0048505

Meeting Minutes
Inter Agency Management Integration Team (IAMIT)
EPA Conference Room
712 Swift Blvd., Richland
September 23, 1997

Appvl.: Jackson Kinzer Date: 10-28-97
Jackson E. Kinzer, RL
IAMIT Representative

Appvl.: Douglas R. Sherwood Date: 10/28/97
Douglas R. Sherwood, EPA
IAMIT Representative

Appvl.: Michael A. Wilson Date: 10/28/97
Michael A. Wilson, Ecology
IAMIT Representative

Prepared by
Appvl.: for Terry D. Cameron Date: 10/27/97
Terry W. Noland
Fluor Daniel Hanford, Inc.

Distribution

Abdul, W.	RL	S7-53	Rasmussen, J. E.	RL	A5-15
Arnold, L. D.	WHC	G3-27	Reddick, G. W.	FDH	N1-26
Brown, W. R.	FDH	G3-27	Rewinkel, D. S.	FDH	S7-40
Cameron, K. D.	RL	A5-54	Romine, L. D.	RL	R3-79
Carlson, J. L.	BWHC	L1-02	Sanders, G. H.	RL	A5-15
Dahl, S. L.	Ecology	B5-18	Sautter, S. P.	ODOE	
Haass, C. C.	RL	S7-51	625 Marion N.E.,	Salem, OR	97310*
Hansen, C. A.	RL	S7-41	Selby, M. A.	Ecology	B5-18*
Holt, R. G.	RL	S7-41	Sellers, E. D.	RL	S7-41
Hopkins, A. M.	ITH	N1-26	Sherwood, D. R.	EPA	B5-01*
Jackson, D. E.	RL	A5-15	Skinnarland, R.	Ecology	B5-18
Kinzer, J. E.	RL	S7-50	Stanley, R.	Ecology	B5-18
McCleary, G. J.	FDH	B3-53	Stevenson, M. W.	FDH	G3-27
McClusky, J. K.	RL	S7-54	Williams, N. H.	FDH	R3-11
McLaughlin, M .A.	FDH	G3-27	Williams, J. D.	FDH	S7-40
Miera, F. R.	RL	A5-15*	Wilson, M. A.	Ecology	B5-18
Morrison, R. D.	FDH	G3-27*	Yerxa, J. K.	RL	A7-75
Noland, T. W.	FDH	G3-27*	EDMC		H6-08*

* W/Attachments

IAMIT MEETING
September 23, 1997

1. **Approval of Minutes**

   The minutes of the August 23, 1997 IAMIT Meeting were approved by Messrs. Kinzer, Wilson and Sherwood.

2. **SMS Memorandum of Understanding Update**

   Kerry Cameron, DOE-RL provided an update on the development of the DOE complex-wide Project Management and Control System. The specifications for the new system are not expected until April 1998. The HANDI system is on line on a limited basis for project reporting. Dave Einan, EPA and Clark Hauter, Ecology will be provided access to HANDI for testing and comments. The goal is to be able to provide finalized reports from HANDI by the end of October 1997. The parties agreed to extend the current reporting agreement through October 1997.

3. **Negotiations Summary - PFP and FFTF**

   Roger Stanley, Ecology provided a copy of a draft Tentative Agreement for FFTF negotiations (Attachment 1) and discussed the proposed changes. DOE-RL agreed to quickly review the proposed changes and inform Ecology and EPA if there are any problems. The need for public meetings for the proposed FFTF changes was discussed. Mike Wilson, Ecology stated that the public meetings must be held. The public comment period for FFTF package will occur 30 days after approval of the Tentative Agreement.

   Jon Yerxa, DOE-RL provided an update on the status of the PFP negotiations. The next negotiation session was scheduled for October 2 and a draft change package is expected by November 3. Roger Stanley stated that Ecology is proposing a phased approach to the PFP negotiations that will be reflected in changes to the draft Agreement in Principle (AIP). Ecology will provide DOE-RL with the revised AIP before the next negotiation session.

4. **M-92-00 (Cs/Sr, Na and Special Case Waste) Treatment Storage and Disposal Facilities Milestone Ownership**

   Andrea Hopkins, Fluor Daniel Hanford presented the path forward for M-92-00 ownership (Attachment 2). A Memorandum of Understanding is being developed to transfer ownership of the M-92-00 milestones to Facility Transition.

5. **Purex Facility and Tunnels Transfer to ER Program**

   Larry Romine, DOE-RL presented the strategy for Purex Tunnels Management (Attachment 3). The PUREX Tunnels will remain in EM-60 until additional waste is stored or the need for the tunnels is eliminated.

6. **Milestone M-41-22 (Single Shell Tank (SST) Interim Stabilization) Dispute Resolution**

Milestone M-41-22, which requires pumping of six SSTs by September 30, 1997 will not be met. The major milestone M-41-00, due 9/30/2000, is impacted by technical considerations and budget decisions and may experience a 3 year delay. The regulators granted an extension to the IAMIT level dispute resolution period to October 28, 1997 (Attachment 4). The regulators also requested that the RL Manager provide a letter to EPA and Ecology referencing the needed extension to Major Milestone M-41-00 and the need to conduct negotiations on the M-41 milestone series. The request was documented on IAMIT Decision Form Number 7 (Attachment 5).

Action: Jackson Kinzer and George Sanders, DOE-RL to draft letter for RL Manager regarding strategy for M-41.

7. **Milestone M-40-07 (C-103 Vapor Treatment System) Dispute Resolution**

Suzanne Dahl, Ecology reported that Ecology was finalizing comments on the DOE Lessons Learned document. The dispute at the Project Managers level was extended through November 18, 1997 (Attachment 6).

8. **Milestone M-45-03A (SST C-106 Retrieval) Dispute Resolution**

Roger Stanley, Ecology provided proposed Change Request M-45-97-05 (Attachment 7) as Ecology's acceptable resolution of the dispute. George Sanders, DOE-RL provided a red-lined version of Ecology's proposed change request (Attachment 8) that would be acceptable to DOE-RL. Both versions were discussed at length. DOE-RL agreed to develop with their Office of Chief Counsel a new version of the Change Request that would be acceptable to DOE-RL, but would also possibly include some of the language that was redlined from the Ecology proposal. The new proposal would be provided to Ecology by September 24, 1997. No extension of the dispute at the IAMIT level was granted. If no agreement is reached by September 24, 1997, the dispute automatically elevates to the Director of the Washington State Department of Ecology for final determination.

9. **Spent Nuclear Fuels Project Briefing**

Beth Sellers, DOE-RL and Nancy Williams, FDH provided an update on the status of the Spent Nuclear Fuels Project. The DOE-RL and contractor reviews of the schedule have been completed (Attachment 9 and 10). The impacts to the schedule and critical path were discussed (Attachments 11 and 12). The detailed draft activity level schedule was distributed (Attachment 13). The schedule for the start of removal of fuel is still delayed by 14 months. Total project cost (TPC) is still being developed. The RL Manager will have to approve the new schedule and TPC prior to determining the impacts on other Hanford projects. The approval is not expected until sometime in November. Spent Nuclear Fuels will have a draft change request prepared by September 30, 1997. The final change package for Spent Nuclear Fuels is expected the first part of March 1998.

Doug Sherwood, EPA expressed concern regarding the current regulatory approach now that there are significant delays to the project. Bob Holt, DOE-RL discussed the analysis of impacts of using other regulatory approaches (Attachment 14).

Action: **DOE-RL to schedule meeting as soon as possible with regulators to discuss impact of not using Engineering Evaluation/Cost Analysis (EE/CA) process for Spent Nuclear Fuels.**

ATTENDEES

INTER AGENCY MANAGEMENT INTEGRATION TEAM (IAMIT) MEETING

DATE: 9/23/97

NAME	ORGANIZATION	MAILSTOP	(√) FOR ATTACHMENTS
✓ Jackson Kinzer	DOE		
✓ Ron Skinnarland	Ecology		
✓ Mike Wilson	Ecology		
✓ George Sanders	DOE-RL		
✓ Suzanne Dahl	Ecology		
✓ [signature]	RL		
✓ [signature]	FDH Proj. Dir.		
✓ Nabil Abdul	DOE-RL		
✓ Marc [illegible]	FDH/HPAI		
✓ Jim Rasmussen	DOE/RL		
✓ Janice Williams	FDH Project Dir.		
✓ Felix Mirra	RL/EAP	A5-15	✓
✓ [illegible]	DOE		
✓ NANCY WILLIAMS	~~DOE~~ FDH		

ATTENDEES

INTER AGENCY MANAGEMENT INTEGRATION TEAM (IAMIT) MEETING

DATE: 9/23/97

NAME	ORGANIZATION	MAILSTOP	(√) FOR ATTACHMENTS
✓ Terry Noland	FDH TPAI	G3-27	
✓ LARRY ARNOLD	FDH/TPAI	G3-27	
✓ DALE JACKSON	DOE RL EAI	A5-15	
✓ Andrea HOPKINS	FDH/PD	N1-26	
JON YERXA	DOE - RL	A7-75	
✓ Larry Romine	DOE-RL/TPD	B3-79	
✓ George Reddick	FDH	N1-26	
✓ RUSS BROWN	FDH-TPAI	63-27	
✓ Doug Sherwood	EPA	B5-01	✓
✓ JEFF CARLSON	BWHC	L1-02	
✓ GORDON MCCLEARY	FDH.	B3-53	
✓ STEVE SAVTTER	ORP Office of Env		✓
✓ KERRY CAMERON	DOE-RL/PD	A5-54	
✓ Melodie Selby	Ecology	B5-18	✓

Ecology edit draft
September 23, 1997

TENTATIVE AGREEMENT
HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER
NEGOTIATIONS REGARDING THE FAST FLUX TEST FACILITY

In January 1997, the Secretary of the U.S. Department of Energy (DOE) ~~made~~ issued a decision to maintain ~~the~~ Hanford's Fast Flux Test Facility (FFTF) in a standby mode pending a decision (to be made by December 1998) on whether the Facility will ~~play a future role~~ be utilized in the national tritium production strategy. In April, 1997 the DOE Richland Operations Office (RL), State of Washington Department of Ecology (Ecology), and U.S. Environmental Protection Agency (EPA) staff personnel, hereinafter the Parties, agreed to conduct negotiations for the purpose of revising Hanford Federal Facility Agreement and Consent Order (Agreement) milestones for the FFTF. ~~The~~ These negotiations have resulted in this tentative agreement~~, which would delete the~~ to delete existing M-81 series milestones and target dates, and to place the M-20-29A milestone in a "To Be Determined" (TBD) status pending the Secretary of Energy's decision. Should environmental compliance issues arise during this interim period of consideration, they will be addressed as part of Ecology's sitewide compliance assurance program.

This tentative agreement will be submitted for tribal and public review and comment for a 45 day period. Copies of this agreement will also be available for review at the parties' public information repositories. The ~~public~~ comment period ~~dates~~ will run ~~be~~ from approximately October 1, 1997 to November 16, 1997. Prior to final agreement, a response to comments document will be developed and the parties will make appropriate revisions to the agreement before final signature. The parties anticipate that final ~~signatures~~ approval will take place by November 30, 1997.

The parties further agree that to minimize additional delay in the event they fail to agree on any changes as the result of ~~public~~ the comment period, all unresolved matters shall be referred to the Agreement dispute resolution process beginning at the Inter Agency Management Integration Team (IAMIT) level ~~as described in the Agreement~~. The parties shall attempt to resolve the dispute(s) as provided for in Agreement paragraph(s) 30.

The parties also agree, that should the Secretary's decision be not to use the FFTF in the tritium production strategy and to resume ~~transition to~~ shutdown activities, ~~that~~ the ~~original~~ M-81 milestone language and structure deleted by this proposed action will be used as a the starting point for new TPA transition milestone negotiations. The parties commit to initiate negotiations on FFTF transition within 90 days of a decision not to use FFTF as a production facility. Although, it is uncertain at this time, it is assumed that the Office of Nuclear Energy, Science and Technology, will retain the management and funding responsibility for FFTF under a shutdown scenario.

Signed this _____ day of September 1997

_____
John D. Wagoner, Manager
U. S. Department of Energy
Richland Operations Office

_____
Tom Fitzsimmons, Director
State of Washington
Department of Ecology

_____
Chuck Clarke, Regional Administrator
U. S. Environmental Protection Agency
Region 10

DRAFT

Change Number M-81-97-01	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	Date September 23, 1997

Originator USDOE/Ecology Phone

Class of Change

[x] I - Signatories [ ] II - Executive Manager [ ] III - Project Manager

Change Title

Deletion of Fast Flux Test Facility (FFTF) transition milestones and targets (M-81-00 series). Modification of milestone M-20-29A.

Description/Justification of Change

In January 1997, the Secretary of the U.S. Department of Energy (DOE), issued DOE's decision to maintain Hanford's Fast Flux Test Facility (FFTF) in a standby mode pending a decision (~~projected~~ to be made by December 1998) on whether or not the facility will play a role in the nation's tritium production strategy. As a consequence of this action, FFTF transition work is being limited to activities that would not inhibit a reactor restart, and work schedules are no longer valid. This change request deletes out of date milestones and target dates from the scope of the TPA.

Should the Secretary of Energy's decision be that FFTF has no tritium production role, and that FFTF transition and initiation of the surveillance and maintenance phase should occur: DOE, Ecology and EPA (hereafter the parties) agree that within ninety (90) days following such final Secretarial decision, the DOE Richland Operations Office (RL) shall issue a draft change control request detailing a proposed set of FFTF transition milestones and associated targets. Such proposal shall also include proposed modifications to TPA interim milestone M-20-29A (Sodium Storage and Reaction Facilities closure planning). Following the receipt of this draft change request, the parties agree to complete negotiation of a new FFTF transition milestone series in no more than six (6) months time.

Impact of Change

Approval of this change control request deletes the current TPA FFTF transition milestones and target dates, and allows all activities required during the standby condition to proceed without jeopardizing any necessary future FFTF mission(s).

Affected Documents

The Hanford Federal Facility Agreement and Consent Order, as amended, and Hanford Site internal planning and budget documents (e.g., Project Management Plans and Multi Year Work Plans).

Approvals

_____ _____ ____ Approved ____ Disapproved
DOE Date

_____ _____ ____ Approved ____ Disapproved
EPA Date

_____ _____ ____ Approved ____ Disapproved
Ecology Date

The following M-81-00 series milestones and targets are deleted by this action:

Milestone	Description	Due Date
M-81-00	Complete FFTF Facility Transition and initiate the surveillance and maintenance phase. This major milestone will be achieved by completion of all activities necessary to achieve the end point criteria for placing the facility in a safe and stable surveillance and maintenance mode.	~~12/31/2001~~ Deleted
M-81-00-T01	Complete Reactor Defueling. At the completion of defueling, there will be 236 non-fueled components in the reactor vessel, 113 fueled components in the interim decay storage and 258 fueled components in the fuel storage facility.	9/30/95 Completed 4/19/95
M-81-00-T02	Complete transfer of Irradiated Fuel to Dry Cask Storage. The Irradiated Fuel assemblies and pin containers will be transferred from the interim decay storage vessel and the fuel storage facility to the IEM cell for residual sodium removal, loaded into a core component container, transferred to the reactor service building cask loading station for placement into an interim storage cask for dry storage, and transferred to the interim storage area located in the northeast corner to the FFTF complex.	~~10/31/98~~ Deleted
M-81-00-T03	Complete transfer of unirradiated fuel to the Plutonium Finishing Plant. Thirty two unirradiated fuel assemblies presently stored in the interim decay storage vessel will be transferred to the IEM cell for washing and drying, loaded into existing approved shipping containers, and transferred to an appropriate storage area in the Plutonium Finishing Plant.	~~10/31/98~~ Deleted
M-81-00-T04	Complete transfer of special fuel to the Idaho National Engineering Laboratory for consolidated storage. Sodium-bonded irradiated metal and carbide fuel pins from assemblies cleaned and disassembled in the IEM Cell will be loaded into existing, approved shipping casks, and transported to the Idaho National Engineering Laboratory in Idaho Falls, Idaho, for consolidated storage. One unirradiated metal fuel assembly will also be dispositioned in a similar manner.	~~10/31/98~~ Deleted
M-81-00-T05	Complete auxiliary systems deactivation. A major portion of the plant auxiliary systems are required to support hot sodium circulation prior to draining the sodium. As these systems, and the balance of plant systems, become available for shutdown, they will be deactivated to a safe, stable condition.	~~3/21/2001~~ Deleted
M-81-01	Initiate sodium storage facility construction. This milestone will be achieved when the construction contractor is issued the notice to proceed with construction by the contracting officer.	2/28/97 completed 10/09/95

M-81-02	Complete sodium storage facility startup. This milestone will be achieved by completion of the sodium storage facility startup activities which include final testing of the mechanical and electrical systems and confirmation that the facility is ready to receive sodium from FFTF. Construction of the new facility closely coupled to the FFTF complex is required to support sodium drain operations. This new facility will be designed, constructed and operated in compliance with RCRA and WAC 173-303 storage requirements. The facility will provide storage capacity for the 260,000 gallons of FFTF metallic sodium coolant.	7/31/98 completed 01/97
M-81-02-T01	Submit final sodium disposition evaluation report/decision point. Under this target DOE will submit its final report following evaluation of the acceptable sodium product form for the TWRS Tank Sludge Pretreatment Process (i.e., caustic washing). This evaluation will be conducted in concert with TWRS TPA Milestone M-50-03 (due date March 31, 1998). This Hanford Site Radioactive (FFTF, Hallam, and Sodium reaction experiment) sodium evaluation will address other conversion options for disposal of the sodium if the product use for TWRS is not viable, regardless of which option is selected, a new sodium reaction facility will be constructed adjacent to the sodium storage facility to convert the bulk metallic sodium to the appropriate chemical form. This report will include a decision on the final disposition of the Hanford Site Radioactive Sodium (e.g., disposal or reuse). Appropriate milestones and target dates will be established for construction and operation of the sodium reaction facility based on the option selected.	~~6/30/98~~ Deleted
M-81-03	Submit FFTF End Point Criteria Document. A document identifying the end point criteria necessary to place the FFTF in a safe and stable configuration will be developed. This document will be provided to EPA and Ecology for review, and approval for the hazardous substances proposed to remain at the facility.	~~12/31/98~~ Deleted
M-81-04	Complete FFTF Sodium Drain. This milestone will be complete when all of the sodium coolant has been drained from the plant to the new sodium storage facility to the maximum practical extent. The sodium residuals that remain are integral to the system, are solid in form, and adhere to the surfaces to the system components. The residuals will be maintained under an inert gas blanket to minimize potential reactions during the long-term surveillance and maintenance phase. During final disposition of the facility, any regulated wastes generated from the cleaning or dismantlement of these systems, will be appropriately managed.	~~3/31/2000~~ Deleted
M-81-04-T01	Complete reactor and heat transport system sodium drain. The reactor and primary and secondary heat transport system sodium coolant and supporting sodium systems will be maintained in a safe configuration, molten and circulating until the fuel is removed from the FFTF Reactor vessel and the sodium storage facility is operational. The sodium will then be drained to the tanks located in the sodium storage facility and allowed to freeze.	~~4/30/98~~ Deleted

M-81-04-T02	Complete interim decay storage vessel and fuel storage facility sodium drain. The interim decay storage vessel and fuel storage facility sodium will be maintained in a molten state until the fuel is removed from these storage locations. The sodium will then be drained to the tanks located in the sodium storage facility and allowed to freeze.	~~12/31/98~~ Deleted
M-81-05	Submit FFTF Surveillance and Maintenance Plan. A plan describing the S&M phase will be developed. This plan will be provided to EPA and Ecology for review, and approval for the hazardous substances proposed to remain at the facility. This plan will include documentation of lists of hazardous substances, including dangerous waste that remain in the FFTF Facility upon completion of Phase I activities because the hazardous substance: (1) contains non-dangerous waste components that are highly radioactive, (2) is part of the plant structure and/or (3) is an intact piece(s) of equipment.	~~6/30/2001~~ Deleted
M-81-06	Complete PCB Transformer disposal. The nineteen Polychlorinated Biphenyl (PCB) electrical transformers at the FFTF will be disposed of after the transformers are removed from service. Twelve of the nineteen transformers, will be drained, flushed and removed from FFTF within thirty days after being removed from service as specified in 40 CFR 761. Seven of the transformers, which are in areas that are difficult to obtain access, will be drained, flushed and removed from FFTF within nine months of cessation of service to ensure their disposal within one year from the start of the storage. Cessation of service constitutes the start of the storage, and 40 CFR 761 limits the storage and subsequent disposal to a one-year period.	~~9/30/2001~~ Deleted

The following M-20-29A interim milestone due date is modified by this action. The parties agree to revisit and reestablish a due date as appropriate should FFTF transition resume:

M-20-29A	Submit sodium storage facility and sodium reaction facility closure plan or request for procedural closure as defined in section 6.3.3 of this Tri-Party Agreement to EPA and Ecology. A potential use for the sodium as feedstock in the TWRS Program has been identified and will be evaluated as discussed pursuant to M-81-02-T01. The sodium will be stored as product material in the sodium storage facility until the final disposition of the material is determined. FFTF is proceeding on the basis of providing RCRA and WAC 173-303 compliant storage for the sodium. The sodium reaction facility is included in the permit request, even though the sodium reaction facility availability and regulatory status will be determined by the 1998 evaluation/decision point. If the sodium use for the TWRS is confirmed, a request for procedural closure as defined in section 6.3.3 of the Tri-Party Agreement will be submitted for the sodium storage facility and sodium reaction facility units. If the sodium is determined to be a waste, a closure plan will be submitted for the two units.	~~12/31/99~~ TBD

DRAFT

FAST FLUX TEST FACILITY

TRIBAL AND PUBLIC INVOLVEMENT PLAN

In January 1997, the Secretary of the U.S. Department of Energy (DOE), issued DOE's decision to maintain Hanford's Fast Flux Test Facility (FFTF) in a standby mode pending a decision (~~projected~~ to be made by December 1998) on whether or not the facility will play a role in the nation's tritium production strategy. As a consequence of this action, FFTF ~~transition~~ work is being limited to activities that would not inhibit a reactor restart, and work schedules are no longer valid. A change request which deletes out of date FFTF milestones and target dates from the scope of the Hanford Federal Facility Agreement And Consent Order (Tri Party Agreement or TPA) is proposed.

~~The creation of a~~ Class I proposals to modify the TPA ~~Change Request~~ require the initiation of an adequate proposal review/comment period ~~to revise the TPA necessitates public involvement~~. A 45 day ~~public~~ comment period, beginning approximately October 1, 1997 and running through November 15, 1997 will be the principal tribal and public involvement activity. The Hanford Advisory Board, ~~regulators,~~ local and state officials in Washington and Oregon, and Tribal nations are among the groups that will ~~continue to~~ receive briefings on the FFTF Standby Project on a requested basis. No public meetings are planned as this change ~~does not make the decision for an FFTF mission, but rather~~ only reflects the status change of the FFTF until such time that ~~such~~ a final FFTF mission decision is made.

A Response to ~~Public~~ Comments Received Document will be created by the three agencies after the end of the ~~public~~ comment period.

Copies of the proposed modifications and associated information and response to ~~public~~ comments received will be sent to the TPA Public Information Repositories, as well as to members of the public requesting these documents.

If USDOE decides to ~~include~~ utilize the FFTF in the nation's tritium production strategy, the department will consult with the public, complete necessary safety ~~environmental~~ reviews and comply fully with the National Environmental Policy Act (NEPA) and other applicable requirements.

a:fftf-pi.rn2

TPA Milestone M-92-00

TPA Major Milestone M-92-00

- Acquisition and/or Modification of Facilities for Storage, Treatment/Processing, and Disposal of Cesium and Strontium Capsules (Cs/Sr), Unirradiated Uranium (UU), Bulk Sodium (Na), and 300 Area Special Case Waste (SCW)
- Tri-Party Agreement Major Milestone Management Review, SCW Integration
  - September 23, 1997
  - Richland, Washington

Status of SCW Integration

- DOE AMT is Owner of Record for M-92
  - Ownership formally being transferred to AMF via MOU
- DOE AMF now leads integration of 300 Area SCW under M-92

Status of SCW Integration (cont'd)

- FDH tasked by AMF to facilitate milestone transfer
  - MOU being developed
- FDH tasked to integrate SCW activities under M-92
  - Key element is M-92-13 (Project Management Plan)
  - PMP due September 2000

Status of SCW Integration (cont'd)

- Funding
  - Currently split between AMF and AMT
  - Develop strategy for integrating AMF/AMT workscope, budget and schedule
  - WPD will handle shutdown of 340 Building

PUREX Tunnels Management

Larry Romine

September 23, 1997

PUREX Tunnels Management After Turnover to ER Program

- Tunnels will not be turned over to ER Program at this time
- Tunnels will remain in EM-60 until:
  - » Additional waste is placed in storage if needed, or
  - » It is determined that the tunnels are not required for additional waste storage

Current Status of PUREX Tunnels Waste Storage

- Compiling data on waste from 324/327 Buildings that may need to be stored in tunnels
- Discuss with DOH off-gas upgrades necessary before placing additional waste in tunnel
- Develop cost estimates/schedule information for options
- Make decision

Tri-Party Agreement

September 23, 1997

EXTENSION TO DISPUTE RESOLUTION FOR HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER CHANGE REQUEST M-41-97-01

On July 16, 1997 the U.S. Department of Energy invoked the dispute resolution provisions of Tri-Party Agreement Article VIII concerning Tri-Party Agreement Change Request M-41-97-01. The initial period during which the Department of Energy and Ecology Project Managers seek resolution of the dispute was extended through August 26, 1997. On August 26, 1997 the dispute was elevated to the Inter Agency Management Integration Team (IAMIT) for resolution, and the period during which the IAMIT seeks resolution of the dispute was extended through September 23, 1997.

Discussions between the Department of Energy and Ecology have indicated that the scope of the discussions on Change Request M-41-97-01 should be expanded to address impacts to the Major Milestone M-41-00, Complete Single Shell Tank Interim Stabilization. The time period for resolution of the dispute on Change Request M-41-97-01 is hereby extended through October 28, 1997 to allow time for further discussions between the Department of Energy and Ecology.

Jackson E. Kinzer
Assistant Manager, Tank Waste
Remediation System
U.S. Department of Energy
Richland Operations Office

Michael A. Wilson
Manager, Nuclear Waste Program
State of Washington
Department of Ecology

cc: L. D. Arnold, FDH
M. L. Blazek, OOE
S. L. Dahl, Ecology
B. G. Erlandson, LMHC
C. C. Haass, DOE
N. T. Hepner, Ecology
D. R. Sherwood, EPA
A. M. Umek, FDH
J. K. Yerxa, DOE
D. Powaukee, Nez Perce
R. Jim, YIN
B. Burke, CTUIR
Administrative Record

HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER

INTER AGENCY MANAGEMENT INTEGRATION TEAM (IAMIT)

DECISION / DETERMINATION / ACTION ASSIGNMENT Number: 007

This form is intended to document the decisions and determinations made by the IAMIT within their authorities under the terms and conditions of the Hanford Federal Facility Agreement and Consent Order. This form is also intended to provide notification, to the affected persons, of the IAMITs decisions / determinations or actions assigned.

SUBJECT (Note the change request number, disputed subject or milestone addressed)

M-41-22 DISPUTE (IAMIT LEVEL) 9/23/97

DECISION / DETERMINATION / ACTION ITEM (Note the assignee and due date)

The Draft M41-22 recovery schedule M41-22 Dispute indicates a potential 3-year delay to the major milestone M41-00. EPA and Ecology have requested that the Senior Field Office Manager RL (Mr. John Wagoner) prepare and send to Ecology and EPA senior management a letter referencing DOE proposed TPA Milestone M41-00 extension and enter into formal Tri-Party Agreement negotiations on the M41-00 milestone series and incorporate the M41-22 dispute resolution into said negotiations.

Subject M41-22 Dispute 9/23/97 has been extended 30-days to 10/28/97.

IS THIS DECISION / DETERMINATION / ACTION ITEM

___ FINAL ___ INTERIM (Further action to be taken)

IAMIT Member Approvals

Jackson Kanzig 9-23-97
DOE Date

EPA Date

Michael A. Wilson 9/23/97
Ecology Date

Tri-Party Agreement

September 23, 1997

EXTENSION TO DISPUTE RESOLUTION FOR HANFORD FEDERAL FACILITY AGREEMENT AND CONSENT ORDER MILESTONE M-40-07

On April 9, 1997 the U.S. Department of Energy invoked the dispute resolution provisions of Tri-Party Agreement Article VIII concerning the State of Washington Department of Ecology assertions about completion of Interim Milestone M-40-07. The period during which the Department of Energy and Ecology Project Managers seek resolution of the dispute was previously extended through September 27, 1997. The dispute resolution period is hereby further extended through November 18, 1997 at the Project Manager level.

Jackson E. Kinzer
Assistant Manager,
Tank Waste Remediation System
U.S. Department of Energy
Richland Operations Office

Michael A. Wilson
Manager, Nuclear Waste Program
State of Washington
Department of Ecology

cc: L. D. Arnold, FDH
S. L. Dahl, Ecology
B. G. Erlandson, LMHC
C. C. Haass, DOE
D. H. Irby, DOE
A. B. Stone, Ecology
A. M. Umek, FDH
J. K. Yerxa, DOE
M. L. Blazek, OOE
D. Powaukee, Nez Perce
R. Jim, YIN
B. Burke, CTUIR
Administrative Record

Change Number M-45-97-05	Federal Facility Agreement and Consent Order Change Control Form Do not use blue ink. Type or print using black ink.	DRAFT Date September 23, 1997

Originator Ecology **Phone**

Class of Change [ ] I - Signatories [X] II - Executive Manager [ ] III - Project Manager

Change Title **Dispute Resolution Agreement: Tri Party Agreement interim milestone M-45-03A**

Description/Justification of Change This M-45-97-05 change request constitutes a Dispute Resolution Agreement in the matter of the U. S. Department of Energy and its contractors (hereafter referred to as DOE) failure to meet the requirements of Tri Party Agreement interim milestone M-45-03A: Initiate sluicing retrieval of tank 241-C-106 to resolve the high heat safety issue and demonstrate waste retrieval: October 31, 1997.

Compliance Issue description

Interim milestone M-45-03A was established in January of 1994 as a key tank waste remediation system (TWRS) project requirement. Work required to meet M-45-03A has long been recognized as of primary importance in that it both: a) provides for resolution of tank C-106 high heat safety (and environmental) issues via waste transfer to more appropriate facilities, and b) represents a critical test and demonstration of waste retrieval technologies, and an important first step in building DOE's ability to retrieve Hanford tank wastes for processing. Unfortunately, slow DOE progress in meeting M-45-03A requirements has plagued this project to the point where DOE is now unable to meet the milestones' October 31, 1997 compliance deadline. These failures have included a lack of adequate oversight and management by DOE, in conjunction with a lack of timely technical work and associated management by DOE's contractors.

DOE recognizes and agrees that due to these failures it stands in violation of M-45-03A requirements.

Resolution of Dispute

Descriptions of Ecology and DOE positions regarding the state's disapproval of DOE's May 6, 1997 request for (M-45-03A) extension were presented at the Parties' August 26 1997 Inter Agency Management Integration Team (IAMIT) meeting. Since that time the Parties' have worked with one another in crafting this Dispute Resolution Agreement, and its associated additions to the C-106 path forward. Approval of this change request constitutes resolution of the Parties' dispute.

Impact of Change Approval of this change request resolves the Parties' current dispute regarding interim milestone M-45-03A (RE: DOE's request for due date extension), and amends Tri Party Agreement tank 241-C-106 requirements consistent with current TWRS program logic and planning.

Affected Documents the Hanford Federal Facility Agreement and Consent Order, as amended, Project Hanford Management Contract (PHMC), e.g., PHMC Performance Expectations and Agreements (PE's and PA's), TWRS Multi Year Work Plan (MYWP), and associated DOE budget and planning documentation.

Approvals

_____ _____ ___ Approved ___ Disapproved
DOE Date

_____ _____ ___ Approved ___ Disapproved
EPA Date

_____ _____ ___ Approved ___ Disapproved
Ecology Date

Description/Justification of Change cont.

In light of the preceding, Ecology and DOE agree as follows:

A. That Tri Party Agreement interim milestone M-45-03A is not modified.

B. That the following new Tri Party Agreement requirement is established by approval of this M-45-97-05 change request:

M-45-03B: Complete Sluicing Retrieval of Tank 241-C-106 Wastes: July 1999

Completion of sluicing retrieval shall be a mutual determination by Ecology and DOE that the limit of sluicing retrieval capability has been reached for tank 241-C-106, and that subsequent waste removal, if necessary to meet the retrieval goal of M-45-00, will be accomplished by alternative technology.

C. That Tri Party Agreement target dates M-45-03T01 and T02 are modified by approval of this change request. These two target dates are established as interim milestones as follows:

M-45-03C: Initiate Final Retrieval Demonstration of Waste Removal from Tank 241-C-106: February 2001

This requirement will be met by the initiation of full scale residual waste removal following completion of sluicing retrieval operations (M-45-03B). This activity will be performed by a retrieval technology other than sluicing, and will demonstrate alternative retrieval systems for waste removal from tanks.

M-45-03D: Complete Retrieval Demonstration of Waste Removal from Tank 241-C-106: February 2002.

This requirement will be met on completion of waste removal from tank 241-C-106 to the reasonable and practical limits of technology as jointly agreed to by DOE and Ecology. This final waste removal shall be implemented using an alternative retrieval technology other than sluicing. See M-45-00 for a description of the required removal efficiencies.

D. Nothing in this dispute resolution agreement shall prevent Ecology from assessing penalties, stipulated or otherwise, against DOE for violating M-45-03A.

E. That DOE's Assistant Manager for TWRS will forward bimonthly letter reports to Ecology's TWRS Project Manager describing 241-C-106 project actions taken pursuant to the TWRS program critical path and logic, and whether or not DOE has/is maintaining adequate progress and compliance with interim milestones M-45-03B, M-45-03C, and M-45-03D. The signature block of these DOE determinations shall include the statement "The information contained within this report is complete and accurate to the best of my knowledge." Adequate progress is defined here as progress that is sufficient to meet (these) milestone requirements without shifting funds from other Tri Party Agreement required work.

F. That maintaining adequate progress and compliance with interim milestones M-45-03B, M-45-03C, and M-45-03D is deemed a term of Part Two of the Tri Party Agreement (See Tri Party Agreement Part Two, Article IX, paragraph 31).

G. That should DOE, at any time, determine that it is no longer maintaining adequate progress and compliance with interim milestones M-45-03B, M-45-03C, and M-45-03D, it shall immediately notify Ecology of such failure in writing.

H. That on Ecology's receipt of such notification, stipulated penalties pursuant to Tri Party Agreement Part Two, Article IX shall automatically begin to accrue on a weekly basis, and shall continue to accrue until adequate corrective actions are agreed to by signature of the Director of Ecology and DOE's Manager of the Richland Field Office. Such stipulated penalties shall not be subject to the dispute provisions of the Tri-Party Agreement.

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DOE recognizes and agrees that ~~due to these failures it stands in violation of~~ as of September 1, 1997, it will fail to meet M-45-03A requirements. However, the Parties also recognize that there remains a material question of fact, as to whether DOE is entitled to relief from performance of its M-45-03A obligations under the provisions of Article XL of the Hanford Federal Facility Agreement and Consent Order, as amended.

Resolution of Dispute

Descriptions of Ecology and DOE positions regarding the state's disapproval of DOE's May 6, 1997 request for (M-45-03A) extension were presented at the Parties' August 26 1997 Inter Agency Management Integration Team (IAMIT) meeting. Since that time the Parties' have worked with one another in crafting this Dispute Resolution Agreement, and its associated additions to the C-106 path forward. Approval of this change request constitutes resolution of the Parties' dispute.

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Affected Documents the Hanford Federal Facility Agreement and Consent Order, as amended, Project Hanford Management Contract (PHMC), e.g., PHMC Performance Expectations and Agreements (PE's and PA's), TWRS Multi Year Work Plan (MYWP), and associated DOE budget and planning documentation.

Approvals

DOE	Date	___ Approved	___ Disapproved
EPA	Date	___ Approved	___ Disapproved
Ecology	Date	___ Approved	___ Disapproved

Description/Justification of Change cont.

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This requirement will be met by the initiation of full scale residual waste removal following completion of sluicing retrieval operations (M-45-03B). This activity will be performed by a retrieval technology other than sluicing, and will demonstrate alternative retrieval systems for waste removal from tanks.

M-45-03D: Complete Retrieval Demonstration of Waste Removal from Tank 241-C-106: February 2002.

This requirement will be met on completion of waste removal from tank 241-C-106 to the reasonable and practical limits of technology as jointly agreed to by DOE and Ecology. This final waste removal shall be implemented using an alternative retrieval technology other than sluicing. See M-45-00 for a description of the required removal efficiencies.

D. Nothing in this dispute resolution agreement shall prevent Ecology from assessing penalties, stipulated or otherwise, against DOE for violating M-45-03A.

E. That DOE's Assistant Manager for TWRS will forward bimonthly letter reports to Ecology's TWRS Project Manager describing 241-C-106 project actions taken pursuant to the TWRS program critical path and logic, and whether or not DOE has/is maintaining adequate progress and compliance with interim milestones M-45-03B, M-45-03C, and M-45-03D. The signature block of these DOE determinations shall include the statement "The information contained within this report is complete and accurate to the best of my knowledge." Adequate progress is defined here as progress that is sufficient to meet (these) milestone requirements without shifting funds from other Tri Party Agreement required work.

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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

97-AMW-016

SEP 09 1997

Mr. H. J. Hatch, President
Fluor Daniel Hanford, Inc.
Richland, Washington 99352

Dear Mr. Hatch:

CONTRACT NO. DE-AC06-96RL13200 - SPENT NUCLEAR FUEL (SNF) PROJECT SCHEDULE

The SNF Project has made remarkable progress in the past two and one-half years, and noticeable improvements have been made since the PHMC contract commenced on October 1, 1996. However, delays have continued to occur which prevent meeting schedule commitments. While some delays can be attributed to new technical data, new safety requirements, and actions of other contractors, there continue to be delays due to poor quality technical work and poor project management and contracting practices.

FDH and DESH must take near-term decisive action if DOE is to achieve its objective at the K Basins: rapid removal of the spent fuel to safe, dry interim storage with a low cost mortgage. The following are needed at a minimum:

1. reinforce the fundamental project goal to provide safe, stable, low mortgage dry storage of the spent fuel as soon as possible;

2. provide in the immediate future a technically sound and well-documented basis for design and safety. Include this effort in the baseline;

3. seize the opportunity to simplify the designs of the buildings and the equipment to be used for fuel retrieval, processing, handling and storage operations such that operational reliability is ensured once fuel retrieval commences;

4. establish a sense of urgency with regard to the commitment dates for the project. FDH will be able to establish new baselines dates to reflect the delays that have occurred; there must be a buy-in by all project personnel to ensure commitments are met. Project management reports must focus on delivering information that permits intervention to avoid delays;

5. improve senior management understanding of the details of the project such that long delays are not encountered to resolve programmatic issues. The delay in Canister Storage Building construction due to two hoisting and rigging accidents involved excessive time for investigation. FDH and DESH have worked for almost four months on a baseline schedule change without issuing a final product;

6. commence an immediate senior management review with RL, weekly (or more often), to identify and resolve open issues affecting project success. This would include design simplifications, problems with closure of technical issues, and implementation of improved project management controls to establish status and identify problems;

7. resolve promptly critical decisions with regard to fuel conditioning and ensure that NUMATEC concurrence is obtained promptly on conditioning process matters;

8. immediately provide a date when RL can expect to see a finalized baseline change request to reflect the current delays; and,

9. commence the long overdue (scheduled to start May 1, 1997) full-element spent fuel testing in Building 324; this testing is important to fuel conditioning processes.

It is absolutely critical that FDH and DESH retain full accountability for technical direction and integration of all aspects of the project. RL considers that there is now a clear path forward for safe execution of the SNF Project; no major technical obstacles remain. It is expected that FDH and DESH will promptly establish a firm baseline for the project that will result in safe and reliable operations until its conclusion. The urgent risk represented by the spent fuel in the K Basins will not be alleviated until the project is complete.

Please advise RL as soon as possible of the actions you are taking to address the matters discussed in this letter and its enclosure.

Sincerely,

C. A. Hansen, Assistant Manager
for Waste Management

AMW:PGL

Enclosure:
Report on RL Review of SNF Project
Schedule

cc w/encl:
H. E. Bilson, EM-65
T. L. McConnell, DESH
N. H. Williams, FDH

Enclosure to 97-AMW-016

REPORT OF RL REVIEW OF SPENT NUCLEAR FUEL PROJECT SCHEDULE

Executive Summary

On August 18, 1997, Fluor Daniel Hanford (FDH) provided RL with a proposed revision to the SNF Project schedule. This revision is the outcome of a several-month risk-based assessment by the FDH and Duke Engineering and Services (DESH) management team; it proposes establishing July 31, 1999 as the new date for start of K Basins fuel removal. This is 14 months later than the presently approved MYWP date and 19 months later than the DOE Implementation Plan for DNFSB Recommendation 94-1.

The RL Spent Nuclear Fuel Project commenced a detailed review of this proposed revision to the MYWP baseline on August 22, 1997. This review included members of the SNF Project staff and members of the SNF Project Technical Assistance Group (TAG) (see attachment 1). This is a report of the findings of the review and recommendations made by those involved. In the discussions that follow, the term "original" refers to the schedule approved in April 1995 which identified the start of fuel removal as December 1997, while "current" denotes the schedule approved in April 1997 identifying the start of fuel removal as May 1998 and "proposed" means the schedule which FDH and DESH have informally proposed to RL with a fuel removal start of July 1999.

The objectives of the RL review were to:

- Determine why the start of K Basins fuel removal has been delayed from the original schedule
- Assess the validity of the proposed new schedule and determine if it is realistic or if it could be improved upon.
- Identify options not considered in the proposed schedule that might expedite the removal of fuel from the K Basins at the earliest time

To achieve these objectives, RL and TAG members participated in a series of meetings with DESH sub-project managers, compiled and reviewed a line-by-line comparison of the current and proposed schedules, reviewed other supporting documentation, and held numerous internal discussions.

It is important for the contractors to note that there are inherent limitations in a review of this kind, conducted over a very short (two-week) time frame: it is necessarily a top-down, overview evaluation and does not include the insights which could be garnered from a thorough bottoms-up analysis. Further, the conclusions and recommendations

herein reflect the reviewers' broad experience and knowledge of the SNF project; they are not based solely on the information presented in the two-week review process.

Conclusions and recommendations are presented throughout this report. The following are key:

1. The primary causes of delay in the start of fuel retrieval operations are:

   - Disorganized and poor quality technical basis
   - Distorted (excessively conservative) safety analyses
   - Extremely complex equipment designs (to accommodate distorted design and safety requirements).
   - Weak project management and weak management of subcontractors

   These are long standing problems at Hanford and to some extent was a legacy when the PHMC contract commenced on October 1, 1996. FDH and DESH have made improvement in all areas over the past year; however, the delays now proposed highlight the need for urgent additional substantive action. The above deficiencies are not the only problems leading to the proposed delay; RL recognizes that the original schedule had no technical or safety basis when it was established. Nor did the very optimistic testing and training times reflect the actual facilities and equipment that will be used. RL considers, however, that correction of the primary causes of delay noted above will have a substantial positive impact on minimizing testing and training time required and will ensure the most prompt completion of the fuel and sludge removal tasks.

2. There is little basis for confidence that the proposed schedule can be achieved or improved upon.

   The FDH and DESH proposed schedule was provided to RL with the caveat that a low aggregate probability existed (less than one chance in five) of moving fuel by the scheduled (July 1999) date.

   The proposed schedule has yet to be formally presented to RL and some DESH sub-project managers indicated that it was not yet fully revised. They also indicated that it was not fully resource loaded, and may not represent the fastest possible schedule for non-critical path activities. RL found no evidence that a detailed bottoms-up review was conducted by DESH to provide the needed confidence to ensure validity.

   All DESH sub-project managers did not appear to own the milestone commitments made by senior management in the current schedule. Thus, contractor acceptance of an accelerated program to place spent nuclear fuel in dry storage cannot be said to have been complete. It is crucial now to establish a schedule to which all Project

personnel are committed. It is also critical that all project personnel understand the urgent need to remove the fuel from the vicinity of the Columbia River and the importance of completing this task so that other important cleanup work can proceed.

The proposed schedule process elements are the same as in the current schedule. It allocates additional time to many tasks, where experience has shown that to be necessary, and it includes some new tasks omitted in previous versions, but it follows the same basic path as before. There is no question that additional time is clearly warranted to get the job done correctly and safely; construction of the Cold Vacuum Drying Facility is six months behind schedule and experience and new design information clearly show the need for additional testing and personnel training and certification time. Correction of the primary causes of delays may not change the start of fuel removal from the basins, but will certainly reduce the risk of additional delays and provide a real opportunity to succeed in achieving the completion of fuel retrieval on time.

3. **A sound technical baseline - for safety, design and operations - must be established, regardless of the path forward adopted by management.**

RL considers that the deficiencies in engineering baseline and safety analysis work will continue to lead to problems, errors and delays. Correction of these is not optional; whether FDH/DESH chooses to continue with the current technical path forward or a more innovative approach (major technical simplification), completion of high quality baseline engineering and safety analysis documents are prerequisites to success. Poor technical integration, and disorganized and distorted safety analysis and design work, have been real problems since project inception. FDH and DESH recognized this during transition to the PHMC contract yet corrective action progress has been much too slow.

4. **Improved project management and management of subcontractors is required.**

RL considers that without greatly improved project engineering and improved management of subcontractors that the risk of additional delays is high. The CVD is the most obvious example of weak performance in both areas. FDH and DESH also identified this problem at commencement of the PHMC contract and some corrective actions have been taken. However, there is a clear need to improve project baseline and project management discipline. In addition, there appears to be a lack of urgency to meet commitment dates for the project. Working with the end in mind it would appear that there would be serious excitement about missing dates at the project level since there are downstream impacts on testing and operations organizations. However, the approach seems to have been one of waiting for delivery of input and translating delays downstream. There also seems to be acceptance of the inevitability of delays if subcontractors do not perform. Such delays should be considered a failure

of the customer organization. Positive customer actions frequently improve subcontractor performance.

There is an immediate need for FDH and DESH to be able to provide RL with clear concise reports of potential delays such that time remains to take corrective actions. RL will commit to near term TPA enforceable milestones in upcoming negotiations; the TPA requires significant advance notice of milestone delays.

5. **Serious technical and management consideration should be given to aggressive simplification of SNF systems and components.**

The reality of a substantial project delay - more than a year, with little potential for recovery (based on the FDH/ DESH proposed schedule) - presents the opportunity for beneficial, cost-effective simplification. A prime candidate is the elimination of the requirement for inerted storage, and the attendant simplification of the Multi-Canister Overpack (MCO), MCO Handling Machine (MHM), and Canister Storage Building (CSB) storage tubes.

RL also considers it essential that FDH and DESH promptly establish the feasibility of using one conditioning step as laid out in the proposed schedule. It is crucial that the work on fuel conditioning proceed on an urgent basis and while short term delays to investigate the right technical approach may be warranted, it is critical to maintain progress on this important part of the project.

The incentives for aggressive simplification include:

- Restored ability to achieve the desired end-state (i.e., safe, low mortgage, extended term storage).
- Reduced vulnerability to schedule delays due to equipment delivery, Startup and Test (SU&T) problems, added operator training requirements, and the potential to recover some of the front-end schedule loss.
- Lower capital cost of systems and equipment.
- Improved safety for operations

RL considers that these improvements would prove to be cost and schedule beneficial, over the life of the program, but more importantly, would provide for more reliable and safe operation. However, in view of the advanced state of engineering and design work, it is clear that there may be some front-end penalty (cost and schedule) associated with this approach. Therefore, a decision to adopt this approach must be based on a technically thorough, high-priority evaluation. RL strongly urges that such an evaluation be conducted and completed promptly.

In summary, the RL review resulted in a conclusion that there is a legitimate need for schedule extension, in order to complete the project in accordance with the current path forward approach. There is not enough information to validate the projected (14-month) slip, but RL concurs that an extension of that approximate length will be required. RL is concerned that, unless positive actions are taken to address the root causes of the delays experienced so far, continued slippage is possible. Further, it is the review team's view that some changes to the path forward – particularly simplifications to systems and equipment – should be considered and may result in improved cost, schedule and technical performance once fuel retrieval commences.

This report is presented in a series of "layers"; the Summary above contains the main points, while the Sections below address the three objectives of the RL review and the Attachments provide somewhat more detail on some aspects of the review.

SECTION 1- UNDERLYING CAUSES OF THE 14 MONTH SCHEDULE DELAY

Based on RL's review of the proposed schedule information and on its broader understanding of SNF Project issues, it concludes that the primary causes of the projected schedule slip are:

- Disorganized and poor quality technical basis. For example, several key parameters, for which overly conservative values have been used in safety analyses, are being revised very slowly; these issues were formally documented nine months ago.
- Distorted (excessively conservative) safety analyses. For example, settling due to gravity is not accounted for and, in some cases, arbitrary and very large (10^6) factors are sometimes applied to parameters "for conservatism".
- Because of the above, many designs are unnecessarily complex. For example, the MHM has been designed for full inerted containment of the MCO during transfer and handling operations; this design complexity has led directly to delays in engineering, fabrication and delivery of the unit.
- Weak project management and weak management of subcontractors. Delays in completion of the CVD facility can be attributed to poor implementation of Quality Assurance requirements and the poor quality of vendor engineering.

Additional factors have contributed to the schedule delay. These include:

- Inadequate time allocated to some portions of the current schedule; e.g., in the Operational Readiness Review area
- Some necessary tasks were not incorporated in the current schedule; e.g., operator training
- Sub-contractor relationships in at least one sub-project are not conducive to a fast track schedule; e.g., five fixed price FRS subcontractors each with a piece of the system

Finally, it is noted that the original project schedule was very ambitious (intentionally so); the aim was to move work along faster by setting a very tight target. To some degree, the proposed schedule corrects this situation by making key durations more realistic; it now reflects a safety basis and design basis that did not exist earlier. Further, it appears that contractor management was not entirely committed to either the original (December 1997) or the current (May 1998) start-date. For example, one sub-project manager asserted that the original schedule was widely regarded as completely unrealistic, and another asserted that the changes that resulted in the May 1998 start date did not go far enough. While this is significant, it is not considered by RL to be the primary reason for the delay.

SECTION II-ASSESSMENT OF THE PROPOSED SCHEDULE

The RL review team reviewed and evaluated the proposed schedule primarily through a series of topical review meetings, during the week of August 25-29, with the DESH sub-project managers and other involved project personnel. The team's observations and conclusions from these review sessions are summarized in this section, with elaboration in some cases provided in attachments to this report.

OVERALL OBSERVATIONS REGARDING COMPLETENESS AND CREDIBILITY

The proposed schedule, as reviewed, is not complete. (And in fact, it has not been advertised as such; the contractor has not yet formally presented this schedule to DOE.) Further, there seems to be little basis for confidence that the new schedule, as proposed, can be achieved or improved upon.

Specifically:

- It is not yet completely man loaded or resource loaded, and level 3 is not yet linked to level 4; FDH issued a letter to DESH last week that required formal changes to the baseline to remedy problems of this nature. The review team found no evidence that it incorporates detailed bottoms-up review needed to provide confidence in its validity.

- The FDH/Ares risk assessment assigns only a 17% probability of moving fuel by the rescheduled (July 1999) date. While clearly a qualitative estimate, the low confidence is a major concern; FDH reported this when presenting the proposed schedule to RL.

- The proposed schedule process elements are the same as in the previous one. It increases the time allocated to many tasks (where experience has shown that to be necessary) and it includes some tasks that were not shown in previous versions, but it does not incorporate significant changes to path forward or process. In the absence of positive steps to resolve the causes of the slippage, the vulnerability to schedule upset will remain high and the delays of the kind experienced before are likely to persist.

- There are some items off the critical path that are delayed for no apparent reason.

It seems illogical to keep delaying work when it can be completed sooner. Such delays will only lead to complications later in the project. RL was unable to determine whether these are legitimate delays and what effect they have on the overall outcome.

- Although the proposed schedule has not been implemented, some tasks are already lagging their "new" start date. In fact, it is not clear what schedule project personnel are following at this time.

- FDH has not yet identified to RL the key drivers that force the 14-month schedule delay. FDH has committed to providing such an analysis to RL.

TECHNICAL BASELINE, INCLUDING ENABLING ASSUMPTION (EA) RESOLUTION AND CHARACTERIZATION

As noted in Section I, the yet-incomplete SNF Project technical baseline is considered by the team to be a primary contributor to the schedule slippage. Observations regarding the technical baseline, as regards the proposed schedule, are:

- Although there has been progress in establishing and documenting the technical baseline this fiscal year, work is still not complete and is prerequisite to successful engineering and design. Completion of this vital technical baseline work appears not to be scheduled (with the exception of the EA resolution, as discussed below), and should be.

- The proposed schedule does include resolution of high priority EAs. However, most of these are normal engineering work tasks, technical input or design requirements, that are identified and tracked for configuration control purposes. As scheduled, they are incorrectly linked to characterization work (all EAs can be resolved without characterization), setting up the potential for unnecessary delays.

- The point has repeatedly been made by RL that the safety basis does <u>not</u> depend on characterization testing. This has been the case since May 1996 and has been agreed to by the contractor. Accordingly, no safety-related activity should be dependent on the completion of characterization testing, and schedules should be revised accordingly.

Attachment 2 is a summary of the high priority EAs and their significance.

SAFETY ANALYSIS

As noted in Section I, the team considers safety analysis problems – both in content and process – to be significant contributors to the schedule slippage experienced so far on the project. In some respects, these problem areas persist in the proposed new schedule.

Observations:

- The underlying problem of excessively conservative safety analyses (see Section I) remains. The proposed schedule doesn't show these being repaired.

- The proposed schedule reflects the revised safety authorization process conceptualized recently in the Key Drivers assessment[1]. This process is an improvement, in that it addresses some of the difficulties experienced with the earlier "phased Safety Analysis Report (SAR)" approach, but it doesn't completely fix the problem and it introduces some new ones. Specifically:

  - The new plan still calls for multiple SARs, in several phases. There has been some consolidation and the magnitude of the problem is much lower than before, because most of the phased SARs have already been produced. However, the obvious flaws in the multiple phased SAR approach - inconsistencies, parallel review paths, overlaps, need for backfitting - could be avoided by consolidating all of the remaining SARs into two documents.

  - Per the schedule, the MCO Topical (considered to be a SAR) will not be available in time to support preparation of the other, related SARs.

  - The process introduces a new product, the Safety Analysis Document (SAD), which is not adequately defined or scoped and seems not to be well understood by users. This needs to be resolved soon to avoid inefficiencies and delays in implementation.

  - The schedule reflects a "requirement" for DOE approval of a SAD (or a PSAR-like document) prior to FRS equipment immersion in the K-Basin. The basis for this requirement is not clear, and it seems to add little or no value.

- Several safety analysis tasks are linked, per the proposed schedule, to characterization work. These links are not valid and should be deleted.

- There is a need to carefully assess the schedule for FSAR issue on the project to ensure that information required for training operations personnel is available in a timely fashion.

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[1] Key Drivers Resolution Committee Agreements document, dated August 15, 1997

Attachment 3 is a summary of the necessary changes to the technical baseline and the safety analysis.

CONDITIONING PROCESSES

Per the proposed schedule, Cold Vacuum Drying (CVD) is the critical path for the entire project. The team concurs that CVD is likely to be the pacing sub-project and is vulnerable to further delay, based on experience to date. At the same time, the schedule proposes to delay engineering work on the Hot Conditioning System (HCS), apparently awaiting the completion of an evaluation underway to determine whether HCS can be eliminated altogether. This decision should not be based on lack of budget. Completion of fuel conditioning is mandatory for safe, low mortgage interim storage of the fuel unless (and until) the contractor can show that this can be achieved with CVD alone.

Alternative conditioning process concepts, involving elimination or modification of either CVD or HCS, must be evaluated in an integrated way. For example, consolidation of all conditioning into a single step at the HCS facility is a previously identified and potentially attractive alternative to HCS elimination. In view of the critical path nature of the CVD work, it seems advisable to evaluate that alternative before it is precluded by HCS delay. Similarly, elimination of HCS may place additional performance requirements on CVD (which would then be the only treatment step), that could adversely affect the overall schedule.

For that reason, RL considers that an integrated evaluation of conditioning process alternatives (including elimination of either HCS or CVD) be conducted as soon as possible, prior to delay of HCS.

IN-BASIN TASKS

RL reviewed both the Integrated Water Treatment System (IWTS) and the Fuel Retrieval System (FRS). The following was observed:

- There is significant uncertainty (perhaps inherent in the nature of water treatment projects) regarding IWTS performance. The schedule should include adequate time for functional testing, operational trial-and-error, and resultant corrective action. Allocated time frames in the proposed schedule seem insufficient for that.

- The MCO Loading System (MLS), a part of FRS, is a highly automated basket loading system. The review team did not look at this in detail, but raises the question of system reliability and its effect on schedule. It is critical that operations personnel review designs well in advance of receipt such that operability is assessed in time to implement any needed improvements.

CANISTER STORAGE BUILDING (CSB)

The CSB is well along in construction, and its completion is unlikely to impinge on the project critical path. The only review team observation of consequence, with respect to CSB aspects of the proposed schedule, regards the delivery of storage tube covers. As shown in the proposed schedule those deliveries will be late in the project. Given the complexity of the tube cover design, it would be prudent to provide substantial margin in the delivery schedule.

More broadly, there is very substantial complexity in the CSB design, particularly with respect to the systems and equipment required for storage tube inerting, and also those related to safety grade HVAC systems. These complexities will affect plant capital cost (the ~200 storage tube covers are presently estimated to cost $40K each, exclusive of hold-down attachments), but are unlikely to have any perceptible effect on project schedule. Their most significant adverse effect will be on operation and maintenance cost and efficiency. Opportunities for improvement are discussed in Section III.

MCO HANDLING MACHINE (MHM)

The MHM is an exceedingly complex machine. Engineering and fabrication of the MHM have already been the cause of schedule slippage. The proposed schedule presumes that the basic MHM configuration will remain unchanged. In that case, continued difficulty with fabrication, testing and operation can be expected and should be accommodated in the schedule.

The review team's detailed comments on the MHM portion of the schedule are provided in Attachment 4. In summary:

- The allocated time for acceptance testing, turnover and startup/operational upsets appears insufficient, given the complexity and experience to date with the MHM.

- There is an effort underway to determine if the MHM inerting and sealing requirements can be eliminated. This is a very positive step and is likely to reduce the MHM complexity and its schedule implications. However, presuming a satisfactory conclusion of that work, some engineering effort will be required to incorporate the results; that work should be anticipated in the schedule.

- The recent Newport News design review of the MHM made recommendations regarding elimination or simplification of interlocks and controls. These also have the potential to yield long-term benefit, but their near-term schedule implications need to

be evaluated.

A discussion of possible major simplification of the MHM is provided in Section III.

KW AND KE BASINS WORK SEQUENCING

The current schedule calls for an eight-month stagger between the start of K-West (KW) fuel removal and that in K-East (KE); the proposed schedule would reduce that interval to six months.

It is critical that the timing of work in both basins be sequenced such that proper management and supervisory attention can be provided to both operations simultaneously. It is also essential that there be substantial time between KW and KE operations to maximize opportunity for feedback on design, installation and operational lessons-learned, and also to minimize competition for staff resources in construction, testing and operation. In conducting its schedule review, RL found several circumstances where the six-month stagger may be problematic:

- FRS construction/installation work in the two pools, as scheduled, will be overlapping
- Training and Startup and Test (SU&T) work will be overlapping, both between basins and also with CVD and CSB SU&T.
- The planned start of fuel movement in KE will coincide with the planned acceleration (to five MCOs per week) in KW. This will be a severe management challenge.
- Six-month stagger is not sufficient to permit any meaningful KW operational experience to be factored into the KE design work. Much greater stagger, perhaps to the point of sequential (rather than parallel) basin operations would be required to accommodate that but this may not be possible due to schedule constraints. It is clearly not contemplated by the proposed (or current) schedule. The contractor should reassess the stagger interval so as to optimize feed back, management control and task duration.

Opportunities in this respect are discussed in Section III.

OPERATIONAL READINESS REVIEW AND STARTUP

The proposed schedule allocates significantly more time for Management Self-Assessment (MSA), contractor ORR and DOE ORR than the current schedule. The team concurs that this is realistic.

The primary area of concern noted by the team in this area is the overlap in SU&T (particularly the dry runs) for FRS, CVD, CSB, as noted above. More details are provided in Attachment 4.

In summary, RL concludes that there is a legitimate need for schedule extension, in order to complete the project in accordance with the current path forward approach. There is not enough information to validate the projected (14-month) slip, but the team concurs that an extension of that approximate length, or longer, will be required. RL is concerned that the proposed schedule appears not to incorporate positive actions to address the root causes of the delays experienced so far; therefore, continued slippage is possible.

SECTION III - AN ALTERNATIVE APPROACH

Based on its conclusions regarding the causes for the SNF Project schedule slip and the uncertainties associated with the proposed new schedule, RL recommends that consideration be given to several changes to the proposed approach. These are outlined in this section. A prerequisite to the success of this alternate approach is correcting the primary causes of the project delay as discussed in Section I of this report.

A project delay of a year or longer presents the opportunity for beneficial, cost-effective simplification. The evolving designs of SNF systems and equipment (particularly the MHM, the MCO and the CSB /HCS) are excessively complex, to the degree that they do not support the top-tier objectives of long term, low cost operation and maintenance. More importantly the complexities threaten the overall system reliability and, potentially, safe operations. Success of the project depends heavily on reliable long-term operation of this equipment.

The RL team believes that these improvements would prove to be cost and schedule-beneficial, over the life of the program. However, in view of the advanced state of engineering and design work, it is clear that there would be some front-end penalty (cost and schedule) associated with this approach. Therefore, a decision to adopt this approach must be based on an objective, technically thorough, high-priority evaluation. The RL team strongly urges that such an evaluation be conducted

The following simplification opportunities are suggested as having high potential:

- Conduct all conditioning (de-watering, and cold and hot conditioning) in a single step, at the CSB. (An evaluation of the relative merits of this approach should be conducted right away and prior to any decision to defer HCS engineering).

- Eliminate the requirement for inerted storage and handling of MCOs.

    - Utilize the available visual fuel inspection information (principally for KE, but to a limited extent also for KW) together with information obtained in the course of characterization, to revise downward the safety-basis MCO sludge loading of 300 kg.
    - Generate from this analysis an improved (more realistic) MCO sludge probability distribution function (pdf). This pdf will allow for reasonable, yet conservative, estimates of expected (i.e., design basis) MCO sludge loading as well.
    - Make a realistic assessment of the pressure-holding capability of a welded closure MCO, which will be significantly greater than the current design value

of 150 psi.

- Based on the above, demonstrate that an MCO cannot credibly be over pressurized ($< 10^{-6}$ probability) and that pressure relief devices are not necessary.

- This will permit major equipment simplifications as follows:

  - Simplify the MHM design, eliminating features for inerting, sealing, and pressure tolerance.

  - Simplify the CSB design, including elimination of equipment and operational provisions for maintaining inerted storage tubes, and elimination of accident HEPA filters and ESF HVAC.

- Increase the schedule stagger between KW and KE operations, to make it possible for the lessons learned in the first (KW) application – including design, installation, testing and operation – to be applied to the subsequent (KE) work.

Further detail on these opportunities for simplification is provided in Attachment 6.

RL's recommendations are based on the premise that it will be possible to make technically sound simplification decisions in a 1 - 2 month time frame. This will require concerted, objective effort on the part of the contractor. Despite short term adverse schedule impact (i.e., introduction of new engineering work and delay or change to ongoing work), the proposed major simplifications have the potential to yield reduced overall cost, equivalent or improved overall schedule (compared to DESH proposal) and reduced vulnerability to further delay.

Attachment 1 - RL Schedule Review Participants

The following participated in the RL review of the SNF Project Schedule:

C.A. Hansen
E.D.Sellers
P.G. Loscoe
J.C. DeVine (TAG/Polestar)
J.D. Trotter (TAG/Polestar)
R.M. Hiegel
W.L. Smoot
F.M. Roddy
A. Mehta (EM-60 Rep)
R.N. Warren
J.J. Allen[2]

[2] Part time

Attachment 2 - Enabling Assumptions

Enabling Assumptions are technical inputs that are needed for safety analyses but have not been finally determined and documented. The contractor currently indicates that there are 92 Enabling Assumptions (EAs) being tracked to closure. However, the latest listing of these EAs, Rev. 3 dated August 21, 1997, shows only a total of 86.

These EAs have recently been reviewed and placed into three categories: Category 1, High Programmatic Risk/Impact; Category 2, Lower Impact/Data Development and Analysis Ongoing; and Category 3, Close Now. There are currently 19 EAs in Category 1, 31 in Category 2 and 36 in Category 3.

Many, if not all, of the Category 1 EAs can be closed now (or within a few weeks, including time for a documenting the basis for closure). For example:

> EA-001, *"Maximum particulate content of 300 kg to remain in MCO. Maximum particulate quantity of 160 kg in MCO during CVD and transport."* This has already been shown to be an incredible amount of particulate. Furthermore, if flaws in the analysis on which this conclusion is based were corrected, that amount of particulate would be even more incredible.
>
> EA-012, *"CSB design approach is based on maintaining fuel conditions such that a runaway reaction of the fuel with water or air is precluded."* Existing (albeit recent) analyses show that, even with very conservative assumptions on sludge/water content and exposed fuel surface area, a runaway reaction cannot occur. With a more realistic but still conservative sludge content, such an event is incredible.
>
> EA-013, *"CSB design approach is based on maintaining an inert environment in the MHM...."* This is a design requirement that is currently in place. It is not an assumption.
>
> EA-021, *"Runaway reactions and fuel ignition are precluded by limiting fuel temperature, water and air."* This is essentially the same as EA-012.
>
> EA-066, *"The blowdown and particulate release from the MCO pressurization are estimated conservatively from the blowdown model."* In view of the fact that the blowdown model ignores gravity and agglomeration effects, assumes the sludge is as radioactive as the fuel, considers the entire sludge inventory to be at risk and all of it to be respirable, and includes an arbitrary factor of one million on the resuspension factor, it is safe to say that the current blowdown release

calculation is conservative. A more realistically conservative calculation should be promptly done, after which this EA can be closed.

EA-052, *"Uranium corrosion reaction rates are derived from WHC-SD-SNF-TI-020."* This assumption is, essentially, that the uranium reaction rates are given by the widely used Pearce correlations with a factor of 10 included to insure they are conservative. The contractor plans to close this EA by verifying, through characterization work at PNNL, that measured rates are within the bounds of Pearce times 10. In view of the very few samples to be tested, applicability of the characterization results will be questionable at best. That is, the uncertainty associated with the measurement of the behavior of a few samples out of hundreds of thousands of potential samples is unlikely to have any more statistical validity than the use of the world body of data with a factor of 10 included.

In addition to EA-013, several other EAs (-044, -055, -063, and -078, -091, -092) are design or procedure requirements. For the purpose of preparing safety documentation it seems appropriate to "close" the design requirements by incorporating them into the appropriate system specifications. The system design is then unacceptable if it doesn't comply with specifications. Procedural requirements can be handled similarly.

The majority of the remaining (Category 2 and 3) Enabling Assumptions are either closed or will be closed in the near future. However, some of these EAs are inappropriately tied to the completion of some characterization work. For example, EA-007, *"Particulate contains same radionuclide content as fuel"* indicates that it "needs characterization of particulate". More correctly stated, the enabling aspect of this assumption is that the particulate is not more radioactive than the fuel. It is currently assumed in the accident analyses that the radionuclide content of the particulate is that of the fuel (appropriately decay corrected). Since it is inconceivable that the sludge could contain more activity than the fuel from which it came, especially in view of the fact that most of the soluble nuclides (^{137}Cs and ^{90}Sr, which comprise about 40% of the fuel activity) have been removed, characterization cannot invalidate this assumption.

Similarly, EA-039, *"SNF fuel particulate behavior is consistent with or bounded by data from all models used"* refers to the need for particulate characterization. It is unclear what measurable property of the particulate could possibly invalidate the conservative assumptions used in the analyses: notably that 100% of the particles are respirable and the radionuclide content is the same as that of the fuel.

Attachment 3 - Necessary Improvements to Technical Design Basis and Safety Analysis

1. The following actions are required to identify, quantify and document the technical parameters needed to finalize the project safety analysis and design work. These include:

- Sludge distribution (quantity of sludge loaded in MCOs)
- Water content of sludge
- Sludge drying characteristics
- Thermal decomposition of uranium hydrates in sludge
- Release rates of bound water, due to radiolysis
- Uranium-Oxygen and Uranium-Hydrogen reaction rate relationships
- Reactive surface area in the MCO
- Free volume in the MCO
- Reaction temperatures
- MCO particulate content (for blowdown analysis)
- Release path geometry inside and outside the MCO)

In each case, as has been pointed out by RL and by the Technical Baseline Validation Team, it is necessary to assess the technical basis for the parameter in question, and determine whether there is sufficient existing data to select firm values for safety and design. The combination of information currently available from the technical literature and, to a limited extent, from characterization and testing work is likely to prove adequate to establish a full set of firm, defensible parameters for safety and design. While this has been in progress since late last year, it is not yet complete.

2. Establish a clear project position regarding the margin / conservatism required for safety and design calculations.

3. Revise the SNF Project safety analyses, using more realistic assumptions, calculation models and consequence analyses to provide a meaningful portrayal of the safety risk of SNF Project facilities. Address accident consequences in a complete way, taking into account physically based phenomena. In particular:

- Review calculation models for completeness. For example, the current off-site calculation predicts dose effects at 15 to 18 kilometers from a momentary MCO relief of cold-gas borne particles. Such dispersion is not physically reasonable. The calculation model should be expanded to include all natural removal mechanisms that can be reliably credited. Gravitational settling inside systems and structures is the most obvious of these reliable removal mechanisms.

- Eliminate excessive conservatism. This is a judgment call, and conservatism in safety analyses is clearly appropriate. However, use of a factor of 10^6 for unspecified reasons in the calculation of offsite dose is not called for.

- Reexamine the analytical (and management) approach for protecting "collocated workers". For example, it may be cost- and safety-effective to calculate on the basis of actual worker locations (instead of an arbitrarily assumed distance from the plant) or to consider reclassification and qualification of the nearest workers to be part of the emergency response organization

Attachment 4 - MCO Handling Machine (MHM)

The following comments are principally based on discussions with DESH(McNeil) and review of the proposed schedule.

1. The MHM fabrication schedule has slipped approximately 9.5 months. This is due in part, (3.5 months) to the time expended to complete the design for the hoist. The design activity was completed on 8/15/97; however, Foster-Wheeler (FW) has not awarded the contract to fabricate the hoist assembly. FW is considering awarding the contract to GEC, which is purported be a cost and schedule savings.

2. The schedule has also expanded to include a two-month window to allow for shipment of the assembly to England for fit-up prior to delivery of the complete assembly to Richland for assembly and installation in the CSB.

3. The rest of the schedule slip is a result of the non-availability of the sub-contractor to perform the hoist fabrication. FW lost the window due to the design problems.

4. The current schedule does not address the failure modes and effects analysis (FMEA) for the hoist and grapple system. This activity is supposed to run concurrent with the first three weeks of the engineering effort. Net result, no impact.

5. The 6/9/98 date for MHM Fabricate/Assembly/Deliver is based on a window of activity of 8.2 Months. The work allotted to that activity is:

6 weeks engineering
24 weeks fabrication
1 week ship to England
8 weeks fit up
5 weeks ship assembly to Richland

---

44 weeks total or 11 months

McNeil stated that part of the engineering activity has started and the drop-dead date for start of the work to meet the 6/9/98 date is 9/1/97.

Attachment 5 - Startup and Operational Readiness Review

The following comments are principally based on discussion with Chris Thompson and Cherri Defigh-Price and review of the proposed schedule:

1. The operational procedure development activity is dependent on the sub-projects providing their completed designs, manufacturer's requirements, and draft operational documents to Startup.

The current input from projects to Startup was not sufficient to support the May start date. According to Thompson, the current schedule is achievable if they get the procedure input from the projects as required.

2. Procedure development and operations training is also dependent on the development of the Technical Safety Requirements (TSRs), Operational Safety Requirements (OSRs), and Limiting Conditions for Operations (LCOs). These, in turn, are dependent on the development of the SAR. The current schedule starts training before the SAR is approved. There is an element of risk with this, as training may have to be repeated is there are significant changes in the preliminary safety requirements for operations due to changes in the SAR.

3. The current schedule does not allot any time to address problems that may come up as a result of pre-operational testing (Acceptance Test Procedures (ATPs) and Operating Test Procedures (OTPs)).

4. The current ORR preps activity is predicated on validating only a portion of the operating procedures. At the present time, DESH has three categories of procedure validation: prior to ORR, prior to use, or use J-1 work procedures and develop procedures at a later date. The basic justification is the routine use of the procedure, however, criteria for the decision process has not been formally defined or justified.

5. The current 40 working days for the complete Contractor and DOE ORR activity is not sufficient time to complete all required activities. This time period only allows two weeks for the contractor ORR. If the DOE ORR is two weeks and its purpose is to validate the contractor ORR it would seem that the Contractor activity would be deeper in scope and naturally take longer. This period also does not allow for DOE-RL validation of contractor corrective actions taken as a result of the contractor ORR.

6. The overall time commitment for the start-up activity in the new schedule is longer. In response, it was stated that the time durations in the submitted schedule in support of the May date was longer than that approved by management. Start-up was

told that the requested time was unacceptable and that they would have to trim the schedule.

7. There is an overlapping of the three major activity dry run/certifications. While there are sufficient planned staff to perform the dry runs, there will not be enough procedure writers to address issues that result in procedure modifications.

8. The planned schedule shows that installation of the CSB plugs/impact limiters will not be completed until 5/18/99. This activity will be going on during the period that Start-up will be trying to run training and dry runs. With the cranes and support equipment on the CSB floor, the operations crew will not be able to run the MHM and perform their required activities.

Attachment 6 - Opportunities for Simplification

The following are candidates for simplification that should be considered:

1. **Finalize SNF conditioning requirements, and consolidate the CVD and HCS into a single step.**

   Presently, there are two related sets of problems in the design and development of the SNF Project conditioning systems:

   - The key conditioning process parameters (temperature, pressure and time) for hot conditioning (HCS) have not been finalized. Preliminary values are being used, but there are open questions remaining. Concerns have been raised regarding the advisability of bulk conditioning (HCS) of an entire MCO of fuel at very high (~300C) temperature.

   - CVD was conceived as a way to protect the critical path schedule, by permitting temporary staging and off-line hot conditioning. However, as it has evolved, the CVD itself is a large, complex, expensive and critical path facility. Further, temporary staging adds complexity to the overall process, and the double handling (associated with two-step conditioning) adds equipment, time and cost.

   These problems should be attacked in a parallel, coordinated manner. The proposed action items are:

   1.1. Evaluate, on an urgent basis, the suitability of conducting single-step treatment of the SNF at the K-Basins (in the CVD facility). This single-step process is presumed to be conceptually similar (or perhaps identical) to the existing CVD process; therefore, the evaluation must determine whether or not that limited process will achieve the required end state. As an alternative, consideration could be given to ways of modifying the CVD process (e.g., by increasing the CVD temperature), such that it would constitute sufficient processing without follow-up HCS.

   1.2. Similarly, evaluate the merits of consolidating the current cold vacuum drying and hot conditioning in a single step, to be conducted in the HCS station at the CSB. In this scenario, the fuel would be transported wet from the K Basins to the CSB, and would be dried and conditioned prior to storage. (There would be no staging period.) Therefore, de-watering capability at the CSB would be required, as would an acceptable means of returning the water to the basins or otherwise disposing of it. The SARP may also require some revision.

1.3. For both scenarios, the maximum conditioning temperature should be reexamined. A lower final temperature for HCS (e.g., between 170C and 200C, a temperature higher than any MCO in storage will ever reach) may produce acceptable bound water removal without the practical difficulty and potential safety concerns associated with 300C operation. Similarly, a higher temperature at CVD (i.e., higher than 50C) may increase the likelihood that CVD alone can be shown to be sufficient.

Note that the recently announced plan to delay HCS for one year cannot be accepted by RL, unless and until there is clear evidence (via the evaluations outlined above) that the CVD-only option is technically viable and will achieve the requirement for low mortgage interim storage.

2. **Simplify the design of CSB systems.**

Based primarily on the recommended safety analysis revisions, there are likely to be CSB simplification opportunities, which can yield long term operational cost savings. These are:

- Elimination of requirement for storage tube inerting
- Elimination of storage tube shield plug hold-downs
- Elimination of accident response filters and fans

The opportunities in this area are constrained by the advanced state of CSB engineering and construction. Clearly, any potential savings will have to be weighed against the costs of re-engineering, contract changes and physical modifications (if any). Time is a key factor here because CSB construction is proceeding and because any changes must be accomplished without impacting the critical path. For that reason, RL recommends immediate action to identify and conceptualize CSB simplifications.

3. **Simplify the design of MCO.**

The SNF Project will be building, testing and operating more than 400 MCOs; there is huge economic leverage on simplification. RL recognizes that the MCO design is nearly complete and changes will require time and effort. Nonetheless, the cost and reliability advantages warrant that another look should be taken at simplifying the MCO design, fabrication, and operations, consistent with the desired end point of sealed MCO storage with no pressure relief and no continuous monitoring.

Specifically:

3.1. Return to the original MCO closure concept in which the shield plug is welded to the MCO shell. This concept would eliminate the mechanical seal, threaded locking ring (and potential for thread galling between locking ring and MCO shell), and jacking bolts. The weld would provide the first of the two closure welds currently required for commercial SNF storage systems utilizing welded closures; the welded cover cap would serve as the second. Presuming NRC regulatory equivalency, this concept would allow storage of the MCO in the CSB storage tubes without inerting the tube or monitoring of the tube environment.

The following are additional opportunities for significant MCO simplification, with attendant savings in capital cost and operational efficiency. In each case, it is necessary to establish the technical basis and then implement the simplification:

3.2. Eliminate the MCO internal HEPA filters. In commercial nuclear applications, HEPA filtration is generally provided to reduce (or essentially eliminate) the release and transport of radioactive particulate material. In cases where safety analyses take credit for particulate removal to meet regulatory limits, the filtration system is safety grade. Since the MCO internal HEPA filters are not needed to satisfy regulatory limits, it appears that they can be eliminated.

3.3. Eliminate one penetration through the MCO shield plug. A review of the intended function of each MCO shield plug penetration during normal, off normal, and accident conditions indicates that at least one penetration is unnecessary and can be eliminated.

3.4. Eliminate the MCO pressure relief capability, consistent with the desired project end point. It is anticipated that the technical basis validation will confirm that MCO overpressure, sufficient to cause MCO loss of integrity, is not credible.

For each of the above changes pricing options to the awarded MCO fabrication contract should be obtained

4. Simplify the design of the MHM.

The current MHM design is untenable. Substantial simplification is needed. In particular, requirements for inerting, sealing and pressure containment can probably be eliminated (as demonstrated by the revised safety analysis work outlined above). The following actions are proposed:

4.1. Develop a performance specification for the MHM which would be applicable if it

were determined that MCO rupture (during MCO transport, transfer, staging, or storage) is not a credible event. Evaluate and document the design changes that could be made to the current MHM design, based on this alternative performance specification. The evaluation should include capital and operating cost estimate savings.

4.2. Similarly, evaluate and document the design and/or operational changes that could be made to accommodate MCO relief system actuation within the MHM. This evaluation can include consideration of relief system capping prior to MCO pickup, as a way of precluding (rather than accommodating) relief system actuation.

4.3. Develop an alternate shielded transfer cask that could be utilized at the CSB in the event that the MHM is inoperable. This alternative concept should be based on the premise that MCO rupture is not a credible event. The shielded transfer cask should be very simple in design and conceptually similar to casks currently utilized for transfer of commercial SNF.

There is very large uncertainty regarding the true potential for cost reduction, in light of the advanced design and fabrication status. RL agrees that serious effort should be applied to developing a redesign that makes best use of existing, purchased MHM material or equipment.

5. **Increase the schedule stagger between KW and KE operations**

In simplest terms, this change would involve basing all design, procurement, construction, staffing and operational planning on the assumption that the SNF would be removed from the K-Basins in sequence (that is, one basin at a time) or with substantially less schedule overlap than is presently planned. This would reduce and simplify the work needed to start fuel removal and would permit sharper management focus on operations at each basin. Furthermore, and very importantly, the initial operations at one basin would provide a full scale, production line test of the all designs, equipment and procedures, in time to make necessary changes or refinements before installing equipment and commencing operations at the other basin.

The primary penalty of a sequencing change would be an extension of the projected overall time (and end date) for removal of all SNF from the K-Basins. However, the true impact here is not easily predicted, because the elimination of parallel work paths and the more manageable single-basin operations would reduce vulnerability to schedule upsets.

FLUOR DANIEL

Fluor Daniel Hanford, Inc.
P.O. Box 1000
Richland, WA 99352

September 10, 1997 FDH-9758158

Ms. E. D. Sellers, Director
Spent Nuclear Fuels Project Division
U.S. Department of Energy
Richland Operations Office
Richland, Washington 99352

Dear Ms. Sellers:

CONTRACTOR REVIEW OF PROPOSED SPENT NUCLEAR FUEL PROJECT SCHEDULE

Attached is the Committee Report for the joint contractor review of the proposed revised schedules for the Spent Nuclear Fuel (SNF) Project. The review, conducted between August 22, and September 2, 1997, focused on overall integrity of the proposed schedule.

In summary, the committee found no realistic means of reducing the proposed 14-month delay of the start of fuel removal from the Basins. However, the schedules appear to present an aggressive approach and no major flaws in planning assumptions or schedule logic were found which would reduce the probability of meeting the proposed fuel removal date. Several sub-project activities were identified where continuous management attention could yield significant improvement in near-critical path areas, reducing overall schedule risk. Several improvements to schedule logic were identified, for incorporation, which also should improve the probability of success.

While extensive changes to the overall project structure, technical strategy, or priorities were not within the scope of this review, many strategy revisions within the sub-projects were found to be incorporated into the proposed schedules. Noteworthy examples include early acquisition of process hardware for first article testing by the Cold Vacuum Drying (CVD) Facility sub-project, and rethinking of the role of enabling assumptions and characterization data in constraining safety analysis. It should be noted that the proposed schedule includes activities to investigate the elimination of the Hot Conditioning process based on results of a joint contractor/U.S. Department of Energy, Richland Operations Office review of overall technical strategy conducted in June as part of the Risk-Based Schedule Analysis process.

Schedule improvements described in the attachment are being incorporated into the proposed schedules. The risk analysis model, with the changes, will be run to determine changes in success probability and to finalize identification of key schedule drivers. Results will be documented in an ARES report.

If you have any questions, please call me on 373-6307, or Mr. E. W. Gerber of my staff on 376-9356.

Very truly yours,

N. H. Williams, Project Director
Spent Nuclear Fuel Project

ljc

Attachment

FDH-9758158

Attachment

Committee Report
Spent Nuclear Fuel Project Schedule Review

Consists of 7 Pages
Including Cover

COMMITTEE REPORT

SPENT NUCLEAR FUEL PROJECT SCHEDULE REVIEW

September 9, 1997

Objective

The Spent Nuclear Fuel (SNF) Project has proposed modified schedules which delay the start of fuel removal from the K Basins to July 30, 1999, a delay of 14 months from the current baseline. As part of the process to review and finalize modification of the baseline schedule a contractor committee was formed to review the schedules with the following three objectives:

1. Determine if the proposed schedule is viable and free of major logic or planning assumption errors which could impact the Project's ability to meet the revised fuel removal start date.

2. Review critical path or near-critical path sub-projects to identify potential changes in schedule logic or strategy which could reduce the 14-month delay without appreciable added risk.

3. Identify sub-project activities where additional management attention or alternate strategies could shorten schedule durations and increase the probability of success.

Process

The committee was formed on August 22, 1997 and conducted a series of schedule reviews and topical meetings through September 2, 1997. Committee members included:

George Babenko, MACTEC
Eric Gerber FDH, (Chairman)
Bruce Kirstein, FDI
Csaba Molnar, FD - Fernald
Bill Rasin, DESH
Bob Wilkinson, DESH

Committee interviews with sub-project managers were conducted jointly with the U.S. Department of Energy, Richland Operations Office (RL) schedule review committee to minimize time impacts on Project staff. Sub-projects with activities on or within sixty days of the critical path were reviewed. These included:

	Proximity to Critical Path (Float in Working Days)
Cold Vacuum Drying (CVD)	On Critical Path
Integrated Water Treatment (IWTS)	37
Fuel Retrieval System (FRS)	31
Startup/ORR	On Critical Path
Safety Analysis (Crosscut)(SAR)	10
Characterization	12
MCO/Cask Loading	18
Canister Storage Building (CSB)	38

All Level Three schedules were reviewed for each of these sub-projects with focus on critical activities. The Cold Vacuum Drying (CVD) Project Level Four schedule was also reviewed. In addition, topical meetings were held to further review two areas of concern which arose during schedule reviews: manual fuel handling to shorten the fuel retrieval schedule; and detailed discussion and agreement as to the extent of safety analysis required and the RL approval process necessary to satisfy installation of major modifications hardware in the K Basins. In all cases, the sub-project managers were well prepared and their cooperation and effort are appreciated.

Conclusions and Recommendations

1. Based on this review, the committee found the schedules to be viable and found no realistic way of shortening the fourteen month delay to start of fuel removal without substantially increasing programmatic risk. In several cases, individual sub-projects had improvements which shortened their own critical paths but had no impact on the overall SNF Project critical path. These sub-project scheduled improvements are noted in Item 6 below and should improve the overall probability of schedule success.

2. Several sub-project activities were identified where continuous management attention could yield significant improvement in that sub-projects critical path. For example, it was noted by the Integrated Water Treatment System (IWTS) Project Manager, Jim Loomis, that it was possible that additional work with their primary vendor could accelerate deliveries and/or enable parallel installation to a greater extent. Such improvements would further distance IWTS activities from the SNF Project critical path and support accelerated start of Fuel Retrieval System (FRS) Pre-Op testing with IWTS.

3. The committee did not find major disconnects in Project logic or planning assumptions which would jeopardize overall viability of the proposed schedule. A number of errors were found including unnecessary logic restraints and schedule date constraints, and small inconsistencies with Safety Analysis Report (SAR) planning assumptions. However, these have no apparent impact on overall Project start or end dates. Most of these errors were noted by scheduling staff during the meetings for later correction and only the most noteworthy are listed in item six below.

4. The committee found no characterization or enabling assumptions on the SNF Project critical path. Only one characterization task is near the critical path, initial whole element drying tests, which restrains finalization of CVD process design. Other characterization tasks shown near the critical path were found during the review to unnecessarily constrain other activities and can be removed from the list of activities within 60 days of the critical path.

5. During the period of the review the committee found instances of continued change to the schedule database. The schedule should be placed under configuration control even during its final revision prior to approval as the baseline.

6. Meetings were held on August 27 and 28 to discuss the possibility of using manual fuel handling, at least during initial operation, to accelerate the availability of the FRS. The committee concludes the following:

   A. Manual fuel handling to sort fuel and load Multi-Canister Overpack (MCO) baskets is feasible and could be achieved relatively quickly to provide a backup to the remote manipulators.

   B. Unless major modifications are made to the K Basins' operations deck (grate) and to the loading table and possibly fuel baskets, throughput would be less than that needed to support current schedules for operation.

   C. If the manual system can be fabricated quickly, the best schedule acceleration accomplished by removal of the remote manipulators from the FRS critical path is two months with no improvement to the overall SNF Project fuel removal start date. At that point other FRS components become schedule-limiting. It should be noted that the FRS project manager has included in the proposed schedule nearly three months contingency for late delivery of the remote manipulators (because of the vendor's historical performance).

   D. Operations staff believed that some remote operation capability is desirable as a backup, or for recovery from upset and unforeseen conditions. The FRS project manager has no plans to deliver such a system. It is recommended that further discussions occur between Operations and FRS project staff to decide whether or not the backup system is justified and plan accordingly.

7. A meeting was held on September 2, 1997, to determine specific requirements for safety analysis as a condition of installation of hardware in the K Basins. The general requirements are outlined in the "Spent Nuclear Fuel Schedule Key Drivers Resolution Committee" report dated August 15, 1997. This meeting addressed details from submittals to RL, and RL reviews and approvals, as applied to three major modifications: FRS; IWTS; and MCO/Cask Loading. Agreements reached between DE&S Hanford, Inc. (DESH), Fluor Daniel Hanford, Inc. (FDH), and RL follow and should be used to schedule the safety analysis submittals described:

A. Safety analysis needed by DESH to assign safety class and quality requirements to procured equipment should suffice to support construction/installation. This analysis is to be augmented by Unreviewed Safety Questions (USQ) screenings for the installation activities themselves (heavy lifts, etc.).

B. DESH/FDH is to assemble that existing documentation and transmit it as the basis for installation for RL review. The analysis will then be incorporated into the next K Basin SAR update which will undergo for RL review and approval. If RL concludes during its review that the analysis is inadequate then appropriate actions, including possible work stoppage, will be determined by RL in conjunction with FDH and DESH.

C. Since Critical Decision 3 is already granted for MCO/Cask Loading, installation may proceed with the above actions occurring in parallel.

8. Listed below are specific recommendations resulting from the committee's review. The recommendations primarily identify sub-project activities that should be reviewed and modified now or receive continued management focus to improve schedules and probability of success:

A. Further review of imposed schedule logic constraints (approximately 250), and open-ended activities shown in the schedules, is warranted. In several instances, unnecessary constraints near the critical path were identified to the sub-project manager during committee review meetings.

B. Schedules for IWTS, MCO/Cask Loading, and FRS do not yet consistently reflect generation of RL-approved safety documentation prior to installation in the K Basins. A series of three meetings are being scheduled by DESH and FDH with RL staff to arrive at a detailed agreement for each of these projects as to level of safety analysis required and specific RL approvals. The meetings should be completed during the week of September 2. Results of these meetings will need to be reflected in the schedules.

C. The committee suggests reviewing the logic for combining the CVD FSAR into the K Basin FSAR. Justification for the current strategy was not made clear during review of CVD on the SAR tasks and the added step of the extra SAR imposes an added critical path activity.

D. The CVD sub-project should continue to refine the first article testing and design verification activities to find opportunities for schedule improvement. Such improvement would directly reduce risk to achieving the July 1999 fuel removal start.

E. FRS has potentially restrained start of installation by full completion of its safety assessment document (SAD). Installation could be accelerated with an intermediate SAD.

F. FRS has included 60 working days for late manipulator delivery in its schedule to reduce risk. This added contingency duration places the

activity on the FRS critical path. This approach lowers risk, but appears inconsistent with schedule risk management elsewhere.

G. For IWTS, two key activities warrant close management for potential schedule improvement. These are fabrication and delivery of process equipment and subsequent installation in the basin. These activities are shown in series with no overlap and have not been optimized.

H. Within the CSB sub-project the installation of tube plugs and impact limiters have fallen onto its critical path due to funding constraints. This activity also conflicts with testing and startup activities scheduled to be conducted in the same part of the facility. Consideration should be given to reevaluating the funding constraint to allow some schedule flexibility and reduce the risk of impacting facility startup due to interference with training and testing activities.

I. The current SNF Project schedules show no planned activity for safeguards and security requirement assessments which may be necessary for operation. The requirement for this assessment should be verified and the schedule augmented if necessary.

J. Overall schedule logic for procedure development, training, startup testing, and readiness reviews is adequate. The greatest risk lies in the large number of parallel activities scheduled within a short period of time. Further work is needed over the coming months to refine the turnover process from construction to operations such that interferences can be identified early. It would also be prudent for the sub-projects to start procedure preparation as early as possible to reduce schedule risk.

K. FSAR preparation for the CSB and the 100 K Area schedules a large number of parallel activities during a relatively short period. The committee found one instance where the FSAR (for the CSB) could begin earlier by eliminating an unrealistic schedule constraint, assuming resources are available earlier. Further detailed review of this area is warranted to attempt to move start of FSAR activities forward to reduce risk.

L. The SAR preparation staff mentioned that certain design details constrained preparation of SAR phases and FSARs, yet there is no definitive list of these critical needs. A list of design needs outside of those included in enabling assumptions should be generated to support prioritization and management.

M. Cask/MCO Loading schedule was greatly improved by an effort championed by Bill Gallo. It appears that by allowing parallel procurement and installation, approximately 10 weeks can be cut from this sub-project's schedule. Additional detailed procurement and equipment installation activities and logic should be added to the sub-project's schedule. Hold points for RL review of safety analysis documentation supporting installation needs to be added to the schedules since the 10 week savings may be reduced by these activities.

N. The CSB's MCO Handling Machine hoist procurement schedule is being reviewed by the Project Manager for improvement. Success would shorten the schedule for CSB completion if impact limiter/tube plug installation is accelerated as discussed in Item H above. Start of the CSB FSAR is shown to be constrained by several enabling assumptions and the gas cart design. However, after discussion with CSB staff these constraints were found to be invalid and it may be possible to accelerate start of FSAR preparation.

9. A top-level review of the Sludge Removal Project was performed to evaluate feasibility of accelerating completion of removal, treatment, and disposal of the K Basins sludge. A one-year acceleration, with completion in September 2002, appears feasible without appreciably impacting probability of success and accelerates closure of the K Basins by a year as well. Further acceleration of the Sludge Removal Project will not further change Basins closure dates because water remediation and debris removal activities become constraining. The year acceleration would likely result in the following impacts:

   A. Sludge Removal costs would increase approximately $10-15M because acceleration would require construction of a new facility to house the treatment process. Use of the CVD facility would not be feasible because processing of MCOs would interfere with necessary sludge equipment installation and testing activities.

   B. Cost of the Basins operations would be reduced $20-25M due to accelerated closure.

   C. Additional Sludge Project funding would be required in FY 1998 through 2001 in the following approximate amounts:

Fiscal Year	Additional Budget ($M)
1998	1 - 2
1999	2 - 3
2000	13 - 16
2001	1 - 4
2002	5 - 6 (savings)
2003	4 (savings)

Therefore, the net savings would be approximately $10M, assuming a shift in the funding profile as discussed above.

Hanford Spent Nuclear Fuel Project

Schedule Changes Major Impacts

- **CVD Definitive Design** **+12 Months**

  –Rapid Reaction Rate Resolution

  –Thermal Analysis/characterization data impacts

  –FMEA: Safety Class System Upgrades

- **CVD Pre-Operational Acceptance Testing** **+ 2 Months**

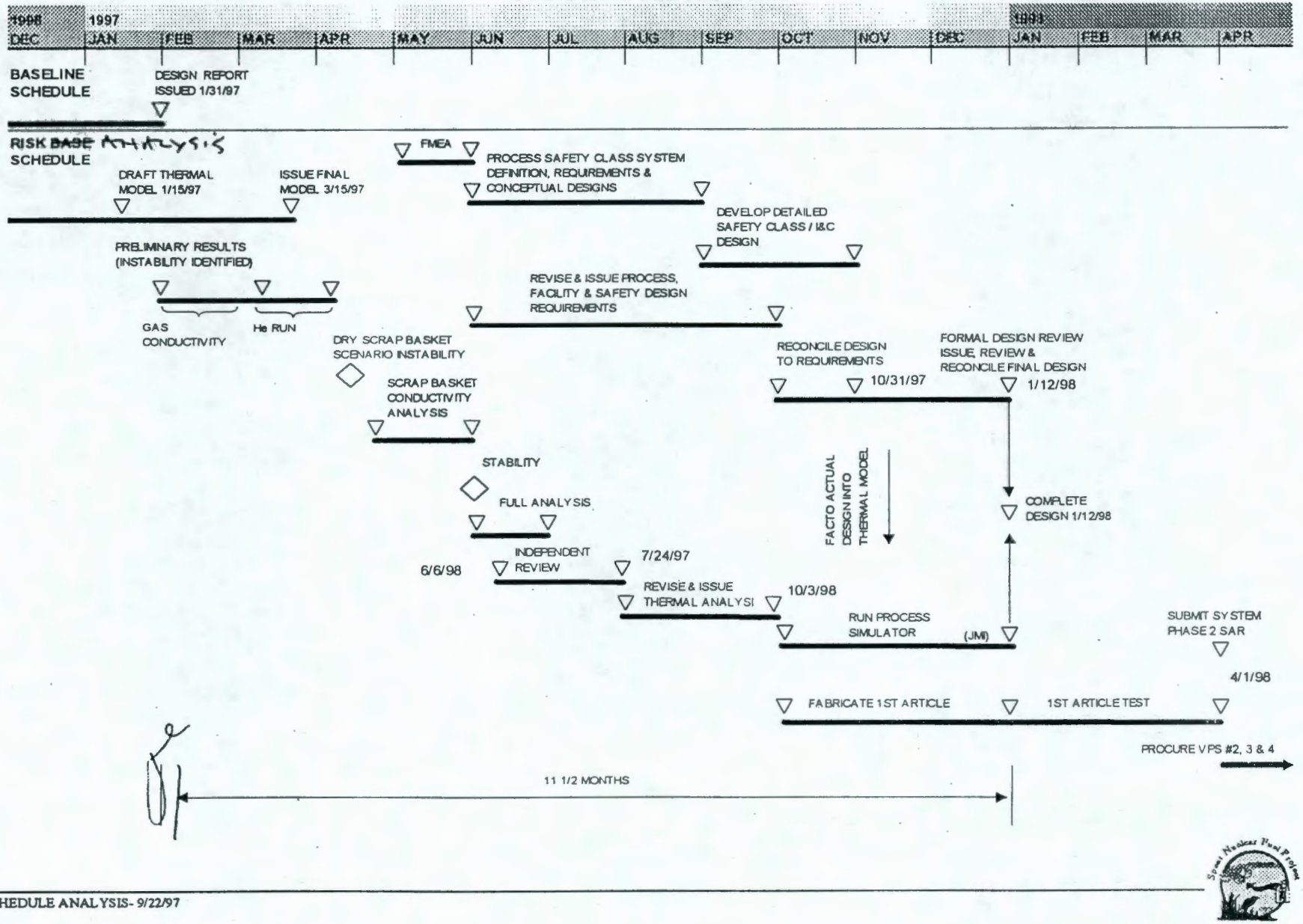
  -PAT includes all 4 bays

  -Extended based on detailed evaluation of required testing

- **Total CVD Impact to Critical Path** **14 Months**

Hanford Spent Nuclear Fuel Project

SPENT NUCLEAR FUEL PROJECT
CVD SCHEDULE ANALYSIS



Schedule Changes Major Impacts

- **MHM Design** +4 1/2 Months

  - *Delay of vendors release due to criteria challenges (single failure proof hoist)*

- **MHM Fabrication/Installation** + 4 1/2 Months

  - *Prefabrication & testing of turrent/hoist/grapple system*

  - *Lost place in hoist vendor que*

Total Subproject 9 Months

Schedule Changes Major Impacts
(Continued)

- **IWTS Design/Procure** — **+4 Months**
  - *Criticality prevention*
  - *Safety Class equipment requirements*
  - *Submerged, safety class setting tanks*
  - *Filtration system selection*
- **IWTS Installation** — **+5 Months**
  - *Build-to-print installation vs. skid*
  - *Safety Class equipment*

Total Subproject — **9 Months**

Schedule Changes Major Impacts
(Continued)

- **FRS Design/Procure** **+6 1/2 Months**
  - *Criticality analysis and modeling impacted design*
  - *Manipulator contract design/fabrication delays*
- **FRS In-Pool Demonstration**
  - *Revised estimate based on specific design* **+1 1/2 Months**

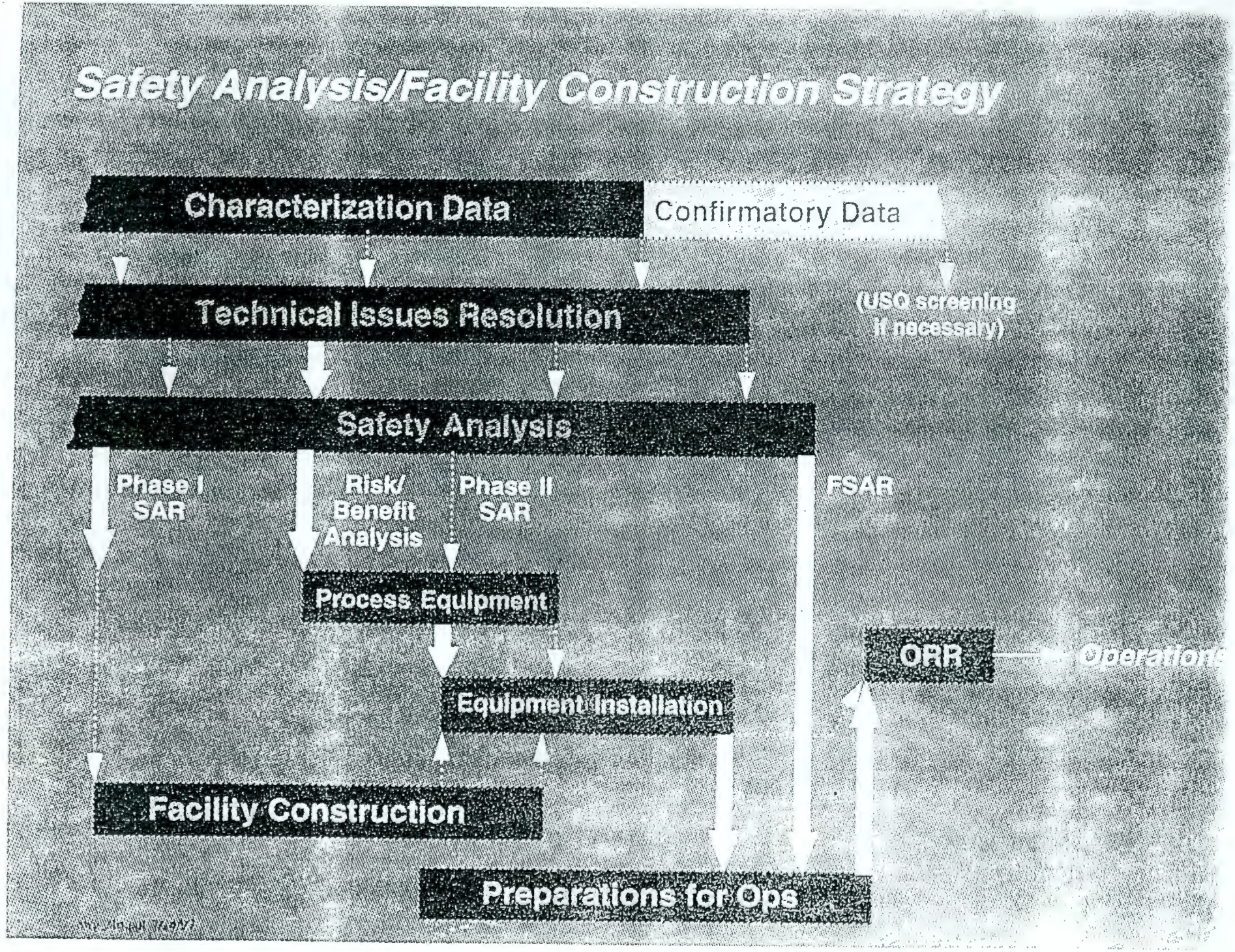
Total Subproject **8 Months**

Risk Based Schedule Modifications

- Optimized and integrated closure of technical issues (enabling assumptions and characterization data)
- Incorporated new SAR template to decouple SAR preparation from critical path as much as possible
- Established a frame work for minimal risk procurement and installation on an accelerated basis
- Revised CVD procurement strategy to accelerate first of four units to test (1st article testing) in order to reduce start-up risk
- Added MHM preassembly strategy to reduce start-up risk
- Recognized need to upgrade technical baseline and make program improvements now to be ready for ORR

Risk Based Schedule Modifications
(Continued)

- Incorporated the impacts of technical issue resolution on subproject design and procurement activities
- Optimized ORR preparation schedule while providing appropriate durations for associated activities
- Added new scope (KQ rack and sludge removal, sludge pretreatment)
- Deferred HCS in FY98 and incorporated an activity to assess the need for the second conditioning step


Safety Analysis/Facility Construction Strategy
Characterization Data
Confirmatory Data
Technical Issues Resolution
(USQ screening if necessary)
Safety Analysis
Phase I SAR
Risk/ Benefit Analysis
Phase II SAR
FSAR
Process Equipment
ORR
Operations
Equipment Installation
Facility Construction
Preparations for Ops

General Schedule Bases

- Implementation of revised SAR strategy which takes advantage of preliminary level documentation and risk-0based decisions relative to procurement/installation (KDRC Agreements)

  - *CVD*
  - *IWTS*
  - *FRS*
  - *Cask Loadout*

- Two FSAR's - 100 Area and 200 Area

- Enabling Assumption closure will not change current technical approach (not on critical path)

- Sufficient resources will be available for key activities:

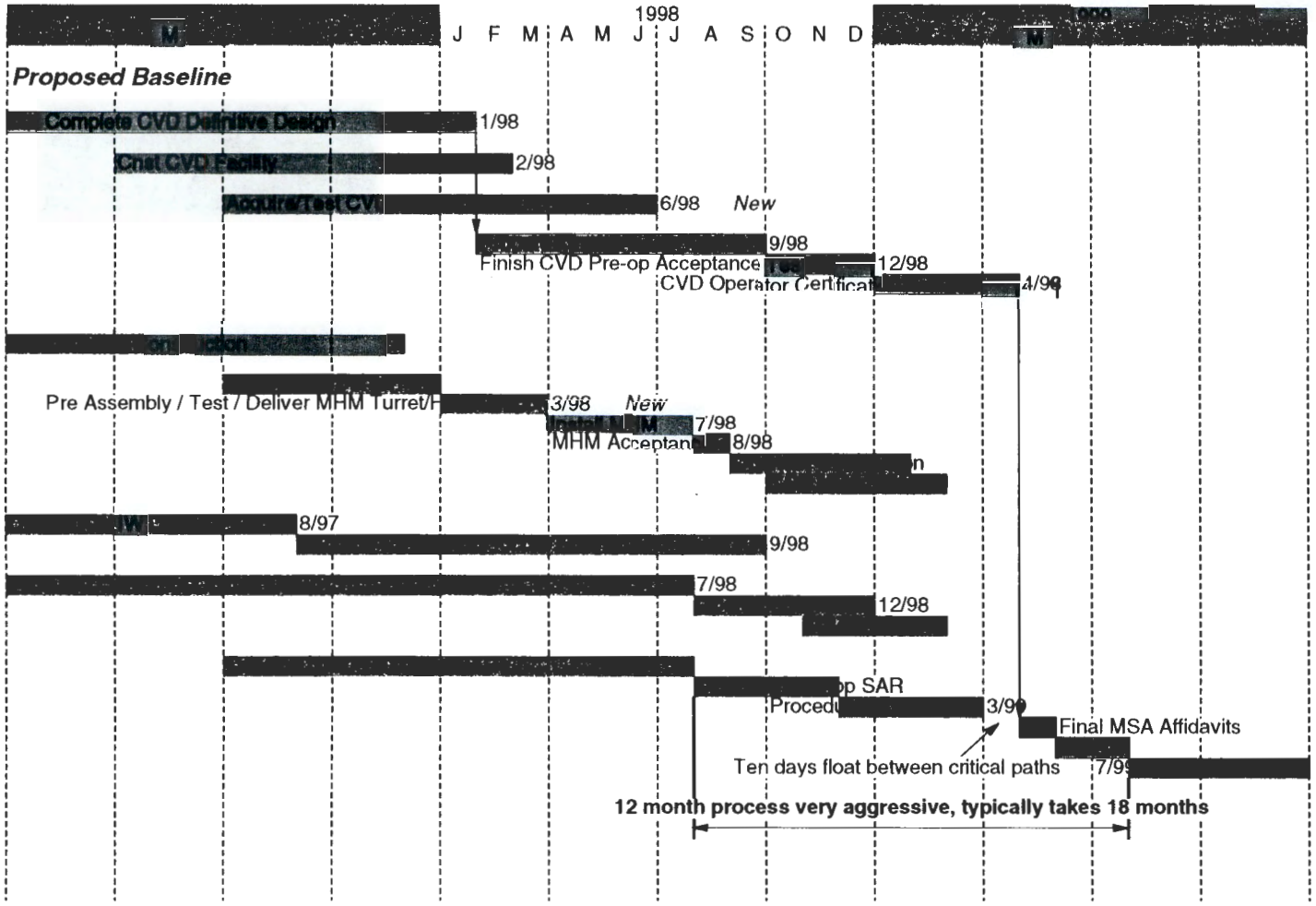
  - *SAR reviews (management pinch point*
  - *Procedure preparation*
  - *Operators*
  - *HP Technicians*

General Schedule Bases
(Continued)

- Minor front end installations related to major subprojects in the K Basins will proceed in accordance with KDRC Agreements
- FRS mock-up activities remain as previously assumed; No additional mock-up activities added
- Operations activities consistent with existing WITNESS model
- MCO Overpack not included in current baseline and not included in proposed schedule
- Inerting included (under review)
- HCS activities put on hold for FY98. Evaluation of the need for this processing step to be conducted by January 1998. Possible elimination
- Construction integration for K Basin Projects will not cause a slip in the critical path (IWTS design just completed to allow for this assessment)

General Schedule Bases
(Continued)

- Fuel movement begins in KW with KE starting movement 6 months later (under review)
- 6 months between basins is considered optimal by Operations personnel
- Sludge processing will take place in the CVD Facility (under review)
- Basin activities (sludge processing) will be conducted under CERCLA



SNF Critical Path

9/23/97

Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
PROJECT INTEGRATION 1.4.1.01					
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AAW00B		31JUL01		31JUL00	-251
AAW00C		15NOV02		22MAR01	-417
AAW00D		23SEP03		30AUG01	-517
AAW00E		30SEP03*		30SEP01*	-502
AAWB201C		31DEC96A		31DEC96*	0
AAWB201D		31DEC96A		31DEC96*	0
AAWBA1	01OCT96A	30SEP97	01OCT96	30SEP97	0
AAWBA2	01OCT97	30SEP98	01OCT97	30SEP98	0
AAWBA3	01OCT98	30SEP99	01OCT98	30SEP99	0
AAWBA4	01OCT99	29SEP00	01OCT99	29SEP00	0
AAWBA5	02OCT00	28SEP01	02OCT00	28SEP01	0
AAWBA6	01OCT01	30SEP02			0
AAWBA7	01OCT02	30SEP03			0
AAWE100010	01OCT96A	30SEP97	01OCT96	30SEP97	0
AAWE100012	02SEP97*		02SEP97*		0
AAWE100013	01OCT97	30SEP98	01OCT97	30SEP98	0
AAWE100014	01OCT98	30SEP99			0
AAWE100015	01OCT99	29SEP00			0
AAWF10001A	01OCT98	30SEP99			0
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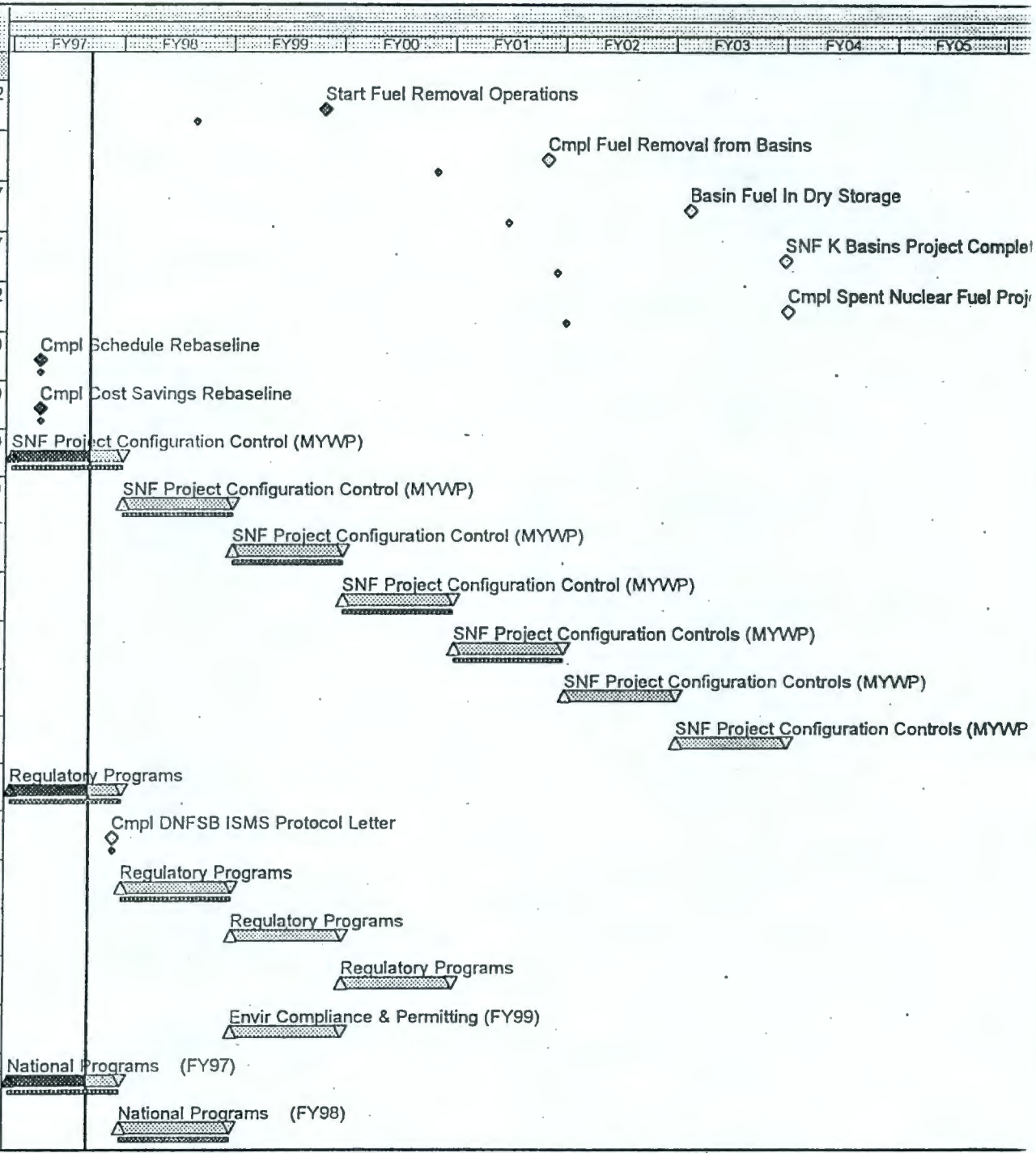

Project Start 01OCT92
Project Finish 29SEP17
Data Date 16JUN97
Print Date 18SEP97

Early Bar
TA11
Progress Bar
Critical Activity

SF98

DRAFT

DUKE ENGINEERING & SERVICES HANFORD
RISK ASSESSMENT BASIS
Rev "C" Draft SF98/TA11 09/16/97

Date	Revision	Checked	Approv

Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AAWG10110E	01OCT98	30SEP99	01OCT98	30SEP99	0
AAWG10110F	01OCT99	29SEP00	01OCT99	29SEP00	0
AAWN10015		30DEC97*			0
Technical Assessment Support to SNFP					
AGW2690	01OCT97*	30SEP98			0
SYSTEMS INTEGRATION 1.4.1.02					
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BAW03095	05SEP97	30OCT97			0
BAWA20200		13DEC96A		16DEC96*	1
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BAWA20206	16JAN97A	28FEB97A	16JAN97	28FEB97	0
BAWA20208		13DEC96A		15JAN97*	20
BAWA20210	16DEC96A	28FEB97A	16JAN97	28FEB97	0
BAWA20211	12MAY97A	10JUN97A	03MAR97	31MAR97	-50
BAWA20212	11JUN97A	24SEP97	01APR97	15JUL97	-50
BAWA202130		30SEP97*		30SEP97*	0
BAWA20214	25JUN97	10NOV97	15APR97	29AUG97	-50
BAWA202150		14NOV97*		14NOV97*	0
BAWB10300	01OCT96A	15NOV96A	01OCT96	15NOV96	0
BAWB10310	18NOV96A	10DEC96A	18NOV96	31DEC96	13
BAWB10320	03MAR97A	30JUN97	03MAR97	16MAY97	-30
BAWB105F	07MAY97A	25AUG97			0
BAWB201C	01OCT96A	30SEP97	01OCT96	30SEP97	0
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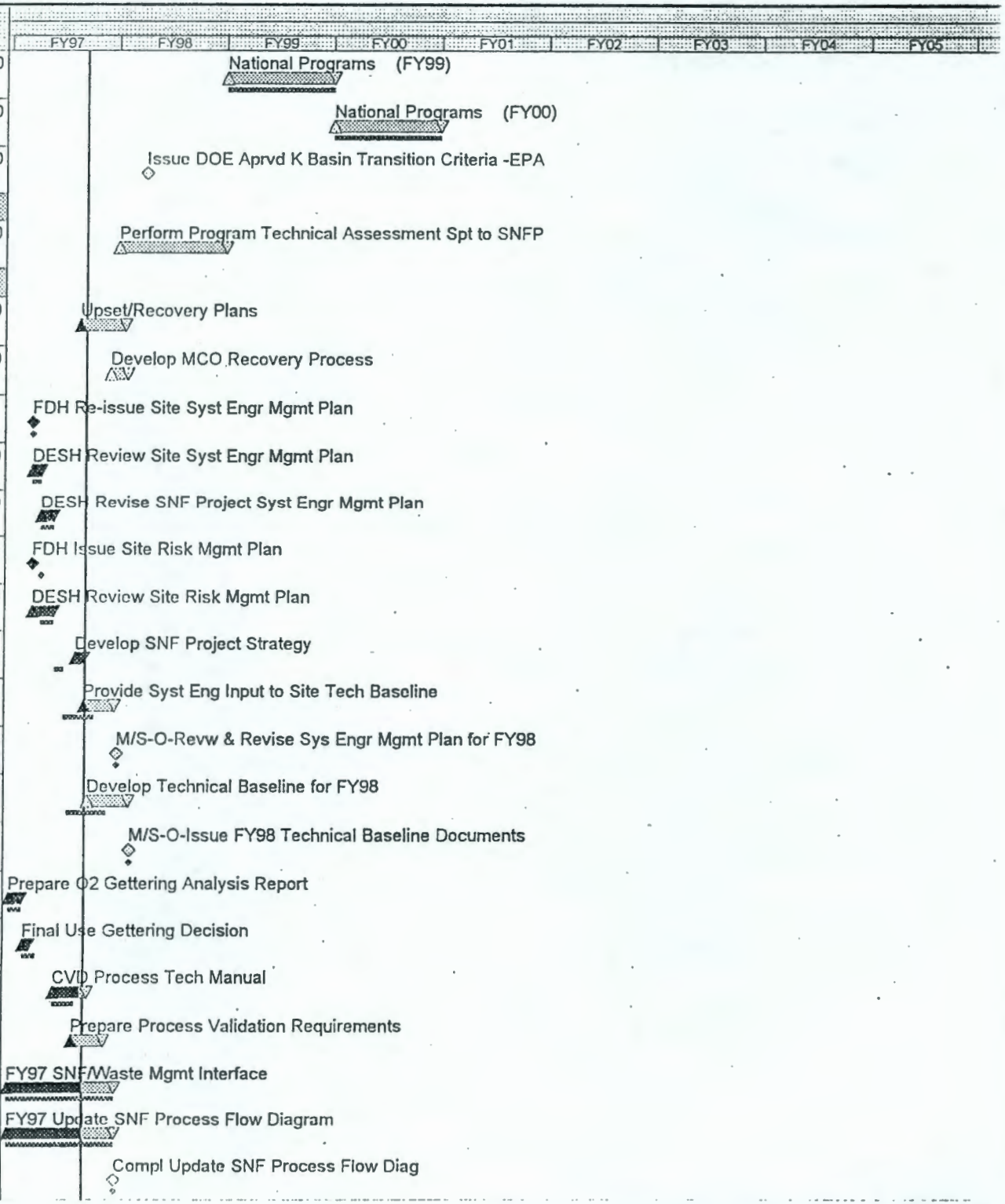

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BAWB502	01OCT96A	30SEP97	01OCT96*	30SEP97	0
BAWB50210A	07OCT97	24NOV97			0
BAWB50215	25OCT96A	13DEC96A	25OCT96	13DEC96	0
BAWB50235	16DEC96A	30JUL97	16DEC96	30JUN97	-20
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CHARACTERIZATION 1.4.1.02.01.04					
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BBW4303D-2	01OCT96A	07MAR97A	28OCT96	03MAR97	-4
BBW4401A6	16OCT96A	14FEB97A	16OCT96	13FEB97	-1
BBW4401A7	31OCT96A	14FEB97A	31OCT96	12DEC96	-43
BBW4401B-1	20JAN97A	20FEB97A			0
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BBW4401B-3	03MAR97A	06MAR97A			0
BBW4401C-1	09DEC96A	10JAN97A	18NOV96	07MAR97	39
BBW4401D	10MAR97A	30JUN97	07APR97	16MAY97	-30
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BBW4511A-1	14MAR97A	04SEP97	14APR97	16JUL97	-35
BBW4511A-3	05SEP97*	02OCT97	17JUN97	16JUL97	-55
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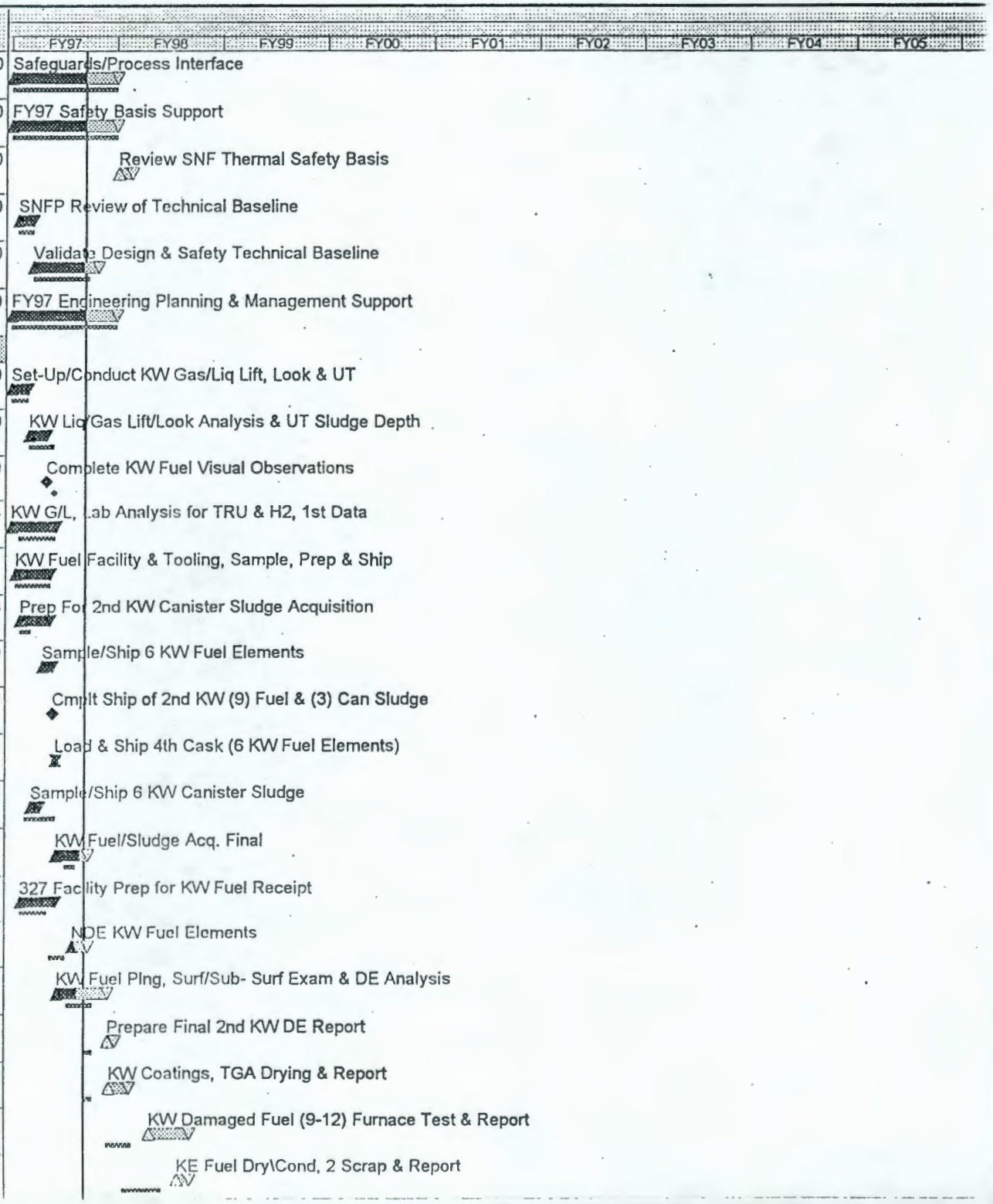

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BBW4605A-1	01OCT96A	31JUL97	01OCT96	25FEB97	-109
BBW4605A-2	01AUG97	21NOV97	26FEB97	07MAY97	-138
BBW4605A-3	29SEP97	13APR98	24APR97	04AUG97	-173
BBW4605A-4		13APR98		25AUG97*	-158
BBW4605A-5	14APR98	13AUG98			0
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BBW4605A-7	17JUN98*	22DEC98			0
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BBW4605B	01OCT98	31MAR99			0
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BBW4606A-2	11AUG97	08SEP97	18JUN97	17JUL97	-36
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BBW4610A-5		05OCT98			0
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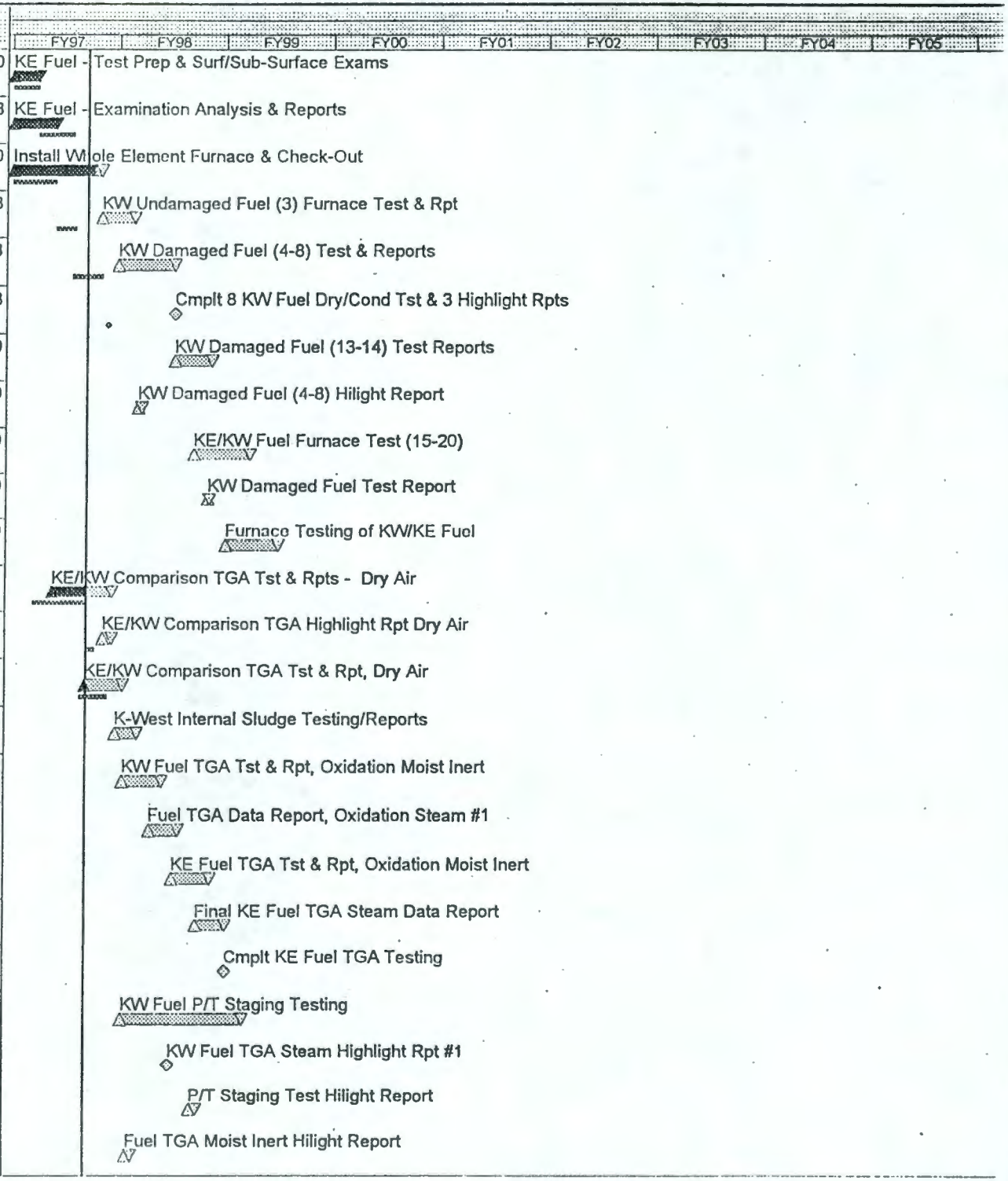

Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
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BBW4903B-1		05AUG97		05MAY97*	-63
BBW4903B-2	01OCT96A	07MAR97A	01OCT96	14MAR97	5
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BBW4905A-2	16JUN97	14NOV97	08AUG97	19SEP97	-40
BBW4905A1		02SEP97		19SEP97	13
BBW4905A2	18JUL97	15AUG97			0
BBW4905AB	01OCT97	17NOV97			0
BBW4905C	05DEC97	11FEB98	20FEB98	02APR98	35
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BBW4922	01JUL98	30SEP98	01JUL98	30SEP98	0
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BCWD143	01OCT96A	24OCT96A	01OCT96	24OCT96	0
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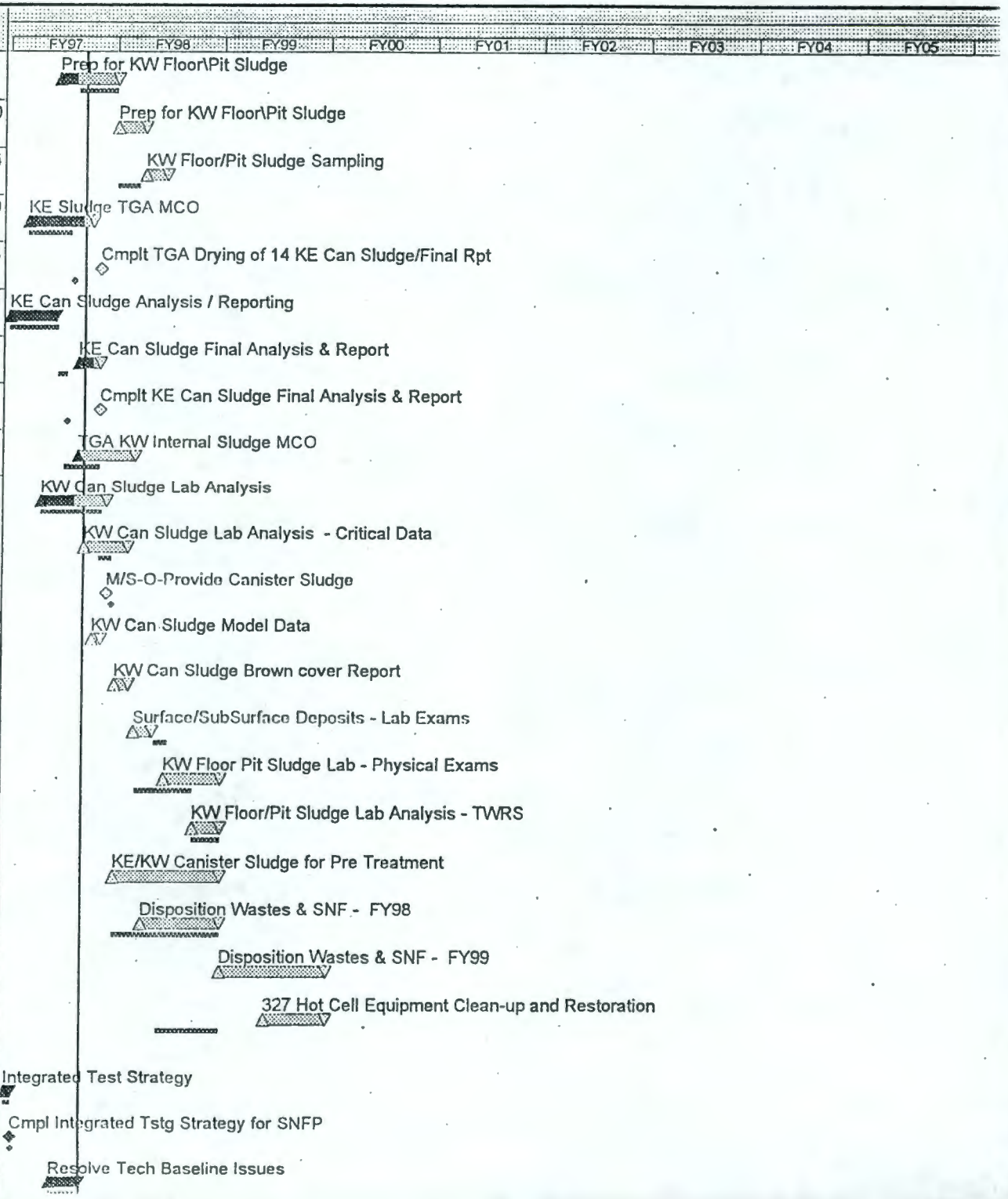
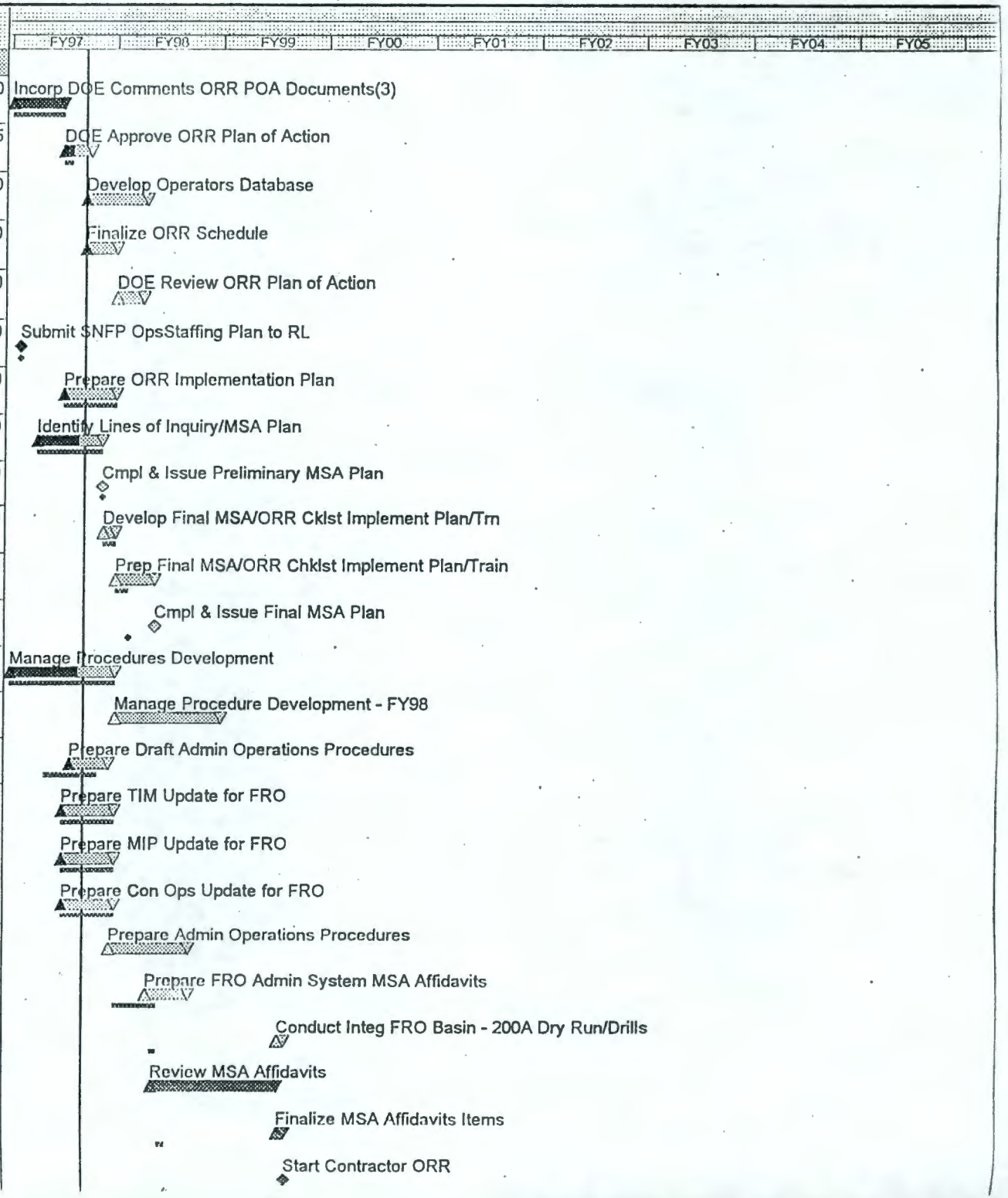
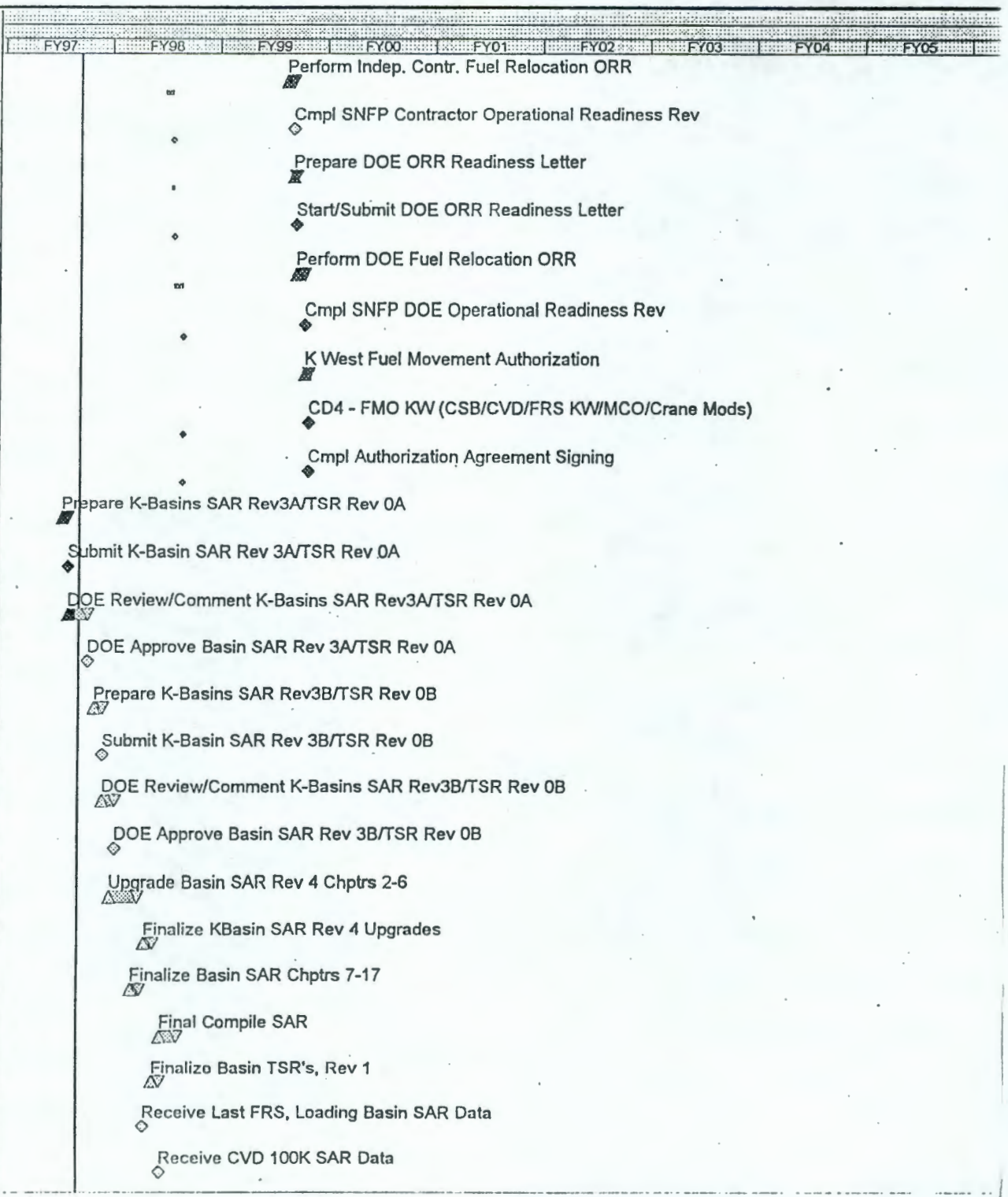


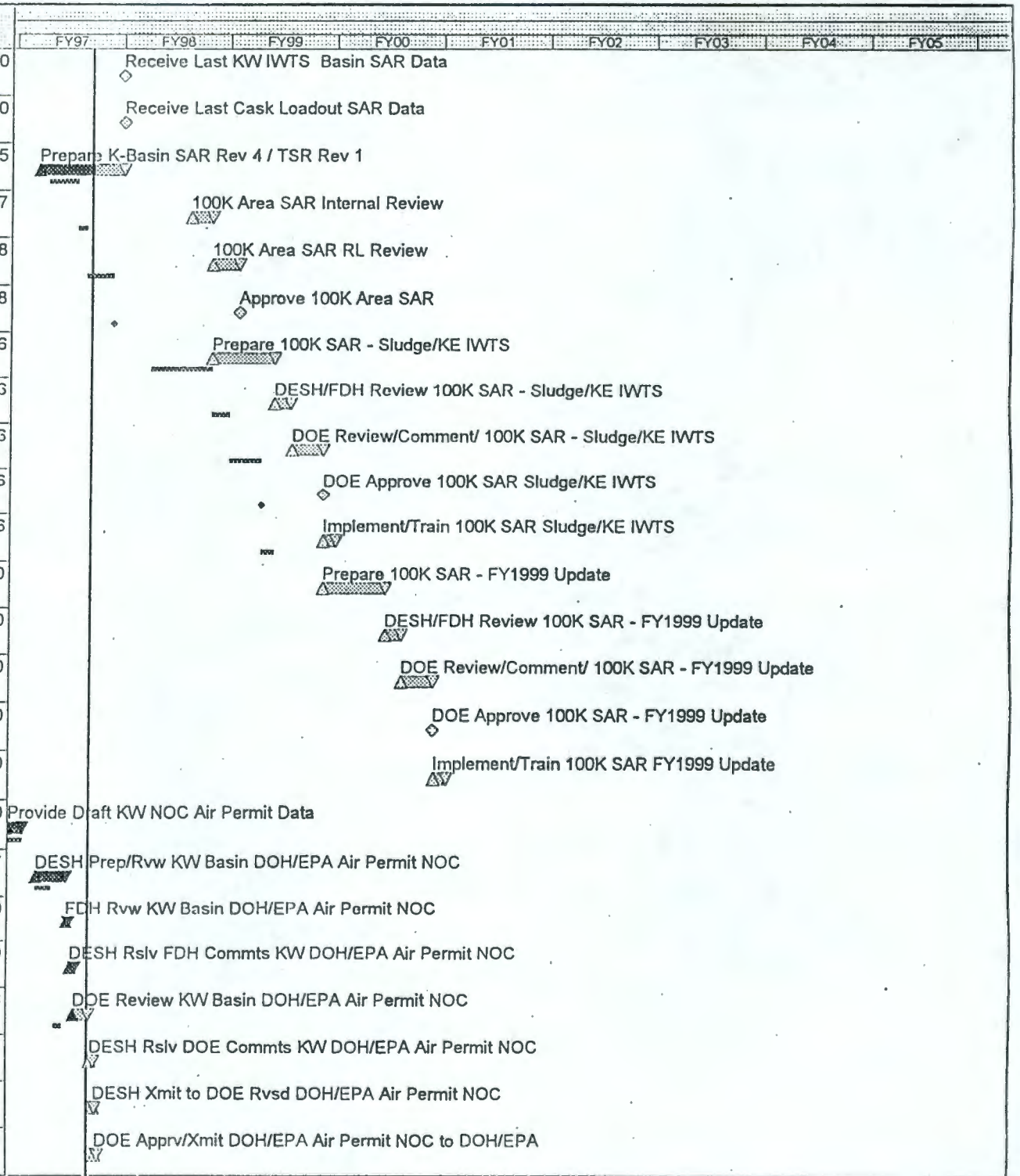
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
K BASINS MAINTENANCE & OPERATIONS 1.4.1.03					
DAW01A04	01OCT96A	28MAR97A	01OCT96	28MAR97	0
DAW01A04A	31MAR97A	01JUL97	31MAR97	28APR97	-45
DAW01A04B	16JUN97A	15JAN98			0
DAW01A04C	16JUN97A	30SEP97			0
DAW01A04D	01OCT97	31DEC97			0
DAW01A06A		31OCT96A		31OCT96*	0
DAW01A10	01APR97A	30SEP97	01APR97*	30SEP97	0
DAW01A12	02JAN97A	15AUG97	02JAN97*	15AUG97	0
DAW01A12A		15AUG97		15AUG97	0
DAW01A14	18AUG97	30SEP97	18AUG97	30SEP97	0
DAW01A14A	01OCT97	12FEB98	01OCT97	14NOV97	-59
DAW01A14B		12FEB98		14NOV97	-59
DAW01A16A	01OCT96A	30SEP97	01OCT96	30SEP97	0
DAW01A16B	01OCT97*	30SEP98			0
DAW01A16F	01MAY97A	12SEP97	03FEB97*	31JUL97	-30
DAW01A17D	01APR97A	30SEP97	01APR97*	30SEP97	0
DAW01A17E	01APR97A	30SEP97	01APR97*	30SEP97	0
DAW01A17F	01APR97A	30SEP97	01APR97*	30SEP97	0
DAW01A18	15SEP97	15JUN98			0
DAW01A20	21JAN98	15JUN98	01OCT97*	27FEB98	-75
DAW01A20A	20APR99	10MAY99	06FEB98	27FEB98	-301
DAW01A20B	10FEB98*	19APR99			0
DAW01A23	20APR99	17MAY99	03MAR98	31MAR98	-284
DAW01A23A		17MAY99		31MAR98	-284



Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
DAW01A24	18MAY99	03JUN99	01APR98	24APR98	-281
DAW01A24A		08JUN99		24APR98	-281
DAW01A25	09JUN99	15JUN99	22APR98	30APR98	-282
DAW01A25A		15JUN99		30APR98	-282
DAW01A26	16JUN99	15JUL99	01MAY98	29MAY98	-282
DAW01A27		15JUL99		29MAY98	-282
DAW01A27D	16JUL99	29JUL99			0
DAW01A28	30JUL99		30MAY98		-292
DAW01A28D	30JUL99		30MAY98		-292
DAW02A02A	15APR97A	06MAY97A			0
DAW02A02B		06MAY97A			0
DAW02A02C	07MAY97A	14JUL97			0
DAW02A02D		14JUL97			0
DAW02A03A	08AUG97	05SEP97*			0
DAW02A03B		05SEP97*			0
DAW02A03C	08SEP97	21OCT97			0
DAW02A03D		21OCT97			0
DAW02A04A	01OCT97	06JAN98			0
DAW02A04D	28JAN98	25FEB98			0
DAW02A04F	15DEC97	14JAN98			0
DAW02A06A	26MAR98	20MAY98			0
DAW02A06D	26FEB98	25MAR98			0
DAW02A08D		27JAN98			0
DAW02A08E		25MAR98			0



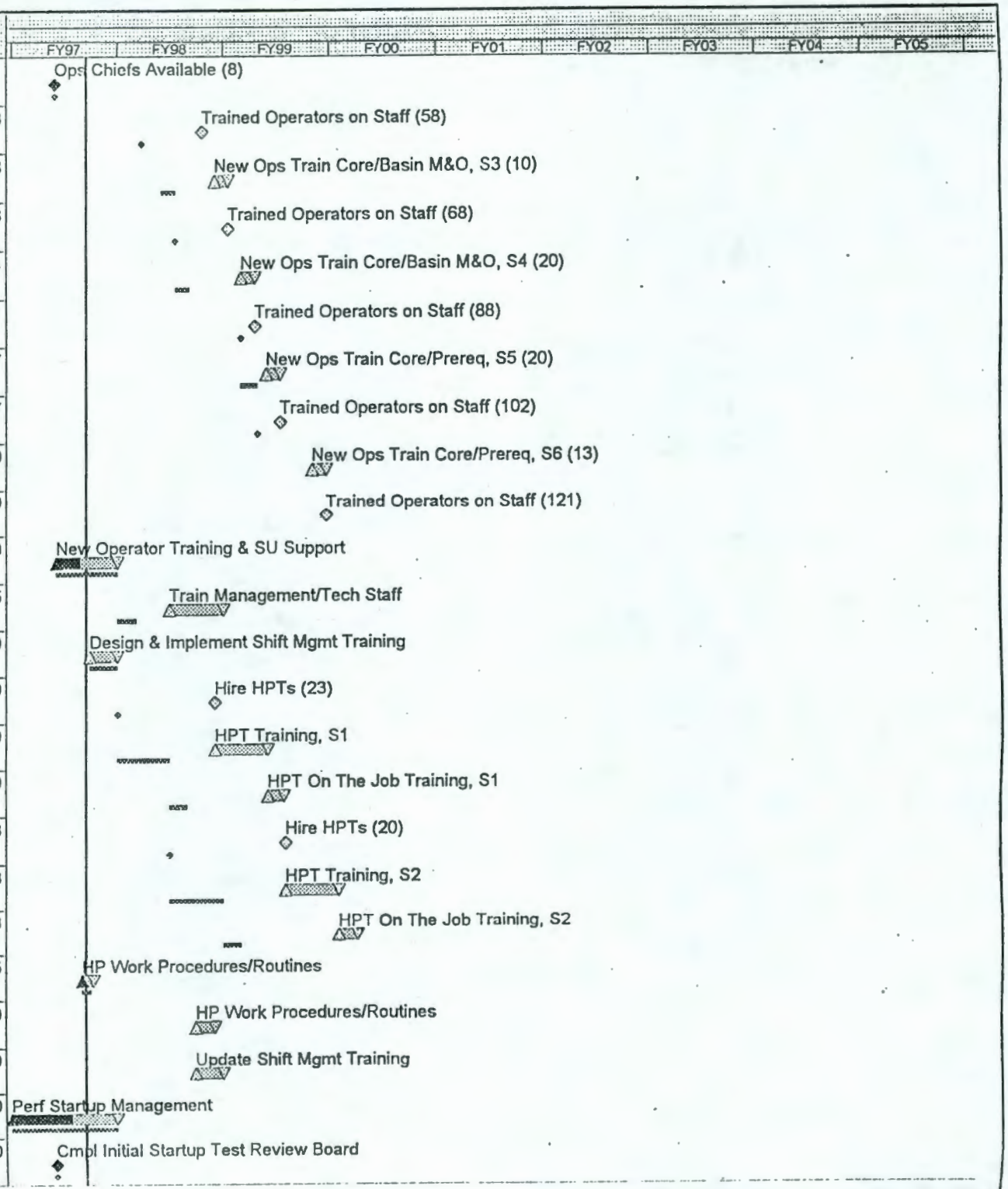
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
DAW02A08F		29SEP97			0
DAW02A08H		30SEP97			0
DAW02A10	17DEC96A	30SEP97	21JAN97*	30APR97	-105
DAW02A12	21MAY98	03AUG98	01MAY97	27MAY97	-297
DAW02A14	04AUG98	03NOV98	28MAY97	27AUG97	-298
DAW02A16		03NOV98		27AUG97	-298
DAW02A30	04AUG98*	04MAR99	06JAN98*	03AUG98	-146
DAW02A32	05MAR99*	30APR99	04AUG98*	30SEP98	-146
DAW02A34	03MAY99	18AUG99	01OCT98	20JAN99	-146
DAW02A36		18AUG99		20JAN99	-146
DAW02A38	19AUG99	01OCT99	21JAN99	05MAR99	-146
DAW02A41A	19AUG99	20MAR00			0
DAW02A41C	21MAR00	16MAY00			0
DAW02A41E	17MAY00	01SEP00			0
DAW02A41G		01SEP00			0
DAW02A41J	05SEP00	17OCT00			0
DAW02A50	03SEP96A	31OCT96A	03SEP96	31OCT96	0
DAW02A52	20DEC96A	02APR97A	20DEC96*	07FEB97	-37
DAW02A53	03APR97A	11APR97A			0
DAW02A53A	14APR97A	01MAY97A			0
DAW02A54	01MAY97A	20JUN97	21FEB97	19MAR97	-66
DAW02A54A	23JUN97	08JUL97			0
DAW02A54B	09JUL97	11JUL97			0
DAW02A54C	14JUL97	18JUL97			0



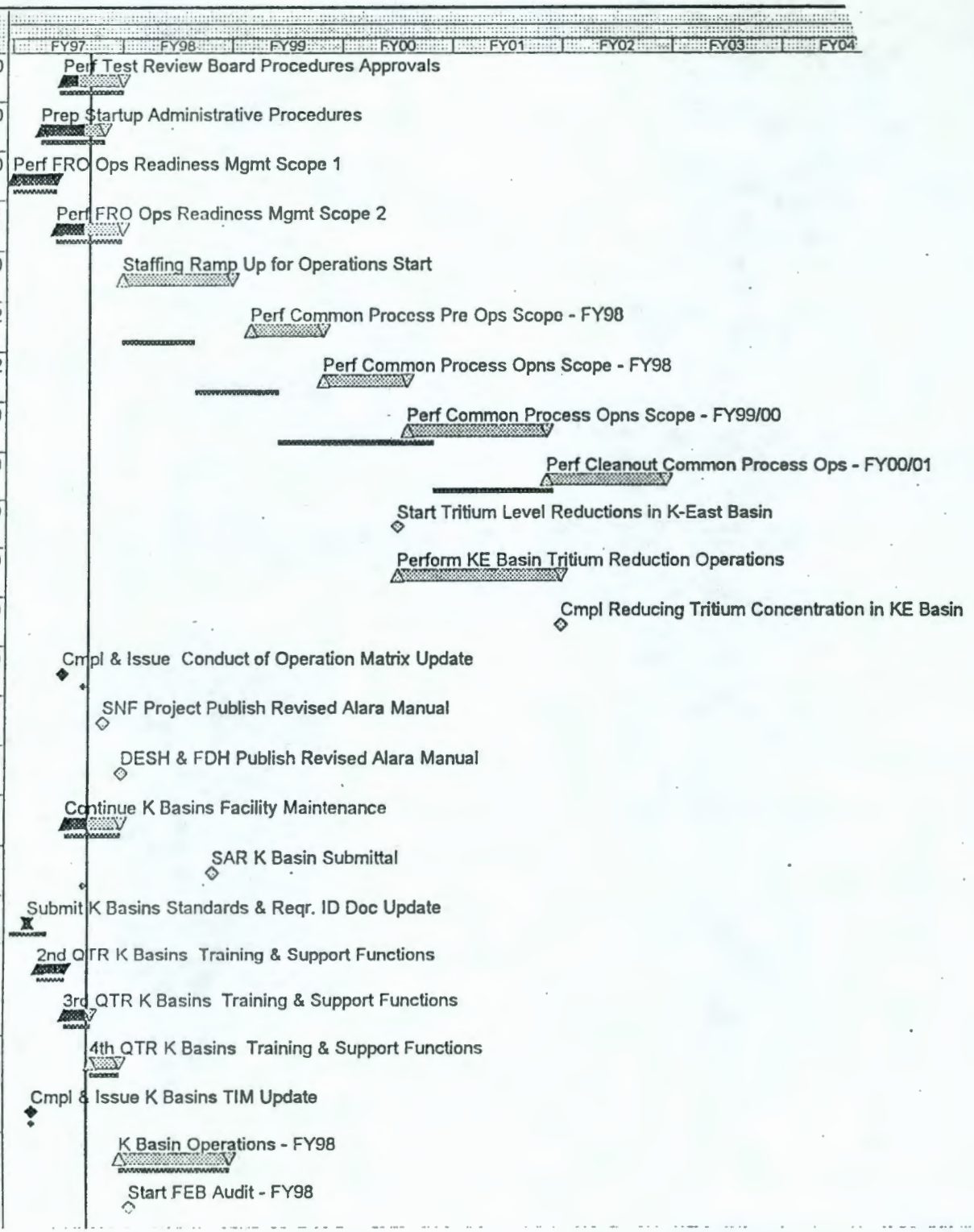
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F	
DAW02A54D	21JUL97	27AUG97			0	DOH Rvw/Apprv KW Basin DOH/EPA Air Permit NOC
DAW02A54E		27AUG97			0	DOH Issue KW Basin DOH/EPA Air Permit NOC
DAW02A55	28AUG97	09OCT97			0	DOH Rvw IWTS Dsn vs. KW DOH Air Permit NOC
DAW02A56	21JUL97	27AUG97	20MAR97	24APR97	-86	EPA Rvw/Apprv KW Basin EPA Air Permit NOC
DAW02A58		27AUG97		24APR97	-86	Cmpl KW DOH/EPA Air Permit NOC Approval
DAW02A70	03SEP96A	31OCT96A	03SEP96	31OCT96	0	Provide Draft KE IWTS Air Permit Data
DAW02A72	26NOV96A	31DEC96A	26NOV96*	31DEC96	0	Prep/Review KE Basin DOH/EPA Air Permit NOC
DAW02A74	02JAN97A	21JAN97A	31JAN97	05MAR97	30	DOE Review KE Basin DOH/EPA Air Permit NOC
DAW02A76	18FEB97A	05MAR97A	06MAR97	01APR97	19	Agency Review KE Basin DOH/EPA Air Permits
DAW02A78		05MAR97A		01APR97	19	Cmpl KE Basin DOH/EPA Air Permits NOC Approval
DAW02A80	28AUG97				0	Recieve Basin FR Final Designs
DAW02A82	28AUG97	15JAN98			0	Reconcile Basin FR Design/Environment Documents
DAW02A84	16JAN98	01JUN98			0	Revise Basin FR Permit for Final Design (if rqd)
DAW02B010	01OCT96A	21FEB97A	01OCT96	21FEB97	0	Acquire Materials, Supplies & Spares-Scope 1
DAW02B010A	04FEB97A	30SEP97	24FEB97	30SEP97	0	Acquire Materials, Supplies & Spares - Scope 2
DAW02B010C	05MAY97A	01AUG97	05MAY97*	01AUG97	0	Procure Dummy MCOs for S/U
DAW02B014	01OCT98*	29JUL99	01OCT97	29MAY98	-292	Acquire Clothing, Supplies & Tools - FY-99
DAW02B014D	01OCT97*	30SEP98			0	Acquire Materials Supplies & Spares - FY98
DAW02B015		01OCT96A		01OCT96*	0	21 New Operators Hired
DAW02B015D		01OCT96A		01OCT96*	0	Trained Operators on Staff (33)
DAW02B015E	01OCT96A	27FEB97A	02OCT96	28FEB97	1	New Ops Train Core/Basin M&O, S1 (21)
DAW02B015F		27FEB97A		28FEB97	1	Trained Operators on Staff (53)
DAW02B015G	01JUN98*	21JUL98	03NOV97*	23DEC97	-143	New Ops Train Core/Prereq, S2 (3)
DAW02B015I		16JAN97A		16JAN97*	0	Ops Chiefs Available (4)

FY97 FY98 FY99 FY00 FY01 FY02 FY03 FY04 FY05

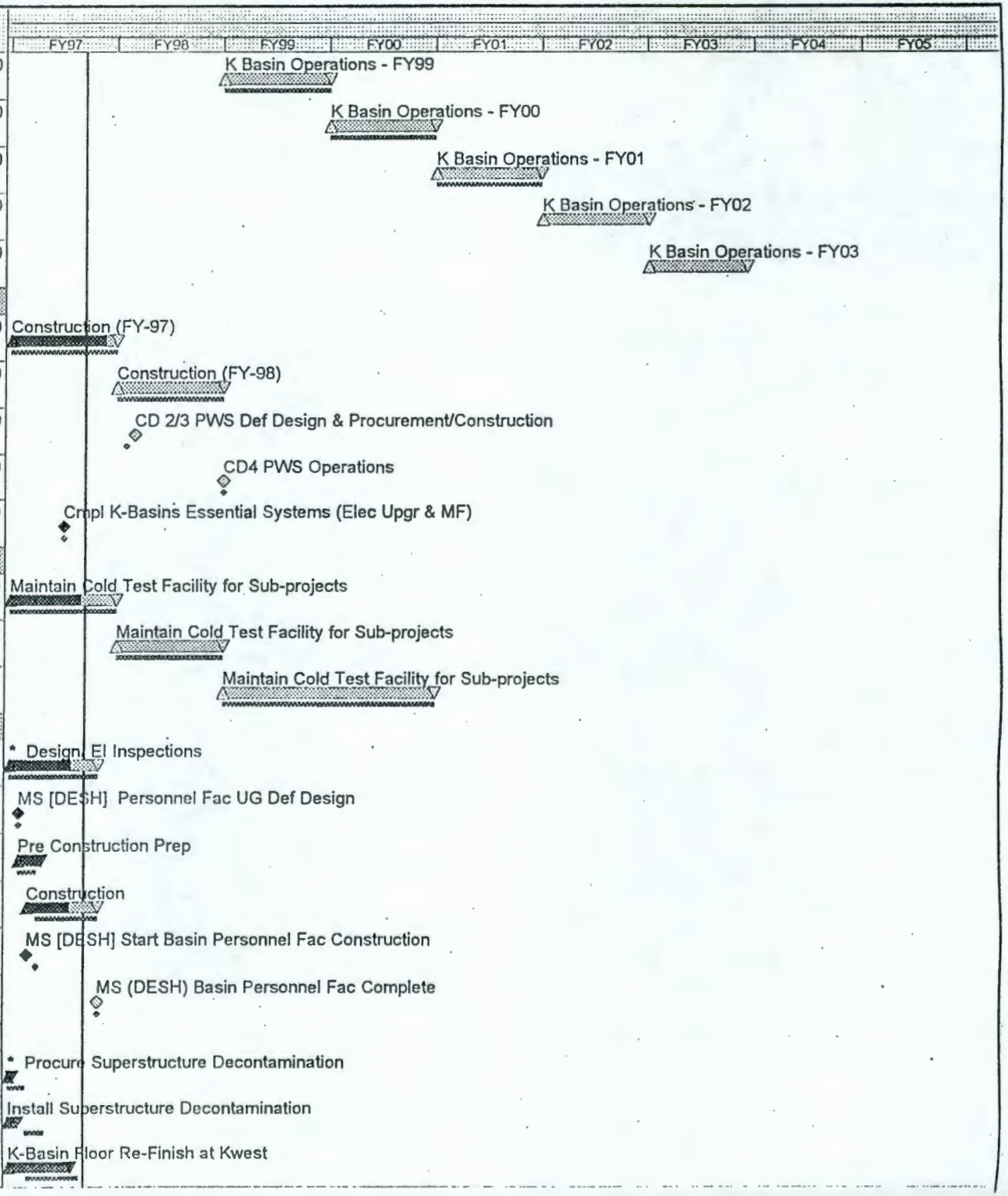
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
DAW02B015K		27FEB97A		28FEB97	1
DAW02B015L		21JUL98		23DEC97	-143
DAW02B015M	01SEP98*	21OCT98	02MAR98	20APR98	-128
DAW02B015N		21OCT98		20APR98	-128
DAW02B015P	01DEC98*	20JAN99	21APR98	08JUN98	-154
DAW02B015Q		20JAN99		03DEC98	-31
DAW02B015R	01MAR99*	16APR99	04DEC98*	26JAN99	-57
DAW02B015S		16APR99		26JAN99	-57
DAW02B015T	02AUG99*	20SEP99			0
DAW02B015U		20SEP99			0
DAW02B018	03MAR97A	30SEP97	03MAR97	30SEP97	0
DAW02B018C	01APR98*	30SEP98	01OCT97	05DEC97	-205
DAW02B019	01JUL97*	30SEP97	01JUL97*	30SEP97	0
DAW02B0191	01SEP98*			01OCT97*	-229
DAW02B0192	01SEP98	01MAR99	02OCT97	31MAR98	-229
DAW02B0193	02MAR99	28APR99	01APR98	29MAY98	-229
DAW02B0194	03MAY99*			31MAR98	-273
DAW02B0195	03MAY99	01NOV99	01APR98	30SEP98	-273
DAW02B0196	02NOV99	07JAN00	01OCT98	03DEC98	-273
DAW02B0197	04JUN97A	11JUL97	04JUN97*	02JUL97	-5
DAW02B0198	01JUL98*	31AUG98			0
DAW02B019A	01JUL98*	30SEP98			0
DAW02B021	01OCT96A	30SEP97	01OCT96*	30SEP97	0
DAW02B023		03MAR97A		03MAR97	0



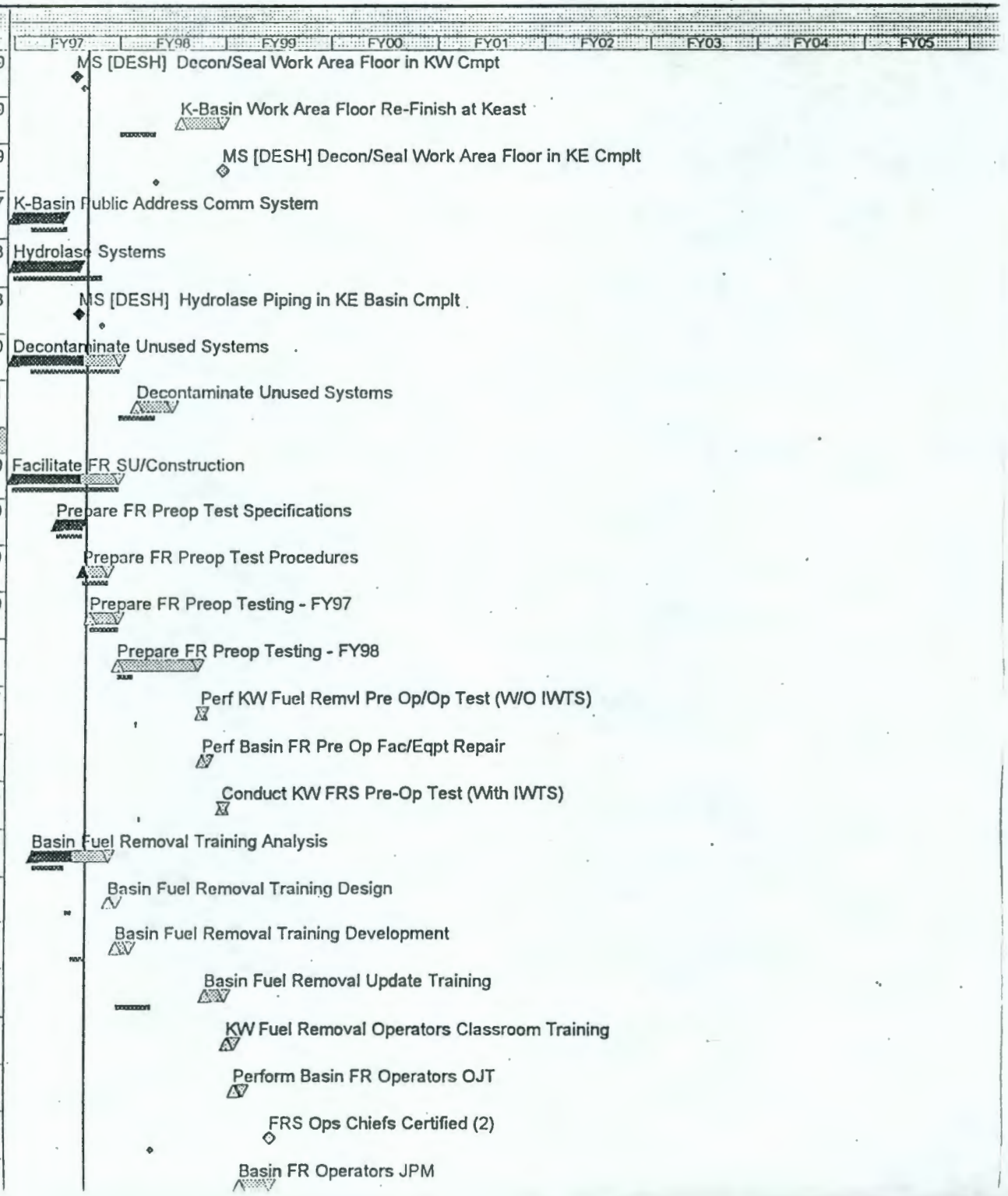
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
DAW02B023A	17MAR97A	30SEP97	04MAR97	30SEP97	0
DAW02B025	02JAN97A	31JUL97	02JAN97*	31JUL97	0
DAW02B03	01OCT96A	20FEB97A	01OCT96	20FEB97	0
DAW02B03A	21FEB97A	30SEP97	21FEB97	29SEP97	-1
DAW02B03G	01OCT97*	30SEP98			0
DAW02E08	01DEC98*	29JUL99	01OCT97	29MAY98	-292
DAW04A50	30JUL99*	01MAY00	01JUN98*	04MAR99	-292
DAW04A52	02MAY00	09AUG01	05MAR99	28JUL00	-259
DAW04A54	10AUG01	12SEP02	31JUL00	30AUG01	-259
DAW05A05	03APR00*				0
DAW05A10	03APR00	28SEP01			0
DAW05A15		28SEP01			0
DAW710101E		20MAR97A		30MAY97	50
DAW710103M		01AUG97			0
DAW710103N		30SEP97			0
DAW710204B	01APR97A	30SEP97	01APR97	30SEP97	0
DAW710302C		03AUG98		27MAY97	-297
DAW710302D	27NOV96A	27NOV96A	01OCT96	30JAN97	41
DAW710401B	02JAN97A	31MAR97A	02JAN97	31MAR97	0
DAW710401C	01APR97A	30JUN97	01APR97	30JUN97	0
DAW710401D	01JUL97	30SEP97	01JUL97	30SEP97	0
DAW710401E		13DEC96A		13DEC96	0
DAW810101	01OCT97	30SEP98	01OCT97	30SEP98	0
DAW810501M		03NOV97			0



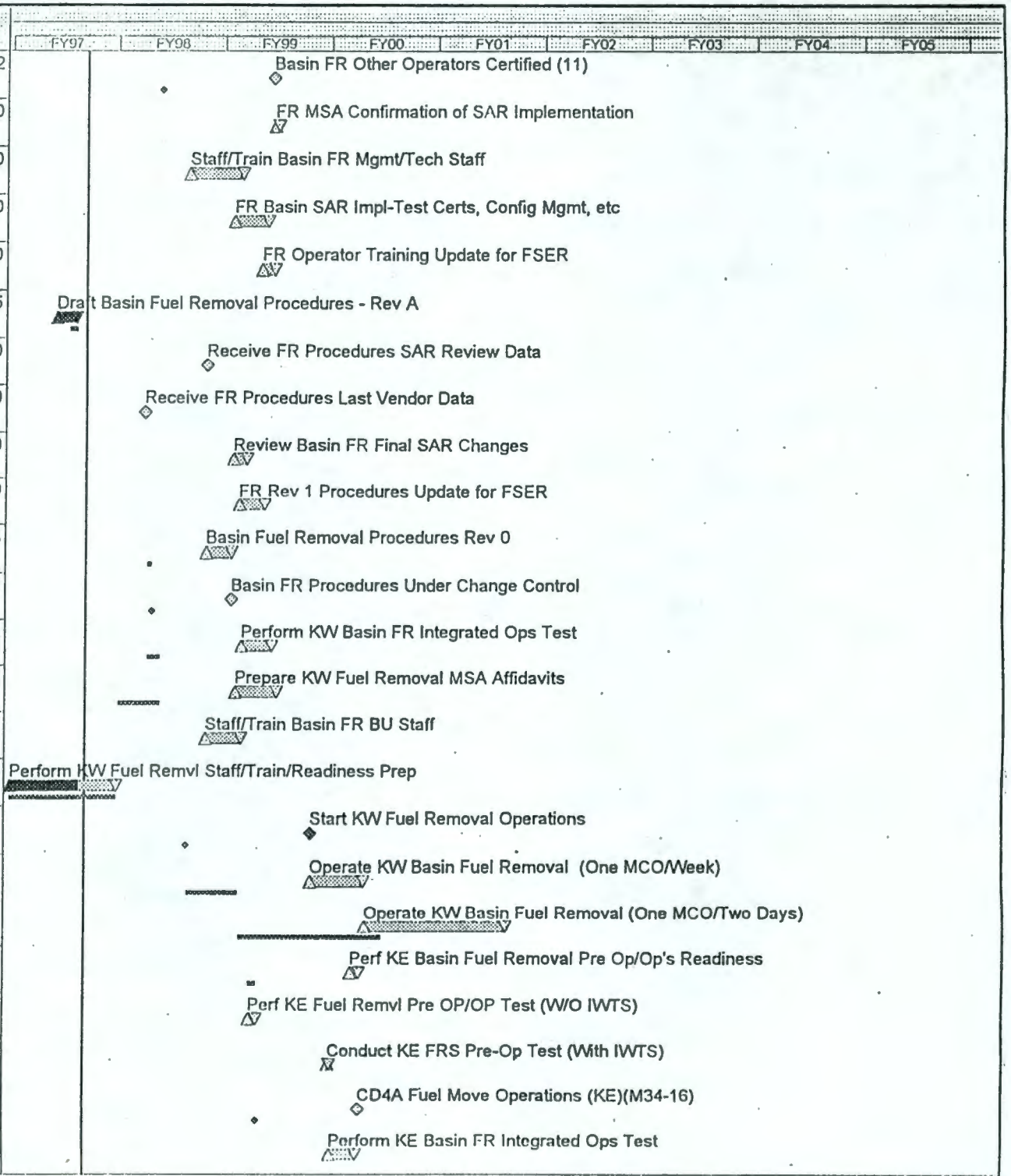
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
DAW910101	01OCT98	30SEP99	01OCT98	30SEP99	0
DAW920101	01OCT99	29SEP00	01OCT99	29SEP00	0
DAW930101	02OCT00	28SEP01	02OCT00	28SEP01	0
DAW940101	01OCT01	30SEP02			0
DAW950101	01OCT02	05SEP03			0
ESSENTIAL SYSTEMS 1.4.1.04.01.01					
DER1302	01OCT96A	30SEP97	01OCT96	30SEP97	0
DER13022	01OCT97	30SEP98	01OCT97	30SEP98	0
DER1302290		01DEC97		31OCT97*	-19
DER1302992		30SEP98		30SEP98	0
DER1302995		31MAR97A		31MAR97	0
COLD TEST FACILITY 1.4.1.04.01.05					
DMW1102	01OCT96A	30SEP97	01OCT96	30SEP97	0
DMW1103	01OCT97	30SEP98	01OCT97	30SEP98	0
DMW11031	01OCT98	29SEP00	01OCT98	29SEP00	0
BASIN PERSONNEL FAC UPGRADES 1.4.1.04.01.07					
DRR1103	01OCT96A	31JUL97	01OCT96	31JUL97	0
DRR1103999		31OCT96A		30OCT96	-1
DRR11051	01NOV96A	17JAN97A	31OCT96	31DEC96	-12
DRR11052	02DEC96A	31JUL97	02JAN97	31JUL97	0
DRR1105200	02DEC96A		02JAN97		20
DRR1105299		31JUL97		31JUL97	0
DOSE REDUCTION 1.4.1.04.02					
EBW14041	01OCT96A	15OCT96A	01OCT96	26NOV96	30
EBW14042	01OCT96A	31OCT96A	27NOV96	31JAN97	61
PW14061	01OCT96A	02MAY97A	02DEC96*	30MAY97	19



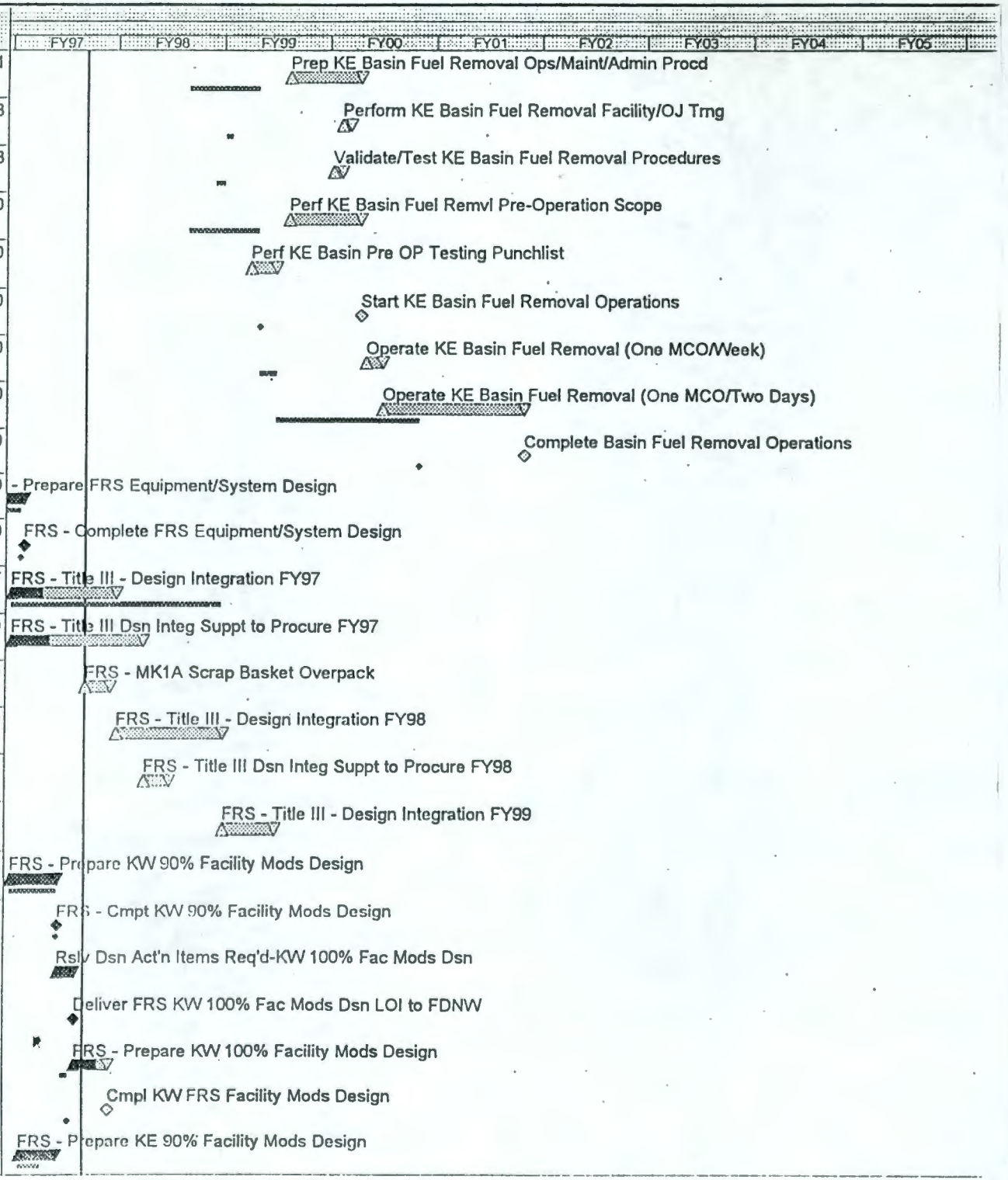
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EBW1406198		02MAY97A		30MAY97	19
EBW14062	01MAY98*	18SEP98	01OCT97*	02FEB98	-159
EBW1406299		18SEP98		02FEB98	-159
EBW1407	01OCT96A	20MAR97A	02DEC96*	31MAR97	7
EBW1501	01OCT96A	14MAY97A	01OCT96	31JUL97	53
EBW1501999		14MAY97A		31JUL97	53
EBW1502	01OCT96A	30SEP97	02DEC96*	30SEP97	0
EBW15021	01DEC97*	01APR98	01OCT97	02FEB98	-41
FUEL RETRIEVAL SUB-PROJECT 1.4.1.04.03					
ECW01A10	01OCT96A	30SEP97	01OCT96*	30SEP97	0
ECW01A10A	03MAR97A	30MAY97A	03MAR97	30MAY97	0
ECW01A10B	02JUN97A	29AUG97	02JUN97	29AUG97	0
ECW01A10C	01JUL97*	30SEP97	01JUL97*	30SEP97	0
ECW01A10D	01OCT97*	01JUL98	01OCT97	21NOV97	-151
ECW01A23D	17JUL98	22JUL98	01DEC97	04DEC97	-157
ECW01A23D1	23JUL98	07AUG98			0
ECW01A23E	28SEP98	01OCT98	16DEC97	17DEC97	-198
ECW01A29D	16DEC96A	02SEP97	16DEC96*	04APR97	-103
ECW01A29E	03SEP97	26SEP97	07APR97	30APR97	-103
ECW01A29F	29SEP97	12NOV97	01MAY97	17JUN97	-103
ECW01A29G	04AUG98	06OCT98	01OCT97*	28JAN98	-174
ECW01A29G1	14OCT98	10NOV98			0
ECW01A29G5	11NOV98	10DEC98			0
ECW01A29J		16MAR99		29JAN98	-282
ECW01A29L	04DEC98	16MAR99	30JAN98	27FEB98	-262



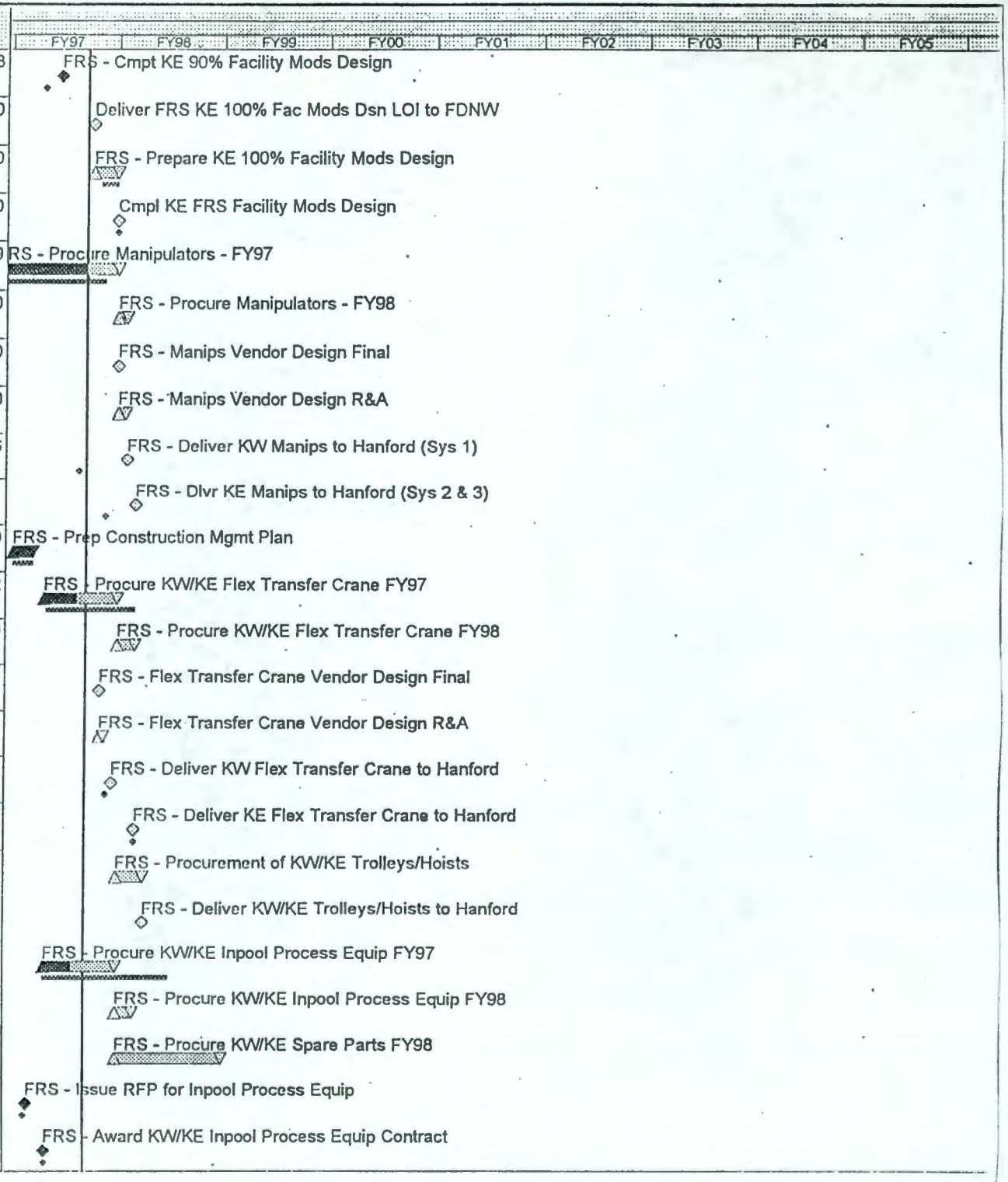
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECW01A29M		16MAR99		27FEB98	-262
ECW01A29N	22MAR99	02APR99			0
ECW01A29P	04JUN98	03DEC98			0
ECW01A30	04NOV98	26FEB99			0
ECW01A30A	05FEB99	19MAR99			0
ECW01A30D	03MAR97A	09MAY97A	21APR97*	16MAY97	5
ECW01A30DD		03AUG98			0
ECW01A30DG		31DEC97			0
ECW01A30GD	04NOV98	17DEC98			0
ECW01A30GF	25NOV98	19FEB99			0
ECW01A30J	04AUG98	27OCT98	16JAN98	29JAN98	-188
ECW01A30K		27OCT98		29JAN98	-188
ECW01A35D	04DEC98	16MAR99	16JAN98	27FEB98	-262
ECW01A38	10NOV98	02APR99	07OCT97	27FEB98	-275
ECW01AG3	05AUG98	03DEC98			0
ECW01B02	01OCT96A	30SEP97	01OCT96*	30SEP97	0
ECW01B09	30JUL99		30MAY98		-292
ECW01B10	30JUL99	28JAN00	01JUN98	25NOV98	-292
ECW01B12	31JAN00	29MAY01	30NOV98	30MAR00	-292
ECW01C02	15DEC99	14JAN00	31DEC98	28JAN99	-241
ECW01C02B	04JAN99	29JAN99			0
ECW01C02C	01OCT99*	06OCT99			0
ECW01C02D	17JAN00			28JAN99	-241
ECW01C02G	07OCT99	05JAN00			0



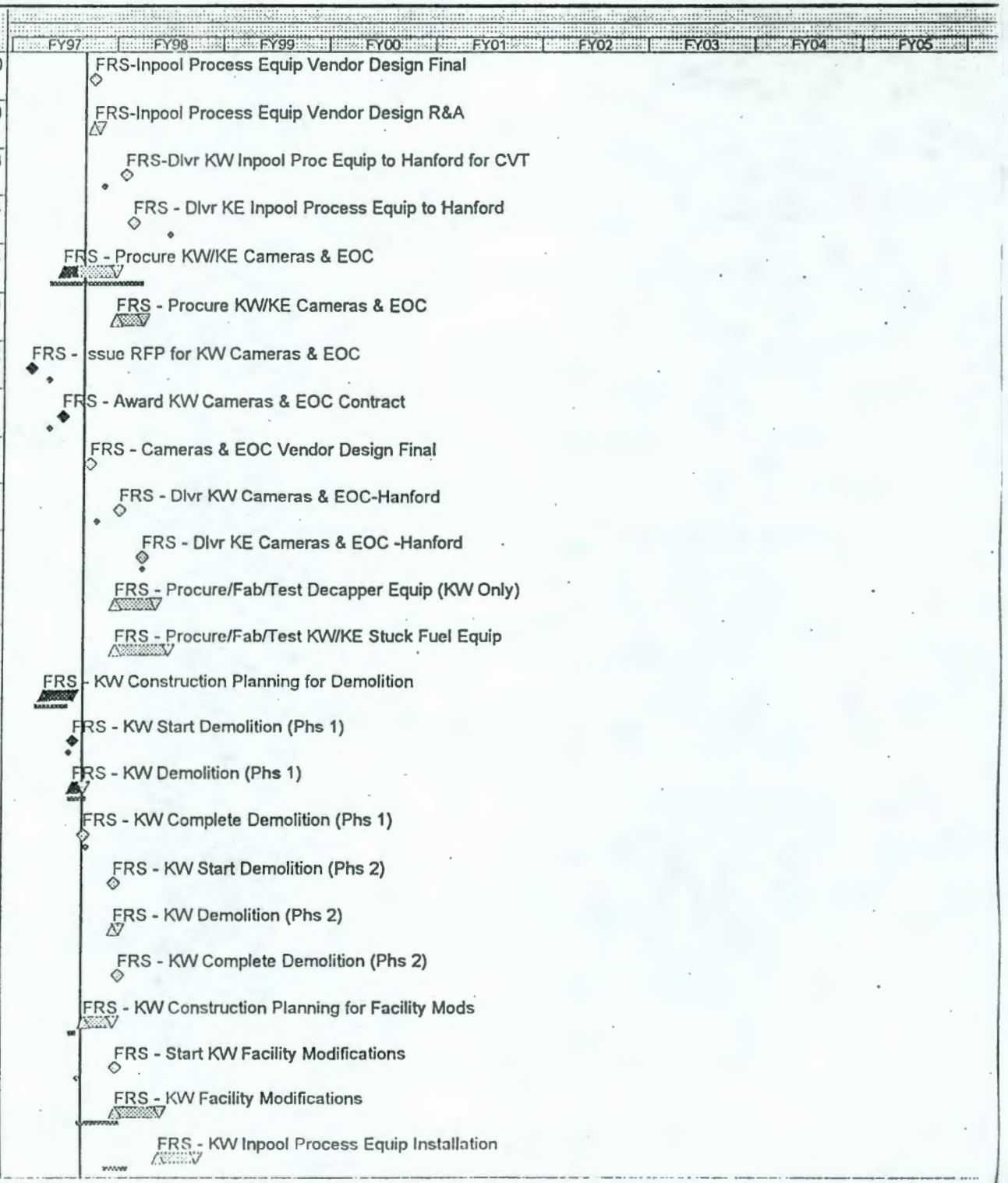
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECW01C03	17MAY99*	14JAN00	01JUN98*	28JAN99	-241
ECW01C04	11NOV99*	09DEC99	05OCT98*	29OCT98	-278
ECW01C05	13OCT99*	10NOV99	03SEP98*	02OCT98	-278
ECW01C22	14MAY99	14JAN00	01JUN98*	29JAN99	-240
ECW01C22B	04JAN99	31MAR99			0
ECW01C23	17JAN00		01FEB99		-240
ECW01C24	31JAN00	29MAR00	01FEB99*	31MAR99	-250
ECW01C26	30MAR00	30JUL01	01APR99	31JUL00	-250
ECW01C28		30JUL01		31JUL00	-250
ECWA3010	30APR96A	15NOV96A	30APR96	01NOV96	-10
ECWA3012		15NOV96A		01NOV96	-10
ECWA3025	01OCT96A	30SEP97	01OCT96*	24SEP98	247
ECWA3025A	01OCT96A	02JAN98			0
ECWA3025A1	16JUN97	10SEP97			0
ECWA3025X	01OCT97	30SEP98			0
ECWA3025Y	05JAN98	02APR98			0
ECWA3025Z	01OCT98	31MAR99			0
ECWA3030	01OCT96A	14MAR97A	01OCT96	10MAR97	-4
ECWA3030A		14MAR97A		10MAR97	-4
ECWA3030M	17MAR97A	14MAY97A			0
ECWA3030P	15MAY97A				0
ECWA3031	16MAY97A	12SEP97	01APR97*	25APR97	-96
ECWA3032		12SEP97		25APR97	-96
ECWA3040	04NOV96A	14MAR97A	04NOV96*	20JAN97	-38



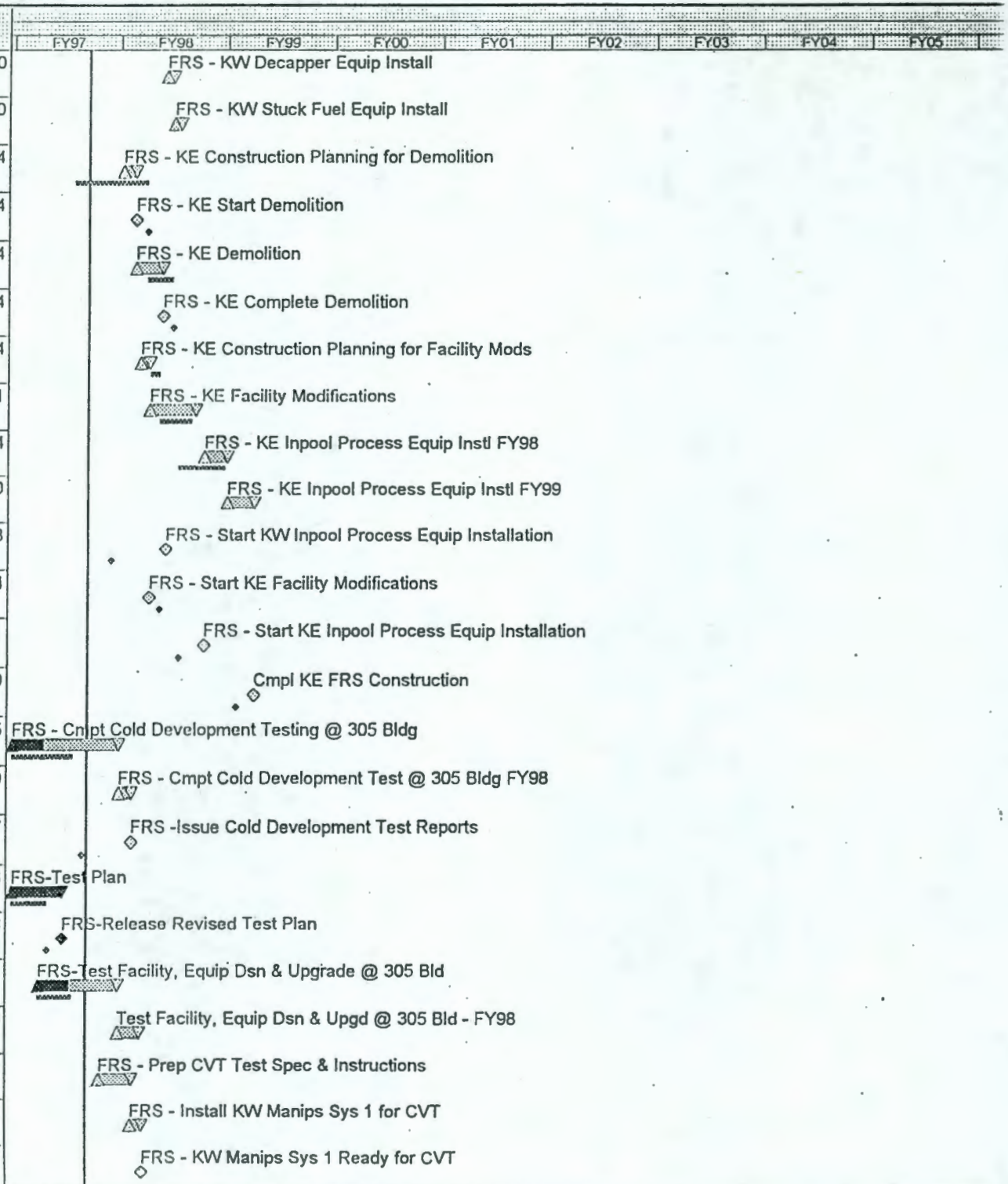
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECWA3040A		14MAR97A		20JAN97	-38
ECWA3040M		07JUL97*			0
ECWA3041	08JUL97	26SEP97	01AUG97	26SEP97	0
ECWA3042		26SEP97		26SEP97	0
ECWA4020	15JUL96A	30SEP97	15JUL96A	19AUG97	-29
ECWA4020A	01OCT97*	03NOV97			0
ECWA4021		30SEP97			0
ECWA4021A	01OCT97	28OCT97			0
ECWA4022		03NOV97*		19MAY97*	-116
ECWA4024		01DEC97*		19AUG97	-71
ECWA4042	07OCT96A	13DEC96A	07OCT96*	13DEC96	0
ECWA4100	23JAN97A	30SEP97	03FEB97*	01DEC97	42
ECWA4100A	01OCT97	01DEC97			0
ECWA4103		01AUG97*			0
ECWA4104	04AUG97	15AUG97			0
ECWA4105		15SEP97*		22AUG97*	-15
ECWA4110		01DEC97		01DEC97	0
ECWA4112	01OCT97*	31DEC97			0
ECWA4114		31DEC97			0
ECWA4120	29JAN97A	30SEP97	29JAN97*	01APR98	125
ECWA4120A	01OCT97	26NOV97			0
ECWA4120X	01OCT97*	30SEP98			0
ECWA4125	02DEC96A		22NOV96*		-4
ECWA4130		29JAN97A		31JAN97*	2



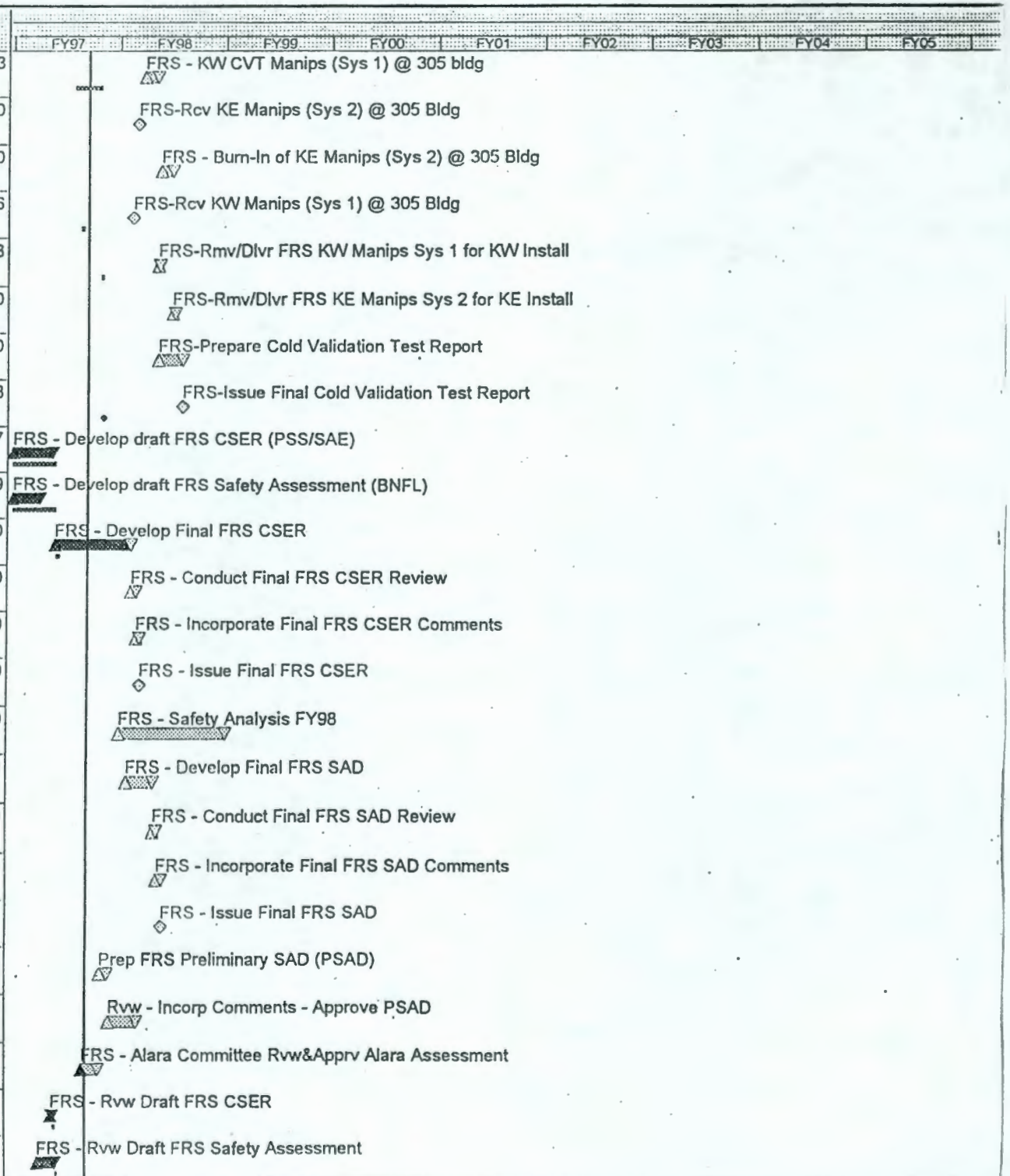
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECWA4132		15JUL97*			0
ECWA4133	16JUL97	01AUG97			0
ECWA4135		03NOV97*		19AUG97*	-53
ECWA4140		26NOV97*		01APR98	84
ECWA4150	01APR97A	30SEP97	14FEB97*	02JAN98	63
ECWA4150A	01OCT97	02JAN98			0
ECWA4155		13DEC96A		14FEB97*	42
ECWA4160		01APR97A		14FEB97*	-31
ECWA4163		07JUL97*			0
ECWA4165		15OCT97*		29JUL97*	-55
ECWA4170		02JAN98*		02JAN98	0
ECWA4171A	01OCT97*	17FEB98			0
ECWA4171C	01OCT97*	02APR98			0
ECWA4172	03FEB97A	09MAY97A	03JAN97	25APR97	-10
ECWA4173	12MAY97A		28APR97*		-10
ECWA4174	12MAY97A	20JUN97	28APR97	27JUN97	5
ECWA4175		20JUN97		27JUN97	5
ECWA4175A	01OCT97*				0
ECWA4175B	01OCT97	21OCT97			0
ECWA4175C		21OCT97			0
ECWA4176	23JUN97	30SEP97	05MAY97	30MAY97	-94
ECWA4180	13OCT97*		02JUN97*		-92
ECWA4182	13OCT97	11MAR98	02JUN97	24OCT97	-92
ECWA4184	10MAR98	16JUL98	03SEP97	21NOV97	-160



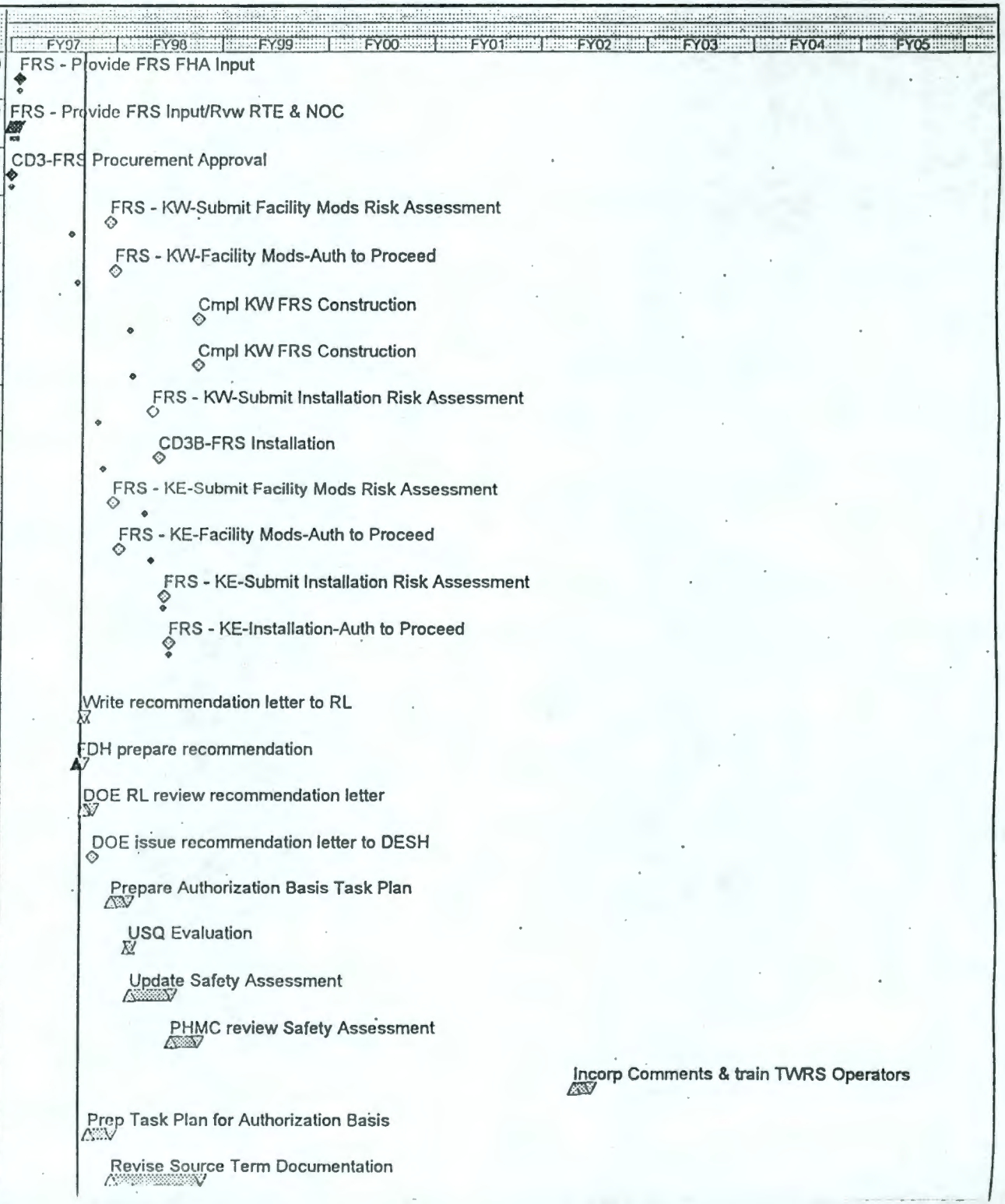
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECWA4184A	10MAR98	30MAR98			0
ECWA4184B	03APR98	23APR98			0
ECWA4185A	13OCT97	21NOV97	28APR97	31DEC97	24
ECWA4185B	24NOV97		02JAN98*		24
ECWA4185C	24NOV97	23FEB98	02JAN98	27MAR98	24
ECWA4185D		23FEB98		27MAR98	24
ECWA4185H	09DEC97	09JAN98	15JAN98	12FEB98	24
ECWA4186	12JAN98	16JUN98	13FEB98	01JUN98	-11
ECWA4188	17JUL98	30SEP98	20APR98	24SEP98	-4
ECWA4188A	01OCT98	31DEC98			0
ECWA4190	10MAR98		03SEP97		-128
ECWA4200	12JAN98		13FEB98		24
ECWA4205	17JUL98		20APR98*		-61
ECWA4210		31DEC98		02NOV98*	-39
ECWA5295	01OCT96A	30SEP97	01OCT96	30APR97	-105
ECWA5295A	01OCT97	14NOV97			0
ECWA5315		14NOV97*		30MAY97	-117
ECWA5335	01OCT96A	25MAR97A	01OCT96*	31JAN97	-36
ECWA5350		25MAR97A		31JAN97	-36
ECWA5355	02JAN97A	30SEP97	02JAN97*	30APR97	-105
ECWA5355A	01OCT97	15DEC97			0
ECWA5358	28JUL97*	18NOV97			0
ECWA5366	17NOV97	23DEC97			0
ECWA5368		23DEC97			0



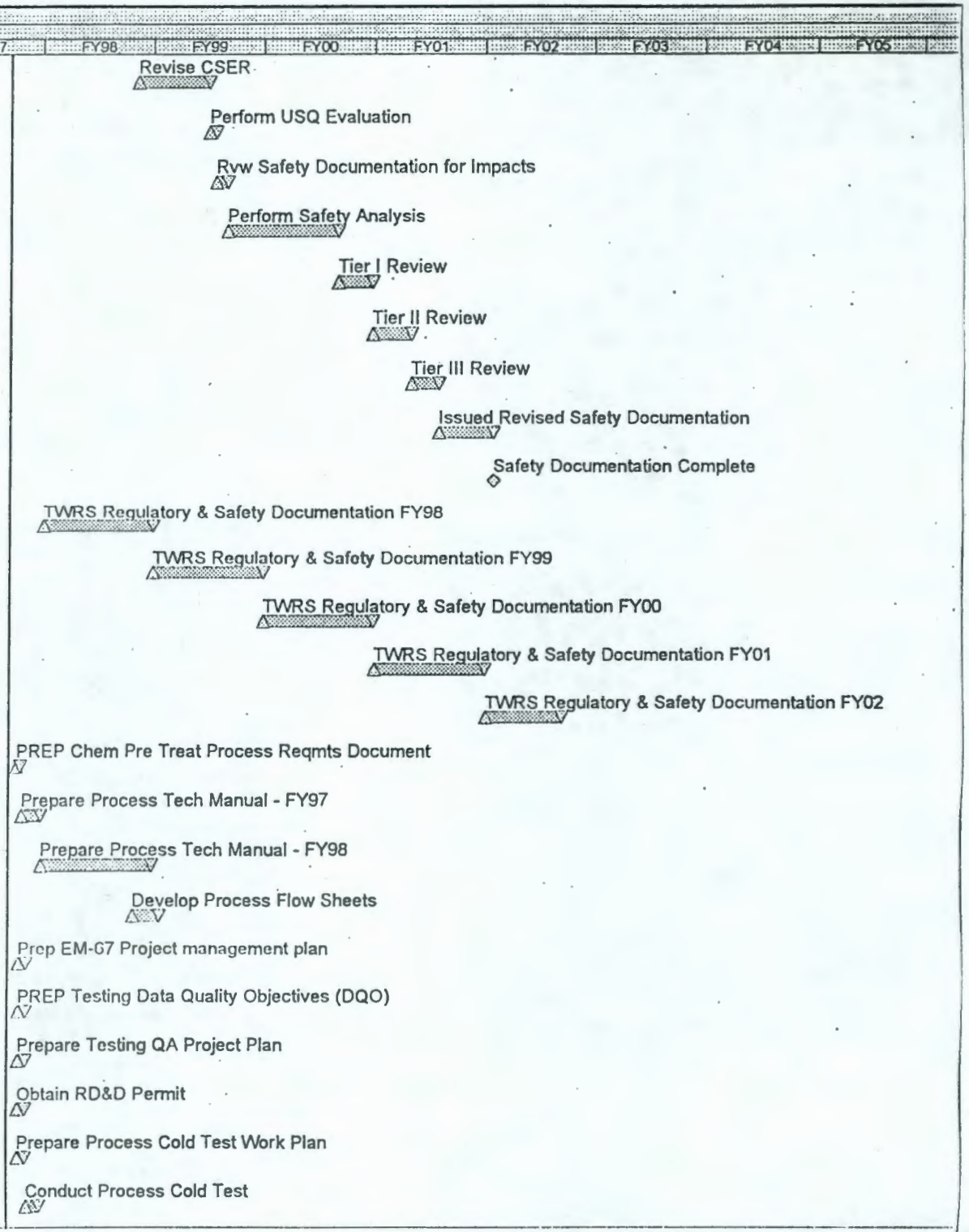
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECWA5370	26DEC97	06FEB98	01MAY97	28JUL97	-133
ECWA5373		01DEC97			0
ECWA5375	17FEB98	30MAR98			0
ECWA5395		14NOV97	20MAY97	02JUN97	-116
ECWA5420	09FEB98	13FEB98	29JUL97	04AUG97	-133
ECWA5425	31MAR98	06APR98			0
ECWA5428	09FEB98	04MAY98			0
ECWA5430		04MAY98		04AUG97	-188
ECWA7020A	01OCT96A	14FEB97A	01OCT96*	26FEB97	7
ECWA7020B	01OCT96A	31DEC96A	01OCT96	26FEB97	39
ECWA7020C	25FEB97A	11NOV97	27FEB97*	12MAR97	-170
ECWA7020G	12NOV97	25NOV97			0
ECWA7020H	26NOV97	10DEC97			0
ECWA7020I		10DEC97			0
ECWA7020X	01OCT97	30SEP98			0
ECWA7021C	29OCT97	27JAN98			0
ECWA7021G	28JAN98	10FEB98			0
ECWA7021H	11FEB98	25FEB98			0
ECWA7021I		25FEB98			0
ECWA7022A	04AUG97*	29AUG97			0
ECWA7022B	02SEP97	05DEC97			0
ECWA7028	02JUN97A	29JUL97			0
ECWA7030A	18FEB97A	24FEB97A	27FEB97	05MAR97	7
ECWA7030B	01JAN97A	03MAR97A	06MAR97	12MAR97	7



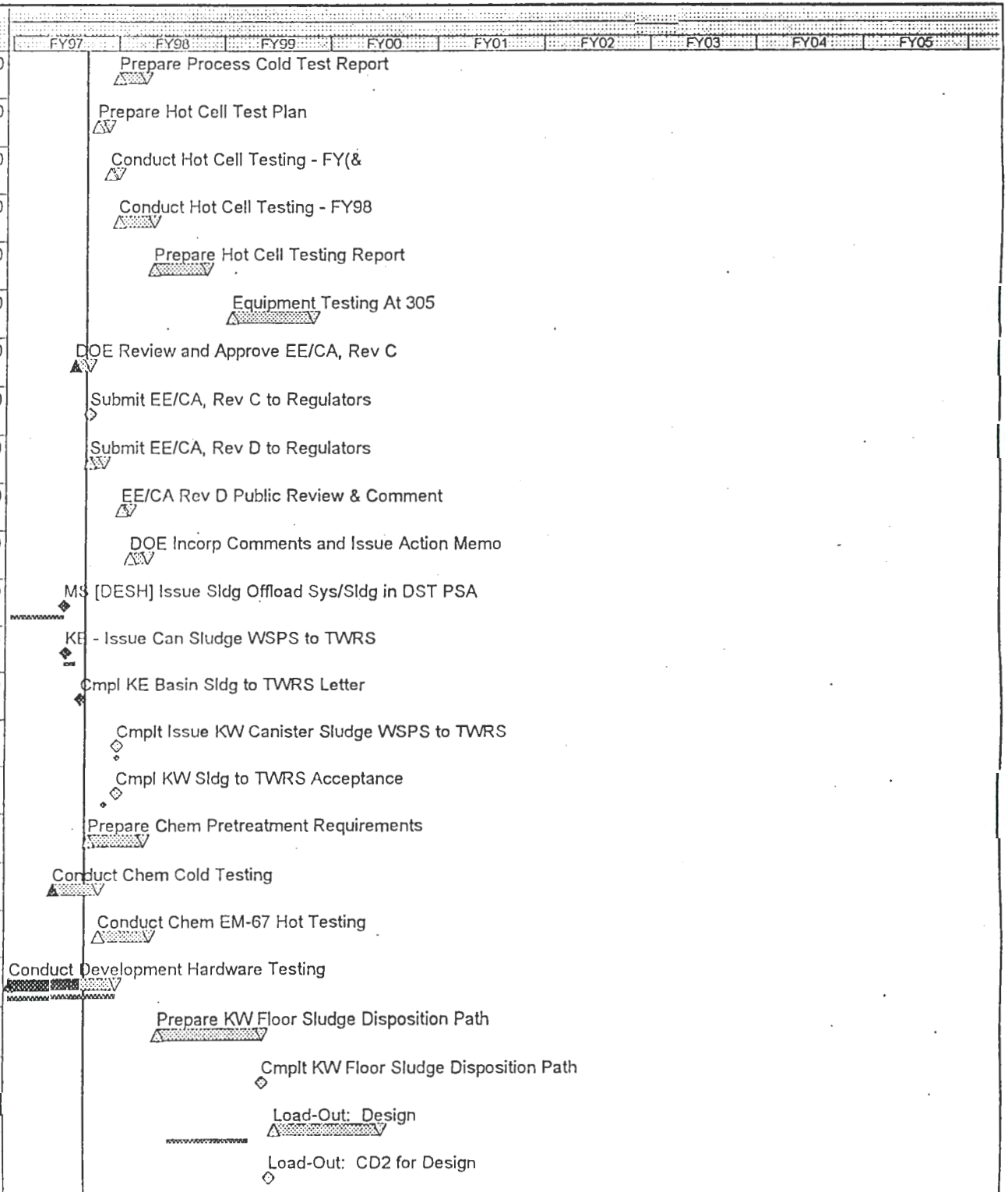
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
ECWA7030E		01NOV96A		01NOV96*	0
ECWA7030F	01OCT96A	01NOV96A	01OCT96	01NOV96	0
ECWM4006	08OCT96A		08OCT96*		0
ECWM4008	15SEP97		02MAY97		-92
ECWM4010		03OCT97		22MAY97	-92
ECWM4011		16JUL98		21NOV97	-160
ECWM4011PA		16JUL98		30NOV97*	-157
ECWM4012	09FEB98		05AUG97		-128
ECWM4014		02MAR98		25AUG97	-128
ECWM4016	29SEP97		16JAN98		74
ECWM4018		17OCT97		05FEB98	74
ECWM4020	24MAR98		23MAR98		-1
ECWM4022		13APR98		10APR98	-1
SLUDGE REMOVAL PROJECT 1.4.1.04.04					
EDSR003	26JUN97	30JUN97			0
EDSR004	02JUN97A	25JUN97			0
EDSR005	01JUL97	28JUL97			0
EDSR006		28JUL97			0
EDSR047A	01OCT97	26NOV97			0
EDSR047B	01DEC97	05DEC97			0
EDSR047C	08DEC97	30APR98			0
EDSR047D	01MAY98	28JUL98			0
EDSR051	14FEB02	11APR02			0
EDSR052A	22JUL97*	06OCT97			0
EDSR052B	07OCT97	11AUG98			0



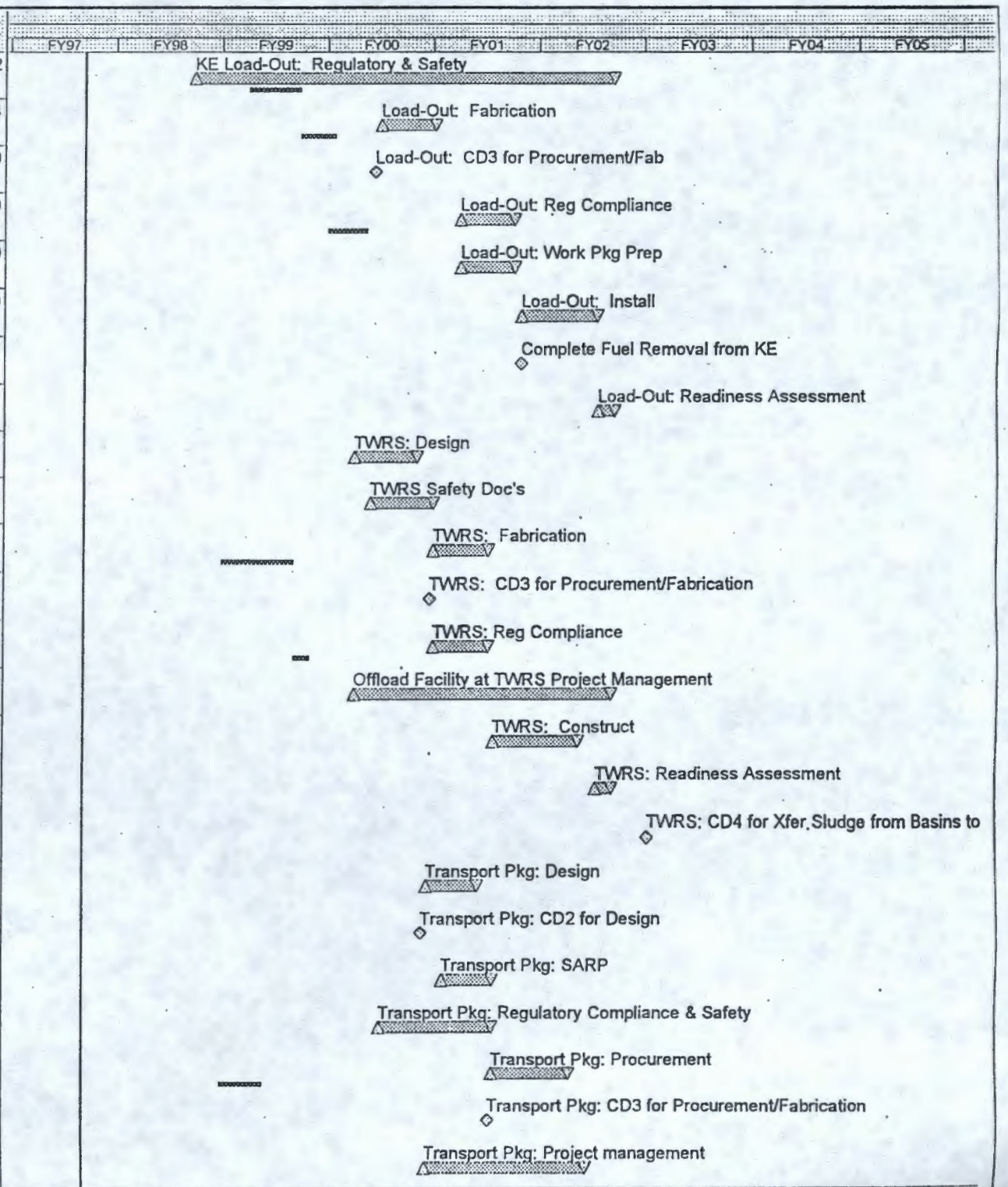
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDSR052C	12AUG98	01APR99			0
EDSR052D	02APR99	22APR99			0
EDSR052E	23APR99	02JUN99			0
EDSR052F	03JUN99	31MAY00			0
EDSR052G	01JUN00	22SEP00			0
EDSR052H	25SEP00	25JAN01			0
EDSR052J	26JAN01	26APR01			0
EDSR052K	27APR01	24OCT01			0
EDSR052L		24OCT01			0
EDSR052X	07OCT97	30SEP98			0
EDSR053A	01OCT98	30SEP99			0
EDSR053B	01OCT99	29SEP00			0
EDSR053C	02OCT00	28SEP01			0
EDSR053D	01OCT01	16JUN02			0
EDW1204102	14JUL97*	25JUL97			0
EDW1204104	28JUL97	30SEP97			0
EDW1204106	01OCT97	30SEP98			0
EDW1204108	03AUG98	29OCT98			0
EDW1204120	21JUL97*	15AUG97			0
EDW1204122	21JUL97	15AUG97			0
EDW1204123	21JUL97	15AUG97			0
EDW1204124	21JUL97	15AUG97			0
EDW1204126	21JUL97	15AUG97			0
EDW1204128	18AUG97	30SEP97			0



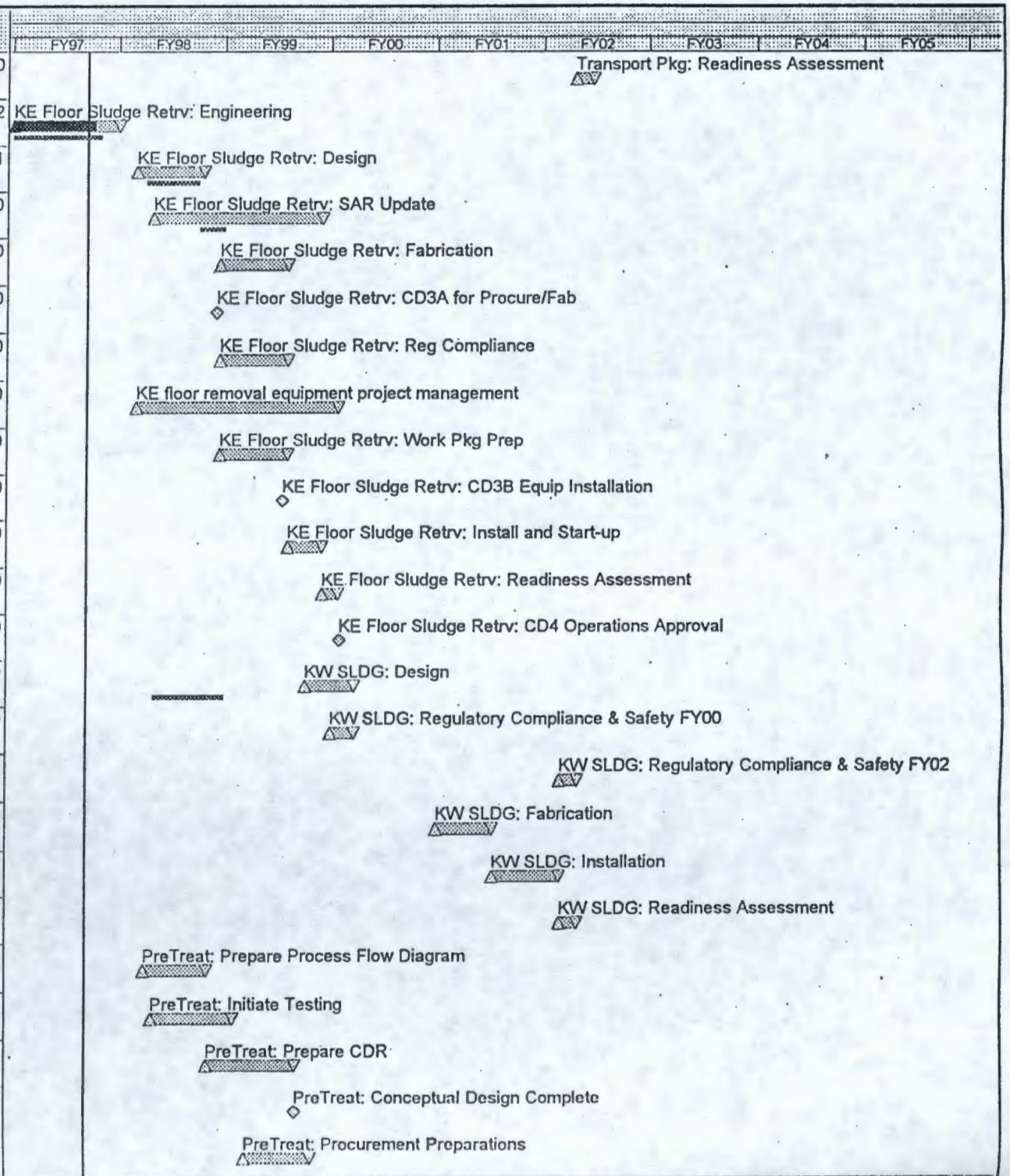
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDW1204130	01OCT97	31DEC97			0
EDW1204140	21JUL97	29AUG97			0
EDW1204142	02SEP97	30SEP97			0
EDW1204144	01OCT97	30JAN98			0
EDW1204146	02FEB98	31JUL98			0
EDW1204150	30OCT98	04AUG99			0
EDW1204300	06MAY97A	30JUN97			0
EDW1204310		30JUN97			0
EDW1204315	01JUL97	14AUG97			0
EDW1204320	15OCT97*	14NOV97			0
EDW1204330	17NOV97	16JAN98			0
EDW1205010		31MAR97A	01OCT96	31MAR97	0
EDW1205015	08APR97A		01APR97	13MAY97	26
EDW1205020		30MAY97A			0
EDW1205100		30SEP97*		30SEP97	0
EDW1205110		30SEP97*	22AUG97		-27
EDW1205200	01JUL97*	31DEC97			0
EDW1205300	01MAR97A	31JUL97			0
EDW1205310	01AUG97	23JAN98			0
EDW1206	01OCT96A	30SEP97	01OCT96	30SEP97	0
EDW1208100	23FEB98*	19FEB99			0
EDW1208199		19FEB99			0
EDW1703	05APR99	31MAR00	01APR98*	31DEC98	-314
EDW1703A	17MAR99*				0



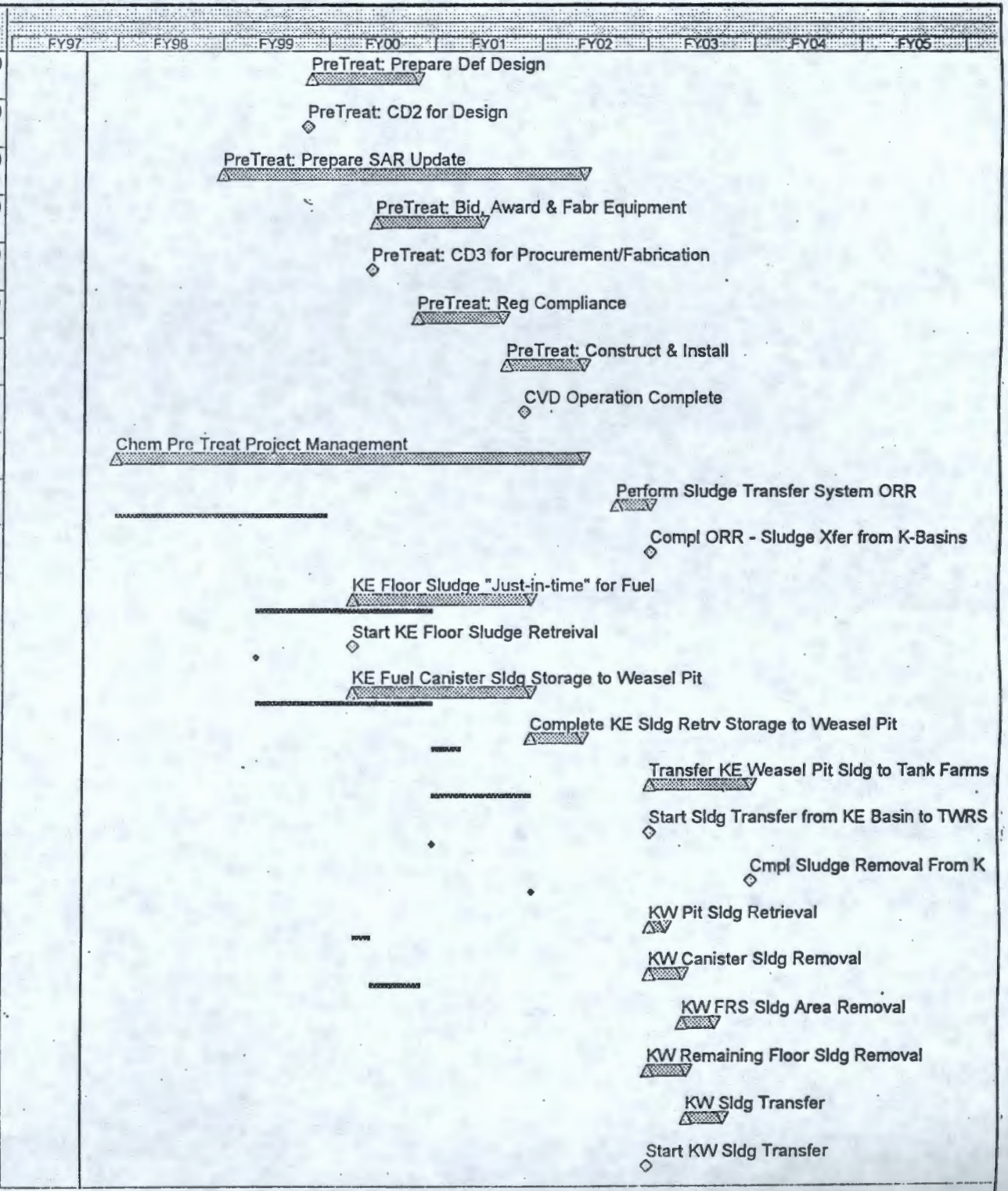
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDW1704	29JUN98*	14JUN02	04JAN99	30JUN99	-742
EDW1705	03APR00	05OCT00	01JUL99	29OCT99	-234
EDW1705A		13MAR00			0
EDW1706	02JAN01*	06JUL01	01OCT99*	15FEB00	-349
EDW1707	02JAN01*	06JUL01			0
EDW1708	31JUL01	17APR02			0
EDW1708A		30JUL01			0
EDW1709	19APR02	14JUN02			0
EDW18031	04JAN00*	04AUG00			0
EDW18032	01MAR00	02OCT00			0
EDW1804	03OCT00	10APR01	01OCT98	07JUN99	-462
EDW1804A		18SEP00			0
EDW1805	03OCT00	10APR01	08JUN99	04AUG99	-422
EDW1806	04JAN00	07JUN02			0
EDW1807	27APR01	13FEB02			0
EDW1809	15APR02	10JUN02			0
EDW1809B		09OCT02			0
EDW1901	11SEP00	05MAR01			0
EDW1901A		23AUG00*			0
EDW1902	06NOV00	30APR01			0
EDW1902A	03APR00*	30APR01			0
EDW1903	01MAY01	18JAN02	01OCT98*	26FEB99	-726
EDW1903A		16APR01			0
EDW1907	11SEP00	18MAR02			0



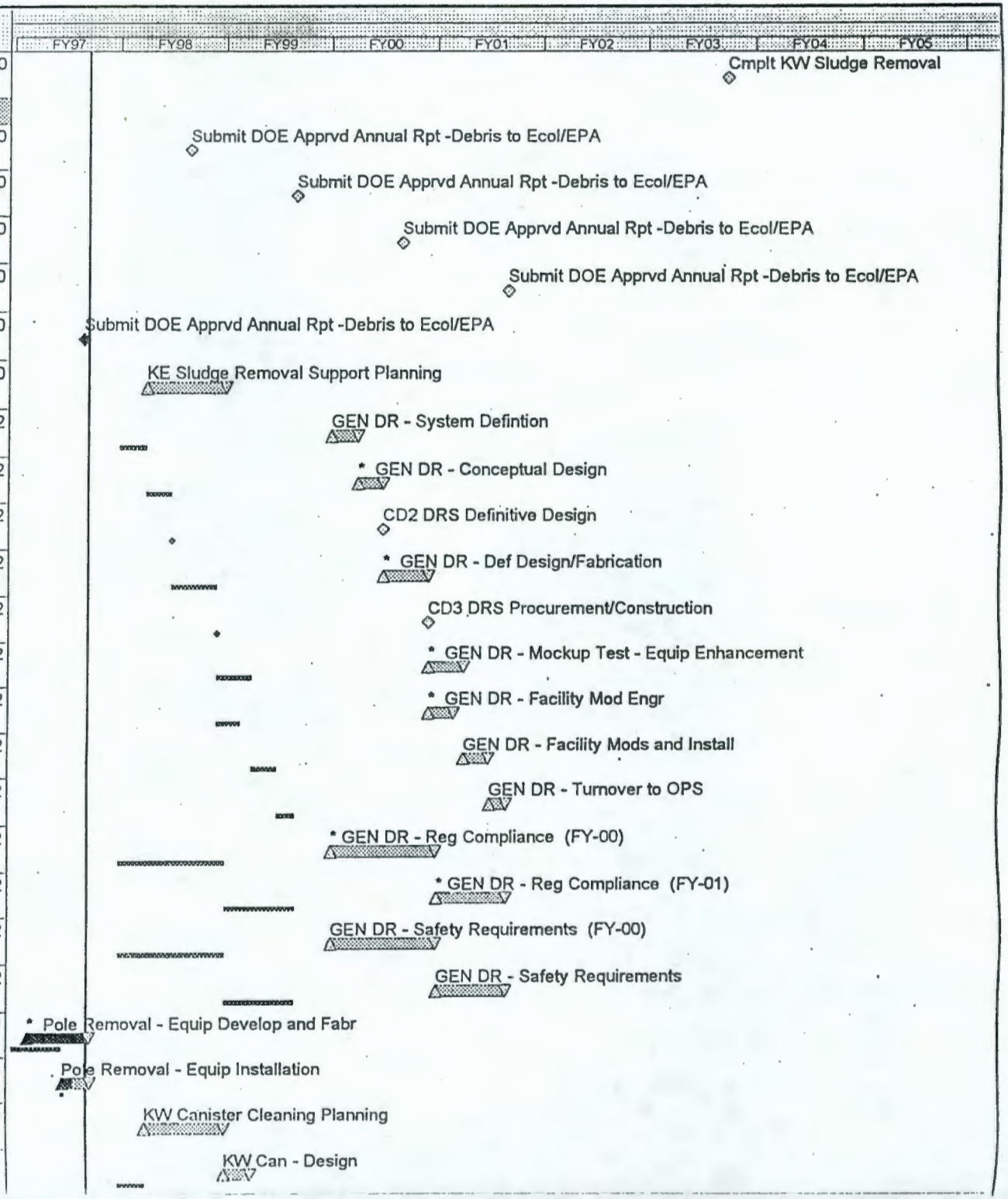
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDW1909	21JAN02	18MAR02			0
EDW1A01	01OCT96A	30SEP97	01OCT96	31JUL97	-42
EDW1A03	01DEC97*	21JUL98	06JAN98*	02JUL98	-11
EDW1A04	29JAN98	31AUG99	07JUL98	30SEP98	-230
EDW1A05	17SEP98	06MAY99			0
EDW1A05A		01SEP98			0
EDW1A06	17SEP98	06MAY99			0
EDW1A060	01DEC97	27OCT99			0
EDW1A07	17SEP98	06MAY99			0
EDW1A07A	22APR99				0
EDW1A08	07MAY99	31AUG99			0
EDW1A09	01SEP99	27OCT99			0
EDW1A09A		03NOV99			0
EDW1B01	06JUL99*	23DEC99	02FEB98*	30SEP98	-309
EDW1B01A	04OCT99	23DEC99			0
EDW1B01B	28NOV01	25JAN02			0
EDW1B02	02OCT00*	09APR01			0
EDW1B03	10APR01	27NOV01			0
EDW1B09	28NOV01	25JAN02			0
EDW1C01	02JAN98	05AUG98			0
EDW1C011	26JAN98	06NOV98			0
EDW1C012	06AUG98	07JUN99			0
EDW1C012A		07JUN99			0
EDW1C02	15DEC98	04AUG99			0



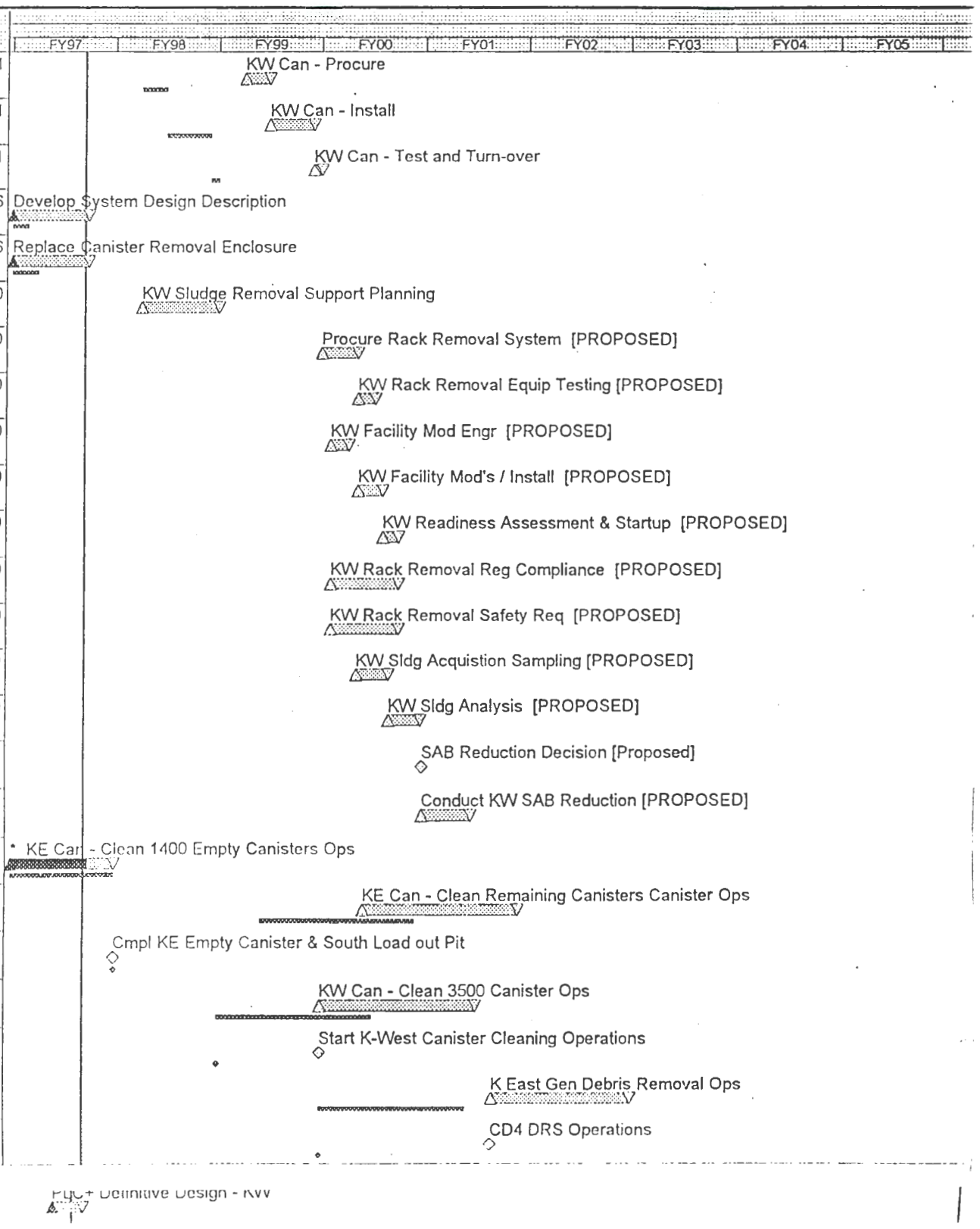
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDW1C03	05AUG99	02AUG00			0
EDW1C03A	19JUL99				0
EDW1C04	01OCT98*	21FEB02			0
EDW1C05	13MAR00	09MAR01			0
EDW1C05A	28FEB00				0
EDW1C06	03AUG00	18MAY01			0
EDW1C07	04JUN01	21FEB02			0
EDW1C13		31JUL01			0
EDW1C99	01OCT97	21FEB02			0
EDW1D01	17JUN02	09OCT02	01OCT97*	30SEP99	-759
EDW1D01999		09OCT02			0
EDW2101	31DEC99	29AUG01	01FEB99	28SEP00	-230
EDW2101000	31DEC99		01FEB99		-230
EDW2102	31DEC99	29AUG01	01FEB99	28SEP00	-230
EDW2103	30AUG01	22FEB02	29SEP00	04JAN01	-285
EDW2104	10OCT02	23SEP03	29SEP00	30AUG01	-517
EDW2104000	10OCT02		29SEP00		-509
EDW2104999		23SEP03		30AUG01	-517
EDW2105	10OCT02	06DEC02	04JAN00*	01MAR00	-696
EDW2106	10OCT02	05FEB03	02MAR00	21AUG00	-616
EDW2A01	06FEB03	30MAY03			0
EDW2B01	10OCT02	20FEB03			0
EDW2C01	21FEB03	27JUN03			0
EDW2C01000	10OCT02				0



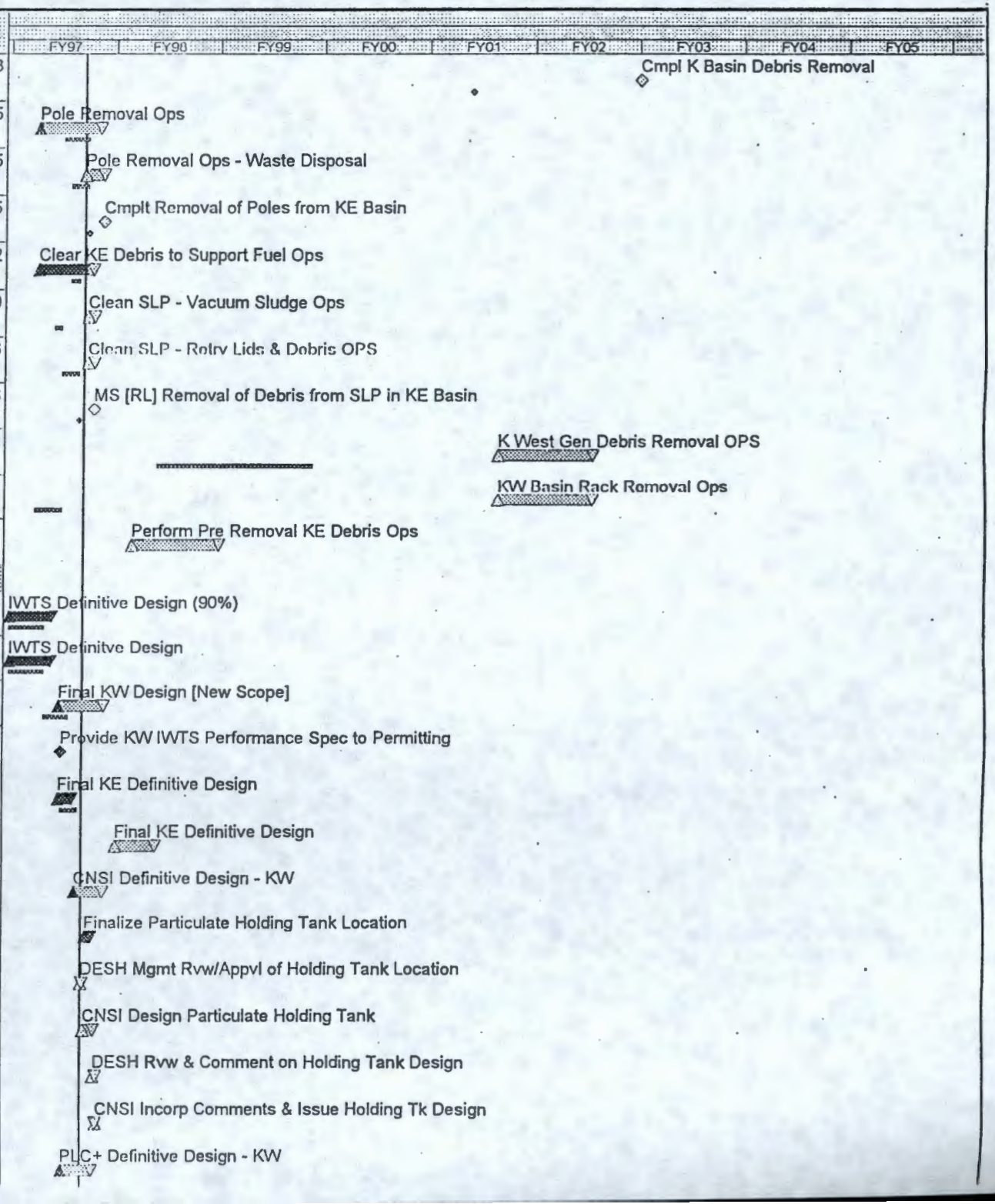
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EDW2C01999		27JUN03			0
DEBRIS REMOVAL PROJECT 1.4.1.04.05					
EFW11031		29MAY98*			0
EFW11041		01JUN99*			0
EFW11051		31MAY00*			0
EFW11061		31MAY01*			0
EFW1200		30MAY97A			0
EFW1500	02JAN98*	30SEP98			0
EFW1501	01OCT99*	31DEC99	01OCT97*	31DEC97	-502
EFW1502	04JAN00	30MAR00	02JAN98	31MAR98	-502
EFW1502999		30MAR00		31MAR98	-502
EFW1503	31MAR00	30AUG00	01APR98	31AUG98	-502
EFW1503999		30AUG00		31AUG98	-502
EFW1504	31AUG00	02JAN01	01SEP98	31DEC98	-502
EFW1505	31AUG00	27NOV00	01SEP98	24NOV98	-502
EFW1506	03JAN01	30MAR01	04JAN99	31MAR99	-502
EFW1507	02APR01	30MAY01	01APR99	28MAY99	-502
EFW1508	01OCT99	29SEP00	01OCT97	30SEP98	-502
EFW15081	02OCT00	30MAY01	01OCT98	28MAY99	-502
EFW1509	01OCT99	29SEP00	01OCT97	30SEP98	-502
EFW15091	02OCT00	30MAY01	01OCT98	28MAY99	-502
EFW17013	22NOV96A	24JUN97	01OCT96	18MAR97	-69
EFW17014	24MAR97A	27JUN97	19MAR97	31MAR97	-63
EFW1900	02JAN98*	30SEP98			0
EFW1901	01OCT98*	31DEC98	01OCT97*	31DEC97	-251



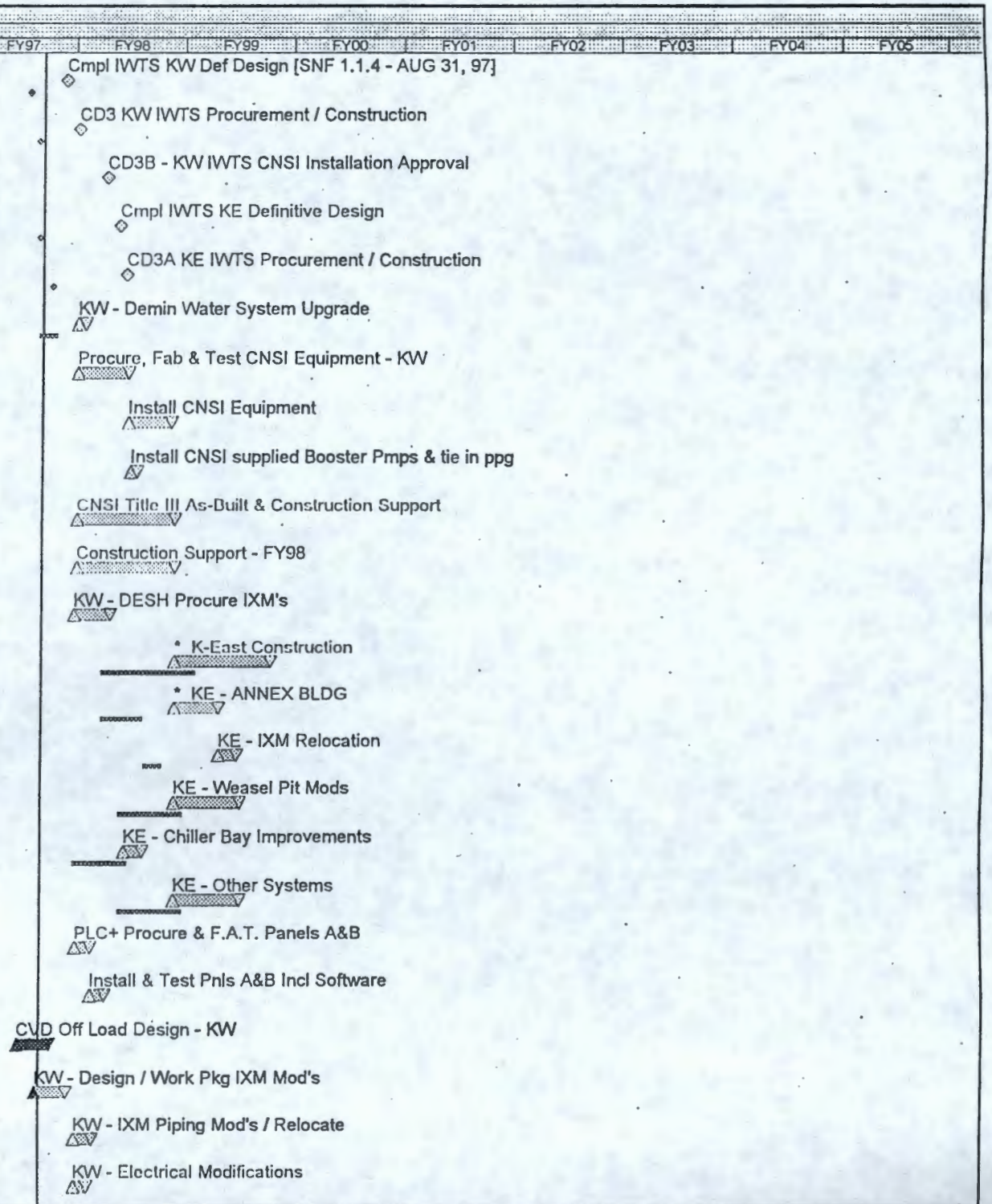
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EFW1902	04JAN99	31MAR99	02JAN98	31MAR98	-251
EFW1903	01APR99	31AUG99	01APR98	31AUG98	-251
EFW1904	01SEP99	30SEP99	01SEP98	30SEP98	-251
EFW1A01	01OCT96A	30JUN97	01OCT96	27NOV96	-146
EFW1A011	01OCT96A	30JUN97	01OCT96	31DEC96	-126
EFW1B00	02JAN98*	30SEP98			0
EFW1B01	01OCT99*	03FEB00			0
EFW1B02	04FEB00	04APR00			0
EFW1B03	02NOV99	05JAN00			0
EFW1B04	04FEB00	02MAY00			0
EFW1B05	03MAY00	29JUN00			0
EFW1B06	02NOV99	29JUN00			0
EFW1B07	02NOV99	29JUN00			0
EFW1B081	31JAN00	22MAY00			0
EFW1B082	23MAY00	15SEP00			0
EFW1B08299	18SEP00				0
EFW1B083	18SEP00	12MAR01			0
EFW2401	01OCT96A	30SEP97	01OCT96	30SEP97	0
EFW24011	29FEB00	27AUG01	02MAR99	28AUG00	-250
EFW2401999		30SEP97		30SEP97	0
EFW2402	01OCT99	03APR01	01OCT98	03APR00	-251
EFW2402A	01OCT99		01OCT98		-251
EFW2501	31MAY01	02OCT02	04OCT99	26FEB01	-403
EFW2501000	31MAY01		04OCT99*		-416
EFW3042B	07APR97A	23JUL97			0



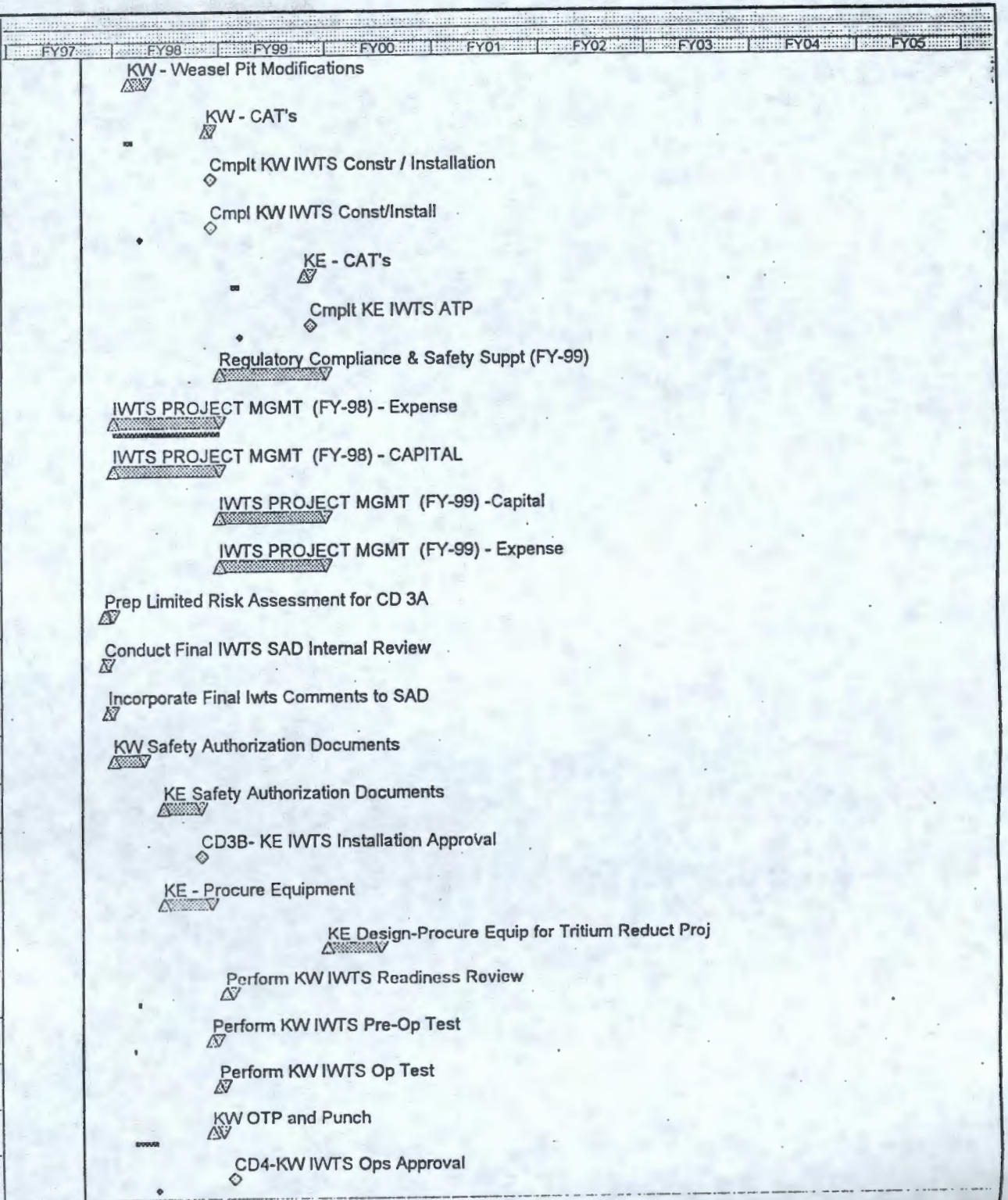
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EFW2501999		02OCT02		26FEB01	-403
EFW26011	06JAN97A	04AUG97	01APR97	26JUN97	-25
EFW26012	16JUN97	18AUG97	28APR97	26JUN97	-35
EFW2601299		18AUG97		26JUN97	-35
EFW2602	06JAN97A	16JUL97	30APR97	29MAY97	-32
EFW27011	30JUN97*	21JUL97	03MAR97	27MAR97	-79
EFW27012	30JUN97*	21JUL97	28MAR97	28MAY97	-36
EFW2701299		21JUL97		28MAY97	-36
EFW2801	30MAY01	24APR02	26FEB98*	24AUG99	-669
EFW2A01	30MAY01	24APR02	30DEC96*	31MAR97	-1,272
EFW2B01	01DEC97*	30SEP98			0
WATER TREATMENT 1.4.1 04.06					
EGW1504	01OCT96A	28FEB97A	01OCT96	31JAN97	-19
EGW15040	01OCT96A	21FEB97A	01OCT96	31JAN97	-14
EGW15041	24MAR97A	27AUG97	03FEB97	30APR97	-82
EGW1504100		03APR97A			0
EGW150411	24MAR97A	09MAY97A	01APR97*	03JUN97	16
EGW150411A	13OCT97	27FEB98			0
EGW15042A	22MAY97A	29AUG97			0
EGW15042A1	30JUN97A	18JUL97A			0
EGW15042A2	16JUN97	20JUN97			0
EGW15042A3	23JUN97	28JUL97			0
EGW15042A4	29JUL97	04AUG97			0
EGW15042A5	05AUG97	07AUG97			0
EGW15042B	07APR97A	22JUL97			0



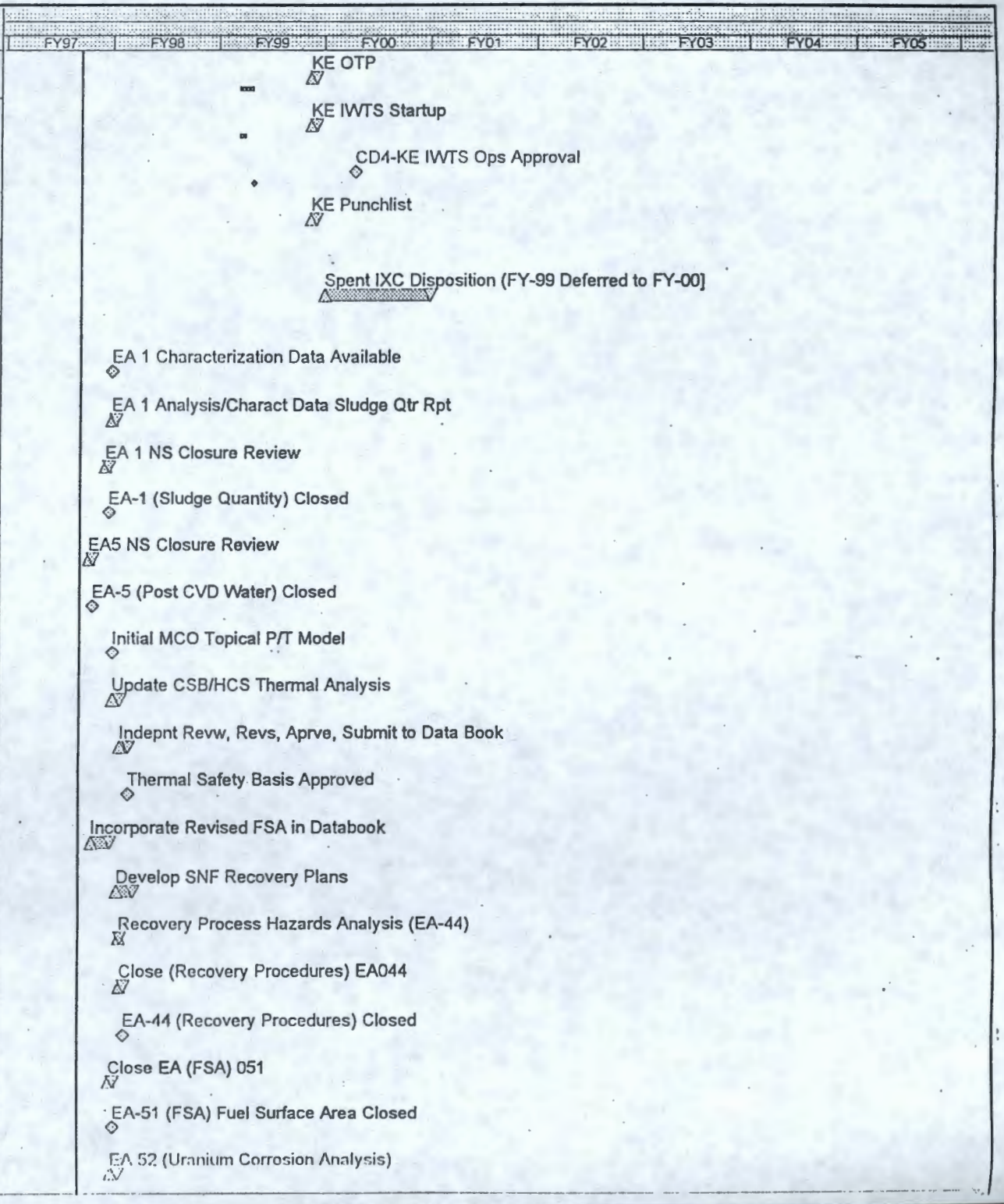
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
EGW1504988		29AUG97		30APR97	-84
EGW1504989		10OCT97		28MAY97*	-94
EGW1504995		12JAN98			0
EGW1504998		27FEB98		03JUN97	-184
EGW1504999		20MAR98		15JUL97*	-171
EGW1506105	13OCT97	07NOV97	02JUN97	31JUL97	-70
EGW15061A	13OCT97	30MAR98			0
EGW15061B	31MAR98	20AUG98			0
EGW15061C	07APR98	27APR98			0
EGW15061D	13OCT97	03SEP98			0
EGW15061E	13OCT97	03SEP98			0
EGW15061X	01OCT97	30JAN98			0
EGW15062	03SEP98	20JUL99	02JAN98*	11NOV98	-170
EGW1506215	03SEP98	28JAN99	02JAN98*	22MAY98	-170
EGW1506230	29JAN99	29MAR99	26MAY98	23JUL98	-170
EGW1506240	03SEP98*	09APR99	02MAR98	01OCT98	-130
EGW1506250	23MAR98*	18MAY98	01OCT97*	03APR98	-31
EGW1506260	03SEP98*	09APR99	02MAR98	01OCT98	-130
EGW15062A	13OCT97	03DEC97			0
EGW15062B	04DEC97	19JAN98			0
EGW15063A	04APR97A	18JUL97A			0
EGW15064A	02JUN97A	15SEP97			0
EGW15064B	13OCT97	09DEC97			0
EGW15064C	13OCT97	21NOV97			0



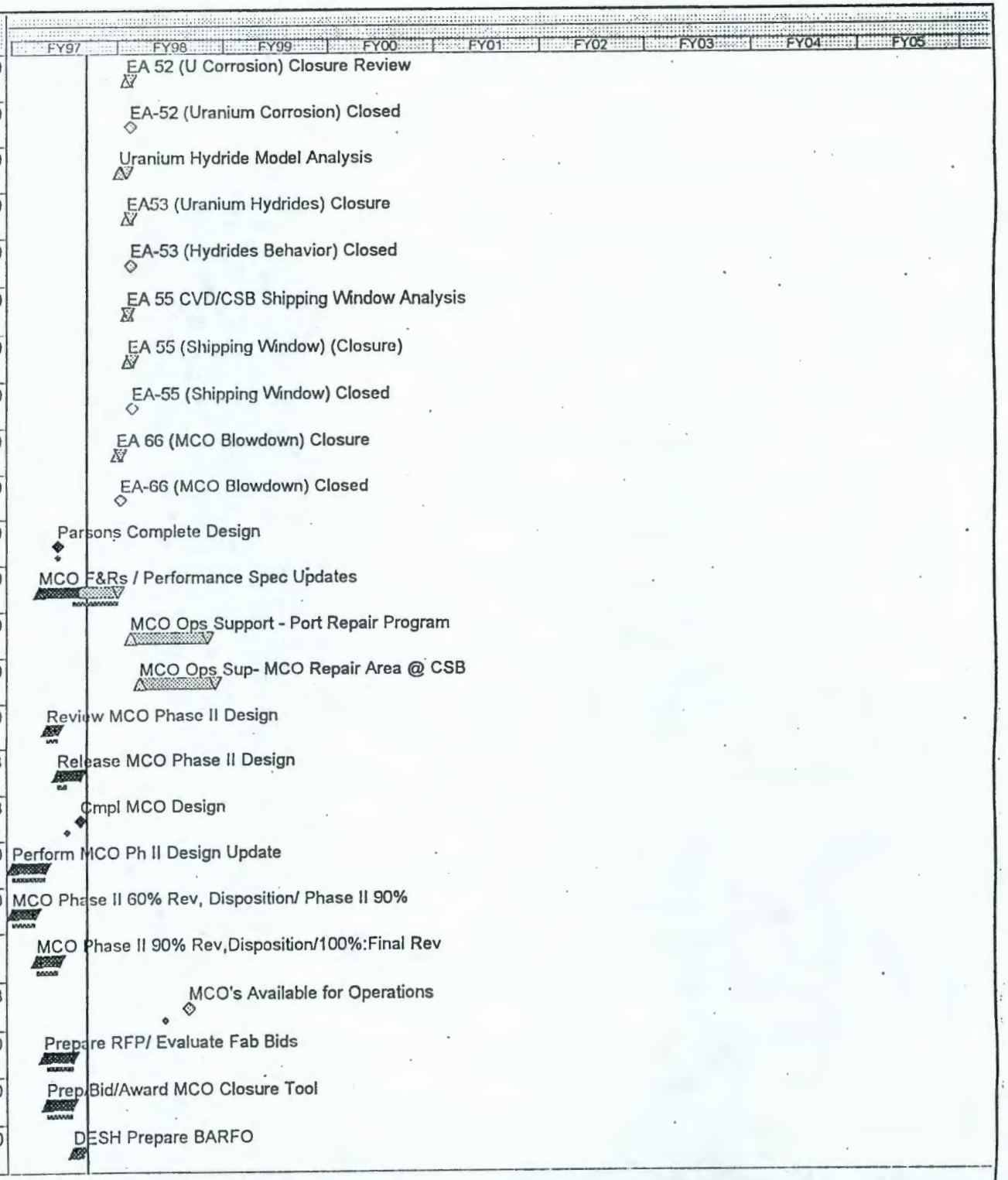
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
GW15064D	24NOV97	23JAN98			0
GW1507110	21AUG98	03SEP98	12NOV97	09DEC97	-185
GW1507199		03SEP98			0
GW15071PA		03SEP98		31DEC97*	-171
GW1507210	21JUL99	13AUG99	12NOV98	09DEC98	-170
GW1507299		13AUG99		09DEC98	-170
GW1520A	01OCT98	30SEP99			0
GW1602	01OCT97	30SEP98	01OCT97	30SEP98	0
GW1602C	01OCT97	30SEP98			0
GW1603C	01OCT98	30SEP99			0
GW1603E	01OCT98	30SEP99			0
GW1999095	02SEP97*	03OCT97			0
GW1999100	02SEP97	15SEP97			0
GW1999105	16SEP97	29SEP97			0
GW1999125	01OCT97	12JAN98			0
GW1999150	23MAR98	29JUL98			0
GW1999155		29JUL98			0
GW1999160	23MAR98	02SEP98			0
GW1999180	01OCT99*	31MAR00			0
GW24001E	19OCT98	13NOV98	26DEC97	30DEC97	-222
GW24002A	04SEP98	25SEP98	10DEC97	15DEC97	-196
GW24002B	28SEP98	16OCT98			0
GW24011	04SEP98	09OCT98	10DEC97	26FEB98	-157
GW2401199		13NOV98		26FEB98	-182



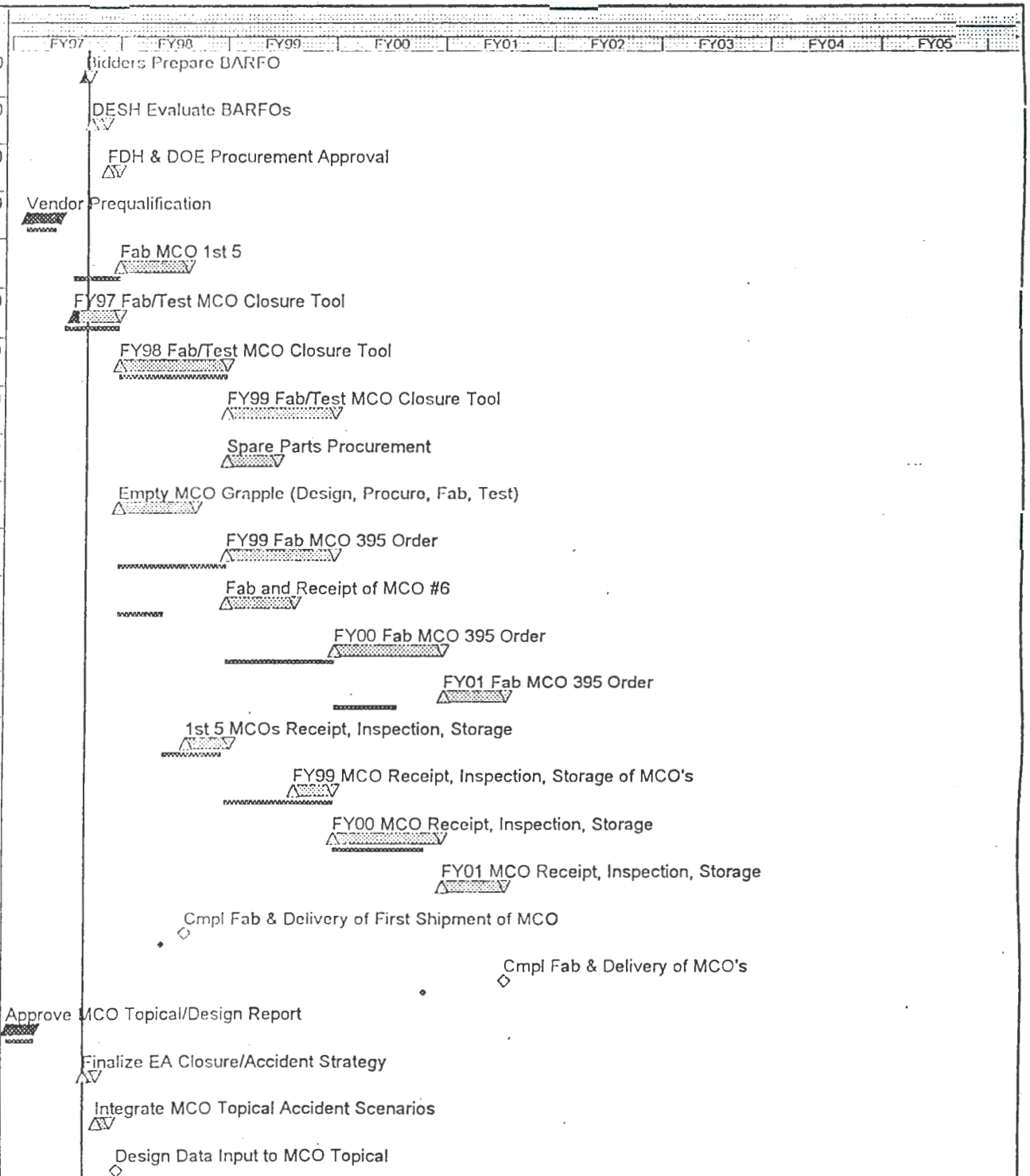
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
GW24012	16AUG99	01SEP99	10DEC98	28JAN99	-150
GW2401230	16AUG99	01SEP99	10DEC98	30DEC98	-170
GW2401299		14JAN00		29JAN99	-240
GW24012A	16AUG99	01SEP99			0
Disposition of IXC's					
IW23031	01OCT99	29SEP00			0
MCO ACQUISITION 1.4.1.05					
AW124001A		02OCT97			0
AW124001B	03OCT97	16OCT97			0
AW124001C	12SEP97*	25SEP97			0
AW124001D		25SEP97			0
AW124005F	15JUL97*	30JUL97			0
AW124005J		30JUL97*			0
AW12400A		06OCT97			0
AW12400D	07OCT97	30OCT97			0
AW12400E	31OCT97	01DEC97			0
AW12400F		01DEC97			0
AW12400G	31JUL97*	30SEP97			0
AW12400J	24OCT97	19DEC97			0
AW124044A	31OCT97	06NOV97			0
AW124044B	07NOV97	20NOV97			0
AW124044C		20NOV97			0
AW124051A	01OCT97	14OCT97			0
AW124051B		14OCT97			0
AW124052A	07OCT97	30OCT97			0



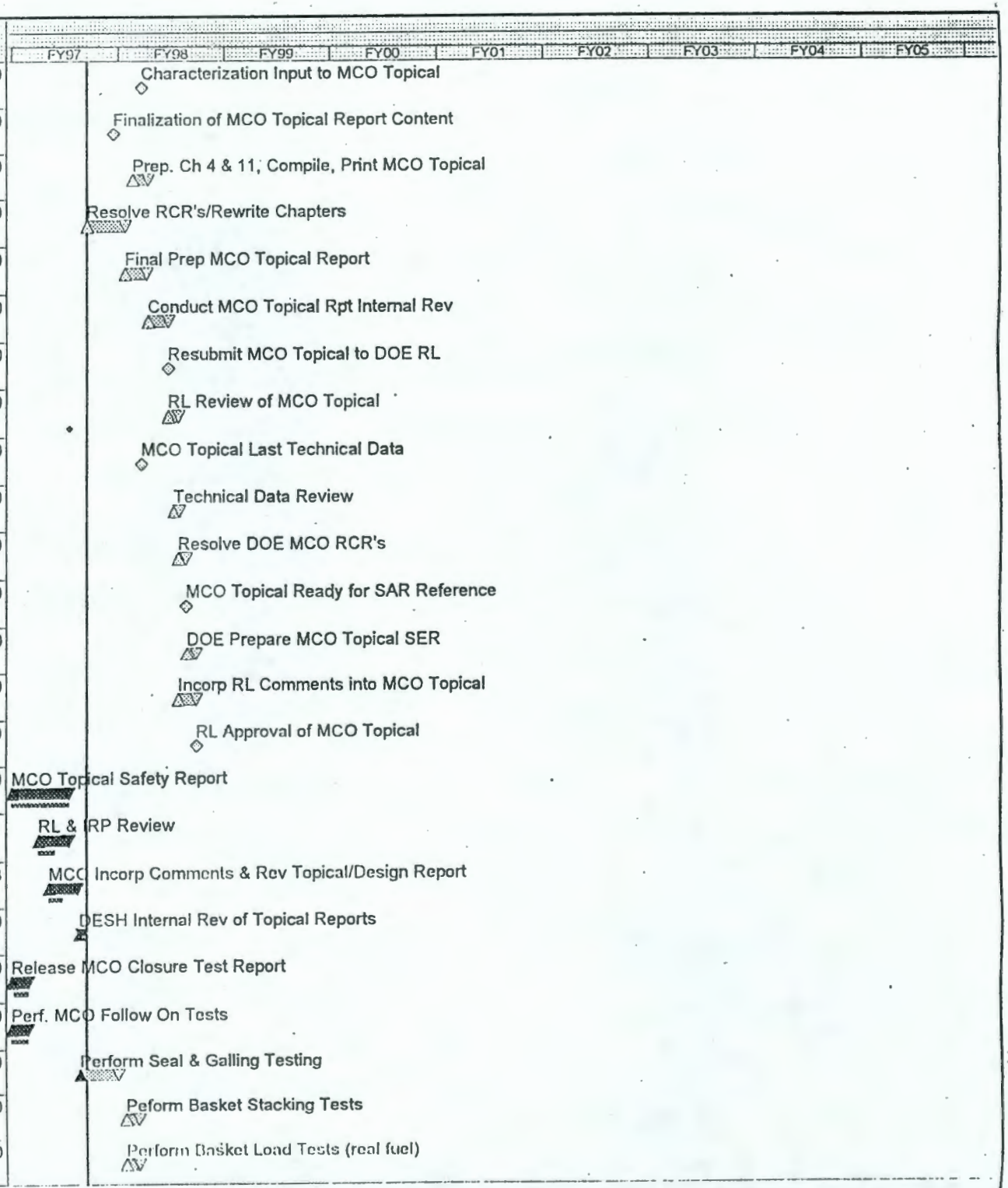
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
FAW124052B	31OCT97	13NOV97			0
FAW124052C		13NOV97			0
FAW124053D	07OCT97	30OCT97			0
FAW124053F	31OCT97	13NOV97			0
FAW124053J		13NOV97			0
FAW124055D	31OCT97	06NOV97			0
FAW124055F	07NOV97	20NOV97			0
FAW124055J		20NOV97			0
FAW124066F	29SEP97	10OCT97			0
FAW124066J		10OCT97			0
FAW222		07MAR97A		07MAR97	0
FAW277	02JAN97A	30SEP97	01MAY97	30SEP97	0
FAWA0203A	17NOV97	06AUG98			0
FAWA0203C	15DEC97	01SEP98			0
FAWA0250	27JAN97A	07MAR97A	27JAN97	07MAR97	0
FAWA0251	10MAR97A	23MAY97A	10MAR97	08APR97	-33
FAWA0252		23MAY97A		08APR97	-33
FAWA0940	01OCT96A	24JAN97A	01OCT96	24JAN97	0
FAWA0941	01OCT96A	20DEC96A	01OCT96	20DEC96	0
FAWA0942	23DEC96A	10MAR97A	23DEC96	07MAR97	-1
FAWA0980	04JUN98		13MAR98		-58
FAWA1160	20JAN97A	30APR97A	27JAN97	30APR97	0
FAWA1160.1	27JAN97A	23APR97A	27JAN97	23APR97	0
FAWA1160A	01MAY97A	30MAY97A			0



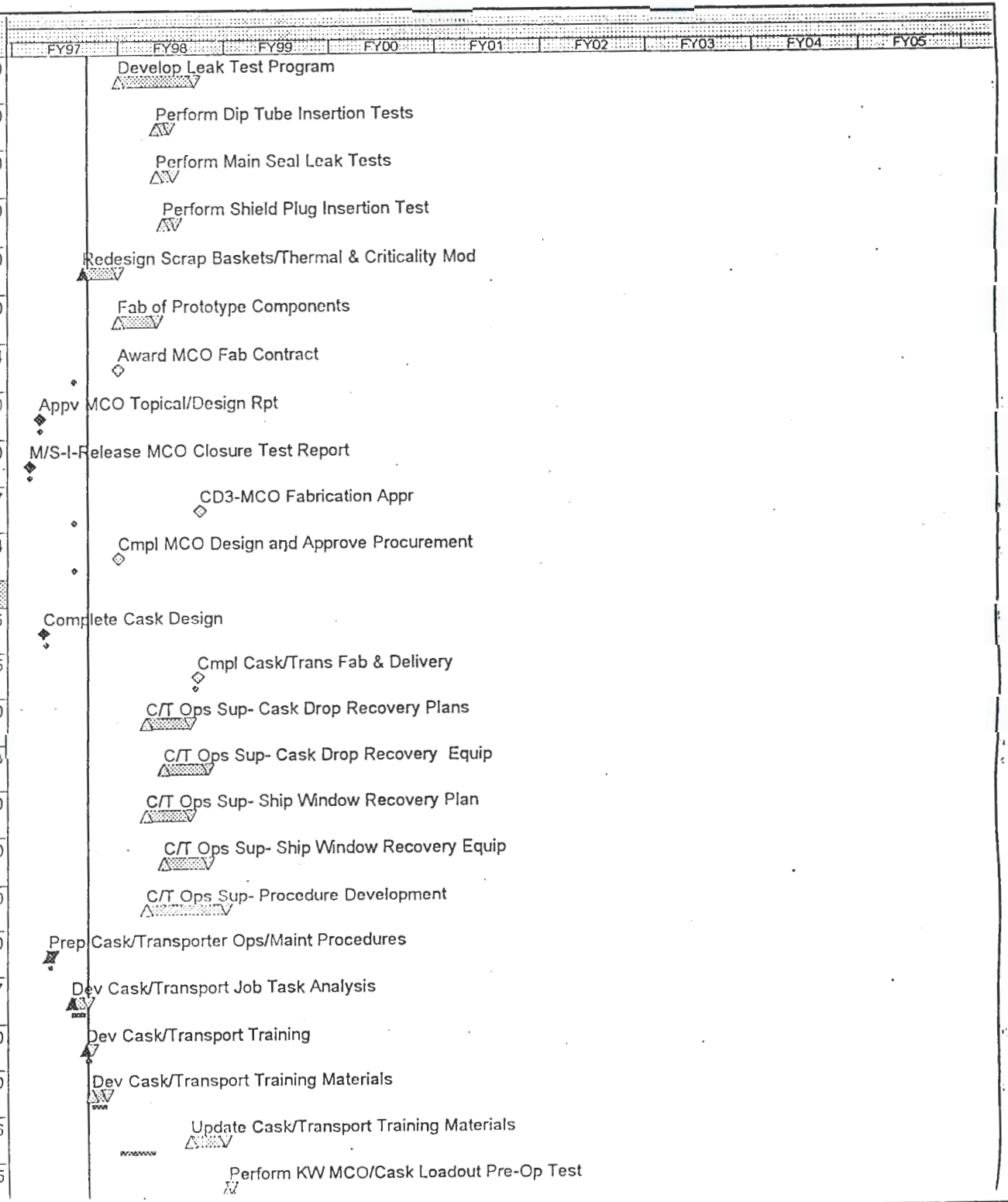
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AWA1160B	02JUN97A	20JUN97			0
AWA1160C	23JUN97	15AUG97			0
AWA1160D	18AUG97	29SEP97			0
AWA1163	18NOV96A	10MAR97A	18NOV96	25FEB97	-9
AWA1170	01OCT97	21MAY98	01MAY97	30SEP97	-161
AWA1170.1	01MAY97A	30SEP97	28MAR97	30SEP97	0
AWA1170.3	01OCT97	30SEP98	01OCT97	30SEP98	0
AWA1170.4	01OCT98	30SEP99			0
AWA1170A	01OCT98	19MAR99			0
AWA1170B	01OCT97	18JUN98			0
AWA1171A	01OCT98*	30SEP99	01OCT97	30SEP98	-251
AWA1171B	01OCT98	20MAY99	01OCT97	02MAR98	-308
AWA1172	01OCT99	29SEP00	01OCT98	30SEP99	-251
AWA1173	02OCT00	30APR01	01OCT99	28APR00	-251
AWA1176	22MAY98	16OCT98	03MAR98	18SEP98	-20
AWA1177	21MAY99	30SEP99	01OCT98	30SEP99	0
AWA1178	01OCT99	29SEP00	01OCT99	31JUL00	-43
AWA1179	02OCT00	30APR01			0
AWA1180		21MAY98		02MAR98	-58
AWA1200		30APR01		31JUL00	-188
AWA1250	01OCT96A	30DEC96A	01OCT96	30DEC96	0
AWA1250A	16JUN97	28JUL97			0
AWA1250B	29JUL97	16SEP97			0
AWA1251A	07OCT97				0



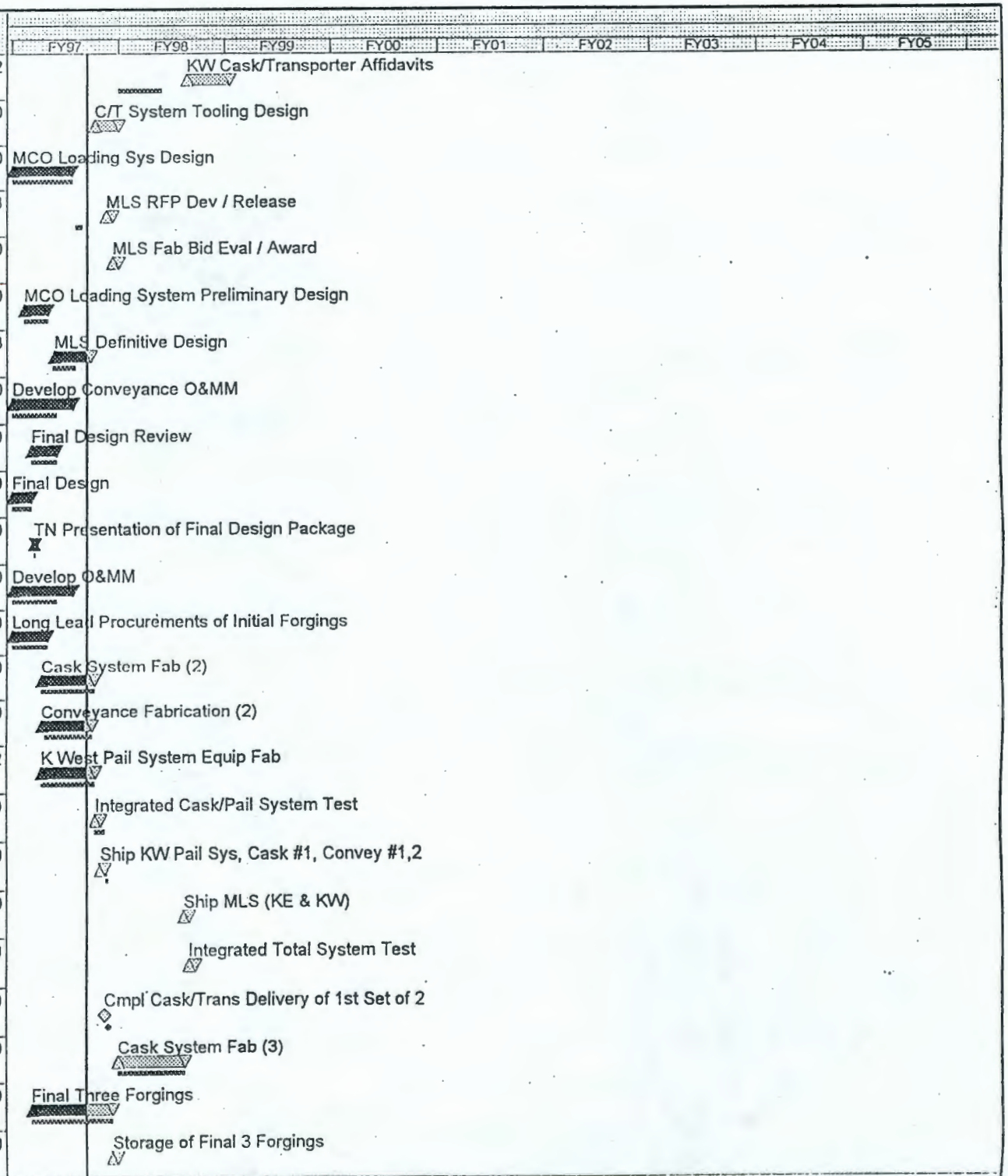
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AWA1251B		19DEC97			0
AWA1252B	17SEP97				0
AWA1252C	21NOV97	08JAN98			0
AWA1252D	16JUN97	22OCT97			0
AWA1252E	23OCT97	07JAN98			0
AWA1253	09JAN98	20MAR98			0
AWA1254	23MAR98				0
AWA1255	23MAR98	24APR98		14APR97	-259
AWA1255A		19DEC97			0
AWA1255B	14APR98	27APR98			0
AWA1255C	27APR98	22MAY98			0
AWA1256		22MAY98			0
AWA1257	26MAY98	22JUN98			0
AWA1258	27APR98	22JUN98			0
AWA1259		22JUN98			0
AWA1260	01OCT96A	14APR97A	01OCT96	14APR97	0
AWA1261	31DEC96A	14APR97A	31DEC96	28FEB97	-31
AWA1262	07FEB97A	16MAY97A	07FEB97	25MAR97	-38
AWA1262A	19MAY97A	30MAY97A			0
AWA250.5B	01OCT96A	27NOV96A	11OCT96	27NOV96	0
AWA250.5D	01OCT96A	27NOV96A	01OCT96	27NOV96	0
AWA250.5E	27MAY97A	30SEP97			0
AWA250.5F	29OCT97	11DEC97			0
AWA250.5G	29OCT97	11DEC97			0



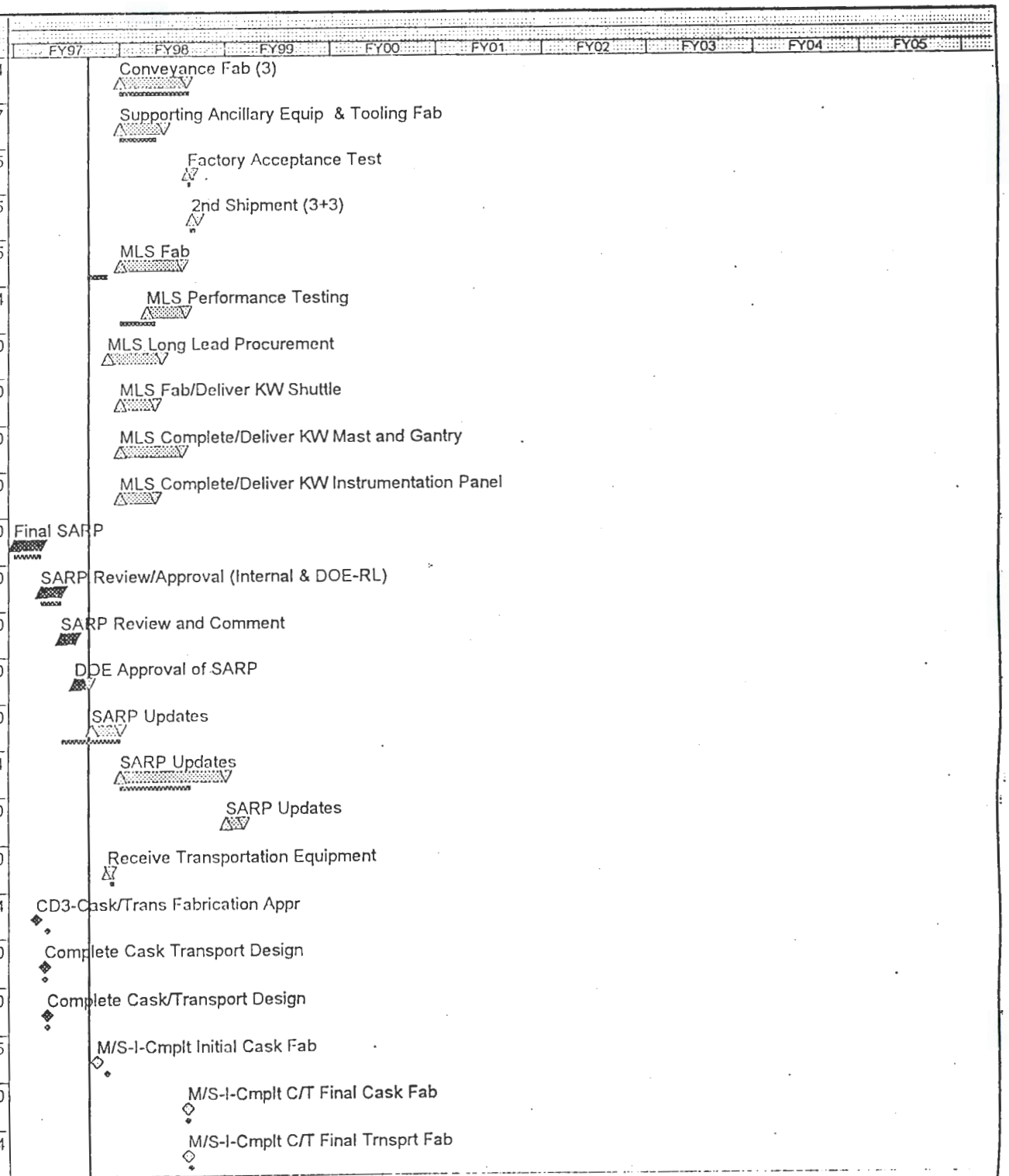
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AWA250.5H	01OCT97	18JUN98			0
AWA250.5J	10FEB98	24MAR98			0
AWA250.5K	10FEB98	07APR98			0
AWA250.5L	04MAR98	14APR98			0
AWA2500	28MAY97A	29SEP97			0
AWA260	30SEP97	09FEB98			0
AWM002	30SEP97		01MAY97		-104
AWM008		30DEC96A		30DEC96	0
AWM017		27NOV96A		27NOV96	0
AWMCD3		08JUL98		30APR97	-297
AWMPA132	30SEP97		01MAY97		-104
CASK/TRANSPORTATION SYSTEM					
BW001.3		15JAN97A		22JAN97	5
BW001.5		26JUN98		19JUN98	-5
BW004.2E	02JAN98	01JUN98			0
BW004.2F	02MAR98	03AUG98			0
BW004.2G	02JAN98	01JUN98			0
BW004.2H	02MAR98	03AUG98			0
BW004.2J	02JAN98	30SEP98			0
BW01B08	03FEB97A	14FEB97A	03FEB97*	14FEB97	0
BW01B10	21APR97A	17JUN97	21APR97*	06JUN97	-7
BW01B10D	09JUN97A	30JUN97	09JUN97	30JUN97	0
BW01B10E	01JUL97	20AUG97	01JUL97	20AUG97	0
BW01B10F	01JUN98*	28SEP98	01OCT97*	30JAN98	-166
BW01B14D	13OCT98	19OCT98	18DEC97	26DEC97	-205



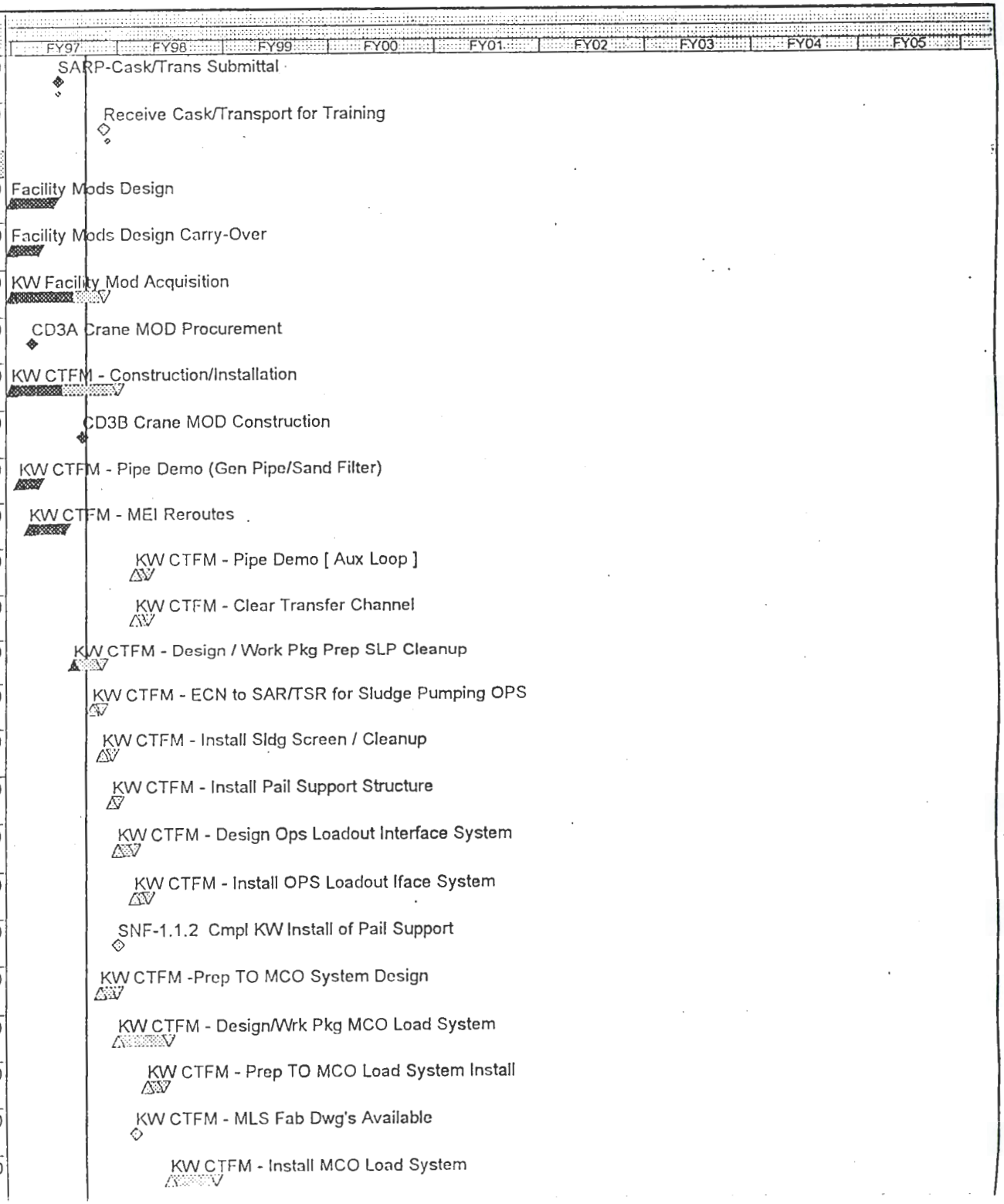
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
FBW01B15	26MAY98	19OCT98	01OCT97*	27FEB98	-162
FBW043B	14JUL97	30SEP97			0
FBW045	01OCT96A	25APR97A	01OCT96	25APR97	0
FBW045.1	18AUG97*	11SEP97	06MAY97	28MAY97	-73
FBW045.1B	12SEP97	30SEP97			0
FBW045A	11NOV96A	30JAN97A	11NOV96*	30JAN97	0
FBW045B	25FEB97A	27JUN97	18FEB97	05MAY97	-38
FBW047	01OCT96A	28APR97A	01OCT96	03MAR97	-40
FBW051.1	06DEC96A	03MAR97A	06DEC96	03MAR97	0
FBW051.1A	01OCT96A	05DEC96A	01OCT96	05DEC96	0
FBW051.1B	17DEC96A	18DEC96A	17DEC96	18DEC96	0
FBW052	01OCT96A	28APR97A	01OCT96	03MAR97	-40
FBW062.1	01OCT96A	31JAN97A	01OCT96	31JAN97	0
FBW063	10JAN97A	11JUL97	10JAN97	11JUL97	0
FBW064	10JAN97A	01JUL97	23JAN97	01JUL97	0
FBW065	10JAN97A	15JUL97	10JAN97	11JUL97	-2
FBW066	16JUL97	01AUG97	14JUL97	15AUG97	10
FBW066.2	04AUG97	15AUG97	18AUG97	28AUG97	9
FBW066.3	18MAY98	02JUN98			0
FBW066C	03JUN98	23JUN98			0
FBW067		15AUG97		28AUG97	9
FBW068	01OCT97	22MAY98	01OCT97	22MAY98	0
FBW068.1	09DEC96A	15SEP97	09DEC96	15SEP97	0
FBW068.1A	16SEP97	30SEP97			0



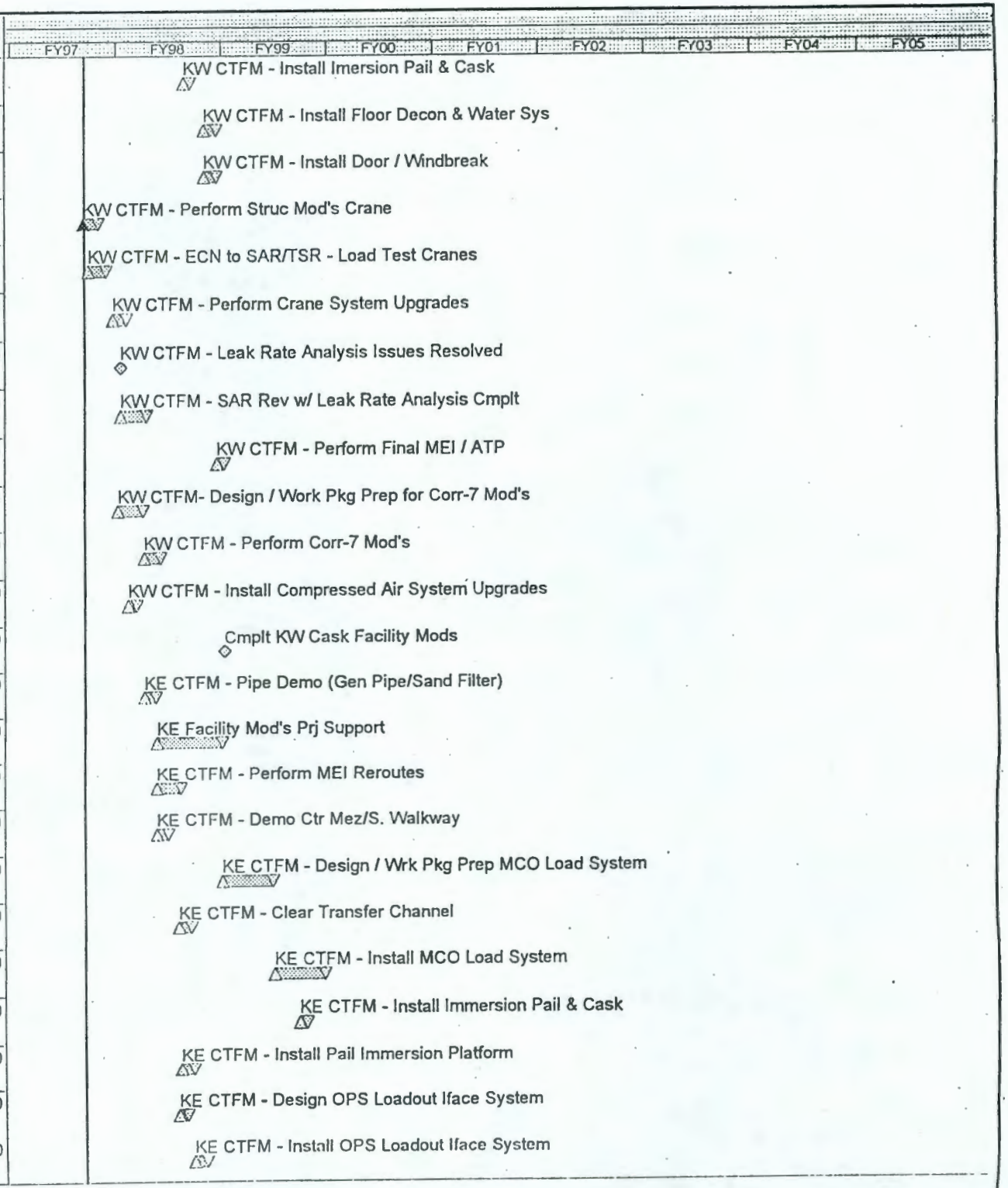
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW069	01OCT97	22MAY98	01OCT97	29MAY98	4
BW070	01OCT97	02MAR98	01OCT97	04FEB98	-17
BW070.1	26MAY98	08JUN98	26MAY98	01JUN98	-5
BW070.3	09JUN98	26JUN98	02JUN98	19JUN98	-5
BW075	01OCT97	01MAY98	13JUN97	20AUG97	-175
BW075.2	31DEC97	15MAY98	01OCT97	30JAN98	-74
BW075A	18AUG97*	20FEB98			0
BW075C	01OCT97	30JAN98			0
BW075D	01OCT97	01MAY98			0
BW075E	01OCT97	30JAN98			0
BW077A	01OCT96A	30DEC96A	01OCT96	30DEC96	0
BW078	31DEC96A	11MAR97A	31DEC96	11MAR97	0
BW078A	12MAR97A	30APR97A			0
BW078B	01MAY97A	17JUN97			0
BW079	23JUN97	30SEP97	17MAR97	30SEP97	0
BW079.1	01OCT97	30SEP98	01OCT97	01JUN98	-84
BW079.2	01OCT98	01DEC98			0
BW080	18AUG97	29AUG97	29AUG97	12SEP97	9
BWM0042		16DEC96A		22JAN97*	24
BWM006		15JAN97A		15JAN97	0
BWM006PA		22JAN97A		22JAN97*	0
BWM007		11JUL97		15AUG97	25
BWM008		22MAY98		22MAY98	0
BWM015		22MAY98		29MAY98	4



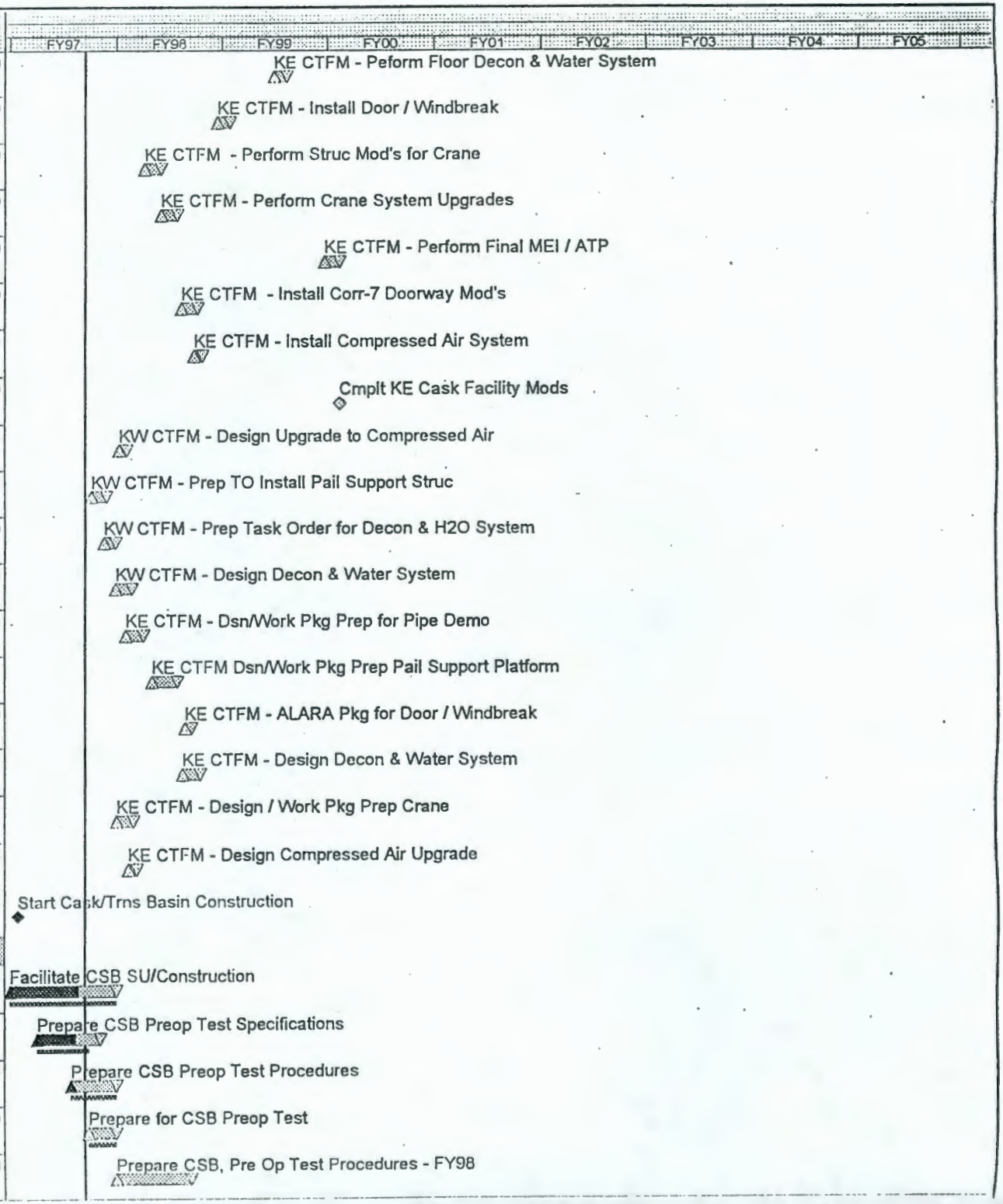
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
CWM018		11MAR97A		11MAR97	0
CWM022		15AUG97		28AUG97	9
Facility Upgrades for Transport					
CW091000	01OCT96A	21FEB97A			0
CW091001	01OCT96A	31DEC96A			0
CW091100	01OCT96A	14AUG97			0
CW091101		09DEC96A			0
CW091105	01OCT96A	30SEP97			0
CW091109	02JUN97A				0
CW091110	30OCT96A	31DEC96A			0
CW091115	02DEC96A	04APR97A			0
CW091120	01DEC97	14JAN98			0
CW091127	01DEC97*	14JAN98			0
CW091128	05MAY97A	08AUG97			0
CW091128A	07JUL97*	05AUG97			0
CW091129	11AUG97	16SEP97			0
CW091130	17SEP97	30SEP97			0
CW091130A	01OCT97	25NOV97			0
CW091130B	26NOV97	13JAN98			0
CW091131		30SEP97			0
CW091133	04AUG97*	29SEP97			0
CW091134	01OCT97*	25MAR98			0
CW091134A	12JAN98*	09MAR98			0
CW091134B		01DEC97*			0
CW091135	31MAR98	03SEP98			0



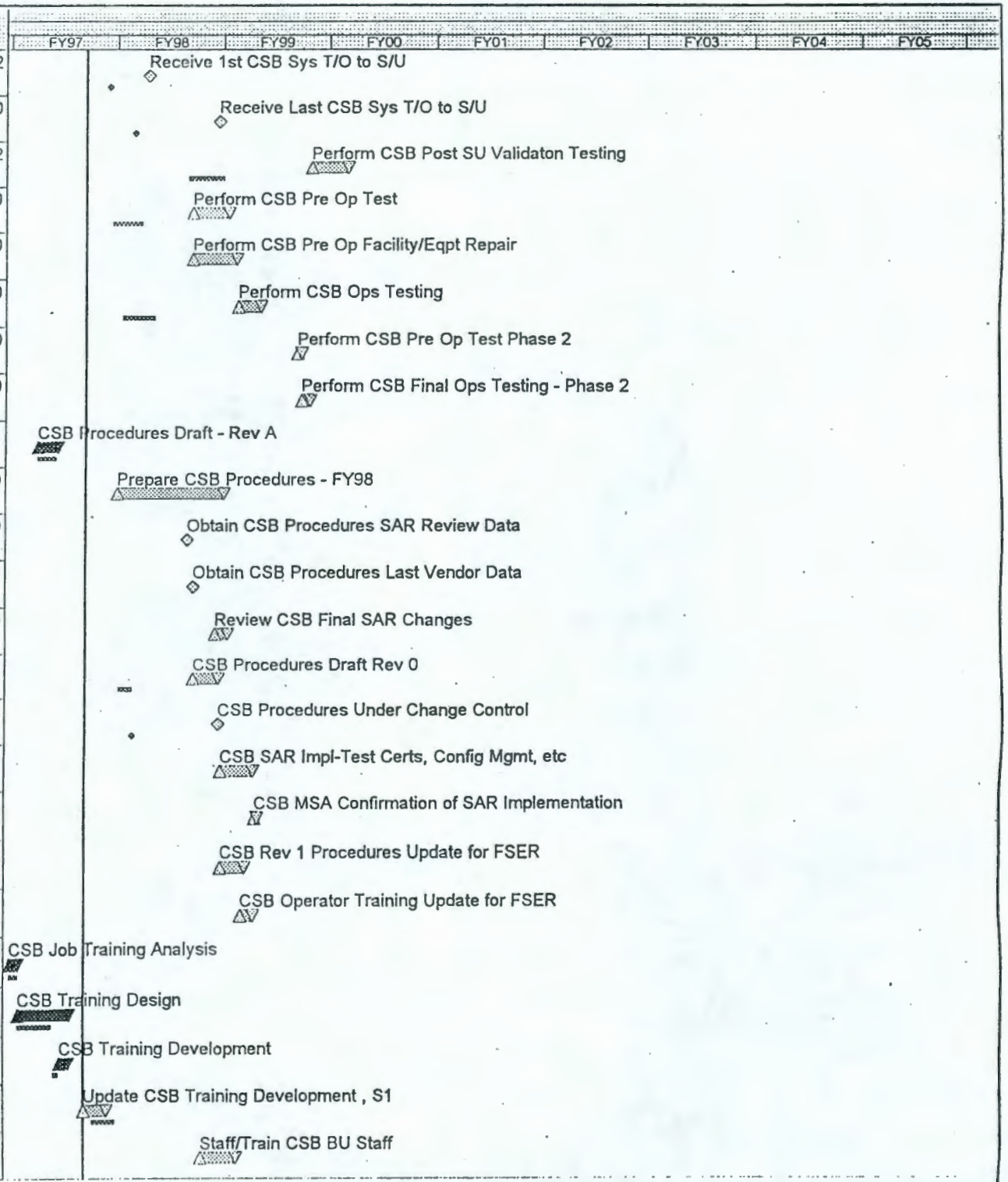
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
CW091137	27MAY98	16JUN98			0
CW091140	03AUG98*	14SEP98			0
CW091145	03AUG98*	14SEP98			0
CW091147	12JUN97A	01AUG97			0
CW091149	01JUL97*	29AUG97			0
CW091150	18SEP97	04NOV97			0
CW091153		13OCT97*			0
CW091154	14OCT97	12JAN98			0
CW091155	15SEP98	12OCT98			0
CW091160	06OCT97*	02JAN98			0
CW091165	05JAN98	02MAR98			0
CW091170	10NOV97	09DEC97			0
CW091199		12OCT98			0
CW091210	05JAN98*	13FEB98			0
CW091211	17FEB98*	30SEP98			0
CW091215	17FEB98	11MAY98			0
CW091220	17FEB98	30MAR98			0
CW091226	01OCT98*	25MAR99			0
CW091227	04MAY98*	15JUN98			0
CW091230	30MAR99	17SEP99			0
CW091232	23JUN99	22JUL99			0
CW091235	12MAY98	23JUN98			0
CW091237	04MAY98*	01JUN98			0
CA091237A	24JUN98	06AUG98			0



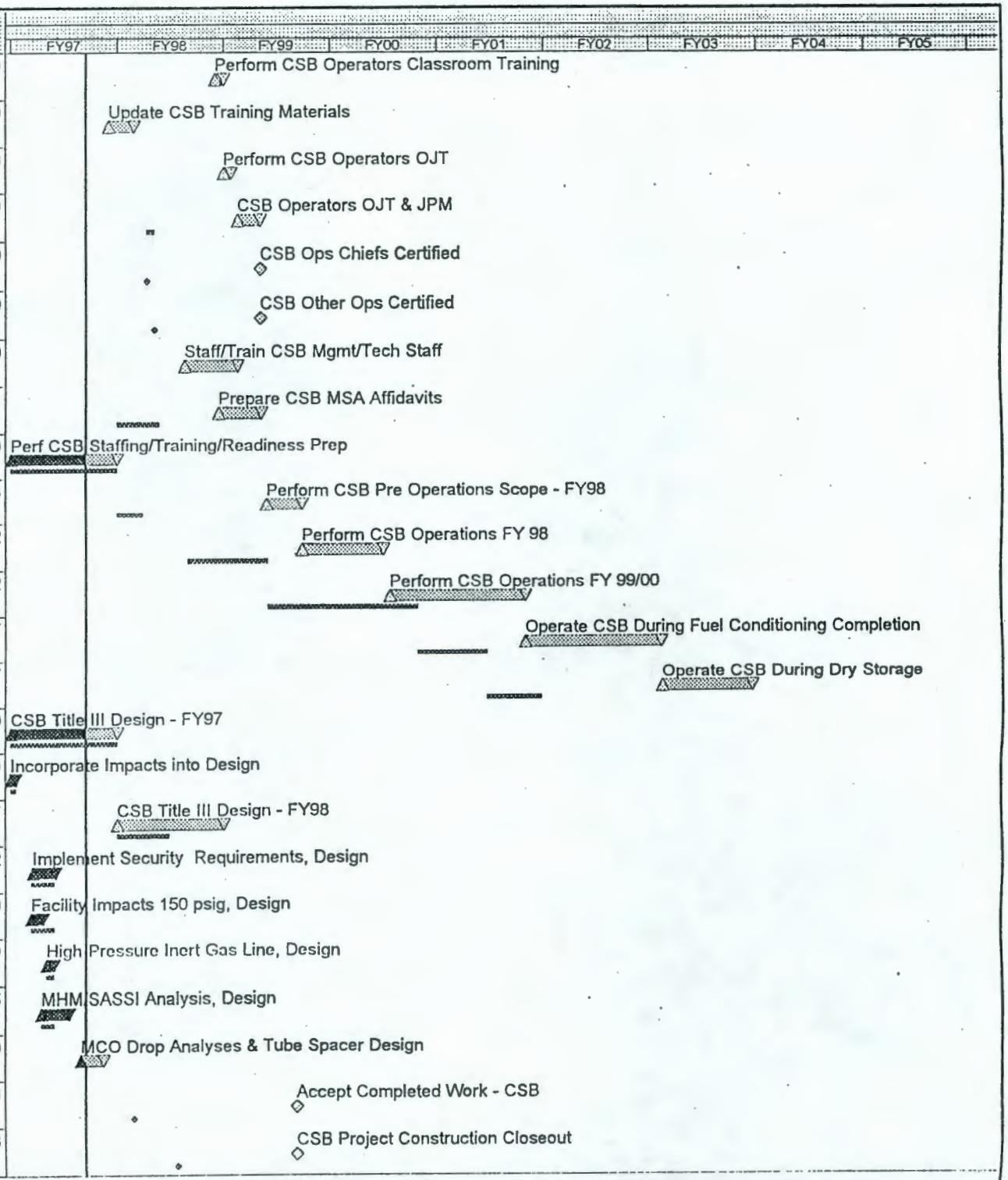
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
CW091240	30MAR99	10MAY99			0
CW091245	15SEP98	26OCT98			0
CW091247	05JAN98*	02MAR98			0
CW091250	03MAR98	27APR98			0
CW091255	20SEP99	12NOV99			0
CW091265	12MAY98	09JUL98			0
CW091270	24JUN98	23JUL98			0
CW091299		12NOV99			0
CW091800	13OCT97*	07NOV97			0
CW091820	07JUL97*	29AUG97			0
CW091830	18AUG97*	29SEP97			0
CW091840	30SEP97	24NOV97			0
CW091865	03NOV97*	02JAN98			0
CW091870	02FEB98*	27APR98			0
CW091880	26MAY98*	15JUN98			0
CW091890	18MAY98*	15JUL98			0
CW091900	01OCT97*	25NOV97			0
CW091910	10NOV97	09DEC97			0
CWM020	30OCT96A				0
SNF CANISTER STORAGE BUILDING					
AW03B06	01OCT96A	30SEP97	01OCT96*	30SEP97	0
AW03B06A	02JAN97A	06AUG97	02JAN97*	30JUN97	-25
AW03B06B	01MAY97A	30SEP97	01MAY97*	30SEP97	0
AW03B06C	01JUL97*	30SEP97	01JUL97*	30SEP97	0
AW03B06F	01OCT97*	16JUN98			0



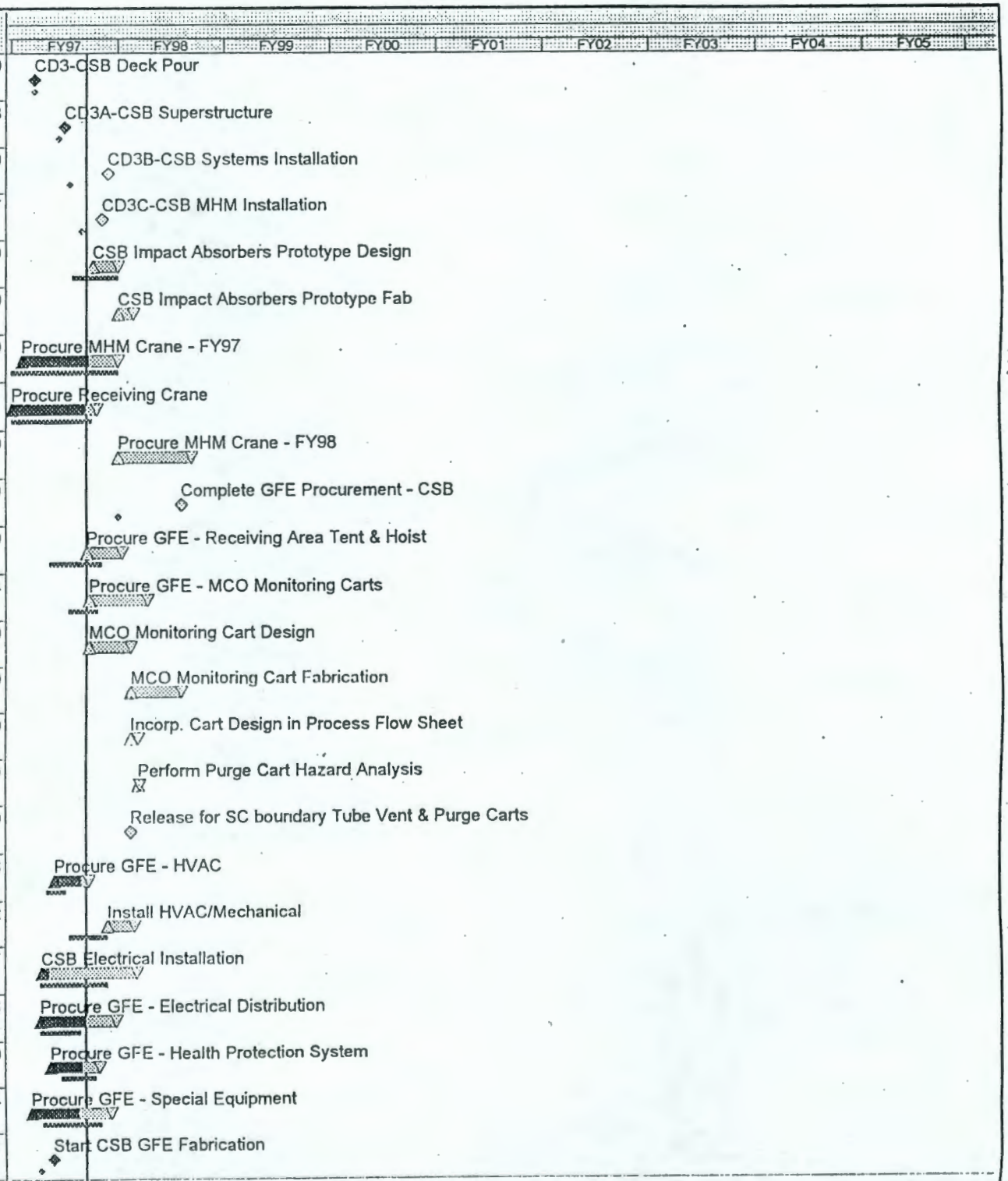
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
GAW03B08		15JAN98		02SEP97*	-92
GAW03B09		16SEP98		26NOV97	-200
GAW03B12	30JUL99	30NOV99	01JUN98	30SEP98	-292
GAW03B13A	17JUN98	21OCT98	15SEP97*	22DEC97	-209
GAW03B13A1	17JUN98	16NOV98			0
GAW03B13B	18NOV98	04FEB99	21OCT97	05FEB98	-250
GAW03B13F	10JUN99	23JUN99			0
GAW03B13G	24JUN99	23JUL99			0
GAW03B14D	02JAN97A	10MAR97A	02JAN97*	07MAR97	-1
GAW03B14D1	01OCT97*	30SEP98			0
GAW03B14FD		29MAY98			0
GAW03B14FG		19JUN98			0
GAW03B14H	02SEP98	14OCT98			0
GAW03B14J	22JUN98	16SEP98	06OCT97*	21NOV97	-203
GAW03B14K		16SEP98		21NOV97	-203
GAW03B14L	23SEP98	14JAN99			0
GAW03B14P	18JAN99	29JAN99			0
GAW03B15D	24SEP98	15DEC98			0
GAW03B15F	02DEC98	15JAN99			0
GAW03B16D	01OCT96A	31OCT96A	01OCT96	31OCT96	0
GAW03B16E	01NOV96A	29APR97A	01NOV96	28FEB97	-42
GAW03B16F	24MAR97A	24APR97A	03MAR97	20MAR97	-25
GAW03B16G	16JUN97	03SEP97	15JUL97*	30SEP97	19
GAW03B16I	22JUL98	17NOV98			0



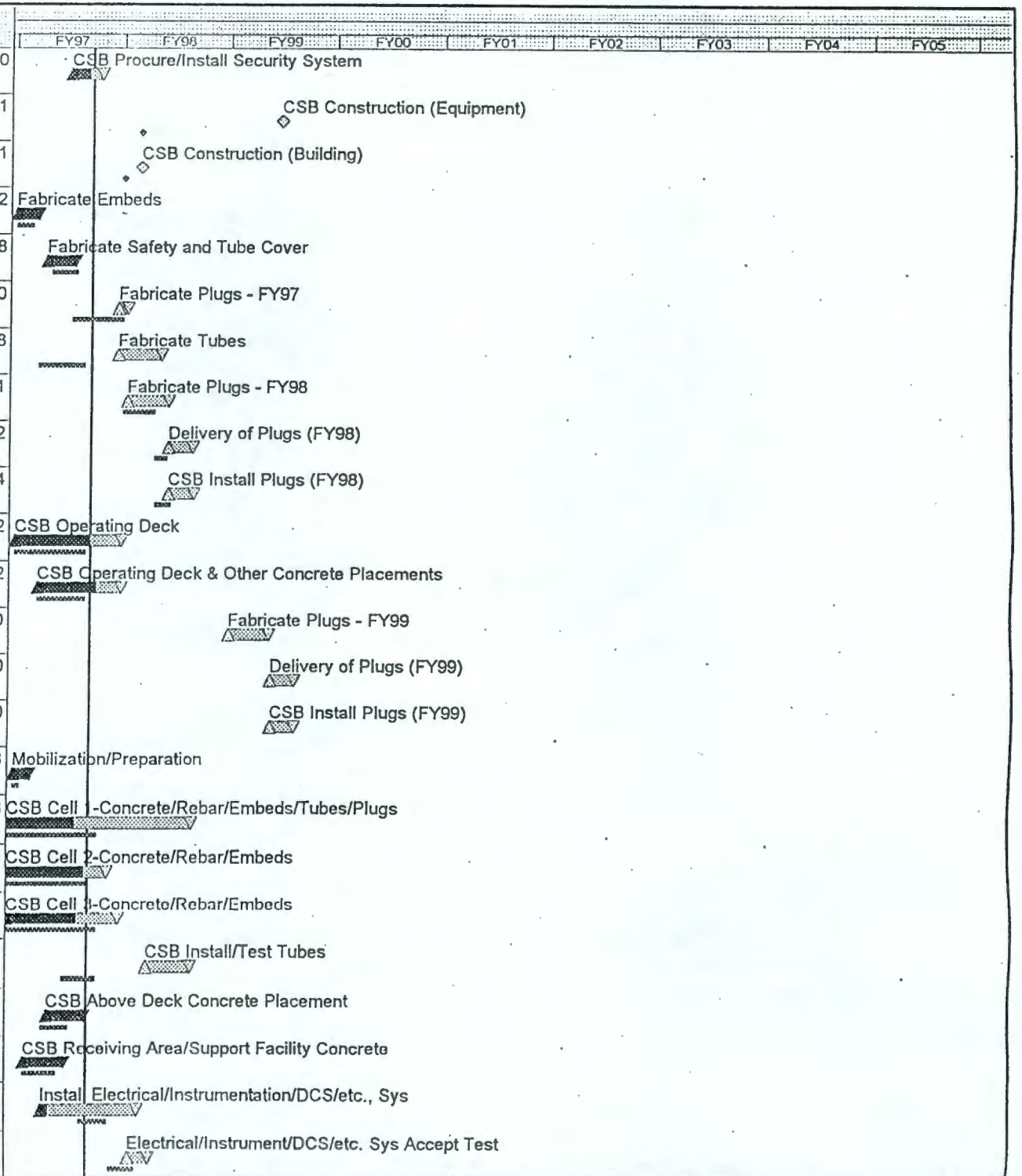
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AW03B16IA	02SEP98	30SEP98			0
AW03B16IB	04SEP97	26NOV97			0
AW03B16ID	01OCT98	28OCT98			0
AW03B16L	18NOV98	04FEB99	09JAN98	05FEB98	-250
AW03B16M		04FEB99		08JAN98	-270
AW03B16N		04FEB99		05FEB98	-250
AW03B17A	20MAY98	17NOV98			0
AW03B20	17SEP98	08FEB99	01OCT97	23FEB98	-241
AW03C02	01OCT96A	30SEP97	01OCT96	30SEP97	0
AW03C08	01MAR99*	29JUN99	01OCT97*	29DEC97	-378
AW050	30JUN99	31MAR00	01JUN98	03MAR99	-272
AW052	24APR00	31JUL01	04MAR99	28JUL00	-252
AW054	01AUG01	15NOV02	31JUL00	22MAR01	-417
AW060	18NOV02	23SEP03	23MAR01	28SEP01	-497
AW3304040	01OCT96A	30SEP97	01OCT96	30SEP97	0
AW3304042	01OCT96A	18OCT96A	01OCT96	18OCT96	0
AW3304044	01OCT97	30SEP98	01OCT97	31MAR98	-127
AW3304055	17DEC96A	04MAR97A	13DEC96*	28FEB97	-2
AW3304060	12DEC96A	17JAN97A	13DEC96*	28FEB97	29
AW3304065	03FEB97A	28FEB97A	03FEB97*	28FEB97	0
AW3304067	13JAN97A	18APR97A	13JAN97*	28FEB97	-35
AW3304070	29MAY97A	15AUG97			0
AW41000M2		09JUN99		26NOV97	-383
AW41000M3		09JUN99		30APR98	-278



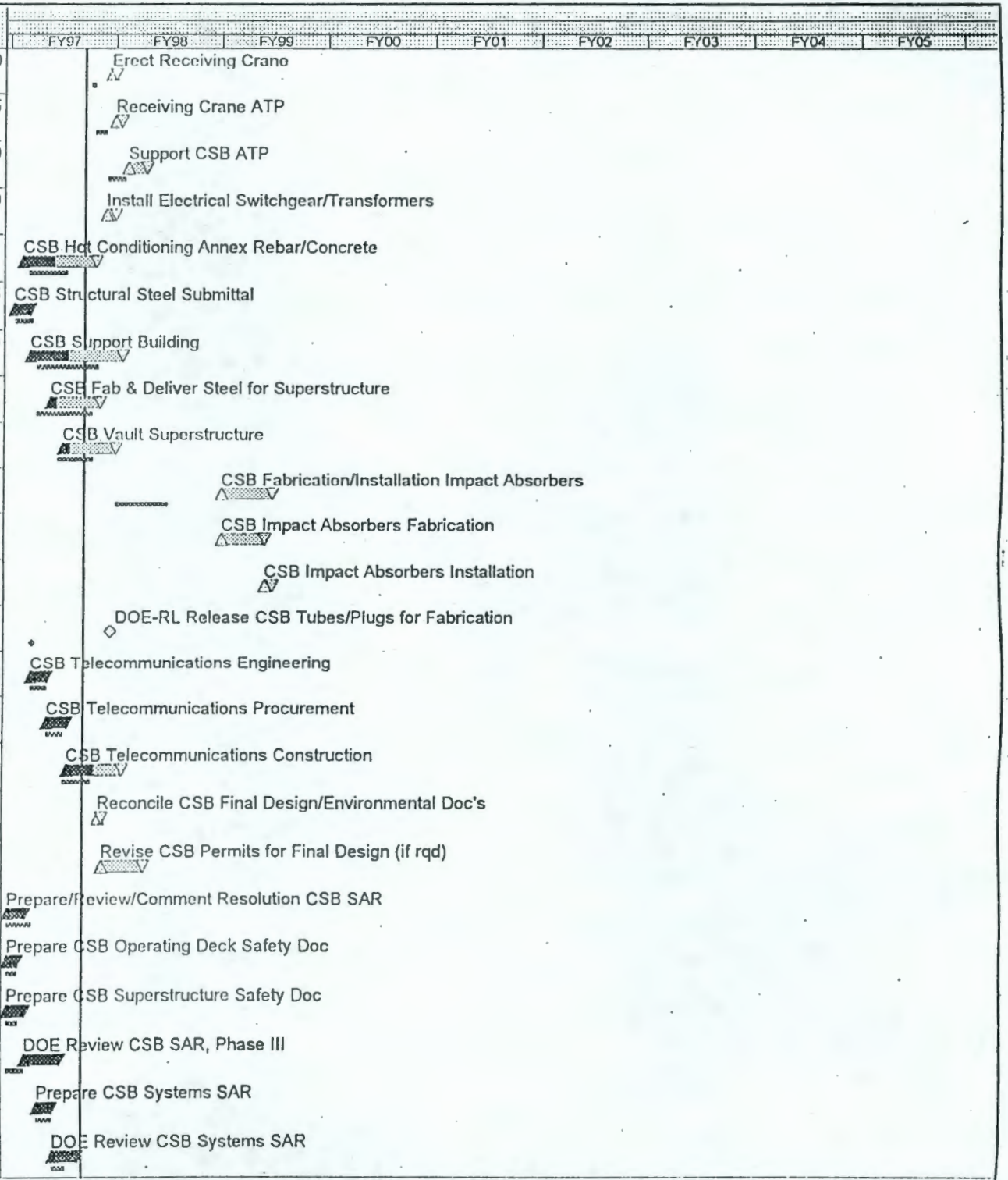
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AW4101M2	20DEC96A		20DEC96*		0
AW4101M4	04APR97A			10MAR97	-18
AW4101M5	27AUG97		21APR97		-89
AW4101M6	07AUG97		30MAY97*		-47
AW4108010	08JUL97*	30SEP97	01MAY97*	30SEP97	0
AW4108011	01OCT97	24NOV97			0
AW4201023	07NOV96A	30SEP97	01OCT96	30SEP97	0
AW4201028	01OCT96A	21JUL97	01OCT96	02JUL97	-11
AW420102A	01OCT97	09JUN98			0
AW42010M2		05MAY98		30SEP97	-149
AW4204010	16JUN97	14OCT97	10FEB97*	05AUG97	-49
AW4204020	24JUN97*	08JAN98	14APR97*	24JUL97	-114
AW4204021	24JUN97	14NOV97			0
AW4204022	17NOV97	05MAY98			0
AW4204023	17NOV97	09DEC97			0
AW4204025	10DEC97	16DEC97			0
AW420402A	17NOV97*				0
AW4204030	26FEB97A	25JUN97	03FEB97*	07APR97	-56
AW4204032	27AUG97	26NOV97	21APR97	29AUG97	-62
AW4204034	13JAN97A	05DEC97	09JAN97*	29AUG97	-67
AW4204040	09JAN97A	29SEP97	09JAN97*	27MAY97	-86
AW4204060	12FEB97A	01AUG97	24MAR97	18JUL97	-10
AW4204070	11DEC96A	08SEP97	20JAN97*	04AUG97	-24
AW4204M1	24FEB97A		09JAN97*		-31



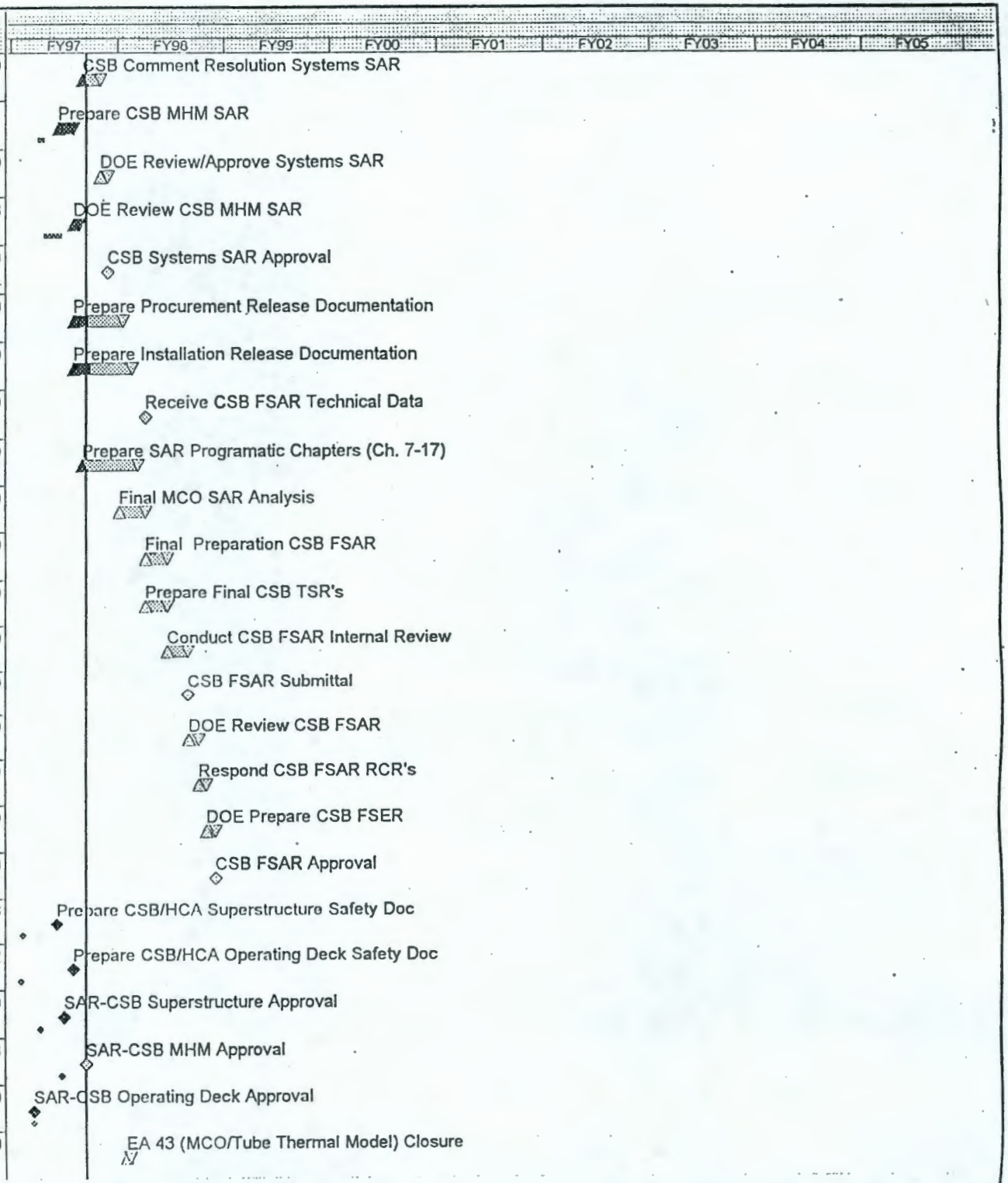
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
SAW4205010	04APR97A	15JUL97			0
SAW45010M2		26MAR99		26NOV97	-331
SAW45010PA		26NOV97		30SEP97*	-41
SAW4502020	01OCT96A	13DEC96A	01OCT96	25NOV96	-12
SAW4502029	14JAN97A	18APR97A	03FEB97*	30APR97	8
SAW4502030	16SEP97	14OCT97	11APR97*	30SEP97	-10
SAW4502033	16SEP97	10FEB98	20DEC96	23MAY97	-178
SAW4502034	15OCT97	05MAR98	01OCT97	20JAN98	-31
SAW4502036	06MAR98	29MAY98	21JAN98	03MAR98	-62
SAW4502037	09MAR98	02JUN98	21JAN98	17MAR98	-54
SAW4502038	01OCT96A	26SEP97	01OCT96	30MAY97	-82
SAW4502039	20DEC96A	26SEP97	20DEC96	30MAY97	-82
SAW4502040	01OCT98*	19FEB99			0
SAW4502041	22FEB99	14MAY99			0
SAW4502042	23FEB99	18MAY99			0
SAW4502045	01OCT96A	27NOV96A	01OCT96	25OCT96	-23
SAW4502048	09AUG96A	02JUN98	09AUG96	14JUL97	-223
SAW4502052	20AUG96A	21AUG97	20AUG96	10JUN97	-50
SAW4502054	09SEP96A	26SEP97	09SEP96	14JUL97	-53
SAW4502055	02JAN98	02JUN98	27MAR97	14JUL97	-223
SAW4502056	30JAN97A	06JUN97A	14JAN97	14APR97	-38
SAW4502058	15NOV96A	04APR97A	15NOV96*	07MAR97	-20
SAW4502062	13JAN97A	05DEC97	23MAY97	29AUG97	-67
SAW4502063	07NOV97*	15JAN98	02SEP97	26NOV97	-31



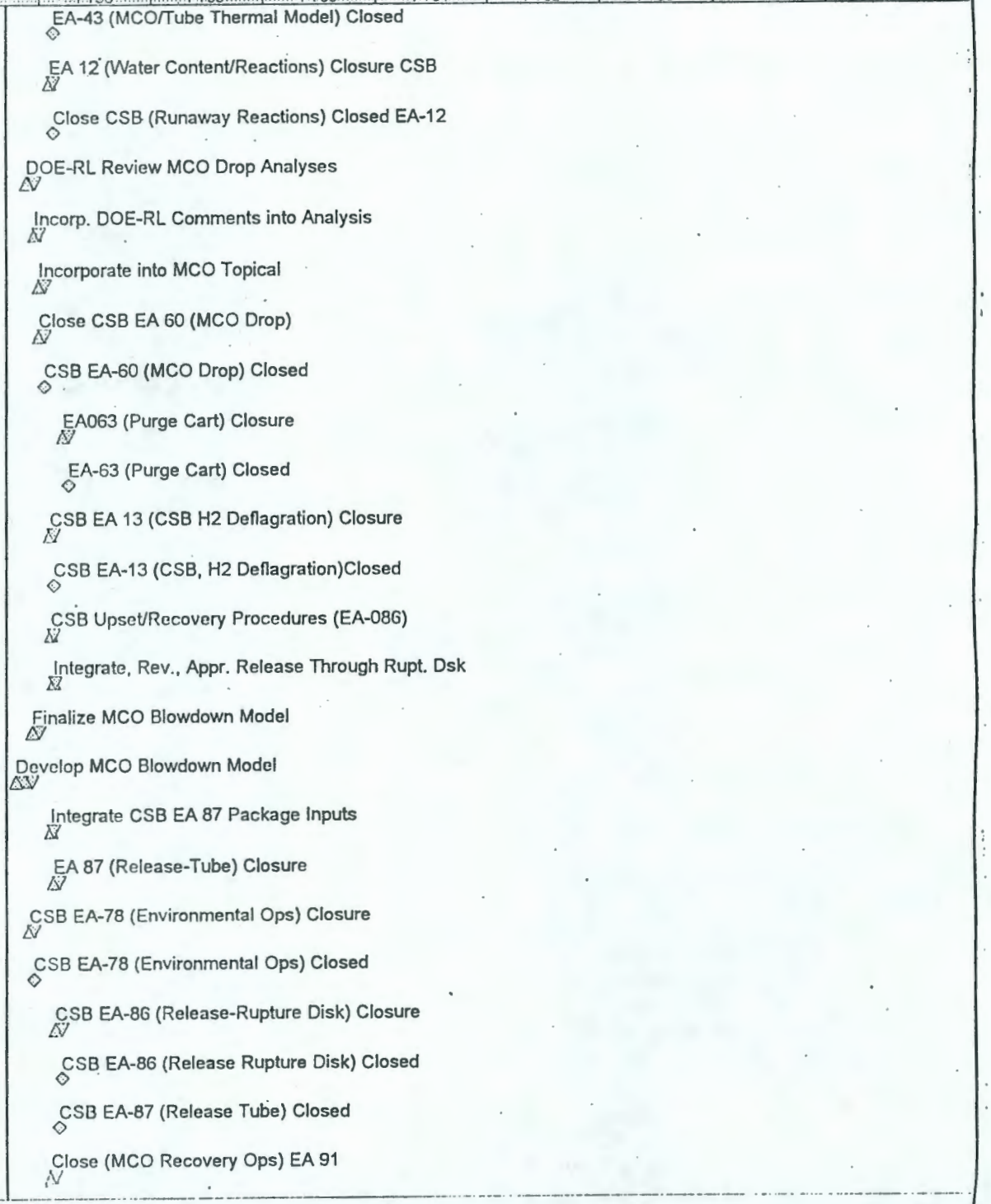
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AW4502064	15SEP97*	29SEP97	07JUL97	18JUL97	-50
AW4502066	30SEP97	20OCT97	21JUL97	29AUG97	-35
AW4502068	10NOV97	15JAN98	02SEP97	31OCT97	-49
AW450206B	27AUG97	26SEP97			0
AW4502070	15NOV96A	25JUL97	06DEC96	14APR97	-71
AW4502071	17OCT96A	10DEC96A	18OCT96*	17DEC96	5
AW4502072	11DEC96A	24OCT97	02JAN97	31JUL97	-60
AW4502074	18FEB97A	04AUG97	02JAN97	09JUL97	-18
AW4502075	04APR97A	01OCT97	17MAR97	17JUL97	-53
AW4502080	01OCT98*	26MAR99	01OCT97	31MAR98	-248
AW4502082	01OCT98	26FEB99			0
AW4502084	01MAR99	26MAR99			0
AW4502M1	16SEP97*		20DEC96		-184
AW4701005	16DEC96A	10FEB97A	16DEC96*	10FEB97	0
AW4701010	11FEB97A	18APR97A	11FEB97	07APR97	-9
AW4701015	21APR97A	27OCT97	08APR97	11JUL97	-75
AW520240	07AUG97	20AUG97			0
AW520242	21AUG97	08JAN98			0
AW6202020	01OCT96A	03DEC96A	01OCT96	23DEC96	14
AW6202023	01OCT96A	05NOV96A	01OCT96	05NOV96	0
AW6202025	01OCT96A	03DEC96A	01OCT96	11NOV96	-14
AW6202028	04DEC96A	03APR97A	01OCT96	03DEC96	-83
AW6202034	13JAN97A	05MAR97A	13JAN97*	05MAR97	0
AW6202036	06MAR97A	03JUN97A	06MAR97	18APR97	-31



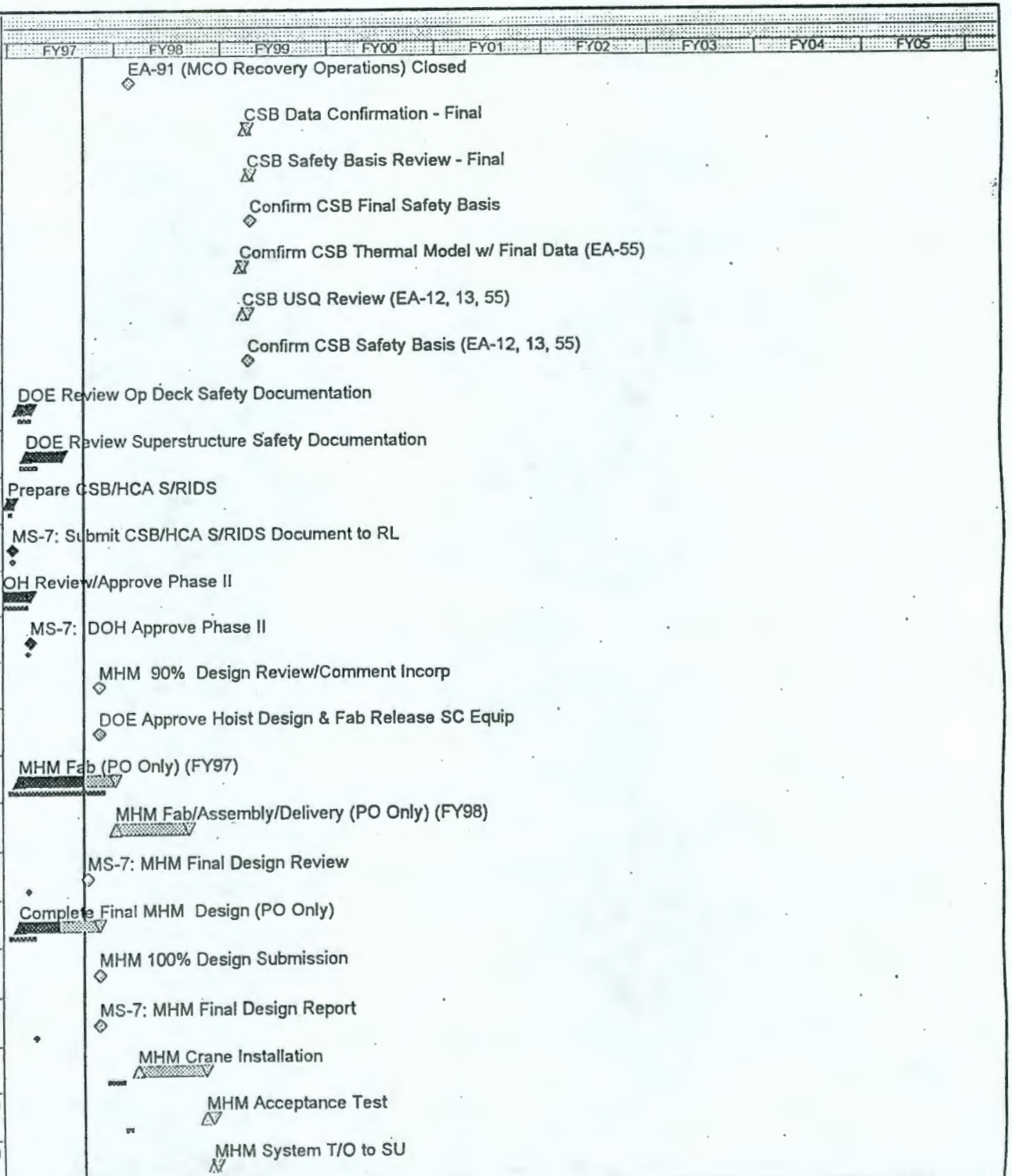
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
SAW6202037	04JUN97A	01AUG97			0
SAW6202038	11MAR97A	02MAY97A	02JAN97	22JAN97	-71
SAW6202039	04AUG97	27AUG97			0
SAW6202040	05MAY97A	22MAY97A	23JAN97	24MAR97	-43
SAW6202041		27AUG97			0
SAW6202050	05MAY97A	21OCT97			0
SAW6202055	05MAY97A	20NOV97			0
SAW6202057	08JAN98				0
SAW6202058	02JUN97A	12DEC97			0
SAW6202059	07OCT97	05JAN98			0
SAW6202060	08JAN98	19MAR98			0
SAW6202063	08JAN98	19MAR98			0
SAW6202075	20MAR98	29MAY98			0
SAW620280		29MAY98			0
SAW620290	01JUN98	07JUL98			0
SAW620291	08JUL98	04AUG98			0
SAW620292	05AUG98	01SEP98			0
SAW620295		01SEP98			0
SAW6202M1		05MAR97A		11NOV96	-76
SAW6202M2		02MAY97A		05NOV96	-122
SAW6202M6		03APR97A		09JAN97	-59
SAW6202M8	16JUN97*		25MAR97		-58
SAW6202M9		19DEC96A		19DEC96	0
SAW6205M43	31OCT97	13NOV97			0



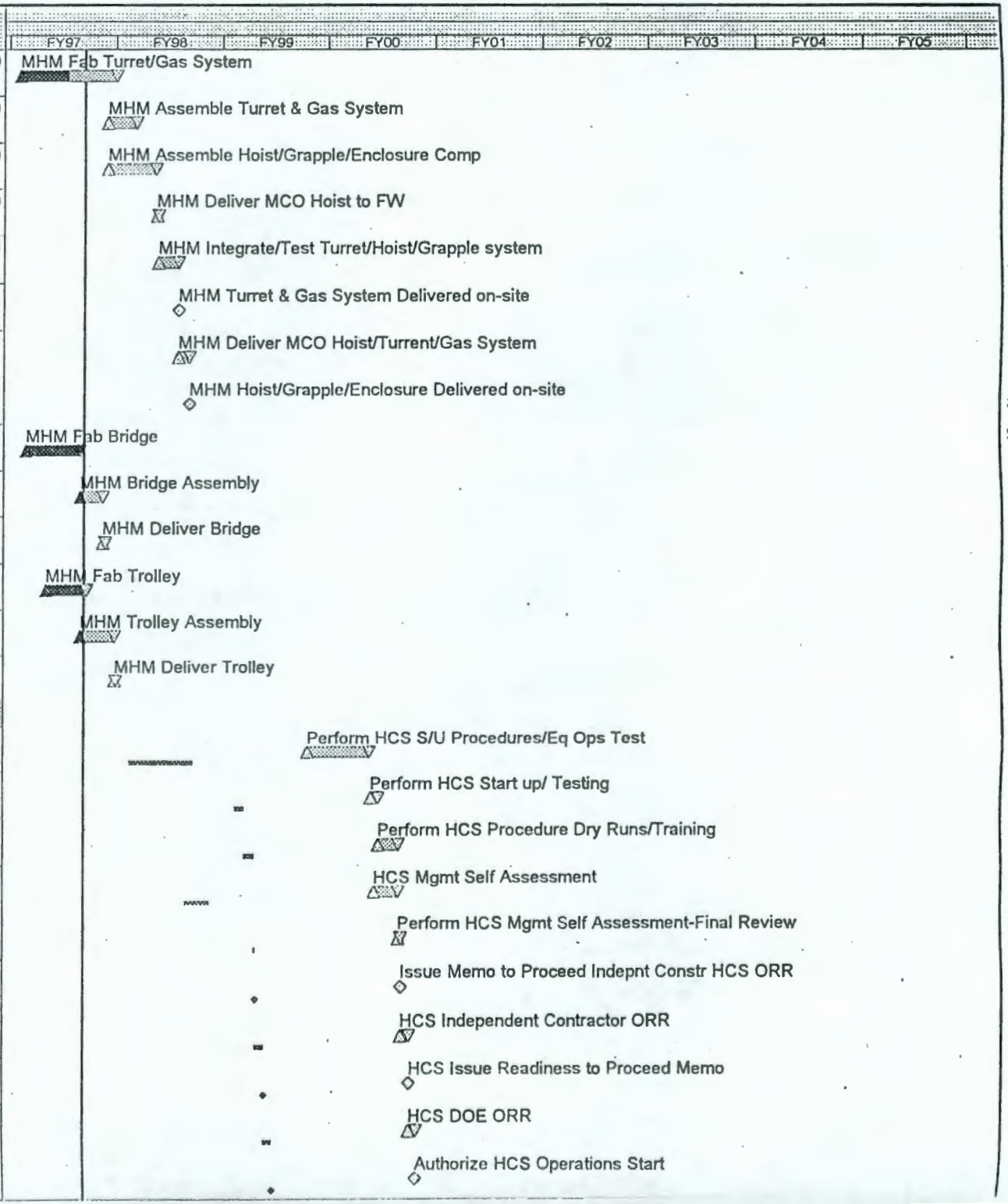
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
AW6205M44		13NOV97			0									
AW6205M45	31OCT97	13NOV97			0									
AW6205M46		13NOV97			0									
AW6205M60	18AUG97	15SEP97			0									
AW6205M61	16SEP97	29SEP97			0									
AW6205M62	30SEP97	13OCT97			0									
AW6205M63	30SEP97	13OCT97			0									
AW6205M64		13OCT97			0									
AW6205M65	17DEC97	02JAN98			0									
AW6205M66		02JAN98			0									
AW6205M68	31OCT97	13NOV97			0									
AW6205M69		13NOV97			0									
AW6205M70	07NOV97	13NOV97			0									
AW6205M72	14NOV97	20NOV97			0									
AW6205M73	08SEP97	26SEP97			0									
AW6205M74	15JUL97*	05SEP97			0									
AW6205M75	07NOV97	13NOV97			0									
AW6205M76	14NOV97	01DEC97			0									
AW6205M78	28AUG97	11SEP97			0									
AW6205M79		11SEP97			0									
AW6205M85	21NOV97	08DEC97			0									
AW6205M86		08DEC97			0									
AW6205M87		01DEC97			0									
AW6205M91	07NOV97	20NOV97			0									



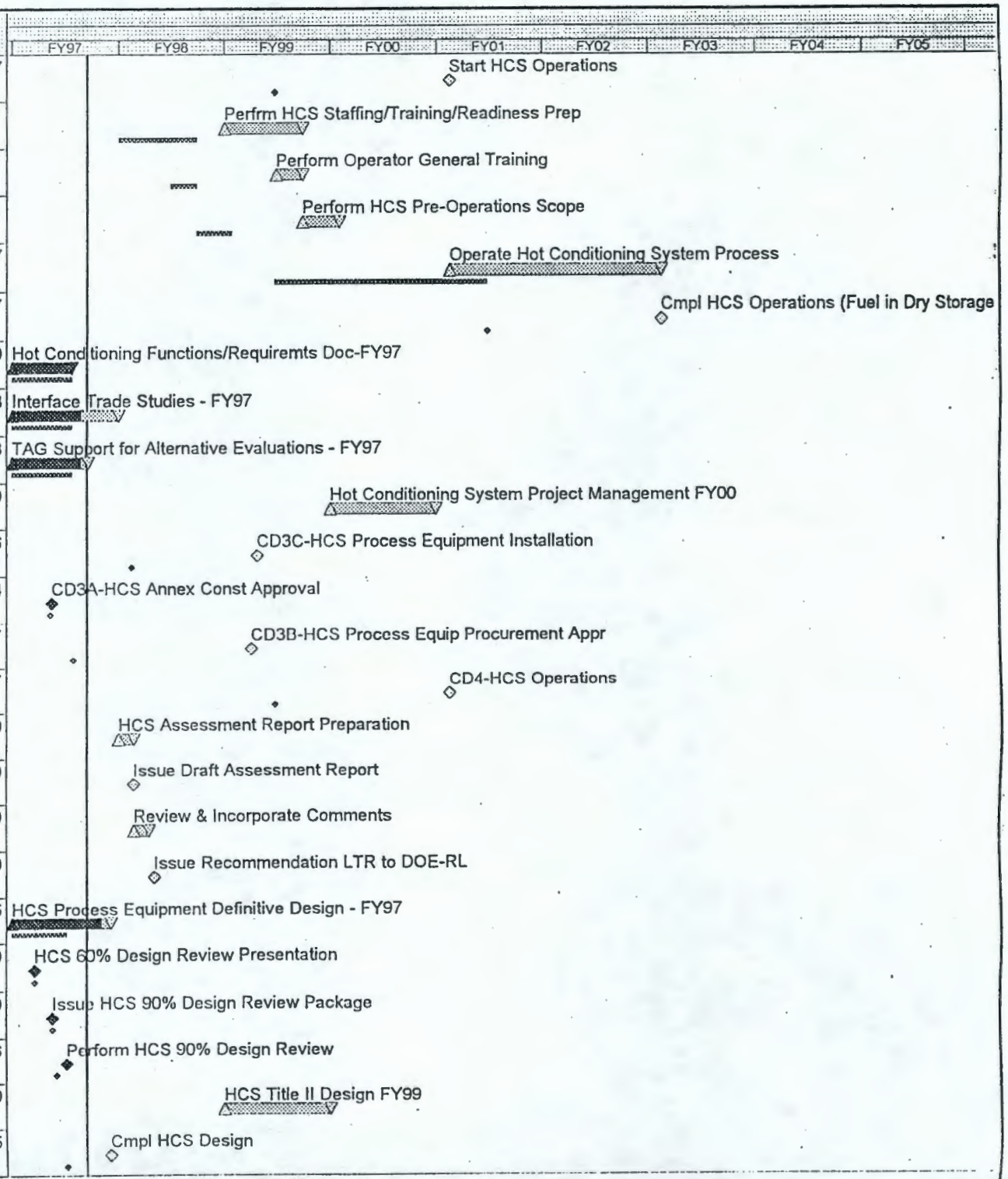
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BAW6205M93		20NOV97			0
BAW6205M94	23DEC98	31DEC98			0
BAW6205M95	04JAN99	08JAN99			0
BAW6205M96		08JAN99			0
BAW6205M97	08DEC98	14DEC98			0
BAW6205M98	15DEC98	30DEC98			0
BAW6205M99		30DEC98			0
BAW62D02	06NOV96A	19DEC96A	06NOV96	19DEC96	0
BAW62D04	04DEC96A	03APR97A	12NOV96	09JAN97	-59
BAW6401020	01OCT96A	16OCT96A	01OCT96	16OCT96	0
BAW64010M1		16OCT96A		16OCT96	0
BAW6601020	25JUL96A	16DEC96A	25JUL96A	04DEC96	-8
BAW6601M3		16DEC96A		04DEC96	-8
BAWA8415		06AUG97			0
BAWA8415A	07AUG97				0
BAWA8416	07NOV96A	30SEP97	01OCT96	29AUG97	-21
BAWA8416A	01OCT97	09JUN98			0
BAWA8417		26JUN97*		06DEC96	-139
BAWA8418	07NOV96A	06AUG97	01OCT96	31DEC96	-151
BAWA8418A		06AUG97			0
BAWA8419		06AUG97		31DEC96	-151
BAWA8421	15DEC97	06AUG98	02SEP97	31OCT97	-190
BAWA8426	07AUG98	01SEP98	03NOV97	26NOV97	-190
BAWA8427	02SEP98	16SEP98			0



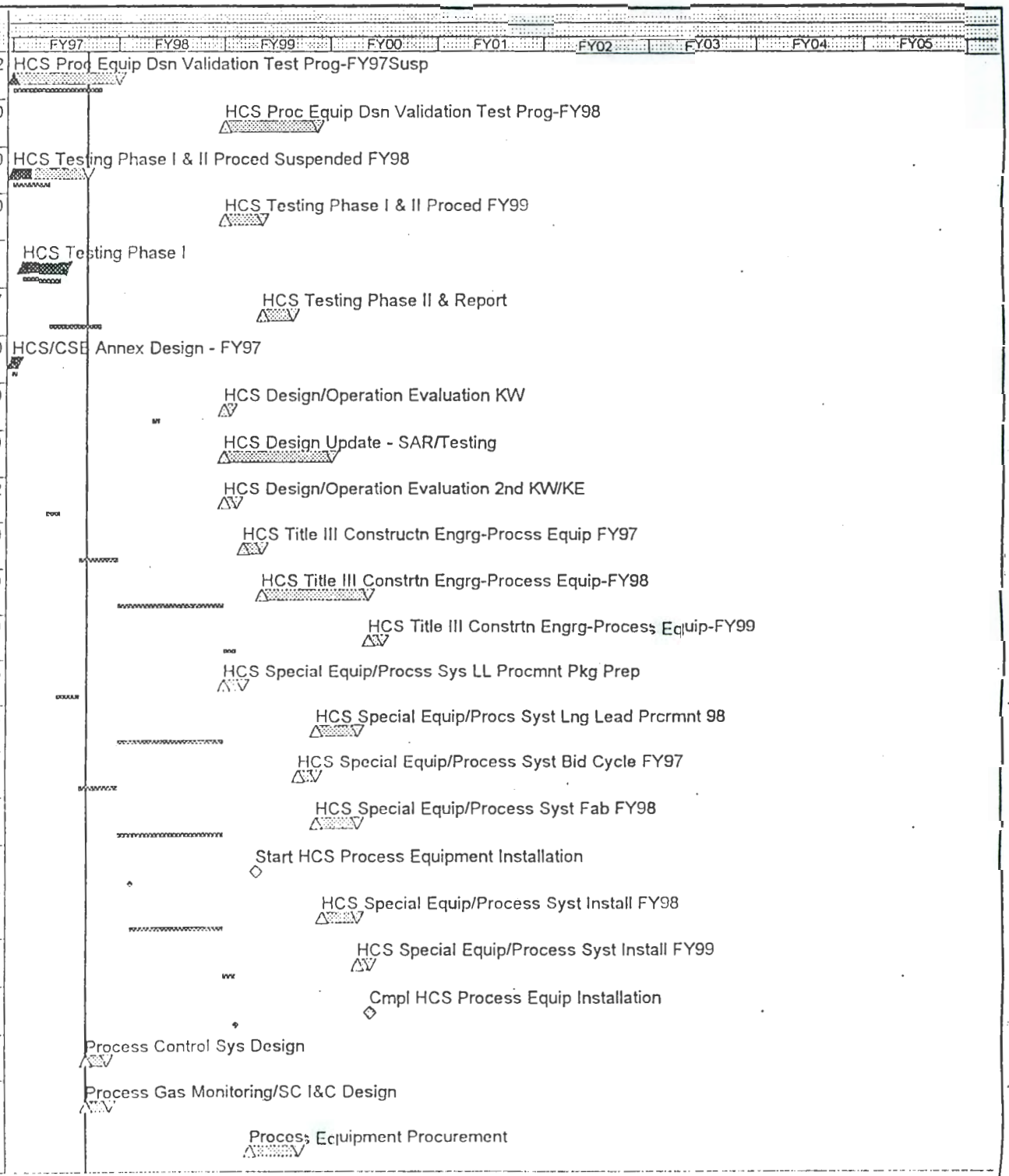
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AWA8442	07NOV96A	30SEP97			0
AWA8450	02SEP97*	09DEC97			0
AWA8461	02SEP97*	13FEB98			0
AWA8463	17FEB98	23FEB98			0
AWA8464	24FEB98	04MAY98			0
AWA8464A		04MAY98			0
AWA8466	05MAY98	09JUN98			0
AWA8466A		09JUN98			0
AWA8470	27NOV96A	02JUN97A			0
AWA8472	03JUN97A	21AUG97			0
AWA8474	22AUG97	27AUG97			0
AWA8480	05FEB97A	24JUN97			0
AWA8482	03JUN97A	26SEP97			0
AWA8484	29SEP97	02OCT97			0
UEL CONDITIONING PROCESS 1.4.1.08					
WW04B10	23JUL99*	18FEB00	21NOV97*	22JUN98	-416
WW04B14	22FEB00	20MAR00	17NOV98	16DEC98	-314
WW04B24	21MAR00	30MAY00	17DEC98	18JAN99	-344
WW04B26	07MAR00	30MAY00	28MAY98*	21AUG98	-444
WW04B30	31MAY00	06JUN00	19JAN99	25JAN99	-344
WW04B31		06JUN00		25JAN99	-344
WW04B36	07JUN00	06JUL00	26JAN99	23FEB99	-344
WW04B40		06JUL00		23FEB99	-344
WW04B45	07JUL00	03AUG00	24FEB99	23MAR99	-344
WW04B47	04AUG00		24MAR99		-344



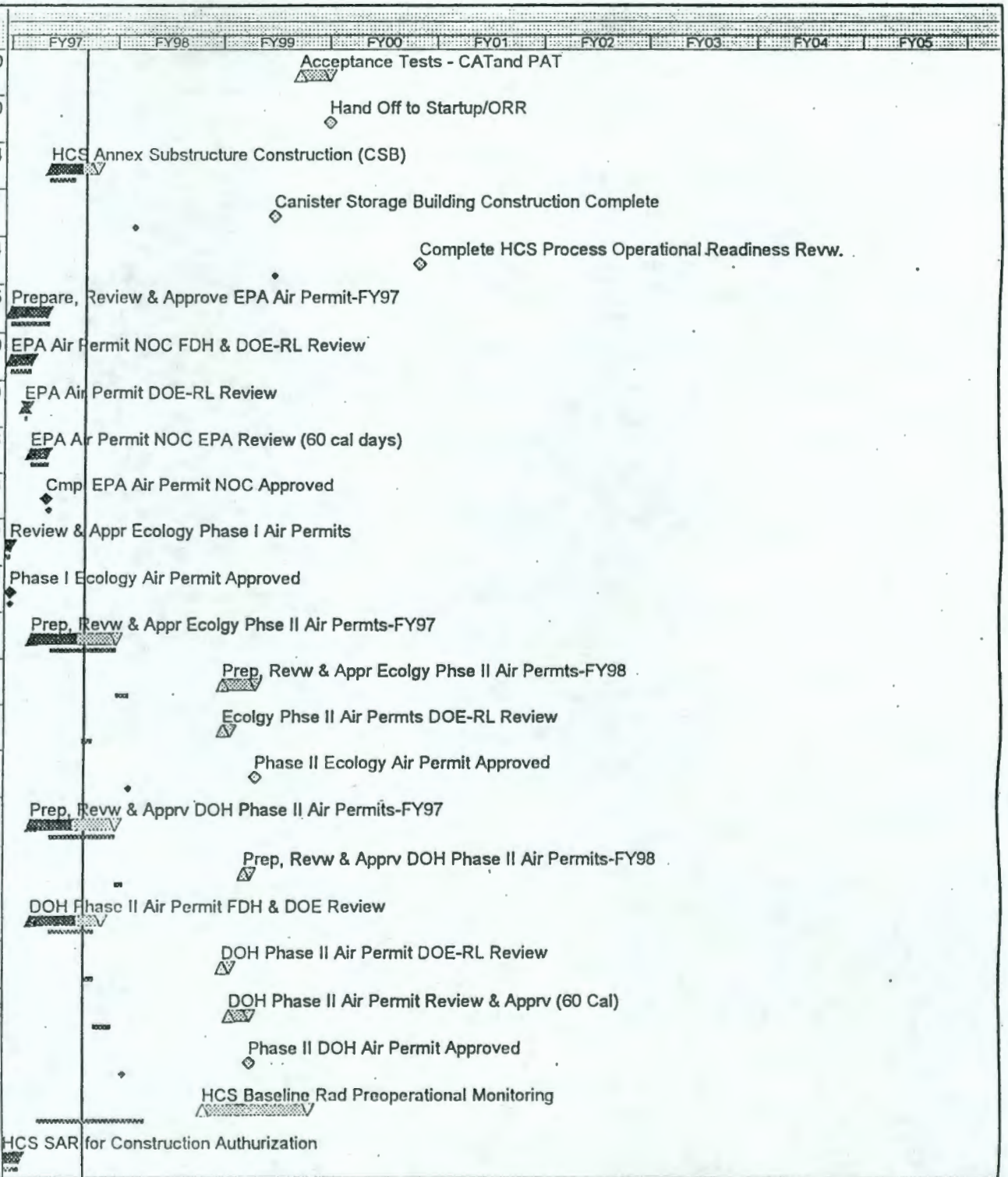
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
HAW04B60		15NOV00		23MAR99	-417
HAW04C10	01OCT98	30JUN99	01OCT97*	30JUN98	-251
HAW04C12	01APR99	30JUN99	01APR98*	30JUN98	-251
HAW04C14	01JUL99	01NOV99	01JUL98*	30OCT98	-251
HAW04C20	16NOV00	15NOV02	24MAR99	22MAR01	-417
HAW04C25		15NOV02		22MAR01	-417
HAW1103A10	01OCT96A	25APR97A	01OCT96*	25APR97	0
HAW1103C10	01OCT96A	30SEP97	01OCT96	25APR97	-108
HAW1103G10	01OCT96A	19JUN97	01OCT96	25APR97	-38
HAW1302A00	01OCT99	27SEP00			0
HAW1302A08		25JAN99		14NOV97	-296
HAW1302A09		14FEB97A		10FEB97*	-4
HAW1302A14		30DEC98		30APR97*	-417
HAW1302A29		15NOV00		23MAR99	-417
HAW1302B01	01OCT97	21NOV97			0
HAW1302B10		21NOV97			0
HAW1302B20	24NOV97	16JAN98			0
HAW1302B30		30JAN98			0
HAW1401B02	01OCT96A	05SEP97	01OCT96	07APR97	-105
HAW1401B03		17DEC96A		17DEC96*	0
HAW1401B05		18FEB97A		18FEB97*	0
HAW1401B06		08APR97A		03MAR97	-26
HAW1401B10	01OCT98	30SEP99			0
HAW1401B19		05SEP97		07APR97*	-105



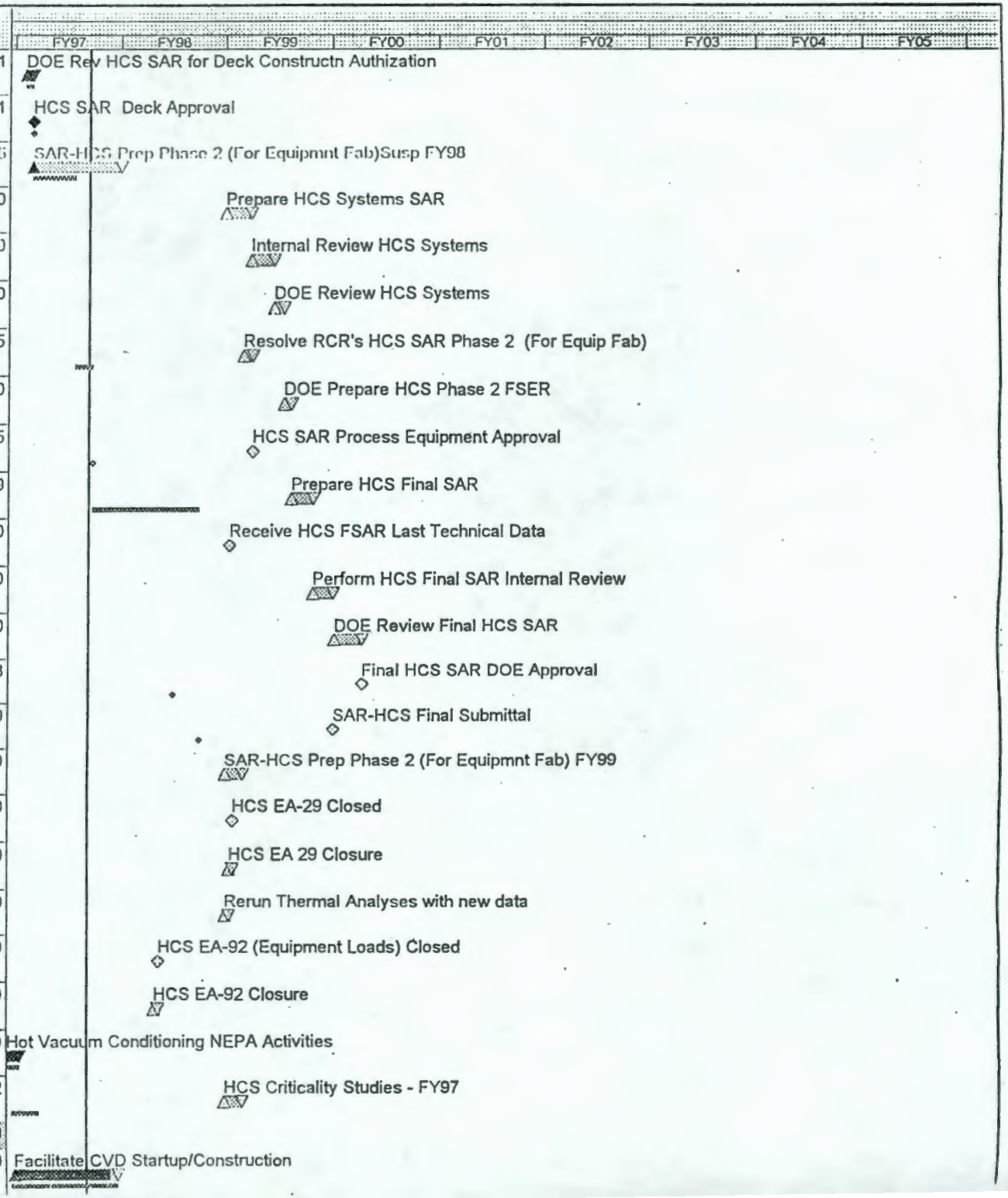
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
KW1401C00	01OCT96A	30SEP97	01OCT96	31JUL97	-42
KW1401C0A	01OCT98	17AUG99			0
KW1401C10	01OCT96A	13JUN97	01OCT96	06FEB97	-89
KW1401C11	01OCT98	08FEB99			0
KW1401C20	04NOV96A	01APR97A	04NOV96*	17MAR97	-11
KW1401C30	09FEB99	26MAY99	07FEB97	31JUL97	-457
KW1402A02	01OCT96A	18OCT96A	01OCT96	18OCT96	0
KW1402A40	01OCT98	22OCT98	29JAN98	20FEB98	-170
KW1402A42	01OCT98	08OCT99			0
KW1402A45	01OCT98*	16NOV98	28JAN97*	14MAR97	-422
KW1501A10	08DEC98	08FEB99	21MAY97	30SEP97	-339
KW1501A12	09FEB99	08FEB00	01OCT97	30SEP98	-339
KW1501A14	09FEB00	27MAR00	01OCT98	16NOV98	-339
KW1501B02	01OCT98	07DEC98	04MAR97	20MAY97	-388
KW1501B05	18AUG99	04JAN00	01OCT97	30SEP98	-314
KW1501B06	17JUN99	17AUG99	20MAY97	30SEP97	-471
KW1501B07	18AUG99	04JAN00	01OCT97	30SEP98	-314
KW1501B08	26JAN99		17NOV97		-296
KW1501B12	08SEP99	04JAN00	17NOV97	30SEP98	-314
KW1501B13	05JAN00	18FEB00	01OCT98	16NOV98	-314
KW1501B15		18FEB00		16NOV98	-314
KW1501B20	16JUN97	29AUG97			0
KW1501B25	16JUN97	05SEP97			0
KW1501B30	31DEC98	21JUN99			0



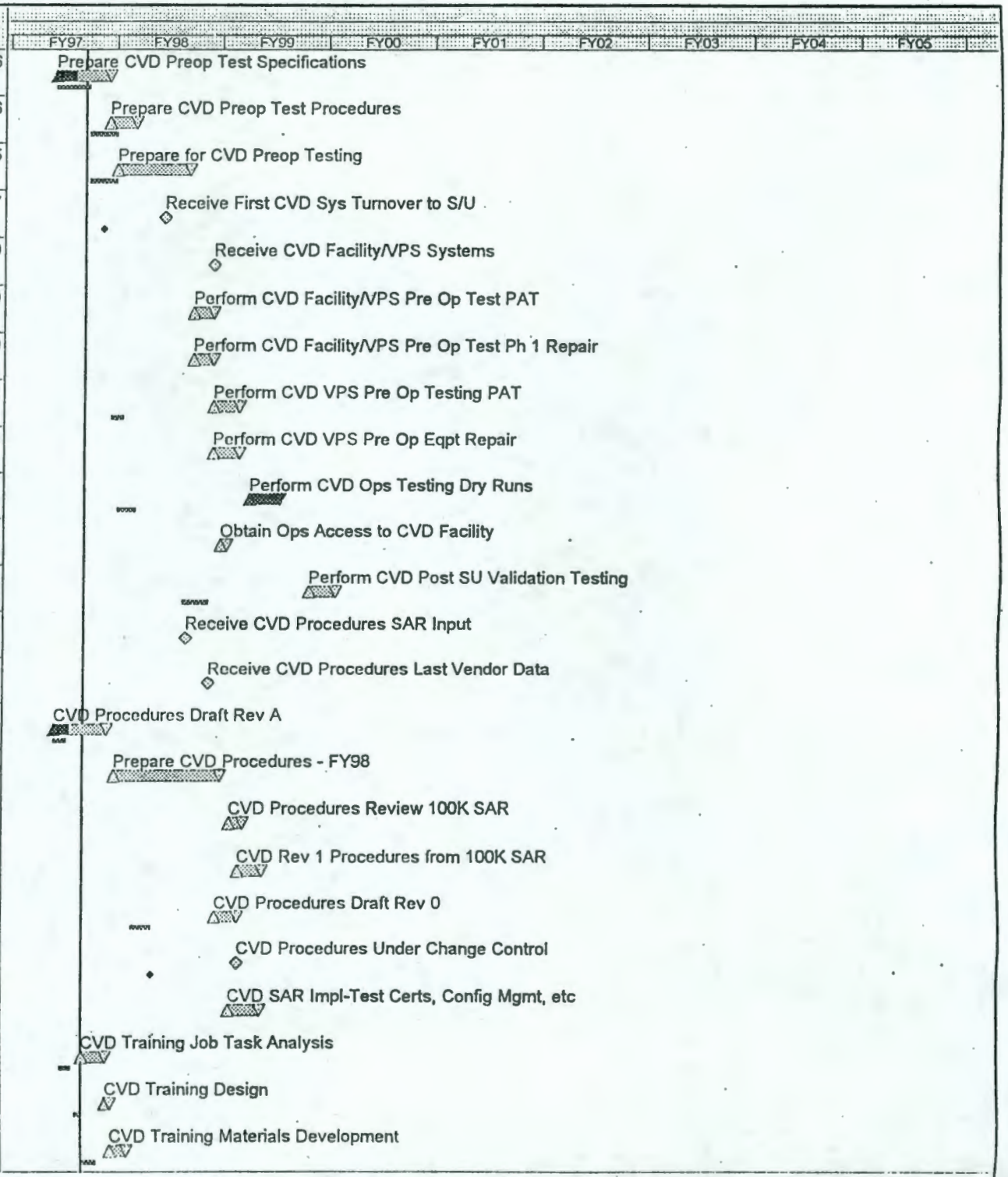
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
HAW1501B35	22JUN99	29SEP99			0
HAW1501B50		29SEP99			0
HAW1501C07	14FEB97A	25JUL97	11FEB97	07MAY97	-54
HAW1501C40		26MAR99		26NOV97*	-331
HAW1602B09		03AUG00		23MAR99	-344
HAW1700A34	01OCT96A	31JAN97A	01OCT96	07FEB97	5
HAW1700A35	01OCT96A	12DEC96A	01OCT96	12DEC96	0
HAW1700A36	21NOV96A	25NOV96A	21NOV96*	25NOV96	0
HAW1700A37	13DEC96A	31JAN97A	13DEC96	10FEB97	6
HAW1700A39		31JAN97A		10FEB97	6
HAW1700A40	01APR96A	03OCT96A	01APR96	03OCT96	0
HAW1700A49		03OCT96A		03OCT96	0
HAW1700A50	17DEC96A	30SEP97	19FEB97*	30SEP97	0
HAW1700A54	01OCT98	25JAN99	01OCT97	14NOV97	-296
HAW1700A55	01OCT98*	29OCT98	09JUN97*	09JUL97	-330
HAW1700A59		25JAN99		14NOV97	-296
HAW1700A70	17DEC96A	30SEP97	19FEB97*	30SEP97	0
HAW1700A72	16DEC98	05JAN99	01OCT97*	28OCT97	-295
HAW1700A80	17DEC96A	15AUG97	19FEB97*	21JUL97	-19
HAW1700A82	01OCT98*	29OCT98	19JUN97*	21JUL97	-322
HAW1700A85	30OCT98	05JAN99	22JUL97	19SEP97	-322
HAW1700A89		05JAN99		28OCT97	-295
HAW1700A95	30JUL98*	29JUL99	10JAN97*	09JAN98	-390
HAW1701C13	01APR96A	06NOV96A	01APR96	06NOV96	0



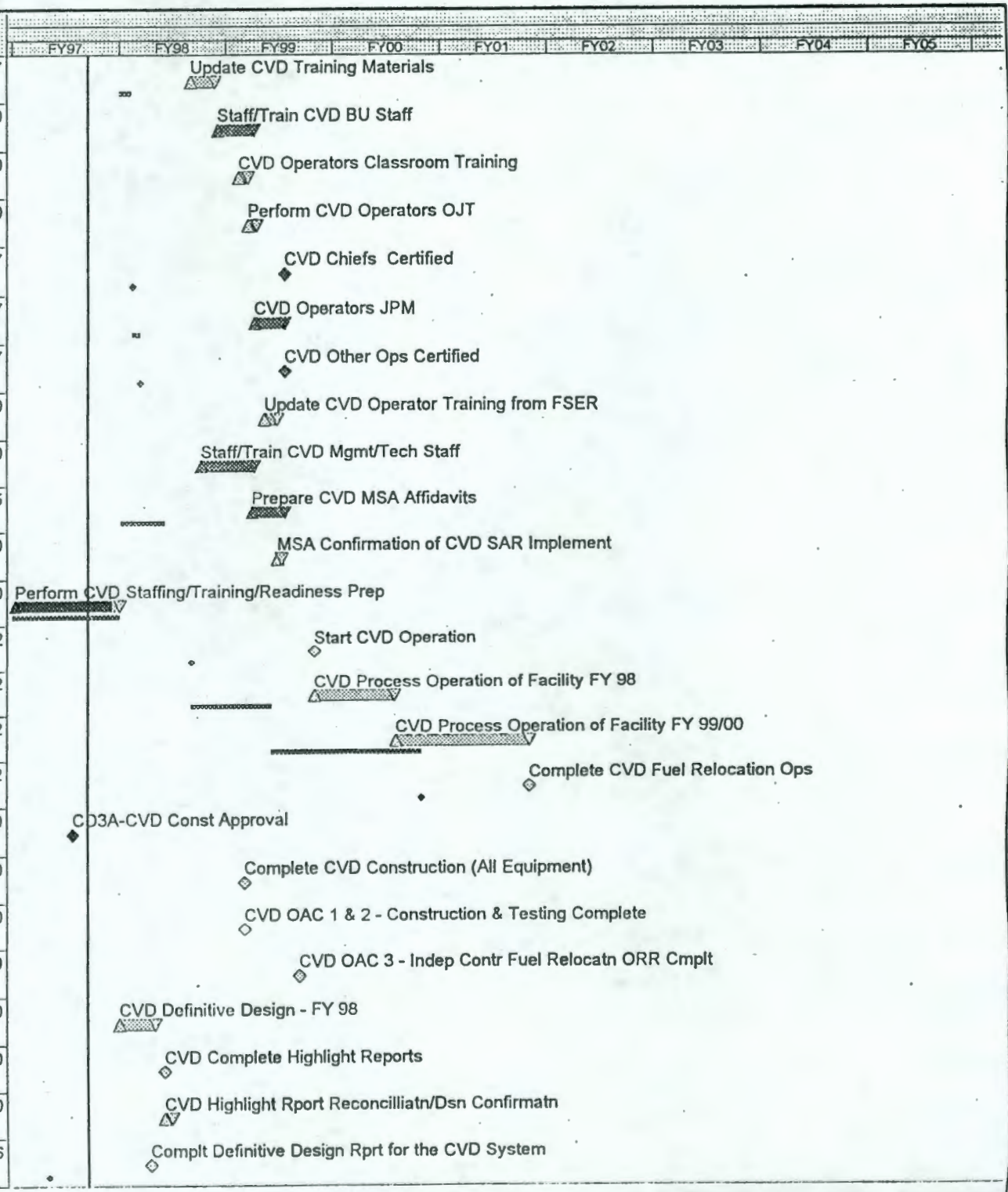
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AW1701C16	07NOV96A	02DEC96A	07NOV96	03DEC96	1
AW1701C18		02DEC96A		03DEC96	1
AW1701C19	04DEC96A	30SEP97	04DEC96	30APR97	-105
AW1701C20	01OCT98	29DEC98			0
AW1701C21	30DEC98	15MAR99			0
AW1701C22	16MAR99	19APR99			0
AW1701C23	01DEC98	30DEC98	01MAY97	30JUN97	-375
AW1701C24	20APR99	17MAY99			0
AW1701C25		30DEC98		30JUN97	-375
AW1701C30	18MAY99	29JUL99	01JUL97	01JUL98	-269
AW1701C34		14OCT98			0
AW1701C36	30JUL99	08OCT99			0
AW1701C38	11OCT99	14JAN00			0
AW1701C40		14JAN00		01APR98*	-448
AW1701C46		08OCT99		01JUL98	-319
AW1701CA9	01OCT98	30NOV98			0
AW1701E10		28OCT98			0
AW1701E20	15OCT98	28OCT98			0
AW1701E30	01OCT98	14OCT98			0
AW1701E40		13FEB98			0
AW1701E50	02FEB98	13FEB98			0
AW1701F00	23AUG96A	29OCT96A	23AUG96	29OCT96	0
AW1701G04	01OCT98	01DEC98	01OCT96	31DEC96	-482
-BASINS COLD VAC DRYING ACQUISITION 1.4.1.08.0					
AW04A10	10OCT96A	30SEP97	01OCT96	30SEP97	0



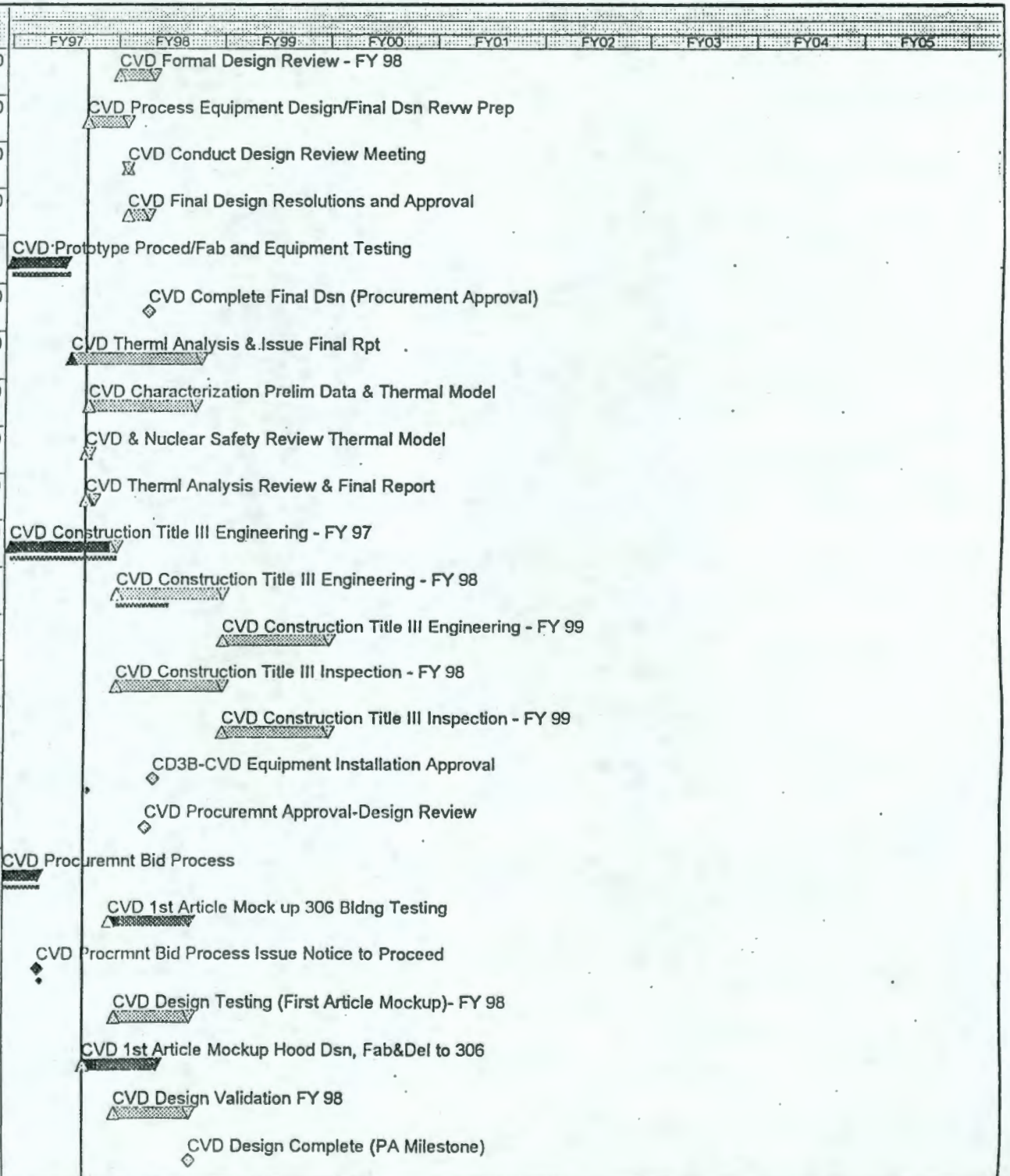
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW04A10A	03MAR97A	05SEP97	03MAR97	30JUN97	-46
BW04A10B	08SEP97*	05DEC97	01JUL97	30SEP97	-46
BW04A10C	01OCT97*	11JUN98	01JUL97	30SEP97	-175
BW04B12	18MAR98		14AUG97*		-147
BW04B12A		03SEP98			0
BW04B12D	26JUN98	03SEP98			0
BW04B12D1	26JUN98	03SEP98			0
BW04B14	04SEP98	01DEC98	16SEP97*	29OCT97	-272
BW04B141	04SEP98	01DEC98			0
BW04B15	08JAN99	19APR99	07OCT97	12DEC97	-337
BW04B15D	28SEP98	20OCT98			0
BW04B17	30JUL99	27OCT99	20MAY98*	19AUG98	-299
BW04B19A		04JUN98			0
BW04B19B		18AUG98			0
BW04B19D	10MAR97A	05SEP97	10MAR97	18APR97	-96
BW04B19DB	01OCT97*	30SEP98			0
BW04B19GD	04NOV98	17DEC98			0
BW04B19GF	02DEC98	24FEB99			0
BW04B19J	17SEP98	01DEC98	02DEC97	09FEB98	-204
BW04B19K		01DEC98		09FEB98	-204
BW04B19M	04NOV98	17FEB99			0
BW04B20D	16JUN97*	05SEP97	01APR97*	09MAY97	-81
BW04B20E	08SEP97	25SEP97	27MAY97*	13JUN97	-71
BW04B20F	26SEP97	18NOV97	16JUN97	08AUG97	-71



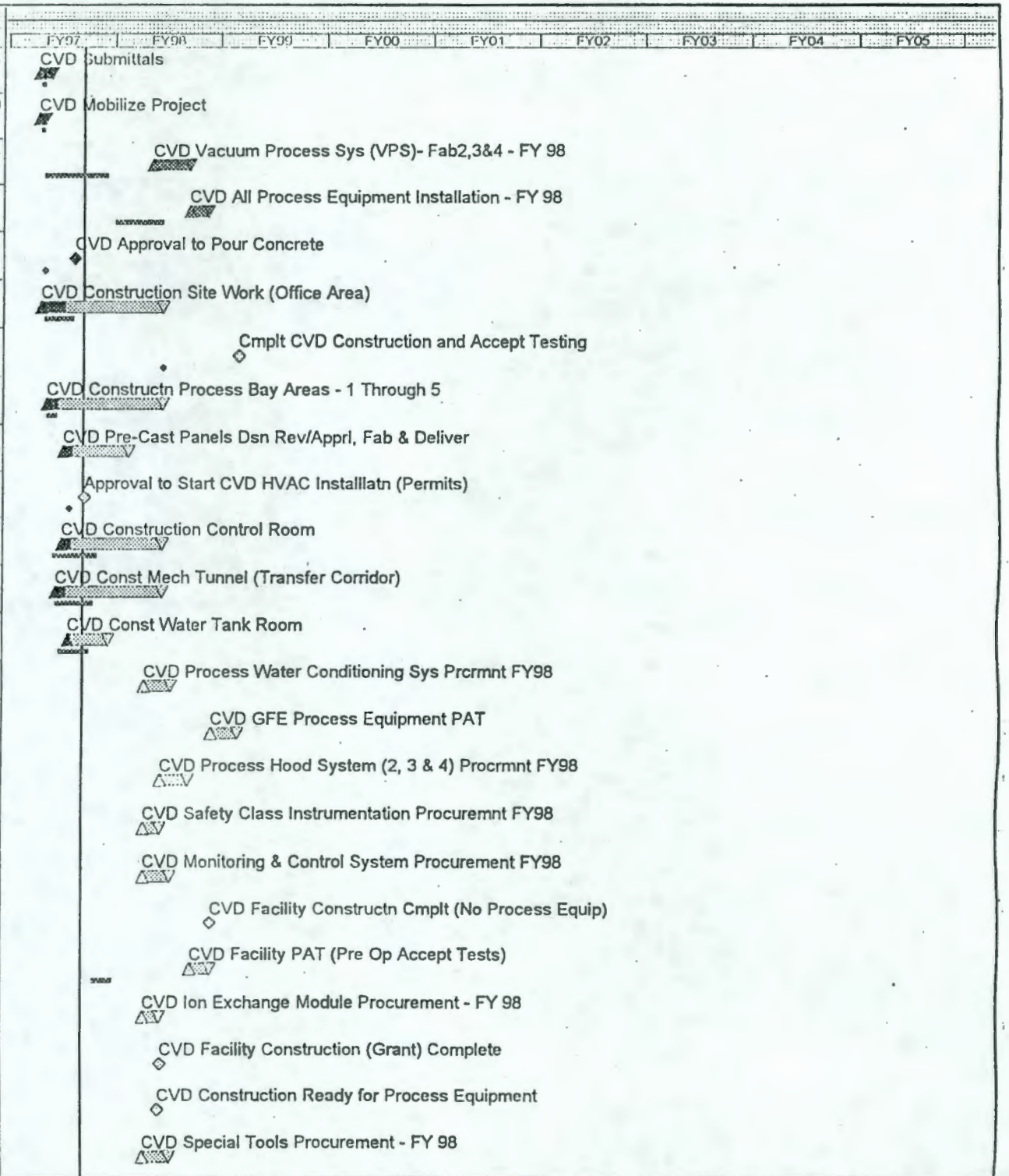
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW04B20G	01JUN98*	25AUG98	01OCT97*	10NOV97	-197
BW04B20GA	04SEP98	07JAN99			0
BW04B20GD	16NOV98	15DEC98			0
BW04B20GF	16DEC98	15JAN99			0
BW04B20J		19APR99		12NOV97	-357
BW04B20K	08JAN99	19APR99	13NOV97	12DEC97	-337
BW04B20N		19APR99		12DEC97	-337
BW04B20ND	10FEB99	24MAR99			0
BW04B20P	08JUL98	07JAN99			0
BW04B24	30DEC98	19APR99	08OCT97	02MAR98	-285
BW04B24D	25MAR99	07APR99			0
BW04C10	10OCT96A	30SEP97	01OCT96*	30SEP97	0
BW04C11	30JUL99		01JUN98		-292
BW04C18	30JUL99	28APR00	01JUN98	03MAR99	-292
BW04C20	01MAY00	31JUL01	04MAR99	28JUL00	-252
BW04C25		31JUL01		28JUL00	-252
BW3301A95		24APR97A			0
BW3301A96		01DEC98			0
BW3301A98		01DEC98			0
BW3301C99		08JUN99			0
BW3401B04	01OCT97	30JAN98			0
BW3401B14	03MAR98*				0
BW3401B16	03MAR98	30MAR98			0
BW3401B19		12JAN98		31JAN97	-236



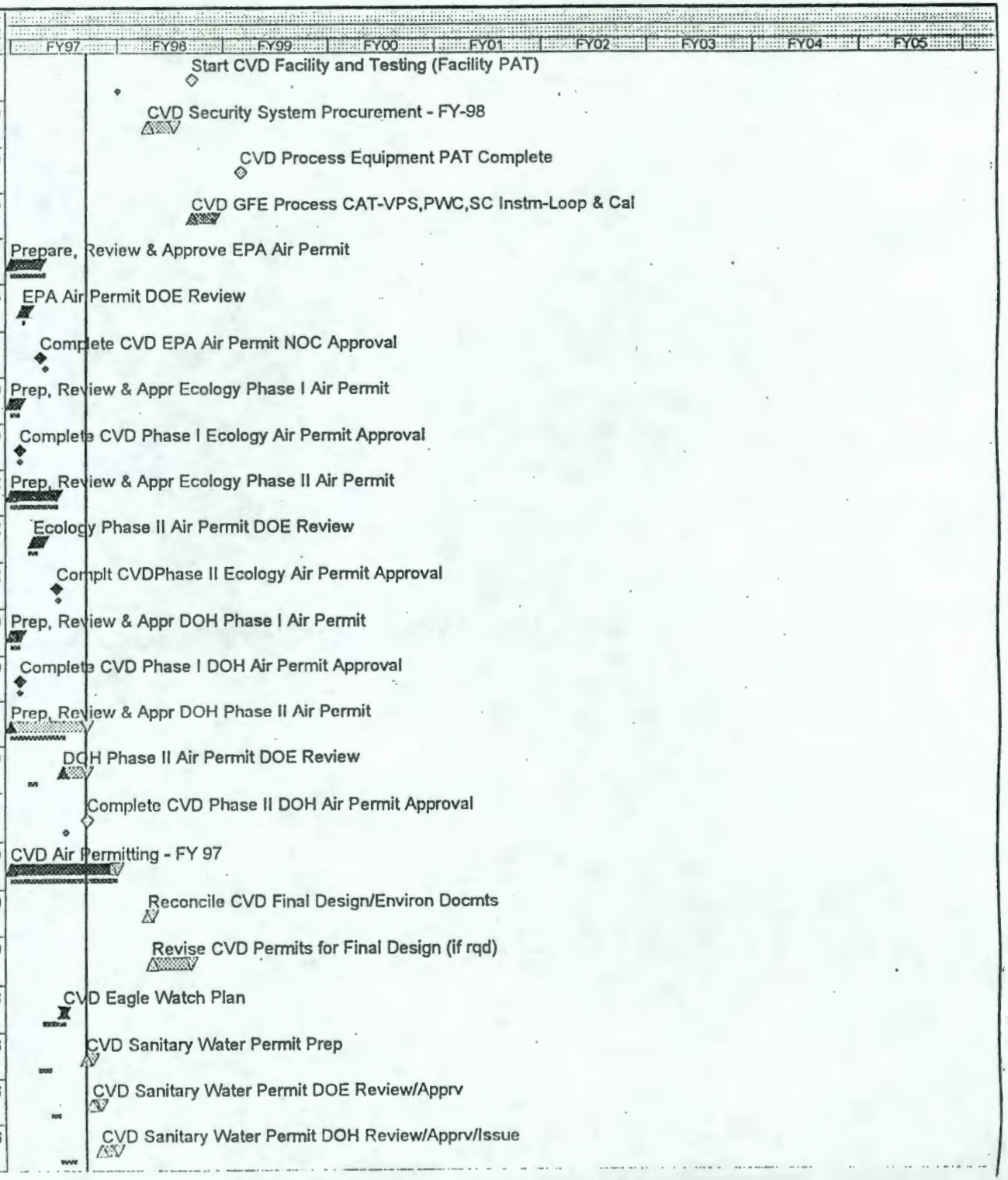
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW3401B20	01OCT97*	30JAN98			0
BW3401B22	16JUN97*	30OCT97			0
BW3401B27	31OCT97	03NOV97			0
BW3401B29	04NOV97	12JAN98			0
BW3401B30	01OCT96A	04APR97A	01OCT96*	21APR97	11
BW3401B32		12JAN98			0
BW3401B33	25APR97A	16JUL98			0
BW3401B50	26JUN97*	30JUN98			0
BW3401B70	16JUN97	27JUN97			0
BW3401B85	16JUN97	17JUL97			0
BW3501A02	01OCT96A	30SEP97	01OCT96	30SEP97	0
BW3501A05	01OCT97	30SEP98	01OCT97	31MAR98	-127
BW3501A06	01OCT98	30SEP99			0
BW3501A10	01OCT97	30SEP98			0
BW3501A11	01OCT98	30SEP99			0
BW3501B09	11FEB98		27JUN97*		-155
BW3501B10		12JAN98			0
BW3501C03	01AUG96A	10JAN97A	01AUG96	20JAN97	6
BW3501C04	12SEP97	15JUN98			0
BW3501C05		10JAN97A		20JAN97	6
BW3501C06	01OCT97*	15JUN98			0
BW3501C07	16JUN97*	23FEB98			0
BW3501C08	01OCT97*	15JUN98			0
BW3501C09		15JUN98			0



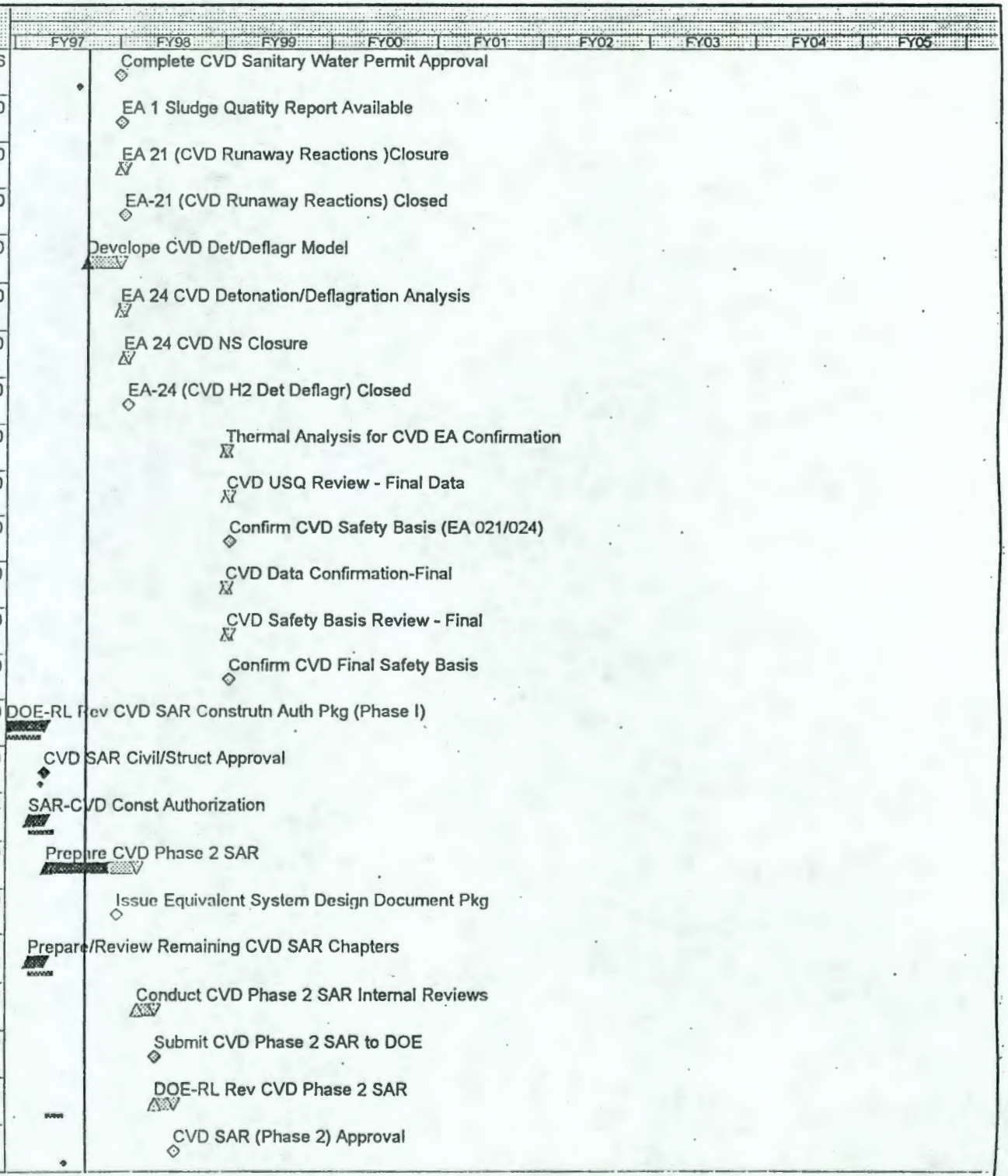
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW3501C10	10JAN97A	21FEB97A	20JAN97	31JAN97	-14
BW3501C12	10JAN97A	31JAN97A	20JAN97	31JAN97	0
BW3501C14	10FEB98	15JUN98	30JAN97*	05SEP97	-194
BW3501C15	16JUN98	18AUG98	01OCT97*	17MAR98	-107
BW3501C16	16MAY97A		03FEB97		-73
BW3501C17	21JAN97A	17MAR98	03FEB97	13MAY97	-210
BW3501C18		01DEC98		17MAR98	-179
BW3501C20	10FEB97A	17MAR98	10FEB97*	14MAR97	-252
BW3501C23	08APR97A	18NOV97			0
BW3501C28	20JUN97*		01MAY97*		-35
BW3501C45	01APR97A	17MAR98	04MAR97	31JUL97	-156
BW3501C52	12MAR97A	17MAR98	14MAR97	18JUL97	-165
BW3501C58	24APR97A	08SEP97	26MAR97	07JUL97	-44
BW3501C65	13JAN98	15APR98			0
BW3501C70	04SEP98	01DEC98			0
BW3501C71	13MAR98	15JUN98			0
BW3501C76	13JAN98	10MAR98			0
BW3501C78	13JAN98	15APR98			0
BW3501C79		03SEP98			0
BW3501C80	26JUN98	03SEP98	24JUL97*	30SEP97	-233
BW3501C81	13JAN98	10MAR98			0
BW3501C82		17MAR98			0
BW3501C83		06MAR98*			0
BW3501C84	13JAN98	15APR98			0



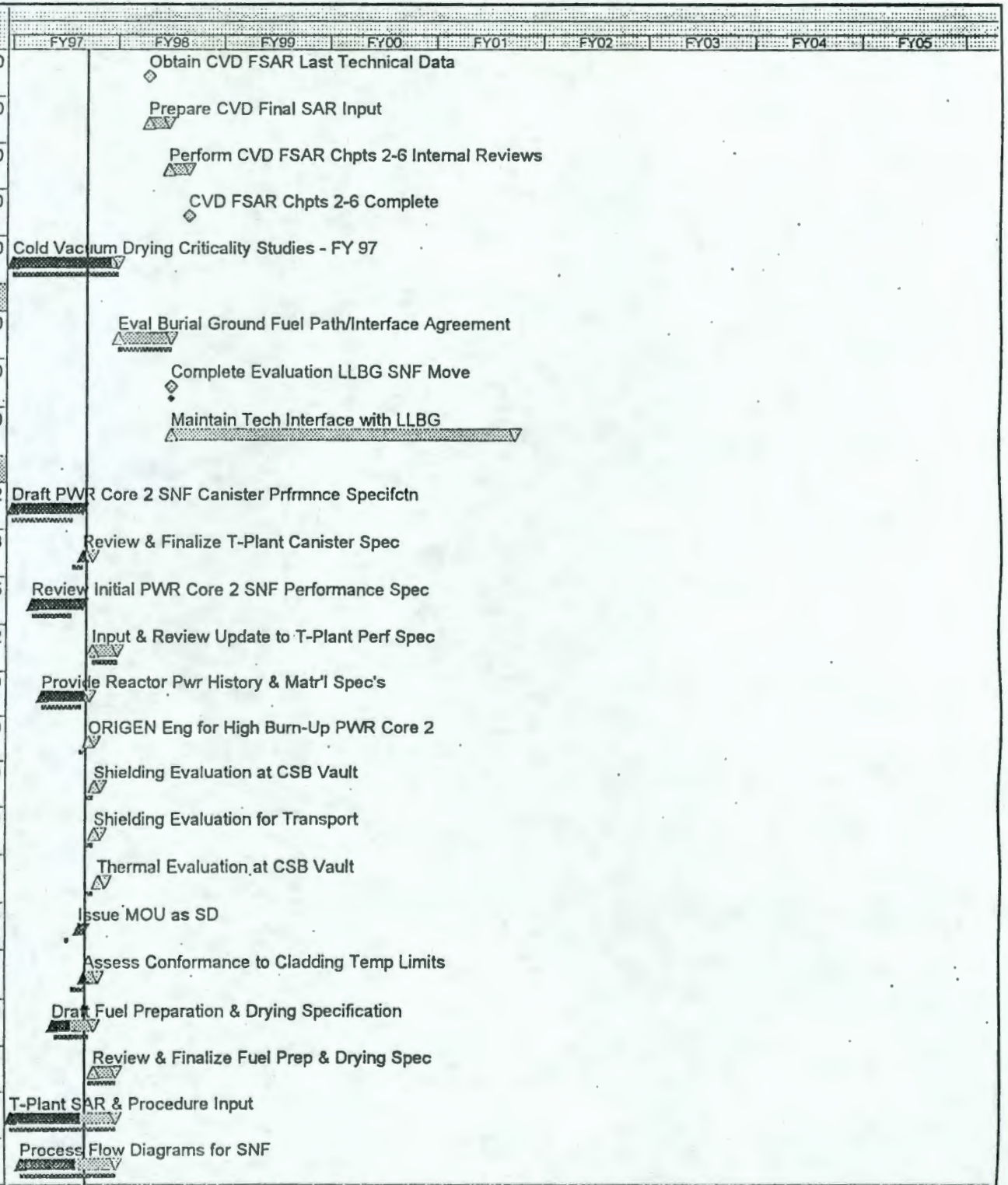
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW3501C85		15JUN98		30SEP97*	-177
BW3501C87	13JAN98	15APR98			0
BW3501C90		01DEC98			0
BW3501C95	16JUN98*	03SEP98			0
BW3701A00	01OCT96A	10JAN97A	01OCT96*	27JAN97	11
BW3701A05	12NOV96A	27NOV96A	12NOV96*	20NOV96	-5
BW3701A09		10JAN97A		27JAN97	11
BW3701A12	01OCT96A	31OCT96A	01OCT96*	31OCT96	0
BW3701A19		31OCT96A		31OCT96	0
BW3701A22	01OCT96A	07MAR97A	01OCT96*	11MAR97	2
BW3701A24	20DEC96A	17JAN97A	02DEC96*	31DEC96	-12
BW3701A29		07MAR97A		11MAR97	2
BW3701A32	01OCT96A	31OCT96A	01OCT96*	31OCT96	0
BW3701A39		31OCT96A		31OCT96	0
BW3701A42	01OCT96A	19JUN97	01OCT96*	08APR97	-51
BW3701A44	28MAR97A	19JUN97	02DEC96*	31DEC96	-119
BW3701A49		19JUN97		08APR97	-51
BW3701A55	01OCT96A	30SEP97	01OCT96*	30SEP97	0
BW3701A56	13JAN98	26JAN98			0
BW3701A57	27JAN98	10JUN98			0
BW3701A60	31MAR97A	31MAR97A	21JAN97	08APR97	6
BW3701A70	16JUN97	07JUL97	07JAN97*	18FEB97	-96
BW3701A72	08JUL97*	04AUG97	19FEB97	18MAR97	-96
BW3701A75	05AUG97*	30SEP97	19MAR97	13MAY97	-96



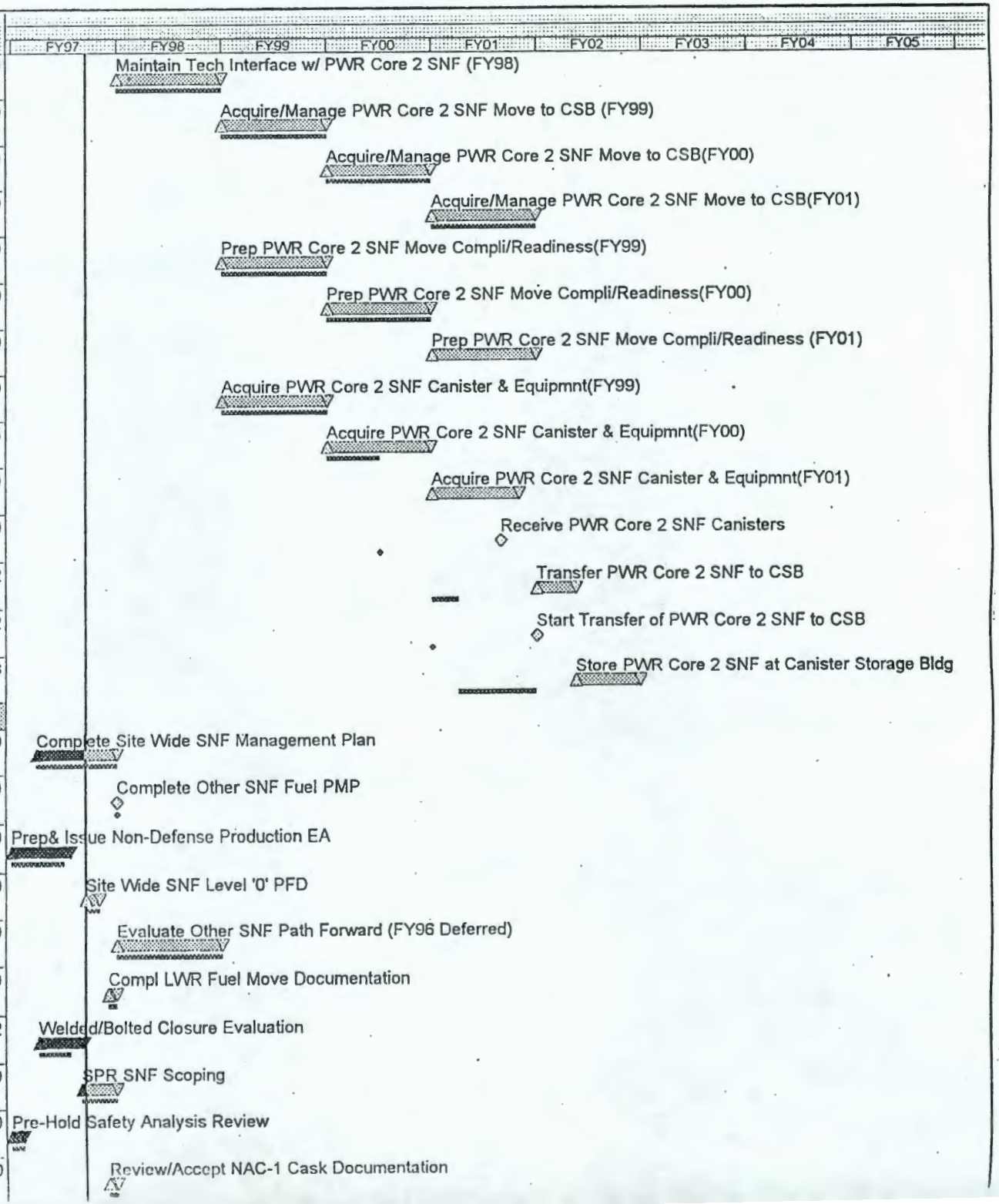
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW3701A85		30SEP97		13MAY97	-96
BW3701B05		06OCT97			0
BW3701B24	07OCT97	20OCT97			0
BW3701B26		20OCT97			0
BW3701B30	13JUN97A	06OCT97			0
BW3701B34	07OCT97	20OCT97			0
BW3701B36	21OCT97	03NOV97			0
BW3701B38		03NOV97			0
BW3701B42	06OCT98	12OCT98			0
BW3701B47	13OCT98	19OCT98			0
BW3701B50		19OCT98			0
BW3701B52	06OCT98	12OCT98			0
BW3701B57	13OCT98	19OCT98			0
BW3701B60		19OCT98			0
BW3701C20	03SEP96A	24JAN97A	03SEP96	10JAN97	-10
BW3701C29		24JAN97A		10JAN97	-10
BW3701C30	02DEC96A	24JAN97A	02DEC96*	28FEB97	24
BW3701C35	03FEB97A	11DEC97			0
BW3701C36		30SEP97*			0
BW3701C40	02DEC96A	24JAN97A	02DEC96*	28FEB97	24
BW3701C48	12DEC97	10FEB98			0
BW3701C54		10FEB98			0
BW3701C55	11FEB98	15APR98	01FEB97	31MAR97	-262
BW3701C59		15APR98		31MAR97	-262



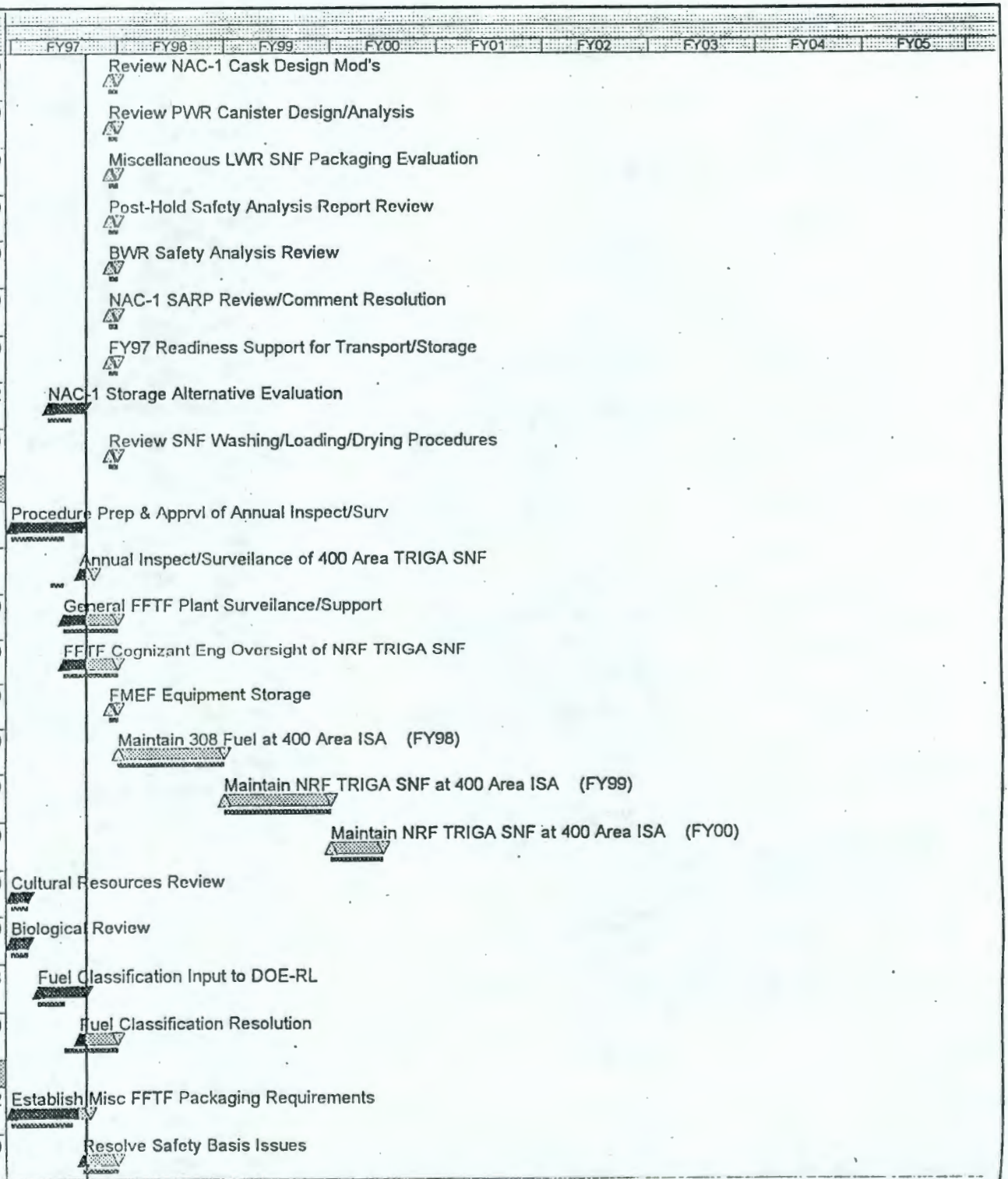
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
BW3701C78		13JAN98			0
BW3701C84	14JAN98	25MAR98			0
BW3701C90	26MAR98	04JUN98			0
BW3701C92		04JUN98			0
BW3701G01	01OCT96A	30SEP97	01OCT96*	30SEP97	0
BURIAL GROUNDS 1.4.1.09.01.02					
AWA10102	01OCT97*	01APR98	01OCT97*	01APR98	0
AWA101150		01APR98		01APR98	0
AWA2000A	02APR98	26JUN01			0
- PLANT 1.4.1.09.01.03					
AWA103	01OCT96A	02JUN97A	01OCT96	30APR97	-22
AWA10300	03JUN97A	08JUL97	01MAY97	03JUN97	-23
AWA10301	12DEC96A	02JUN97A	12DEC96*	25APR97	-25
AWA10302	09JUL97*	02OCT97	07JUL97*	30SEP97	-2
AWA10303	13JAN97A	27JUN97	13JAN97*	30MAY97	-20
AWA10304	23JUN97	15JUL97	23MAY97	13JUN97	-20
AWA10305	16JUL97	08AUG97	16JUN97	11JUL97	-20
AWA10306	16JUL97	08AUG97	16JUN97	11JUL97	-20
AWA10307	31JUL97	25AUG97	16JUN97	11JUL97	-31
AWA10308	27MAY97A	10JUN97A	07APR97*	21APR97	-35
AWA10309	11JUN97A	30JUL97	28APR97*	13JUN97	-31
AWA1031	24FEB97A	15JUL97	03MAR97	27JUN97	-10
AWA10310	16JUL97	30SEP97	30JUN97	30SEP97	0
AWA1032	01OCT96A	30SEP97	01OCT96	30SEP97	0
AWA1033	04NOV96A	30SEP97	04NOV96	30SEP97	0



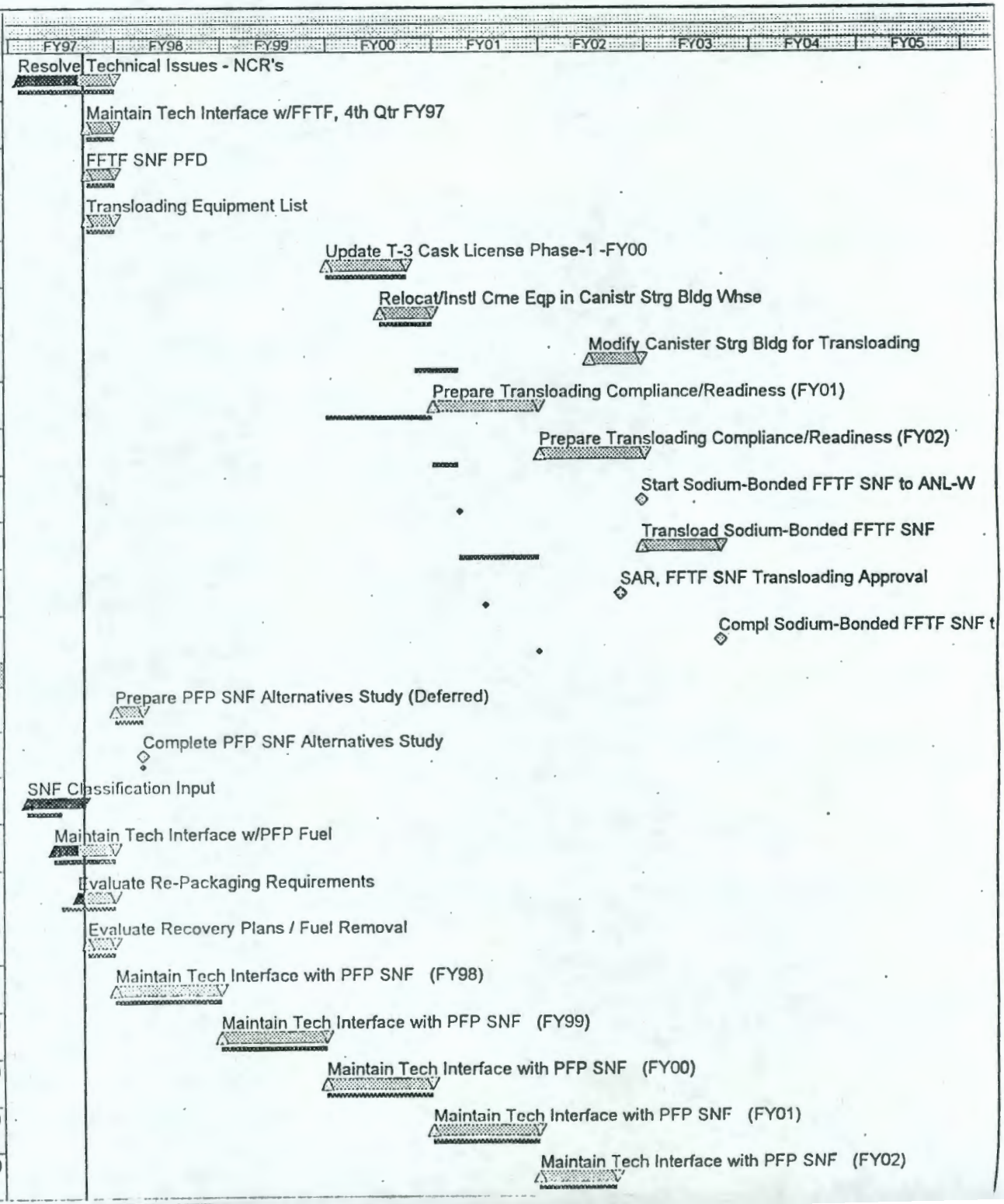
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
AWA103A	01OCT97	30SEP98	01OCT97	30SEP98	0
AWA301	01OCT98	30SEP99	01OCT98	30SEP99	0
AWA301A	01OCT99	29SEP00	01OCT99	29SEP00	0
AWA301B	02OCT00	28SEP01	02OCT00	28SEP01	0
AWA305	01OCT98	30SEP99	01OCT98	30SEP99	0
AWA305A	01OCT99	29SEP00	01OCT99	29SEP00	0
AWA305B	02OCT00	28SEP01			0
AWA310	01OCT98	30SEP99	01OCT98	30SEP99	0
AWA310A	01OCT99	29SEP00	01OCT99	03APR00	-125
AWA310B	02OCT00*	01AUG01			0
AWA320		29MAY01		03APR00	-290
AWA501	03OCT01	14FEB02	02OCT00	02JAN01	-282
AWA501M	03OCT01		02OCT00		-252
AWA705	15FEB02	23SEP02	03JAN01	28SEP01	-246
NL LABS BUILDINGS 324,325,327 1.4.1.09.01.04					
AWA1001	30DEC96A	30SEP97	30DEC96	30SEP97	0
AWA10010		30SEP97		30SEP97	0
AWA100101	01OCT96A	25APR97A	01OCT96	31MAR97	-19
AWA100102	16JUN97*	31JUL97	16JUN97*	31JUL97	0
AWA101102	01OCT97*	30SEP98	01OCT97*	30SEP98	0
AWA1022	02SEP97*	30SEP97	02SEP97*	30SEP97	0
AWA10221	06JAN97A	09JUN97A	06JAN97*	23APR97	-32
AWA10222	02JUN97A	30SEP97	02JUN97*	30SEP97	0
AWA10223	01OCT96A	15NOV96A	01OCT96	15NOV96	0
AWA10224*	02SEP97*	30SEP97	02SEP97*	30SEP97	0



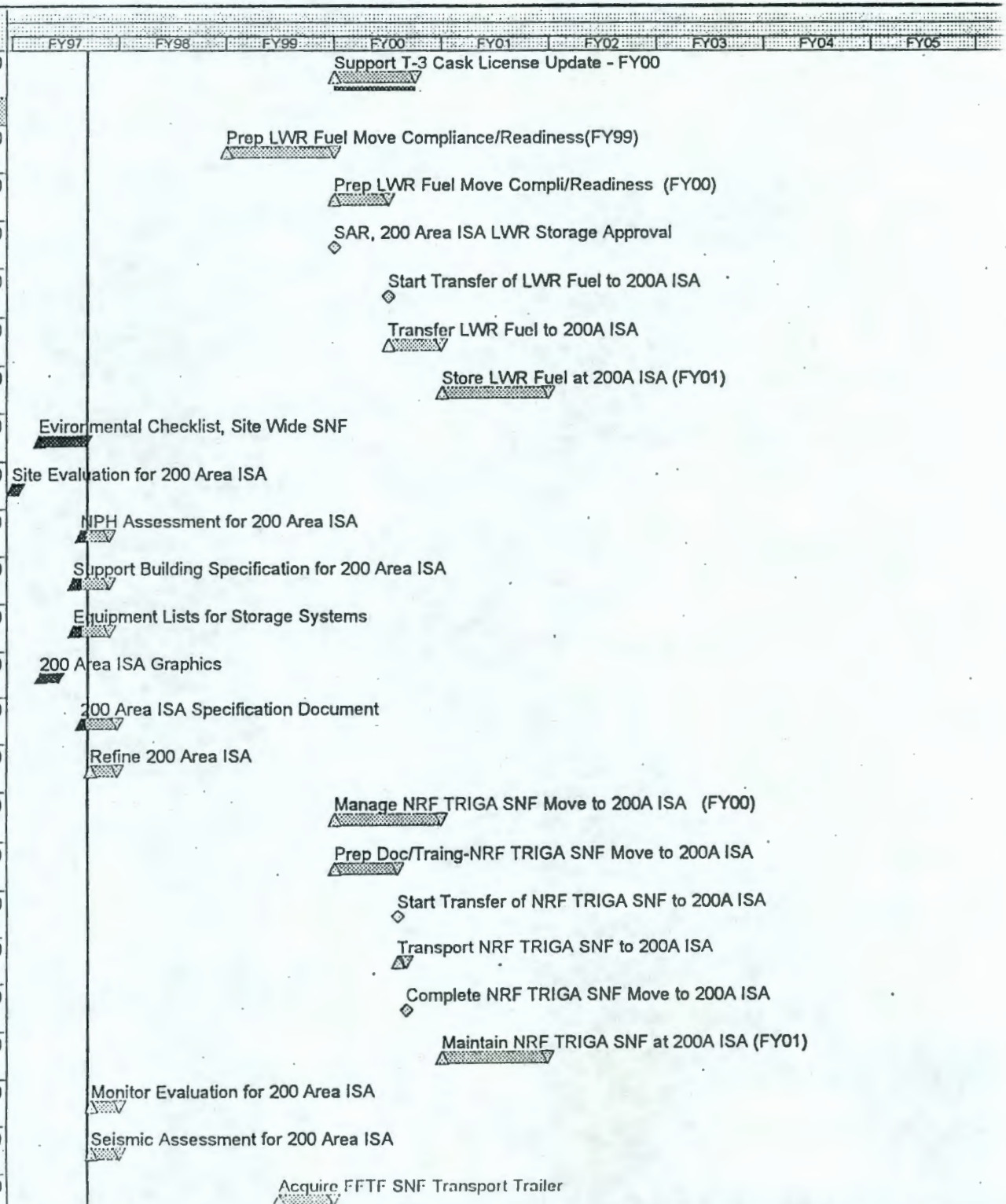
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
MAWA10225	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10226	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10227	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10228	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10229	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10230	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10231	02SEP97*	30SEP97	02SEP97*	30SEP97	0
MAWA10232	05FEB97A	09JUN97A	05FEB97*	23APR97	-32
MAWA10233	02SEP97*	30SEP97	02SEP97*	30SEP97	0
308 BLDG ANNEX 1.4.1.09.01.05					
MAW103	01OCT96A	27MAY97A	01OCT96	28MAR97	-41
MAW1032	27MAY97A	10JUL97	14FEB97	28MAR97	-71
MAW1034	31MAR97A	30SEP97	31MAR97	30SEP97	0
MAW1036	31MAR97A	30SEP97	31MAR97	30SEP97	0
MAW1038	02SEP97	30SEP97	02SEP97	30SEP97	0
MAW105	01OCT97	30SEP98	01OCT97	30SEP98	0
MAW107	01OCT98	30SEP99	01OCT98	30SEP99	0
MAW109	01OCT99	30MAR00	01OCT99	30MAR00	0
MAW20102	01OCT96A	27NOV96A	01OCT96	27NOV96	0
MAW20104	01OCT96A	27NOV96A	01OCT96	27NOV96	0
MAW20106	02JAN97A	13JUN97A	02JAN97*	31MAR97	-53
MAW20108	27MAY97A	30SEP97	01APR97	30SEP97	0
FFTF 1.4.1.09.01.06					
MAW10102	01OCT96A	30JUN97	01OCT96	30APR97	-42
MAW10104	02JUN97A	30SEP97	02JUN97*	30SEP97	0



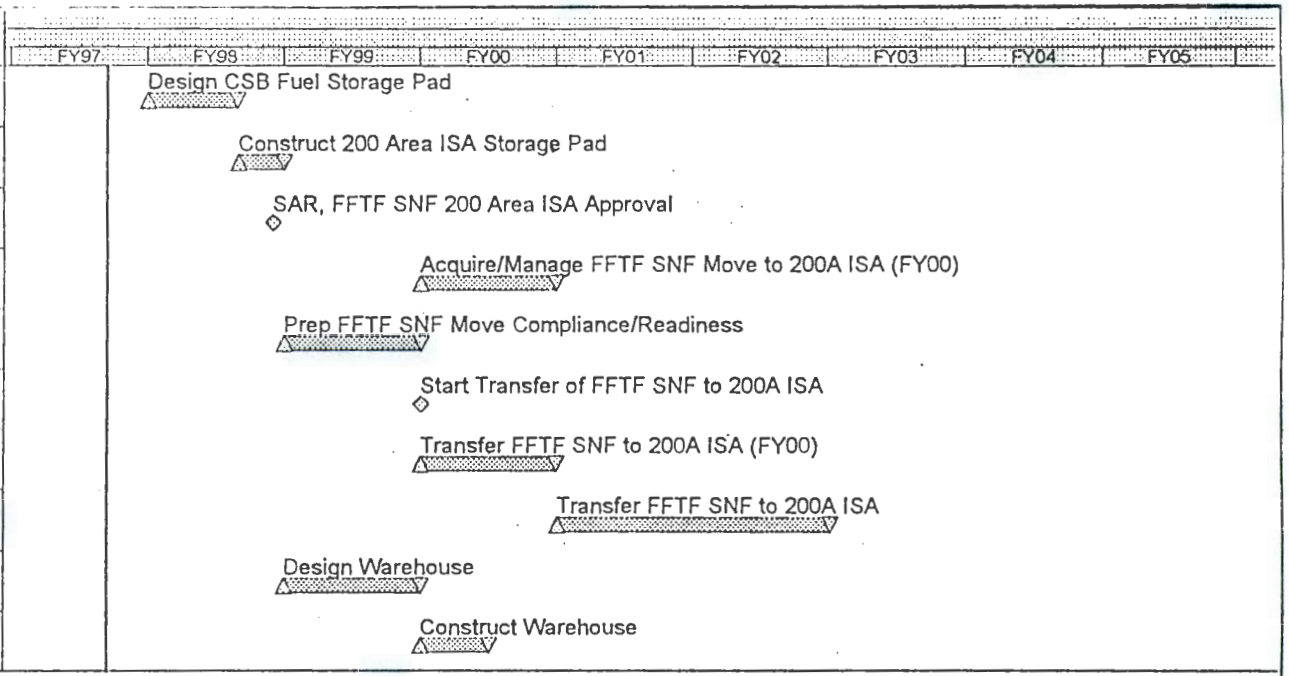
Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
PAW10106	04NOV96A	30SEP97	04NOV96	30SEP97	0
PAW10130	30JUN97	30SEP97	30JUN97	30SEP97	0
PAW10132	30JUN97	30SEP97	30JUN97	30SEP97	0
PAW10134	30JUN97	30SEP97	30JUN97	30SEP97	0
PAWA301105	01OCT99*	30JUN00	01OCT99*	30JUN00	0
PAWA301110	03APR00	29SEP00	03APR00	29SEP00	0
PAWA401110	20MAR02*	16SEP02	01AUG00*	29DEC00	-430
PAWA401120	02OCT00*	28SEP01	01OCT99	29SEP00	-250
PAWA401122	01OCT01	27SEP02	02OCT00	29DEC00	-439
PAWA401125	17SEP02*		02JAN01		-430
PAWA401130	17SEP02*	16JUN03	02JAN01	28SEP01	-429
PAWA401132		01JUL02*		30MAR01	-315
PAWA401135		16JUN03		28SEP01	-429
PFP 1.4.1.09.01.07					
PAWA10109	01OCT97	06JAN98	01OCT97	06JAN98	0
PAWA1011		06JAN98		06JAN98	0
PAWA1012	02DEC96A	13JUN97A	02DEC96	28MAR97	-54
PAWA10120	03MAR97A	30SEP97	03MAR97	30SEP97	0
PAWA10121	27MAY97A	30SEP97	31MAR97	30SEP97	0
PAWA10122	30JUN97	30SEP97	30JUN97	30SEP97	0
PAWA10125	01OCT97	30SEP98	01OCT97	30SEP98	0
PAWA10126	01OCT98	30SEP99	01OCT98	30SEP99	0
PAWA10127	01OCT99	29SEP00	01OCT99	29SEP00	0
PAWA10128	02OCT00	28SEP01	02OCT00	28SEP01	0
PAWA10129	01OCT01	28JUN02	01OCT01	28JUN02	0



Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
RAWA3027	01OCT99*	30JUN00	01OCT99*	30JUN00	0
TK					
TK100120	01OCT98	30SEP99			0
TK100140	01OCT99	31MAR00			0
TK100160		30SEP99			0
TK100180	03APR00				0
TK100200	03APR00	29SEP00			0
TK100220	02OCT00	28SEP01			0
TK200100	02JAN97A	10JUN97A			0
TK200120	01OCT96A	25OCT96A			0
TK200140	27MAY97A	27AUG97			0
TK200160	28APR97A	27AUG97			0
TK200180	28APR97A	27AUG97			0
TK200200	06JAN97A	07MAR97A			0
TK200220	27MAY97A	25SEP97			0
TK200240	26JUN97	25SEP97			0
TK200300	01OCT99	29SEP00			0
TK200320	01OCT99*	02MAY00			0
TK200340	03MAY00				0
TK200360	03MAY00	02JUN00			0
TK200380		02JUN00			0
TK200400	02OCT00	28SEP01			0
TK300100	30JUN97	30SEP97			0
TK300120	30JUN97	30SEP97			0
TK300140	01APR99	30SEP99			0



Activity ID	Early Start	Early Finish	TA11 E S	TA11 E F	Var E F
K300160	01OCT97	29MAY98			0
TK300180	01JUN98	30SEP98			0
TK300200		01SEP98			0
TK300260	01OCT99	29SEP00			0
TK300300	01OCT98*	30SEP99			0
TK300320	01OCT99				0
TK300340	01OCT99	29SEP00			0
TK300360	02OCT00	30SEP02			0
TK300520	01OCT98*	30SEP99			0
TK300540	01OCT99	31MAR00			0



Regulatory Strategy for M-34 Negotiations

The following is an analysis of potential regulatory strategies, implementation requirements and associated costs that could be used as the basis for establishing target and interim enforcable milestones in the Tri-Party Agreement

Justification and Impacts:

1. Comprehensive Environmental Response and Compenstation and Liability Act (CERCLA) Engineering Analysis and Cost Assessment for near term removal actions.

STRATEGY/COST ELEMENT	COST[1]	SCHEDULE[2]	OTHER
Conduct as CERCLA Removal Action			
EE/CA and Record of Decision	$20 K	2 months	Update EE/CA to include sludge pretreatment, no additional disposal alternatives; no additional risk assessment.
Revise Draft Document	$15 K	2 months	
RDR/RAWP	$60 K	3 months	
Total	**$95 K**		

STRATEGY/COST ELEMENT	COST[3]	SCHEDULE[4]	OTHER
Conduct as CERCLA remedial action			
RI/FS	$20 K	2 months	Modify EE/CA; no additional alternatives; more detailed screening, analysis, risk assessment.
Proposed Plan	$15 K	2 months	
RDR/RAWP	$60 K	3 months	
Total	**$95 K**		

STRATEGY/COST ELEMENT	COST[3]	SCHEDULE[4]	OTHER
Conduct as RCRA TSD closure			
RCRA Part A permit application (K Basins)	$20 K	2 month	Assumes interim status expansion; includes groundwater monitoring plan; no Part B application - straight to closure.
TSD documents (K Basins)	$35 K	2 months	Inspection plan, contingency plan, training plan, operating record.
Closure plan/post-closure plan (K Basins)	$60 K	3 months	Post-closure plan required because of remaining soil/groundwater contamination; defer cleanup to CERCLA OU.
RCRA Part A permit application (sludge treatment facility)	$20 K	2 month	Assumes approval as interim status expansion; otherwise, full Part B permit required before construction can begin.
TSD documents (sludge treatment facility)	$35 K	2 months	Inspection plan, contingency plan, training plan, operating record.
Closure plan (sludge treatment facility)	$30 K	2 months	Assume no Part B application since process will only operate 1-2 years.
Radioactive air NOC (sludge treatment facility)	$90 K	9 months	More definitive design data needed before NOC can be prepared.
Formal BARCT analysis (sludge treatment facility)	$45 K	4 months	
Non-radioactive air NOC (sludge treatment facility)	$60 K	9 months	More definitive design data needed before NOC can be prepared.
Formal BACT analysis (sludge treatment facility)	$45 K	4 months	
TSCA permit (sludge treatment facility)	$300 K	2 years	Includes demonstration test.
NEPA EA (minimum) (sludge treatment facility)	$50 K	6 months	EA is minimum; may require EIS. EA/FONSI must be complete before construction can begin.
Total	**$790 K**		

STRATEGY/COST ELEMENT	COST[3]	SCHEDULE[4]	OTHER
Conduct as RCRA corrective action			
RFI/CMS	$20 K	2 months	Modify EE/CA; no additional alternatives; more detailed screening, analysis.
Modify permit with preferred closure option	$15 K	2 months	
Corrective Measures Implementation (CMI) plan	$60 K	3 months	
RCRA Part A permit application (sludge treatment facility)	$20 K	2 month	Assumes approval as interim status expansion; otherwise, full Part B permit required before construction can begin.
TSD documents (sludge treatment facility)	$35 K	2 months	Inspection plan, contingency plan, training plan, operating record.
Closure plan (sludge treatment facility)	$30 K	2 months	Assume no Part B application since process will only operate 1-2 years.
Radioactive air NOC (sludge treatment facility)	$90 K	9 months	More definitive design data needed before NOC can be prepared.
Formal BARCT analysis (sludge treatment facility)	$45 K	4 months	
Non-radioactive air NOC (sludge treatment facility)	$60 K	9 months	More definitive design data needed before NOC can be prepared.
Formal BACT analysis (sludge treatment facility)	$45 K	4 months	
TSCA permit (sludge treatment facility)	$300 K	2 years	Includes demonstration test.
NEPA EA (minimum) (sludge treatment facility)	$50 K	6 months	EA is minimum; may require EIS. EA/FONSI must be complete before construction can begin.
Total	**$760 K**		

3. Costs include review/revision cycles. Extent of review/revision is uncertain and costs could vary significantly.

4. Assumes aggressive internal and external review cycles.