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		Design Agent									
/	/	Cog. Eng. T. J. Conrads	<i>T. J. Conrads</i>	1/23/98				Charles E. Marshall	<i>Charles E. Marshall</i>	1/23/98	H5-61
/	/	Cog. Mgr. R. P. Marshall	<i>R. P. Marshall</i>								
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# Project Management Plan Double-Shell Tank System Specification Development

T. J. Conrads

Numatec Hanford Company, Richland, WA 99352  
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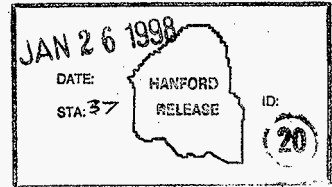
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Key Words: double-shell tanks, waste retrieval, project requirements, storage tanks.

Abstract: This document describes the process for developing an approach to designing a system for retrieving waste from double-shell tanks. It includes a schedule and cost account for the work breakdown structure task.

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## Approved for Public Release

**HNF-2121**  
**Revision 0**

**Project Hanford Management Contract**

**Project Management Plan**  
**Double-Shell Tank System Specification**  
**Development**

**Prepared by**  
**T. J. Conrads**

**NUMATEC HANFORD CORPORATION**

**November 25, 1997**

# NUMATEC HANFORD CORPORATION

## PROJECT MANAGEMENT PLAN



T. J. Conrads  
Technical Authority  
Numatec Hanford Corporation

12/5/97

Date



R. P. Marshall  
Functional Area Manager  
Numatec Hanford Corporation

12/10/97

Date

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## **1.0 INTRODUCTION**

The Project Hanford Management Contract (PHMC) members have been tasked by the U.S. Department of Energy (DOE) to support removal of wastes from the Hanford Site 200 Area tanks in two phases. The schedule for these phases allows focusing on requirements for the first phase of providing feed to the privatized vitrification plants. The Tank Waste Retrieval Division's near-term goal is to focus on the activities to support Phase I. These include developing an integrated (technical, schedule, and cost) baseline and, with regard to private contractors, establishing interface agreements, constructing infrastructure systems, retrieving and delivering waste feed, and accepting immobilized waste products for interim onsite storage.

## **2.0 PURPOSE**

The program described below focuses on developing a systems approach for defining the project requirements for the architecture to retrieve wastes from the double-shell tanks (DST) and designated miscellaneous underground storage tanks (MUST); provide waste feed to privatization contractors for processing and receive by-product from the privatization contractors all in an environmentally sound, safe, secure, and cost-effective manner. This approach uses an integrated requirements-driven, technically defensible physical system configuration that incorporates functional analysis, requirements analysis, alternative generation analysis, evaluation and optimization, and test and evaluation. Specialty engineering, decision/risk management, and interface management are integral parts of the process.

The results of the process will yield definitions of the integrated projects required to support the mission, upgrade the existing architecture where it is lacking, and continue the engineering process to design, construct, and turn over the new or modified facilities. Once the required projects are defined, activities must continue to implement the systems engineering approach and not just focus on the new or modified facilities. Continued implementation of the systems engineering processes, as they relate to the existing architecture, is critical to ensure acceptability of the system as a whole. Test and evaluation and reliability, availability, and maintainability assessments on the existing systems are considered critical elements of this process.

## **3.0 TECHNICAL OBJECTIVE**

The technical objective for this project is to use a systems approach to define the integrated project scope to satisfy the mission of waste retrieval, supply feed to the privatization contractors and receive byproduct from the privatization contractors. The scope will address the required modifications to existing systems as well as definition for new structures, systems, and components.

#### 4.0 PROJECT DEFINITION/WORK SCOPE

The WORK SCOPE is described in the Tank Waste Remediation System (TWRS) FY-1998 Multi-Year Work Plan and defined in more detail by the Task Schedule shown in Figure A.1 and described in more detail by Task Notes depicted in Table A.1. In general, the WORK SCOPE defines, documents, and maintains the functions and requirements of the DST and system segments supporting the Tank Waste Remediation System (TWRS). It includes completion of planning for resolution of the To Be Determined (TBDs) in the DST System specification, the performance and/or management of selected priority analyses, and preparation of change requests to update the DST System technical baseline. The system level analyses are required to support functional and requirements analyses to get to the component level in support of Phase I DST waste retrieval and feed delivery decisions.

##### 4.1 DST System Specification

- DST System Specification Support/Performance Analysis:

TWRS defines functional requirements to the 4th and 5th levels, and generates the associated performance requirements. (Resolves TBDs in current DST System Specification.)

- DST Project Management:

Conduct management analysis to establish Risk Analysis, and a Schedule Baseline.

- DST Process Analysis

Phase I DST system process parameters will be defined using the Hanford Tank Waste Operations Simulator Software.

- DST Specialty Engineering Studies:

Conduct studies to define Reliability, Availability and Maintainability (RAM), Logistics, Training, and Test and Evaluation requirements based on TWRS management policies.

- Internal Review :

Conduct a review of the DST System Specification limited to the System Specification and its associated planning.

- DST Trade Studies/AGAs:

Trade Studies and AGAs are completed to document engineering analysis and select architectures to support System needs. This scope establishes funding for an Analytical Assessment of the Existing DST System and four small trade/AGA studies.



- DST Interface Control Documents:

This work establishes the interfaces between each subsystem. These documents will provide the basis for delivery and acceptance of products from each subsystem in the TWRS.

#### 4.2 DST Components Specifications

- DST Component Level Functional Analysis:

Perform additional decomposition of functions, through levels 6 and 7, as necessary to define DST system. Complete Functional Flow Block Diagrams (FFBD).

- DST Component Level Performance Analysis:

Generates the performance requirements associated with the functions established at the 6th and 7th levels.

- DST Trade Studies/AGAs:

Trade Studies and AGAs are completed to document engineering analysis and select appropriate architectures.

- DST Design Component Specifications:

Generate design to specifications for architectures selected by trade studies and Alternative Generation Analysis (AGA). Currently 15 component specifications are expected to be needed including:

- DST Master I&C
- Decant Pump
- Slurry/Transfer Pump
- Master Pump Shutdown Controls
- Mixer Pump
- Chemical Addition System.

#### 4.3 DST Project Acquisition Baseline

This work establishes the requirements and scope for each Project.

#### 4.4 Configuration Management

Review and approve changes to the technical and programmatic SST and DST System baselines as needed. Generate and submit updates via change request as lower level Functions and Requirements (F&R) are developed.

4.5 Deliverables

Major deliverables consist of revised systems engineering documents that define the functions and requirements of the DST System. These documents will support DOE's strategy for facility acquisition. Documents include supporting documents for the DST System Specification, e.g., Trade Studies/AGAs, Interface Control Documents (ICDs) and Component Specifications.

4.6 Costs

The estimated costs for this program are \$2M. Funding currently available under TWRS FY-98 Multi-Year Work Plan, project summary work breakdown structure element 1.1.1.3.1.1.3.2 is \$1.62M. Formal change requests will be processed for the difference.

**5.0 PROJECT ORGANIZATION**

The overall responsibility for this project has been delegated by Lockheed Martin Hanford Company to Numatec Hanford Corporation. Major participants in this project are the U.S. Department of Energy, Richland Operations Office (RL), Project Hanford Management Contract (PHMC) Team and other on- and offsite contractors. The PHMC Team is comprised of a number of companies, of which Fluor Daniel Hanford, Incorporated (FDH) is the prime, hereby referred to as the Managing Contractor (MC).

Contractual relations and responsibilities established between RL and the MC are identified in the U.S. Department of Energy Contract DE-AC106-96RL13200. The RL approach for administering this contract is specified in the Contract Administration Plan, Project Hanford Management Contract (CAP). This contract administration style entails partnering with the MC and its subcontractors to achieve mutually beneficial results.

5.1 U.S. Department of Energy, Richland Operations Office

The RL Manager (or designee) is responsible for the definition, oversight, and acceptance of the work performed by the PHMC and its subcontractors. The RL Manager has the authority to stop any work activity, add work, and/or withdraw work from the PHMC contract. In addition, the RL Manager has authority for approval of those project Key and Critical Decisions formally delegated to RL by DOE-HQ.

In general terms, the role of RL, with regard to administering the PHMC contract, is to:

- Define success criteria/values
- Establish boundaries for integration
- Set priorities
- Establish strategic performance measures
- Define outcomes/deliverables
- Establish minimum site standards/evaluate results.

Authority for contractual direction to the MC is reserved to the RL Contracting Officer (CO) and designated Contracting Officer Representatives (COR). Overall COR responsibility for the TWRS strategic system is assigned to the Assistant Manager (AM) for TWRS.

5.2 Project Hanford Management Contractor

The PHMC is a team comprised of 13 companies: a prime contractor/MC, 6 major subcontractors, and 6 "enterprise" companies.

As the MC, FDH has overall responsibility for integrating and directing the work of the other team members. Subcontractor members of the PHMC team include Babcock and Wilcox Hanford Company; Duke Engineering and Services Hanford, Incorporated; DynCorp; Lockheed Martin Hanford Corporation (LMHC); Numatec Hanford Corporation (NHC); and Rust Federal Services of Hanford, Incorporated. The PHMC enterprise companies are B&W Protec, Incorporated; DE&S Northwest, Incorporated (DESH); Fluor Daniel Northwest (FDNW); Lockheed Martin Services, Incorporated; Rust Federal Services, Incorporated (RFSH); and SGN Eurisys Services Corporation (SESC).

5.3 Fluor Daniel Hanford, Incorporated

As the MC, FDH is responsible and accountable for management of all DST System Specification activities. FDH's role focuses on allocating resources, management, and integration of the work (how and whom), while its subcontractors are responsible for operations (doing the work). The MC role includes defining the work necessary to accomplish the objectives established by RL and working with RL to establish specific Performance Agreements tied to PHMC award fee objectives.

FDH's responsibilities include serving as the prime interface with RL. All contractual requirements and formal communications concerning this project between the PHMC team and RL shall be coordinated through the office of the FDH TWRS Project Director.

The TWRS Project Director is responsible for integrating horizontally across major project boundaries and vertically to DOE and the major subcontractors (e.g., LMHC and NHC). This approach will ensure vertical definition of interfaces and requirements from FDH down through the major subcontractors, and will also provide horizontal integration of interfaces and requirements among major subcontractors.

5.4 Lockheed Martin Hanford Corporation/Numatec Hanford Corporation

Programmatic and operational responsibilities for TWRS have been assigned by FDH to LMHC (one of the six major subcontractors in the PHMC team). Direct programmatic ownership of this project is provided by the TWRS Tank Waste Retrieval organization. Within this sponsoring organization, Waste Retrieval Program provides programmatic integration with other projects and provides operations liaison with Tank Farm Operations

(TFO). Both the Tank Waste Disposal Director and TFO Director report to the TWRS President and General Manager.

Numatec Hanford Corporation provides matrixed project management personnel and expertise to LMHC. The Project Manager, Tom Conrads, who reports to the Waste Retrieval Program manager via the NHC Project implementation manager, Rob Marshall, has direct responsibility and accountability for day-to-day management of this project.

## 6.0 PROJECT BASELINE

The project integrated baseline is made up of the technical, schedule, and cost baselines. Changes to any of these baselines will require the appropriate revision coordination to the others.

### 6.1 Technical Baselines

The following documents make up the technical baseline for this project:

Grenard, C. E., and Claghorn, R. D., 1997, *System Specification for the Double Shell Tank System*, HNF-SD-WM-TRD-007, Rev. A Draft, Fluor Daniel Hanford Company, Richland, Washington.

Peck, L. G., 1996, *Tank Waste Remediation System, Systems Engineering Management Plan*, WHC-SD-WM-SEMP, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

Rieck, R. H., 1996, *Tank Waste Remediation System Mission Analysis*, WHC-SD-WM-MAR-008, Rev. 1, Westinghouse Hanford Company, Richland, Washington.

Lenseigne, D. L., 1997, *Tank Waste Remediation System Fiscal Year 1998 Multi-Year Work Plan Work Breakdown Structure 1.1*, HNF-SP-1230, Rev. 0, Fluor Daniel Hanford Company, Richland, Washington.

### 6.2 Schedule Baseline

Appendix A includes the baseline schedule for this project.

### 6.3 Cost Baseline

Project Summary Work Breakdown Schedule Element 1.1.1.3.1.1.3.2 reflects the baseline cost for this project. (See Appendix B)

## **7.0 BASELINE CHANGE CONTROL**

Changes to baselines are authorized by approval of a change request (CR) in accordance with HNF-PRO-569, Baseline Change Control.

## **8.0 PERFORMANCE MONITORING AND REPORTING**

The Project Manager will establish the appropriate monitoring measurements to report progress.

## **9.0 CONFIGURATION MANAGEMENT**

Configuration Management will be performed in accordance with HNF-PRO-440.

**APPENDIXES**

**APPENDIX A Project Task Schedule and Notes**

**APPENDIX B WBS Cost Accounts**

**APPENDIX A**  
**PROJECT TASK SCHEDULE AND NOTES**

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Figure A.1. Task Schedule.  
(Sheet 1)

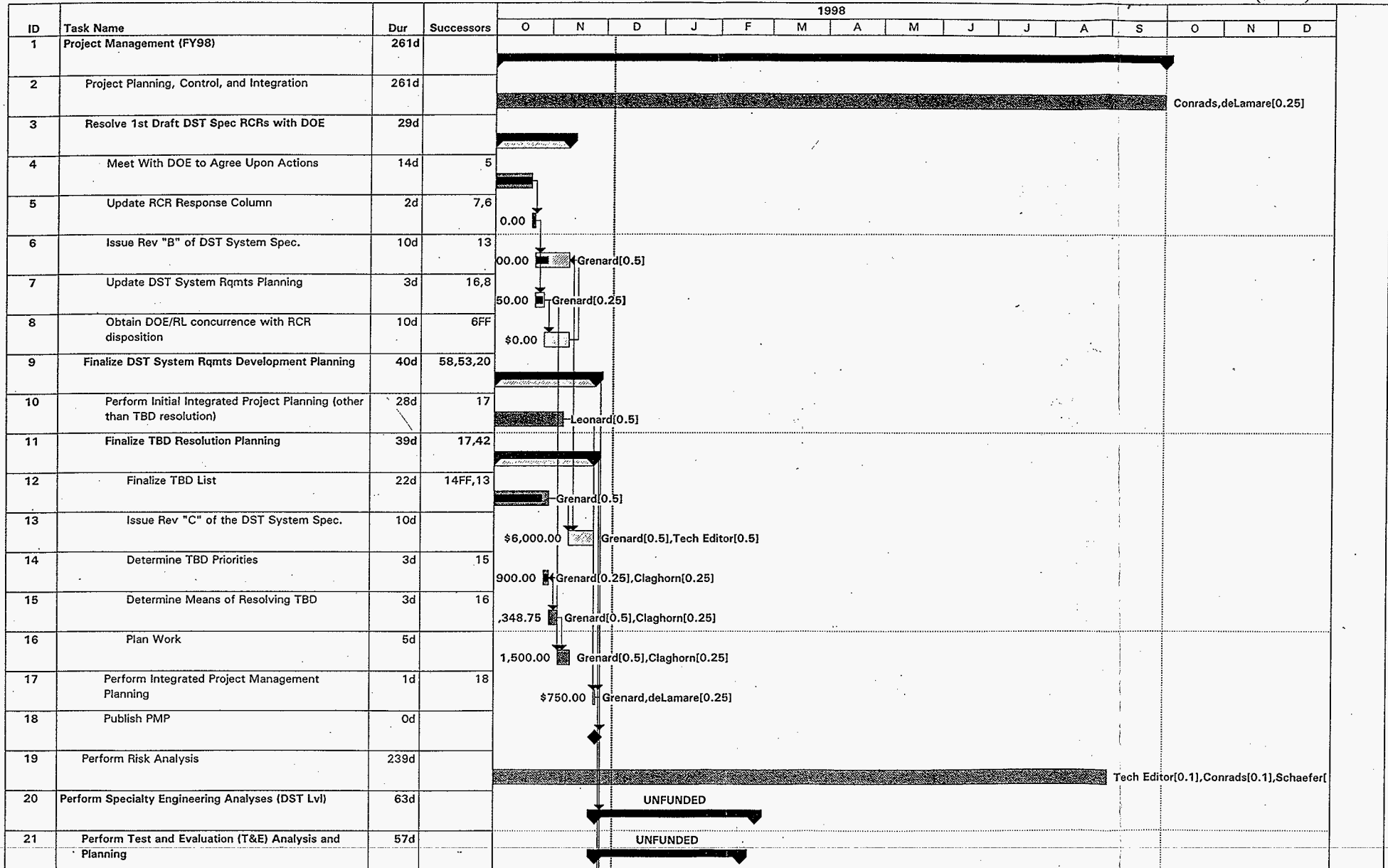


Figure A.1. Task Schedule.  
(Sheet 2)

ID	Task Name	Dur	Successors	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
22	Establish DST System T&E Policy & Requirements	21d	23,24															
23	Input T&E requirements into section 4.0 of the DST Sys Spec	5d	77,78															
24	Generate a DST Sys T&E Plan (Integrate with TWR)	36d	89															
25	Perform Logistics Support Analysis and Planning	63d																
26	Work with TWR and Ops to Establish a Logistics Concept and Strategy	42d	27															
27	Analyze DST System Logistics Support Rqmts	10d	29,28,78															
28	Input Logistics Requirements for DST System Spec into HSTD.	5d																
29	Generate an Integrated Logistics Support Plan	11d	93															
30	Perform RAM Analysis	47d	67SS															
31	Work with PLG to Determine DST System RAM Rqmts	42d	32															
32	Input Rqmts to HSTD.	5d	67,66															
33	Perform Safety Analyses	14d	77,40															
34	Perform Human Factors Analyses	2d	77,40															
35	Identify Natural System Environments	10d	77,40															
36	Determine Induced System Environments	21d	40															
37	Determine Flexibility and Expansion Policy & Rqmts	21d	77,40															
38	Determine Electromagnetic Interference Rqmts	5d	77,40															
39	Perform Other Constraints Analysis	21d	77,40															
40	Input Constraint Requirements into HSTD	5d																
41	Complete "Clashorn" AGA	42d	84															
42	Resolve Critical Performance TBDS	41d																

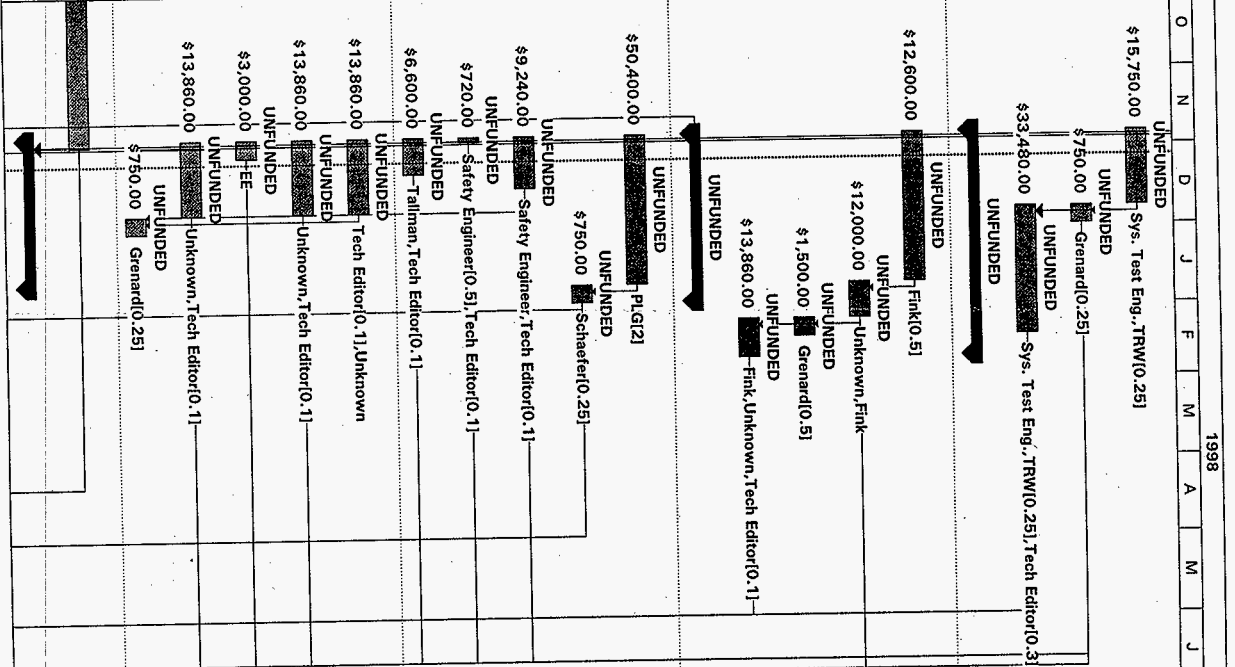


Figure A.1. Task Schedule.  
(Sheet 3)

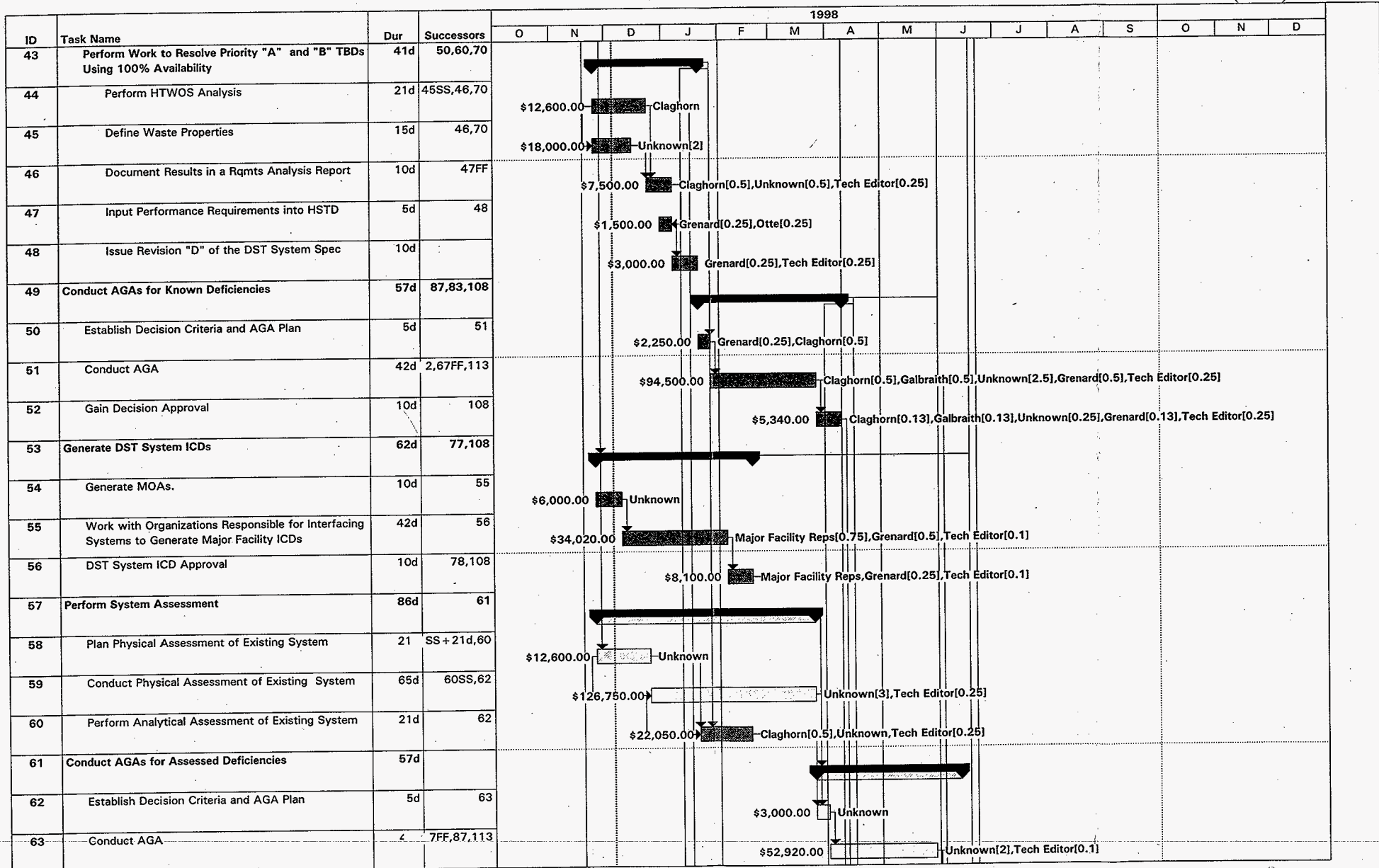


Figure A.1. Task Schedule.  
(Sheet 4)

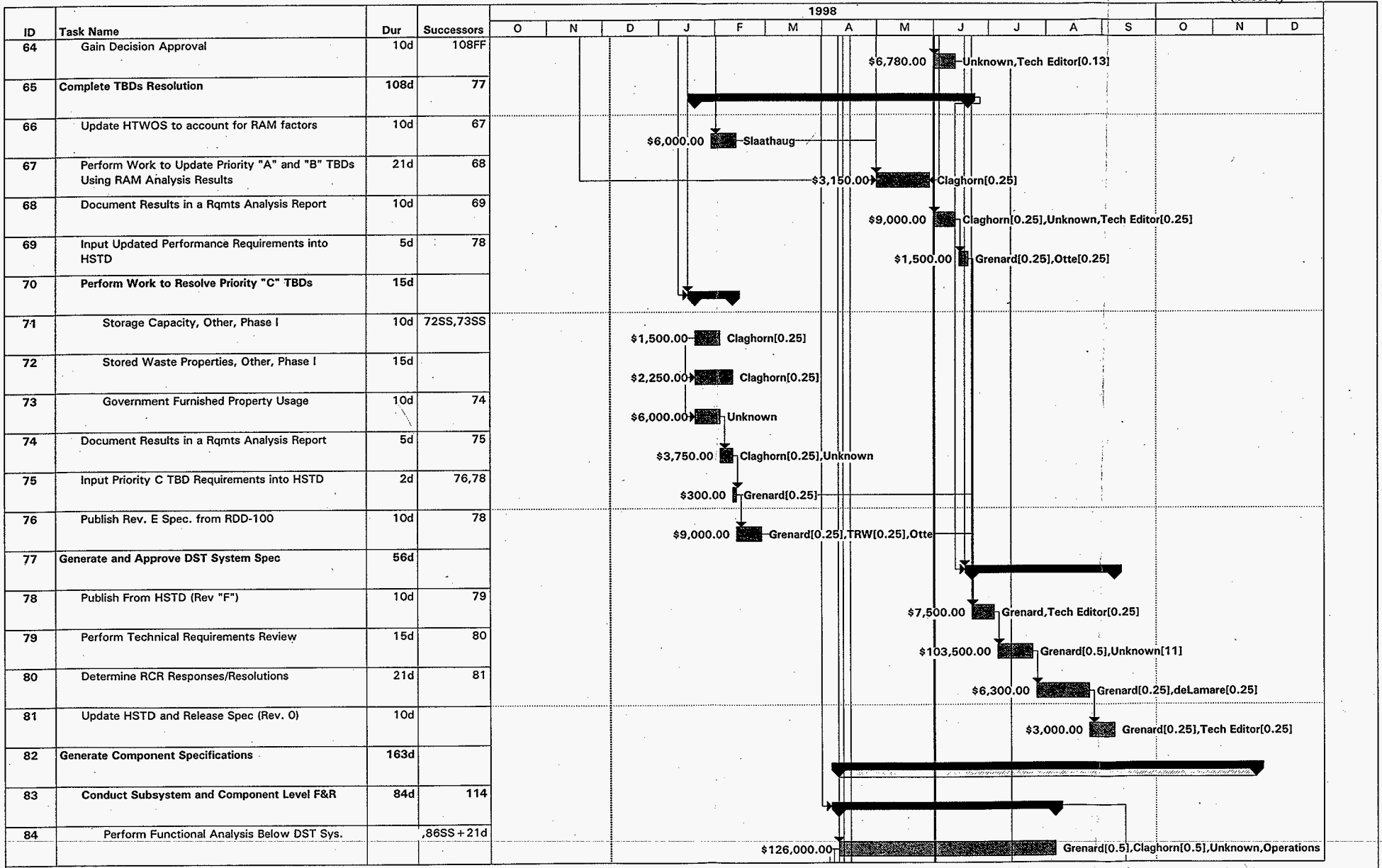
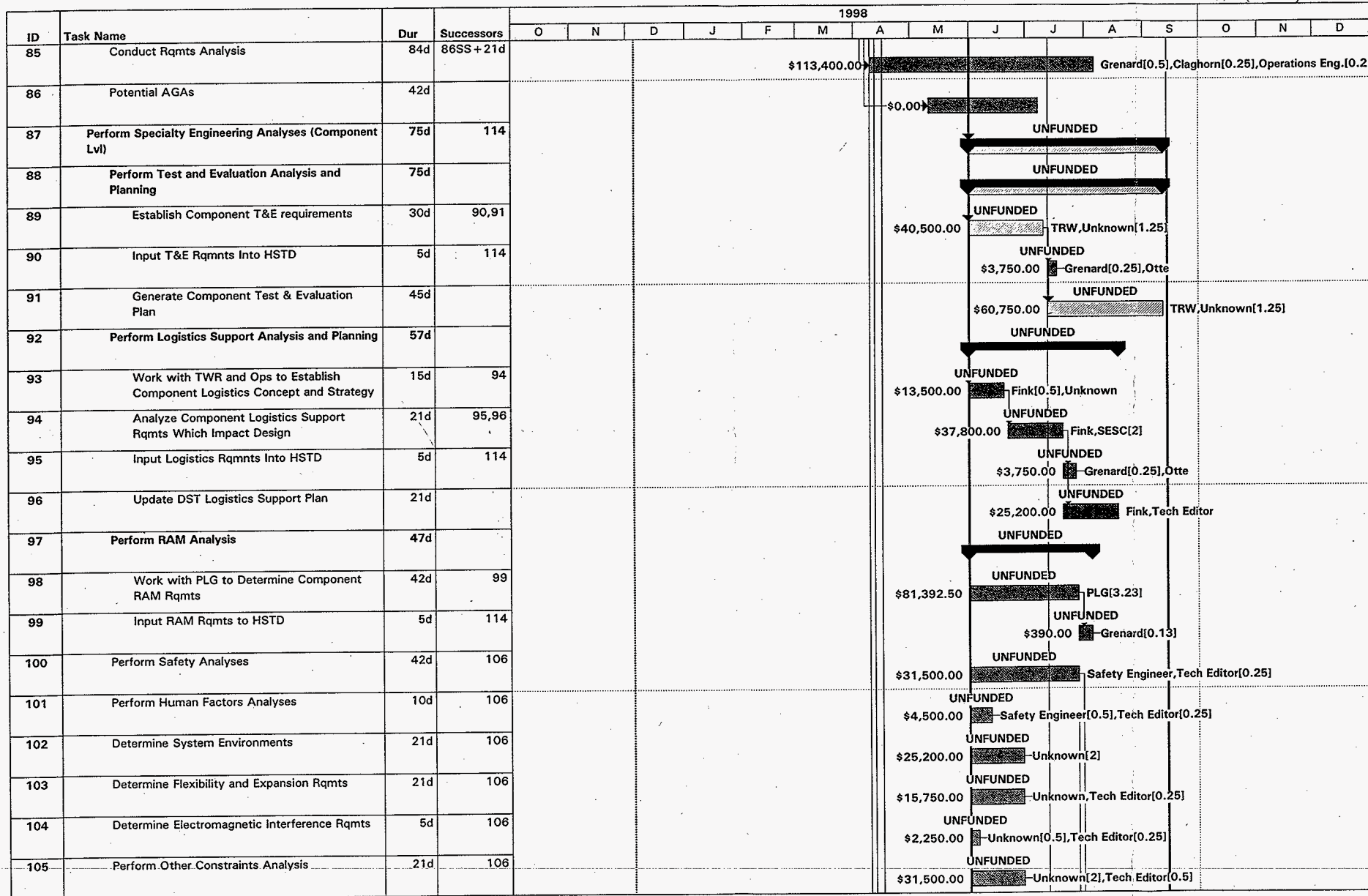


Figure A.1. Task Schedule.  
(Sheet 5)



A-11/A-12

Figure A.1. Task Schedule.  
(Sheet 6)

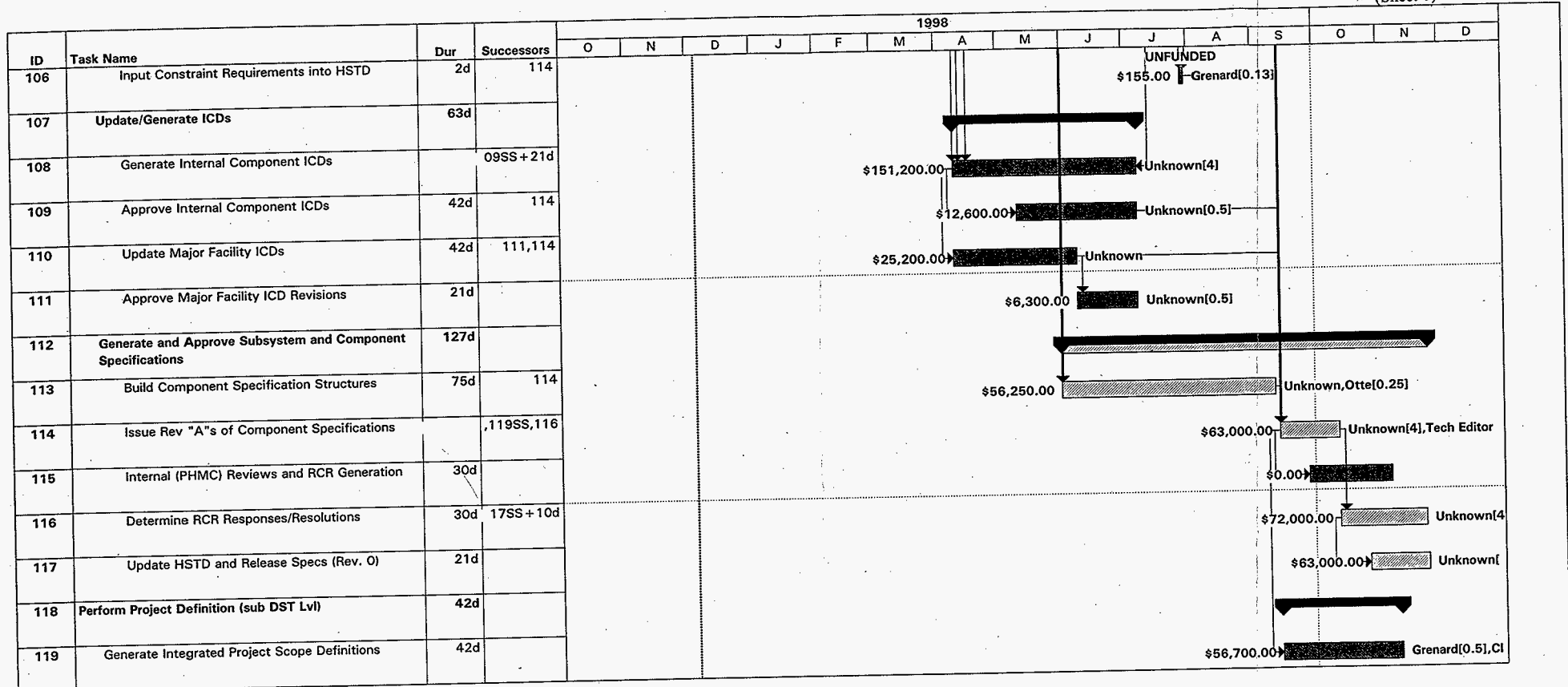


Table A.1. Task Schedule Notes. (Sheet 1)

- 1 **Project Management (FY98)**  
Rollup of project management activities for FY98
- 2 **Project Planning, Control, and Integration**  
Generate & maintain a PMP for Planning and controlling activities. LOE activity for the Project Management. OUTPUT: the management plan (PMP).
- 3 **Resolve 1st Draft DST Spec RCRs with DOE**  
Rollup of activities to resolve DOE RCRs.
- 4 **Meet With DOE to Agree Upon Actions**  
Reach agreement with DOE on RCR responses. OUTPUT: agreed to review comments records (RCRs) responses.
- 5 **Update RCR Response Column**  
Update RCR response columns to reflect agreements. OUTPUT: updated review comments records.
- 6 **Issue Rev "B" of DST System Spec.**  
Provides DOE a spec update incorporating specific changes satisfying "easy" RCR incorporations. OUTPUT: an updated DST System Specification, issued as Revision "B".
- 7 **Update DST System Rqmts Planning**  
Captures commitments in RCRs and inputs them into PMP. OUTPUT: updated management plan (PMP) with commitments.
- 8 **Obtain DOE/RL concurrence with RCR disposition**  
This activity presents the DST System Spec RCR dispositions for DOE/RL to concur. OUTPUT: DOE/RL concurrence on review comments records disposition.
- 9 **Finalize DST System Rqmts Development Planning**  
Rollup of Concentrated activities to generate the initial FY98 PMP.
- 10 **Perform Initial Integrated Project Planning (other than TBD resolution)**  
Activities to generate the initial PMP (FY98), excluding TBD resolution detailed planning. This activity includes integration of schedule with mid-level logic and RTP scheduling activities. OUTPUT: concurrence with Readiness to Proceed and mid-level logic schedules.
- 11 **Finalize TBD Resolution Planning**  
Rollup of activities for planning TBD resolution.
- 12 **Finalize TBD List**  
Scrubs the TBD list now in the specification. OUTPUT: updated Hanford Site Technical Database (HSTD) and generates a TBD list.
- 13 **Issue Rev "C" of the DST System Spec.**  
Provides DOE a specification update incorporating finalized TBD list and any changes as a result of RCR concurrence. OUTPUT: an updated system specification issued as revision "C".
- 14 **Determine TBD Priorities**  
Prioritizes the TBDs against a predetermined set of criteria. OUTPUT: list of TBDs in priority.
- 15 **Determine Means of Resolving TBD**  
Identifies what we must do to resolve each TBD. Some by modeling, other by legwork, etc. OUTPUT: a set of steps to resolve the TBDs.
- 16 **Plan Work**  
Establishes resources, cost and schedule to resolve TBDs. Also gains commitments from supporting organizations. OUTPUT: an agreed to work plan, including resources needed to resolve TBDs.
- 17 **Perform Integrated Project Management Planning**  
Rolls together activities "Perform Initial Integrated Proj. Planning" through "Plan Work" into single integrated plan. OUTPUT: an integrated project management plan.
- 18 **Publish PMP**  
A milestone marking the publishing of the PMP. OUTPUT: a published integrated project management plan.
- 19 **Perform Risk Analysis**  
Qualitative analyzes and manages programmatic risks and integrates them with the TWR risk management program. OUTPUT: a prioritized and approved risk list for DST, Phase I.

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Table A.1. Task Schedule Notes. (Sheet 2)

- Rollup of Specialty Engineering Activities.
- 21 **Perform Test and Evaluation (T&E) Analysis and Planning**  
Rollup of Activities to Establish DST System T&E Requirements and Planning.
  - 22 **Establish DST System T&E Policy & Requirements**  
This activity develops DST System design verification requirements and supports TWR. OUTPUT: a supporting document, including guidelines on selecting T&E methods, and results of application, this is to be placed in section 4 of the system spec. Note: Integration w/ TWRS level data will be reflected when it becomes available.
  - 23 **Input T&E requirements into section 4.0 of the DST Sys Spec**  
This activity takes the results of activity "Establish DST System T&E requirements" and inputs the data into the Hanford Site Technical Database (HSTD), using an approved change request, for inclusion in the DST System Spec. OUTPUT: updated HSTD file.
  - 24 **Generate a DST Sys T&E Plan (integrate with TWR)**  
This activity analyzes how DST System level testing and evaluation will be accomplished. It looks at design verification, acceptance test (ATP), and operational test (OTP) at the system level. OUTPUT: a test and evaluation plan integrated with TWR, to feed the TWRS TEP.
  - 25 **Perform Logistics Support Analysis and Planning**  
This is a rollup of activities which establish logistics support requirements.
  - 26 **Work with TWR and Ops to Establish a Logistics Concept and Strategy**  
DST philosophy is to start this activity and allow TWR to use if they so desire. OUTPUT: A logistics support concept/strategy.
  - 27 **Analyze DST System Logistics Support Rqmts**  
This activity analyzes the logistic support requirements for the system by searching other documents. OUTPUT: an acceptable set of DST logistics support requirements.
  - 28 **Input Logistics Requirements for DST System Spec into HSTD.**  
This activity inputs the logistic support requirements for the system into the Hanford Site Technical Database (HSTD) using an approved change request. OUTPUT: an updated set of requirements in the HSTD.
  - 29 **Generate an Integrated Logistics Support Plan**  
This activity generates a logistics support concept. OUTPUT: an integrated logistics support document.
  - 30 **Perform RAM Analysis**  
Rollup of activities for Reliability, Availability, and Maintainability analyses.
  - 31 **Work with PLG to Determine DST System RAM Rqmts**  
This activity works with PLG to determine DST RAM requirements. OUTPUT: a set of reliability, availability, and maintainability requirements.
  - 32 **Input Rqmts to HSTD.**  
This activity takes results from the RAM analysis work and inputs into the Hanford Site Technical Database (HSTD) using an approved change request. OUTPUT: an updated set of requirements in the HSTD.
  - 33 **Perform Safety Analyses**  
Confirm Hazard Class and provide a pointer to the emergency responses to the credible accidents recorded in the bio. Verifies adequacy of requirements in the System Specification section 3.3.6 and 3.3.8 and assigns Hazard classes. OUTPUT: a verified set of safety requirements.
  - 34 **Perform Human Factors Analyses**  
Verifies adequacy of requirements in System Specification section 3.3.7. OUTPUT: a verified set of Human Factors requirements.
  - 35 **Identify Natural System Environments**  
Identify the appropriate natural environments requirements (e.g. Chemical, Radiation, Vibration, Shock), from existing equipment or work activity. OUTPUT: a set of natural environment requirements, traceable to a supporting document.
  - 36 **Determine Induced System Environments**  
To determine values of induced environments. OUTPUT: a set of induced environment requirements, traceable to a supporting document.
  - 37 **Determine Flexibility and Expansion Policy & Rqmts**  
This activity develops "flexible and expandable" policy not limited to Phase 1, then establishes requirements applicable to the DST system. OUTPUT: a policy, and a set of requirements for flexibility within Phase 1 and expansion readily expanded to Phase 2.

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**Table A.1. Task Schedule Notes. (Sheet 3)**

- This activity develops the specific EMI (the generation and tolerance to) requirements (that cover both emit. and resistance to EMI, required materials, unallowed materials, required designs, unallowed designs). OUTPUT: a set of EMI requirements.
- 39 **Perform Other Constraints Analysis**  
This activity performs reviews for all other constraints (e.g., Documentation, training, and security), the requirements document to ensure it is compatible and traceable. OUTPUT: a completed review of the requirements in the system specification section 3.3..
  - 40 **Input Constraint Requirements into HSTD**  
This activity takes the constraint requirements generated in the previous tasks and inputs into the Hanford Site Technical Database (HSTD) using an approved change request. OUTPUT: an updated set of requirements in the HSTD.
  - 41 **Complete "Claghorn" AGA**  
This activity is a predecessor to part of the baseline comparison. This AGA is needed to validate W-211's architecture and to give an estimate of pump performance requirements. OUTPUT: an AGA report and an approved decision paper on the chosen alternative.
  - 42 **Resolve Critical Performance TBDs**  
A rollup of activities required to resolve priority "A" and "B" TBDs in the DST System Spec.
  - 43 **Perform Work to Resolve Priority "A" and "B" TBDs Using 100% Availability**  
Activity to resolve Priority "A" and "B". Spec section 3.2.1, TBDs Assume 100% Availability. OUTPUT for this set of tasks: resolved priority A and B TBDs.
  - 44 **Perform HTWOS Analysis**  
This activity uses the HTWOS model to generate and analyze Reliability, Availability, and Maintainability estimates. OUTPUT: an HTWOS analysis report.
  - 45 **Define Waste Properties**  
This activity defines ranges of physical waste properties associated with waste storage. This are priority "A" and "B" TBDs in the system spec that HTWOS is unable to provide. OUTPUT: a waste properties report.
  - 46 **Document Results in a Rqmts Analysis Report**  
OUTPUT: a document of the analytical work used to resolve TBDs.
  - 47 **Input Performance Requirements into HSTD**  
Inputs analysis results into the Hanford Site Technical Database (HSTD) using approved database change requests. OUTPUT: an updated set of requirements in the HSTD.
  - 48 **Issue Revision "D" of the DST System Spec**  
Produces a system specification from the Hanford Site Technical Database (HSTD) that includes the resolved TBDs ("A" and "B"). OUTPUT: an updated system specification issued as Revision D.
  - 49 **Conduct AGAs for Known Deficiencies**  
Rollup of activities of AGAs for known deficiencies.
  - 50 **Establish Decision Criteria and AGA Plan**  
This activity establishes the decision attributes for selecting options for resolving known deficiencies. Know deficiencies include equipment/systems to agitate or mix the waste, to flush the pipeline, to add chemicals, and to agitate or mix of the waste. OUTPUT: an AGA plan and the decision criteria.
  - 51 **Conduct AGA**  
This activity conducts the analyses for evaluating component alternatives for known deficiencies. OUTPUT: an AGA report.
  - 52 **Gain Decision Approval**  
This activity presents the information (AGAs) to a decisionmaker for selection of components for resolving known deficiencies. OUTPUT: an approved decision paper with the selected alternative.
  - 53 **Generate DST System ICDs**  
Rollup of activities to generate ICDs for the DST System Spec.
  - 54 **Generate MOAs.**  
Develop letters documenting the agreements to work interface control between DST System and other Project's Major Facilities (e.g., Waste Management's Central Waste Complex). Agreements include responsibility for developing and maintaining the interface control document (ICD) associated with the DST System interface. OUTPUT: Memorandums of Agreement.

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**Table A.1. Task Schedule Notes. (Sheet 4)**

This activity identifies all DST system interfaces based on the DST System interfaces captured into the HSTD and based on project personnel interviews. Updates the HSTD after receiving concurrence on ICDs with developers of other major facility specifications (with whom we have MOAs). OUTPUT: Interface Control Documents.

- 56 **DST System ICD Approval**  
Gain signatures to approve ICDs. OUTPUT: an approved set of ICDs
- 57 **Perform System Assessment**  
Rollup of activities for assessing the system, both physically and analytically.
- 58 **Plan Physical Assessment of Existing System**  
This activity produces a plan to physically assess the existing system capabilities and condition. OUTPUT: an approved plan to assess the existing system.
- 59 **Conduct Physical Assessment of Existing System**  
This activity implements the physical assessment plan. Visually inspects the physical assets. This task will require the personnel trained to inspect and also the necessary approvals to access the existing equipment. OUTPUT: a report of the physical assessment.
- 60 **Perform Analytical Assessment of Existing System**  
Perform HTWOS and other analyses of existing system to determine operational capabilities. OUTPUT: an analysis report of the assessment.
- 61 **Conduct AGAs for Assessed Deficiencies**  
Rollup of activities for Alternative Generation Analyses of assessed deficiencies.
- 62 **Establish Decision Criteria and AGA Plan**  
This activity establishes the decision attributes for selecting options for assessment deficiencies. OUTPUT: an approved AGA plan and the decision criteria.
- 63 **Conduct AGA**  
This activity conducts the analyses for evaluating component alternatives for assessing deficiencies (allows for short-comings). OUTPUT: an AGA report with the selected alternative.
- 64 **Gain Decision Approval**  
This activity presents the information (from the AGAs) to the decisionmakers for selection of components for resolving assessed deficiencies. OUTPUT: an approved alternative.
- 65 **Complete TBDs Resolution**  
Rollup of activities to resolve TBDs.
- 66 **Update HTWOS to account for RAM factors**  
This activity is to update HTWOS to account for RAM factors.
- 67 **Perform Work to Update Priority "A" and "B" TBDs Using RAM Analysis Results**  
This activity uses HTWOS and other analyses to update TBDs ("A" and "B") using RAM estimates. OUTPUT: an updated list of priority A and B TBDs.
- 68 **Document Results in a Rqmts Analysis Report**  
Document analytical work used to update TBDs ("A" and "B"). OUTPUT: a Requirements Analysis Report.
- 69 **Input Updated Performance Requirements into HSTD**  
Inputs analysis results into the Hanford Site Technical Database (HSTD) using an approved change request. OUTPUT: an updated HSTD.
- 70 **Perform Work to Resolve Priority "C" TBDs**  
This work describes and performs the work to resolve type "C" TBDs. OUTPUT from these tasks: an updated list of priority C TBDs.
- 71 **Storage Capacity, Other, Phase I**  
This activity resolves the storage capacity TBDs in Phase I. OUTPUT: an update to the storage capacity TBDs.
- 72 **Stored Waste Properties, Other, Phase I**  
This activity provides the information (properties) for items such as the Waste Evaporator, that are presently Priority "C" TBDs. OUTPUT: an update to the waste properties TBDs.
- 73 **Government Furnished Property Usage**  
This activity provides a policy (at system assessment) of what equipment will be used by the contractor that is to be supplied by the Government. OUTPUT: an approved policy of gov. furnished equip.

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Table A.1. Task Schedule Notes. (Sheet 5)

- Document analytical work used to resolve TBDs ("C"). OUTPUT: a Requirements Analysis Report.
- 75 **Input Priority C TBD Requirements into HSTD**  
Inputs analysis results into the Hanford Site Technical Database (HSTD) using an approved change request. OUTPUT: an updated HSTD.
  - 76 **Publish Rev. E Spec. from RDD-100**  
This activity produces the System Specification from the HSTD. OUTPUT: An updated system specification, issued as Revision E.
  - 77 **Generate and Approve DST System Spec**  
Rollup of activities to generate, from HSTD, a Rev E of the system specification (incorporates AGAs, etc.)
  - 78 **Publish From HSTD (Rev "F")**  
This activity produces a System Specification from the HSTD, that has the updates and approval of AGAs. OUTPUT: an updated system specification, issued as Revision E.
  - 79 **Perform Technical Requirements Review**  
This activity consists of a Technical Requirements Review of the DST System Specification and generation of RCRs (comments). OUTPUT: a reviewed system specification and a set of comments.
  - 80 **Determine RCR Responses/Resolutions**  
This activity disposes comments, provides resolution, and closure of the RCRs. OUTPUT: a set of comment dispositions and responses.
  - 81 **Update HSTD and Release Spec (Rev. 0)**  
This activity produces a specification from the HSTD after the updates are incorporated. OUTPUT: a final draft system specification, issued as Revision 0.
  - 83 **Conduct Subsystem and Component Level F&R**  
Rollup of Functions and Requirements activities for the components.
  - 84 **Perform Functional Analysis Below DST Sys.**  
Begin development of planned level 2 specifications. Perform needed Functional, Requirements, Architectural, and Test and Evaluation analyses to develop the required level 2 specifications. OUTPUT: completed functional analyses on components.
  - 85 **Conduct Rqmts Analysis**  
This activity generates preliminary requirements for the component functions needing project level definition; updates the functional analyses to resolve needs identified during the preliminary analyses; and generates requirements for the component functions needing project level definition. OUTPUT: a completed requirements analysis for components.
  - 86 **Potential AGAs**  
This activity provides a placeholder in the event additional AGAs are identified to determine additional components. This may identify additional specifications that need to be generated. OUTPUT: Completed AGAs and Component requirements.
  - 87 **Perform Specialty Engineering Analyses (Component Lvl)**  
Component level rollup of numerous analyses in the Specialty Engineering areas.
  - 88 **Perform Test and Evaluation Analysis and Planning**  
Rollup of activities for analysis and planning of Test and Evaluation.
  - 89 **Establish Component T&E requirements**  
This activity develops component design verification requirements and integrates and coordinates component T&E requirements with the system and operations level. OUTPUT: Component T&E requirements for section 4 of the Component Specification completed.
  - 90 **Input T&E Rqmnts Into HSTD**  
Inputs the test and evaluation requirements into the HSTD using an approved change request. OUTPUT: an updated HSTD.
  - 91 **Generate Component Test & Evaluation Plan**  
This activity generates the test and evaluation planning requirements for the environments as coordinated with TWR and Operations. OUTPUT: Component T&E Plans.
  - 92 **Perform Logistics Support Analysis and Planning**  
Rollup of activities for analysis and planning for component level Logistics Support.
  - 93 **Work with TWR and Ops to Establish Component Logistics Concept and Strategy**  
This activity looks at specific component logistics concepts for components. OUTPUT: Component level logistics concepts reports.

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Table A.1. Task Schedule Notes. (Sheet 6)

	This activity analyzes the logistics support requirements for the components. OUTPUT: component logistics support requirements for input to component specification.
95	<b>Input Logistics Rqmnts Into HSTD</b> This activity inputs the logistics support requirements into the HSTD using an approved database change request. OUTPUT: an updated HSTD.
96	<b>Update DST Logistics Support Plan</b> Updates the DST ILSP with component information from the logistic support concept reports. OUTPUT: an updated Integrated Logistics Support Plan (ILSP).
97	<b>Perform RAM Analysis</b> Rollup of activities for analysis of component level Reliability, Availability, and Maintainability.
98	<b>Work with PLG to Determine Component RAM Rqmts</b> This activity works with PLG to assign component Reliability, Availability, and Maintainability requirements using the system requirements. OUTPUT: Component RAM requirements.
99	<b>Input RAM Rqmts to HSTD</b> This activity takes the RAM results and inputs into the HSTD for component specification(s). OUTPUT: an updated HSTD.
100	<b>Perform Safety Analyses</b> Review Unresolved Safety Question (USQ) evaluation of the new components and establish a preliminary safety class. OUTPUT: USQs, a letter report assigning component preliminary safety classes, and a report safety design guidelines.
101	<b>Perform Human Factors Analyses</b> This activity provides the requirements in component specifications (section 3.3.6). OUTPUT: a supporting document completed Human Factors requirements for the component specifications.
102	<b>Determine System Environments</b> This activity generates the requirements for the component specifications (section 3.3.7). OUTPUT: a set of Component system environments requirements.
103	<b>Determine Flexibility and Expansion Rqmts</b> This activity generates the flexibility and expansion requirements applicable to components. OUTPUT: a set of Component flexibility and expansion requirements.
104	<b>Determine Electromagnetic Interference Rqmts</b> This activity develops the specific EMI requirements for components (that cover both emit. and resistance to EMI). OUTPUT: an allocation of the Component EMI requirements.
105	<b>Perform Other Constraints Analysis</b> This activity evaluates constraints identified in DST specification and additional constraint sources for applicability to component in question. In addition, this activity has to convert the constraints to measurable design requirements. OUTPUT: a completed analysis of the constraint requirements.
106	<b>Input Constraint Requirements into HSTD</b> This activity inputs the constraint requirements into the HSTD using an approved change request. OUTPUT: an updated HSTD.
107	<b>Update/Generate ICDS</b> Rollup activities for updating and generating DST and component Interface Control Documents.
108	<b>Generate Internal Component ICDS</b> This activity generates the new ICDS (internal and Major Facility) for Phase 1 components. OUTPUT: a set of Component ICDS.
109	<b>Approve Internal Component ICDS</b> Gain signatures to approve component ICDS. OUTPUT: approved Component ICDS.
110	<b>Update Major Facility ICDS</b> This activity updates the major facility ICDS. OUTPUT: updated major facility ICDS.
111	<b>Approve Major Facility ICD Revisions</b> Gain signatures to approve major facility ICDS. OUTPUT: approved major facility ICD revisions.
112	<b>Generate and Approve Subsystem and Component Specifications</b> Rollup of activities for component and subsystem specification generation and approval.

<p>This activity generates specification sections 1, 2, and miscellaneous other "non-requirement" sections. It also periodically generates specifications from RDU-100 to inspect quality and progress. OUTPUT: structure for Component specifications.</p> <p>Issue Rev "A"s of Component Specifications</p> <p>This activity issues a component level specification with approved l/f's and completed analyses. These are issued by using the HSTD. OUTPUT: Component Specifications, issued as Revision A.</p> <p>Internal (PHMC) Reviews and RCR Generation</p> <p>This activity acquires reviews from inside PHMC and develops RCRs against component specifications. OUTPUT: review comments on Component Specifications.</p> <p>116 Determine RCR Responses/Resolutions</p> <p>This activity responds to RCRs and provides resolution to RCRs. OUTPUT: a set of comment resolutions/responses for the Component specifications.</p> <p>117 Update HSTD and Release Specs (Rev. 0)</p> <p>This activity takes the results of the component RCR resolutions and inputs into the HSTD for inclusion in the component level specifications. OUTPUT: an updated HSTD and a set of Component Specifications, issued as Revision 0.</p> <p>118 Perform Project Definition (sub DST LV)</p> <p>Rollup of activities for definition of subproject level integration and documentation.</p> <p>119 Generate Integrated Project Scope Definitions</p> <p>This activity would define the scope of needed new projects. Considerations will include component need dates, commonality of requirements, available funding, etc. OUTPUT: draft Project scope sheets.</p>	
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Table A.1. Task Schedule Notes. (Sheet 7)

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**APPENDIX B**  
**WBS COST ACCOUNTS**

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COST ACCOUNTWBS 1.1.3.1.01.03

<u>TASK #</u>	<u>TASK TITLE</u>	<u>FY 1998 BUDGET (K)</u>
1D2DD30201	DST Specification Support	332.1
1D2DD30202	DST System Level Performance Analysis	74.6
1D2DD30205*	Technical Requirements Review	103.7
1D2DD30206	DST Component Level Functional Analysis	110.1
1D2DD30207	DST Comment Level Performance Analysis	53.3
1D2DD30208	Trade Studies/AGAs	106.5
1D2DD30209*	Design Requirement Documents	311.0
1D2DD30210	DST System Specification	70.7
1D2DD30211	Configuration Management	79.6
1D2DD30212	DST Interface Control Documents	70.7
1D2DD30213	DST Project Acquisition Baseline	29.5
1D2DD302A3	DST Risk Analysis	79.6
1D2DD302A8	DST Trade Studies/AGAs	70.0
1D2DD302B3	DST Life Cycle Cost/Schedule	120.5
	Total	<hr/> \$1,616.9

\* Note: These tasks have been reprogrammed to support the speciality engineering tasks (Appendix A) at the systems level.

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