January 24, 1997

NOTE TO: Terry C. Frazee, Head
RAM Section

FROM: Richard L. Bangart, Director /s/ Richard L. Bangart
Office of State Programs

SUBJECT: HANFORD OVERSIGHT

Per our conference call discussions on January 9, 1997, please find enclosed two SECY papers that address NRC's regulatory role for the DOE privatization of two future Hanford tank waste remediation systems. As indicated in the conference call, NRC will appreciate receiving information from you about the oversight/regulatory responsibilities you will be implementing over DOE privatized activities at Hanford.

Enclosures:
1. SECY-96-027, Evaluation of Issues Necessary to Determine the Feasibility of Licensing, and Level of Involvement In, the Department of Energy Proposed High-Level Radioactive Waste Solidification Systems

2. SECY-95-305, Request to Evaluate Issues Necessary to Determine the Feasibility of Licensing and Level of Involvement in Planned Future Department of Energy High-Level Radioactive Waste Solidification Systems

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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POLICY ISSUE

(NEGATIVE CONSENT)

December 26, 1995 SECY-95-305

FOR: The Commissioners

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: REQUEST TO EVALUATE ISSUES NECESSARY TO DETERMINE THE FEASIBILITY OF LICENSING AND LEVEL OF INVOLVEMENT IN PLANNED FUTURE DEPARTMENT OF ENERGY HIGH-LEVEL RADIOACTIVE WASTE SOLIDIFICATION SYSTEMS

PURPOSE:

To inform the Commission of the staff's intent to evaluate the feasibility of licensing future privatized Department of Energy (DOE) waste treatment systems constructed for the solidification of high-level waste (HLW) from Hanford tanks. This evaluation will also include a determination of the extent of staff involvement necessary during the construction and operation of pilot facilities.

DISCUSSION:

On December 4, 1995, DOE briefed the staff on plans to privatize two future Hanford tank waste remediation systems (TWRS), possibly using different technologies. The purpose of the TWRS is to immobilize highly radioactive tank waste from the Hanford site in a safe, environmentally sound, and cost-effective manner. These TWRS will be designed, constructed on the Hanford reservation, owned, and run by government contractors in two phases: Phase I pilot-scale facilities and Phase II full commercial operations. DOE has proposed that the Nuclear Regulatory Commission license Phase II and has

CONTACT: Gary Comfort, NMSS
(301) 415-8106

SECY NOTE: TO BE MADE PUBLICLY AVAILABLE WHEN THE FINAL SRM IS MADE AVAILABLE.

IN THE ABSENCE OF INSTRUCTIONS TO THE CONTRARY, SECY WILL NOTIFY THE STAFF ON THURSDAY, JANUARY 11, 1996, THAT THE COMMISSION, BY NEGATIVE CONSENT, ASSENTS TO THE ACTION PROPOSED IN THIS PAPER.

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requested NRC to determine the appropriate level of NRC involvement in Phase I before their issuance of a request-for-proposal (RFP) on February 15, 1996.

The objective of Phase I will be to demonstrate the "proof-of-concept" and commercial viability of the contractor proposals. During Phase I, two pilot-scale plants will be designed and constructed by separate competing contractors to demonstrate separation of "low-activity" waste (LAW) from HLW sludge and to immobilize the LAW. DOE's current schedule requires: (1) selection of two contractors in December 1997, (2) construction of facilities beginning in December 1999, and (3) hot operations starting in June 2002 and ending in 2012. DOE proposes to regulate Phase I with a level of involvement from NRC that NRC determines is appropriate.

Phase II will involve the construction and operation of two full-scale commercial HLW immobilization facilities by separate competing contractors. These facilities will be owned and operated by the contractors. DOE proposes that NRC license the Phase II facilities. Procurement for these new facilities is not expected to begin until 2002, with hot operations starting in December 2009.

Before responding to DOE's proposals for NRC's regulatory participation, the staff will evaluate various options for NRC involvement in Phase I, and will characterize for the Commission the following issues that could affect NRC's role in Phases I and II: (1) NRC's legislative basis for licensing privatized DOE contractors; (2) the sufficiency of current NRC regulations for licensing such operations; (3) the availability of information and experience necessary for the staff to develop appropriate regulatory guidance in the time frames available; and (4) the resource requirements and availability for participating in these activities.

The staff is considering several options for Phase I involvement. None of these options envision licensing the Phase I effort. The option with the least staff involvement would be to provide some NRC staff for general consultation with DOE and DOE private contractors on technical and regulatory issues affecting the proposed facilities. Other options could include onsite monitoring by NRC staff, similar to what has been done at the gaseous diffusion enrichment plants, and staff technical review and acceptance of Topical Reports addressing the TWRS facilities.

The first threshold issue to be determined by the Commission in addressing the NRC role is the legislative basis by which NRC may license or provide regulatory oversight of the DOE project in both phases. The General Counsel is providing advice to the Commission on this issue in a separate paper.

The second issue involves a review of the current regulations to determine their sufficiency for regulating these new processes, which were not specifically envisioned during regulatory development. If the review indicates that current regulations are insufficient for licensing, the staff and OGC will evaluate the modifications and resource requirements necessary to license these facilities and make recommendations for rulemaking activities to the Commission.

The staff will also evaluate the availability of staff experience and other information to assist in developing licensing guidance. The staff's primary experience results from its oversight, since 1980, of the West Valley Demonstration Project, which is a DOE demonstration of HLW vitrification planning to begin hot operations in 1996. The staff may also draw on the experience of foreign governments, such as the French, which already have commercial vitrification facilities operating. However, if DOE opts to use other solidification technologies, NRC's experience base may be limited.

Finally, the staff must explore the resource commitments, and the availability of those resources, necessary to develop regulatory guidance, license, and/or oversee the proposed operations. Although the staff's involvement in the oversight and licensing of these operations is expected to be fully cost-recoverable, either as licensing and annual fees or under the Economy Act, there is no guarantee that Congress will increase NRC's appropriation to cover these activities. The staff would also need to meet with the Office of Management and Budget to determine their support for these activities.

Before the staff responds to DOE's request for NRC licensing of Phase II activities and determines an appropriate level of involvement in Phase I, the staff will evaluate the issues listed above. On completion of the evaluations, the staff will provide the Commission with alternatives and recommendations regarding a response to DOE.

SUMMARY:

Unless directed otherwise the staff will evaluate the issues above, in preparation for a response to DOE before DOE's issuance of an RFP for Phase I activities. We expect to provide our proposed response to the Commission by January 24, 1996.

James M. Taylor
Executive Director
for Operations

Attachment: 12/4/95, DOE Briefing Slides

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Hanford Tank Waste Remediation System Privatization

Briefing for
Hugh Thompson
Deputy Executive Director
for Nuclear Materials Safety, Safeguards and
Operations Support
December 4, 1995

by
Dr. Donald L. Vieth,
Senior Technical Advisor TWRS Program
Richland Operations Office
U.S. Department of Energy

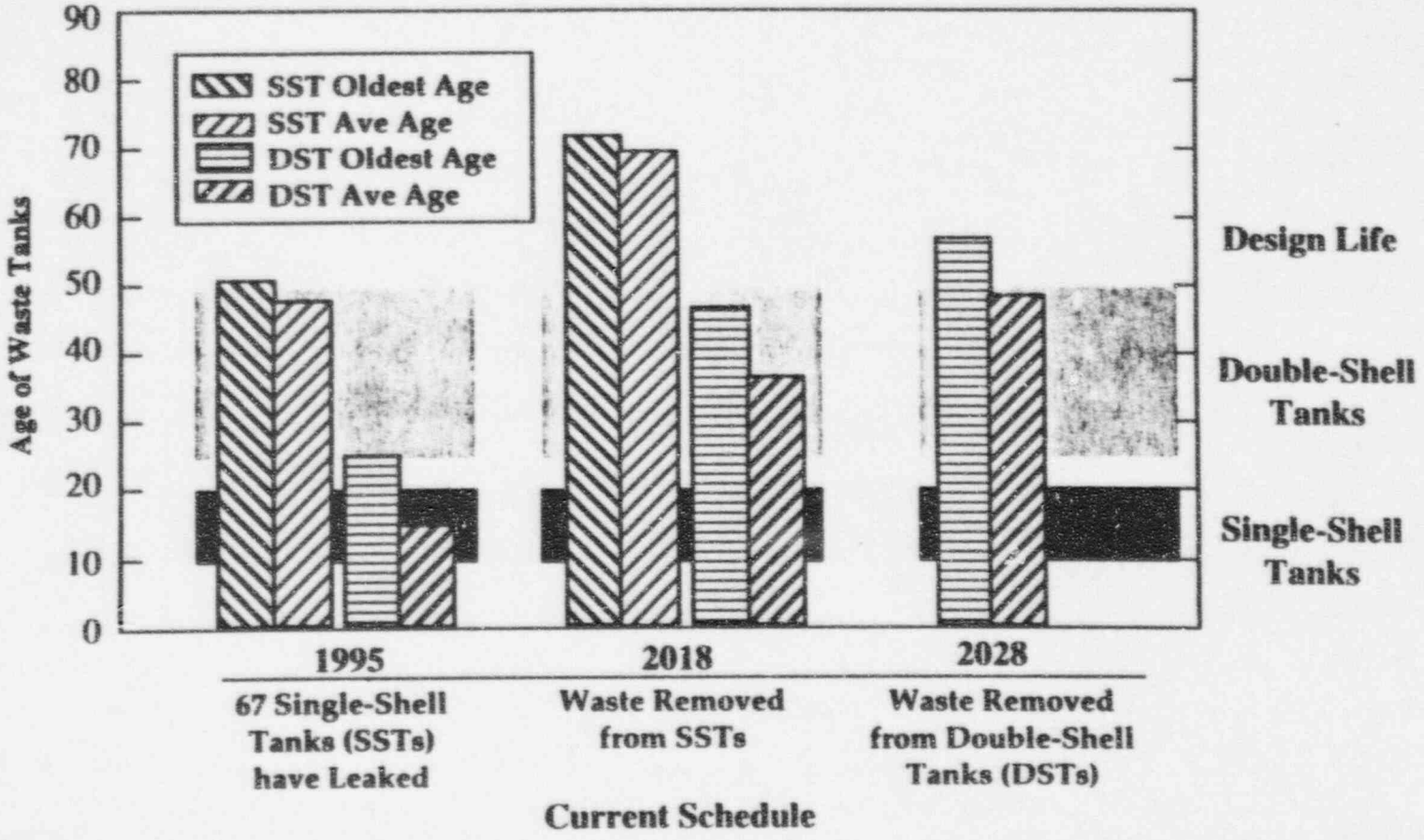
TWRS Privatization - Outline of Briefing

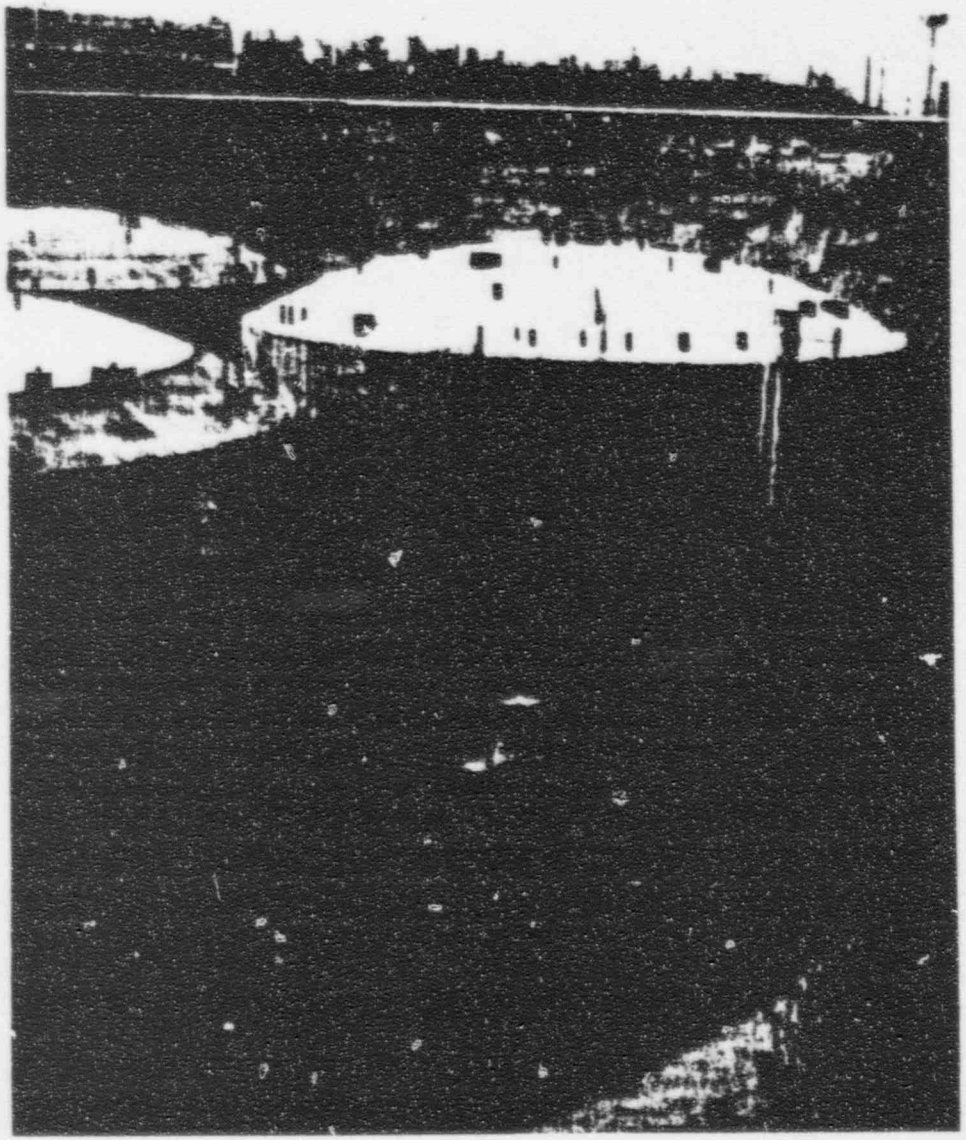
- General background on Hanford tank situation
- Tank Waste Remediation System
- Concept of Privatization
- Motivation Factors behind Privatization
- Potential Benefit of Privatization
- Feasibility of Privatization TWRS
- Procurement Process for Privatization Operations of TWRS
- Schedule Implementation and Demands
- Radiological and Nuclear Safety Regulation Requirements

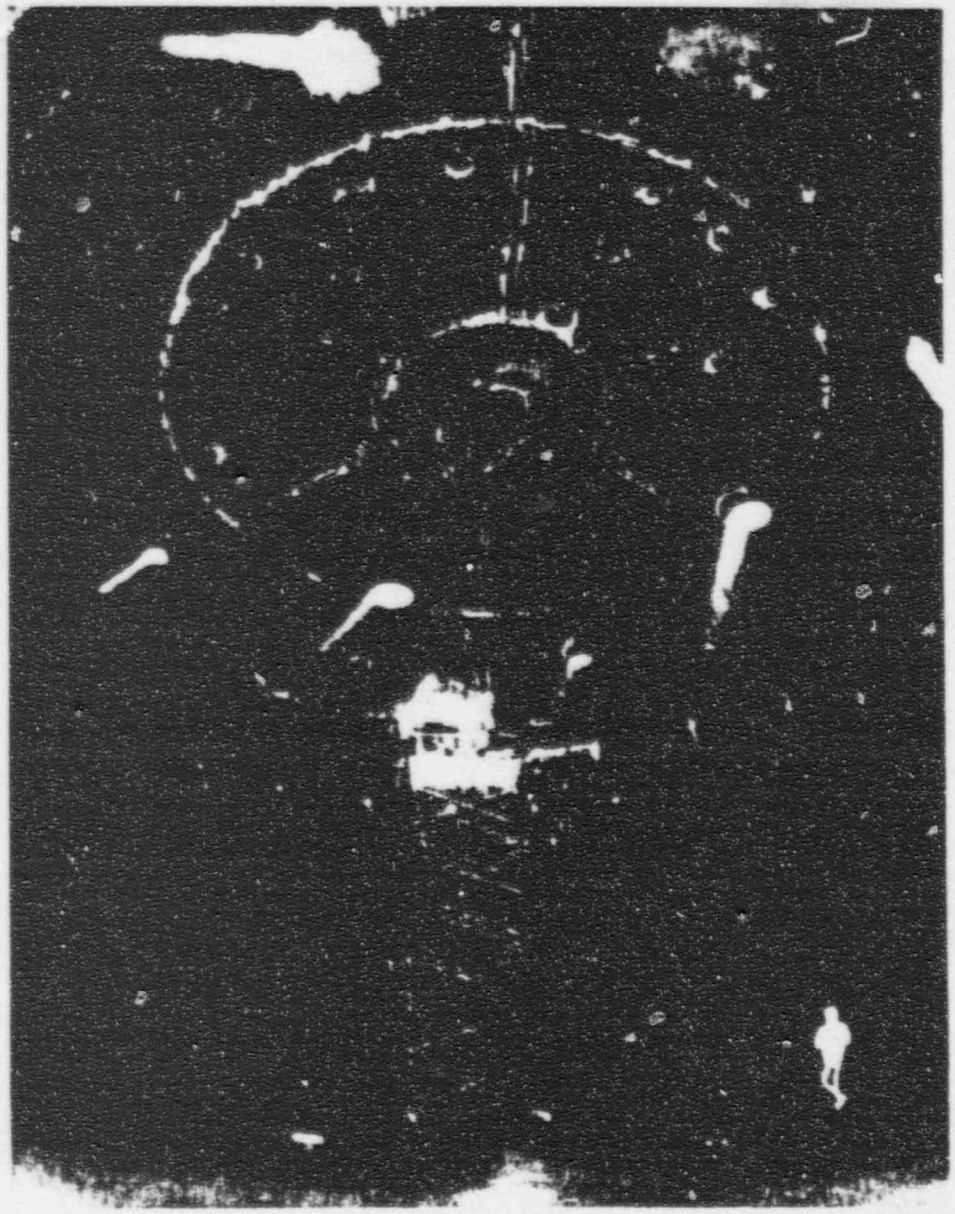
Overall Perspective of TWRS-Hanford Tank Waste Situation

- 7 Tank farms in 200 West area (83 Single-shell, 3 Double-shell tanks)
- 11 Tank farms in 200 East area (66 Single-shell, 25 Double-shell tanks)
- 149 Single-shell tanks (150 MCi/180,000MT of solids)
- 28 Double-shell tanks (92 MCi/50,000 MT of solids)
- 1,948 Capsules of SrF_2 and $CsCl$, (150 MCi)
- 52 Tanks of "Watch List" (46 Single-shell, 6 Double-shell tanks)
  - 20 Ferrocyanide tanks (1 Kg-mole)
  - 25 Hydrogen/flammable gas tanks
  - 10 Organic constituents tanks
  - 1 High-heat Tank
- 67 Assumed leakers

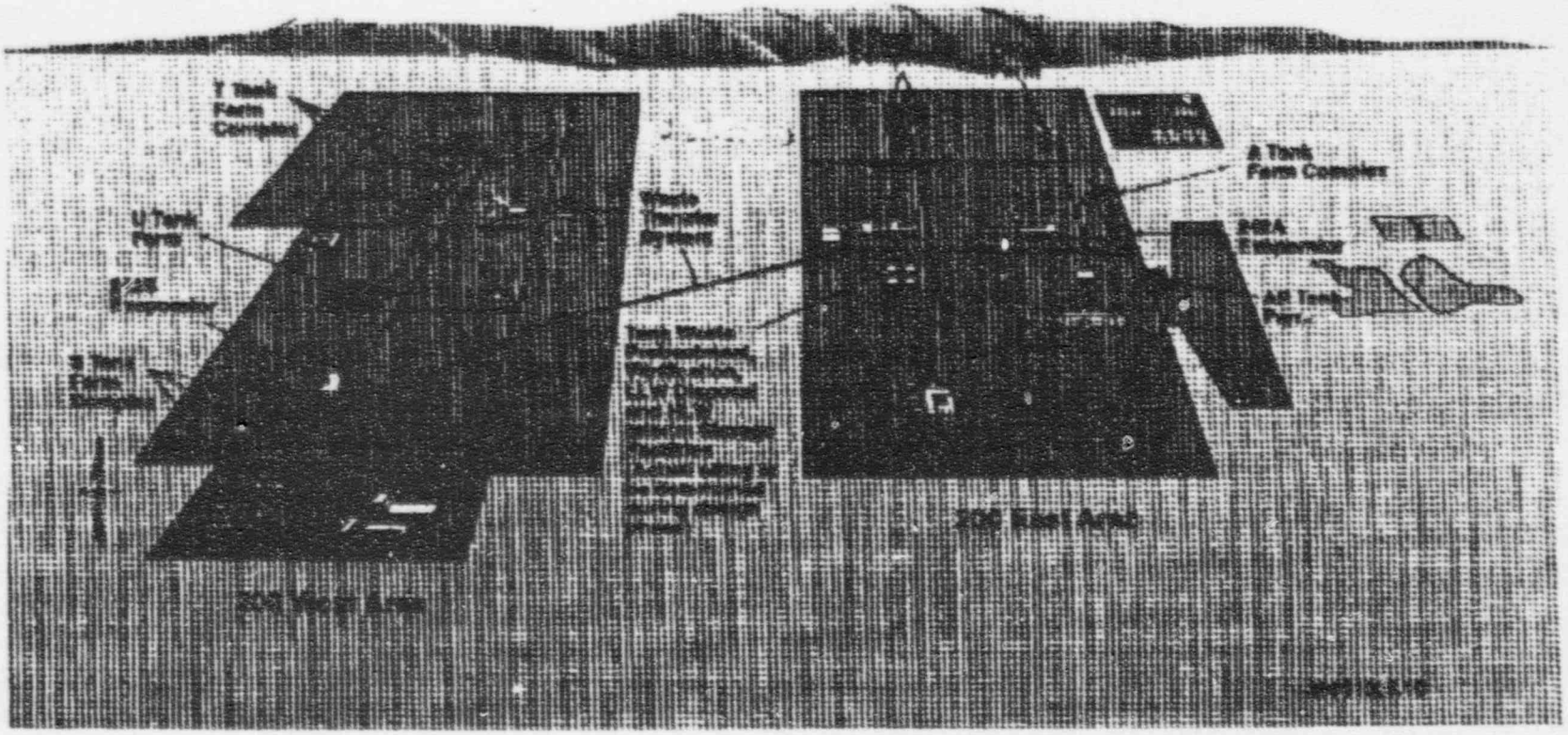
Tank Ages, Factor Potential Risks

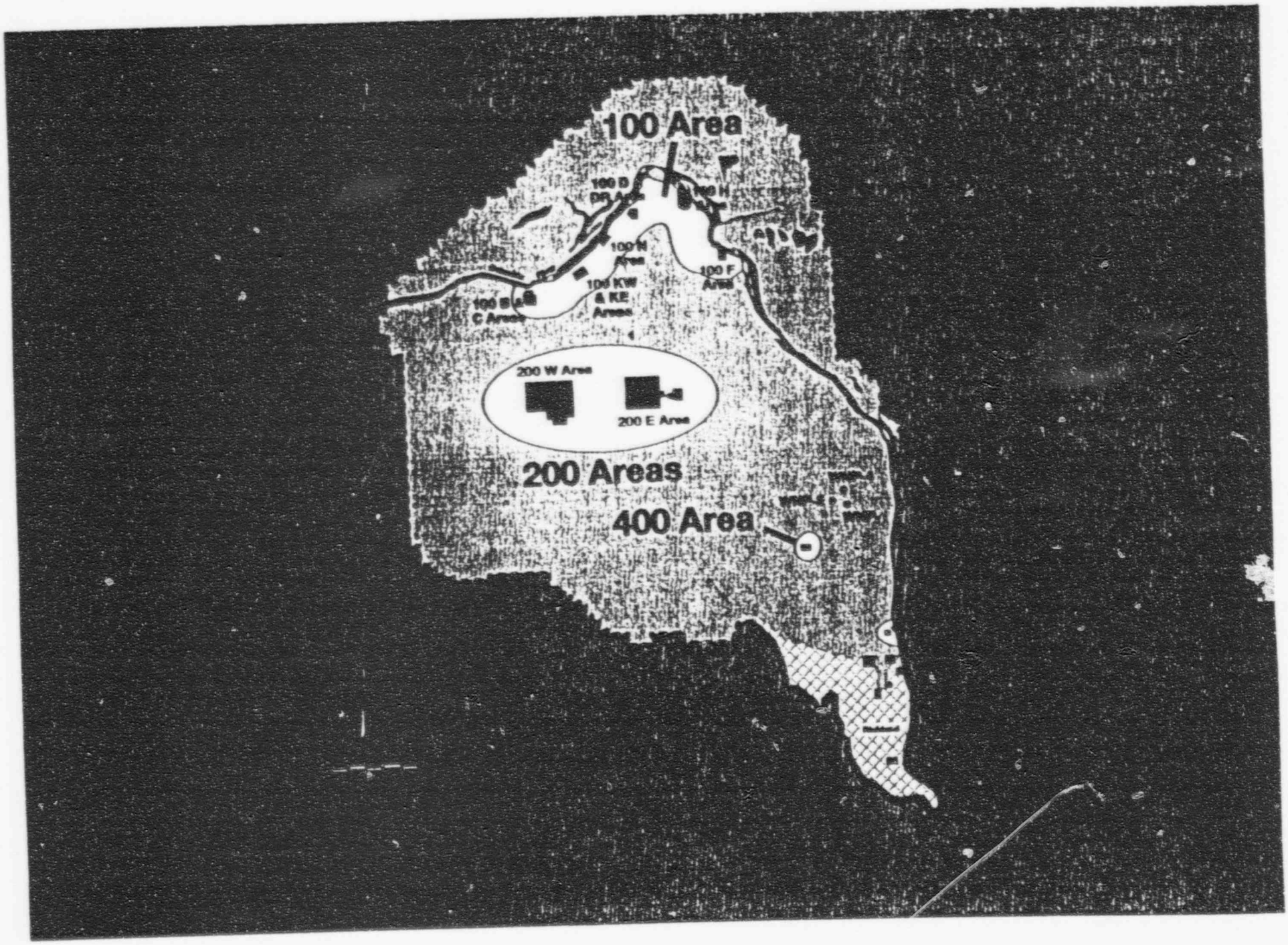






TWRS Program Facilities



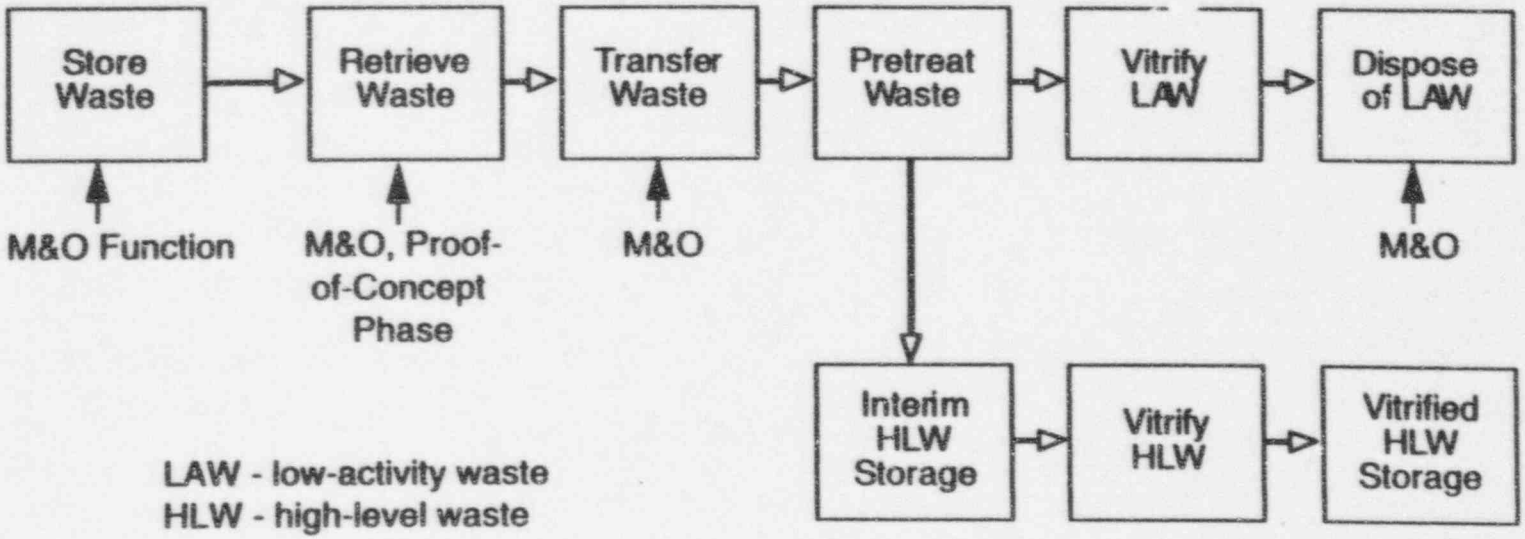

100 Area
100 D Area
100 H
100 N Area
100 KW & KE Areas
100 F Area
100 B & C Areas
200 W Area
200 E Area
200 Areas
400 Area

Tank Waste Remediation System (TWRS) Program Mission

The mission of the TWRS Program is to manage, retrieve, treat, immobilize and dispose of highly radioactive tank waste in a safe, environmentally sound, and cost-effective manner.

The Program's prime responsiblity is to conceive, develop, design, construct and operate the physical system to retrieve and process the waste to convert it into durable solids suitable for disposal.

Schematic Diagram - Tank Waste Remediation System



TWRS - What is in the Tanks

Liquids

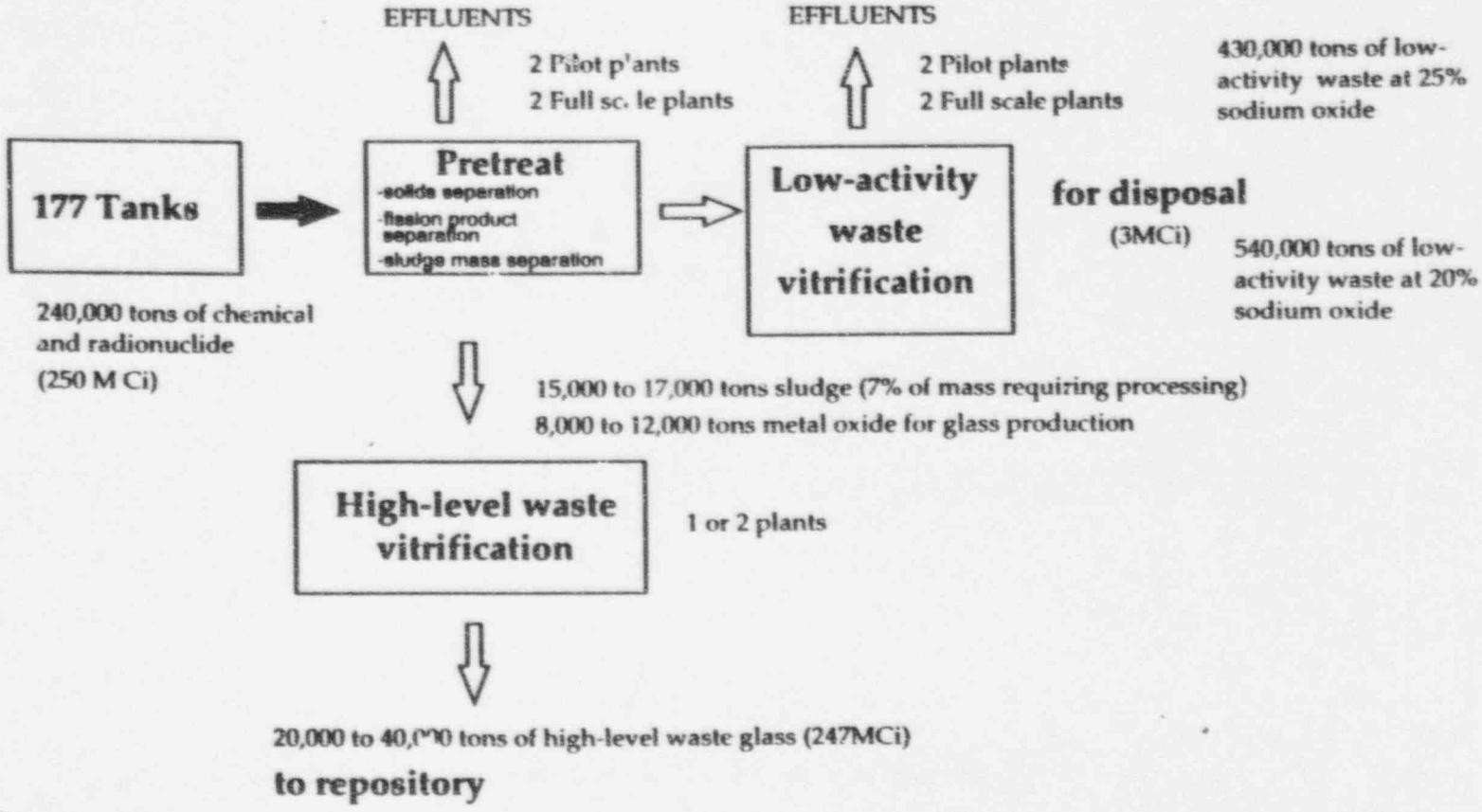
Supernatant
(soluble salts plus sufficient water to make solution)

Solids

Saltcake
(Soluble salts without sufficient water to make a solution)

Sludges (~7% of mass of process chemicals)
(insoluble compounds which must be slurried)

TWRS - Mass Processing Considerations



TWRS - Important Technical Parameters

Waste Chemistry

Cations	
Na	68270 MT
Al	4840 MT
P	1880 MT
Fe	819 MT
Si	506 MT
Cr	165 MT

Anions	
NO_3	110000 MT
OH	12980 MT
NO_2	10560 MT
CO_3	2730 MT
F	1166 MT
Cl	486 MT

Point: sodium will dominate the production of low-activity waste
release of NOx will create a signification requirement for emissions control

TWRS: Important Technical Parameters

Soda Glass Leaching

Percent Soda % Na_2O	Performance Measure Leach Rate (Na g/m_2 /week)
15	0.15
20	0.4
25	1.5
30	6.0
35	35.0

Higher soda content, smaller amount of waste, lower total cost but poorer performance

Lower soda content, better performance, larger amount of waste but higher cost (if unit price is based on mass of solid waste)

Focus on Privatization- Definitions of Privatization

- **Classical Definition**
  - **The Government**, which **runs** a major service operations that **services large client populations**, sells the operations to a private sector organization so they can provide this service. The Government allows the market forces to define the price, nature, and quality of the service.

- **TWRS Definition**
  - Vendors, **under contract** with the Department of Energy (DOE), **to provide a service use private funding** to design, permit, construct, operate, decontaminate and decommission **their own** equipment and facilities to treat tank waste, and **receive payment** when producing products **meeting DOE's performance specifications.**

Requirements for TWRS Privatization

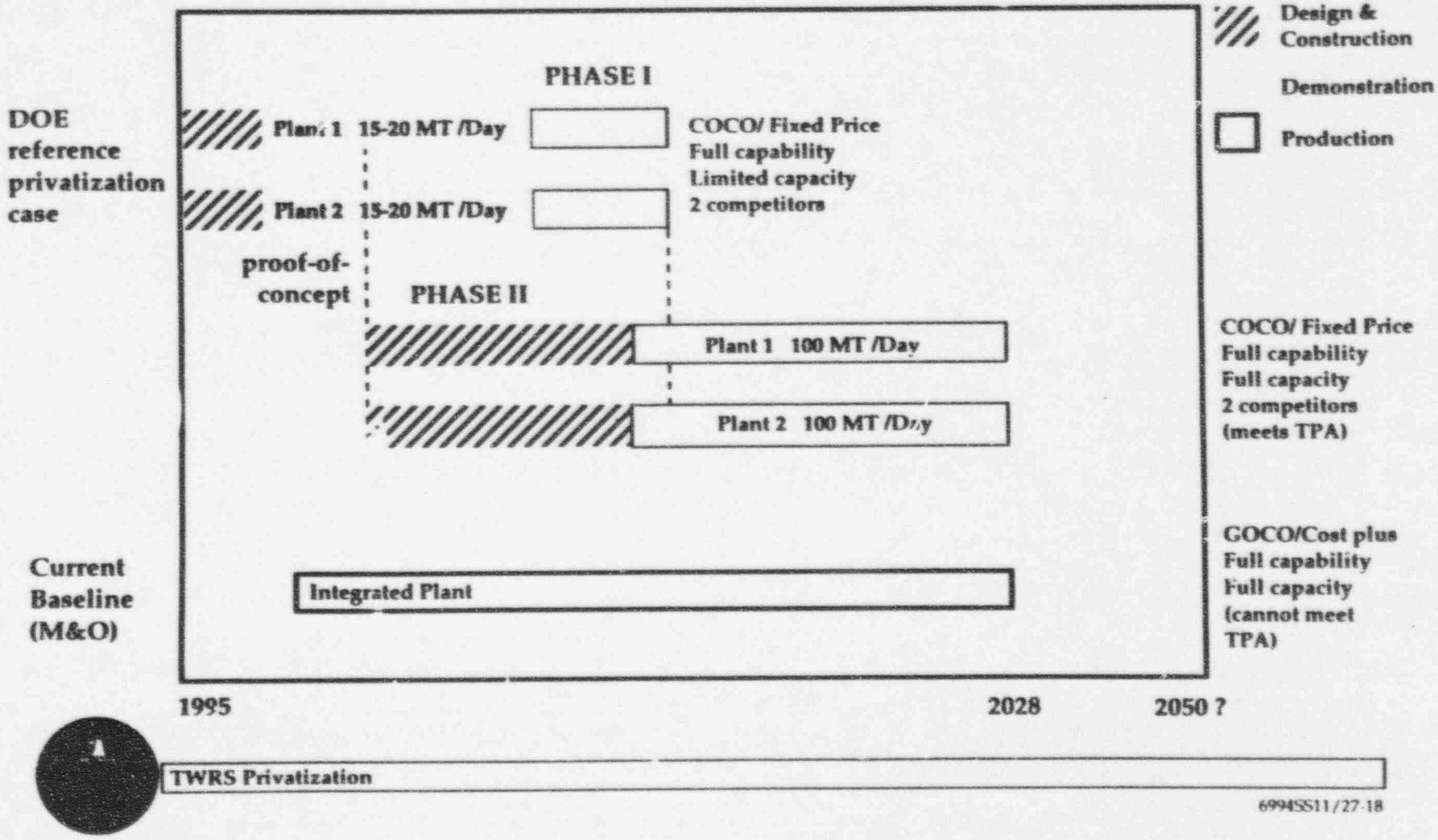
- Ownership of facilities, processes and technology by vendor
- Deliverables purchased against a quantifiable/measurable specification

Note: Must be done within business framework that provides for continuous competition

Two Phased Structure of TWRS Privatization

- Proof-of-Concept phase (Phase I)
- Full-Scale production phase (Phase II)

Concept of Phased Approach
TWRS Privatization



TWRS Privatization

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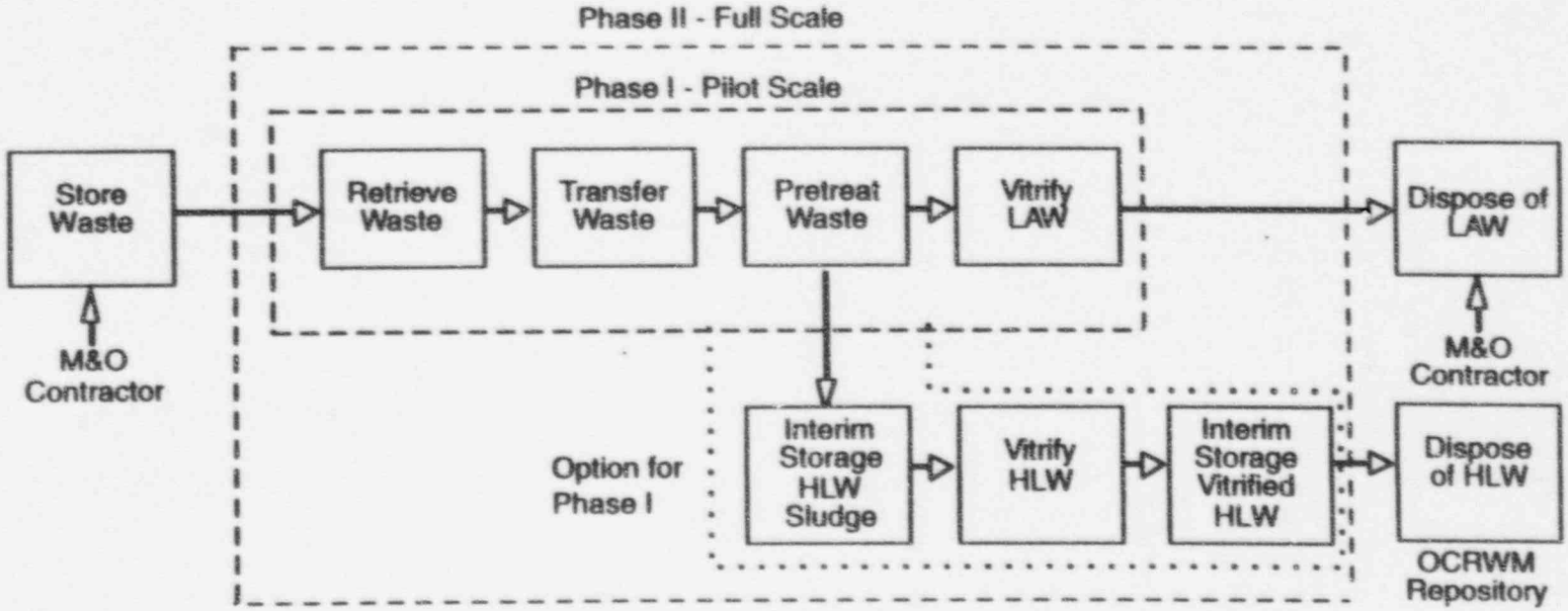
Tank Waste Remediation System Privatization Approach



Assurance of a Competitive Framework

- Two waste process lines operating simultaneously
- Two vendors operating process lines/ facilities

Note: Basis for maintaining continuous competition

Development of Strategy- Objectives of TWRS Privatization

- Reduction of total cost of achieving tank waste remediation
- Improvement on schedule
- Improvement in quality of interim and final products

Summary of Motivating Factors

- Vice President Gore's initiative to reinvent government
- DOE Contract Reform Initiative
- Private Industry's approach to the Department of Energy
- Budgets continuing to decline (not bottomed out yet)
- Cost of Baseline Program
  - Tri-Party Agreement Case Beta cost estimated at $36B
  - Program estimate $40B

Changes in the American Condition

- Escalating Federal Deficit
- Escalating Cost of Government
- Subsequent Changes—and still a dynamic situation
- Theme of Change

Contract Reform Initiative Task Force Recommendations

- Pay for performance
- Fixed Price contracting
- Build versus Buy alternative
- Tiered Fee structure
- Incentive Fees
- Privatize "Routine Operations"

Genesis of Privatization Review of TWRS

- ECA concept to privatize the High-Level Waste Vitrification Plant (Summer 1993)
- Evaluation Requirements codified as TPA milestone (M-51-01-T01)
- Implication: Private company, willing to finance and take on responsibilities to fulfill commitments in Hanford Federal Facility Agreement and Consent Order
- Outcome: Evaluate Privatization of TWRS

Principles Embedded in TWRS Privatization

- Fulfill TPA commitments
- Shifts significant responsibility, accountability, and liability to vendor
- Makes vendor responsible and accountable for cost and technical performance
- Plant/operation, vendor owned, vendor operated
- Vendor responsible for environmental protection/compliance
- No reduction to worker/general public safety/health protection
- Government purchases products/services against performance specifications
- Acquisition of products/services under fixed price contract
- Establish competitive framework for cost control
- Reduction of life cycle cost
- Phased learning/continuous improvements starting with pilot plants
- Vendors own sufficient technology; Department focus on high risk, potentially high payoff technology development

Logic in Making a Decision to Privatize TWRS

- Approach to evaluation
  - Feasibility
  - Desirability

- Concept of Feasibility

  Is it **possible** to successfully - privatize TWRS?

  From the big picture, are there any major hurdles that are clear show stoppers to the effort?

- Concept of Desirability

  Will we **really benefit** if we successfully execute this effort?

  Do we really understand all the details that have to be addressed and can they be accomplished in a fashion that makes the effort effective?

Basis for Feasibility Determination

- Factors considered
  - TPA Schedule
  - Regulatory Framework
  - Financiability
  - Budget/Funding
  - Cost
  - Vendor Interest
  - Performance Specification
  - Definition of waste feedstock
  - Technical implementation
  - Definition of Objectives
- Evaluate both phases
- Used "Reference System" as a basis for evaluation
- Bottom line - it is ***feasible*** to privatize TWRS but it will be a challenge to meet all the boundary conditions

TWRS Privatization
Fundamental Concepts Considered

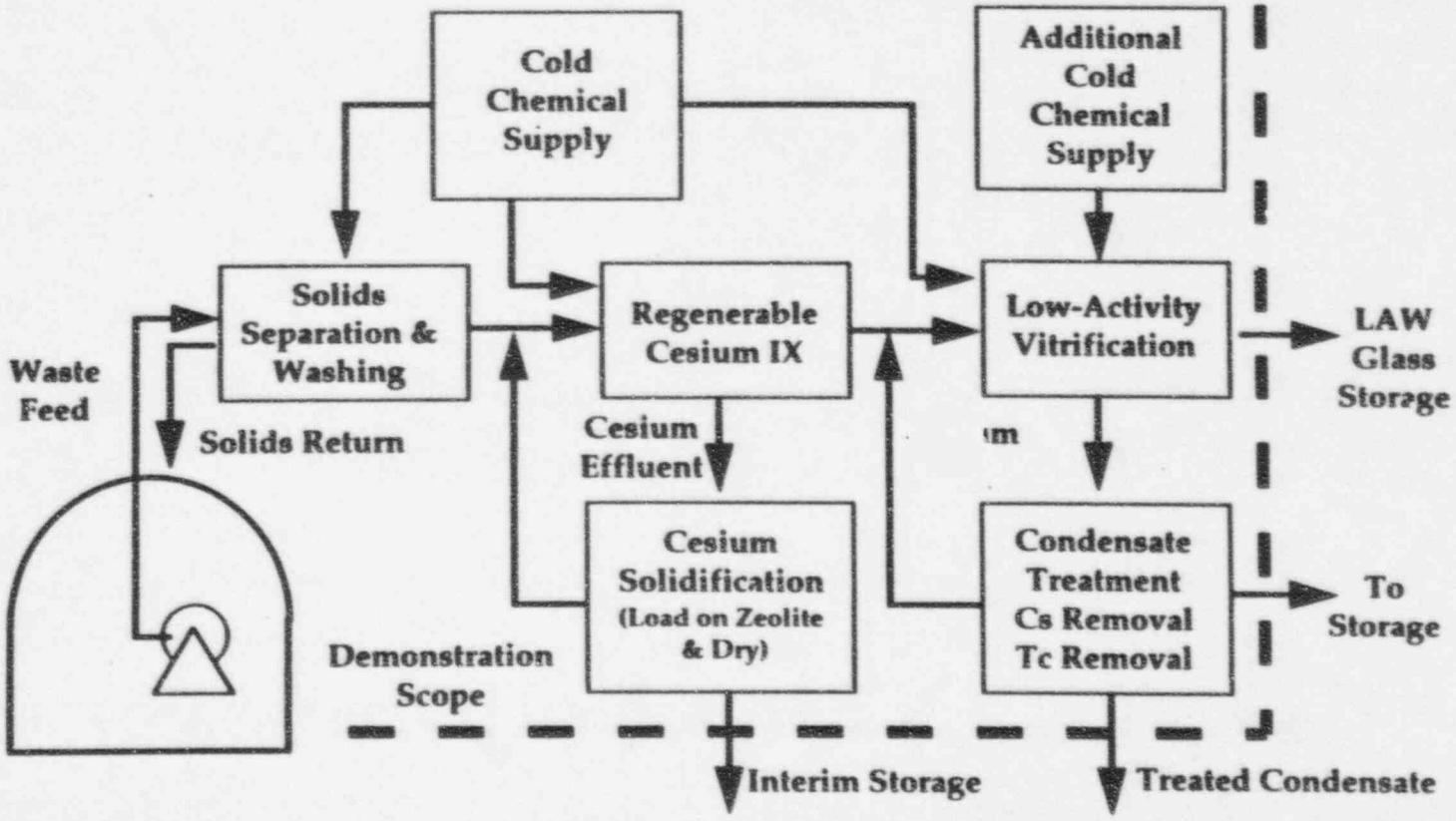
Option 1

- Elementary system with maximum flexibility in terms of facility configuration to handle wide variety of currently ill-defined process situations and requirements

Option 2

- Progressively tailored chemical processing campaigns in modular distributed units based upon good knowledge and technical understanding of waste

Reference System used to Evaluate Feasibility



NEPA Requirements

- NEPA review must be complete before implementing action but is not required to initiate the procurement process
- The Department is looking at two primary paths to provide NEPA coverage for the proposed privatization
  - Perform a supplement analysis to determine whether the action is covered by the 1987 Hanford Defense Waste (HDW) EIS or whether a supplemental HDW EIS is needed
  - Accelerate the schedule for the TWRS EIS which is already in preparation, and assure that it provides the NEPA coverage
- NEPA Record of Decision would be required prior to contract award

Tri-Party Agreement Requirements

Meeting the Department's Long-term commitments is the most critical concern

- Benchmark milestones used to evaluate ability to meet Department's Long-term commitments

Start hot operations of LAW pretreatment facility to remove Cs and Sr	12/31/04
Initiate hot operation of the LAW vitrification facility	06/30/05
Start hot operations of HLW pretreatment facility	06/30/08
Initiate hot operations of HLW vitrification facility	12/31/09
Retrieve waste from all SSTs	09/30/18
Complete closure of SST Farms	09/30/24
Complete pretreatment processing of Hanford tank waste	12/31/28
Complete vitrification of HLW	12/31/28
Complete vitrification of LLW	12/31/28

Vendor Interest

- Most vendors support privatization but express concern with implementation
- Recommendation that DOE hire expert financial, legal and systems engineering advisors to ensure privatization success
- Most vendors indicated it was critical that the federal government ensured funds would be available and are adequate to cover costs
- Most vendors accepted the Tri-Party Agreement as a constraint
- *Many vendors consider* **regulatory uncertainties** *a major risk in terms of potential delays unacceptable to financiers*

Financial Requirements

- Hired financial advisor
- Privatization of TWRS is potentially feasible if DOE can
  - Define the product it ultimately wants to buy
  - Define the tank waste stream within reasonable bounds
  - ***Define the* regulatory framework *in which the facilities will be designed, built, operated, decontaminated, and decommissioned***
  - Define the treated waste product performance specifications and empty tank standard
  - Financially guarantee that if DOE terminates the contract, invested capital with some profit is paid to the vendor

Regulatory Framework

Three components of regulatory oversight

- Environmental Protection & Compliance
  - Standard Washington State permitting requirements
- Occupational Safety and Health
  - Federal Agency - Occupational Safety & Health Administration
  - State Agency - Washington Industrial Safety & Health Administration
- Radiological Safety
  - Committee on External Regulation of DOE Nuclear Facilities
  - Phase I: Department of Energy-Regulation
  - Phase II: Nuclear Regulatory Commission Regulation

Definition of Objectives

- Full-Scale Production Phase
  - Complete remediation within TPA schedule or sooner
  - Accomplish task in economical manner
    (below current estimated cost for baseline)
  - Vendor's objectives still to be defined
- Proof-of-Concept/Commercial Demonstration Scale Phase
  - Vendor's objectives still to be defined
    - Learn/demonstrate capabilities
  - Department's objectives
    - Learn how to make privatization work
    - General objectives
    - Technical objectives
    - Procurement objectives
    - Cost objectives

Objectives for Proof-of-Concept

- General
  - Establish confidence that TPA milestones can be achieved
  - Demonstrated there is a commercially viable business
- Technical
  - Demonstrate production throughput, process efficiency and radionuclide removal
  - Understand and overcome unanticipated problems
- Procurement
  - Establish conditions sufficient to write good contracts for Phase II
- Cost
  - Develop pricing for deliverables
  - Understand framework to keep costs down

Objectives for Proof-of-Concept Specific Technical Objectives

- Name-plate production capacity test
- Solid/liquid separation
- Fission production removal efficiency
- TRU removal
- Effects of organics on operations

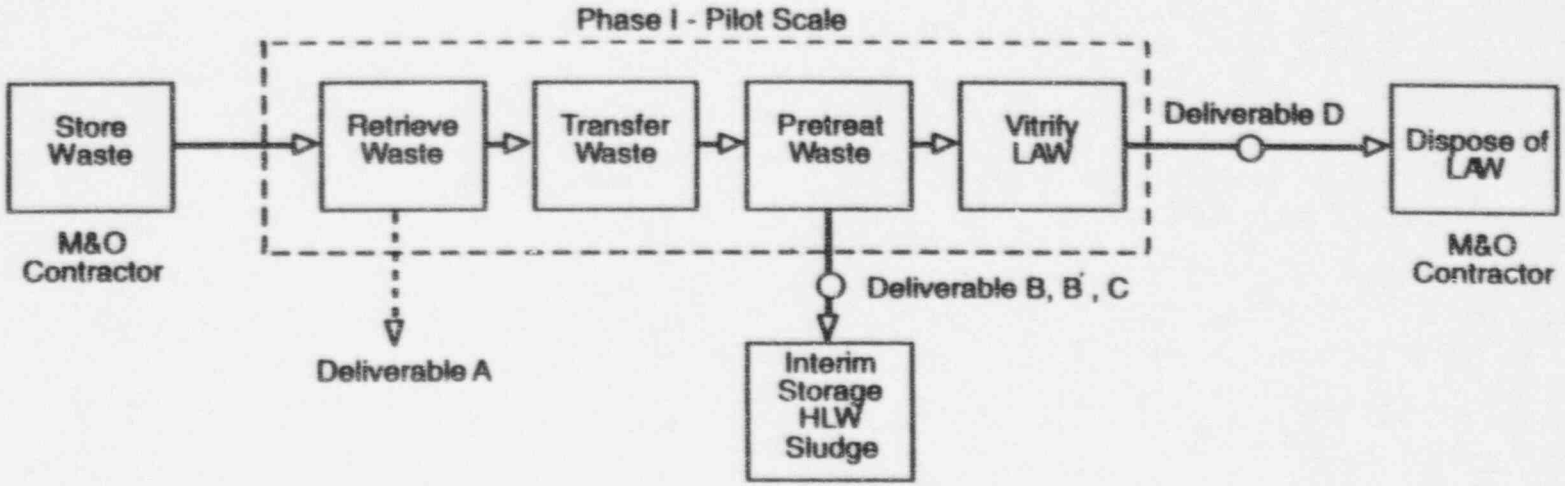
Basic Concept for Initiating TWRS Privatization (Phase I)

- Competitive solicitation for two contractors owned, contractor operated services (including facilities) to process and deliver solidified low-activity waste (high-level waste processing maintained as an option)
- Divide Phase I into two stages
  - Design, radiological safety review, permitting
  - Construction/Operations
- Make pre-determined capital payment to each contractor when design and radiological safety reviews are completed
- Critical factor in evaluating proposals
  - Fixed price cost for design of facilities
  - Fixed price cost for delivery of products (final and interim)
  - Adjustment (downward) of fixed price cost for delivery of products at completion of design

Basic Concept for Initiating TWRS Privatization (continued)

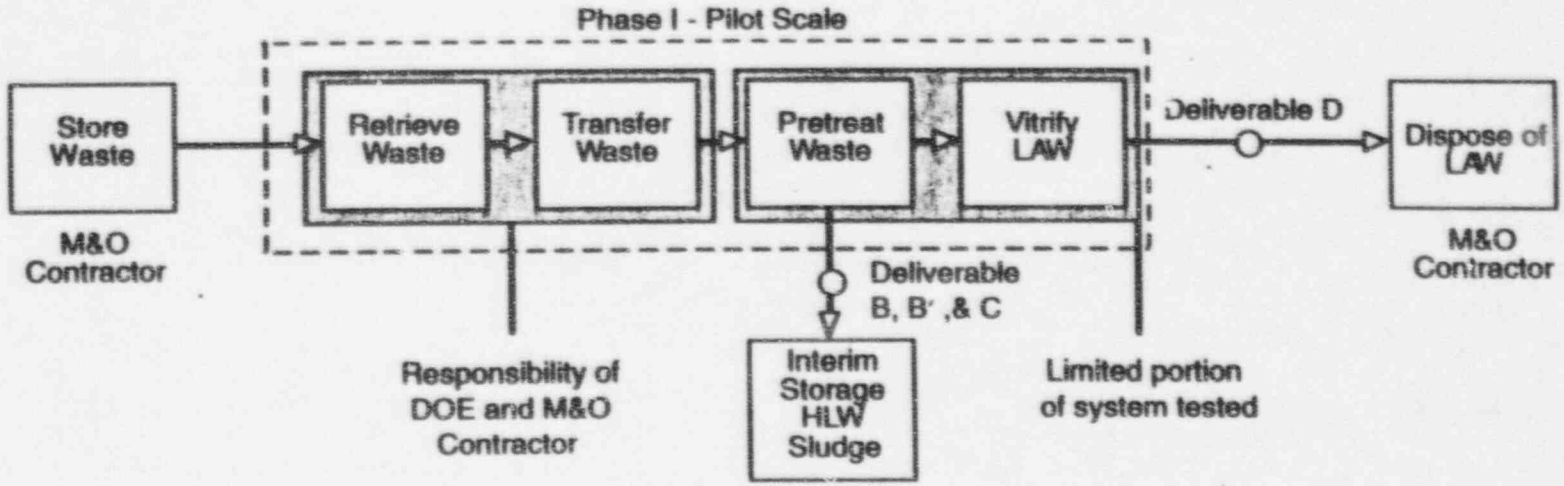
- Hold contractors responsible for technical/cost performance and pay only for treated waste products meeting contract performance/product specifications, once plant begins operation

Proof-of-Concept Phase-General Concept



Deliverable A= Empty tanks that meet TPA defined requirement
Deliverable B = Separated high-level waste sludge for interim storage
Deliverable B' = Separated and pretreated high-level waste sludge ready for vitrification
Deliverable C= Separated fission products suitable for intermediate term storage with the option for high-level waste vitrification
Deliverable D= Vitrified low-activity waste that meets DOE performance/product specifications

Proof-of-Concept Phase-Impact of Limited Funding on Scope of Effort



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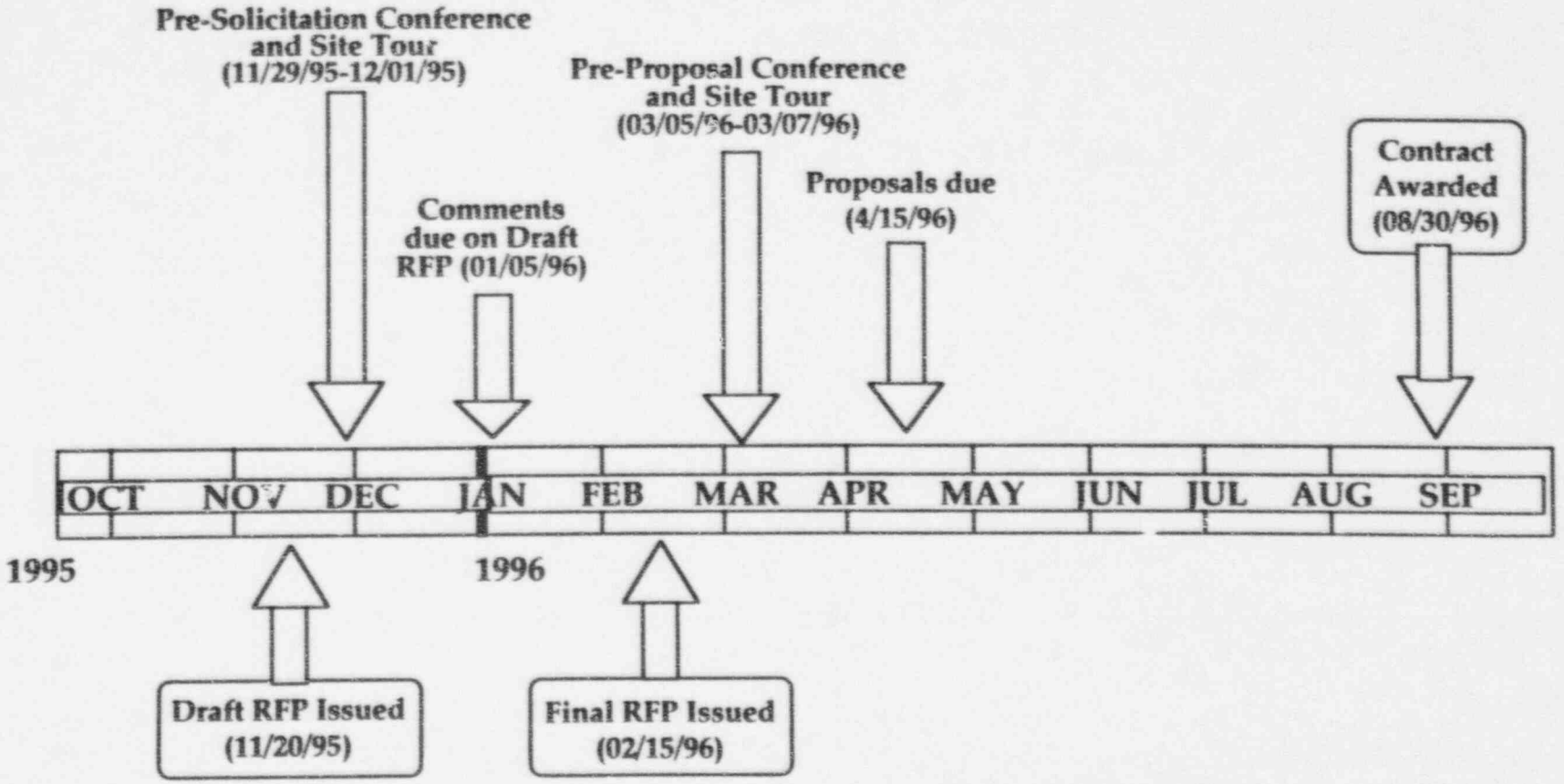
Deliverable D= Vitrified low-activity waste that meets DOE performance/product specifications

Critical Financial Parameter

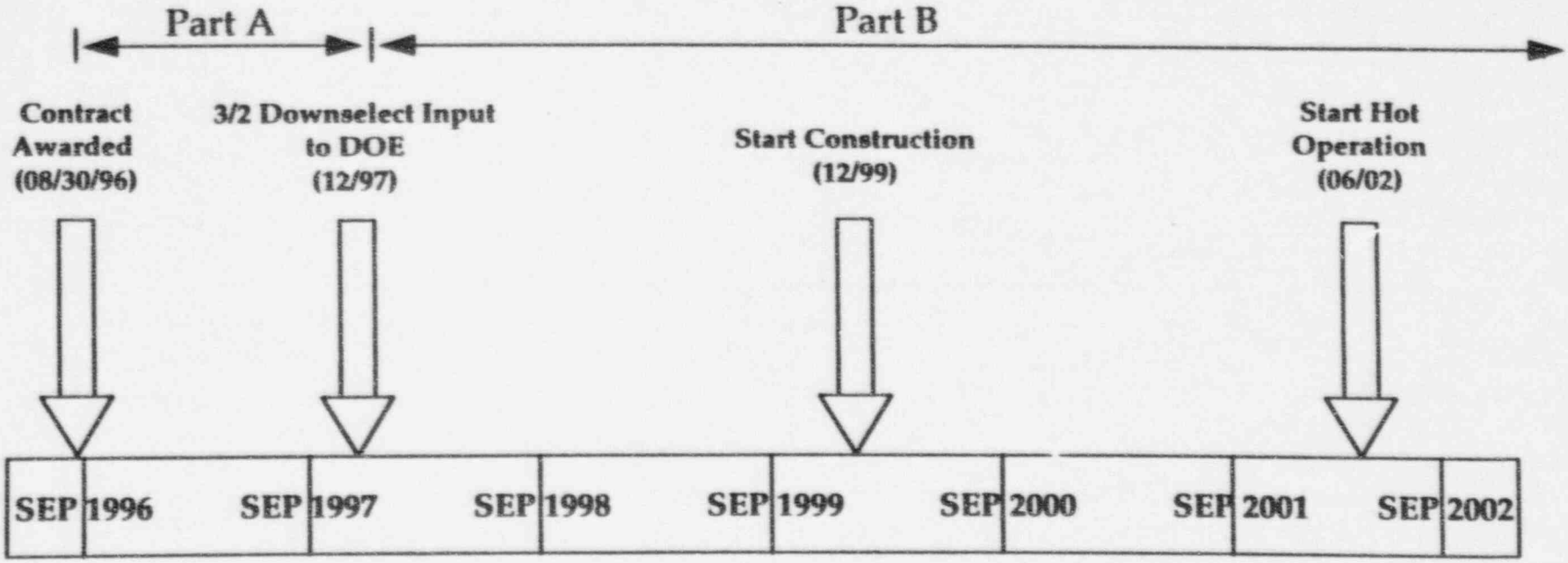
- In Initial Proposal
  - Not to Exceed Price
- At 3 to 2 Downselect
  - Firm Fixed Price

Note: Need to have regulatory uncertainties minimized to get best price

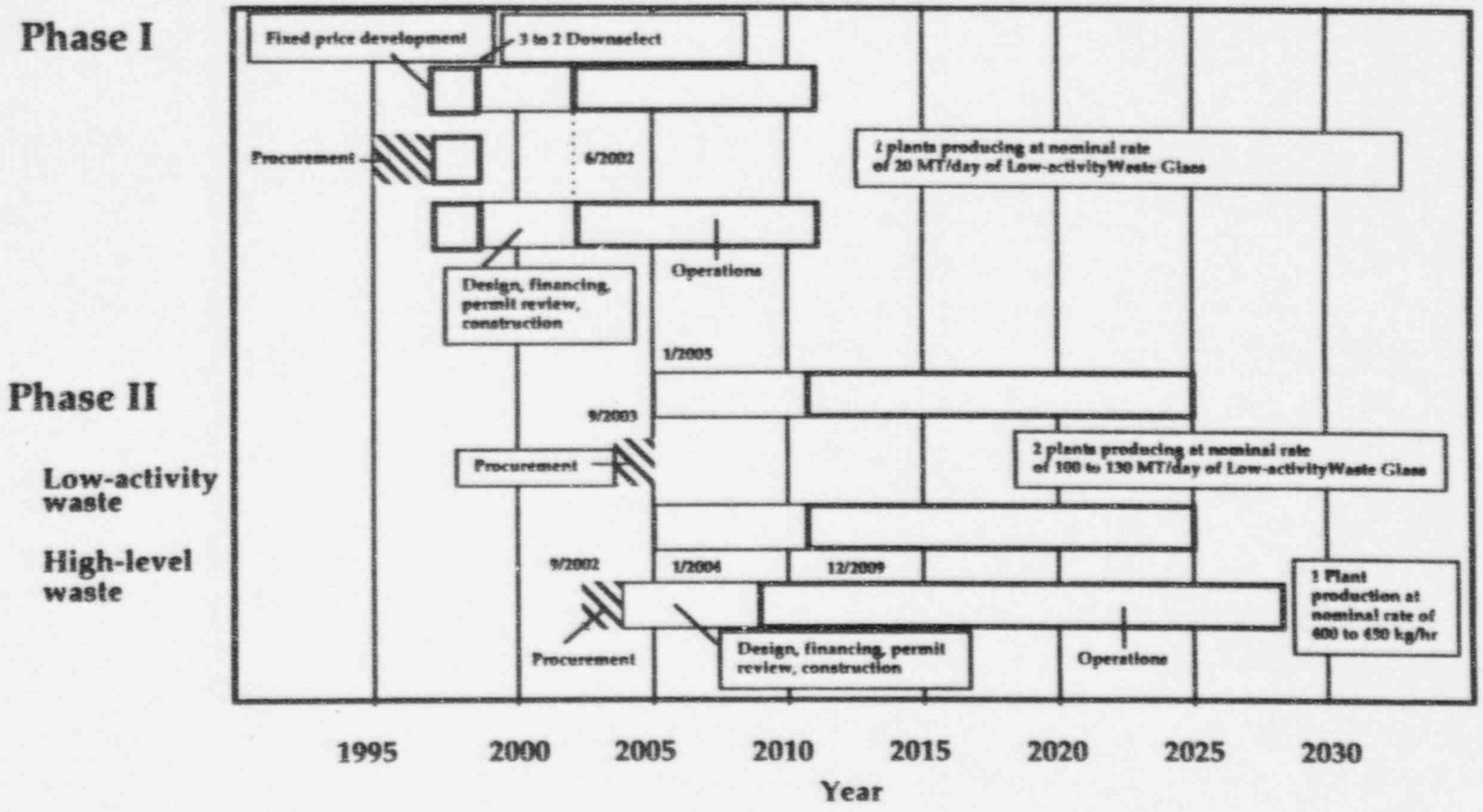
Schedule - Near Term: Privatization Execution for Phase I



Schedule - Long Term: Privatization Execution for Phase I



General schedule for implementing both phases of TWRS Privatization



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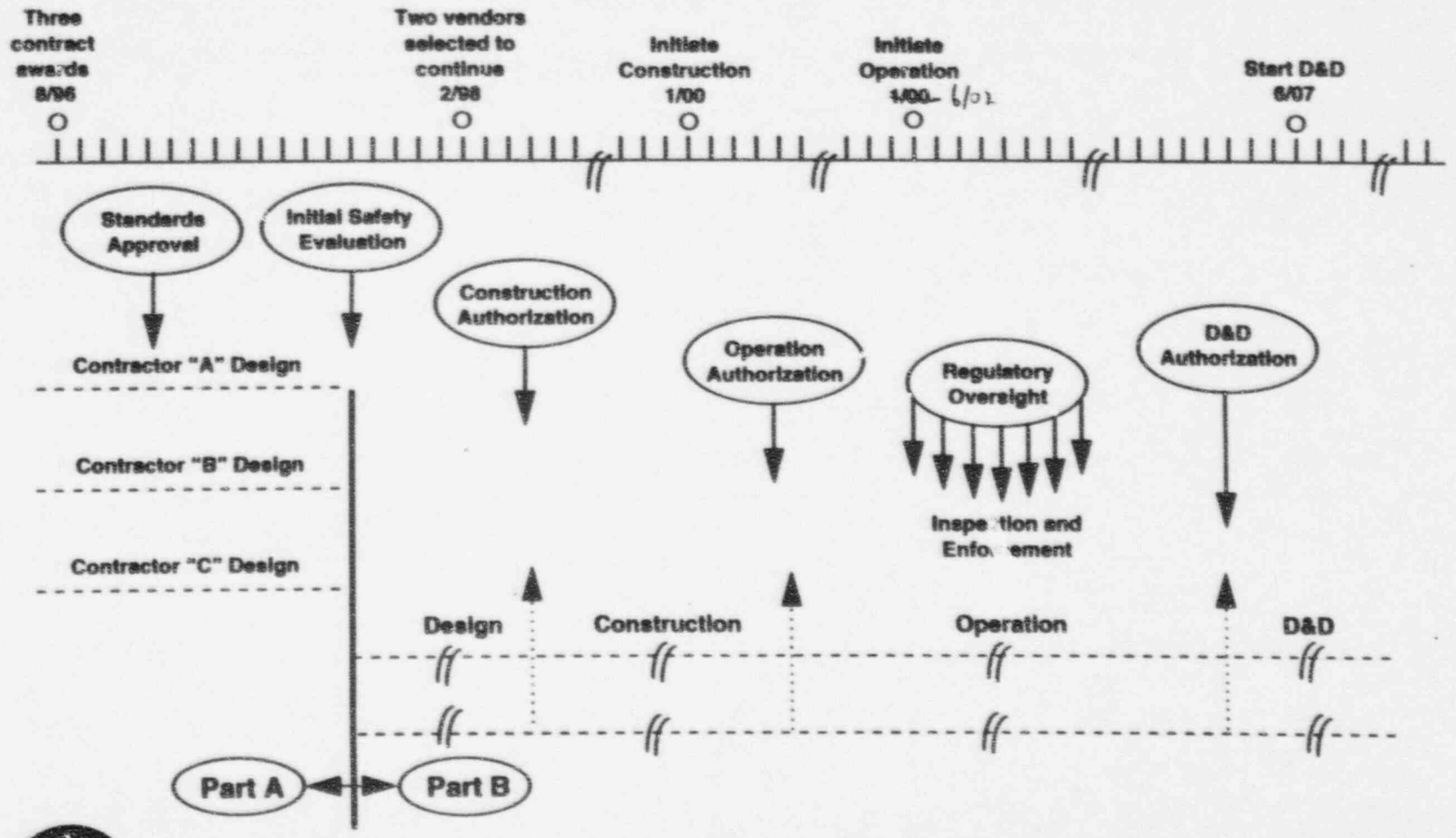
Radiological and Nuclear Safety: General Situation

- High-level radioactive waste being processed; commercial market operation would have to be licensed by NRC
- Technology and processes to be proposed to handle waste not fully revealed to DOE by potential contractor
- Need to remain flexible to accommodate new technology and processes
- DOE not likely to know specifics of technology or processes (which may be proprietary) until proposals are received
- Requirements to effect safety not to be established without reasonable knowledge of the proposed approaches

Radiological and Nuclear Safety

Regulatory Time Line



Radiological and Nuclear Safety

Regulatory Compliance Program Deliverables

Description of Regulatory Compliance Program Deliverable	Reference	Part A Deliverables	Part B Deliverables	
			Start of Construction	Start of Hot Operations
Process & Facility Design Description	DOE/RL-DSRP Standard 2	Draft	Final	Revision
Integrated Standards-Based Safety Management Plan	DOE/RL-STDP DNFSB 95-2	Draft	Final	Final
Hazards Analysis	DOE-STD-3009	Final	Revision 1	Revision 2
Standards and Requirements Identification Document	DOE/RL-STDP	Final	Final	Final
Radiation Exposure Standard for Workers Under Accident conditions	DOE/RL-TLSR	Draft	Draft	Final
Quality Assurance Plan	10 CFR 830.120	Final	Final	Final
Training & Qualification Program Plan	10 CFR 830.330	Draft	Final	Rev. 1
Safety Analysis Report	10 CFR 830.110	Preliminary Draft	Preliminary Draft, Rev. 1	Final
Unreviewed Safety Questions Plan	10 CFR 830.112	Draft	Final	Final
Occurrence Reporting & Processing of Operating Information Plan	10 CFR 830.350	Draft	Final	Final
Contractor Occupational Medical Plan	DOE Order 440.1	---	Draft	Final
On-Site Transportation of Radioactive Materials Plan	DOE Order 460.1	Draft	Draft	Final
Employee Concerns Management System	DOE Order 5480.29	Final	Final	Final
Hazardous & Mixed Waste Handling Plan	DOE Order 5400.3	----	Final	Final

Radiological and Nuclear Safety

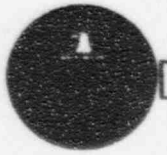
Regulatory Compliance Program Deliverables (continued)

Description of Regulatory Compliance Program	Reference	Part A Deliverables	Part B Deliverables	
			Start of Construction	Start of Hot Operations
RCRA Part B Permit Application	WAC 173-303-806	Final	Final Approved	----
NEPA C-2 Analysis (Supplement)	10 CFR 1021.314(c)	Draft	Final	----
Regular Operational Regulatory Reports	DOE/RL-DSRP	Draft	Final	Final
Conduct of Operations Plan	10 CFR 830.310	----	Final	Final
Technical Safety Requirements Document	10 CFR 830.320	Draft	Construction Draft	Final
Maintenance Management Program Plan	10 CFR 830.340	----	Draft	Final
Operational Readiness Review Plan	DOE/RL-DSRP	----	Draft	Final
Backfit/Plant Modification Plan	DOE/RL-DSRP	Draft	Draft	Final
Emergency Response Plan	See Note 1 below	----	Final	Final
Safegaurds and Security Plan	See Note 2 below	Draft	Draft	Final
Radionuclides and Hazardous Constituents Accountability Plan	See Note 3 below	----	Final	Final
Financial Viability for D&D	DOE/RL-DSRP	Draft	Final	Final
Decontamination & Decommissioning/RCRA Closure/Site Restoration Plan	DOE/RL-DSRP	----	Final	Final

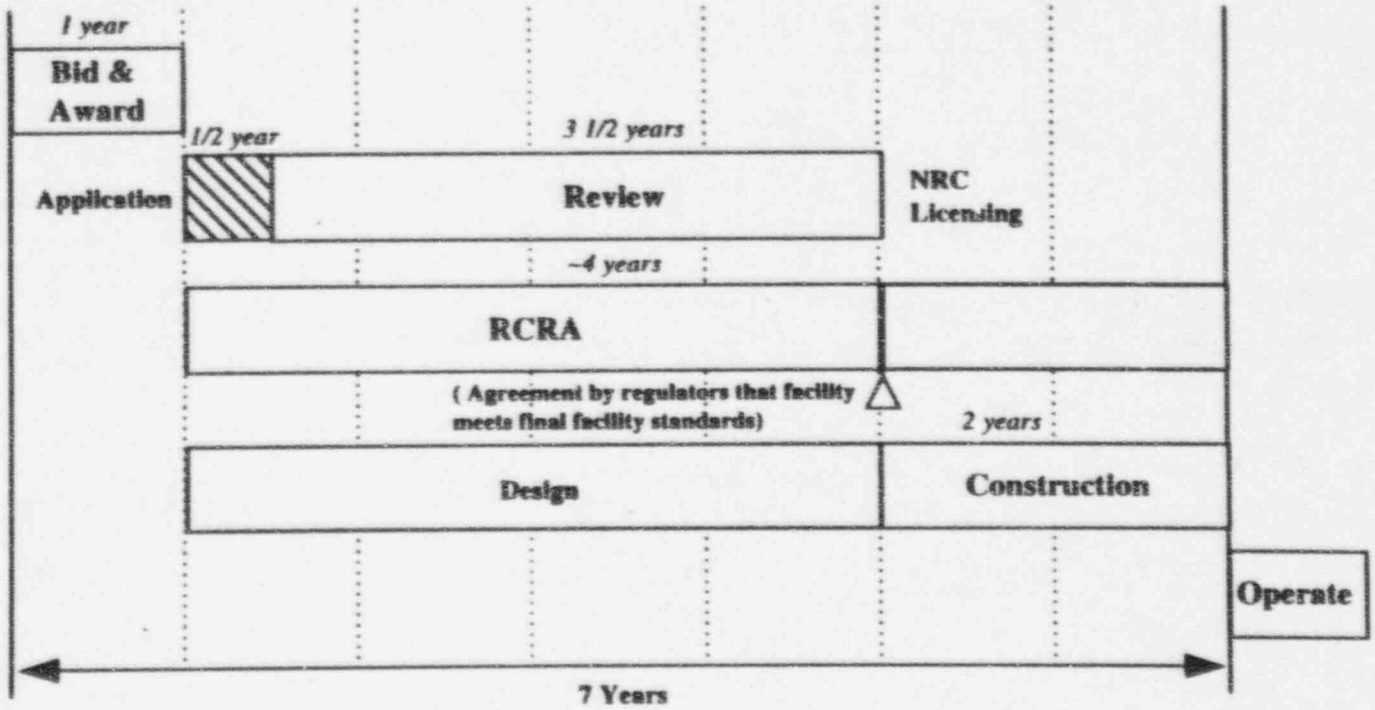
1 Emergency Response Plan shall comply with requirements of 40 CFR 68, 40 CFR 355, and DOE/RL 94-02, Revision 1.
2 Safeguards and Security Plan shall comply with requirements contained in the Top-Level Safeguards and Security Requirements for TWRS Privatization (see Section J).
3 Radionuclides and Hazardous Constituents Accountability Plan establishes the materials accountability basis for DOE to audit by weight and composition all radionuclide and hazardous constituents in the facility. This is the documentation of material balances to assure no release of radiological th hazardous constituents.

DOE-NRC Discussion Regarding Support/Licensing of Privatized Facilities

Date	Topic
April 12, 1994	Discussion on approach to licensing potential ECA high-level waste vitrification plant
September 28, 1994	Informal discussion regarding possible NRC licensing of DOE "privatized' operations
March 6, 1995	Brief NRC staff on the status and present plans in privatization of TWRS facilities
May 11, 1995	Briefing on DOE approach to privatizing portions of the Tank Waste Remediation System



Estimates of Time to License and Permit



Radiological & Nuclear Safety Direction in RFP

Section J	Explain the TWRS Privatization radiological and nuclear safety regulatory approach
Section L	Explains for vendors information to be presented in proposal related to their capability in radiological and nuclear safety
Section M	Outlines for vendors the evaluation factors used to evaluate their radiological and nuclear safety approach and capabilities presented in proposal
Section C	Defines the deliverable under the contract that must be provided, including items important to radiological and nuclear safety (in a fixed-price contract everything has to be specified up front in the scope of work)

Radiological and Nuclear Safety Direction in RFP

Section C Statement of Work - Standards for Deliverables Under the Contract
Standard 4: Regulatory Compliance Program

Section H Special Contract Requirement
H-27 Radiological and Nuclear Safety Regulation (Stop Work)

Section I Contract Clauses

FAR 952.250-7	Nuclear Hazards Indemnification Agreement (January 1992)
DEAR 952.223-72	Radiation Protection and Nuclear Criticality (April 1994)
DEAR 952-223.74	Nuclear Facility Safety Applicability (April 1994)

Section J List of Documents, Exhibits, and Other Attachments

Section L Instructions, Conditions, and Notices to Offerors
L.4 Proposal Preparation Instruction, Volume II, Past Performance, Technical and Regulatory Proposal

Section M Evaluation Factors
M.3 Technical Evaluation Factors

Section J: List of Documents, Exhibits, & Other Attachments

Documents which define proposed radiological and Nuclear Safety Regulatory Approach for TWRS Privatization Contractors

1. Concept of the DOE Regulatory Process for Radiological and Nuclear Safety for TWRS Privatization Contractors
2. Top-level Radiological and Nuclear Safety Standards and Principals for TWRS Privatization Contractors
3. Guide for establishing a Set for Essential Radiological and Nuclear Safety Standards and Requirements for TWRS Privatization
4. DOE Regulatory Process for Radiological and Nuclear Safety for TWRS Privatization Contractors

Section L: Instructions, Conditions, and Notices to Offerors

Safety Basis for Evaluating Contractor's Proposal

- Description of technology and processes
- Preliminary Hazard Analysis of processes and technology
- Strategy for mitigating hazardous conditions
- Basis for Integrated Standards-Based Safety Management Program
- Proposed standards for radiation protection of workers under accident conditions
- Draft Quality Assurance Plan

Hanford Tank Waste Remediation System Privatization

Briefing for
Hugh Thompson

BACK-UP SET

by
Dr. Donald L. Vieth,
Senior Technical Advisor TWRS Program
Richland Operations Office
U.S. Department of Energy

Basic Parameters Important to Privatization

- What constitutes Privatization?
- Service or product to be provided
- Nature of product specifications
- Basis for fee
- Technology requirements
- Basic Risk associated with each element
- Regulatory requirements
- Baseline cost estimate
- Schedule for operations (based upon TPA)
- Connectivity issues
- Decontamination and Decommissioning issues

Case Strategies

Specific strategies were developed by defining a set of features that were thought to influence the feasibility. Those features included:

- Number of phases
- Number of contractors
- Physical location of processing facilities
- Process set (waste type)
- Modularity of processing facilities
- Mobility of processing facilities
- Timing of processing within a phase (in series versus parallel)
- Contract length
- Processing timing (front-end loaded, level loaded, end loaded)
- Maturity of technology
- Regulatory oversight performed by DOE or external agency

"The Challenge"

- **Many "firsts" in this effort executed by inexperienced staff:**
  - Establish authoritative description of waste
  - Define acceptable waste performance specifications
  - Define test method to confirm performance specifications
  - Establish nuclear/radiological safety authorization and enforcement for private contractor
  - Procure service under fixed price contract
  - Make approach satisfactory to private sector project financing
  - Structure effort to minimize uncertainty and opportunities for change orders
  - Meet expectations for stakeholders and commitments in Tri-Party Agreement

Responsibility, Accountability and Liability

- Under the traditional approach used by the federal government and the Department of Energy—**the government is responsible for the review of the design and construction of a facility**. The government, in doing so, **accepts the responsibility, accountability and liability** for the process and facilities, and their future operation.

- **The government staff** responsible for approval of facility and process design, and acceptance of facilities after construction **may not be knowledgeable about the cost effective ways to do these jobs**, that is, not in the commercial sense of a private company that has to consider a bottom line

Responsibility, Accountability and Liability (continued)

- The government staff responsible for the purchase of a final product, within a price competition, against a **well developed product specification, has a decided edge in creating a cost effective situation.**

Benefits of Contracting Change

- Under **cost plus award fee contract**, which covers the fulfillment of the current TPA Baseline Program for the Tank Waste Remediation System, **all of the liability rests with the Department of Energy**, the federal government and the taxpayer.

- Under the concept of privatization with a fixed price contract, far **more of the responsibility, accountability and liability** for delivering the final product will be **shifted to the contractor.**

Benefits of Contracting Change

- Private contractor, with more experienced individuals with private sector approach who are **sensitive to cost control** and **effective use of money,** will be responsible for the design, construction operation and delivery of a product that meets government specifications. This contractor will be responsible for technical and cost performance.

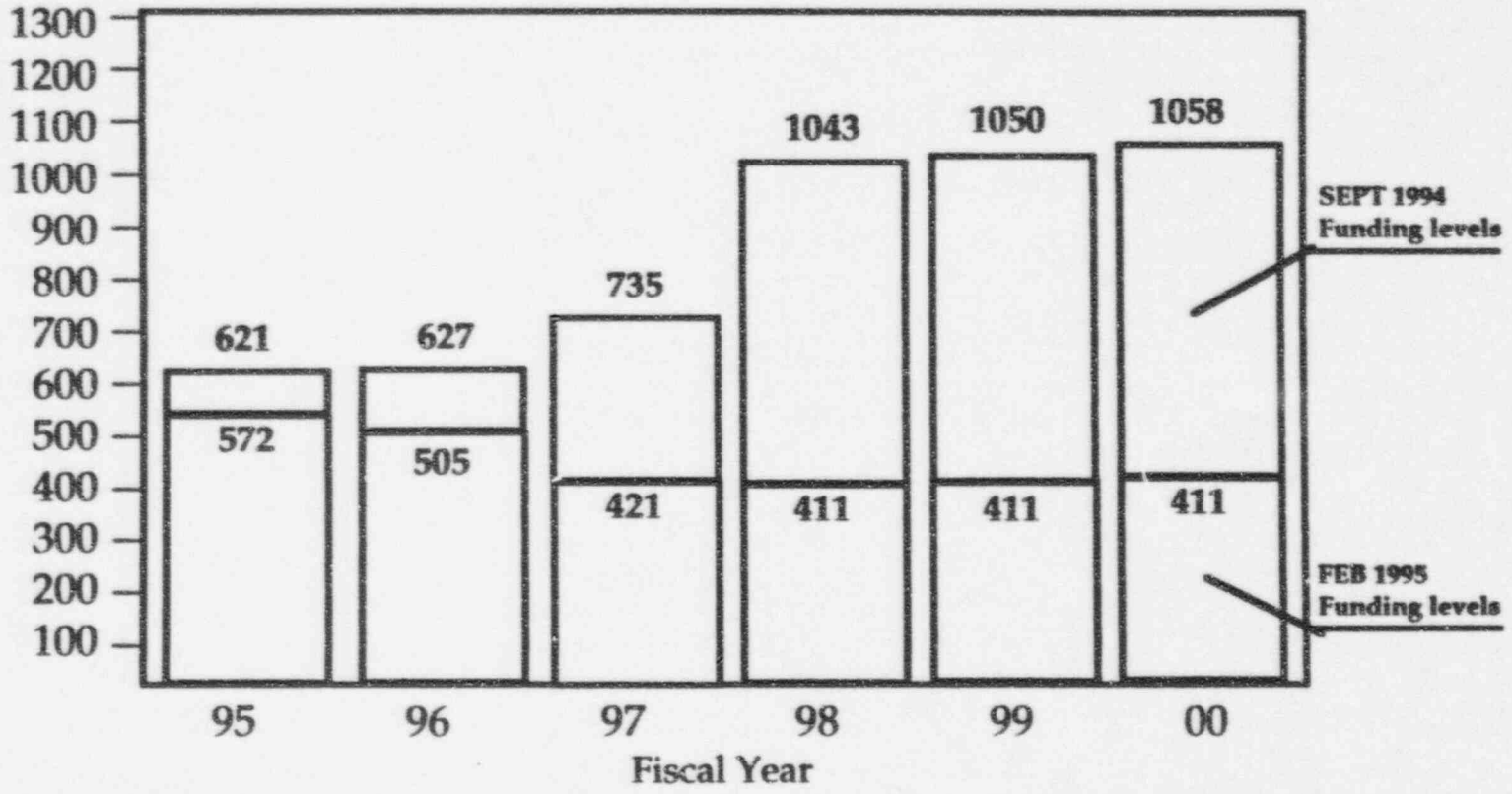
- A primary benefit will be a privatized vendor that has an efficient and controlled organization that will be on top of cost, schedule and deliverables on a daily basis.

TWRS Privatization -Procurement Concept

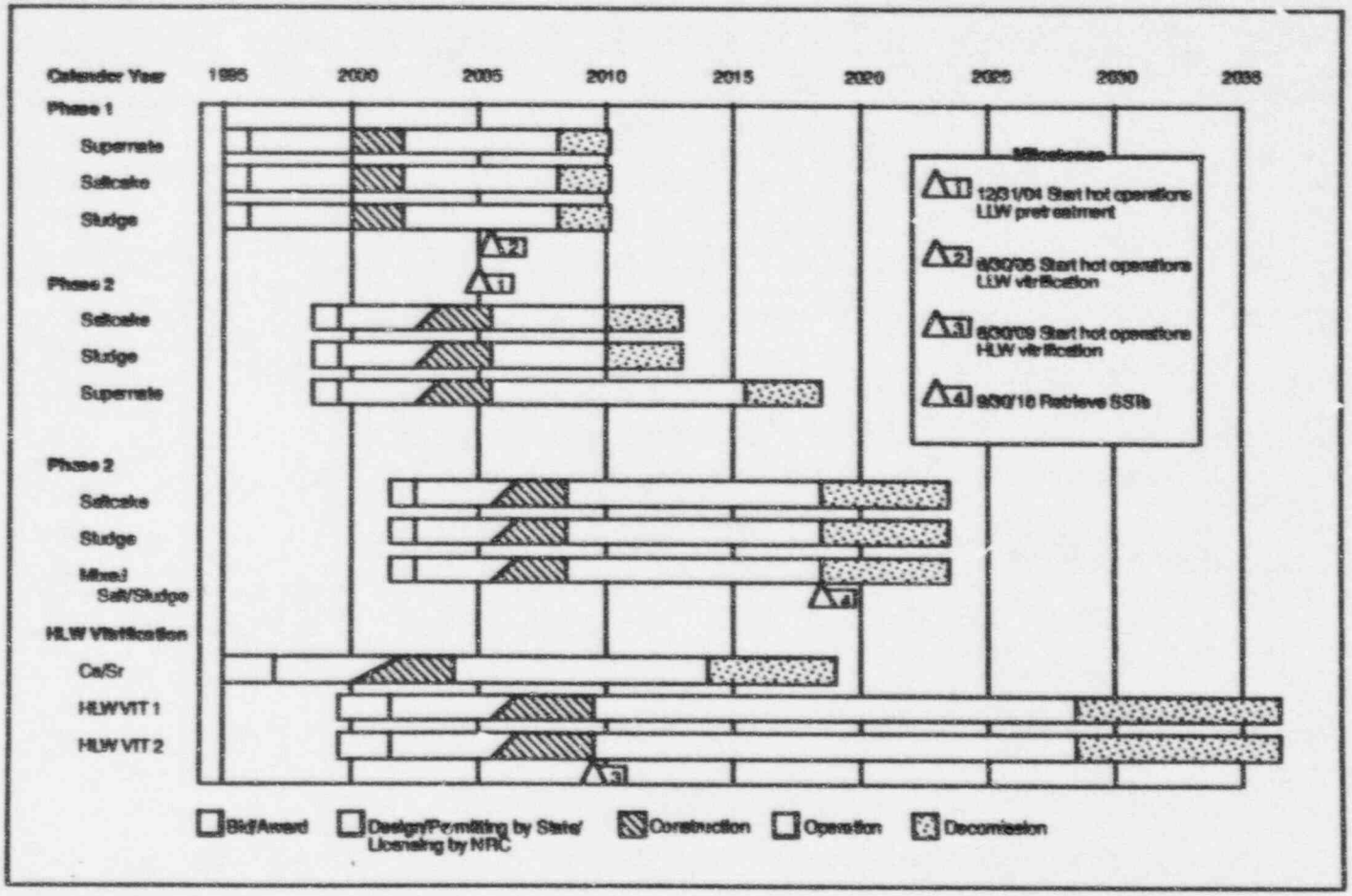
Mechanisms to Accomplish Objectives

- Purchase a service to process DOE-owned waste
- Use contractor-owned, contractor-operated facilities
- Pay only for deliverables that meet the DOE performance specification
- Contract for a service on a fixed-price basis
- Use established regulatory processes where possible
- Eliminate uncertainties important to business operations and costs

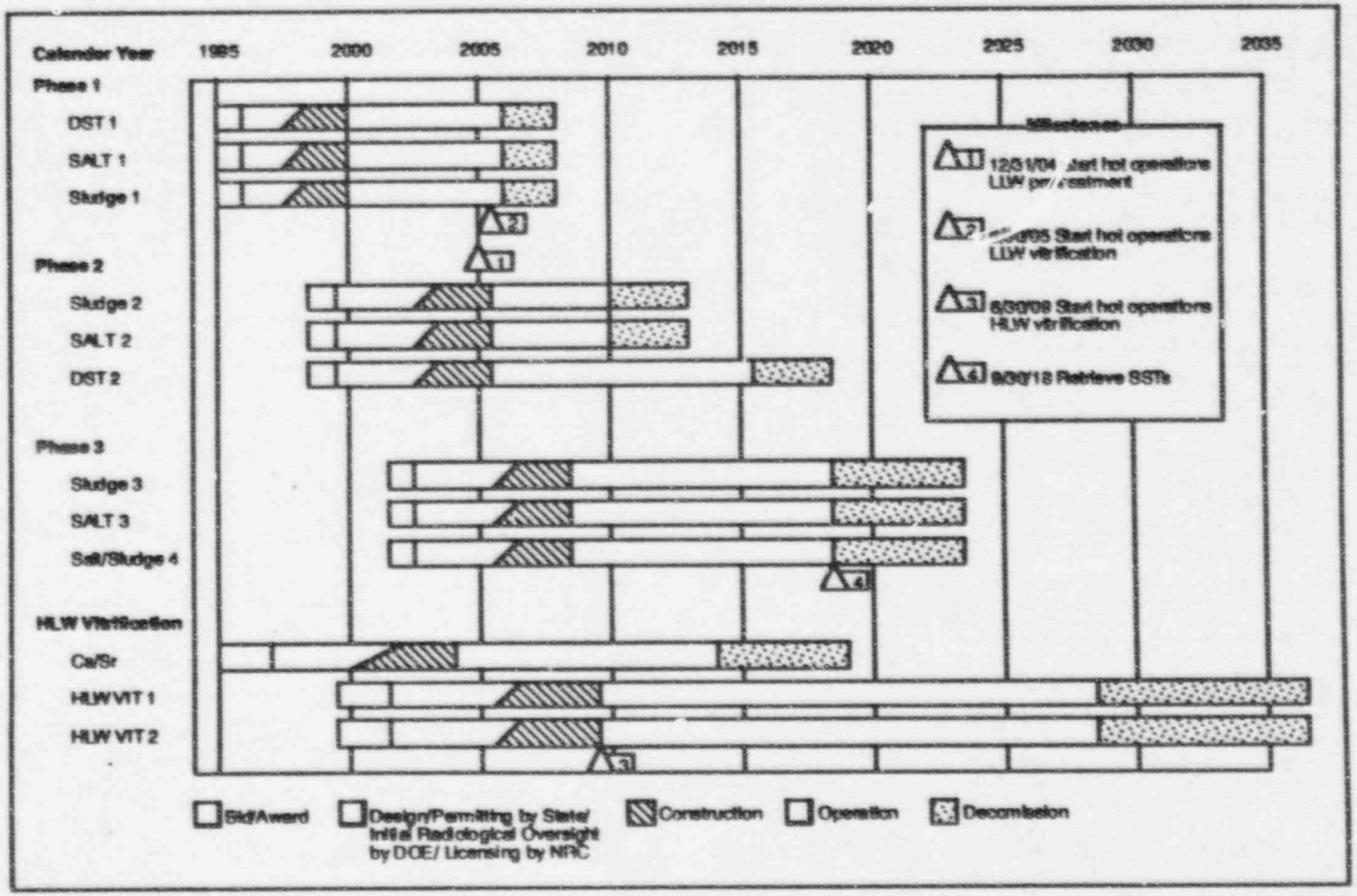
Changes to TWRS Budget Situation



Case 11: TWRS Privatization Program Schedules -3 Phase Competitive and Progressive Processing/Learning Approach; Segmentation by Waste Type and Quantity



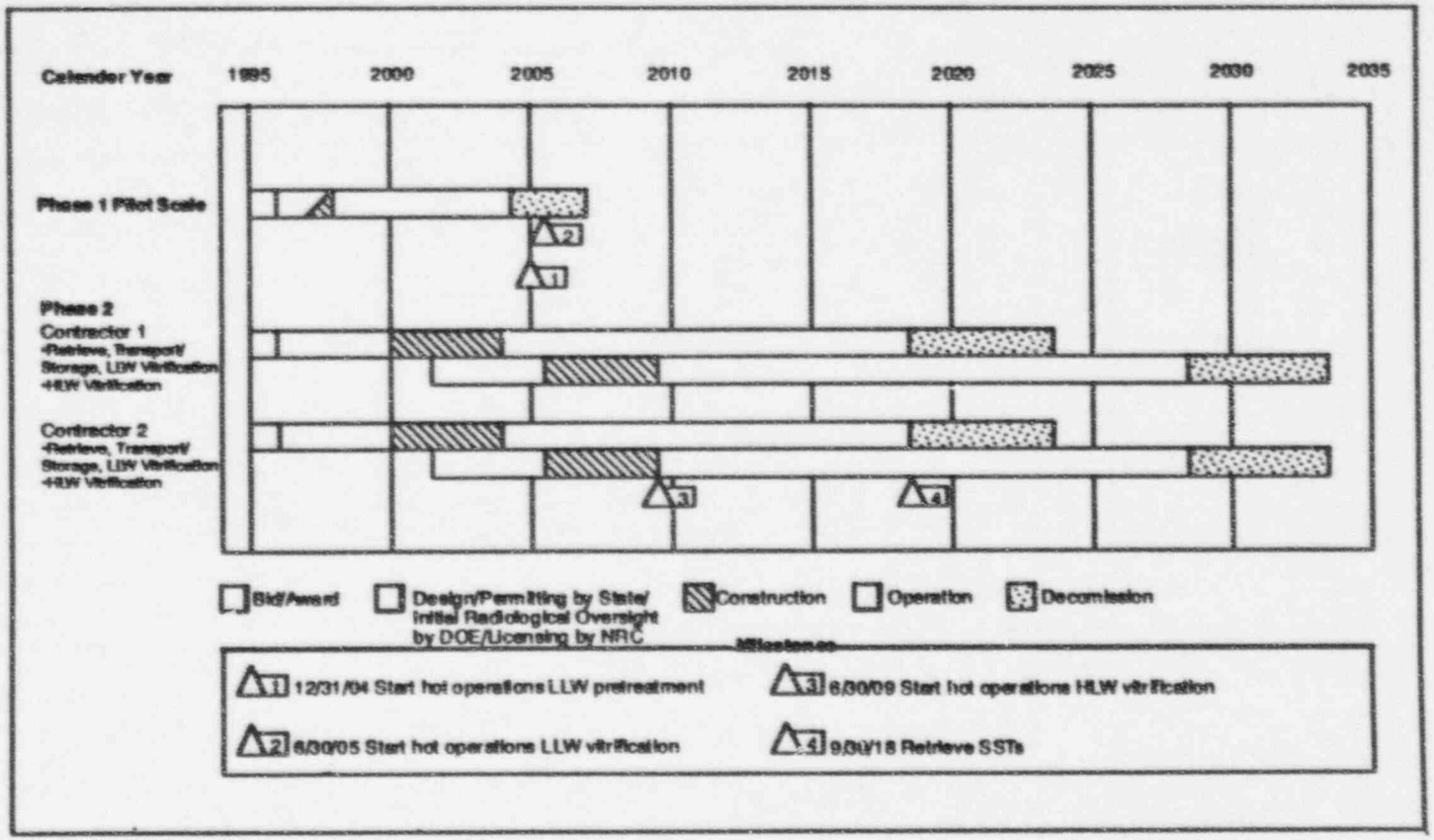
Case 12: TWRS Privatization Program Schedules -3 Phase Competitive and Progressive Processing/Learning Approach (Modified for DOE Self-Regulation); Segmentation by Waste Type and Quanity



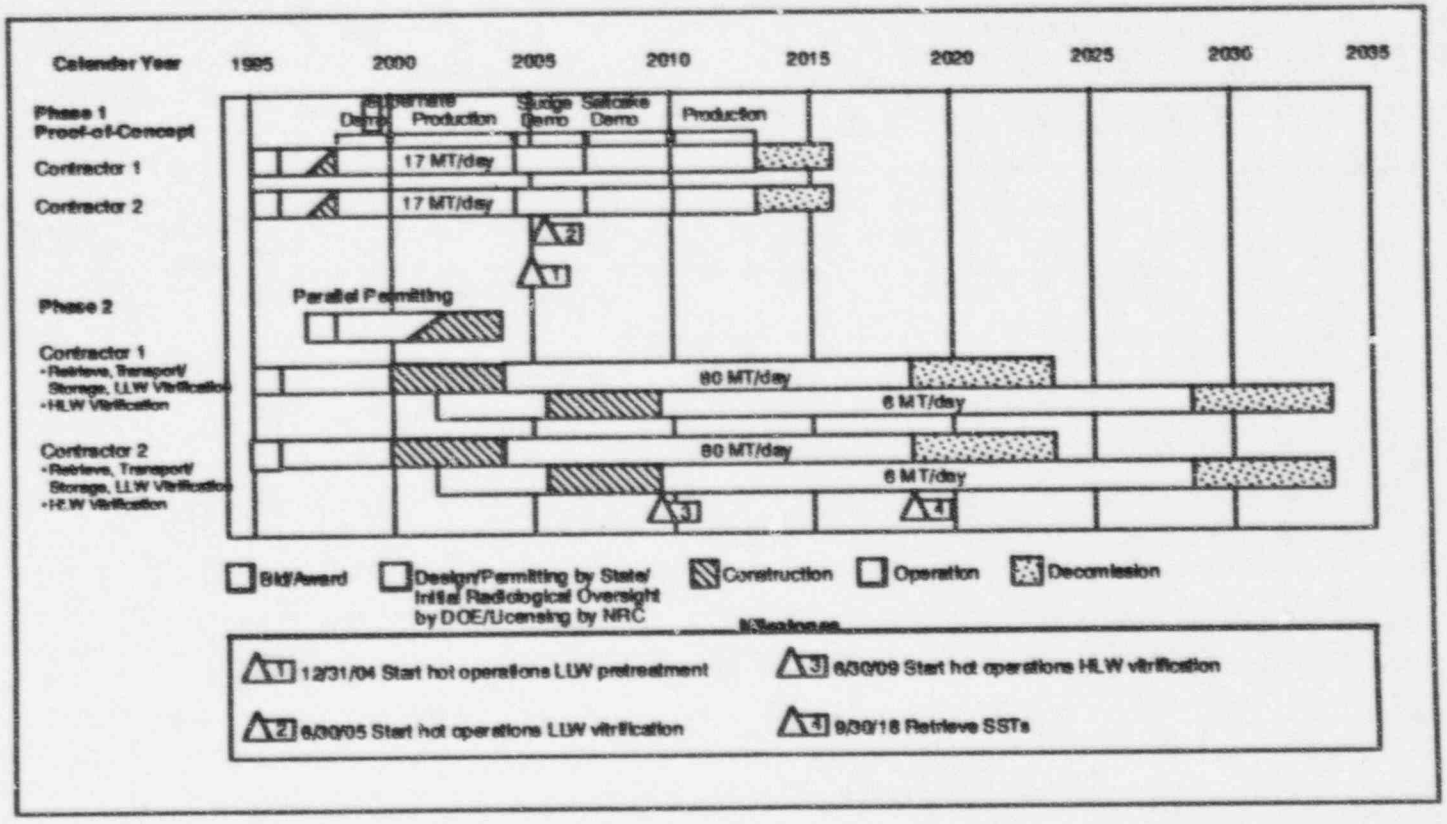
TWRS Privatization

6994SS11/27-72

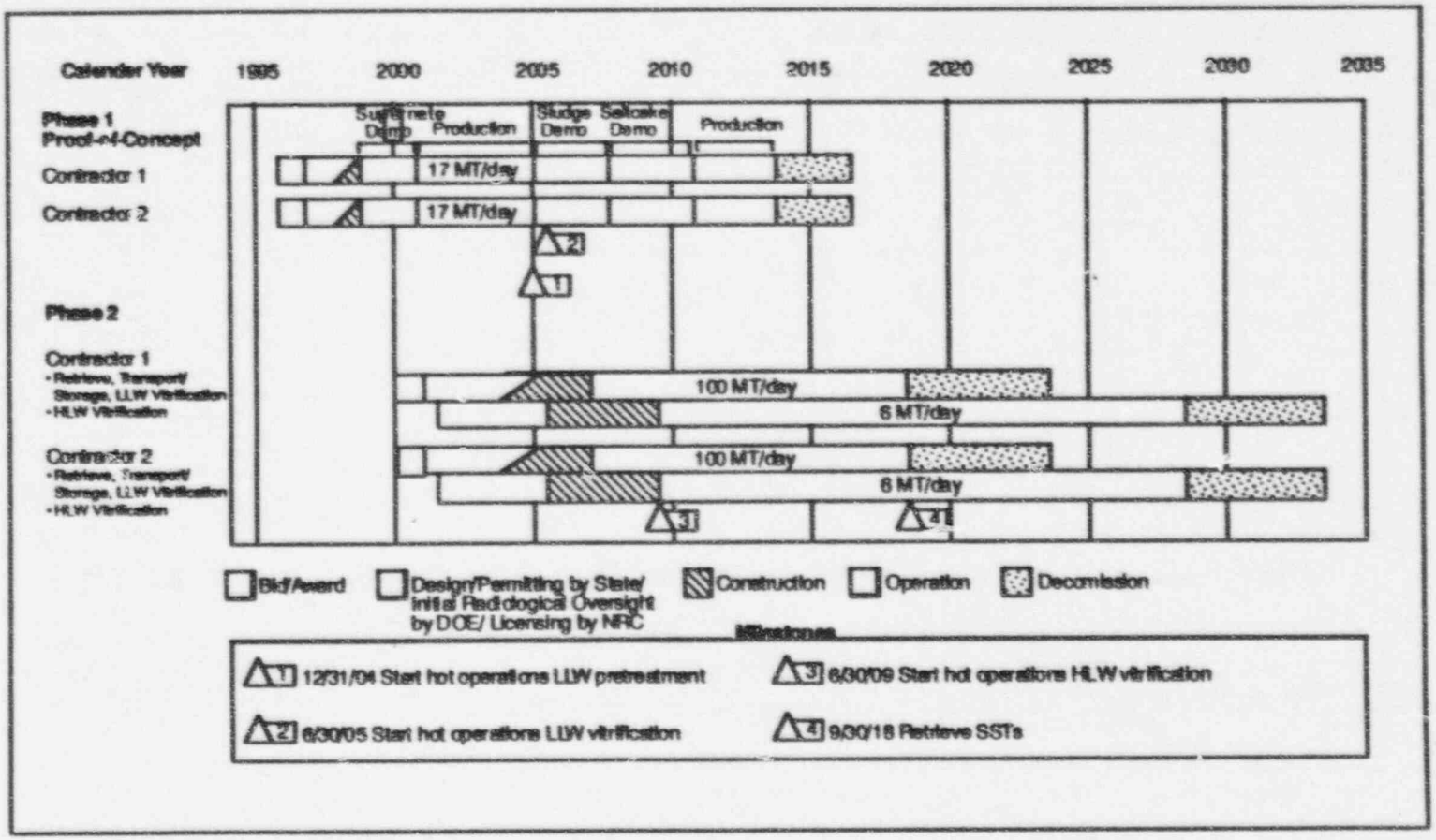
Case 13: TWRS Privatization Program Schedules -2
Phase Competitive and Progressive Processing Approach



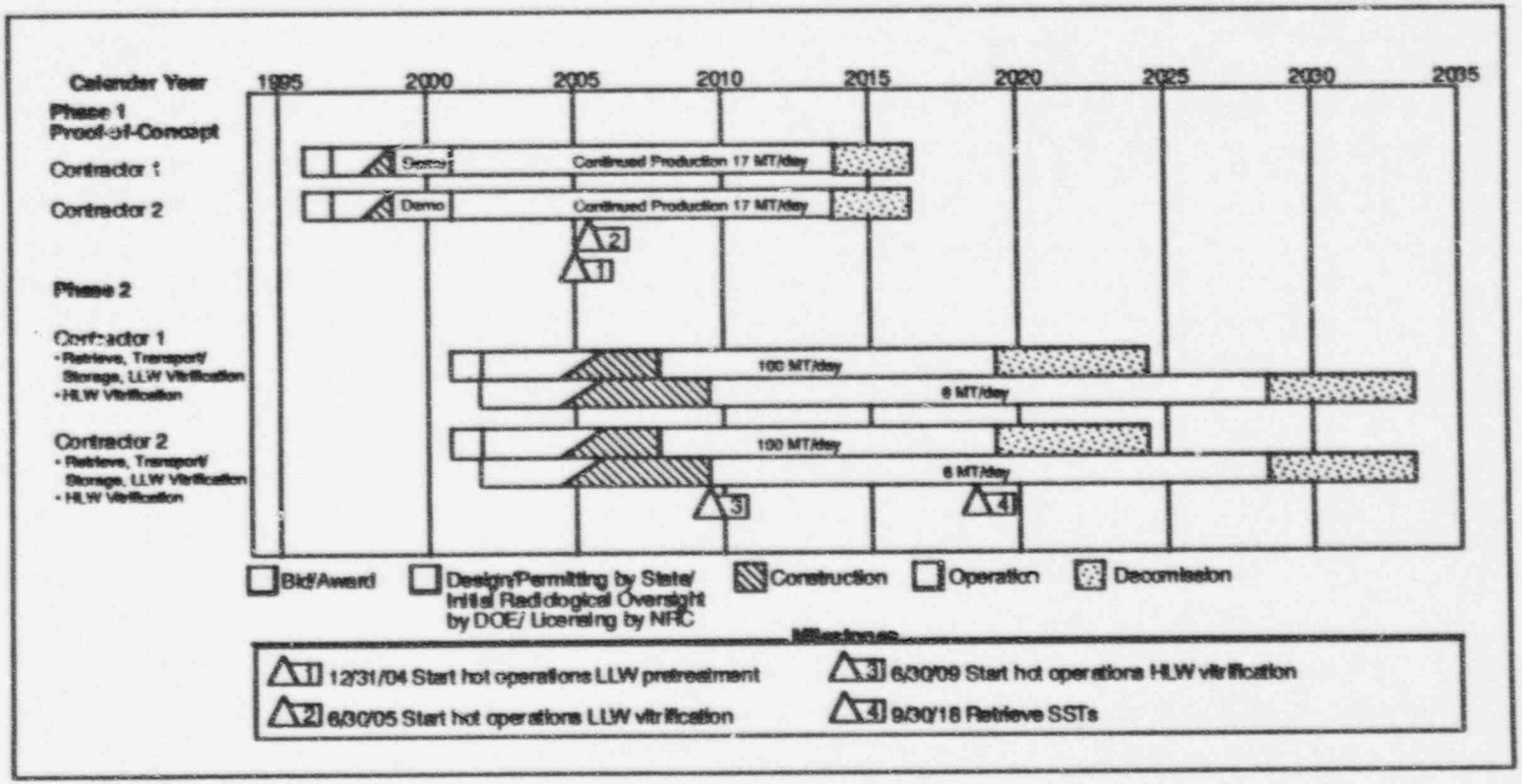
Case 13a: TWRS Privatization Program Schedules -2 Phase Competitive and Progressive Processing Approach



Case 13b: TWRS Privatization Program Schedules -2 Phase Competitive and Progressive Processing Approach



Case 13c: TWRS Privatization Program Schedules -2 Phase Competitive and Progressive Processing with Enhanced Learning and delayed Phase 2 Start Approach



POLICY ISSUE

(Information)

February 6, 1996 SECY-96-027

FOR: The Commissioners

FROM: James M. Taylor
Executive Director for Operations

SUBJECT: EVALUATION OF ISSUES NECESSARY TO DETERMINE THE FEASIBILITY OF LICENSING, AND LEVEL OF INVOLVEMENT IN, THE DEPARTMENT OF ENERGY PROPOSED HIGH-LEVEL RADIOACTIVE WASTE SOLIDIFICATION SYSTEMS

PURPOSE:

To inform the Commission of the staff's evaluation of issues, raised in SECY-95-305, "Request to Evaluate Issues Necessary to Determine the Feasibility of Licensing and Level of Involvement in Planned Future Department of Energy High-Level Radioactive Waste Solidification Systems," that affect the staff's licensing of privatized waste treatment systems constructed for the solidification of high-level waste (HLW) from Hanford tanks, and to seek the Commission's approval of the staff's recommended level of involvement in the regulation of the Department of Energy's (DOE's) proposed High-Level Radioactive Waste Solidification Systems.

DISCUSSION:

On December 4, 1995, the Department of Energy (DOE) briefed the staff on plans to privatize two future Hanford tank waste remediation systems (TWRS), possibly using different technologies. These TWRS will be designed, constructed on the Hanford reservation, owned, and operated by government contractors in two phases: Phase I, pilot-scale facilities; and Phase II, full commercial operations. DOE has proposed that the Nuclear Regulatory Commission license Phase II and has requested NRC to determine the appropriate level of NRC involvement in Phase I before DOE's issuance of a request for proposal on February 15, 1996.

CONTACT: Gary Comfort, NMSS
(301) 415-8106

NOTE: TO BE MADE PUBLICLY AVAILABLE IN 5 WORKING DAYS FROM THE DATE OF THIS PAPER.

In SECY-95-305, the staff notified the Commission of its intention to evaluate NRC options for involvement in Phase I and to characterize four issues that could affect NRC's role in Phase I and Phase II operations. These issues include: (1) the sufficiency of current NRC regulations for licensing such operations; (2) the availability of information and experience necessary for the staff to develop appropriate regulatory guidance in the time frames available; (3) the resource requirements and availability for participating in these activities; and (4) NRC's legislative basis for licensing privatized DOE contractors;

Based on the staff's past involvement in licensing new projects and technologies, the staff believes that full and early interaction with DOE is desirable for the development of staff experience in the utilized technologies. This NRC interaction would include coordination with DOE during the design review, construction, and operation of Phase I through the assignment of onsite NRC observers and dedicated resources at NRC Headquarters. A description of the work expected under this strategy, alternatives to this strategy, and associated resource commitments may be found in the attachment.

The staff has characterized four main issues that could affect NRC's role in following the proposed strategy.

Issue one involves a review of the current regulations to determine their sufficiency for regulating these new processes, which were not specifically envisioned during regulatory development. The existing 10 CFR Part 70 is clearly intended for regulation of receipt, possession, use, and transfer of special nuclear material in any form. Further, it is general enough in structure and content that a variety of chemical processing activities could be licensed within the rule's provisions. A similar argument can be made for 10 CFR Parts 30 and 40, which regulate the receipt, possession, use, and transfer of byproduct and source material, respectively. 10 CFR Part 20 provides standards for protection against radiation and again there is no reason to expect that the regulation would be inadequate or require revision for application to these technologies. It should also be noted that the staff is currently working on a proposed revision to 10 CFR Part 70 that would provide an enhanced regulatory tool because it focuses on establishing requirements that are based on an integrated analysis of the risk from potential hazards with protective measures graded in stringency in accordance with risk levels. The proposed revision will also have improved rule structure and language and will address specific safety areas not addressed by the existing rule such as fire protection, chemical safety, and management controls such as maintenance, quality assurance, configuration management, and audits and assessments. This new rulemaking could also address radioactive waste remediation activities.

Issue two is the availability of staff experience and other information that would be required in developing licensing guidance for these proposed DOE facilities. The staff is experienced in the various disciplines that would be

necessary to oversee and regulate most aspects of any selected solidification technologies. However, the staff's direct experience with any such expected technologies is limited to its oversight, since 1980, of the vitrification process at the West Valley Demonstration Project (WVDP). Hot operations at WVDP are not expected to begin until sometime in late 1996. The staff will also draw on the experience of foreign governments, such as the French and Japanese, that already have commercial vitrification facilities operating. If DOE opts to use solidification technologies other than vitrification, NRC's experience base and access to information on such technologies may be more limited. At the time of operation, since the staff will have worked closely with the designers of these processes, the staff believes that with the use of a limited number of outside technical specialists, and some augmentation of staff resources, it would have the requisite expertise and experience to regulate the operation of these facilities. If the technology option chosen by DOE is radically different from technologies expected by the staff, the staff may need to revisit this issue and will inform the Commission accordingly.

Issues three and four are related to resources and the authority to expend NRC resources on this effort. The staff has explored the level of and the availability of resources needed to develop regulatory guidance, oversee Phase I activities, and license Phase II. An assessment of resource usage for Phase I and Phase II activities is presented in the attachment. As noted in Chairman Jackson's January 18, 1996, letter to Mr. T. J. Glauthier, the resources to review these efforts are not in our current planning base. The fourth and clearly a fundamental issue that must be addressed in deciding the NRC role in either Phase I or II is the authority by which NRC may license or provide regulatory oversight of DOE contractor-owned facilities. The General Counsel provided initial views to the Commission on this issue in SECY-95-304. OGC is forwarding a separate paper to the Commission clarifying to what extent NRC has a statutory basis and authority to expend appropriated funds to license the solidification of the Hanford tank wastes.

RECOMMENDATION:

For the benefit of DOE's program, the staff proposes to interact with DOE during Phase I to gain useful experience in the utilized technologies. If the forthcoming OGC analysis indicates that the NRC has the requisite statutory authority to license or if Congress specifically legislates such authority, and assuming that sufficient resources are appropriated, the staff proposes to interact closely with DOE during the design, review, construction, and operation of Phase II. This close interaction will be through the assignment of onsite NRC observers and dedicated resources at NRC Headquarters. During Phase I, NRC personnel will provide general consultation with DOE and DOE contractors on technical and regulatory issues affecting the proposed facilities as described in the proposed strategy in the attachment. During Phase II, the staff will license the DOE contractor's commercial facilities using applicable NRC regulations. Since it is not likely that the level of involvement in Phase I can be decided before DOE's issuance of a request for

proposal on February 15, 1996, the staff proposes to monitor DOE's initial procurement activities pending the Commission's decision. This level of effort will be 1 FTE or less unless otherwise directed by the Commission.

James M. Taylor
Executive Director
for Operations

Attachment: Options for Involvement
in Phase I and
Licensing of Phase II

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ATTACHMENT

OPTIONS FOR INVOLVEMENT IN PHASE I AND LICENSING OF PHASE II

On December 4, 1995, the Department of Energy (DOE) briefed the staff on plans to privatize two future Hanford tank waste remediation systems (TWRS), possibly using different technologies. The purpose of the TWRS is to immobilize highly radioactive tank waste from the Hanford site in a safe, environmentally sound, and cost-effective manner. These TWRS will be designed, constructed on the Hanford reservation, owned, and run by government contractors in two phases: Phase I, pilot-scale facilities and Phase II, full commercial operations. DOE has proposed that the Nuclear Regulatory Commission license Phase II and has requested NRC to determine the appropriate level of NRC involvement in Phase I before its issuance of a request for proposal on February 15, 1996.

The objective of Phase I will be to demonstrate the "proof-of-concept" and commercial viability of the contractor proposals. During Phase I, two pilot-scale plants will be designed and constructed by separate competing contractors to demonstrate separation of "low-activity" waste (LAW) from high-level waste (HLW) sludge and to immobilize the LAW. DOE's current schedule requires: (1) selection of two contractors in December 1997, (2) construction of facilities beginning in December 1999, and (3) hot operations starting in June 2002 and ending in 2012. DOE proposes to undertake Phase I with a level of involvement from NRC that NRC determines is appropriate.

Phase II will involve the construction and operation of two full-scale commercial HLW immobilization facilities by separate competing contractors. These facilities will be owned and operated by the contractors. DOE proposes that NRC license the Phase II facilities. Procurement for these new facilities is not expected to begin until 2002, with hot operations starting in December 2009.

Based on DOE's request, the staff has evaluated various strategies in which to involve itself in the Phase I activities and determined a proposed strategy. A description of the proposed strategy and its alternatives, as well as resource commitments, is shown below. Figure 1 is a summary of the resource commitments.

Proposed Strategy

The staff does not propose to license Phase I; however, much of staff's involvement would be similar to preparing an actual license. NRC and DOE would enter into a procedural agreement to establish arrangements for review and consultation by NRC with respect to Phase I activities. This agreement would provide minimally for the following: (1) a description of the responsibilities of both parties; (2) submission of documents, or other information, for review that would be expected to be provided in a normal licensing process; (3) arrangements for meetings under NRC's policy for "open meetings"; (4) access and space at the site as necessary to monitor project activities for onsite NRC observers; and (5) guidelines for issue resolution. This agreement would likely be in the form of a Memorandum of Understanding

(MOU) similar to those MOUs previously arranged with DOE for oversight of the West Valley Demonstration Project and the High-Level Waste Repository Program (HWRP).

During DOE's procurement process, the staff would begin development of an overall review strategy, similar to that presented in NUREG-1495, "Overall Review Strategy for the NRC HWRP," which would be available as guidance for DOE's contractors in December 1997. This document would be developed in relation to the staff's expectations of future licensing and may require multiple revisions throughout Phase I as the staff becomes more experienced with the technologies selected for solidification. Throughout Phase I, the staff would be expected to perform reviews (similar to safety evaluation reports) in response to DOE submittals. These documents would be expected to be referenced during licensing activities for Phase II.

Before completion of DOE's procurement process for Phase II (not expected to begin before 2002), the staff would expect to have gained enough experience in the pilot projects to expedite review of Phase II. This experience would be used to develop regulatory guides during Phase II that would be provided to DOE contractors and to implement any necessary changes to current NRC regulations.

Under the proposed strategy, the staff will expend only minimal resources, expected not to exceed 1 full-time equivalent (FTE), unless specific resources are appropriated for further action during FY 1996. These resources will be used to monitor the DOE procurement process. During FY 1997, the staff will require approximately 13 FTE and 2,000,000 dollars contract support for the development of generic information, including a review plan. After selection of DOE contractors in December 1997, the staff is expected to commit, on average, approximately 15 FTE and 2 million dollars contract support per year in total funds. After the onset of Phase I hot operation in the year 2002, the resource requirements dedicated for Phase I would be reduced to approximately 6 FTE per year to continue onsite monitoring of the facilities and to facilitate review of any changes resulting from operating experience.

In the year 2002, resources dedicated for Phase II review are expected to increase to levels similar to those used in Phase I. Despite the larger scope of the project, experience gained from Phase I interaction should help reduce overall resource needs. The largest commitment of these resources would be for the development of National Environmental Policy Acts (NEPA) documents and hearing preparation (if necessary). However, DOE has suggested that they may not limit Phase II technologies to those used in Phase I. This may require a larger outlay of resources for Phase II review beginning sometime after 2002.

Alternatives to the Proposed Strategy

Licensing Phase I

Based on the staff's evaluation, if licensing were required during Phase I the staff would not consider the licensing of the Phase I effort to be viable on the schedule proposed by DOE. NRC regulations would require adherence to certain prescribed processes, including compliance with NEPA requirements and public involvement, which would effectively preclude the staff from licensing Phase I on a time schedule consistent with DOE's planned schedule.

The licensing of Phase I would require as much as an additional 5 FTE and 1 million dollars per year above the commitments in the proposed strategy, primarily for NEPA activities and public interaction. Such activities would likely also extend the need for the resources for a longer period than the proposed strategy as it is unlikely that the staff could meet the current DOE schedule. Resources for Phase II would likely be slightly reduced from those used in the proposed strategy because much of the NEPA information prepared in Phase I could be used.

Monitoring Approach

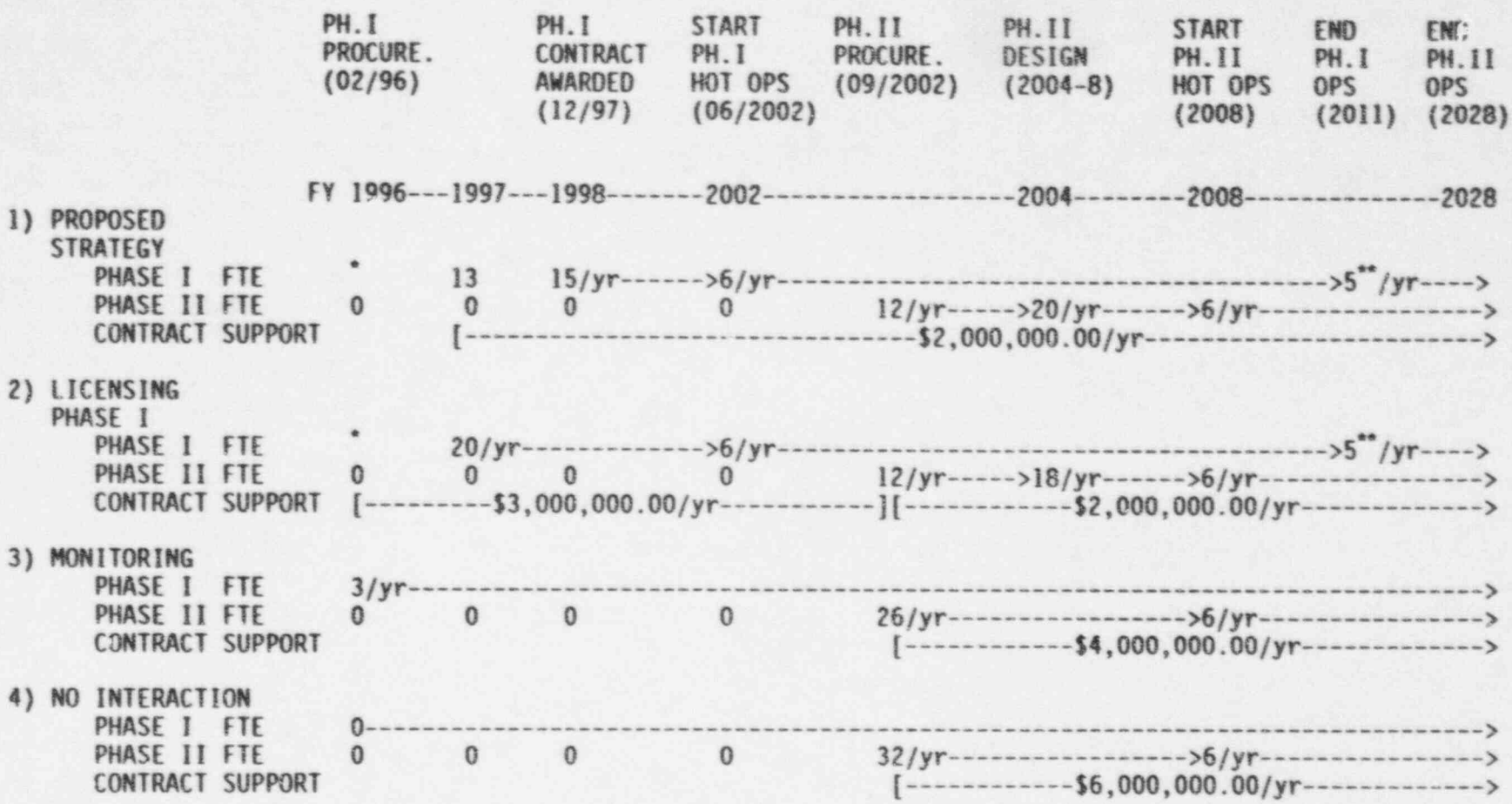
The staff would commit resources necessary to review documentation and progress of the Phase I activities. The staff would not be committed to make any formal reviews or document the results of such reviews. The staff does not consider this the optimal approach because it allows minimally committed resources to be easily sidetracked and does not permit the staff to gain the expertise and experience which greater interaction would allow. This approach could cause delays in licensing Phase II because much of the guidance, information, and staff experience would need to be developed in the early stages, thus extending the overall review period.

Phase I would require as little as 3 FTE per year to keep pertinent staff aware of the developments during Phase I. However, resources for Phase II could increase by as much as 6 FTE and 2 million dollars per year over those resources used in the proposed strategy for the development of guidance and staff experience. Furthermore, it is expected that the required resources would be necessary over a longer time than that in the proposed strategy because of the delays from lack of appropriate guidance for DOE's contractors.

No Interaction Approach

The staff would not become involved in the review of Phase I activities. DOE would be expected to submit an application for Phase II in the future, at which point the staff would become involved. At that point, the staff would begin developing guidance and become familiar with the technologies used. The impact from this approach could be greater delays to licensing of Phase II activities than would result from the monitoring approach because the staff would not be cognizant of DOE's plans.

No resources would be required for this project through FY 2002. In the year 2002, an additional 12 FTE and 4 million dollars per year over the resources used in the proposed strategy would be expected to be necessary for the development of guidance and staff expertise. The requirement for these resources would likely be longer than that for monitoring.



* Resource expenditure depends upon allocation of additional resources from OMB, otherwise only minimal resources (expected not to exceed 1 FTE) will be expended.

**Decommissioning Reviews

FIGURE 1. RESOURCE COMMITMENTS FOR VARIOUS LEVELS OF INVOLVEMENT