71-9235/9270
1013/1015
50-29

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

September 26, 1996

MEMORANDUM TO: William D. Travers, Director
Spent Fuel Project Office, NMSS

FROM: Timothy J. McGinty, Project Manager
Spent Fuel Licensing Section
Spent Fuel Project Office, NMSS

SUBJECT: MEETING WITH NAC INTERNATIONAL

A meeting was held between representatives of NAC International, Yankee Atomic Electric Company (YAEC) and the Nuclear Regulatory Commission on September 17, 1996. The primary purpose of this meeting was to discuss the planned applications under 10 CFR Parts 71 and 72 for the: (1) Multi-Purpose Canister (MPC) to be utilized at Yankee-Rowe, and (2) Universal Multi-Purpose Canister System (UMS). Attachment 1 is an attendance list. Attachment 2 consists of slides presented by NAC pertaining to the Yankee-Rowe NAC-MPC submittals. This meeting was noticed on September 3, 1996.

NAC and YAEC representatives provided a project overview of the planned submittals for the Yankee-Rowe NAC-MPC system. The NAC will submit a dual-purpose (storage and transport) application for the NAC-MPC, that includes: (1) canistered contents, (2) transport cask, (3) concrete storage cask, and (4) transfer cask used to load the canister into the transport or storage cask. The transport system is based on the NRC approved NAC-STC transportation cask, and NAC will request an amendment to the Certificate of Compliance No. 9235. The NAC-MPC storage system submittal will include a comprehensive Safety Analysis Report (SAR) addressing the vertical concrete cask, transportable storage canister, and transfer cask. Yankee-Rowe intends to utilize the Part 72 general license provisions. Thus, NAC plans to seek the addition of the NAC-MPC to the list of approved cask systems in Subpart K of Part 72.

The overall objective of the Yankee-Rowe project is a clean spent fuel pool. To this end, the canistered contents will include: (1) zirconium clad fuel, (2) stainless steel clad fuel, (3) failed fuel rods, and (4) greater than Class C waste (core baffle containers). Additionally, the NAC-MPC bounding analyses were discussed for both the storage and transportation applications. NAC anticipates approval of the storage and transportation submittals in 1997, with spent fuel loading at Yankee-Rowe commencing in the summer of 1998.

During the meeting, the NRC staff commented on various discussion points raised by NAC. The NRC staff advised that the applications should fully address the concerns raised in NRC Bulletin 96-04, that was issued as a result of a hydrogen gas ignition event during canister welding at Point Beach. The NRC staff emphasized the importance of design control and fabricator oversight. The NRC staff acknowledged the benefit of utilizing the NAC-STC

technology as the basis for the NAC-MPC system to be utilized at Yankee-Rowe. Furthermore, the NRC staff encouraged the plans to include Yankee-Rowe's failed fuel and greater than Class C waste as proposed contents in the applications.

The UMS discussions during the second portion of the meeting were proprietary. No regulatory decisions were requested or made at this meeting.

Dockets 71-9235 71-9270 72-1013 72-1015 50-029

Attachments: 1. Attendance List
2. NAC Slides

cc: Service List

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NAME	TJMcGinty		VLTharpe		EJLeeds					
DATE	09/25/96		09/24/96		09/25/96					

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Meeting Between
NAC International and NRC Staff
September 17, 1996

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Carl Withee	USNRC/NMSS/SFPO
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Henry Lee	USNRC/NMSS/SFPO
Fritz Sturz	USNRC/NMSS/SFPO
Jim Spets	USNRC/NMSS/SFPO
Mark Delligatti	USNRC/NMSS/SFPO
Mort Fairtile	USNRC/NRR
Bruce Holmgren	Yankee Atomic
Jim Kay	Yankee Atomic
Len Tremblay	Yankee Atomic
J.M. Buchheit	Yankee Atomic
Rudolf Grube	Yankee Atomic
Ivan F. Stuart	NAC International
Bill Lee	NAC International
Tom Danner	NAC International
C.G. Interrante	USNRC/NMSS/SFPO
Joseph Nick	USNRC/RI/DRS/RSB
Bill Reamer	USNRC/OGC
Bill Reckley	USNRC/NRR
Dave Zabransky	DOE/OCRWM
B. Lemeshewsky	DOE/RW
Alex Panagos	ComEd
N. Prasanna Kumar	DOE/RW-46
Jafar Imam	DOE/RW-46
Brain Hansen	Arizona PSCo
Bud Auvil	NAC International
Dominic Napolitan	NAC International
Steven Shultz	Yankee Atomic
Thomas C. Thompson	NAC International
Russell A. Mellor	Yankee Atomic
Marvin Smith	Virginia Power

ATTACHMENT 1

NAC INTERNATIONAL

MEETING AGENDA

USNRC SPENT FUEL PROJECT OFFICE
AND
NAC INTERNATIONAL, INC.

September 17, 1996 (9:00 am - 11:00 am)

NAC-MPC SYSTEM

- INTRODUCTIONS
- PROJECT OVERVIEW
- PLANNED SUBMITTALS

  AMENDMENT TO THE NAC-STC SAR (Transport)

  NAC-MPC TOPICAL SAR (Storage - General License)
- CASK CONTENTS

  INTACT FUEL (Stainless Steel and Zircaloy Cladding)

  FAILED FUEL

  GREATER THAN CLASS C WASTE (GTCC)
- BOUNDING ANALYSES
- SPECIAL REQUIREMENTS FOR "SHUTDOWN" PLANTS
- PROJECT SCHEDULE

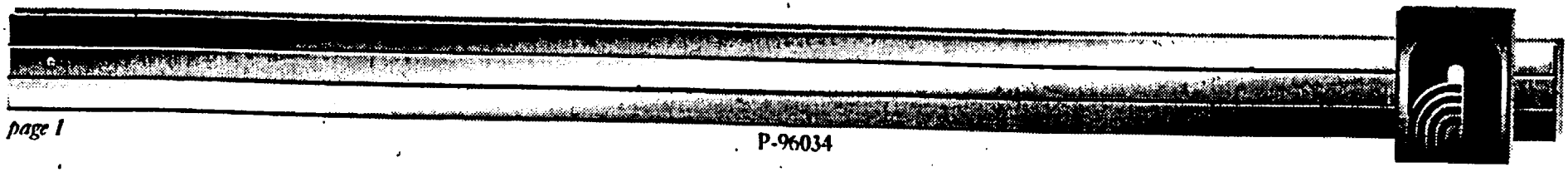
  TRANSPORT AMENDMENT

  STORAGE TOPICAL SAR

ATTACHMENT 2

Meeting with U.S. Nuclear Regulatory Commission on NAC-MPC System

September 17, 1996
9 a.m. – 11 a.m.



Meeting with U.S. Nuclear Regulatory Commission on NAC-MPC System

September 17, 1996
9 a.m. – 11 a.m.

Meeting Agenda

- Introductions
- Project Overview
- Planned Submittals
- Cask Contents
- NAC-MPC Bounding Analyses
- Considerations for Decommissioned Plants
- Project Schedule
- Summary

Introduction

- Representatives
  - NAC International
  - Yankee Atomic Electric Company
- Objective
  - Transport overpack is the licensed NAC-STC
  - NAC-MPC storage system based on licensed technology
  - Canistered contents cover
    - Zr clad fuel — currently licensed
    - SS clad fuel — limited by Zr clad fuel requirements
    - Failed fuel rods — separately canned for confinement
    - GTCC waste — separately canned; waste canister includes additional shielding
  - NAC-MPC transport and storage system is totally based on existing licensed technology

Project Overview

- NAC-MPC System
  - Canister system — structural components are stainless steel
  - Transport cask utilized — NAC-STC (C of C 9235)
  - Storage cask — concrete overpack
  - Transfer cask used to load canister into transport and storage cask

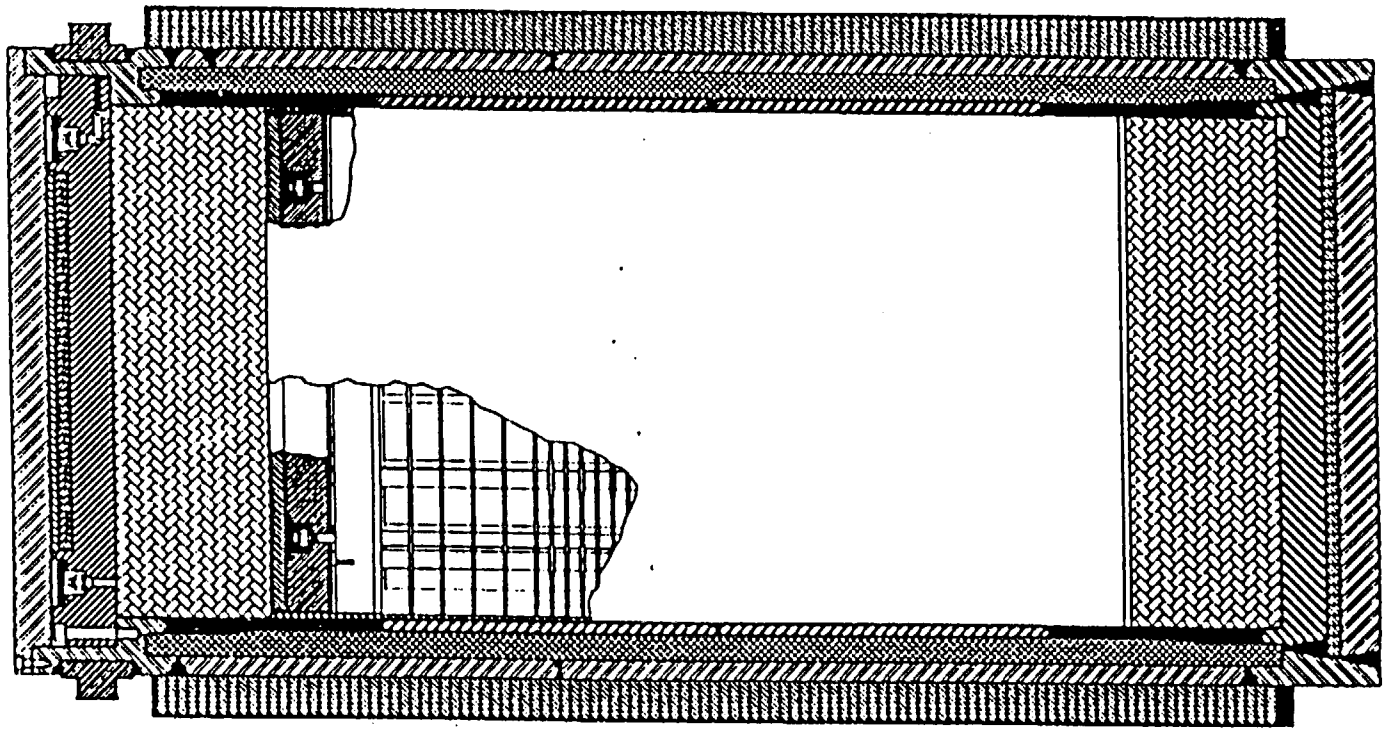
Project Overview

- NAC-MPC Potential Site Applications
  - Yankee Rowe
  - San Onofre Unit 1
  - Big Rock Point
  - Palisades
  - La Crosse
  - Indian Point 1
  - Humboldt Bay
  - Dresden Unit 1
  - Haddam Neck
  - Fort Calhoun

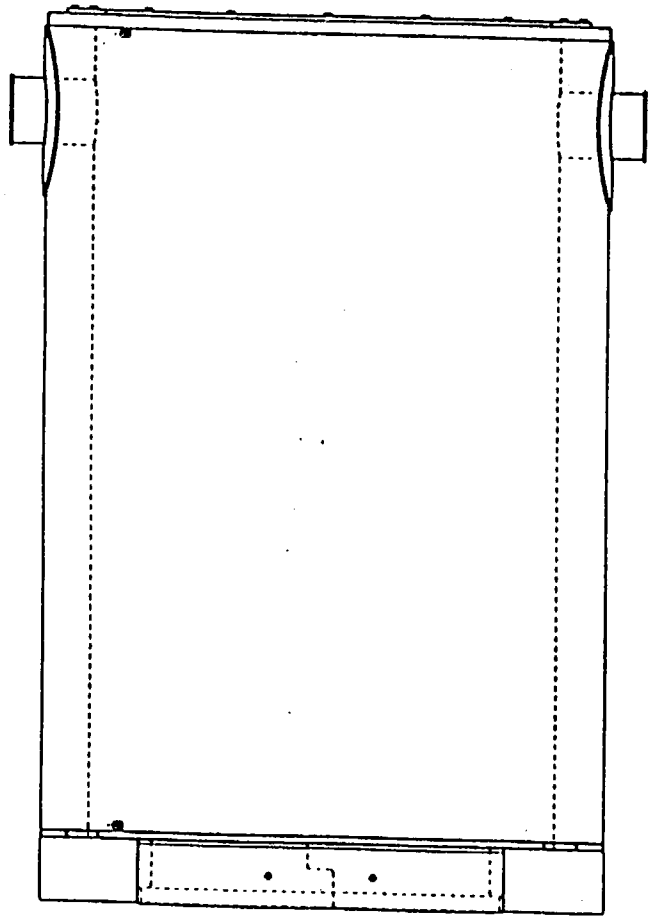
YNPS ISFSI Project Overview

- 15 NAC-MPC canisters of fuel – 533 intact fuel assemblies, 1 failed fuel container of several rods
- 1 canister of Greater than Class C (GTCC) waste – 21 core baffle containers

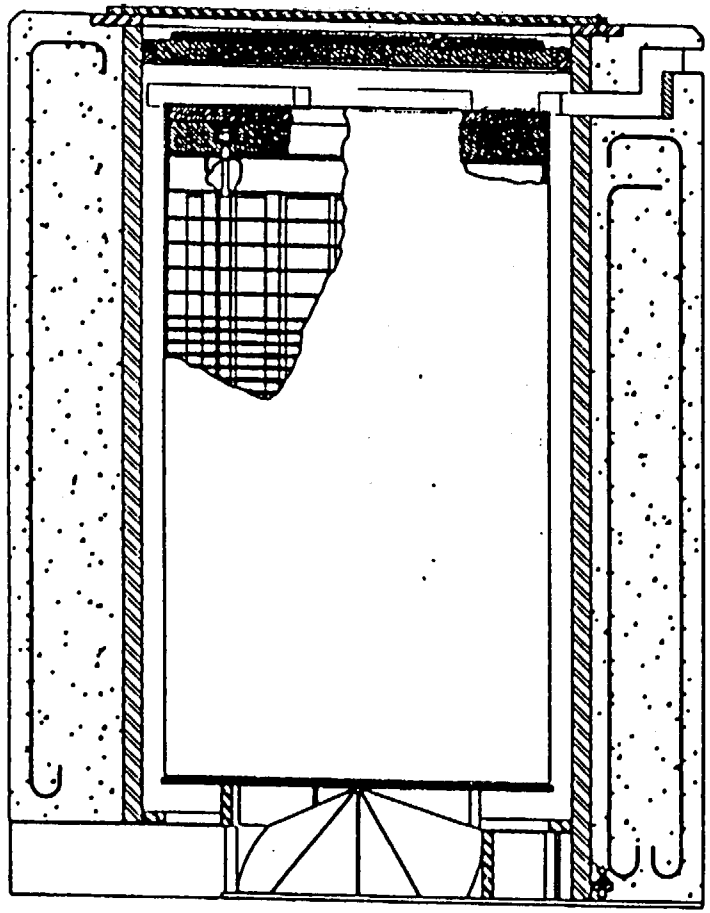
NAC-MPC Transport Cask Assembly



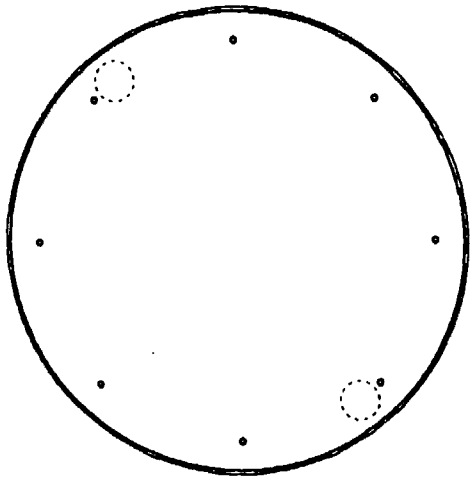
NAC-MPC Transfer Cask Assembly

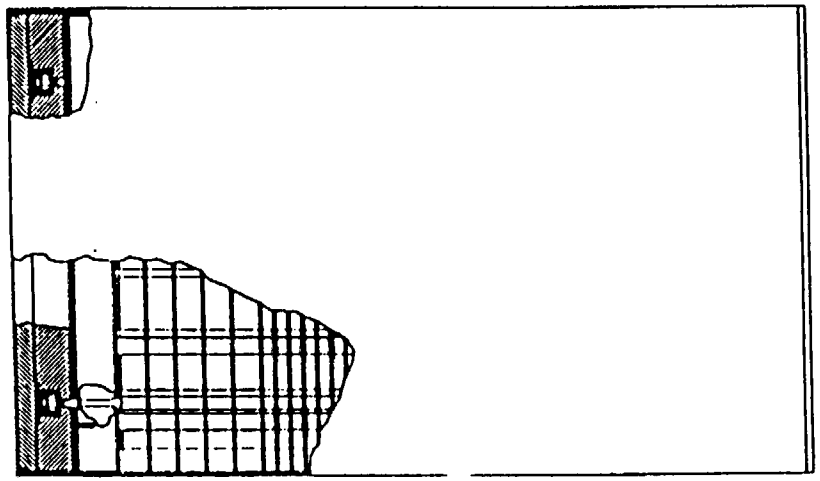


Loaded Vertical Concrete Cask for NAC-MPC

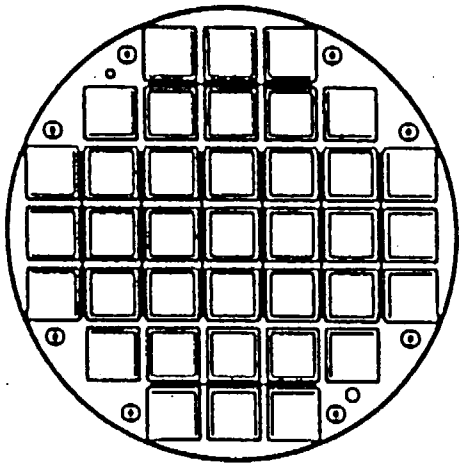


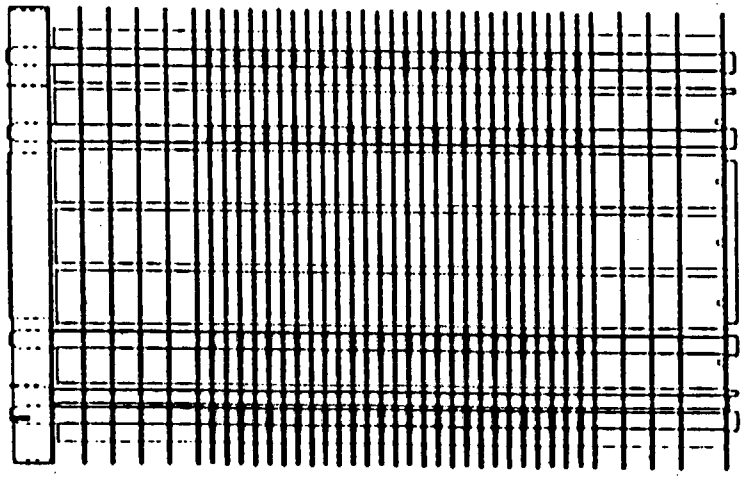
NAC-MPC Transportable Storage Canister Assembly (37-Element)



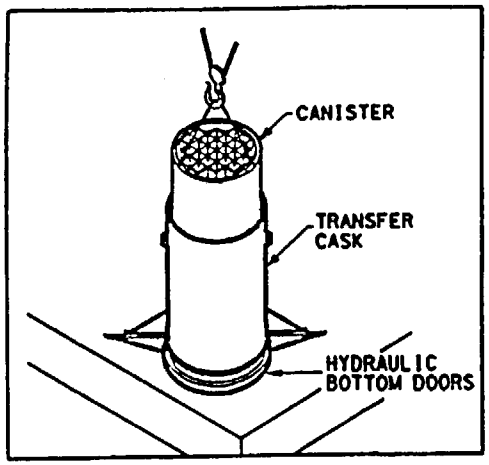


NAC-MPC Fuel Basket Assembly (37-Element)

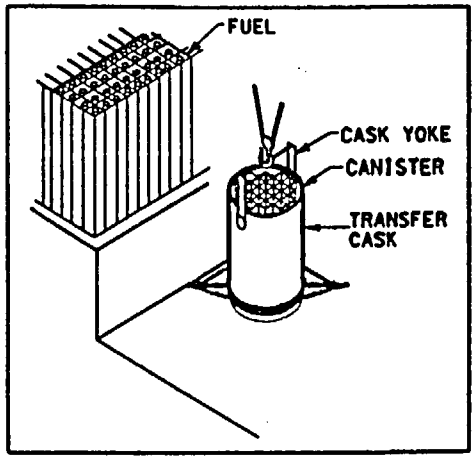




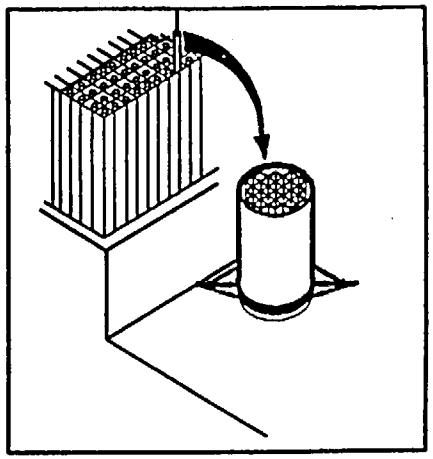
NAC SYSTEM OPERATIONAL ACTIVITIES



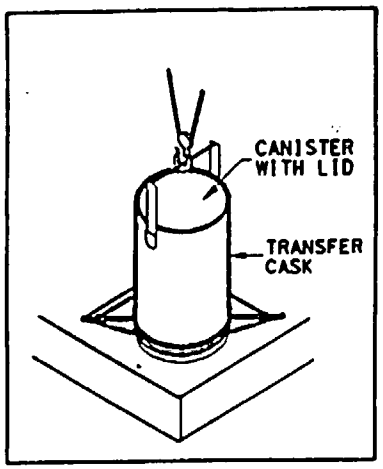
PLACE CANISTER IN TRANSFER CASK



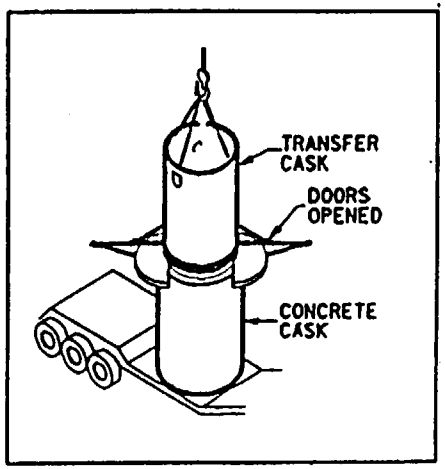
PLACE TRANSFER CASK IN POOL



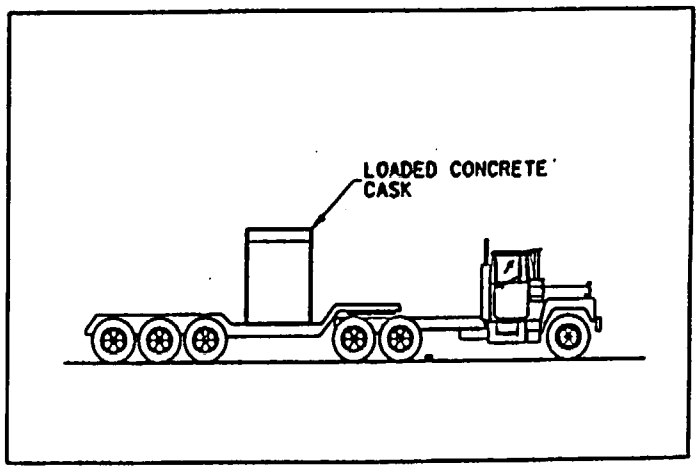
LOAD CANISTER WITH FUEL
PLACE LID ON CANISTER



MOVE TRANSFER CASK TO DECON AREA. DRY, BACKFILL AND WELD LID ON CANISTER



PLACE TRANSFER CASK ONTO CONCRETE CASK. OPEN HYDRAULIC DOORS AND LOWER CANISTER



TOW TRAILER TO STORAGE PAD AND TRANSFER LOADED CONCRETE CASK ONTO PAD

NAC-MPC System Planned Submittals

- Transport system — NAC-STC cask
  - Amendment to NAC-STC SAR
    - Contents weight maintained
    - Package weight maintained
    - Canistered contents
    - Basket structure — tube and disk
    - No Burn-up Credit Basket Maintained
    - Contents have Lower Heat Load and Lower Source Terms

NAC-MPC System Planned Submittals

- Storage system — general license
  - NAC-MPC Safety Analysis Report
    - Vertical concrete cask
    - Transportable storage canister
    - Transfer cask

Integrated NAC-MPC System Readiness

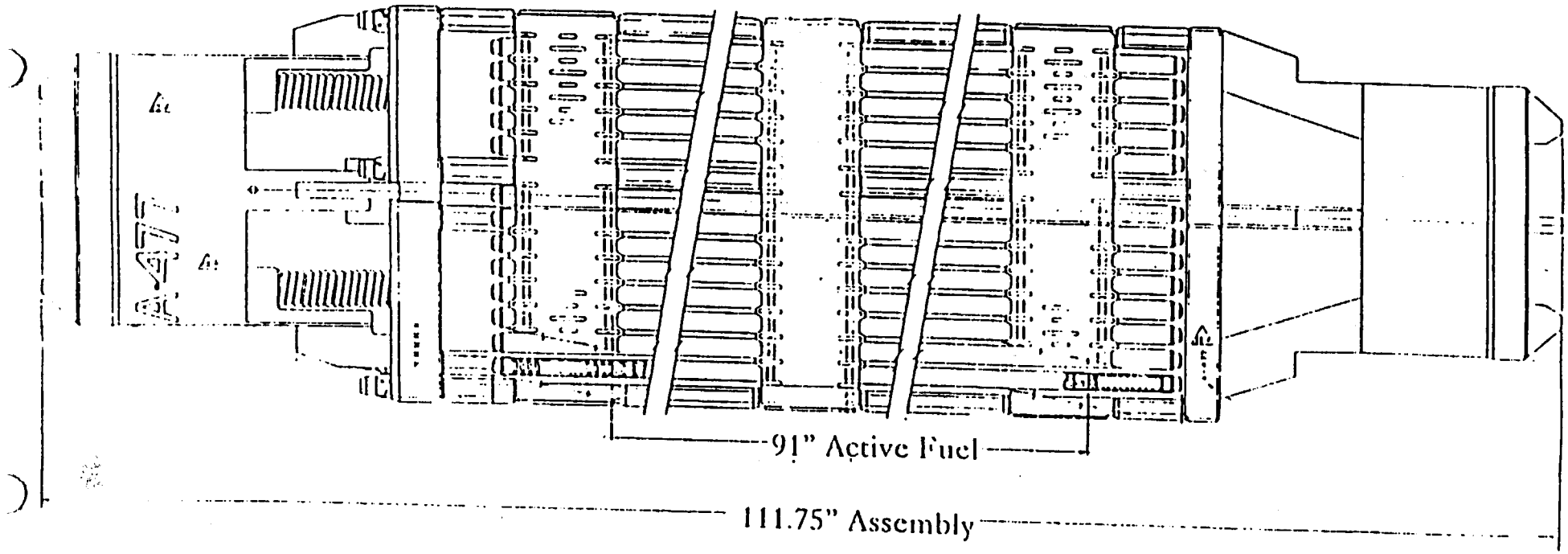
- Comprehensive quality assurance checking and review
- Ongoing fabrication review
- Material compatibility — no chemical, galvanic, or other reactions
- Code clarifications
- Compliance with draft standard review plan, NUREG-1536 (storage)

Integrated NAC-MPC System Readiness

- Maintain no burnup credit
- Compliance with component classification, NUREG/CR-6407
- Spent fuel basket compliance
  - Analysis — ASME Section III, Subsection NG
  - Buckling — NUREG/CR-6322

Cask Contents

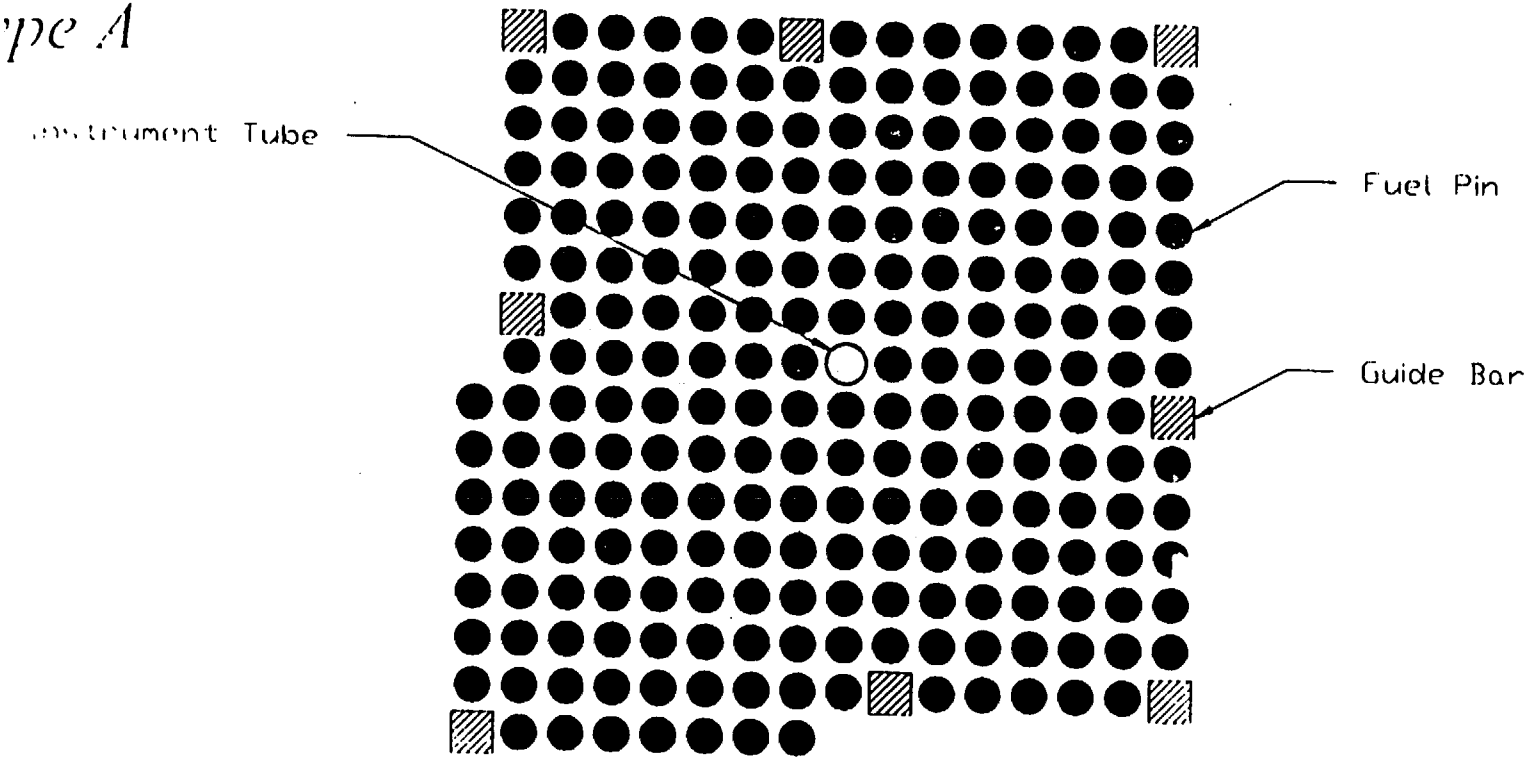
YNPS Axial Fuel Design—850 to 900 lbs



Cask Contents (continued)

YNPS Fuel Array Design - Exxon/CE

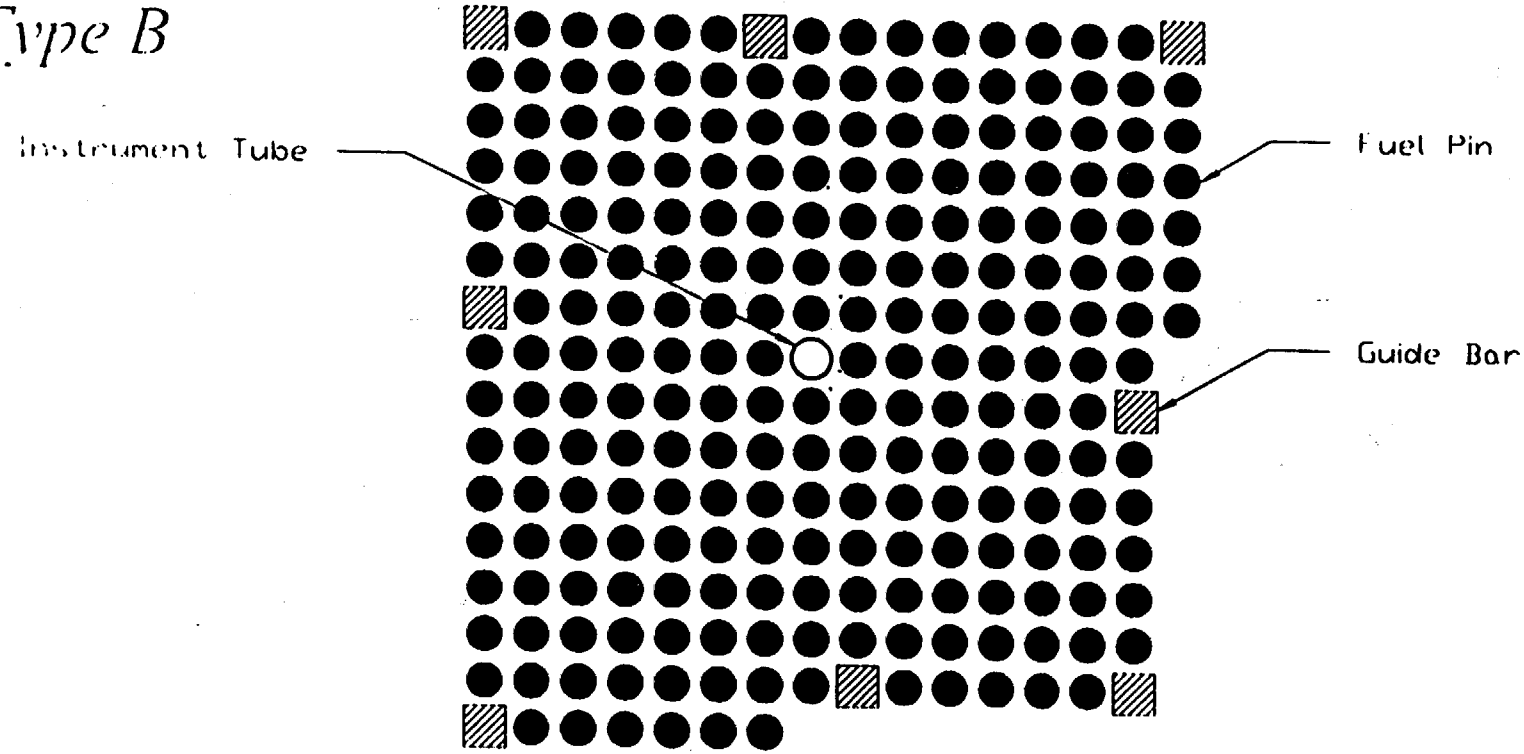
Type A



Cask Contents (continued)

YNPS Fuel Array Design - Exxon/CE

Type B



Cask Contents (continued)

YNPS Fuel Summary

Manufacturer	Clad Material	No. of Assemblies	Max. Initial (% w/o U^{235})
Westinghouse	SS	76	4.94
United Nuclear	Zirc	73	4
Exxon-ANF	Zirc	232	4
Combustion Engineering	Zirc	152	3.9

Cask Contents (continued)

- NAC-MPC design basis contents
  - Up to 37 YNPS fuel assemblies
  - Canister source terms - 36,000 MWd/MtU, 8 years cooled, CE design
    - Gamma source - 6.55×10^{16} γ/s
    - Neutron source - 2.44×10^{9} n/s
    - Heat load - 12.65 kW
  - Criticality - 4.0 wt % U^{235}, United Nuclear design (most reactive)

Cask Contents (continued)

- NAC-MPC GTCC canister design basis contents
  - Up to 21 GTCC waste canisters:
    - 15 containing activated core baffle strips
    - 6 containing dross material
  - 3.22×10^5 curies, 2.5 kW heat load total

NAC-MPC Bounding Analyses

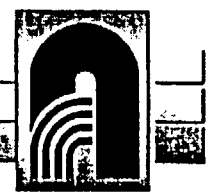
- NAC-STC Bounding Conditions
  - Payload *less than* 56,000 lbs
  - Decay heat *less than* 22.1 kW
  - Center of gravity the same

NAC-MPC Bounding Analyses

- Conditions of bounding package
  - Margins of safety *greater than* or *equal to* NAC-STC
  - Source term *less than* NAC-STC

NAC-MPC Bounding Analyses

- NAC-STC transportation overpack
  - Cask
  - Impact limiters



NAC-MPC Bounding Analyses

- Structural
  - NAC-STC inner shell qualification
  - Lower NAC-STC temperature profile increases stress allowables
  - Increase margins of safety
  - Impact limiter maintained

NAC-MPC Bounding Analyses

- Thermal
  - Lower heat load with NAC-MPC canister
  - Neutron shield < 338°F
  - Metallic O-rings < 500°F
  - Lead gamma shield < 600°F

NAC-MPC Bounding Analyses

- Stainless Steel Fuel
  - Already licensed for transport
  - Zr clad fuel limits are bounding
  - SS clad fuel is less reactive

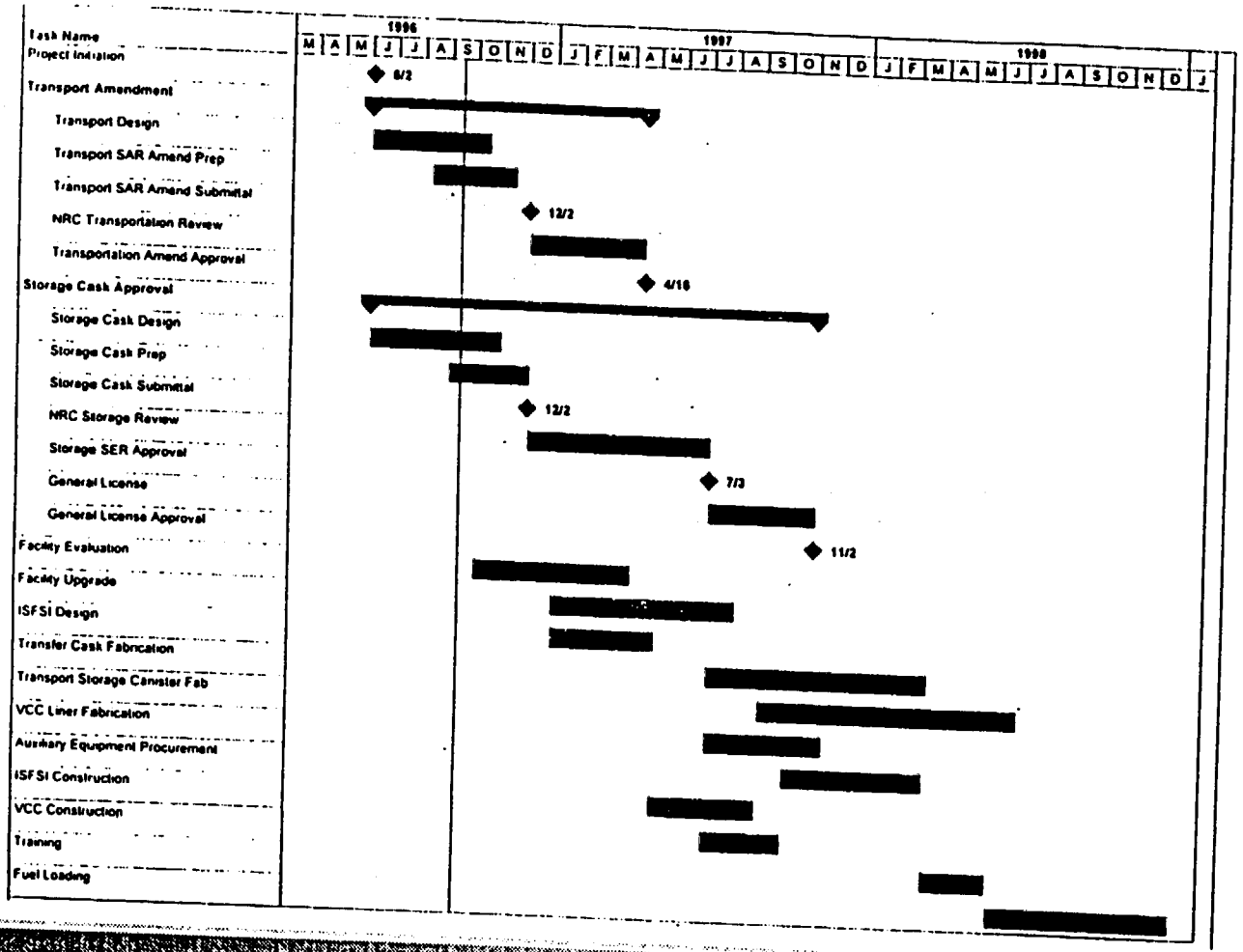
NAC-MPC Bounding Analyses

- Shielding
  - Lower radiation doses by:
    - More shielding material including canister wall
    - Lower source term with YNPS fuel

Considerations for Decommissioned Plants

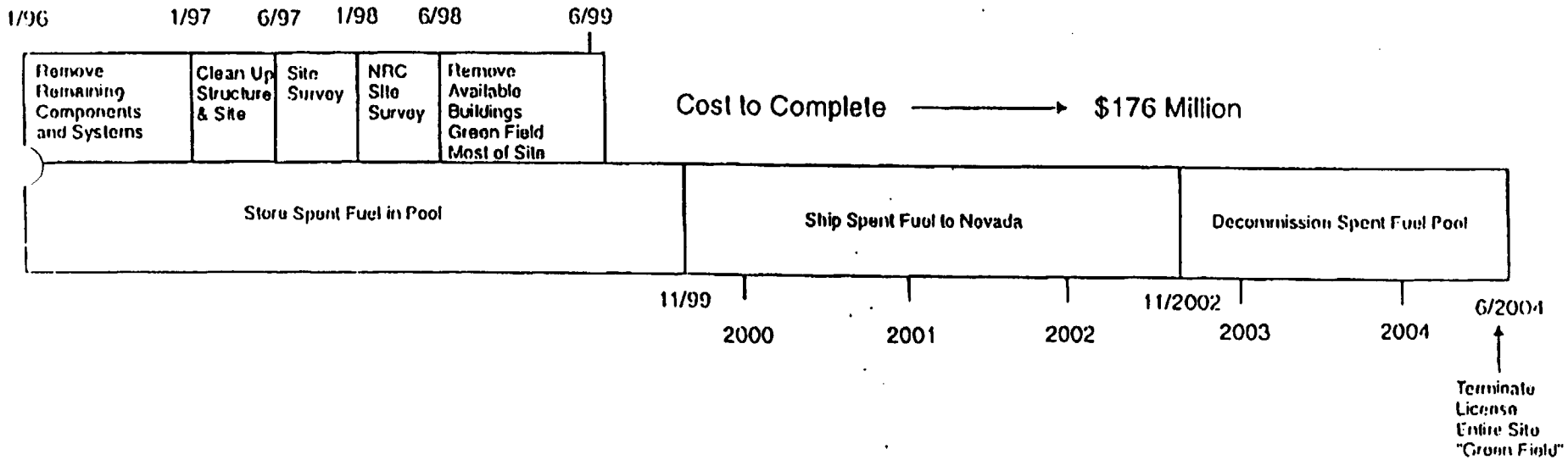
- Spent Fuel Pool no Longer Available
- Contingency use of
  - Transport cask for storage
  - Overpack for storage onsite
  - Transport cask for shipment to repair facility

Project Schedule

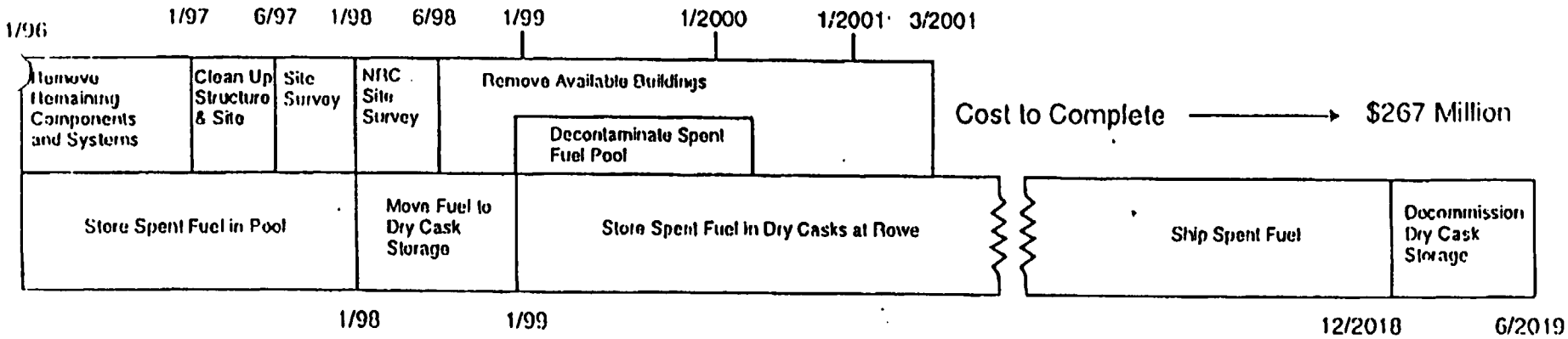


DECOMMISSIONING SCENARIOS

With Passage of High Level Waste Legislation



Without Passage of High Level Waste Legislation



Summary

- NAC-MPC System
  - Uses licensed NAC-STC cask as transport overpack and is ***TRANSPORT READY***
  - General license for on-site storage
  - Applications to cover Zirc fuel, SS fuel, failed fuel and GTCC waste
  - NAC-STC transport amendment essentially bounded by existing license
  - Both applications will be ready for submittal in 1996