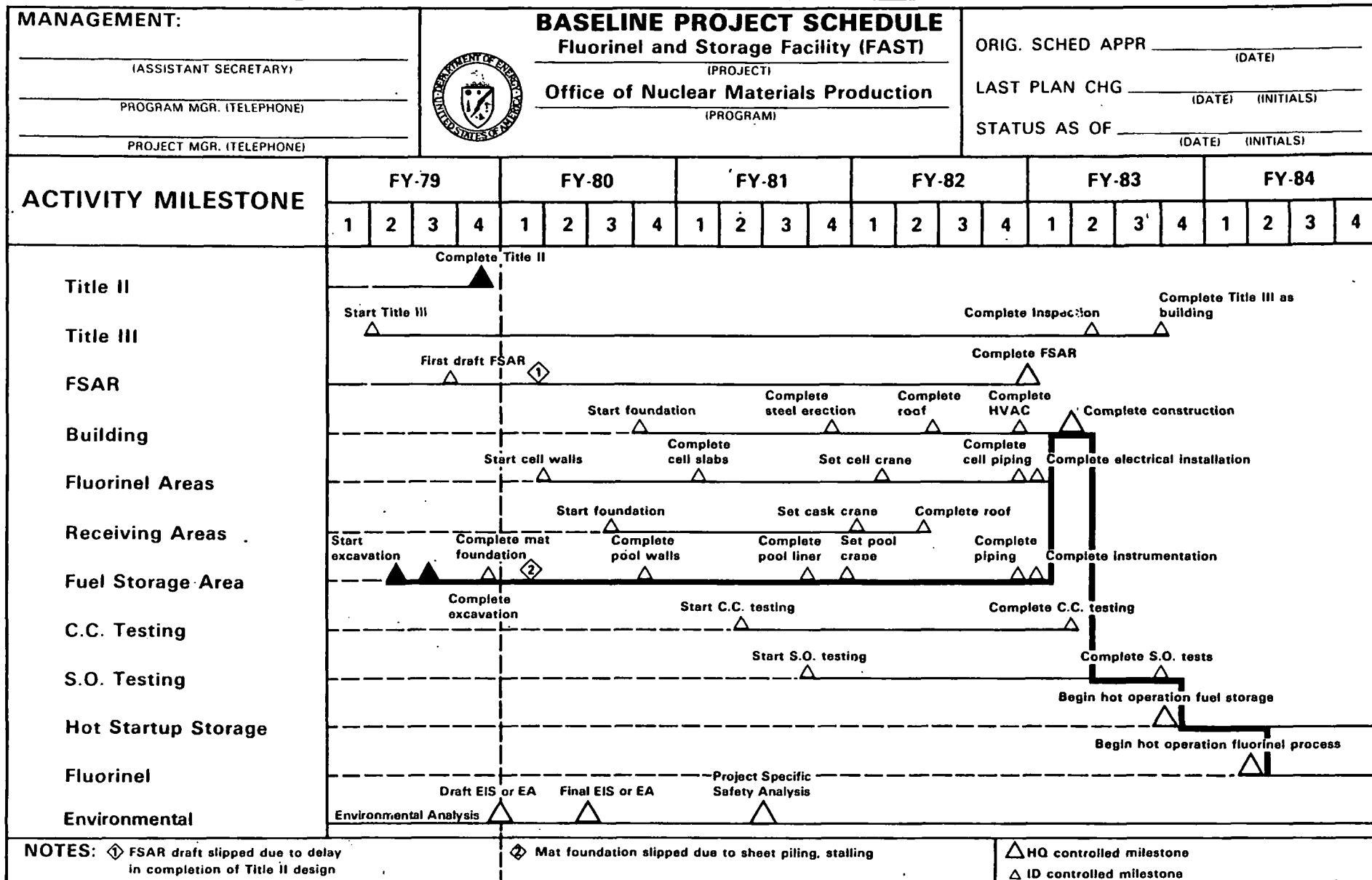
- SUCCESSFULLY COMPLETE DEMONSTRATION PLANT OPERATIONS BY 1985
- DEVELOP A COMMERCIALIZATION STRATEGY BY 19____ TO BEGIN SELLING THE PRIVATE SECTOR ON THE TECHNOLOGY, PROCESS ECONOMICS AND MARKETABILITY OF THE PROCESS

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Status of Management Activities

	DATE COMPLETED OR NEXT UPDATE	STATUS/COMMENTS
• MISSION NEED STATEMENT		NOT REQUIRED
• PROJECT PLAN	UPDATE NOV. 1980	
• PROJECT CHARTER		NOT REQUIRED
• PROJECT MGMT PLAN	APPROVED FEB. 1978	
• PROJECT MGR ON BOARD	JANUARY 1976	
• PROJECT OFC ESTABLISHED	SEPTEMBER 1977	
• COOPERATIVE AGREEMENT		N/A

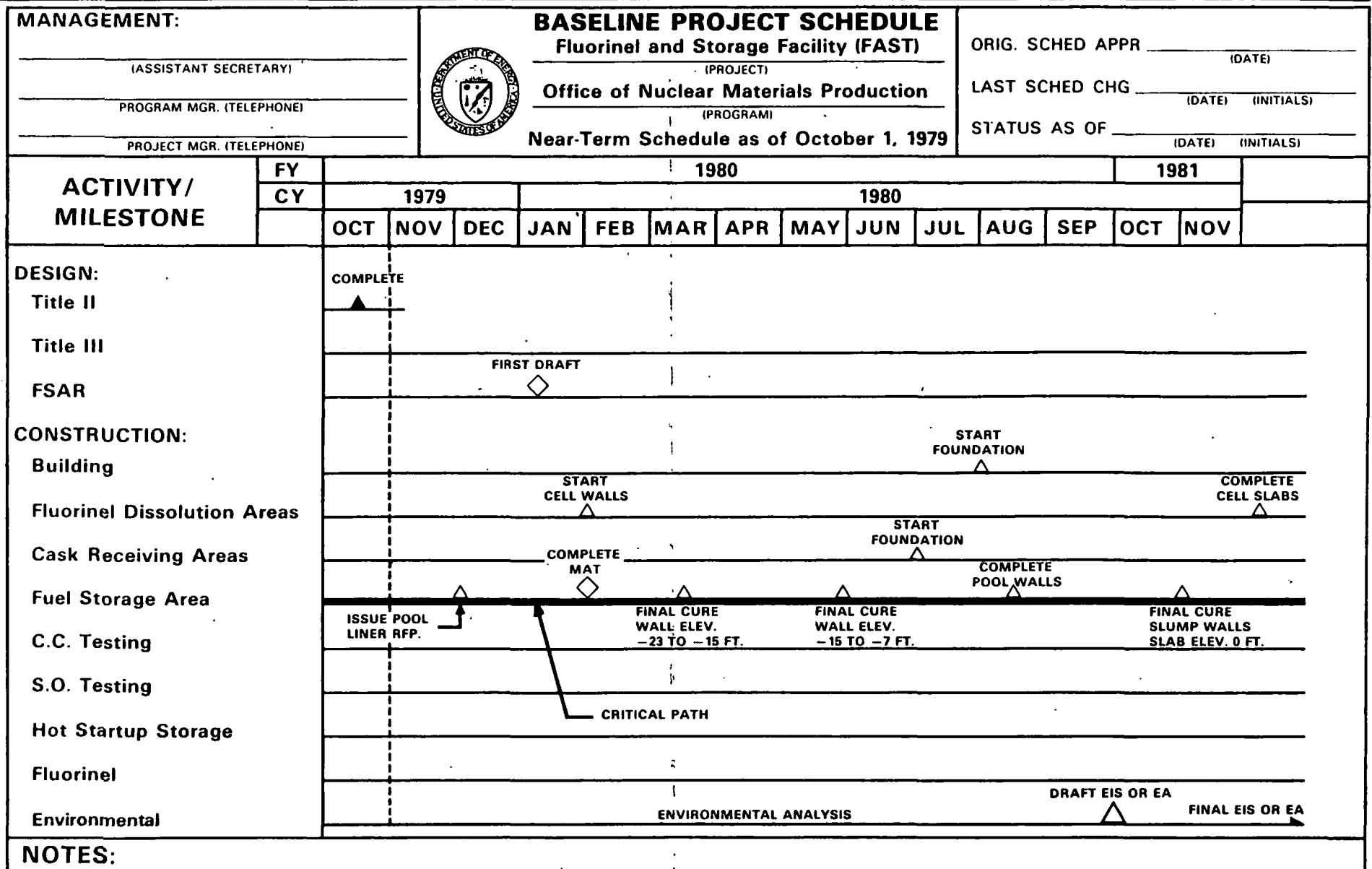
U.S. DEPARTMENT OF ENERGY
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NOTES: ◆ FSAR draft slipped due to delay in completion of Title II design
 ◆ Mat foundation slipped due to sheet piling, stalling
 ▲ HQ controlled milestone
 ▲ ID controlled milestone

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NOTES:


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**Near Term Key
Events/Milestones/Decisions**

EVENTS/MILESTONES	EXPECTED DATE	STATUS/ COMMENTS
Beneficial Occupancy Sextant 7	February 1980	
Award Contract Magnet Enclosure 9 and 11	March 1980	
Start Magnet Factory (Quadrupole)	June 1980	
Beneficial Use—Open Area 4	August 1980	
Magnet Enclosure 5 and 7 Complete	September 1980	
Beneficial Occupancy—Wide Angle Hall	October 1980	
Start Installation of Magnets (Quadrupole)	November 1980	
Start Dipole Magnet Production	January 1981	
DECISIONS		
Review of Dipole R&D Status	May 1980	
Review of Dipole R&D Status	September 1980	
Dipole Magnet Field Strength	October 1980	

CHART 17

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MANAGEMENT: _____ (ASSISTANT SECRETARY) _____ PROGRAM MGR. (TELEPHONE) _____ PROJECT MGR. (TELEPHONE)		BASELINE RESOURCES PLAN ABC Project _____ (PROJECT) _____ (PROGRAM)	ORIG. SCHED APPR _____ (DATE) LAST PLAN CHG _____ (DATE) (INITIALS) STATUS AS OF _____ (DATE) (INITIALS)
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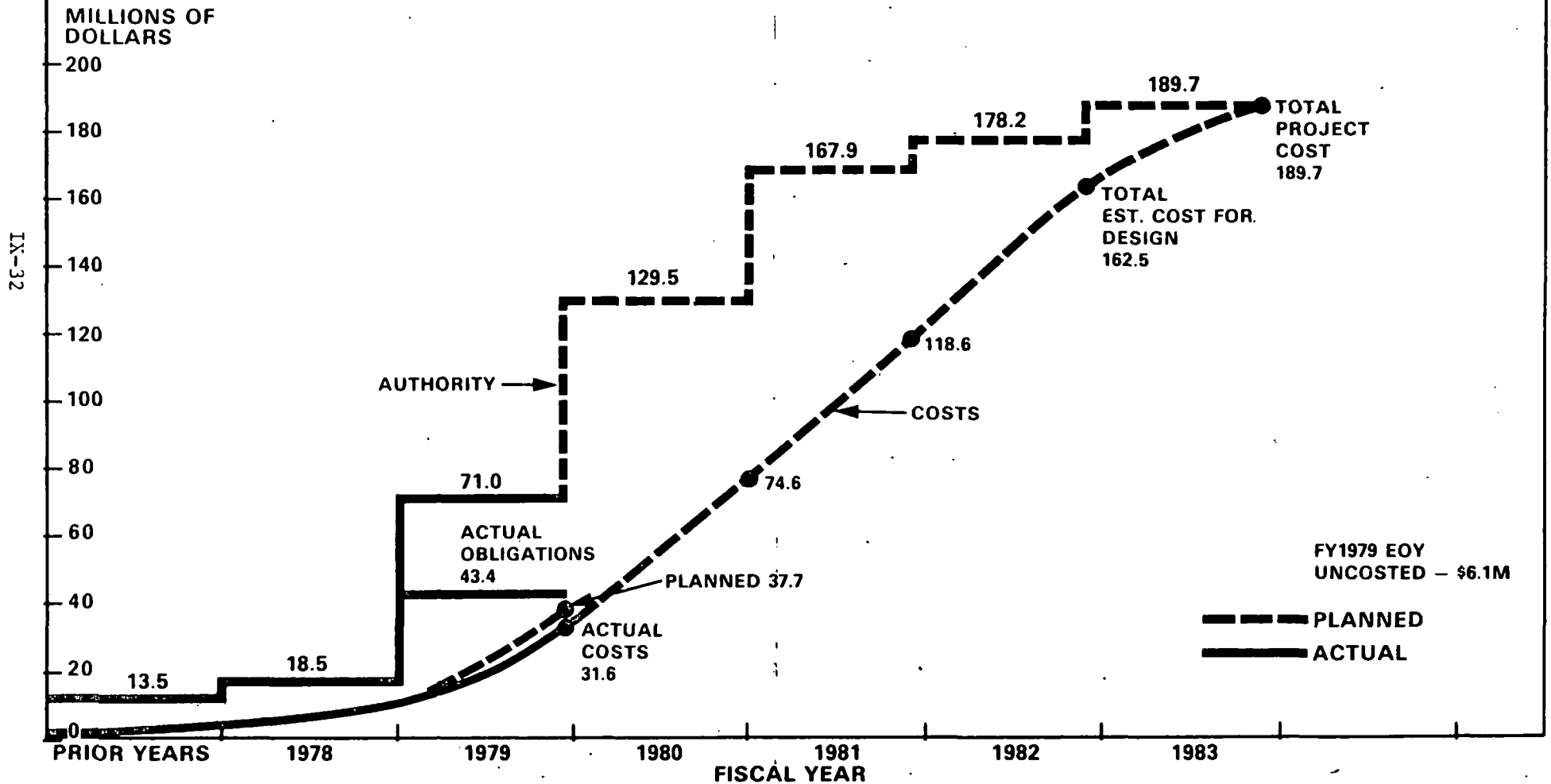


CHART 18

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ENERGY SYSTEM ACQUISITION REVIEW

Project Funding — Obligations

10 MW Solar Central Receiver Pilot Plant

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	PRIOR YEAR		CURRENT YEAR		NEXT YEAR		TOTAL PROJECT COST		
	DOE	OTHER	DOE	OTHER	DOE	OTHER	DOE	OTHER	TOTAL
							(TEC)		
DESIGN & CONSTRUCTION	43.50	0.37	28.00	0.95	36.50	6.00	108.00	13.75	121.75
R&D	25.80*	—	2.10	—	1.50	—	30.68	—	30.68
CAPITAL EQUIPMENT	—	—	—	—	—	—	—	—	—
OPERATIONS	—	0.19	—	0.43	—	0.60	9.50	5.87	15.37
TOTAL	69.30	0.56	30.10	1.38	38.00	6.60	148.18	19.62	167.80

1. 15% of Total Project Cost for Concept Design and Prerequisite R&D
2. 5% for Selected Conceptual Subsystems

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Cost Summary

Fusion Materials Irradiation Test Facility (FMIT)

WBS ELEMENT	COST*	COST* COMMITMENT	EST COST THRU FY 80	DIRECTIVE** AUTHORIZATION	EST BA THRU FY 80	CURRENT BUDGET BAC	EST AT COMPLETION
110 PROJ MGMT & ENGINEERING	664	767	1967	1967	1967	8080	8113
120 BUILDING & UTILITIES	1761	2235	5873	5376	8187	35774	36154
130 ACCELERATOR SYSTEM	985	985	2358	5737	5737	29433	29433
140 LITHIUM SYSTEM	263	315	1367	2168	2158	4841	4841
150 EXPERIMENTAL SYSTEM	177	211	515	787	787	1933	1933
160 FACILITY CONTROL SYSTEM	76	76	160	551	551	1982	1982
170 SUPPORT BUILDING CP&D	975	1214	2255	2255	2255	3580	3580
CONTINGENCY	750	750	750	750	750	750	750
	<u>0</u>	<u>0</u>	<u>1987</u>	<u>1542</u>	<u>2768</u>	<u>18636</u>	<u>18223</u>
TOTAL CONSTRUCTION	<u>5651</u>	<u>6554</u>	<u>17232</u>	<u>21103</u>	<u>25160</u>	<u>105009</u>	<u>105009</u>
R&D	12826	13355	18899	20055	21794	48124	48124
CAPITAL EQUIPMENT	990	1150	1975	1975	1975	4635	4635
OPERATING	120	120	385	385	385	4615	4615
SPARES	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>5000</u>	<u>5000</u>
TOTAL PROJECT	<u>19587</u>	<u>21179</u>	<u>38491</u>	<u>43518</u>	<u>48311</u>	<u>167383</u>	<u>167383</u>

* COSTS THROUGH DECEMBER 1979

** MODIFICATION #12

Contingency Funding Status

	TOTAL (Millions)	OBLIGATED TO DATE (Millions)	% OBLIGATED TO DATE
PROJECT FUNDS	\$189.7	\$43.4	23%
CONTINGENCY FUNDS	\$14.4	\$0.8	5.6%

**U.S. DEPARTMENT OF ENERGY
ENERGY SYSTEM ACQUISITION REVIEW**

Project Staffing

	PLANNED	ACTUAL
DOE		
Headquarters	2	2
Albuquerque Operations Office	2	2
Project Area Office	<u>3</u>	<u>3</u>
Subtotal	<u>7</u>	<u>7</u>
LABORATORY/PRINCIPAL CONTRACTORS (CPFF ONLY)		
Los Alamos National Scientific Lab	121	110
Systems Engineering, Inc.	24	24
Southwest Constructors	<u>156</u>	<u>75</u>
Subtotal	<u>301</u>	<u>209</u>
TOTAL	<u>308</u>	<u>216</u>

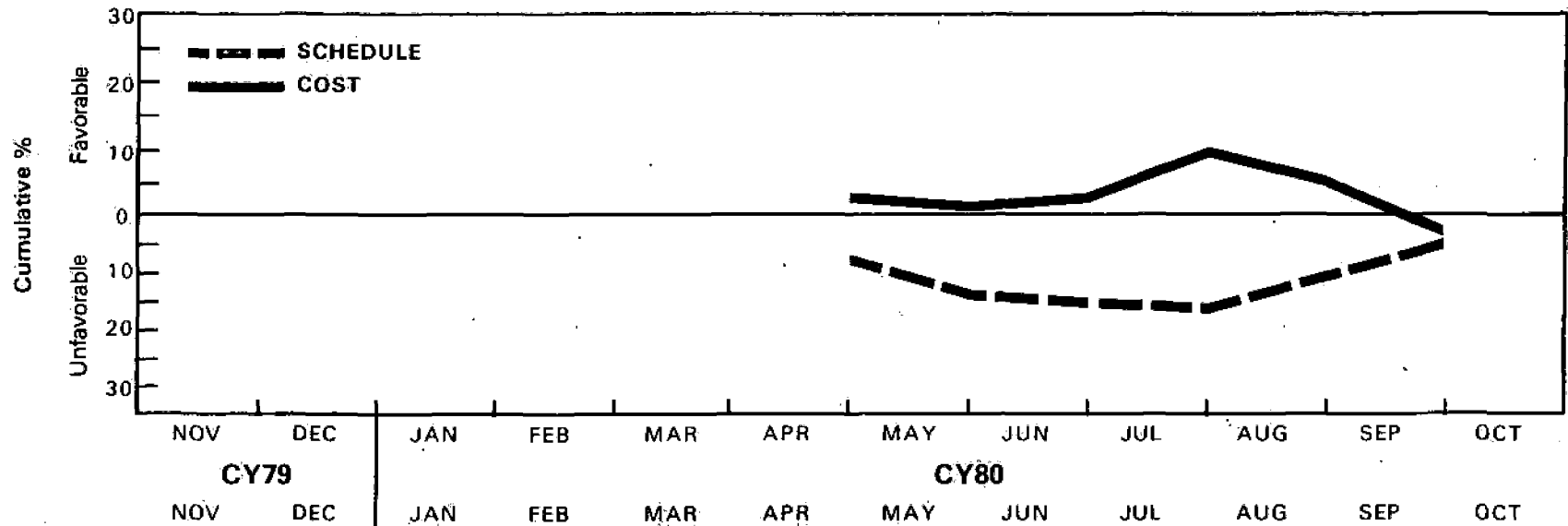
**Baseline Technical Requirements/Design
Criteria Status**

MAJOR ISABELLE PARAMETERS	ORIGINAL BASELINE JANUARY 1978	APPROVED BASELINE MARCH 1978	CURRENT
Top Energy	400 x 400 GeV	Same	Same
Luminosity, Maximum	$10^{33} \text{ cm}^{-2} \text{ sec}^{-1}$	Same	Same
Superconducting Dipole Magnets	732	Same	Same
Superconducting Quadrupole Magnets	348	Same	Same
Vacuum System	3×10^{-11} Torr	Same	Same
Refrigeration Capacity	23,500 Watts at 3.8°K	Same	Same

Cost and Schedule Status

Cumulative Cost and Schedule Performance

Project ABC



07-XI

		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
		CY79		CY80									
		NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
CUM \$1,000	BCWS						1249	2060	3026	4038	4639	5192	
	BCWP						1156	1811	2484	3436	4102	4805	
	ACWP						1124	1803	2433	3085	3899	4935	
Schedule Variance	\$						(93)	(249)	(542)	(602)	(537)	(387)	
	%						(7)	(13)	(14)	(15)	(12)	(7)	
Cost Variance	\$						31	8	52	350	203	(130)	
	%						3	0.5	2	10	5	(3)	

Cost and Schedule Status

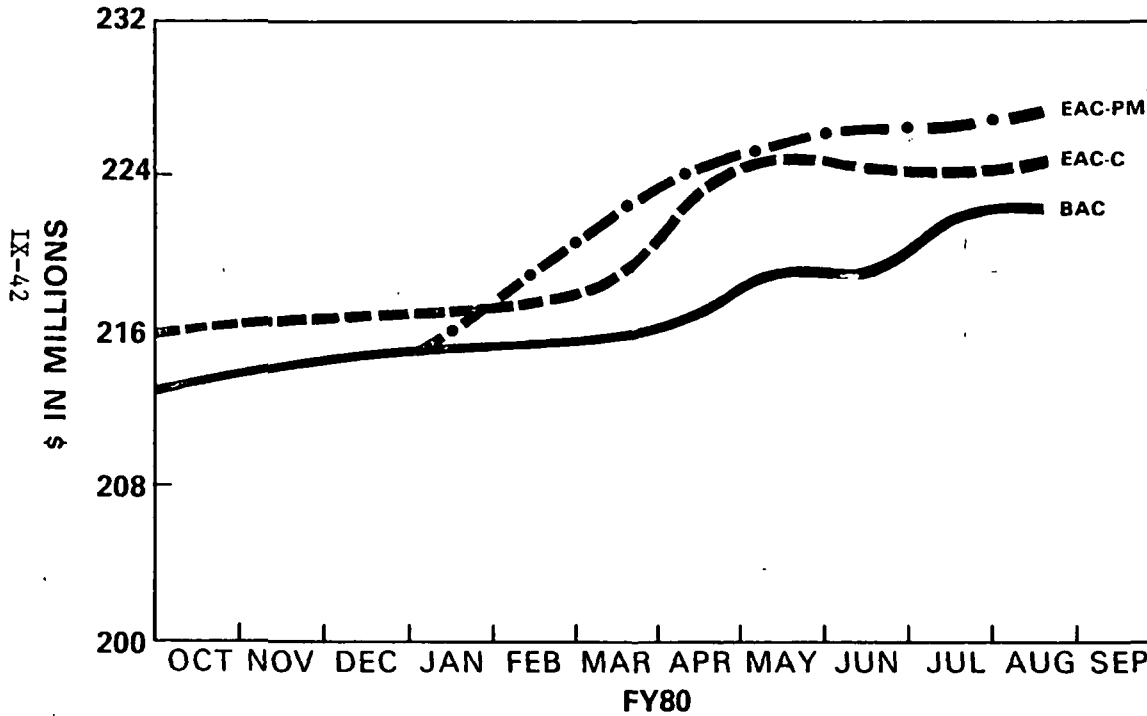
Project ABC (Summary)

BUDGET AT COMPLETION:		\$109,667M
LATEST ESTIMATE AT COMPLETION:		109,797M
STATUS AS OF 30 SEPTEMBER 1979		
BUDGETED COST OF WORK SCHEDULED (BCWS):		5,192M
BUDGET COST OF WORK PERFORMED (BCWP):		4,805M
ACTUAL COST OF WORK PERFORMED (ACWP):		4,935M
COST VARIANCE:	– \$130K or – 3%	
SCHEDULE VARIANCE:	– \$387K or – 7%	

Cost and Schedule Status

Estimated Versus Budgeted Costs at Completion

Project ABC



	<u>CONTRACTOR</u>	<u>PROJECT OFFICE</u>
Estimate at Completion	224	226
Budget at Completion	221	221
At Completion Variance	(3)	(5)
Scheduled Completion Date	9/81	9/81
Expected Completion Date	9/81	12/81

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Cost Baseline Variances

(Thousands of Dollars)

	BASELINE ESTIMATE (78)	CURRENT ESTIMATE (79)	DIFFERENCE
1. ACCELERATOR	162,680	167,000	+ 4,320
2. CONVENTIONAL FACILITIES	36,530	39,100	+ 2,570
3. ARCHITECTURAL CHANGES	5,730	7,150	+ 1,420
4. EDIA	35,020	39,950	+ 4,930
5. CONTINGENCY	<u>36,790</u>	<u>33,640</u>	<u>- 3,150</u>
	276,750	286,840	+ 10,090
CONTINGENCY APPLIED TO OVERCOST POSITION OF FY 79			
5. CONTINGENCY	<u>36,790</u>	<u>23,550</u>	<u>- 13,240</u>
BASELINE, SEPTEMBER 1979 EAC	276,750	276,750	0

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Status of Major Procurements

CONTRACT	AWARD DATE		CONTRACT AMOUNT		TYPE CONTRACT
	PLANNED	ACTUAL or LATEST EST.	PLANNED	ACTUAL or LATEST EST.	
• PROCUREMENT PLAN ISSUED	APR 78	APR 78			
• PROCUREMENT SCHEDULE	APR 78	APR 78			
• REFRIGERATOR COMPRESSOR	—				
• INTERSECTING AREA COMPUTER	FEB 80	JUN 80	425.0K		CPAF
• MAGNET TEST REFRIGERATION	FEB 80	JUN 80	500.0K		CPAF
• SUPERCONDUCTING BRAID	MAY 80	MAY 80	75.0K		CPAF
• WARM BORE TUBE	—				
• BELLOWS ASSEMBLY	FEB 80	FEB 80	200.0K	175.0K	CPFF

Summary of Key Points

- Superconducting Dipole Magnet R&D not completed.
- Superconducting Quadrupole design completed.
- R&D plan to be completed and implemented.
- Decision point whether to accept lesser energy—October 1980.
- Completion date still realistic if Dipole Magnet Design firmed up by December 1980.
- Escalation—a factor to face up to.
- Quality Assurance Program some elements operational—not fully implemented.
- 8 year project—Time to resolve problems.
- Refrigerator Order in process.
- Vacuum system at design pressures.
- Conventional construction ahead of schedule.

CHAPTER X

PROJECT BUDGET PROCESS
(To be issued)

CHAPTER XI

PROJECT MANAGEMENT AND MANAGER DEVELOPMENT
(To be issued)

CHAPTER XII

CONSTRUCTION MANAGEMENT SUBSYSTEM
(To be issued)

CHAPTER XIII

INTEGRATION OF PROJECTS
(To be issued)

CHAPTER XIV

ENVIRONMENTAL PLANNING AND REVIEW .

CHAPTER XIV

ENVIRONMENTAL PLANNING AND REVIEW

A. INTRODUCTION

Environmental planning and review is an integral part of the Program and Project Management System (PPMS) for DOE Outlay Programs.* Requirements for environmental planning and review pertain primarily to the preparation, review, and decisions on Program Plans and Energy Systems Acquisition Project Plans.

B. MECHANISMS:

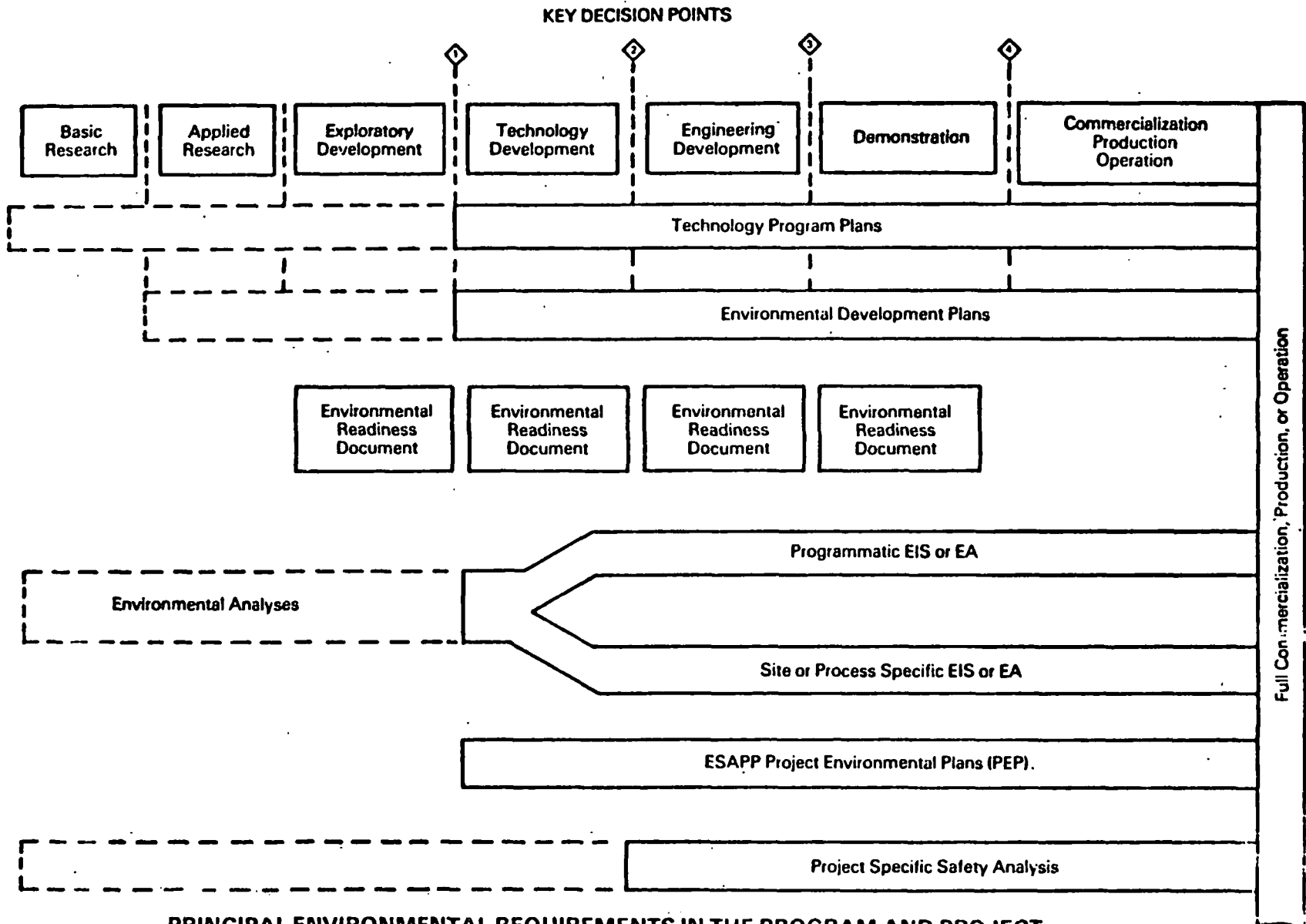
Environmental planning and review mechanisms are of two types: those that are generic to an energy technology, and those that are specific to each project. Environmental Development Plans, Environmental Readiness Documents, and Generic Environmental Impact Statements (EIS's), or Environmental Assessments (EA's), are of the first type. The second type consists of Project Environmental Plans, the Site or Process Specific EIS's or EA's and the Safety Analysis System. These represent vertical cuts throughout each phase in the process and should be constructed during Phase 1 and 2 of Multi-Phase Contracts as described in Exhibit 5 of the PPMS.

C. DOCUMENTS

The principal environmental documents and their intersection with the Program and Project Management System are illustrated in Figure 1. The figure provides a representation of how environmental activities and their documentation work to support the removal of barriers and identification of uncertainties that must be considered within the technology movement to commercialization, production, or operation. The Assistant Secretary for Environment (ASEV) will provide to the Program and Secretarial offices assistance and judgements concerning significant environmental factors that should be considered in program planning and in the acquisition of major projects. Each of these is supported by a set of formal documents that are discussed below.

* Environmental Planning and Review requirements are not generally applicable to the Nuclear Weapons and Verification and Control Technology Programs; however, these programs follow the basic principles of the DOE PPMS. The Assistant Secretary for Defense Programs, with the assistance of the Assistant Secretary for Environment and Office of General Counsel, is responsible for the implementation of environment, health, and safety (EH&S) practices for these programs.

Environmental Planning and Review requirements are not generally applicable to Naval Reactors. The Director of the Division of Naval Reactors is responsible for the EH&S practices for these programs.



PRINCIPAL ENVIRONMENTAL REQUIREMENTS IN THE PROGRAM AND PROJECT MANAGEMENT SYSTEM

Figure 1

Three major documents have been developed to support the program and project plans. The first of these is the Environmental Development Plan (EDP) which takes cognizance of environmental, health, and safety uncertainties that can be resolved through research and schedules NEPA compliance activities. An overview of these research needs and probable scheduling prior to each key decision point is delineated in the EDP to assure that environmental research and decisionmaking are not out of phase with the technology development plans. The second document is the Project Environmental Plan (PEP) which is also prepared jointly by EV and the program offices and which contains similar elements to EDP's, with the exception that environmental requirements are project specific and are tailored to particular characteristics of the projects e.g., pilot plant, demonstration, etc. The third document, the Environmental Readiness Document (ERD) prepared by EV, summarizes the status of a technology to directly support the decision maker at a given point in time, namely, any one of the four Key Decision Points.

Within the energy Major Systems Acquisition phases, the scope of environmental concerns broadens to include not only research and status reports but also environmental, health, and safety, including socioeconomic assessments of specific projects and operations which are proposed. Three documents are utilized in these phases: Environmental Assessment, Environmental Impact Statement, and the Safety Analysis.

The Environmental Assessment and Environmental Impact Statement, if required, is generally prepared first for a program, and then on a site or process specific basis with timing developed to allow major procurements and construction activities to begin with reduced uncertainties and minimum time delay. In a similar fashion, the Safety Analysis examines the health and occupational hazards of proposed major operations under the cognizance of DOE to assure that barriers and impacts are resolved without undue time delays. Subsequent updates assure continued reviews of operational safety.

1. Environmental Development Plan (EDP)

For a specified Program Plan an EDP will be prepared that:

- Identifies and delineates environmental concerns,
- Defines general requirements for environmental, health, and safety research and impact assessments,
- Links timing for required environmental R&D with technology R&D schedules,
- Indicates approximate timing for documents required in the NEPA process.

The EDP is prepared jointly by the technology program and environment office usually in advance of the development phase of a technology. EDP's will be revised and updated as required.

2. Project Environmental Plan (PEP)

For each significant project for which a project plan is prepared, a PEP will be prepared that:

- Identifies specific environmental, health, and safety tasks and NEPA's compliance activities,
- Specifics funding and organizational responsibilities for performing tasks,
- Schedules and links environmental work to technology timelines and milestones.

The PEP is prepared in collaboration with the technical program offices as a part of the Energy System Acquisition Project Plans (ESAPP's) for a specific project by the technology office and the environment office. The PEP will identify specific priority environmental objectives and tasks (and associated responsibilities which will be addressed commensurate with the technology program efforts). If necessary, PEP's will be revised and updated with the ESAPP's at major decision points in the progress of the technology project effort.

3. Environmental Readiness Document (ERD)

The ERD is an independent assessment report prepared by the ASEV but with cognizance of technology program line managers. It provides an assessment of the current environmental status of a technology at a phase transition decision point. The ERD presents the results of a critical review and analysis of environmental R&D results carried on in the preceding phase and provides further definition of concerns and research needs for the ensuing period. The ERD provides the basis for the ASEV position on the environmental acceptability of a DOE technology program or project at each phase transition decision point.

4. Environmental Assessment (EA)/Environmental Impact Statement (EIS)

The National Environmental Policy Act of 1969 requires that agencies prepare Environmental Impact Statements "on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment." For all proposals which may require EIS's an Environmental Assessment may be prepared. An Environmental Assessment is a statement which provides the information upon which to base a determination of the necessity for an Environmental Impact Statement or a finding of no significant impact.

- * Where it is clear that the proposed activity is not a major Federal action significantly affecting the quality of the human environment and therefore does not require an EIS, a brief memorandum may be prepared by the program office which explains the basis for the determination.

Environmental Assessments may be prepared for any action and at any time in order to assist Departmental planning and decision-making. EA's and EIS's are prepared by program offices according to DOE procedures and reviewed by the Office of Environment and the Office of General Counsel. (However, environmental impact statements required for DOE policy and legislative initiatives significantly affecting more than one program or office are prepared at any phase of the Management System as required, but will normally be required beginning at the Technology Development Phase, and at appropriate decision points throughout the remaining phases).

5. Safety Analyses

A safety analysis is prepared by Program Managers according to safety analysis and review systems for DOE operations early in the design phase of a proposed facility that DOE intends to procure and operate. The use of a safety analysis to identify hazards, their elimination and control, assess residual risk and document management authorization of a DOE operation applies equally to technology base activities and energy system acquisition projects. The purpose is to limit risks to health and safety of the public and employees and adequately protect property and the environment.

The safety analysis preparation and review process assures that:

- Potential hazards are systematically identified
- Potential impacts are accurately analyzed
- All reasonable measures to eliminate, control, or mitigate the hazards have been taken
- There is documented management authorization of the DOE operation based upon an objective assessment of the residual risk identified in the safety analysis.