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PROGRAM MANAGEMENT STRATEGIES FOR FOLLOWING EPA GUIDANCE FOR REMEDIAL DESIGN/REMEDIAL ACTION AT DOE SITES

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ABSTRACT

At the U. S. Department of Energy (DOE) facilities, environmental restoration is being conducted in accordance with Federal Facilities Compliance Agreements (or Interagency Agreements). These agreements establish a cooperative working relationship and often define roles, responsibilities and authorities for conduct and oversight of the Remedial Action Programs. The U.S. Environmental Protection Agency (EPA) has guidelines on how to initiate and perform remedial actions for sites they are remediating under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Re-Authorization Act (SARA). This paper addresses some of the difference and commonalities between the DOE project management procedures and EPA guidance documents. This report covers only the RD/RA phase of environmental restoration.

On the surface, there are many apparent differences between the DOE and EPA project management processes. Upon closer review, however, many of the differences are the result of applying different terminology to the same phase of a project. By looking for the similarities in the two processes rather than hunting for differences, many communication problems are avoided. Understanding both processes also aids in figuring out when, how and to what extent EPA should participate in the RD/RA phase for DOE lead cleanup activities.

The DOE Remedial Design and Remedial Action process is discussed in a stepwise manner and compared to the EPA process. Each element of the process is defined. Activities common to both the EPA and DOE are correlated. The annual DOE budget cycle for remediation projects and the four-year cycle for appropriation of remediation funds are discussed, and the constraints of this process examined. DOE orders as well as other requirements for RD/RA activities are summarized and correlated to EPA regulations where this is possible. Finally, schedules for typical RD/RA activities are presented and DOE project schedules are compared to EPA restoration schedules. An innovative schedule is presented to meet CERCLA time constraints requirements for continuous remedial activity within 15 months of the ROD.

INTRODUCTION

At the U.S. Department of Energy (DOE) facilities, environmental restoration is being conducted in accordance with Federal Facilities Compliance Agreements (or Interagency Agreements). These agreements establish a cooperative working relationship and often define roles, responsibilities and authorities for conduct and oversight of the Remedial Action Programs. The U.S. Environmental Protection

Agency (EPA) has guidelines on how to initiate and perform remedial actions for sites they are remediating under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Re-Authorization Act (SARA). However, EPA Remedial Project Managers (RPM) and On-scene Coordinators (OSCs) are not familiar with the DOE project management procedures for initiation and performance of remediation projects. The consequence of this scenario is confusion in concepts, planning, budgeting and terminology during communications between DOE and EPA project managers. This paper addresses some of the differences and commonalities between the DOE project management procedures and EPA guidance documents. Since DOE procedures do not specifically cover the conduct of a Remedial Investigation/Feasibility Study (RI/FS), EPA guidance documents are normally adopted. Both agencies, however, have Remedial Design/Remedial Action (RD/RA) procedures. This report covers only the RD/RA phase of environmental restoration.

On the surface, there are many apparent differences between the DOE and EPA project management processes. Upon closer review, however, many of the differences are the result of applying different terminology to the same phase of a project. For example, DOE's terminology "Title III Reviews" is used for the activities associated with inspecting and evaluating workmanship against drawings and specifications during the construction effort. Analogously, EPA's terminology "Prefinal Inspection" performs a similar function. Basically, both accomplish the same activity but use different terminology. By looking for the similarities in the two processes rather than hunting for differences many communication problems are avoided. Understanding both processes also aids in figuring out when, how and to what extent EPA should participate in the RD/RA phase for DOE lead cleanup activities.

In the following sections, the DOE Remedial Design and Remedial Action process is discussed in a stepwise manner and compared to the EPA process. Each element of the process is defined. Activities common to both EPA and DOE are correlated. The annual DOE budget cycle for remediation projects and the four-year cycle for appropriation of remediation funds are discussed, and the constraints of this process examined. DOE orders as well as other requirements for RD/RA activities are summarized and correlated to EPA regulations where this is possible. Finally, schedules for typical RD/RA activities are presented and DOE project schedules are compared to EPA restoration schedules. An innovative schedule is presented to meet CERCLA time constraints requirements for continuous remedial activity within 15 months of the ROD.

RD/RA PROCESS COMPARISON

In order to fully understand the similarities and differences of the EPA and DOE processes, one must understand the phases of each. This section provides definitions and an overview of the phases for the EPA remediaton project process and the DOE remediation project process. These are followed by a comparison to show distinct similarities and differences.

EPA REMEDIATION PROJECT PROCESS

The following summary of the EPA process will focus on the RD/RA phases. This summary has been organized to reflect the general sequence of events that occur

prior to, during, and after remedial design and remedial action at Superfund sites. The Superfund Remedial Design and Remedial Action Guidance Document of June 1986 was used, although it does not strictly apply to Federal facilities, unless called out in a Federal Facilities Compliance Agreement. Table I is a list of key personnel and their function for the EPA Remediation Project Process.

Figures 1A and 1B show flow charts for the EPA RD/RA Remediation Project Process. RD/RA conducted by other Federal agencies was not addressed in the guidance document referenced. The guidelines for Federal (EPA) lead were used to address Agency RD/RA activities.

Remedial Design

The selection of the Architect/Engineering Firm (A/E) for the Remedial Design can be initiated during the Feasibility Study after the selection of the alternatives. This process consists of the Pre-Design Report, the A/E bid and Proposal, and the selection of the A/E contractor.

The optional Pre-Design Report shall be prepared by the lead RI/FS party and provided to the lead design party. The objective of the Pre-design Report is to describe the engineering parameters and institutional concerns of the selected remedy and package all pertinent project information for transfer to the lead design party. The Pre-Design Report replaces the conceptual design task of the FS. The Pre-Design Report should be completed within two weeks following remedy selection, and the cost should be limited to approximately 5 per cent of the cost of the feasibility study.

Activities involved in selecting an A/E firm for the remedial design will be dependent on the lead party. The following are activities required to retain an A/E firm for the engineering design:

- Synopsize requirements in Commerce Business Daily (CBD)
- Develop A/E pre-selection list
- Contact A/E firms on the pre-selection list to ascertain interest in project
- Develop A/E Selection list (at least three firms)
- Select A/E firm

Following EPA approval of the ROD, action must be taken to initiate design activities. The Lead design party shall ensure the design package is developed consistent with the approved ROD and applicable CERCLA policy and procedures.

It is essential that the A/E firm retained to accomplish the design for a specific remedial action have a clear understanding of the project scope and subsequent required design documents. The following elements of a statement of work are intended as guidance in preparing site-specific A/E instructions. The Design Project Officer (PO) shall ensure that the appropriate elements are addressed. The SOW for remedial design should require the A/E to prepare the final construction plans and specifications to accomplish the remedial action alternative as defined in the ROD. The specification should include quality

TABLE I
EPA RD/RA KEY PERSONNEL
EPA SUPERFUND REMEDIAL DESIGN/REMEDIAL ACTION KEY PERSONNEL

Title	Function
EPA Remedial Project Manager (RPM):	The designated EPA regional official who coordinates, manages, and monitors site activities.
M&O Project Officer (PO):	The official designated by the lead party for the RD or RA who coordinates, monitors, and manages RD or RA activities.
Design Project Officer (DPO):	The designated A/E official who coordinates, monitors and manages the design activities.
Construction Project Officer (CPO):	The designated contract official who coordinates, oversees, monitors, and manages the construction activities.
Supervisor and Administrator (S&A):	The designated official who supervises and administrates the construction/cleanup activities. Duties also include contract administration.
Full Time On-Site Inspector (OSI):	The official designated by the EPA RPM who oversees the construction activities to ensure compliance. The OSI is authorized to stop all activities not incompliance or which endanger human the health and welfare.
Additional On-Site Inspectors:	For complex project additional OSIs may be required.
A/E Field Representative (A/E FR):	The designated official who advises the construction PO on engineering interpretation of the Facility plans and specifications. The A/E FR also assist the CPO in interpreting the impacts on the design of proposed changes and preparing sketches and/or revised drawings to add construction contract modifications.

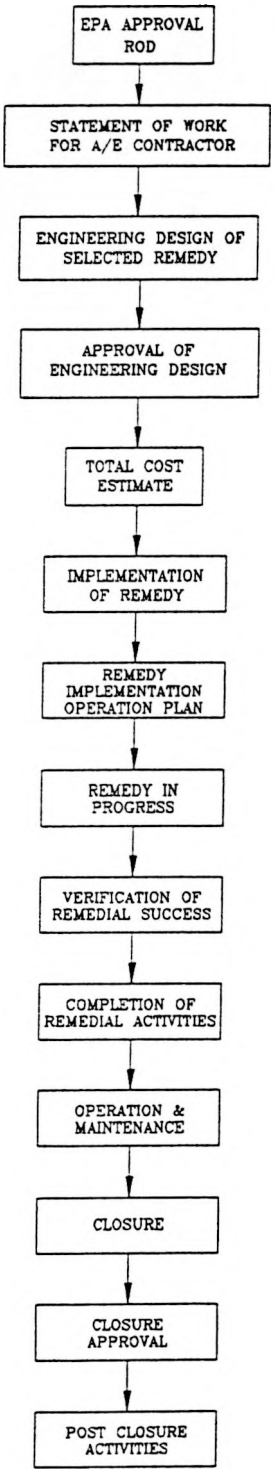

FIG. 1A – EPA RD/RA REMEDIATION PROCESS

REF. OSWER 9355.0-4A

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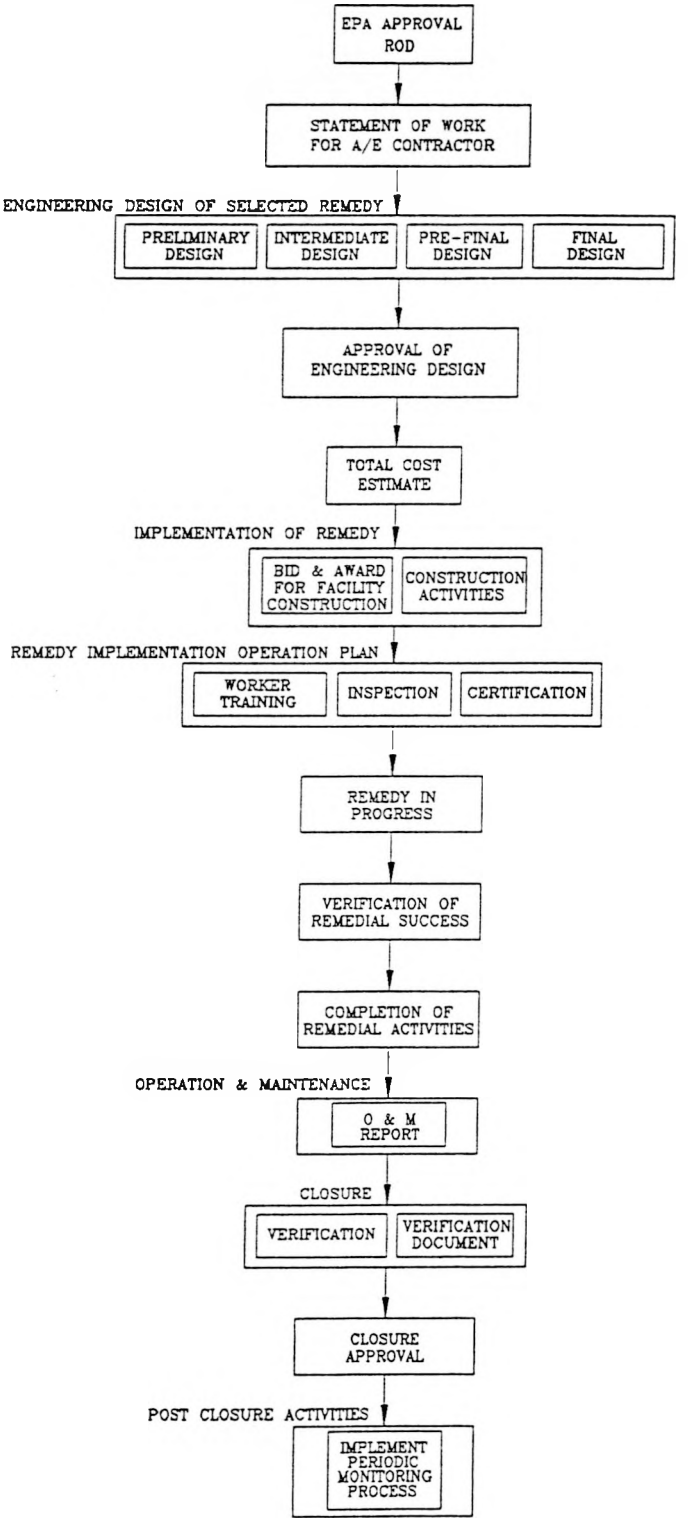

FIG. 1B – EPA RD/RA REMEDIAL PROCESS

REF. OSWER 9355.0-4A

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assurance provisions in all proposed work. In general, the plans and specifications portion of the SOW should include the following phases:

- Preliminary Design (30%)
- Intermediate Design (60% optional)
- Prefinal/Final Design (90%)
- Correlated Plans and Specifications
- Selection of Offsite Resource Conservation and Recovery Act (RCRA) Facilities
- Compliance with the Requirements of Other Environmental Laws
- Equipment Startup and Operator Training

Any additional activities and documents that need to be addressed during the design phase are completed by the A/E firm. Any additional studies needed to supplement the technical data available from the RI/FS activities such as bench scales test and pilot test are initiated. The Operation and Maintenance Plan, the Quality Assurance Project Plan and the Specific Site Safety Plan are developed and finalized during the design phase. Also completed at this time is the scoping of A/E services during construction.

A preliminary design package shall be submitted by the A/E when design effort is approximately 30% complete. The submittal shall contain plans and specifications previously described, bench and pilot studies interim report if required, and the preliminary cost estimate. The submittal shall be reviewed for environmental and technical compliance. The submittal should address full environmental compliance with the ARARs identified in the ROD and technical compliance with the SOW, constructability, and cost accuracy.

At the discretion of the design PO or consent Decree, the intermediate design package shall be submitted at approximately 60% completion.

When design reaches approximately 90% completion, the Prefinal Design Package shall be submitted. The Submittal shall include all plans and specifications, O&M plan, QAPP, specifications for Site Safety Plan (SSP) and the cost estimate. The submittal undergoes an extensive environmental and technical review. The Environmental Review ensures:

- compliance with all ARARs identified in the ROD
- utilization of currently accepted environmental control measures and technology
- the adequacy of the O&M plan, QAPP, and SSP specifications
- consistency with ROD, environmental and public impacts.

Technical Review ensures:

- bidability and constructability of the design
- the accuracy of the construction cost estimate
- utilization of currently accepted construction practices and techniques
- the ability of a construction contractor to submit a fair and reasonable bid based upon the bid schedule included in the specifications

- o the accuracy of any estimated quantities of materials specified in the design.

Final Design Submittal consists of the final design plans and specifications, the A/E firm's final construction cost estimate, final draft O&M plan, final QAPP and SSP specifications. Final Approval of the design is done by the Agency contracting the A/E firm.

All permits, approvals and site access must be acquired and established during the design phase. Concurrently, the Community Relations Plan (CRP) must be revised to include any changes in the level of concern or information needs of the community during design and construction activities.

Remedial Action

After completion and approval of the RD package, action must be taken to initiate remedial action activities. The activities accomplished during the RA are discussed.

Procurement for a remedial action should be through a fixed price contract and should be by formal advertising to assure full free competition. Site inspection may be done by bidders to answer questions regarding design or implementation. The review of bid documents is conducted to ensure that the bidder is both responsive and responsible.

During actual construction monitoring, oversight and inspections must be done. Records and reports maintained during construction and remedy implementation must be adequately documented for use in the final certification of the remedial action. The lead party is responsible for construction inspection during the RA activities. A full-time inspector ensures compliance with environmental and technical requirements. Construction reports are submitted at agreed upon intervals. Progress reports are due to EPA throughout the project. Operator training and procedures are established during construction.

Completion and acceptance for construction must be clearly defined to ensure proper end of project, approval, and closeout. The objective of the Prefinal Construction Conference is to discuss procedures and requirements for project completion and closeout. Prefinal inspection occurs when the preliminary project completion is accomplished. A walk-through inspection of the entire project site is required. When the RA includes construction of a treatment system, the facility start-up and shakedown shall have been completed as part of the RA. The contractor certifies that the equipment and retests have successfully been completed where deficiencies were previously revealed. A Prefinal Inspection Report shall be submitted.

The remedial action activities continue until all ARARs are met and maintained. For remediation of surface water or groundwater, the process shall be under the remedial action phase for a maximum of ten years and then it shall progress to the operation and maintenance phase. At the completion of the remedy, a final inspection and Certification shall be done. A Remedial Action Report shall be submitted for approval.

After the review of the Remedial Action Report and governing bodies are satisfied that the remedy is complete and performing adequately, a written notice of acceptance of completion shall be provided. After acceptance, site closeout activities are conducted, i.e. deletion of the site from the NPL.

Operation and Maintenance

Operation and Maintenance (O&M) is required to ensure the integrity of the remedy. An Operation and Maintenance Report is required at the final completion of O&M activities.

DOE REMEDIATION PROJECT PROCESS

The following defines and clarifies the phases within the DOE Remediation Project Process. This summary has been organized to reflect the general sequence of events that occur prior to, during, and after project initiation at DOE facilities. Figures 2A and 2B are the flow charts of the DOE Remediation Project Process as described in DOE Order 4700.1. Table II is a list of key personnel for the DOE Remediation Project Process.

Project Identification Phase

The project identification phase of the DOE Project Process consists of several sub-phases that need to be completed before Conceptual Funding Process can be started and the next phase can be initiated. These sub-phases include:

- The Environmental Assessment
- Specific Project Identification Report
- Project Formulation Report
- Project estimates
- Conceptual Planning Phases and Report.

Conceptual Design Phase

The Conceptual Design Report (CDR) includes such things as the equipment sizing and layouts, preliminary process and instrument drawings (P&IDs), material balances, process calculations, process control philosophy, operating philosophy, material take-off cost estimates, an integrated project schedule and a total project cost estimate. The construction project data sheets, which include all data and justification, are required to include the construction effort in the Departmental Budget. The Project Plan, which includes the project charter, is a summary of the dimensions of the project to be executed. The Plan includes objectives, schedules, resources, priorities, controlled milestones and environmental requirements. The Project Management Plan (PMP) is the document that sets forth the plans, organization, and systems that shall be utilized by those responsible for managing the project. When required, the Environmental Impact Statement (EIS) shall be initiated at this time and completed before project initiation. After all sub-phases are complete, a submission for DOE Budget is done.

During the Conceptual Design Phase, the preliminary safety analysis shall be initiated. In accordance with DOE order 6430.1A, all DOE facilities shall be

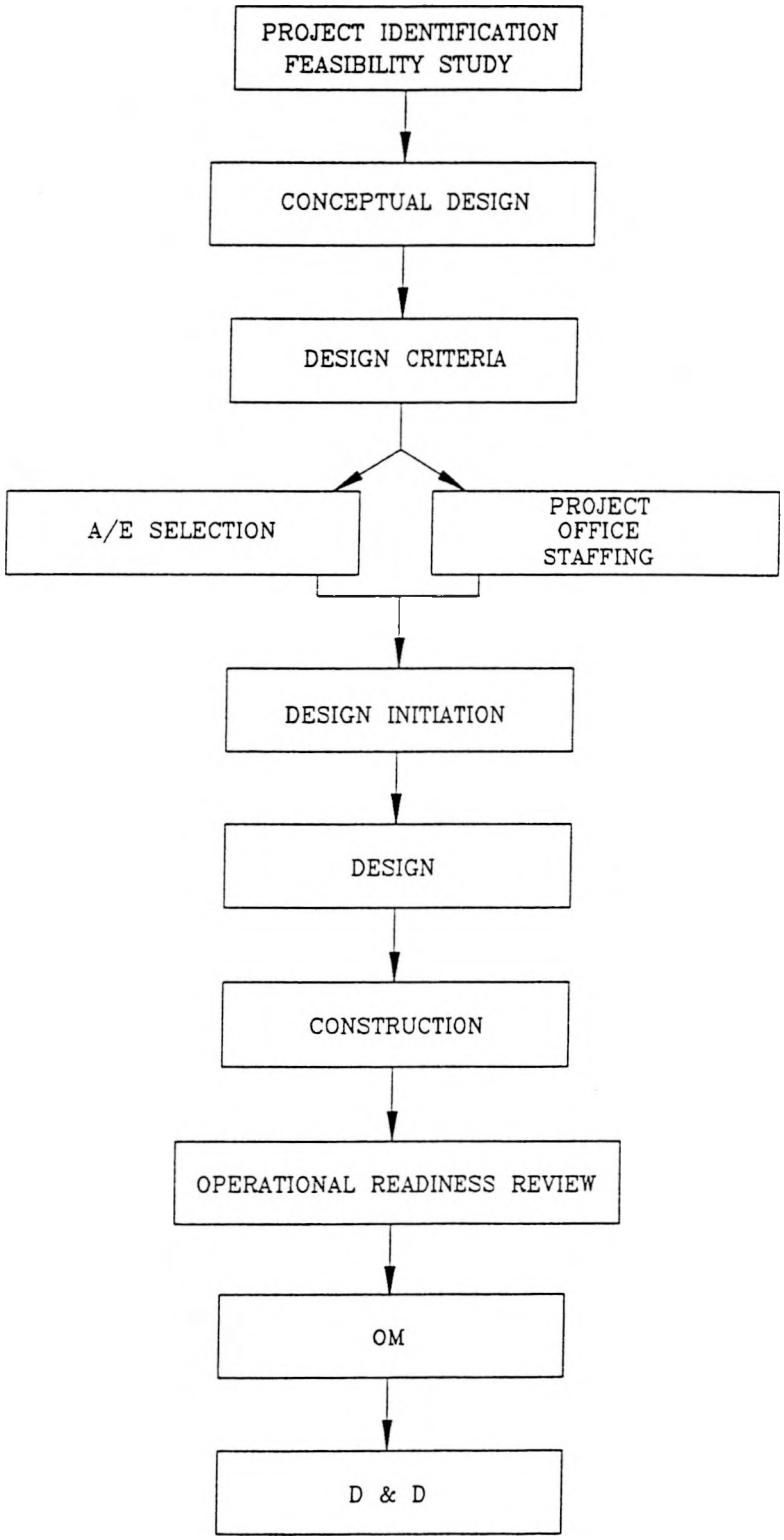

FIG. 2A – DOE REMEDIATION PROJECT PROCESS

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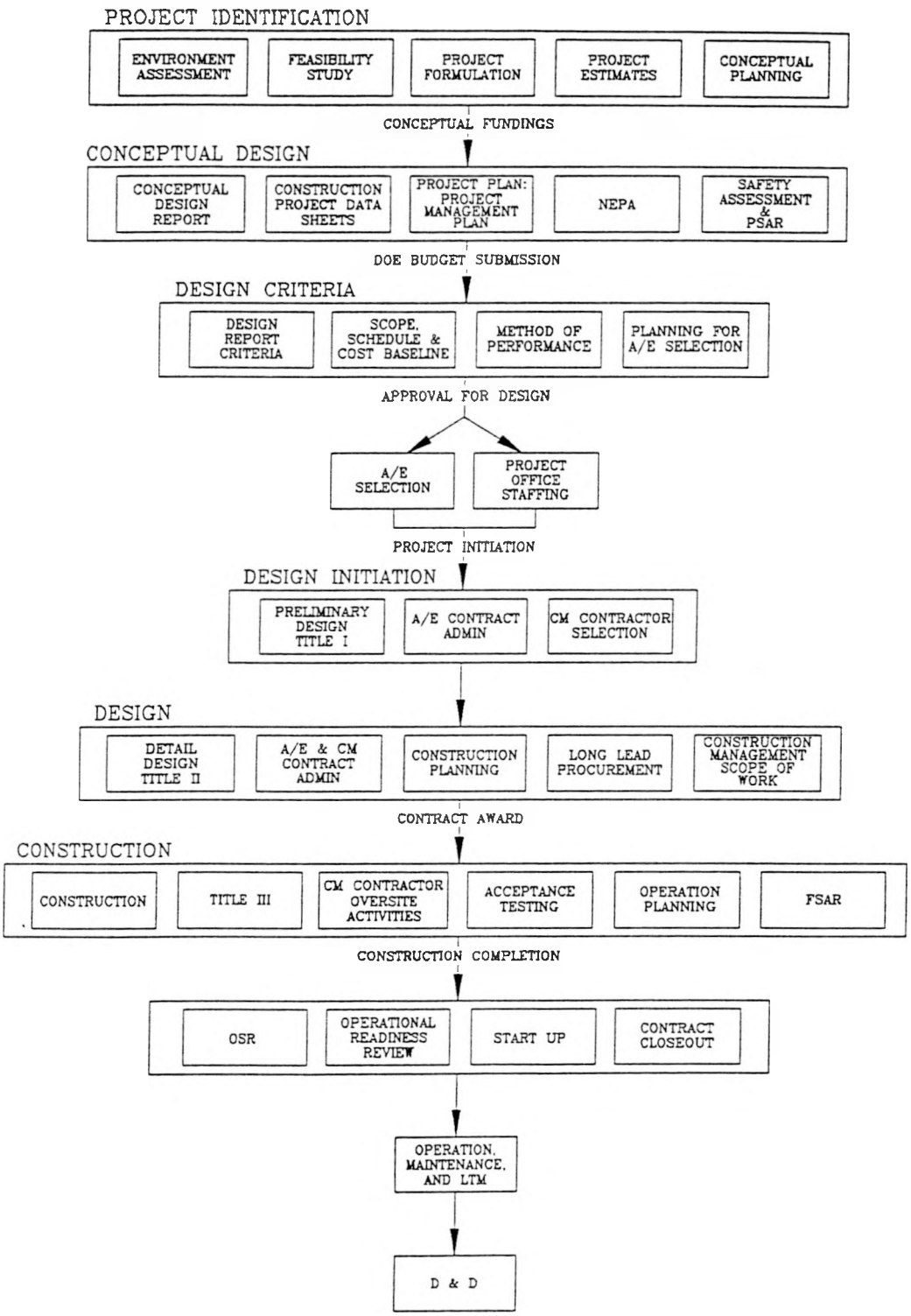

FIG. 2B – DOE REMEDIATION PROJECT PROCESS

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TABLE II
DOE RD/RA KEY PERSONNEL
DOE REMEDIAL DESIGN AND REMEDIAL ACTION KEY PERSONNEL

Title	Function
DOE Project Manager (RPM):	The designated DOE overall official who coordinates, manages, and monitors site activities.
Project Manager (PM):	The official designated by the lead party for the RD or RA who coordinates, monitors, and manages RD or RA activities of the A/E.
Operable Unit Manager (OUM):	The designated DOE official who coordinates, monitors and manages the operable unit activities.
Construction/Project Engineer (CPE):	The designated DOE official who follows construction activities: QA, Safety, Design, Inspection etc..
A/E Project Director (PD):	The designated A/E official who supervises, coordinates, manages, and monitors the A/E activities construction/cleanup activities.
Field Engineers (FE):	The official designated by the DOE who is responsible for Title III inspection and oversees the construction activities to ensure compliance.
A/E Operable Unit Managers (A/E OUM):	The designated official who is responsible for accomplishing the design for Operable Unit.

evaluated for potential risks to the operators, the public, and the environment. Timing, content, format criteria and approval provisions of Safety Analysis Report (SAR) are contained in DOE 5481.1B (Fig. 3). Facility design and construction features identified as a result of the Preliminary Safety Analysis Report (PSAR) shall be factored into the conceptual design before establishing the project cost estimate and requesting Congressional authorization for design and construction. The PSAR shall be completed and approved prior to the start of construction (including site preparation), consistent with DOE 4700.1.

Design Criteria

The Design Criteria phase organizes all activities for the design. It includes the Design Criteria Report (DCR) which expands the CDR framework to list the specific design and operating parameters (criteria) upon which the A/E shall base the detailed design. It also includes management organization, scope, schedule and cost baseline, method of performance and planning for A/E selection. All of these factors need to be addressed to obtain approval for the design. Upon approval for design, the A/E selection process and Project Office Staffing commence. At their completion the project is initiated.

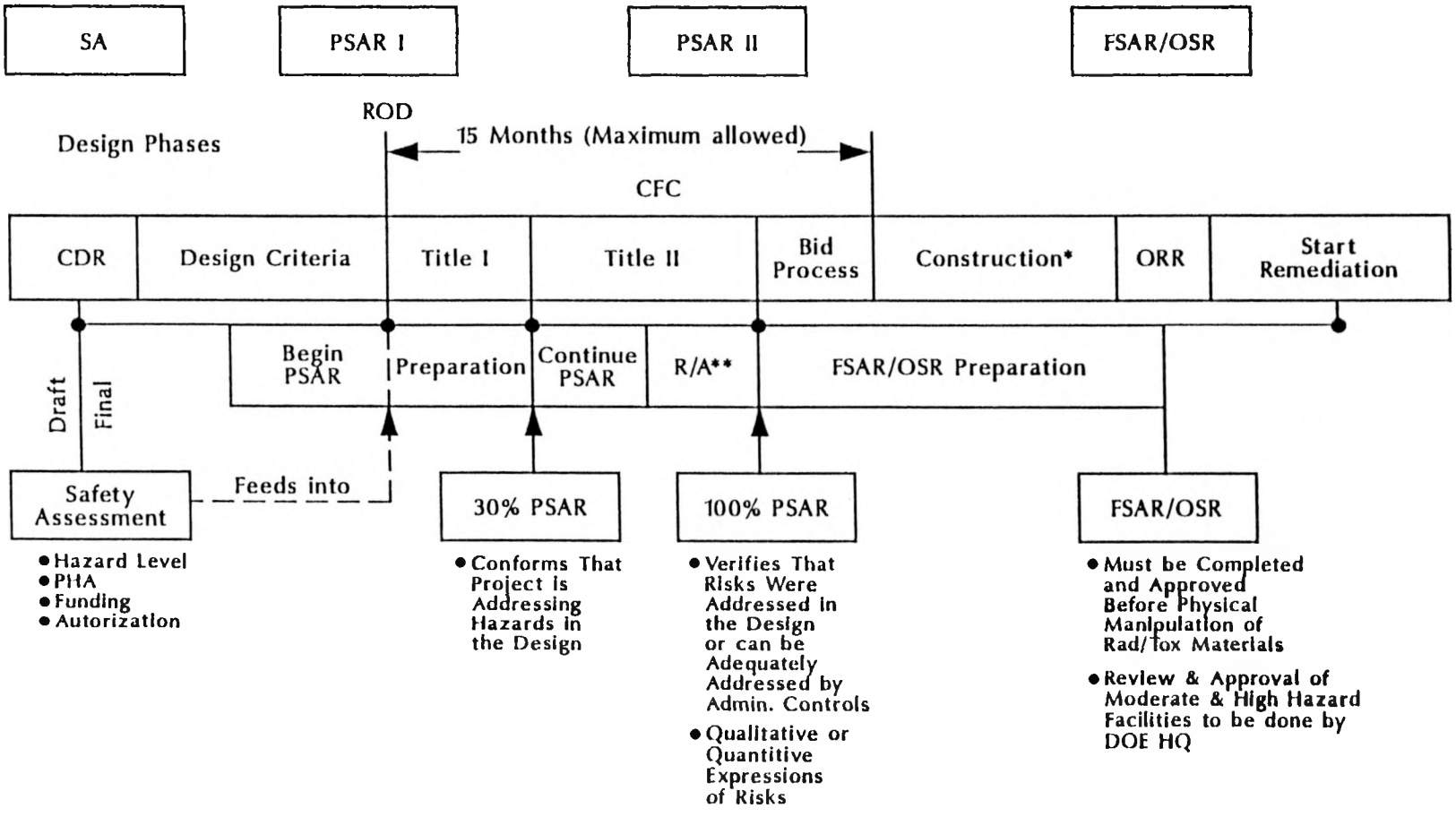
Design Initiation Phase

The Design Initiation Phase comes after the project initiation. The PMP must be activated and implemented, and the A/E contract Administration must be established. Simultaneously, the design effort and PSAR are continued in the Title I (preliminary design) utilizing the conceptual design and the project design criteria as a basis for project development. In Title I, design topographical and subsurface data are developed and the requirements and criteria which will govern the definitive design are determined. The selection process for Construction Management (CM) Contractor is completed during this phase. At the conclusion of Title I, the PSAR and the Design are 30% completed.

Design Phase

The activities undertaken during the design are discussed below. The PMP is updated to reflect current project management status. The planning for construction of the project includes objectives regarding schedules, plan and control of technical tasks, and the management of the integrated technical effort to meet cost. Concurrently, the A/E and CM contract administration is established and defined. In the Title II or Detailed Design, the work of the project, based on approval of the preliminary design, is continued and includes any revisions required of the Title I effort. For Title II, final working drawings, specifications, bidding documents, cost estimates, and coordination with all parties which might affect the project are prepared. The PSAR is completed during Title II. Firm construction and procurement schedules are developed and proposals or bids are analyzed. During the Design Phase, any equipment or service which might be needed by the construction operations of a project are identified and purchased by the Long Lead Procurement activities. These purchases are made on a need for the future basis to minimizing delays in construction or operation start-up times due to lengthy acquisition procedures after project award. The CM plan is developed. The CM plan must be consistent with the quality, size, scope and complexity of the project involved. The CM

SAR Cycle



* Note: Some ERA Projects (e.g., Emergency and Time-Critical) Will Have a "Construction" Phase Within Which to Prepare a FSAR. Physical Operations Involving the Rad/Tox Material Will Begin After Title II. In Those Cases, the 100% PSAR Will Have to be Developed to the Extent OSRs Can be Prepared. Development of Procedures, Training, and As-Builts Will Also be Moved into Title II Phase.

** Note: Review and Approval of Safety Documentation Will Include Site Contractor, FSO, and (in the Case of Moderate and High Hazard Facilities) DOE-HQ.

Fig. 3 - PSAR/FSAR Continuum

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must establish technical interface requirements and procedures, establish a configuration control board, and indicate approval levels for changes. Concurrent with design activities, the construction contract is presented for Pre-Award. Completion of the bid and award procedures leads to project construction. At the conclusion of Title II, the PSAR and the Design are 100% completed.

Construction Phase

The Construction Phase encompasses many activities. Concurrent with the actual construction, planning for facility Operations is initiated. The Final Safety Analysis Report (FSAR) shall be developed during the construction phase and shall be completed and approved prior to the initiation of the facility operations. The FSAR shall be updated as appropriate to reflect changes affecting safety that are made to the facility during its lifetime. Title III activities are performed. These activities assure that the project is constructed in accordance with the plans and specifications (i.e. construction inspection), and that the quality of materials and workmanship is consistent with environmental and technical requirements of the project. The PMP is updated to reflect the current status. The A/E Contractor assumes administrative responsibilities. The CM contractor activities described previously continue until completion of construction. Upon conclusion of construction activities, all reports and documentation for fulfillment of the contract are completed.

Operational Readiness Review

At the completion of construction phase, the final inspection and acceptance take place. Operational Readiness Review (ORR) is completed. These activities include: assignment of test and acceptance functions, establishment of acceptance tests for equipment, operator training, establishment of procedures, establishment of on-the-job worker surveillance programs, and final acceptance and inspection. At this time the Operation Safety Report (OSR) is developed. The contract for construction is then closed out and operations commence.

Project Operation

The Project Operation Phase lasts for the active life of the facility. During Operations, the DOE Annual Budget process is still in effect. At the end of Operations, the decontamination and decommissioning process takes place.

COMPARISON

Figure 4 show both processes with a similar placement of events. Figure 5 shows these in greater detail. Similarities existed between the DOE and EPA requirements. Although the presentation differs, the design items defined in the SOW for the A/E firm are essentially the same components needed for the DOE Design Criteria Report. While specific contents of the reports may differ, most of the requirements needed for the EPA RD work plan are found within the requirements of the DCR and the SOW. Excerpts from both the DCR and the SOW could be used to meet the requirements for the EPA RD Work Plan. Greater similarities can be see in the actual designing of the project. The DOE Title I Design meets the requirements for the EPA Preliminary Design and the DOE Title

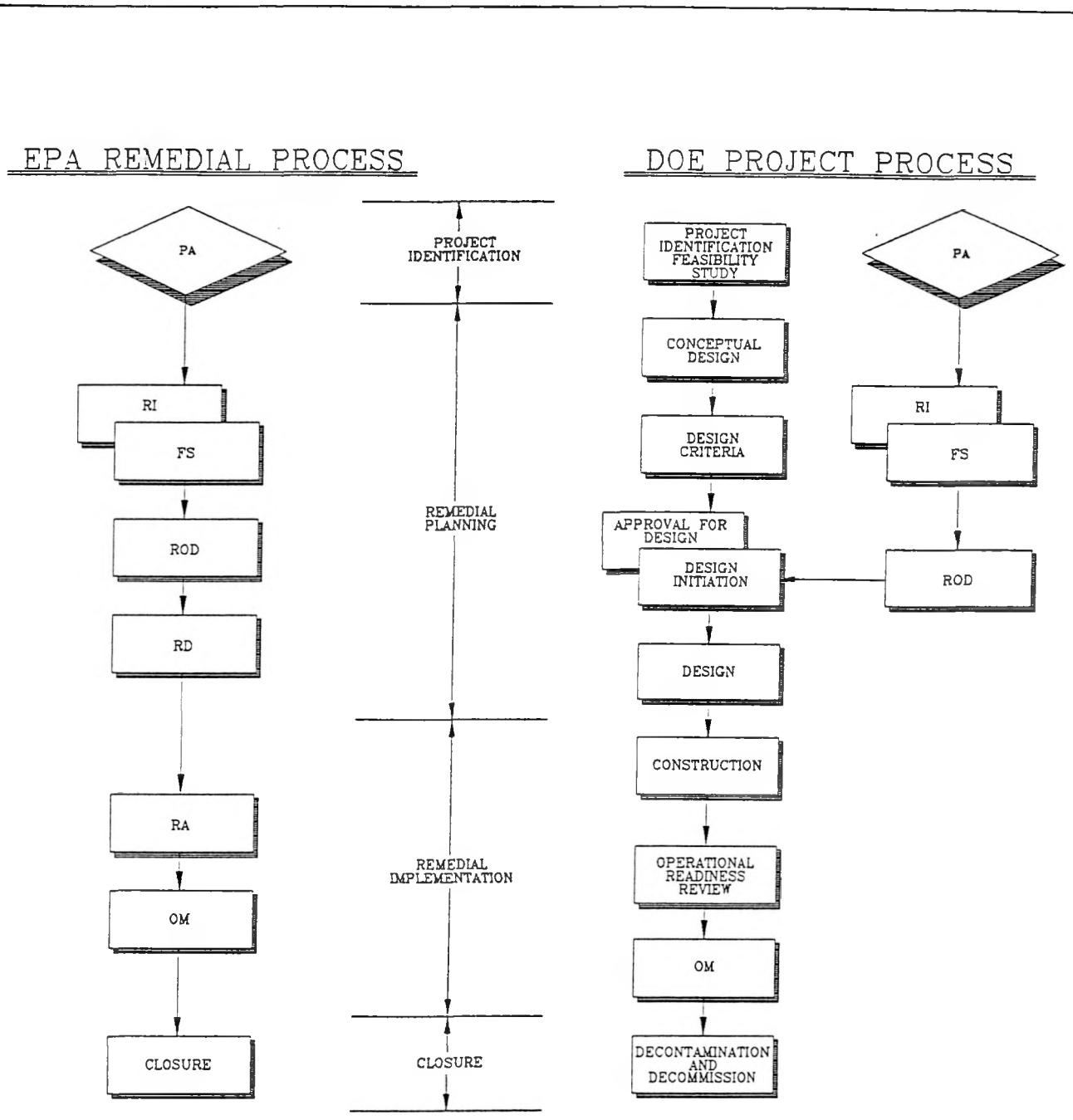

FIG. 4 – EPA/DOE MACRO PROCESS COMPARISON

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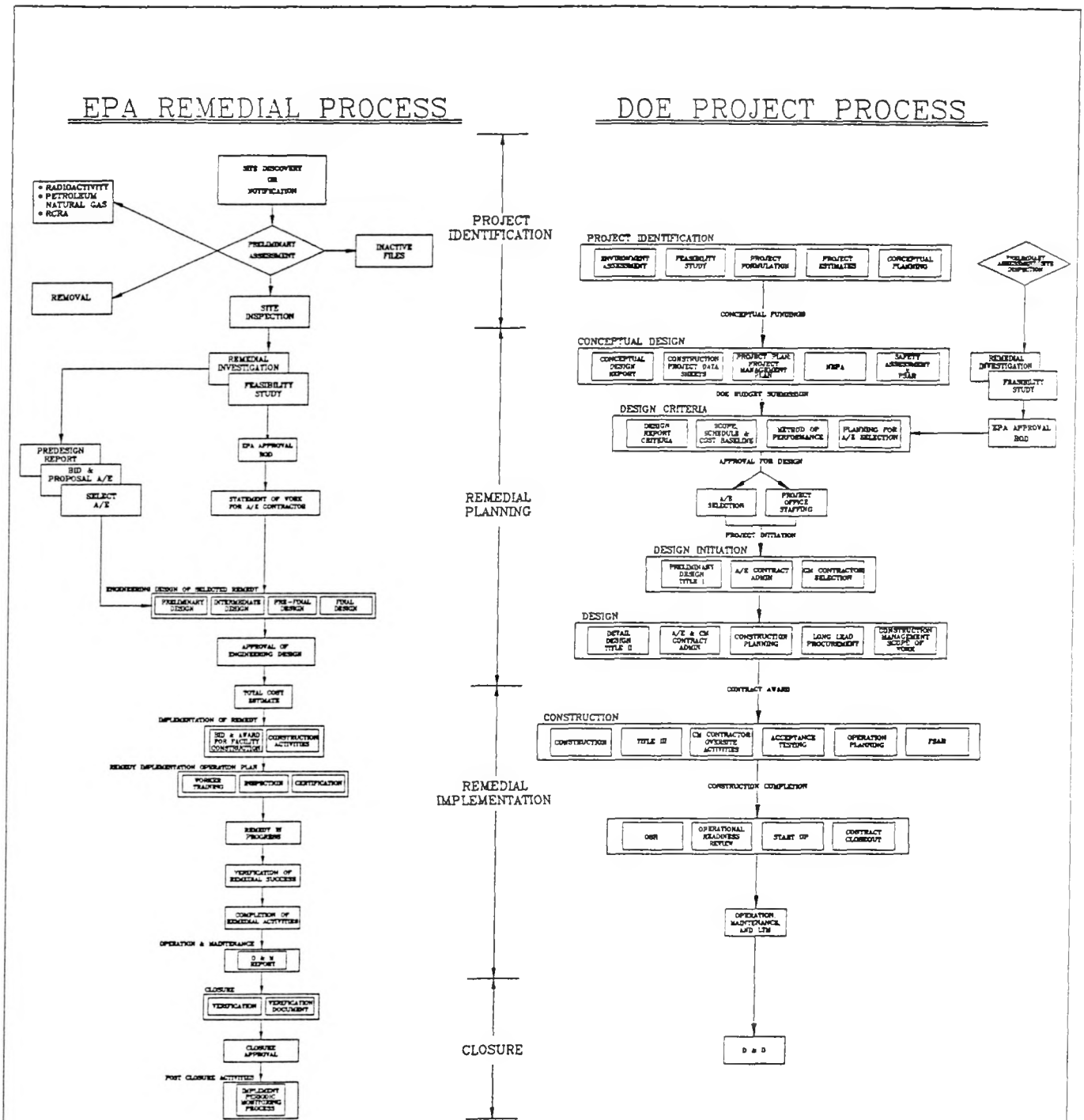

FIG. 5 – EPA/DOE DETAILED PROCESS COMPARISON

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II meets the requirements for the EPA Intermediate, Pre-Final and Final Design. Requirements for quality assurance, site and worker safety, worker training, inspection and certification are congruent. The DOE Construction Phase and Operations corresponds with the EPA RA and O&M phases. Although, as previously discussed, some requirements for DOE are not requirements for EPA and vise versa. Furthermore, as presented earlier, DOE Operations start within the EPA RA phase and continue into the O&M Phase making direct time comparison difficult.

EPA review and comment associated with DOE milestones present certain advantages. EPA involvement and insight would provide valuable direction in remedial proceedings. Possible DOE milestone review and comment by EPA is presented in Table III.

DOE PROJECT BUDGET PROCESS

The project budget is a continuing process that systematically provides funding for design and construction projects. This process is repeated every fiscal year and is used for planning and acquiring funds for budget years BY, BY+1, BY+2, and BY+3. The annual budget chronology (Fig. 6) is described followed by a multi-year chronology description.

ANNUAL BUDGET PROCESS

In October, the DOE closes out prior year projects. Congress appropriates funds for the current year at the same time.

In the November-December time frame, the Office of Management and Budget (OMB) approves the President's budget for Budget Year (BY) and provides guidance for BY+1, BY+2, and BY+3.

The President's budget for Budget Year is sent to Congress in January. The Field Office receives the BY+1 Budget from the contractor. Prior to including a project in the budget, a conceptual design is completed, and sent to Headquarters. Project data sheets are submitted for both new and on-going project efforts requiring additional funding. This documentation is used with the conceptual design report for project validation and to defend the project in the internal review budget.

During February through April, the field offices conduct internal review of BY+1 and complete the call. BY+1 is then returned to the project offices, Controller, and Office of Project and Facilities Management. Also, during this time, Congress conducts hearings on the Budget Year and DOE defends the BY budget and legislation.

From April through May, the Controller issues a field budget call incorporating any budget planning decisions that have been made and an internal review budget call for BY+1. The Field Office submits BY+1 to Head Quarters (HQ). Project validation occurs for projects in BY+1. Validation is conducted by the Program offices and the Office of Project and Facilities Management and evaluates the projects for readiness to proceed into the Department's budget process. It also examines the planning, development, and baseline of a project to ensure that the

TABLE III
EPA INVOLVEMENT
Potential Required DOE Milestones to be Submitted to EPA for Review and Comment

Health and Safety Plan
Sample and Analysis Plans
Quality Assurance Project Plans
Site Safety Plans
Removal Site Evaluation
Action Memorandum
Environmental Assessment
Environmental Impact Statement
Engineering Evaluation/Cost Analysis (EECA)
Remedial Design Work Plan
Remedial Action Work Plan
Title I/II Design
Test and Startup - verification of Remedy
Operational Readiness Review
Operation and Maintenance Plan
Closure Plan
Air Emissions Permit to Install (APT)
Air Emissions Permit to Operate (APTO)
Air Emissions Notice of Intent
Water Discharge Permit to Install (WPTI)
Water Discharge Notice of Intent (WNOI)
Safety Assessment
Preliminary Safety Assessment Report
Final Safety Assessment Report
Standard Operating Procedures

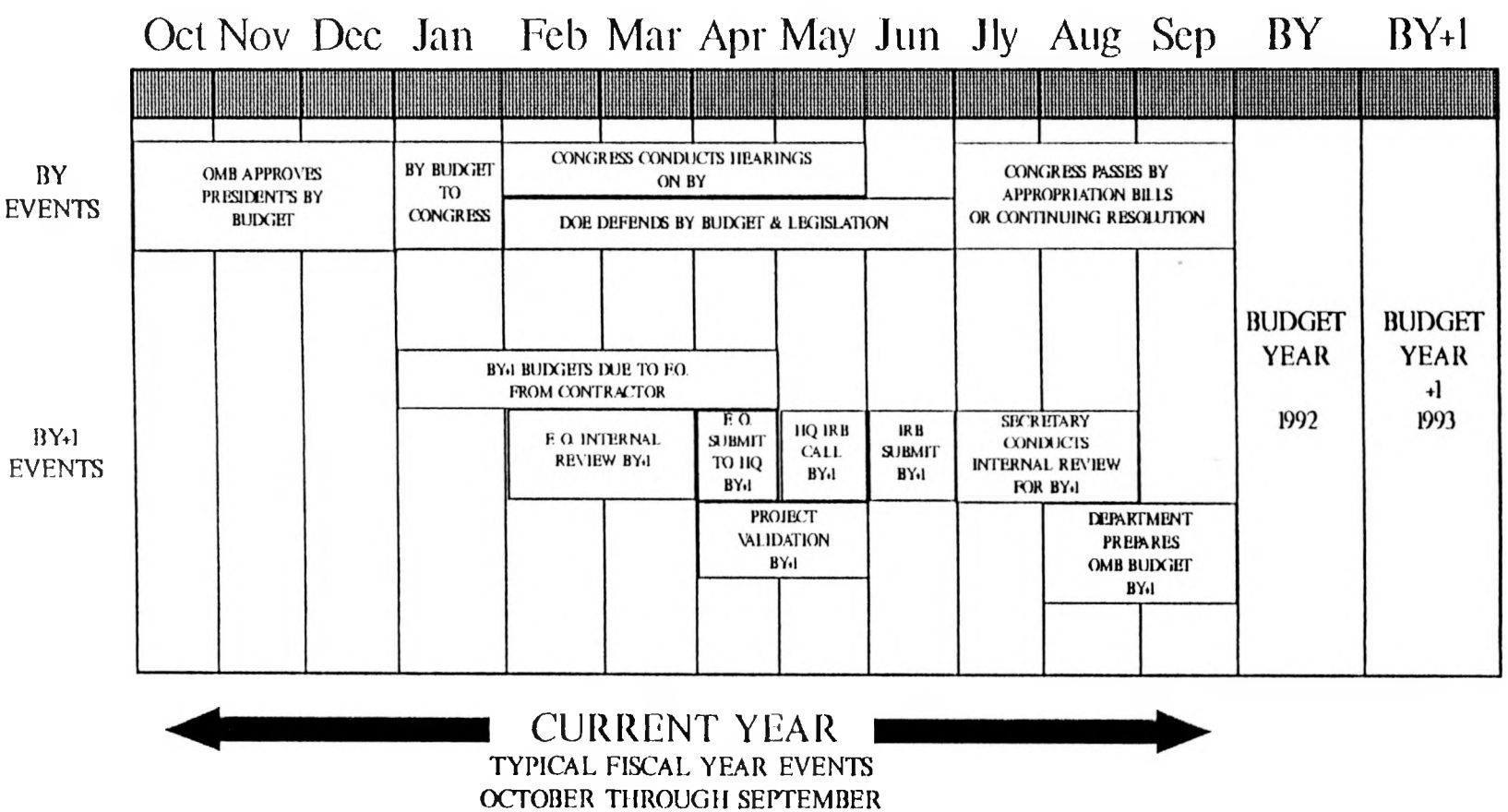

FIG. 6 - ANNUAL BUDGET PROCESS

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funds requested are commensurate with the project's anticipated scope and schedule. Normally, the project must be validated prior to inclusion in the internal review budget. By May, HQ Internal Review Broad (IRB) makes the call for BY+1.

In June, the IRB submits the BY+1 budget. The Secretary conducts an internal review for projects included in BY+1 during July through August. Congress passes BY appropriation bills or continuing resolution.

The Department prepares OMB Budget for BY+1 in August and September.

MULTI-YEAR BUDGET CHRONOLOGY

The interconnected planning and budget cycles encompass an approximate 4-year period. During this time, project identification, project selections, project scope and construction requirements, reliable cost estimates, and advance project planning needed to assure timely project initiation are developed and accomplished. This time must be well utilized and adequately scoped so that sufficient conceptual design work is completed. The budget cycle and planning steps for a project with authorization anticipated in BY+3 is shown in Fig. 7. This indicated the steps required to be taken in proceeding years to authorize a budget in BY+3 project.

In the Current Fiscal Year (CFY), lists of candidate projects accompanied by short form data sheets are delivered to the appropriate program division and the Office of Project and Facilities Management (OPFM) for BY+3 candidate projects. Headquarters reviews the projects to be considered for inclusion in the BY+3 budget. Program Organizations revise the BY+2 requests to include BY+3 requirements as determined through the planning, programming, and budgeting process. Work on Conceptual Design Reports begins at this time for projects to be included in BY+3.

In BY+1, the program organizations review the tentative construction program for BY+2 in light of the approved CFY program and the BY+1 program as submitted to the OMB. Upon completion of this review, program organizations notify field offices and the Office of Project and Facilities Management of the BY+2 budget projects for which planning should continue. Information provided by the short form data sheets, the BY+1 OMB budget, and the current appropriation act is utilized to complete this action. The Field elements shall submit the construction project data sheets and the conceptual design reports to the appropriate program office and the OPFM. The OPFM validates the construction project data sheets planned for inclusion in the BY+2 Internal Review Budget submittal. Headquarters completes all actions required by the planning, programming, and budgeting system. Headquarters incorporates the updated construction project data sheets for BY+2 projects and submits to the OMB. In BY+2, funding is made available for BY+3 Projects. Field organizations accomplish plant engineering and design. Other actions may take place with respect to BY+3 budget but do not require specific action by the field elements. This includes the President's budget being submitted to Congress and the authorization and appropriation Acts being passed.

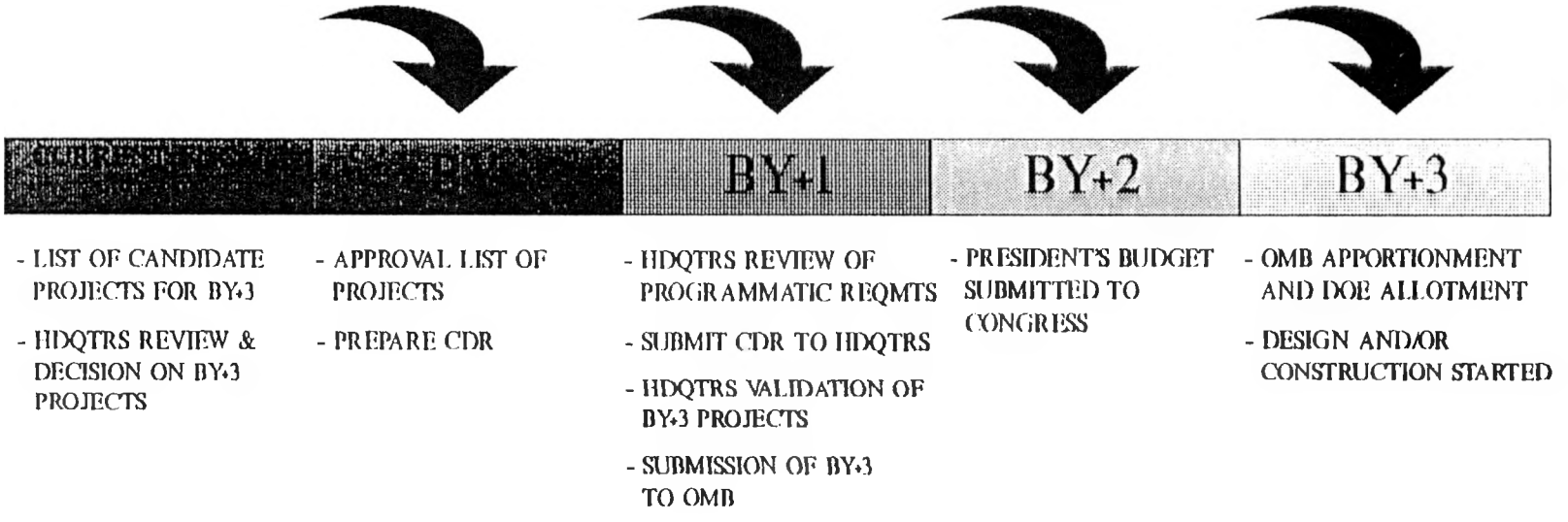

FIG. 7 - APPROPRIATION OF FUNDS

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In BY+3, the OMB apportionment and the DOE allotment occur. These fund the design or construction activities. The field elements initiate the design and construction of a project.

VALIDATION

The Budget Validation evaluates the project for planning, development, baseline, and proposed funding. Budget validation is needed for any new project or to increase funding of any prior project. The Validation Process consists of reviewing project planning and conceptual development documentation. Through discussion with principal parties, validation determines:

- o source basis,
- o procedures,
- o validity of requirements,
- o validity of scope,
- o validity of cost, and
- o validity of schedule.

Validation findings are used for the Annual Budget Formulation.

DOE REMEDIATION PROJECT REQUIREMENTS

DOE Orders/EPA Equivalents

DOE Orders and requirements for environmental restoration activities are summarized in Fig. 8. These requirements have been compared to equivalent EPA requirements.

SCHEDULE FOR RD/RA PROJECTS

Traditional EPA/DOE RD/RA Schedule

Figure 9 depicts the traditional EPA/DOE RD/RA schedule and the DOE Budget Cycle. The figure portrays a need for the design budget submittal to occur at the very early stages of the RI/FS process and the construction budget submittal to occur in the middle of the RI/FS process. This brings into focus the conflicts in time frames for each activity. Viable correlation between the two processes begins to occur within the Design phases. CERCLA requires physical and substantial and continuous ongoing remedial activity to begin 15 months after the signing of the ROD. This is improbable due to the DOE procedures for construction activities. The solution to this dilemma is discussed in the next section.

Innovative EPA/DOE RD/RA Schedule

Figure 10 presents the solution to the 15 month physical, substantial and continuous ongoing remedial action dilemma. "Common threads" (construction items which need to be done for all remedial activities selected) which could be identified early in the RI/FS can be broken out into distinct design packages. After ROD approval, these "distinct design packages" could then go through the DOE project process and be awarded for construction. The "packages" would progress from the simplest to the most complex ending with the remedy selected

FIG. 8 – DOE ORDER/EPA EQUIVALENTS

REQMNT	DOE ORDER	DEFINITION	PURPOSE	EPA EQUAL
SAFETY DOCUMENTATION Safety Assessments, PSAR's, FSAR's, and OSR.	DOE 5480.1B DOE 5481.1B DOE 6430.1A	Prepare safety documentation that identifies the hazard classification, facilty use classification, and safety class items within the facility which protects equipment and personnel.	Identify hazards within facility to provide appropriate mitigating design features and/or administrative controls.	29 CFR 1900 MSDS
QUALITY ASSURANCE Quality Assurance Plans & Risk Assessment Reports.	DOE 5700.6B	Prepare QA documentation for each project and establish overall facility wide QA program consistent with the requirements set forth in ANSI/ASTM NQA-1 Standard. Assures that all projects are performed in a controlled manner and maintained in a manner consistant with good engineering standards, quality practices, and technical specifications. The RAR specifically identifies the key areas or concerns of any given project.	Identify concerns to be addressed in design and operation. Establishes QA levels to guide project.	40 CFR 300 Quality Assurance Project Plan
FEASIBILITY STUDY	DOE 4700.1	Identifies the initial design recommended for any new given project. The FS is prepared as the basic document for obtaining funding for any new Major Project or MSA.	Identifies need for funding for all new projects. Evaluates feasibility of meeting objectives via allocation, ROM, Cost, & Schedule.	40 CFR 300 Feasibility Study
CONCEPTUAL DESIGN REPORT	DOE 4700.1	CDR is prepared as a revision to the FS. Provides a greater level of detail and is prepared at BY-3	Sets baseline scope, cost and schedule.	
DESIGN CRITERIA	DOE 4700.1 DOE 6430.1A DOE 6410	Provides summary of the requirements, codes, orders, etc. that must be adhered to during the Title I/II design effort. Provides an even greater level of detail for the proposed design and is prepared at BY-2	Further refines cost estimate.	40 CFR 300 Remedial Design Remedial Action OSWER 9355.04A Statement of Work
TITLE I/II GENERAL DESIGN REQUIREMENTS	DOE 4700.1 DOE 6430.1A	Provides details for the national standards and codes that must be met for all aspects of design for all new facilities. Identifies special design features that must be incorporated into the design based upon the facility use classification.	Standardizes all design effort using similar guidelines.	40 CFR 300 Record of Decision OSWER 9200.3-010 RD&RA Work Plans
TITLE I/II DESIGN PACKAGES	DOE 4700.1 DOE 6430.1A	Provides 30% to 100% design of project.	Preparation of drawings and specifications (CFC) package.	OSWER 9355.04A Preliminary Design Intermediate Design Prefinal Design Final Design
HUMAN FACTORS ENGINEERING	DOE 6430.1A	Requires that a human factors analysis be performed for all designs to assure operability and maintainability of the equipment in which human interface is required.	Assures properly ergonomically design systems and facilities.	OSWER 9355.04A Certification; Operation and Maintainence Plan
LIFE CYCLE COST ANALYSIS	DOE 6430.1A DOE 4330.2C	Requires that a Life Cycle Cost (LCC) Analysis be performed for all new facilities having a minimum power usage	Provides mechanism for review and optimization of equipment or systems not deemed energy efficient.	OSWER 9355.04A Cost Estimate; Operation and Maintainence Plan

FIG. 8 – DOE ORDER/EPA EQUIVALENTS

REQMNT	DOE ORDER	DEFINITION	PURPOSE	EPA EQUAL
VALUE ENGINEERING	DOE 4101.1 DOE 6430.1A	Provides for the independent review of all designs to assure that they are performed and constructed in the most cost effective manner.	Identifies potential cost savings and improvements in constructability of a project.	OSWER Directive 9355.0-4A Remedial Design and Remedial Action Guidance Document
RADIATION PROTECTION STANDARDS	DOE 5400.5 DOE 5480.1B DOE 5480.11	Provides for a standard and guidelines on which systems, equipment, and facilities must be operated by establishing exposure limits for radionuclide exposure. This combines with the safety document process to assure maximum protection to the operator and to the general populous.	Identifies exposure limits on which to guide technical designs of new facilities and projects.	49 CFR 190 49 CFR 191
NEPA DOCUMENTATION Categorical Exclusion, Environmental Assessment, Environmental Impact Statement	DOE N 5440.1	Establishes guidelines for the need for the necessary environmental documentation to satisfy the requirements of the National Environmental Policy Act. Establishes guidelines for the type of projects requiring the documentation and the approvals required. Documentation approval must be recieved before any Title II design is initiated.	Assures that all projects are performed in accordance with the intent and spirit of the law, and that environmental impacts are properly assessed.	CFR
TITLE III SERVICES	DOE 4700.1	Activities required to assure that a project is constructed in accordance with its plans and specifications. Assure through inspection that the quality of the material and workmanship is consistent with the plans and specifications. Also assure through inspection that all required testing is performed.	Provides for a better product at completion that meets the design criteria.	RD/RA GUIDANCE - Prefinal Inspection Report - Certification
HEALTH AND SAFETY PLAN	DOE 5480.14	A Health and Safety Plan shall be prepared for all activities associated with the characterization of hazardous waste sites and with clean-up operations involving hazardous substances and wastes.	Aids in identifying the anticipated health and safety hazards associated with any project.	40 CFR 300 Site Safety Plan Health and Safety Plan
REMOVAL SITE EVALUATION	DOE 5480.1B	Establishes the environmental protection safety and health programs for DOE operations.		40 CFR 300 Removal Site Evaluation
NESHAPS AIR PERMIT	Executive Order 12088	Federal compliance with pollution control standards which establish regulations and procedures for Federal agencies to comply with environmental legislation and regulation.		Clean Air Act OEPA
PERMIT TO INSTALL/ PERMIT TO OPERATE	Executive Order 12088	Identifies the need for approved permits identifying the expected emissions that may be seen from the facility.		

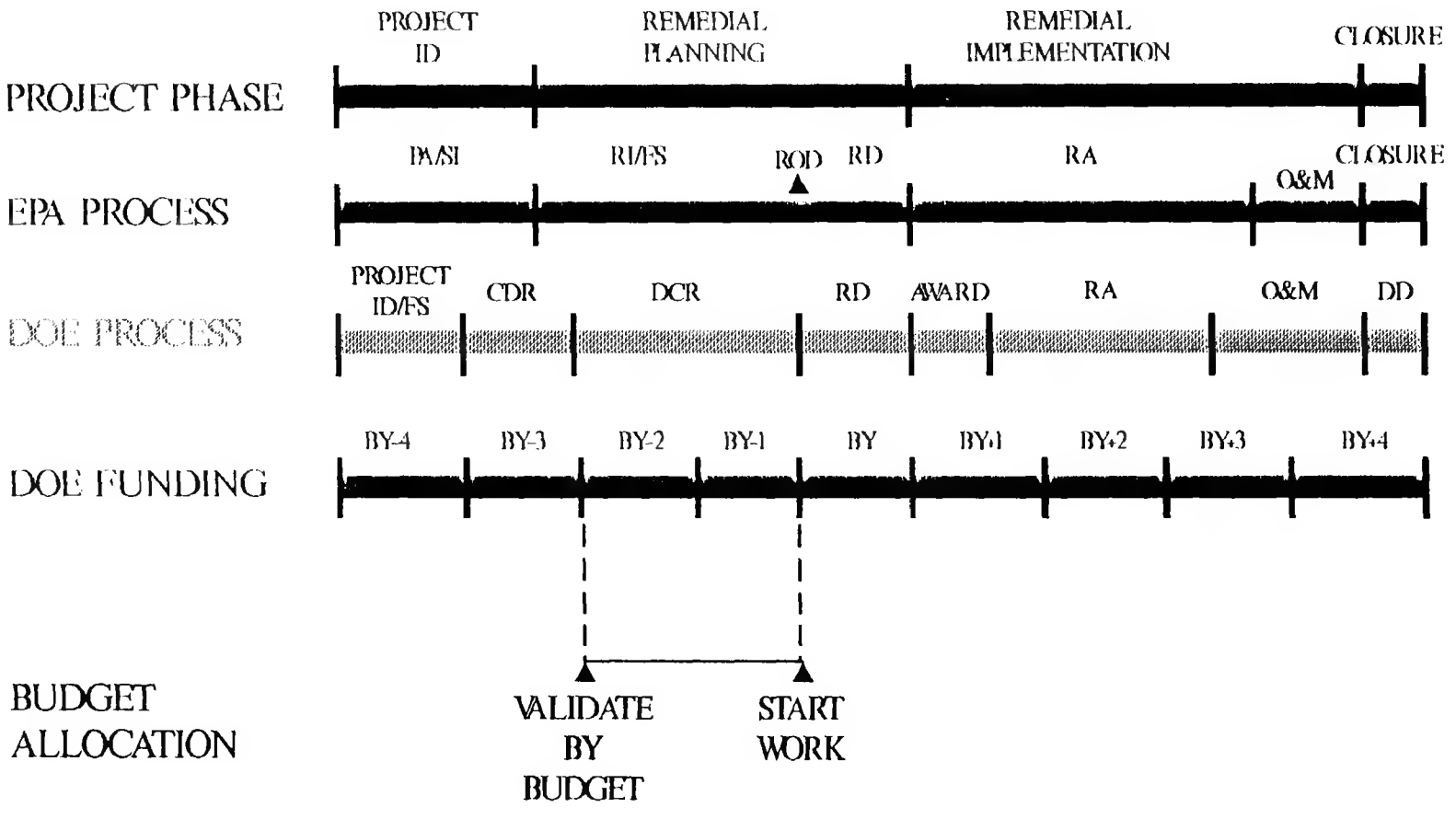

FIG. 9 - TRADITIONAL SCHEDULE

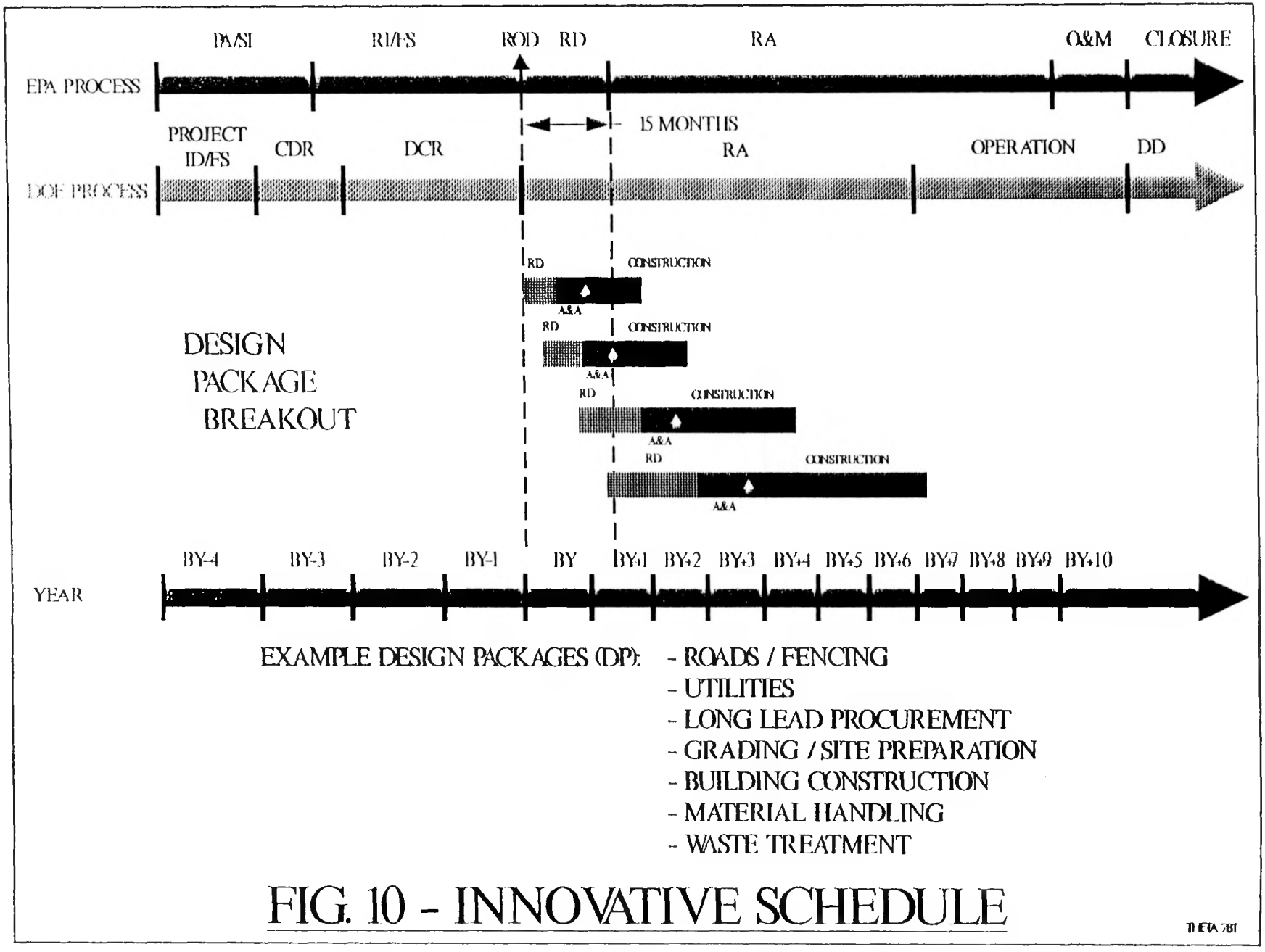

FIG. 10 - INNOVATIVE SCHEDULE

by the EPA ROD. By breaking the overall Design into separate pieces, continuous and ongoing remedial action can be logically implemented within the 15 month criteria.

CONCLUSION

As seen by the comparison in the preceding sections, the traditional DOE remediation project process requirements are quite similar to the EPA remediation process requirements. While differences exist, the sequence and content of the design and approval documents are congruent. Although these similarities exist, time allocation problems still arise. DOE must manage the remediation activities to meet both remediation requirements and budgeting requirements. The annual budget cycle and the line-item allocation process constrain the remediation process. In addition to DOE budget constraints, the DOE design process for a complex remediation exceeds the 15 month time allotment. The Title I and Title II phase of a complex design alone could conceivably take several years to complete. In order to meet the requirements of the traditional remediation project schedule, funding (and cost estimates) for the RD/RA activities would have to be requested in the initial stages of the RI/FS. Furthermore, design of the project would need to start at the middle of the RI before selection of the alternative is even under way. The inherent risks of this approach are apparent.

By using an innovative project methodology, the DOE remediation process can be altered to meet the requirement of substantial continuous physical on site remedial action. The requirements for continuous activity within 15 months of the ROD can be met by dividing the selected remedies into separate design "packages". Common threads activities (such as roads, utilities, etc.) necessary for all remedies will be defined and broken out. This will allow the "common thread" designs to be started upon the signing of the ROD. While construction of the "common threads" are being completed, the more complex parts are being designed. By overlapping the construction activities of the "common threads", a physical, substantial and continuous ongoing remedial activity will be maintained. By breaking out the design packages, the requirement for the 15 month time constraint is met while the complex design is being completed.

DISCLAIMER