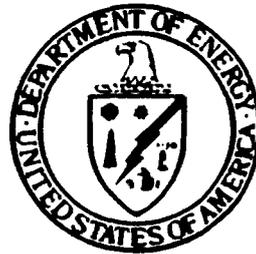


MRS Design Considerations

**Jeffrey Williams, Chief,
Facilities Development Branch
Office of Civilian Radioactive Waste Management**



Presented to

**Nuclear Waste Technical Review Board
March 10, 1992**

INTRODUCTION

- **BACKGROUND OF MRS DEVELOPMENT**
- **STORAGE TECHNOLOGIES**
- **STORAGE TECHNOLOGY BIDS**
- **MRS DESIGN**

BACKGROUND OF MRS DEVELOPMENT

BACKGROUND OF MRS DEVELOPMENT

- **PRE-NWPA**
- **NWPA - 1982**
- **PNL ALTERNATIVE CONCEPTS - 1983**
- **PARSONS CONCEPTUAL DESIGN REPORT - 1985**
- **NWPAA - 1987**
- **SYSTEM STUDIES 1989**
 - **TASK B - MRS DESIGN**
 - **TASK C - RE-EVALUATION OF CONCEPTS**
- **PARSON PRECONCEPTUAL DESIGN OF TRANSFER FACILITY - 1990**
- **M&O/DUKE ENGINEERING CONCEPTUAL DESIGN REPORT**

1985 CONCEPTUAL DESIGN

- **ALL FUEL WAS TO BE HANDLED AT MRS**
- **CONSOLIDATION OF FUEL**
- **WASTE PACKAGING**
- **STORAGE CAPACITY 15,000 TONS**
- **STORE CONSOLIDATED FUEL IN LARGE CONCRETE CASKS**
- **SHIP TO REPOSITORY IN LARGE TRANSPORTATION CASKS**

MRS SYSTEM STUDIES

- **EVALUATED ALTERNATIVE SCENARIOS**
- **NO MRS**
- **"STORE-ONLY" MRS**
- **CONSOLIDATION**
- **WASTE PACKAGING**
- **CONCEPTUAL DESIGN UPDATED**
- **EVALUATED LINKED/UNLINKED**
- **CAPACITY**

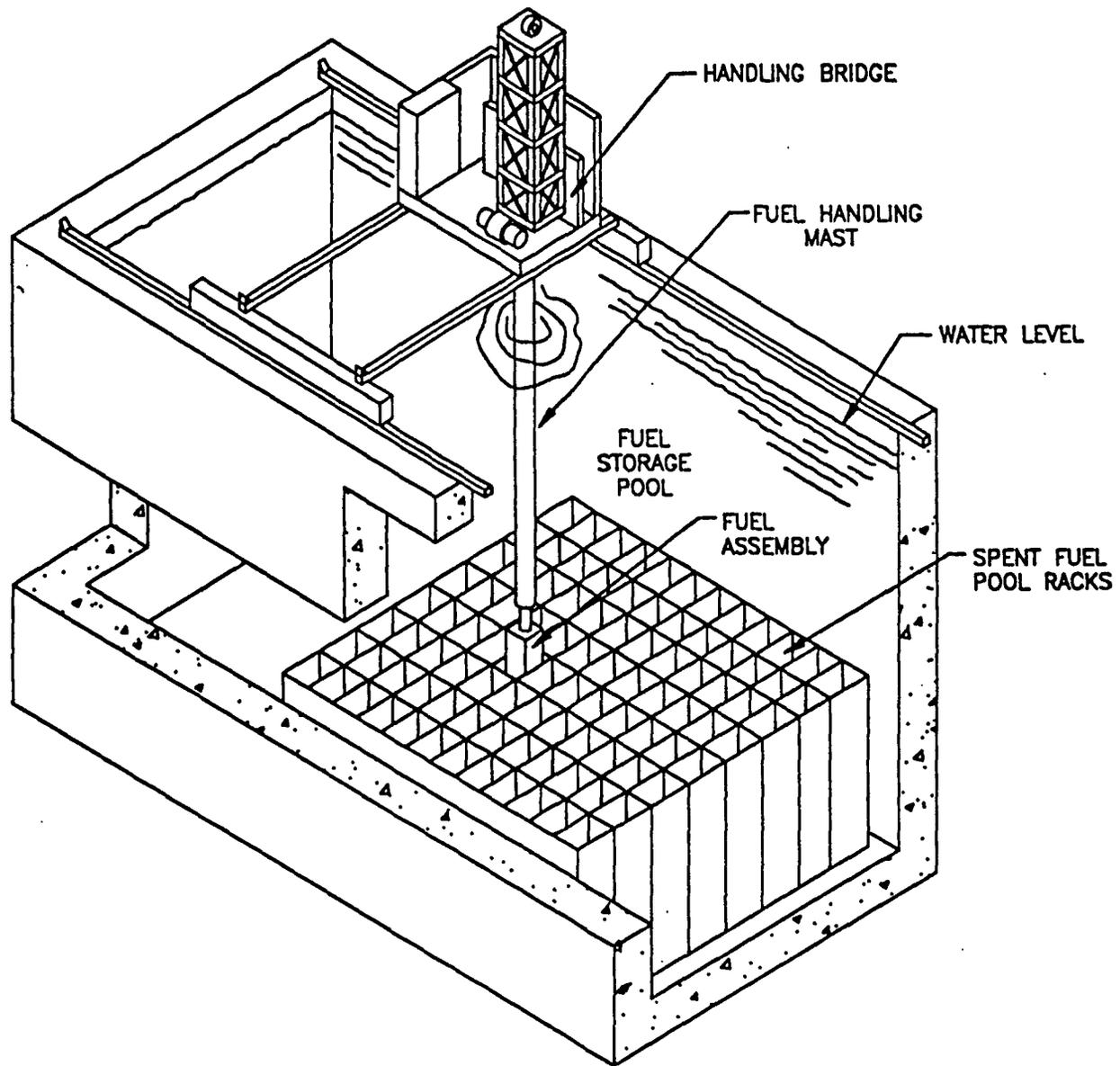
1990 PRECONCEPTUAL DESIGN

- **OBJECTIVE TO IMPROVE SCHEDULE**
- **TRANSFER FACILITY SIMPLIFIED**
- **SIZE REDUCED**
- **THROUGHPUT REDUCED**
- **CONCRETE CASK MAINTAINED**

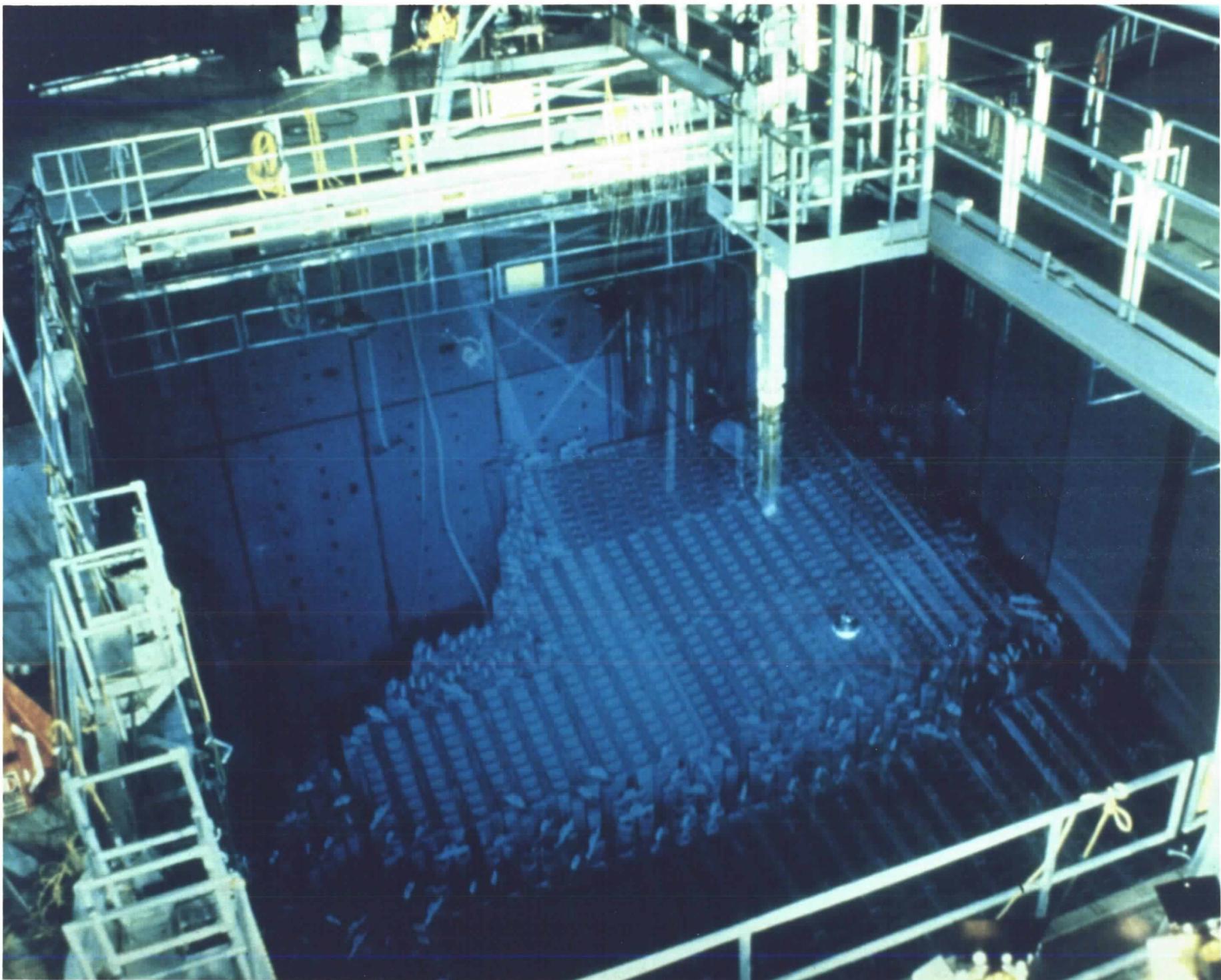
STORAGE TECHNOLOGIES

WET (IN-POOL) STORAGE

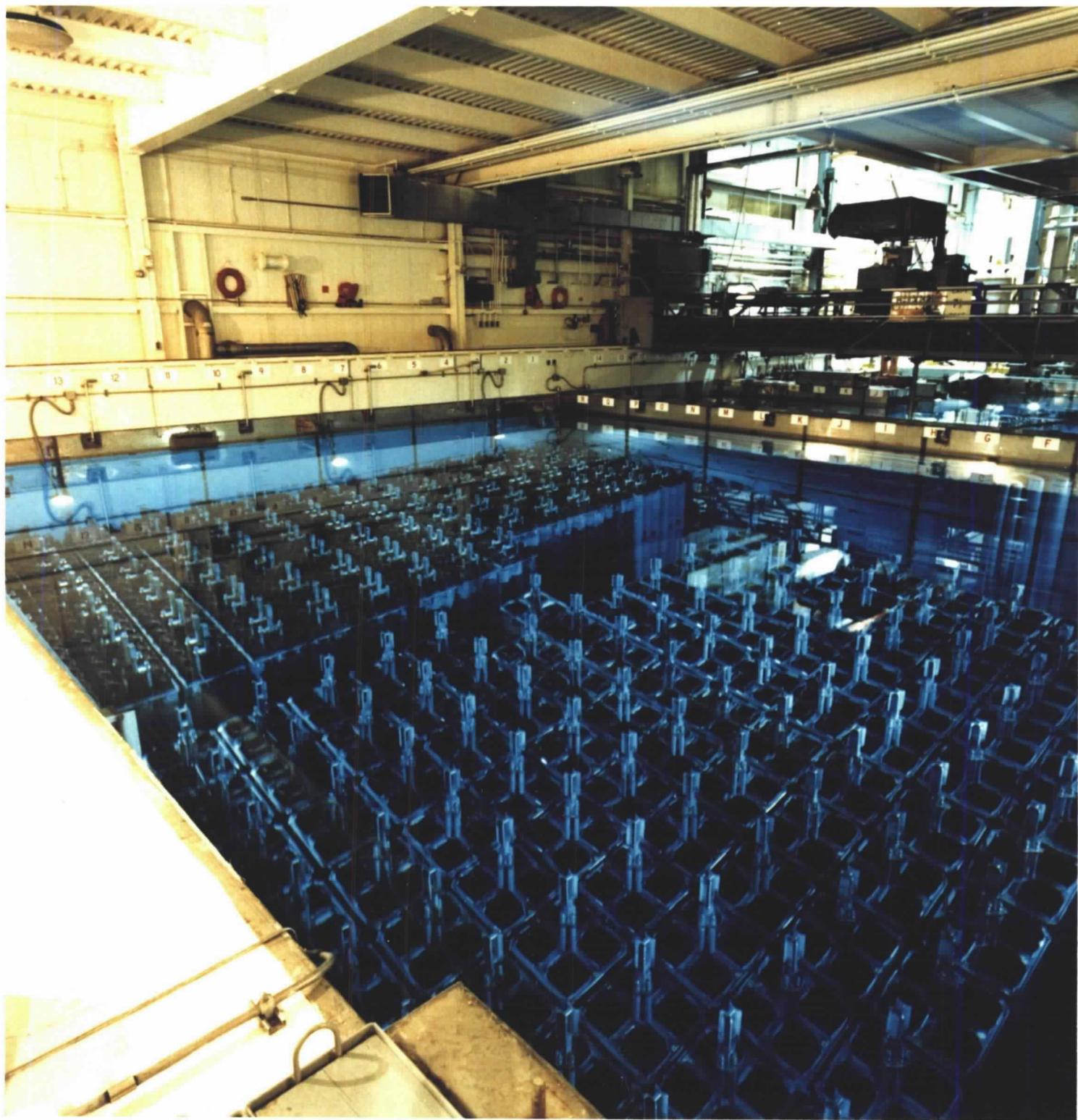
- **EXISTING INSTALLATIONS**
 - **35 YEARS EXPERIENCE AT NUCLEAR REACTOR SITES AND RESEARCH FACILITIES**
- **DESIGN FEATURES**
 - **CONCRETE POOL WITH STAINLESS STEEL LINER**
 - **CHEMICALLY TREATED WATER PROVIDES HEAT REMOVAL AND RADIATION SHIELDING**
 - **ASSEMBLIES STORED IN HIGH DENSITY FUEL RACKS**



WET (IN-POOL) STORAGE



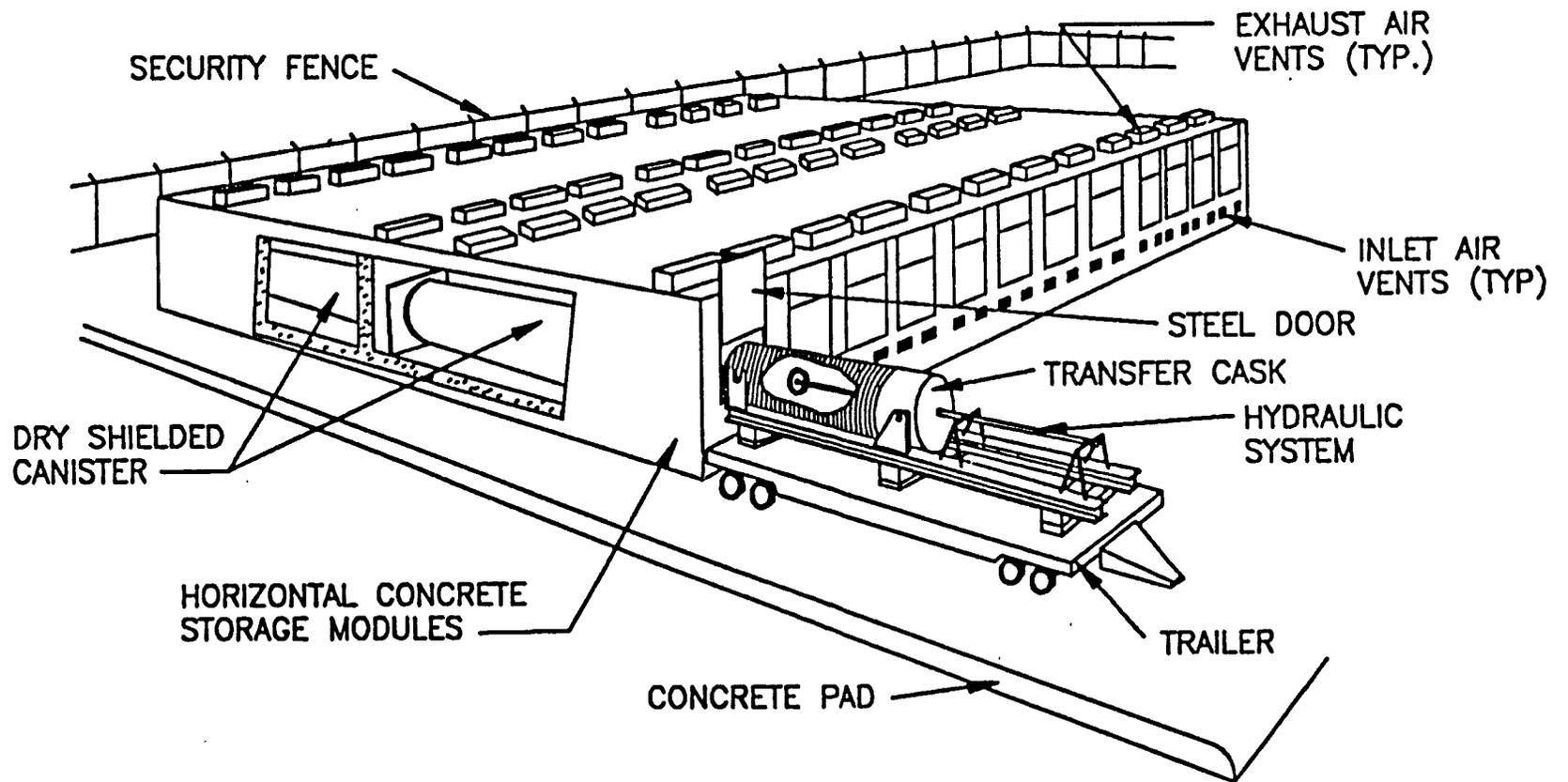
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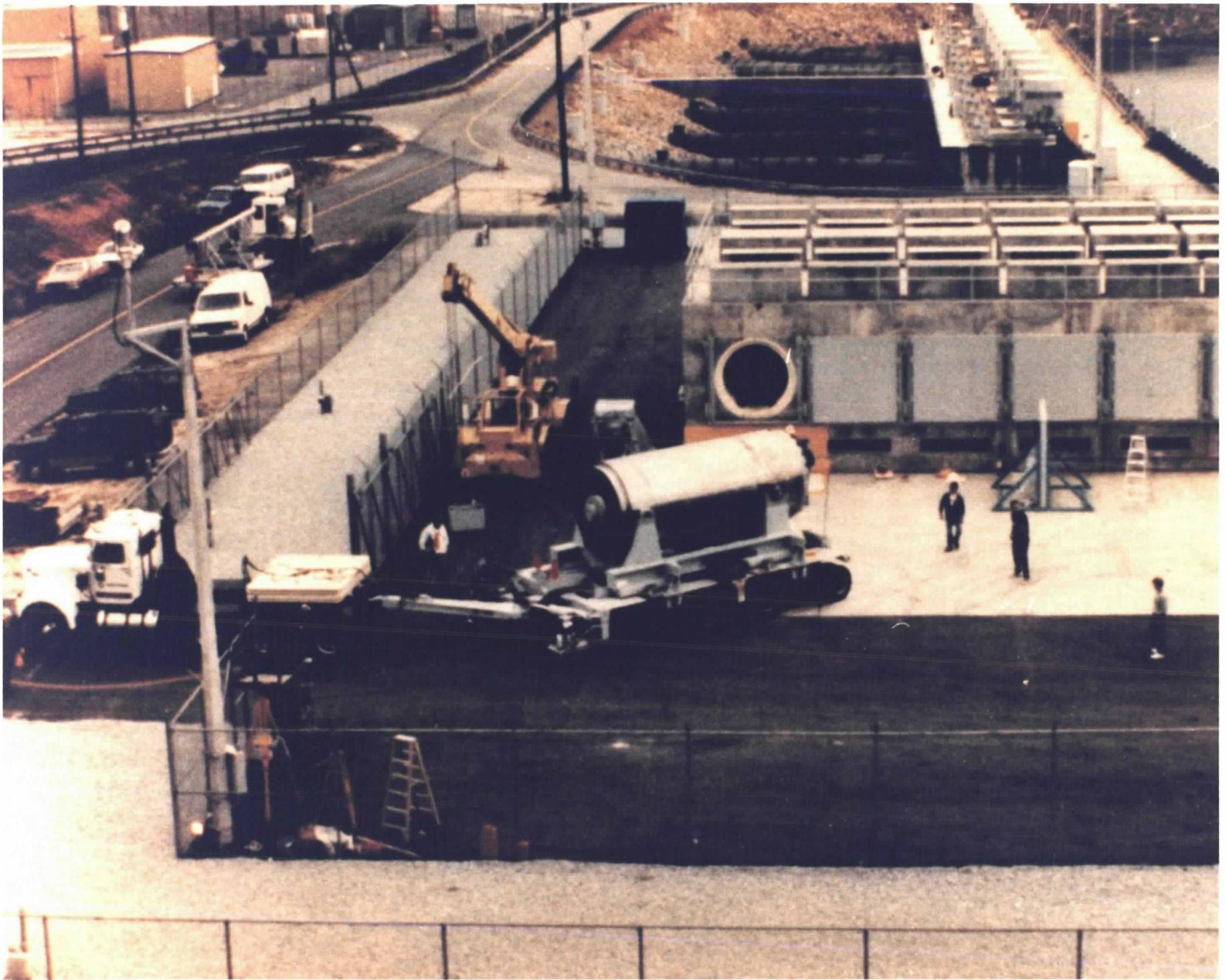
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HORIZONTAL CONCRETE MODULAR STORAGE

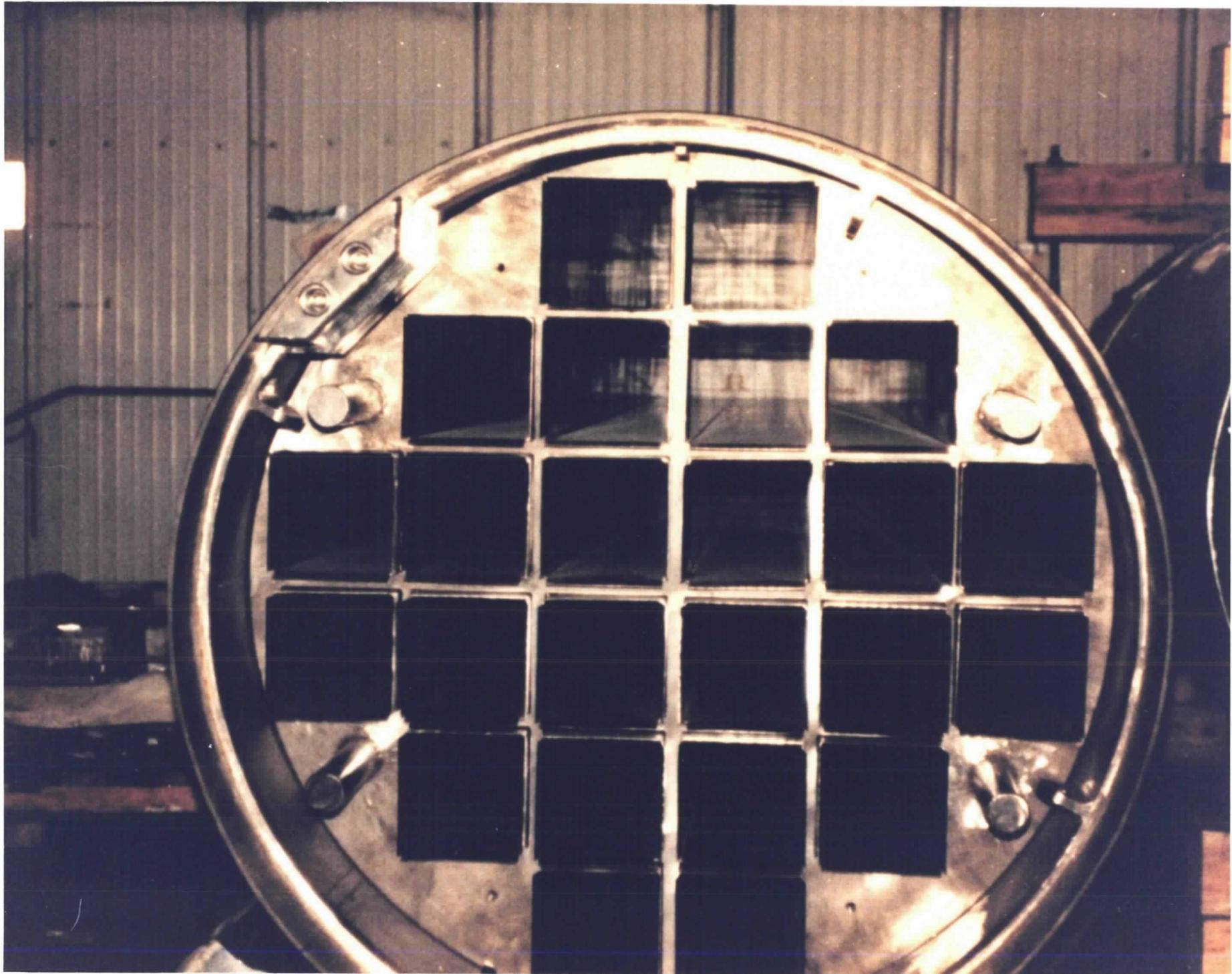
- **EXISTING OR PLANNED INSTALLATIONS**
 - **ROBINSON DEMONSTRATION**
 - **OCONEE ISFSI**
 - **CALVERT CLIFFS ISFSI UNDER CONSTRUCTION**
 - **BRUNSWICK ISFSI (LA UNDER REVIEW)**
- **DESIGN FEATURES**
 - **POOL TO CANISTER TRANSFER**
 - **CANISTER LOADED IN CONCRETE MODULE**
 - **AIR-CHANNEL IN MODULE FOR HEAT REMOVAL**



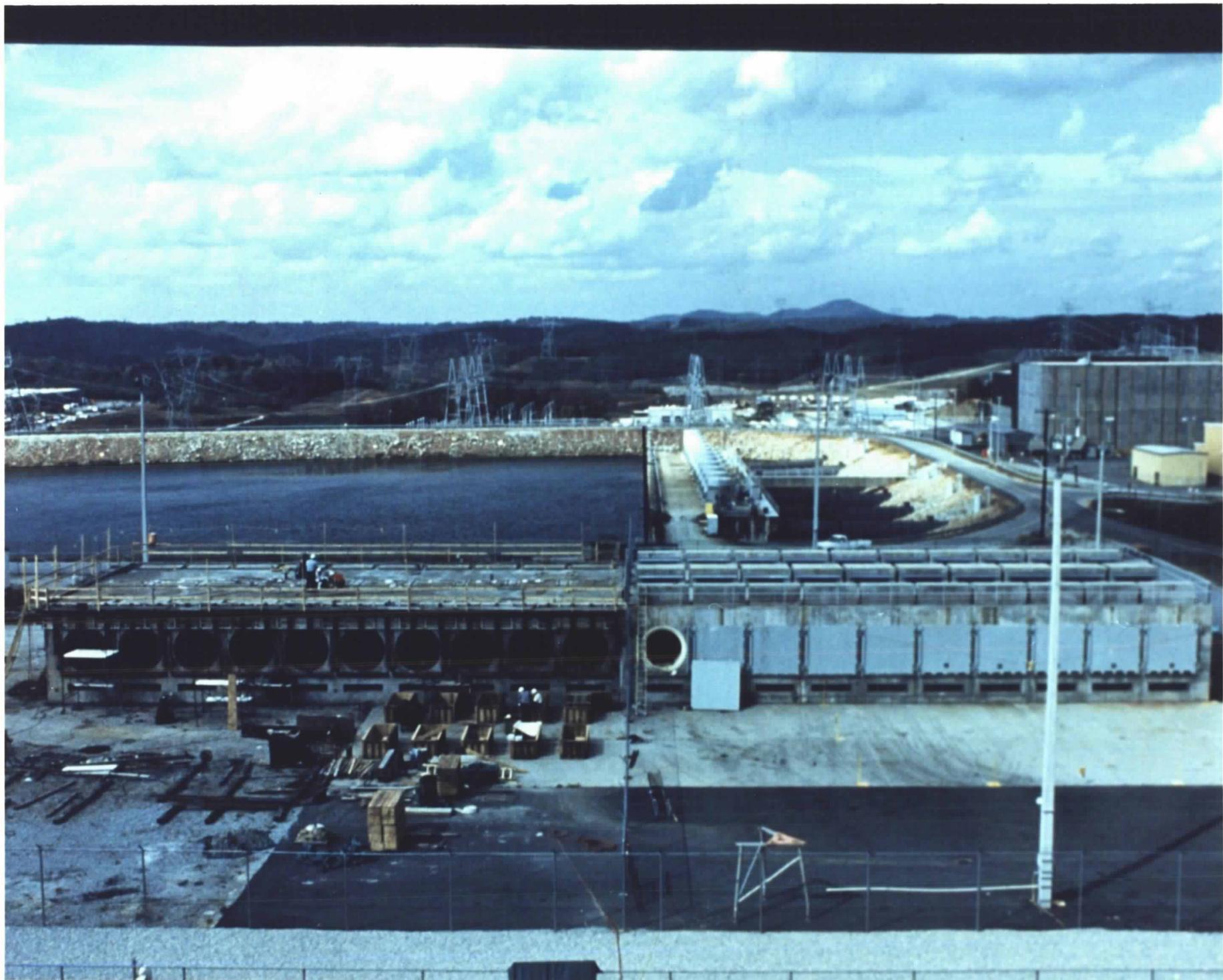
HORIZONTAL CONCRETE MODULAR STORAGE



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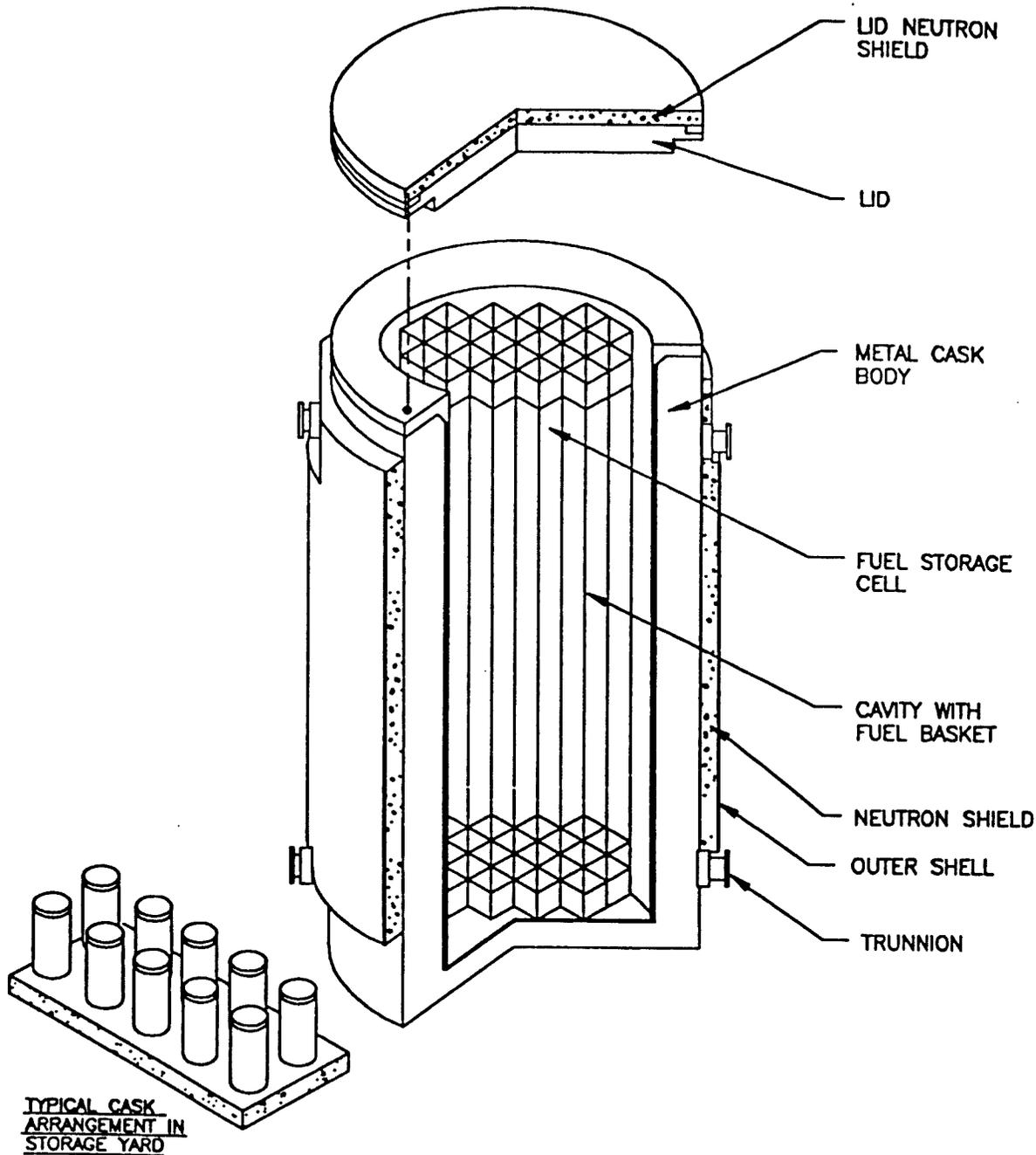
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METAL CASKS

- **SURRY ISFSI (CASTOR, TRANSNUCLEAR, WESTINGHOUSE, NUCLEAR ASSURANCE)**
- **PRAIRIE ISLAND - UNDER REVIEW (TRANS NUCLEAR)**
- **DESIGN FEATURES**
 - **POOL TO CASK TRANSFER**
 - **CASK PLACED ON CONCRETE PAD**
 - **HEAT REMOVAL BY CONVECTION**



METAL STORAGE CASK



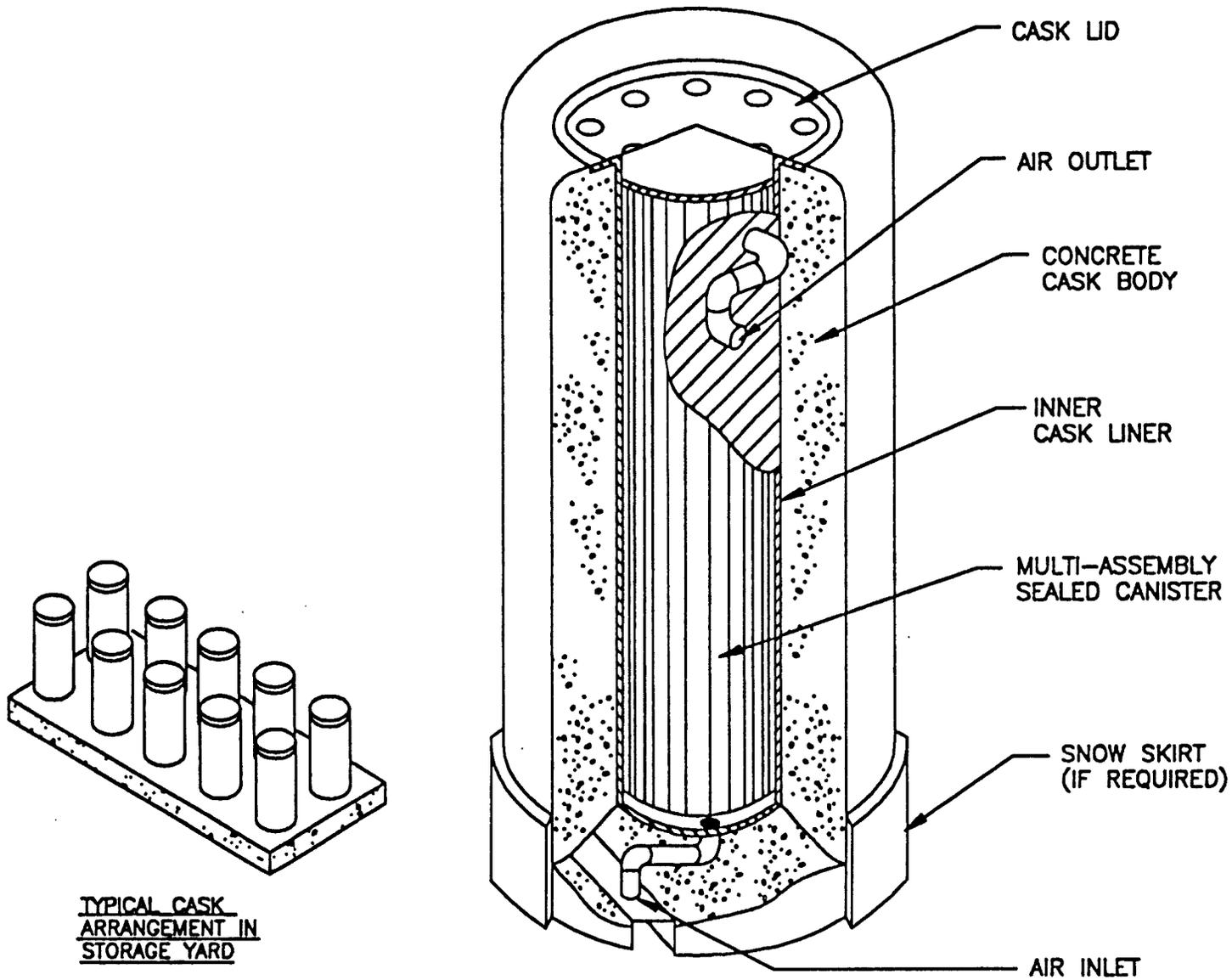
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VERTICAL CONCRETE STORAGE CASKS

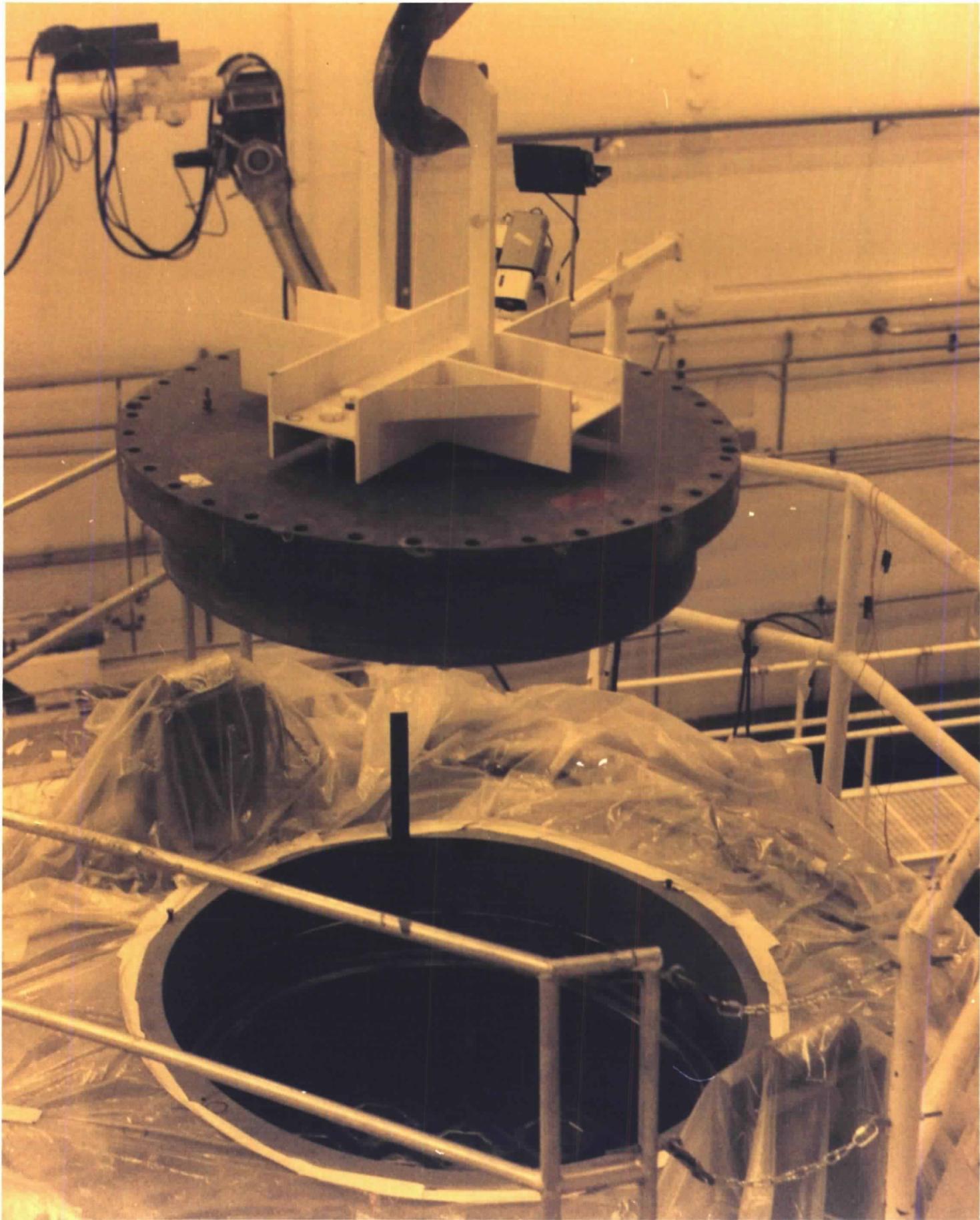
- **PROTOTYPE TESTED AT IDAHO**
- **SIERRA NUCLEAR PALISADES ISFSI**
- **B&W DESIGN - TOPICAL SUBMITTAL**
- **DESIGN FEATURES**
 - **POOL TO CANISTER TRANSFER**
 - **CASK PLACED ON CONCRETE PAD**
 - **VENTILATED STORAGE CASK/HEAT TUBES**



VERTICAL CONCRETE STORAGE CASK



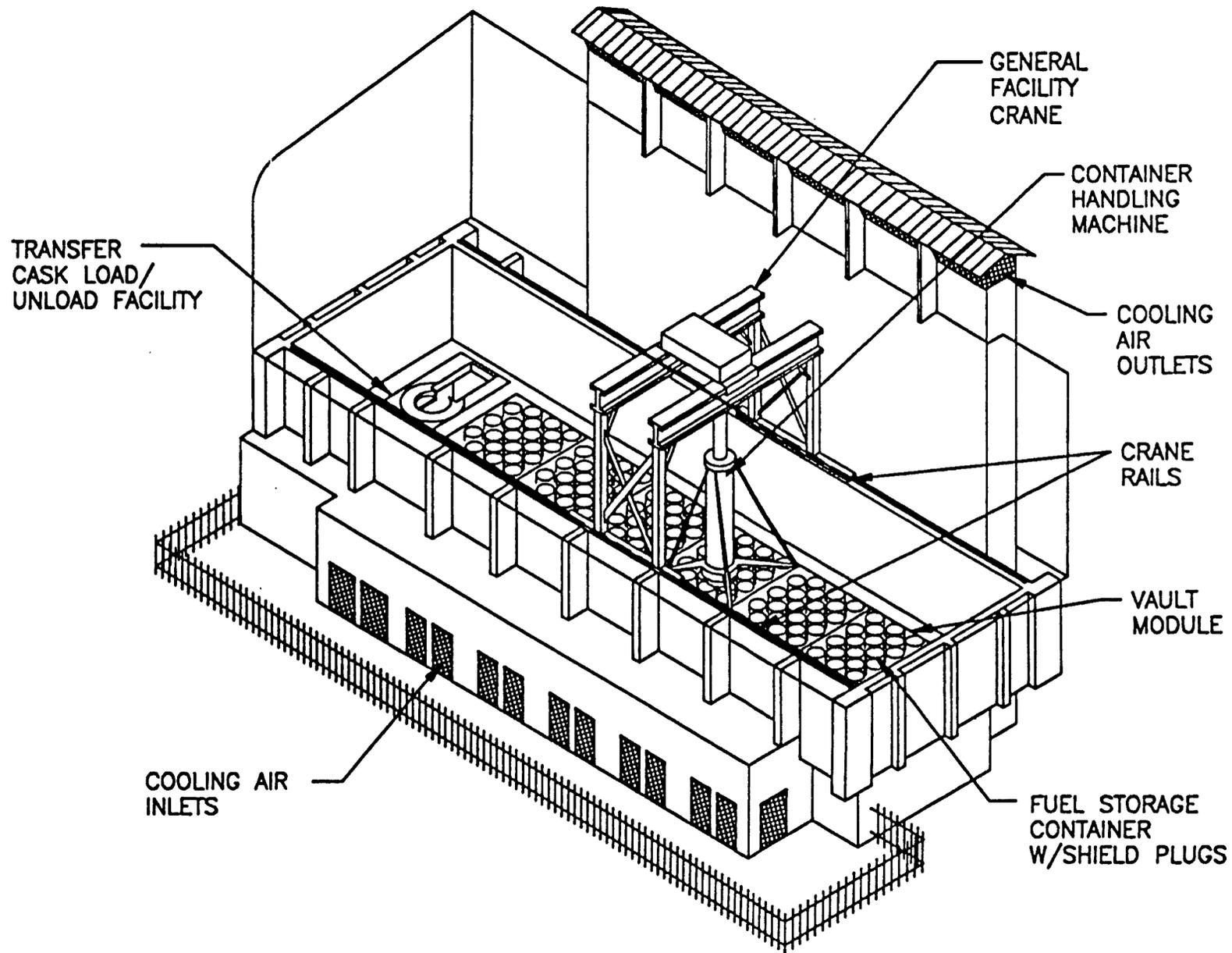
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VAULT

- **FT. ST. VRAIN (FOSTER-WHEELER)**
- **DESIGN FEATURES**
 - **CANISTERED FUEL**
 - **TRANSFER VIA FUEL HANDLING MACHINE**
 - **CANISTER PLACED IN STORAGE TUBE**
 - **MODULAR VAULT DRY STORAGE (MVDS)**
 - **HEAT TRANSFER BY CONVECTION**



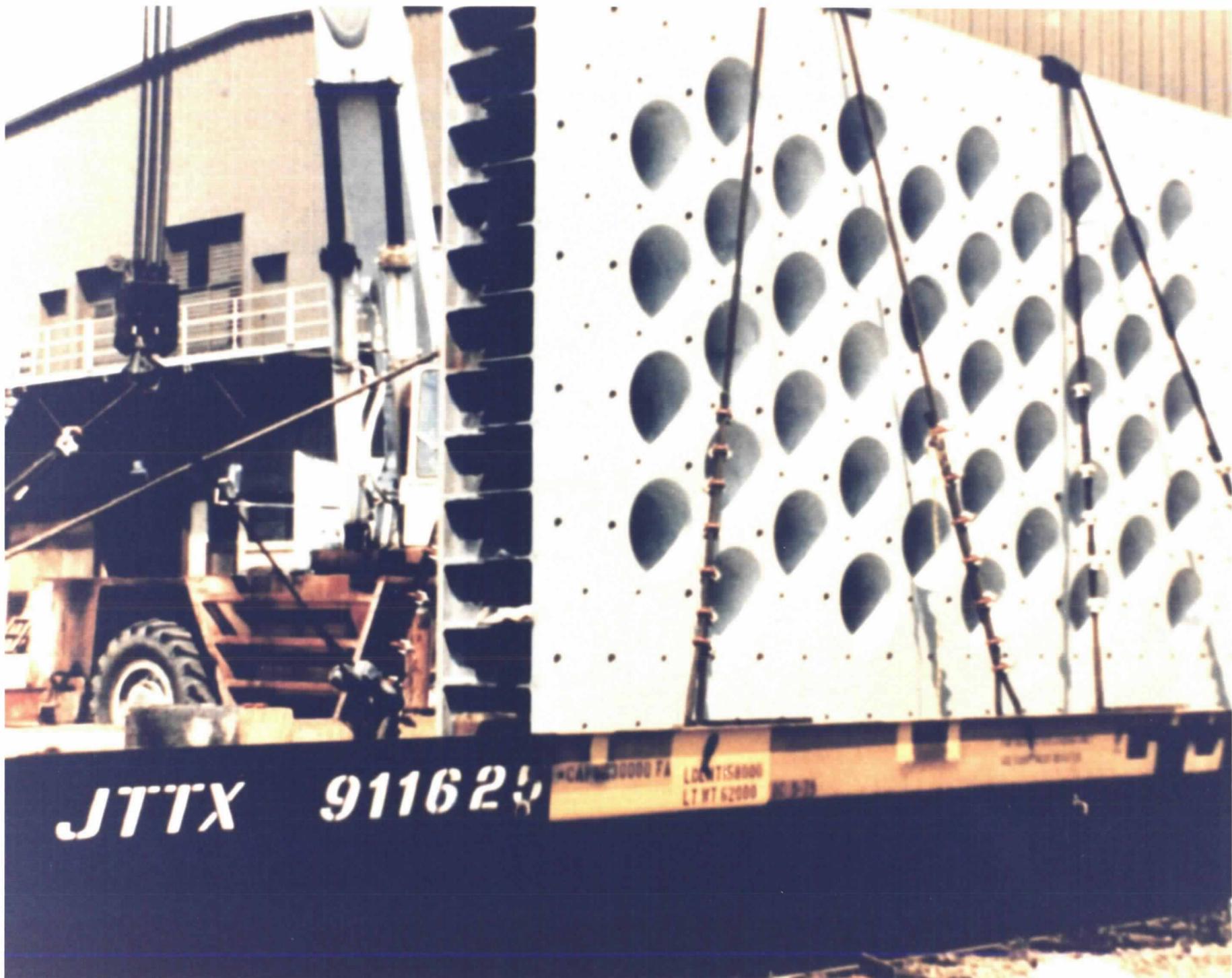
MODULAR VAULT DRY STORAGE (MVDS)



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JTTX 911625

CAPAC 0000 FA
LDENT: 8000
LT WT 62000

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STORAGE TECHNOLOGY BIDS

PROCESS

- **REQUEST FOR PROPOSAL (RFP)**
- **FIXED PRICED PROPOSALS FOR MRS STORAGE CONCEPT (FPPMS)**
- **AWARDS - MULTIPLE BIDDERS**

RFP

- **MULTIPLE BIDS RECEIVED**
- **EVALUATION COMPLETE**
- **MULTIPLE AWARDS WILL BE MADE**

SCOPE OF TECHNOLOGIES FPPMS AWARDS

- **VAULT**
- **CONCRETE CASK**
- **METAL CASK**
- **DUAL PURPOSE CASK**
- **HORIZONTAL STORAGE MODULE**

PROJECTED SCHEDULE

RFP ISSUED	8/20/91
BID DUE DATE	9/20/91
TECH. EVAL. COMPLETED	11/27/91
BIDDER'S MEETINGS COMPLETED	1/06/92
BAFO REQUEST ISSUED	1/13/92
BAFO TECH. EVAL. COMPLETED	1/21/92
COMPLETED EVALUATION TO DOE	3/13/92
DOE APPROVAL	4/01/92
ALL CONTRACTS AWARDED	4/01/92
EARLY SUBMITTAL OF TECHNICAL DATA	5/01/92

TECHNOLOGY PROPOSALS SCHEDULE

PERFORMANCE COMPLETED (INCLUDES FIXED PRICE PROPOSALS)	6/30/92
ORAL PRESENTATIONS BY VENDORS	7/22/92

MRS DESIGN

MRS CDR TECHNOLOGIES

- **REFERENCE**

- **DRY TRANSFER - VERTICAL CONCRETE CASK TECHNOLOGY**

- **ALTERNATES**

- **POOL STORAGE TECHNOLOGY**

- **DRY VAULT STORAGE TECHNOLOGY**

- **DELTA'S**

- **METAL CASK STORAGE TECHNOLOGY**

- **HORIZONTAL STORAGE TECHNOLOGY**

- **DUAL PURPOSE STORAGE TECHNOLOGY**

DRY TRANSFER - VERTICAL CONCRETE CASK TECHNOLOGY

- **DRY TRANSFER CELL FOR LOADING STORAGE CASKS**
- **FLEXIBLE DESIGN FOR MULTIPLE VENDORS**
- **1,300 STORAGE CASKS FOR 15,000 MTU**
- **SITE ACREAGE - 460 ACRES**

POOL STORAGE TECHNOLOGY

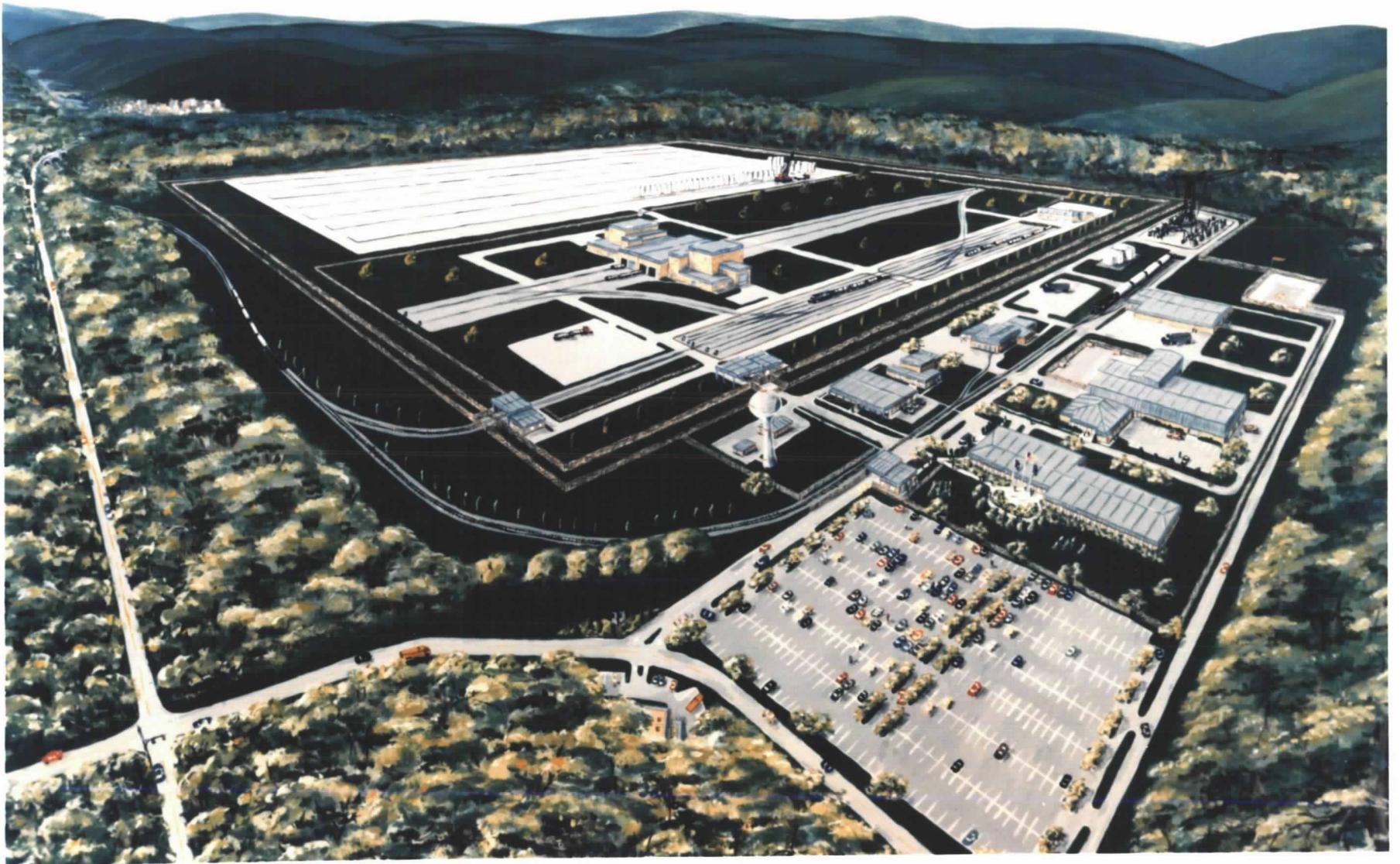
- **POOL TRANSFER FROM SHIPPING CASKS**
- **MODULE POOL STORAGE (2,500 MTU PER POOL)**
- **PROVEN UTILITY POOL STORAGE DESIGN**
- **SITE ACREAGE - 286 ACRES**

DRY VAULT STORAGE

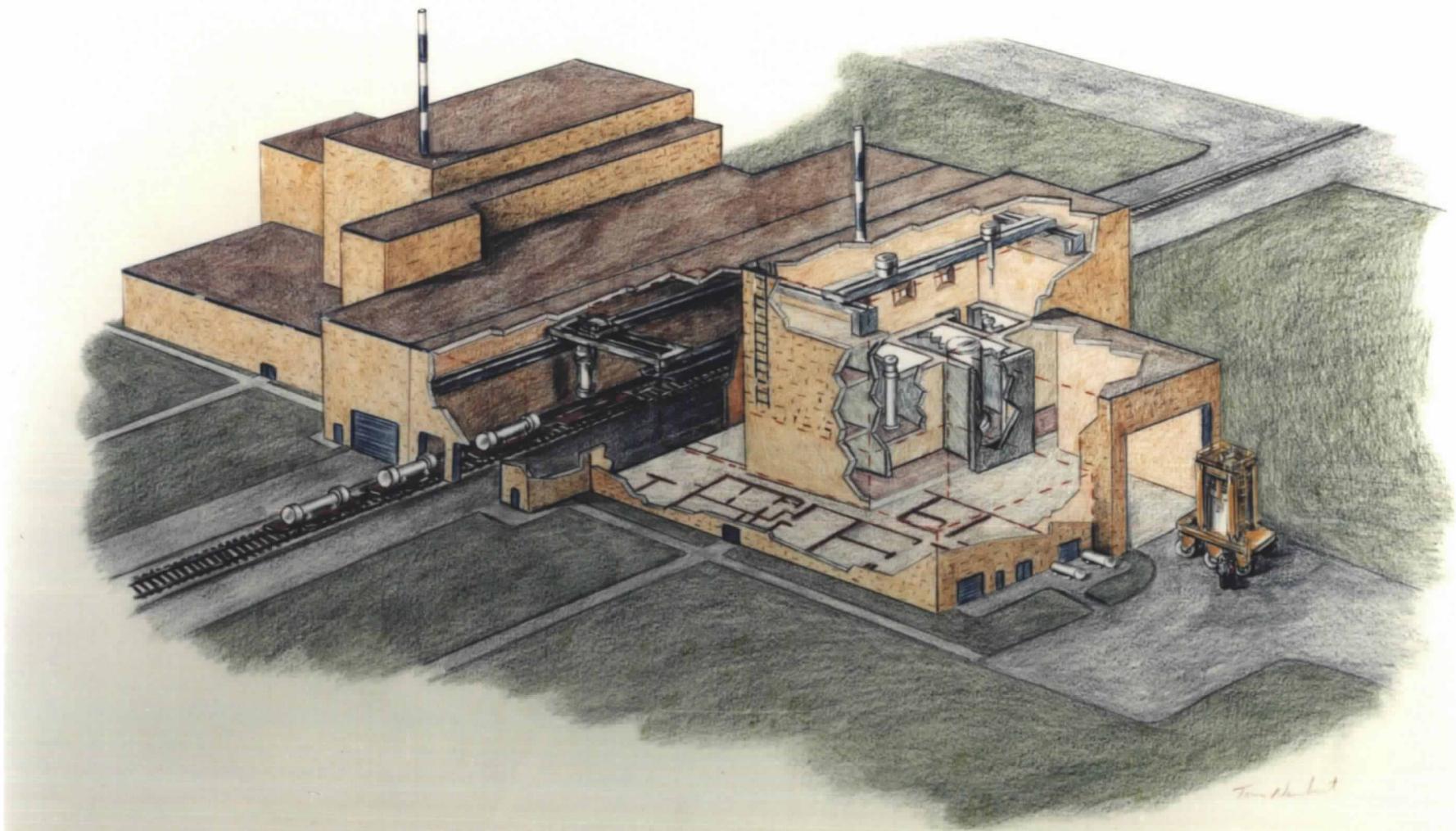
- **DRY TRANSFER CELL TO CANISTER**
- **CANISTERS PLACED IN STORAGE TUBES**
- **MODULAR VAULT DESIGN**
- **SITE ACREAGE - 363 ACRES**

DELTA'S

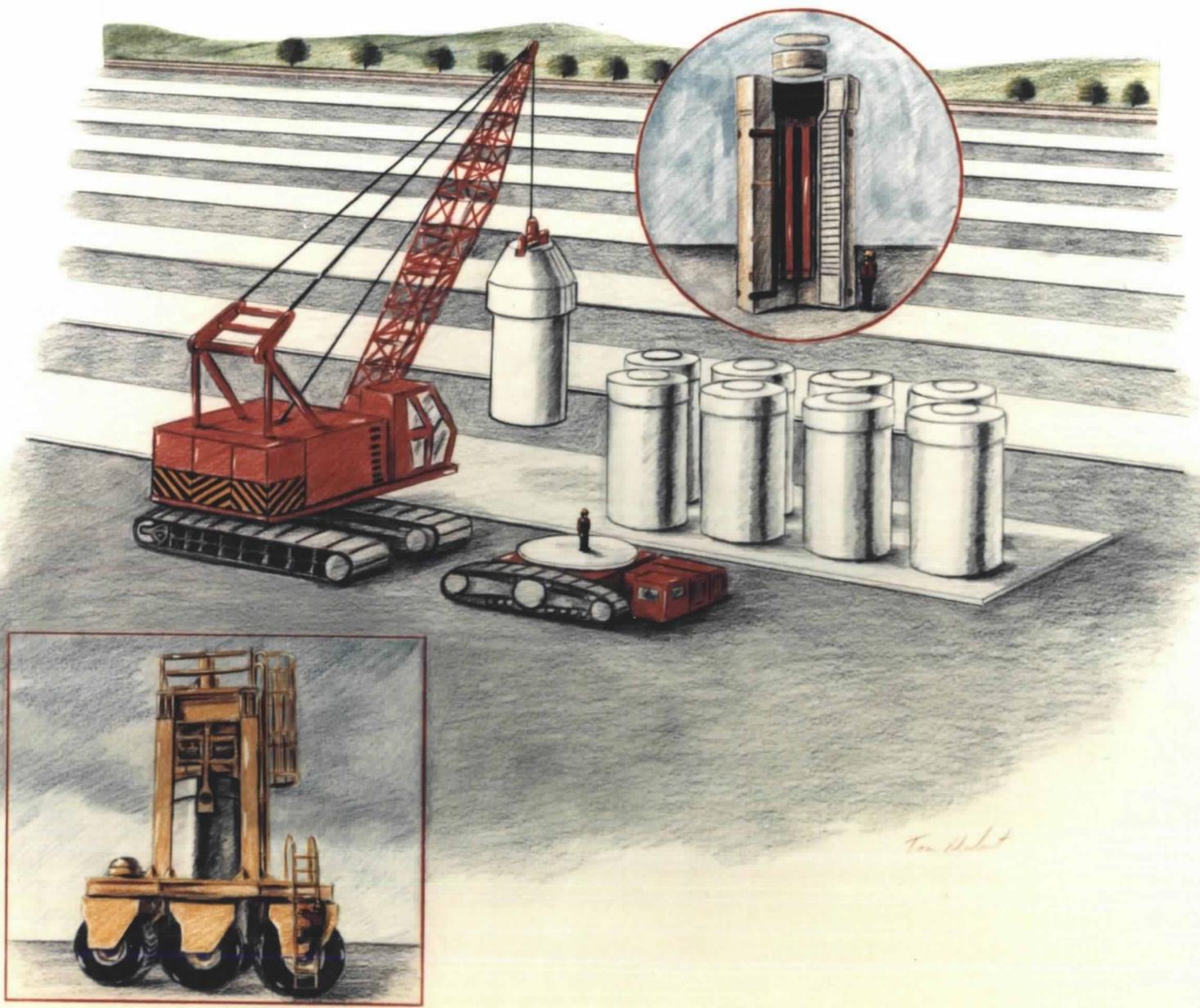
- **SIMILAR DESIGN TO DRY TRANSFER - VERTICAL**
- **NO MAJOR CHANGES TO TRANSFER METHOD**
- **SITE ACREAGE - SAME AS DRY STORAGE**



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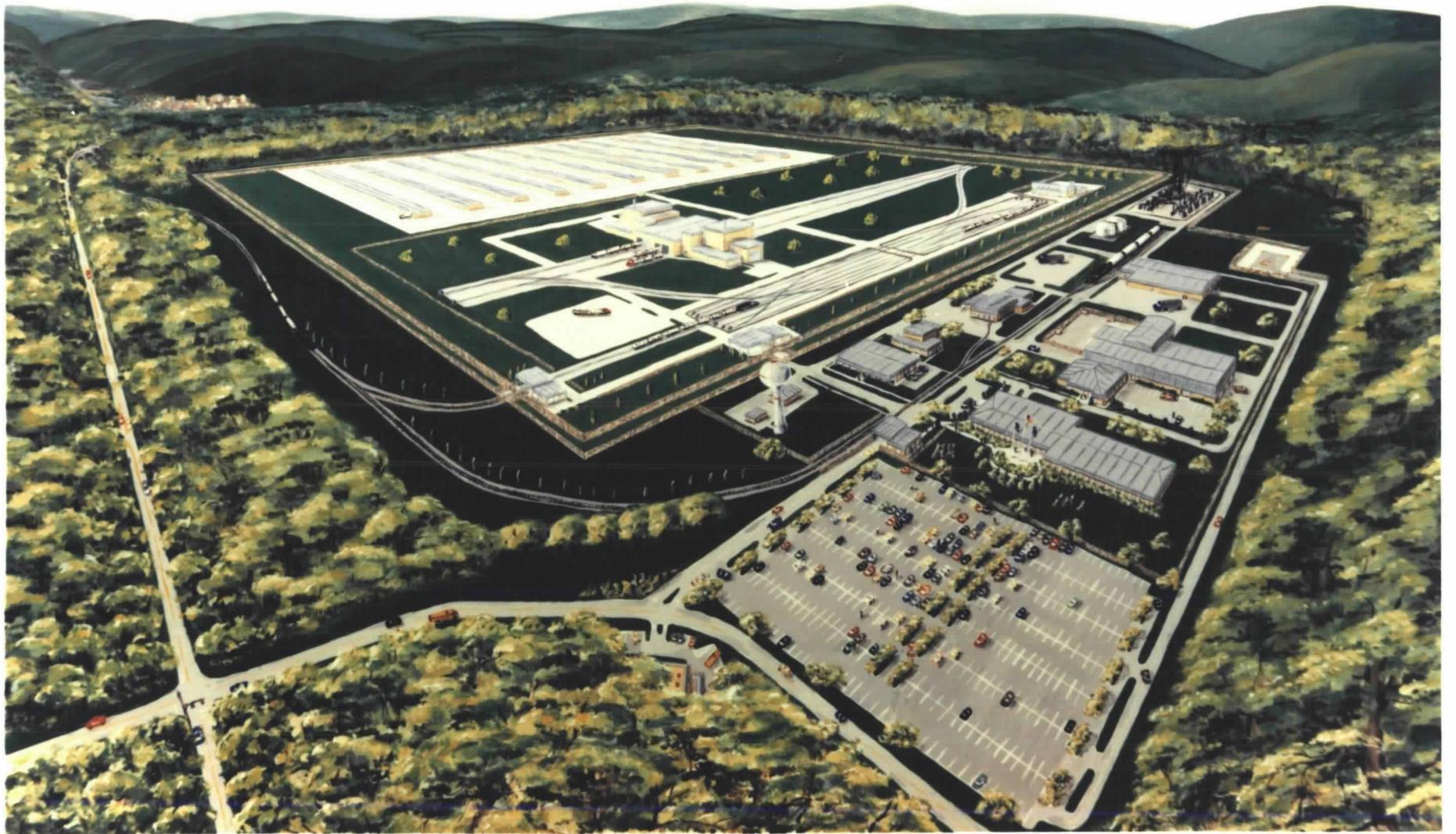


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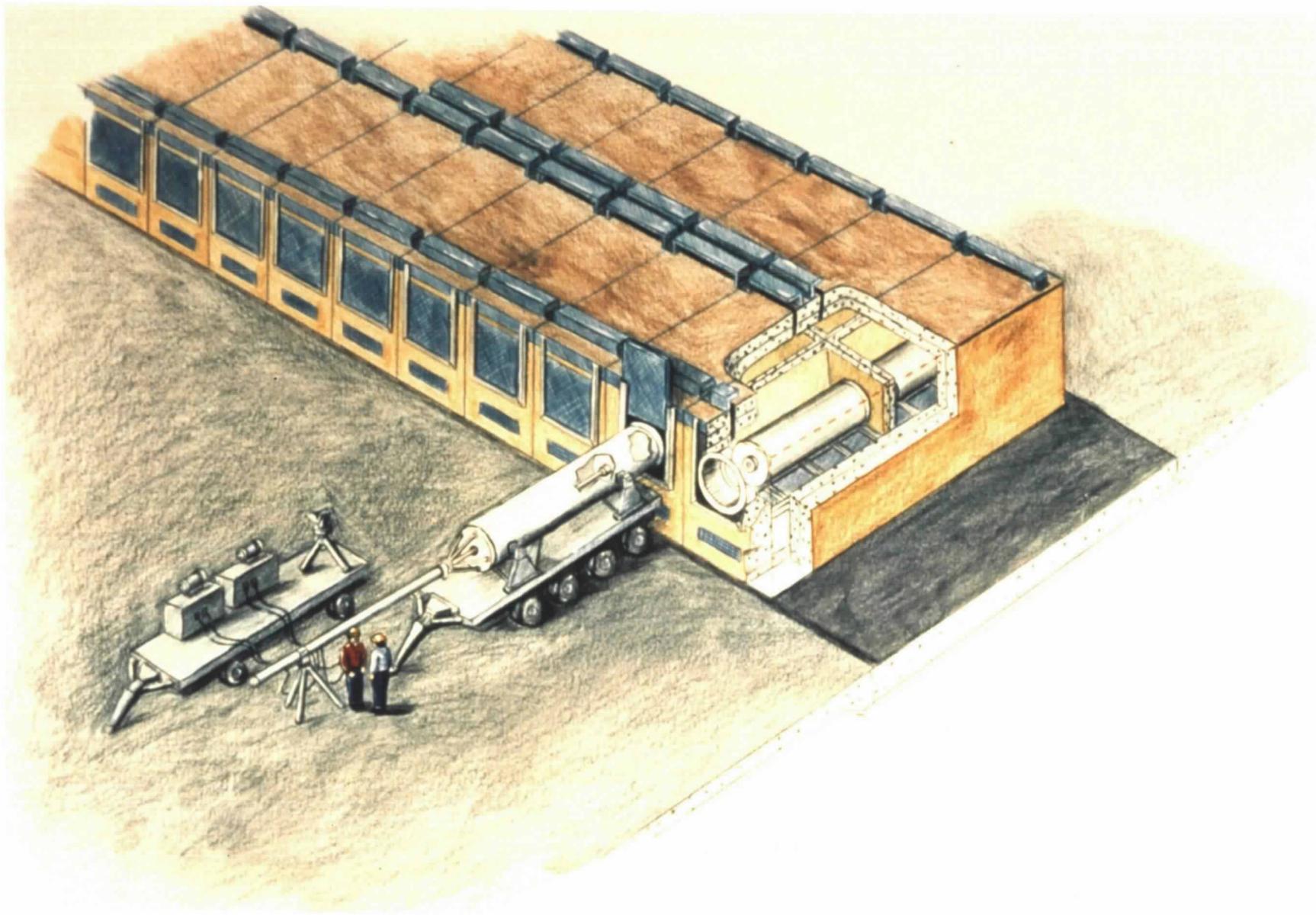


Tom Hubert

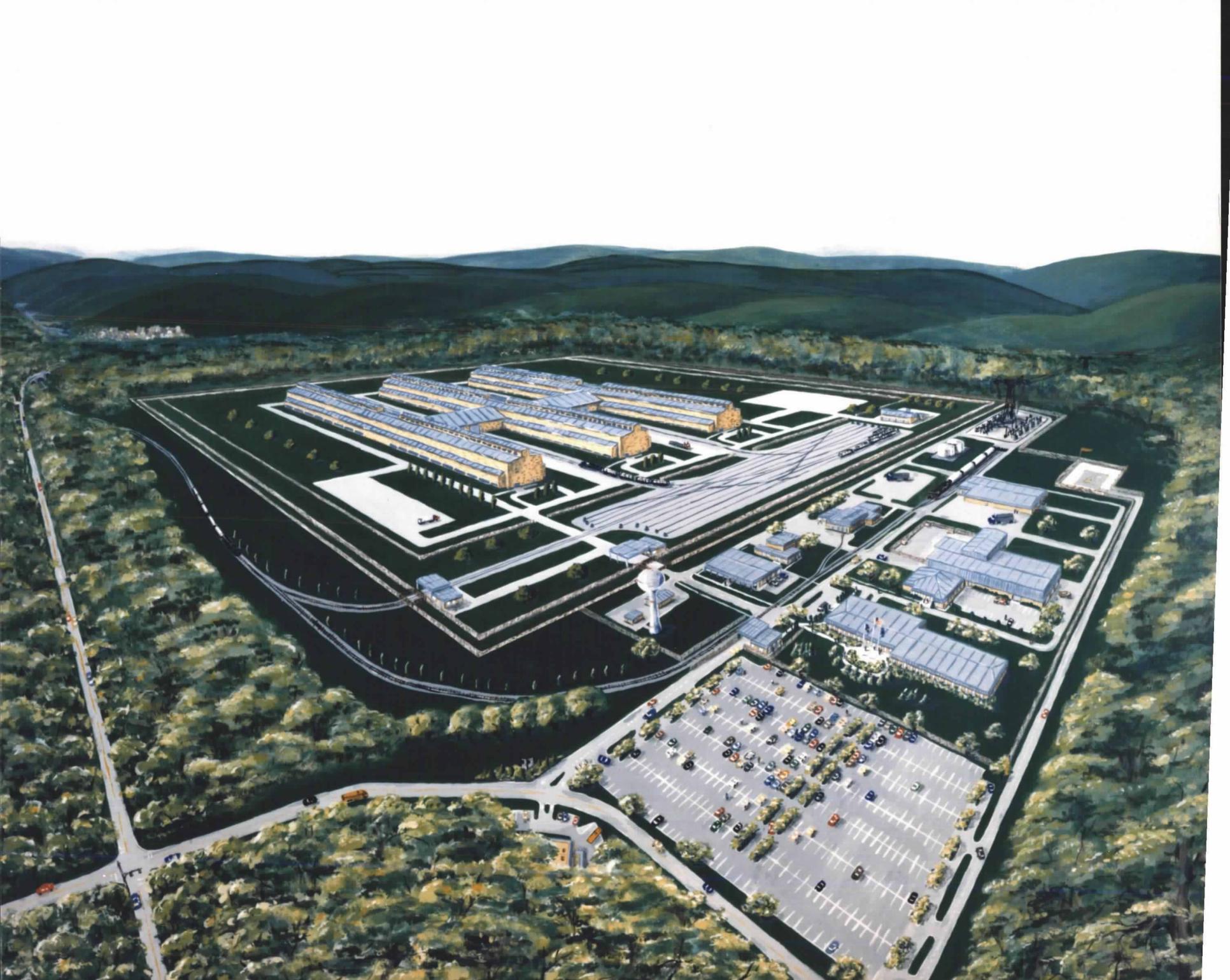
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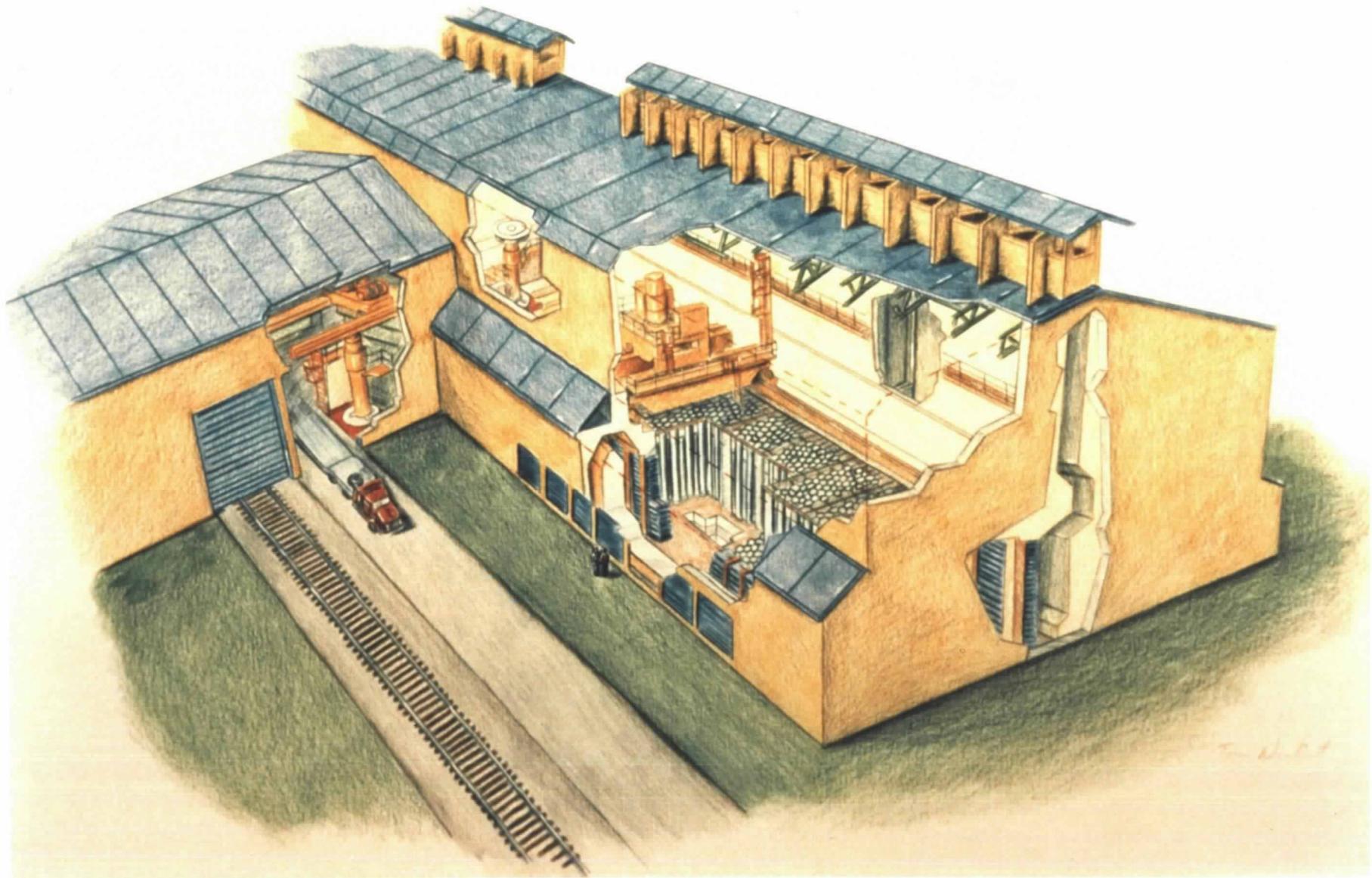
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MRS DESIGN REVIEWS

- **READINESS REVIEW**
- **CDR REVIEW**
- **SAR DESIGN READINESS REVIEW**
- **SAR DESIGN REVIEW**

MRS Schedule

