PROGRAM HISTORY AND ORGANIZATION

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U.S. DEPARTMENT OF ENERGY

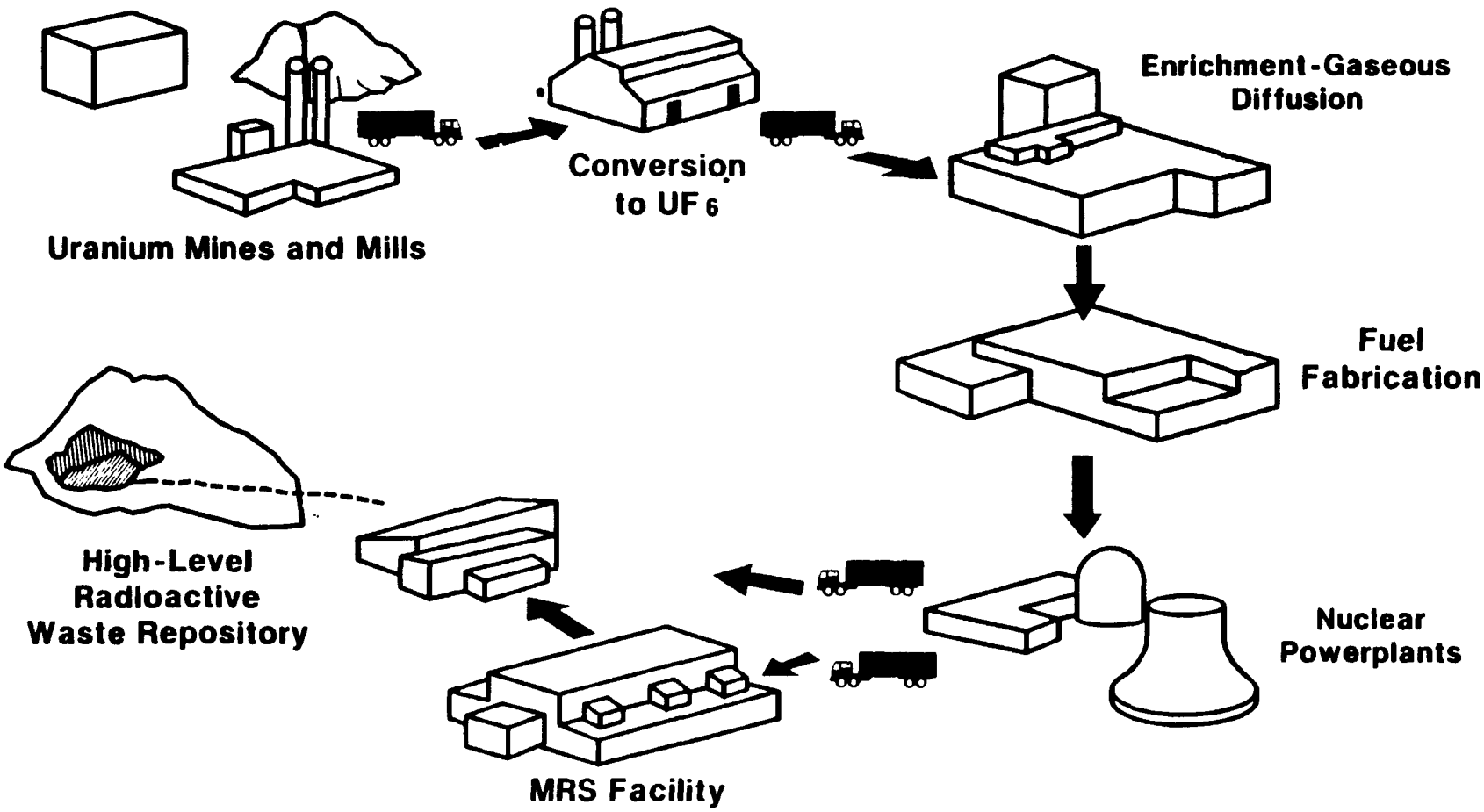
PRESENTATION TO THE
NUCLEAR WASTE TECHNICAL REVIEW BOARD
MARCH 7-8, 1989

CIVILIAN RADIOACTIVE WASTE MANAGEMENT PROGRAM

PURPOSE:

DEVELOPMENT OF A GEOLOGIC REPOSITORY FOR THE DISPOSAL OF HIGH-LEVEL RADIOACTIVE WASTE AND SPENT FUEL, INCLUDING THE DEVELOPMENT OF INTERIM STORAGE AND TRANSPORTATION CAPABILITIES PRIOR TO THE AVAILABILITY OF A REPOSITORY FOR PERMANENT DISPOSAL, IN MANNER THAT FULLY PROTECTS THE PUBLIC HEALTH AND SAFETY IN ACCORDANCE WITH THE NUCLEAR POLICY ACT OF 1982, AS AMENDED

NUCLEAR FUEL CYCLE



Many steps are involved in the generation of electricity at nuclear powerplants. The permanent disposal of radioactive waste is the last step in the nuclear fuel cycle.

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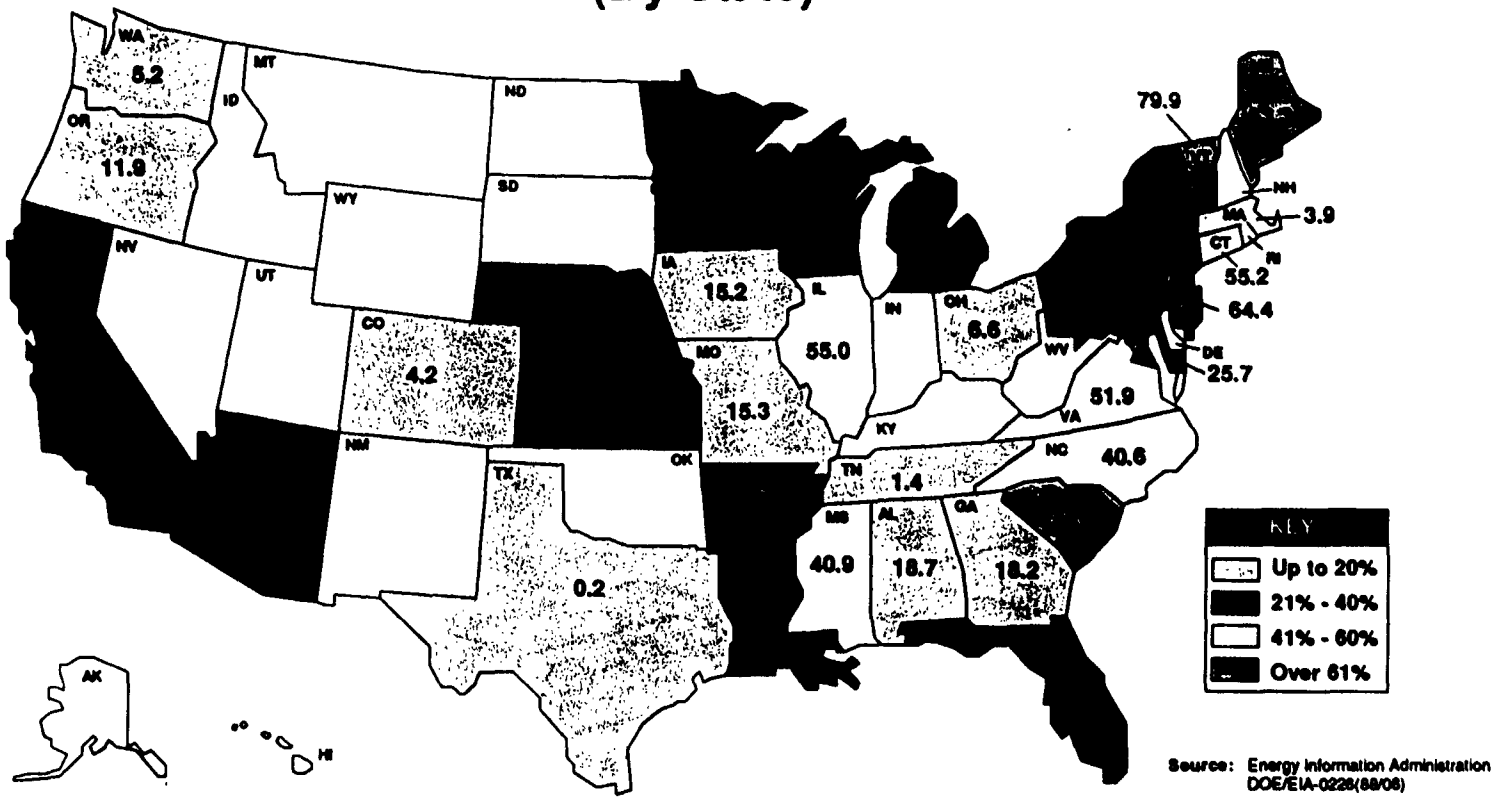
OGR 08 004

PERCENTAGE OF ELECTRICITY GENERATED BY NUCLEAR POWERPLANTS IN 1988

(By State)



Nine states receive more than 40% of their electricity from nuclear powerplants.

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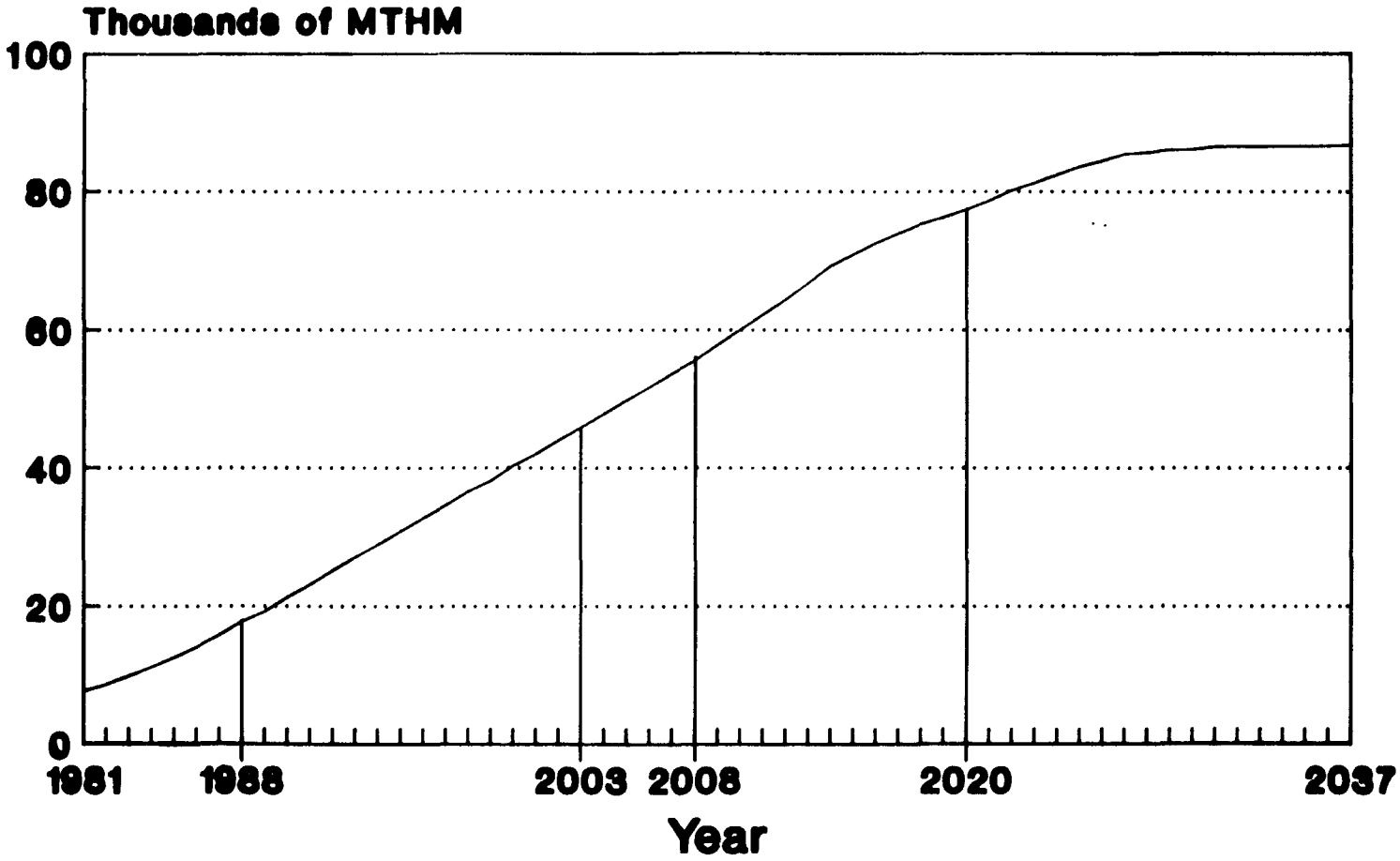
Projections of Cumulative Spent Fuel Discharges



HISTORY OF THE REPOSITORY PROGRAM

HISTORY OF THE REPOSITORY PROGRAM

1955 - NAS CONFERENCE ON GEOLOGIC DISPOSAL

1957 - NAS REPORTS DISPOSAL OF WASTE FEASIBLE IN GEOLOGIC MEDIA; APPENDIX RECOMMENDING SALT FORMATIONS

1958 - USGS REPORT ON ROCK SALT DEPOSITS

1962 - AEC STARTS PROJECT SALT VAULT - 4 SITES STUDIED: 3 IN KANSAS, 1 IN NEW MEXICO, CAREY SALT MINE IN LYONS, KANSAS CHOSEN TO PROCEED

1967 - AEC CLOSES PROJECT SALT VAULT IN CAREY SALT MINE, LYONS, KANSAS

1970 - AEC ANNOUNCES SELECTION OF LYONS, KANSAS FOR DEMONSTRATION OF SALT MINE REPOSITORY
SALT MINE REPOSITORY

- AEC COMMITS TO FEDERAL REPOSITORIES

1971 - AEC CLOSES DEMONSTRATION SALT MINE REPOSITORY IN LYONS, KANSAS

HISTORY OF THE REPOSITORY PROGRAM (CONTINUED)

1972 - AEC ENLARGES FEDERAL REPOSITORY PROJECT TO INCLUDE INVESTIGATIONS OF ROCKS OTHER THAN SALT AND ALTERNATIVE DISPOSAL METHODS

1972 - AEC PROPOSES RETRIEVABLE SURFACE STORAGE FACILITY (RSSF) AS PRIMARY MEANS FOR LONG-TERM STORAGE OF HIGH LEVEL SOLID WASTE AND TRU WASTE FROM REPROCESSING, ALLOWING FOR DEVELOPMENT OF GEOLOGIC REPOSITORY ON LONGER TERM BASIS

1974 - AEC ISSUES RSSF EIS; NEGATIVE REACTION FOCUSES ON RSSF AS INTERIM SOLUTION DIVERTING ATTENTION FROM PERMANENT DISPOSAL

1974 - AEC REORGANIZED INTO ERDA AND NRC; ERDA WITHDRAWS RSSF EIS

- ERDA CREATES GEOLOGIC DISPOSAL EVALUATION PROGRAM (GDEP)

HISTORY OF THE REPOSITORY PROGRAM (CONTINUED)

1976 - ERDA ANNOUNCES PROGRAM TO SEARCH 36 STATES FOR SIX COMMERCIAL REPOSITORY SITES; CREATION OF NATIONAL WASTE TERMINAL STORAGE (NWTS) PROGRAM

1977 - ERDA REORGANIZED INTO DOE

1977 - DOE ANNOUNCES AWAY-FROM-REACTOR STORAGE CONCEPT

1978 - INTERAGENCY REVIEW GROUP (IRG) ESTABLISHED

1979 - COMPTROLLER GENERAL REPORT: SEARCH FOR SITES ON FEDERAL LANDS WHERE RADIOACTIVE MATERIALS ARE ALREADY PRESENT

- NRC INITIATES WASTE CONFIDENCE RULEMAKING

HISTORY OF THE REPOSITORY PROGRAM (CONTINUED)

1980 - IRG RECOMMENDS GEOLOGIC DISPOSAL FOLLOWING CHARACTERIZATION OF 4-5 SITES IN 2-3 GEOLOGIC MEDIA

- DOE ISSUES GENERIC ENVIRONMENTAL IMPACT STATEMENT (GEIS) ON MANAGEMENT OF COMMERCIALLY GENERATED RADIOACTIVE WASTE

1981 - PRESIDENT LIFTS BAN ON REPROCESSING; WITHDRAWS AFR CONCEPT; PROPOSES CHARACTERIZATION OF 3 POTENTIAL REPOSITORIES IN 2 GEOLOGIC MEDIA

1982 - NWPA IS PASSED BY CONGRESS, LOCATION STUDIES IN 5 GEOHYDROLOGIC SETTINGS ARE ALREADY COMPLETE

THE NUCLEAR WASTE POLICY ACT OF 1982

- SITE, CONSTRUCT, AND OPERATE FIRST REPOSITORY
- SITE SECOND REPOSITORY
- NUCLEAR WASTE FUND ESTABLISHED TO PAY COST OF PROGRAM
- LIMITED FEDERAL INTERIM STORAGE CAPABILITY
- SPECIFIC INSTITUTIONAL PROVISIONS FOR STATE, INDIAN TRIBE PARTICIPATION AND PUBLIC INVOLVEMENT
- PREPARE A PROPOSAL FOR CONSTRUCTING A MONITORED RETRIEVABLE STORAGE FACILITY

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HISTORY OF THE REPOSITORY PROGRAM (CONTINUED)

1983 - DOE SENDS OUT DRAFT SITING GUIDELINES FOR PUBLIC COMMENT

- SECRETARY OF ENERGY NOTIFIES GOVERNORS OF 6 STATES THAT DOE IS CONSIDERING 9 SITES WITHIN THEIR STATES FOR POSSIBLE REPOSITORY SITE

1984 - NRC CONCURRENCE ON DOE SITING GUIDELINES

HISTORY OF THE REPOSITORY PROGRAM (CONTINUED)

1984 - DOE ISSUES NINE DRAFT ENVIRONMENTAL ASSESSMENTS, ONE FOR EACH POTENTIALLY ACCEPTABLE SITE:

1) DEAF SMITH COUNTY, TX
2) SWISHER COUNTY, TX
3) LAVENDER CANYON, UT
4) DAVIS CANYON, UT
5) VACHERIE DOME, LA
6) RICHTON DOME, MS
7) CYPRESS CREEK DOME, MS
8) HANFORD, WA
9) YUCCA MOUNTAIN, NV

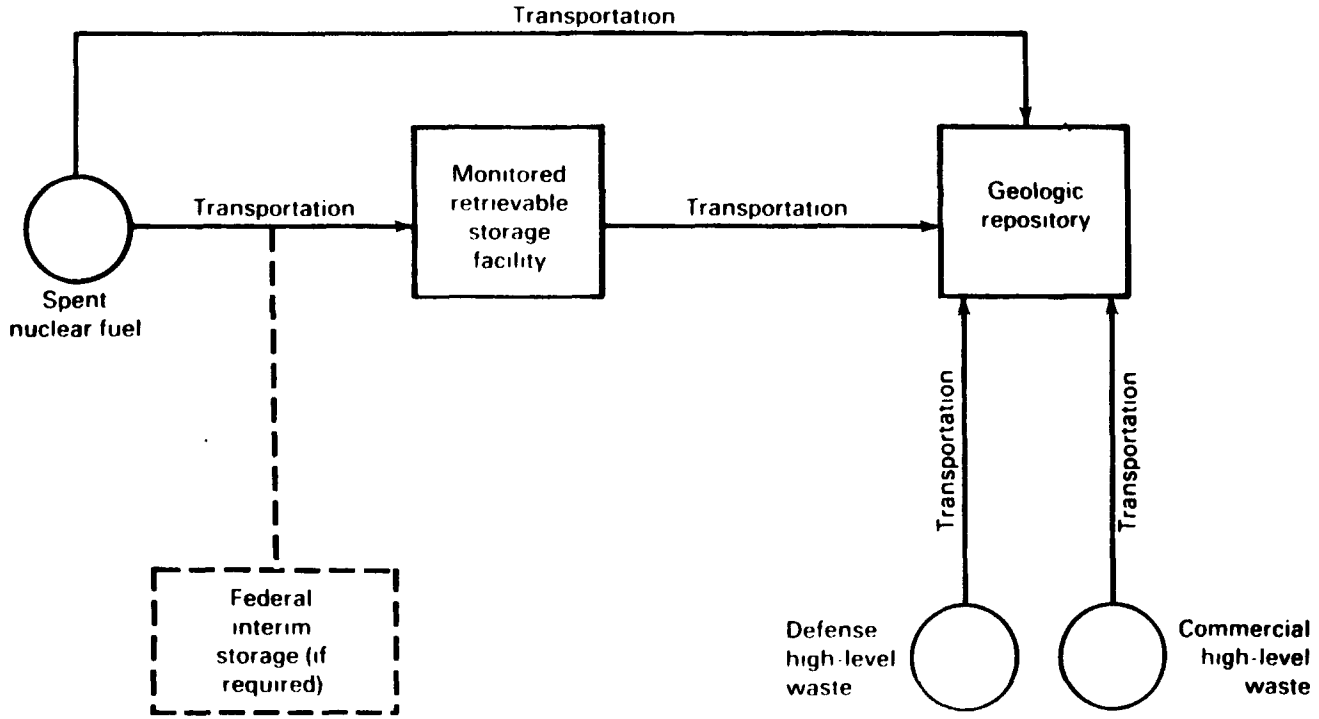
1985 - SITING GUIDELINES EFFECTIVE

1986 - DOE RECOMMENDS THREE SITES TO PRESIDENT AS SUITABLE FOR SITE CHARACTERIZATION

- PRESIDENT APPROVES DOE RECOMMENDATION, THREE SITES ARE:

DEAF SMITH COUNTY, TEXAS
HANFORD, WASHINGTON
YUCCA MOUNTAIN, NEVADA

THE AUTHORIZED WASTE-MANAGEMENT SYSTEM



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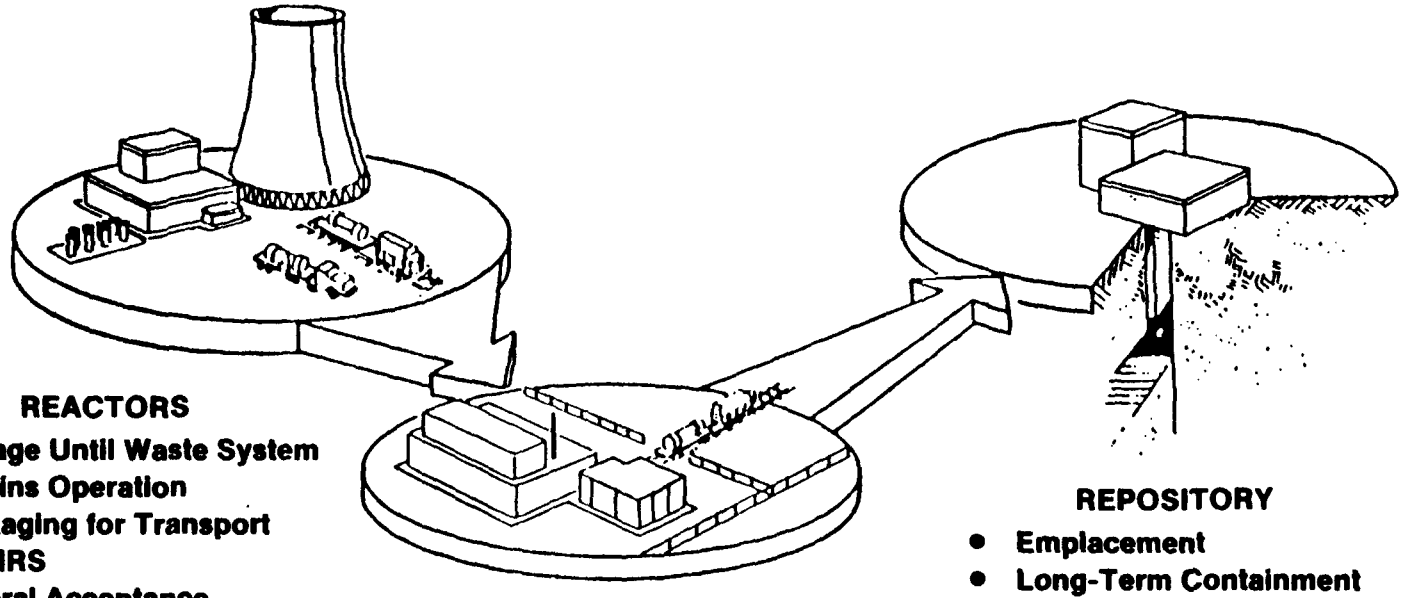

REACTORS

- Storage Until Waste System Begins Operation
- Packaging for Transport to MRS
- Federal Acceptance

REPOSITORY

- Emplacement
- Long-Term Containment

MRS FACILITY

- Managing At-Reactor SF Acceptance
- Scheduling and Controlling Transport to MRS
- SF Receipt, Inspection and Accounting
- Consolidation, Packaging and Conditioning for Disposal
- Monitored, Retrievable Storage
- Controlling Transport to Repository
- Special Packaging, Repair and Testing

Legend:

MRS - Monitored Retrievable Storage

SF - Spent Fuel

EVENTS THAT LED TO THE AMENDMENT OF THE NWPA

- RISING COSTS OF THE REPOSITORY PROGRAM
- RESISTANCE TO THE SITING PROGRAM FOR THE FIRST AND SECOND REPOSITORY

RECENT DEVELOPMENTS

THE NUCLEAR WASTE POLICY AMENDMENTS ACT OF 1987:

FIRST REPOSITORY

- **CHARACTERIZE ONLY YUCCA MOUNTAIN, NV SITE TO DETERMINE SUITABILITY AS REPOSITORY**
- **TERMINATE SITING ACTIVITIES AT HANFORD, WA AND DEAF SMITH COUNTY, TX SITES**
- **IF YUCCA MOUNTAIN IS FOUND TO BE UNSUITABLE, WITHIN 6 MONTHS DOE SHALL REPORT TO CONGRESS WITH RECOMMENDATIONS FOR FURTHER ACTION TO ASSURE SAFE, PERMANENT DISPOSAL OF SPENT FUEL AND HIGH-LEVEL WASTE**

SECOND REPOSITORY

- **DOE MAY NOT CONDUCT SITE SPECIFIC ACTIVITIES**
- **REPORT TO CONGRESS BETWEEN 2007 AND 2010 ON NEED FOR SECOND REPOSITORY**

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THE NUCLEAR WASTE POLICY AMENDMENTS ACT OF 1987: (CONTINUED)

MONITORED RETRIEVABLE STORAGE (MRS)

- SITE, CONSTRUCT, AND OPERATE AN MRS FACILITY, SUBJECT TO CERTAIN CONDITIONS
- ESTABLISH THE MRS REVIEW COMMISSION TO EVALUATE THE NEED FOR AN MRS FACILITY IN THE FEDERAL WASTE MANAGEMENT SYSTEM

OTHER PROVISIONS

- PROVIDE FINANCIAL INCENTIVES THROUGH BENEFITS AGREEMENT FOR REPOSITORY OR MRS HOST STATE OR HOST TRIBE, AND PROVIDE FOR PARTICIPATION BY LOCAL GOVERNMENTS
- ESTABLISH NUCLEAR WASTE TECHNICAL REVIEW BOARD FOR EVALUATION OF SCIENTIFIC AND TECHNICAL ACTIVITIES OF THE PROGRAM
- ESTABLISH NUCLEAR WASTE NEGOTIATOR

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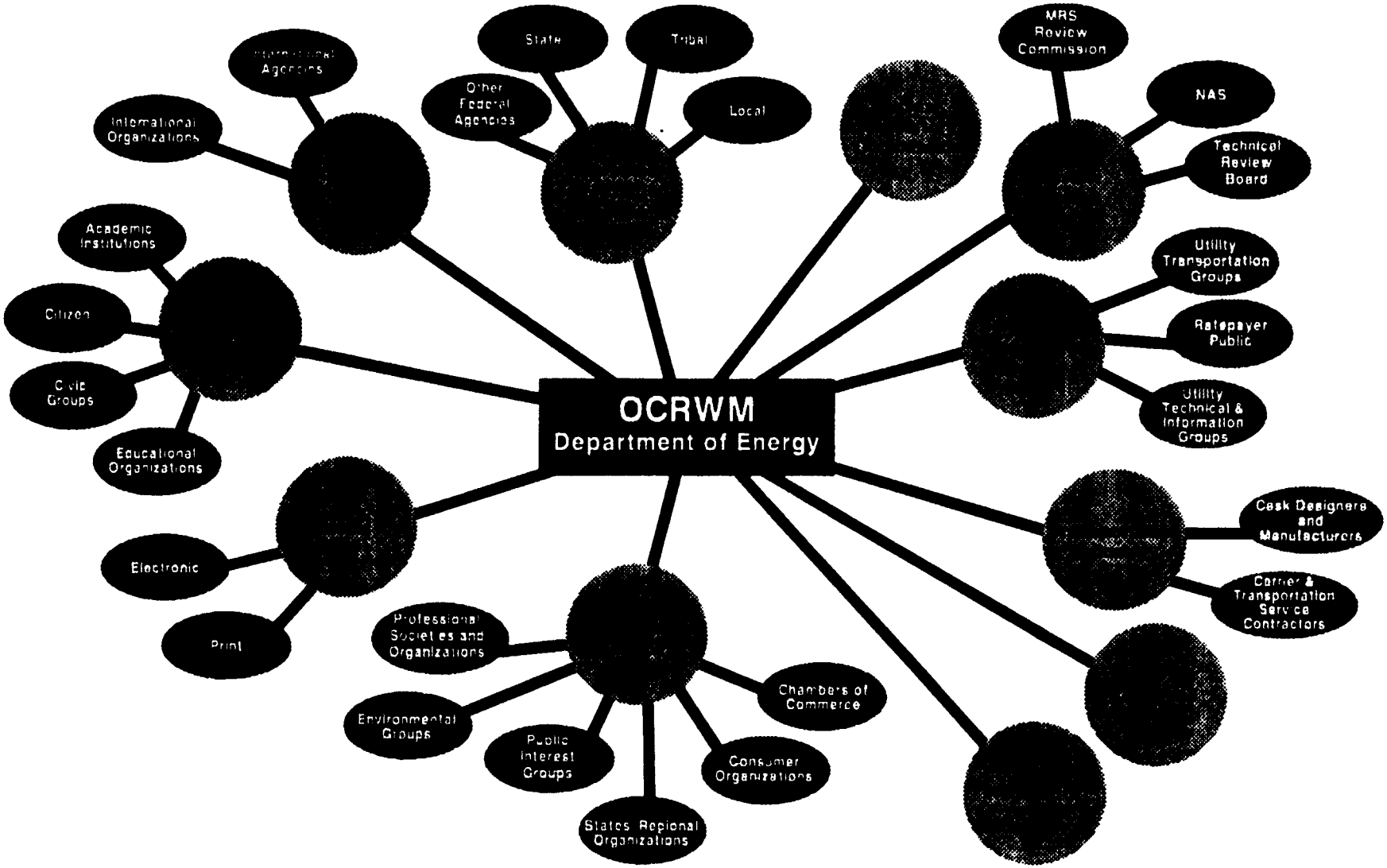
INTERACTION WITH INTERESTED PARTIES



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ORGANIZATIONS THAT HAVE AN IMPORTANT REGULATORY AND/OR OVERSIGHT ROLE

- NUCLEAR REGULATORY COMMISSION (NRC)
- STATE OF NEVADA
  - NUCLEAR WASTE PROJECT OFFICE
  - COMMISSION ON NUCLEAR PROJECTS
  - LEGISLATIVE COMMITTEE ON HIGH-LEVEL RADIOACTIVE WASTE
  - AFFECTED UNITS OF LOCAL GOVERNMENT: NYE COUNTY, CLARK COUNTY, AND LINCOLN COUNTY
- NUCLEAR WASTE TECHNICAL REVIEW BOARD NOMINATED BY THE NATIONAL ACADEMY OF SCIENCES
- U.S. GENERAL ACCOUNTING OFFICE (GAO)
- U.S. CONGRESS

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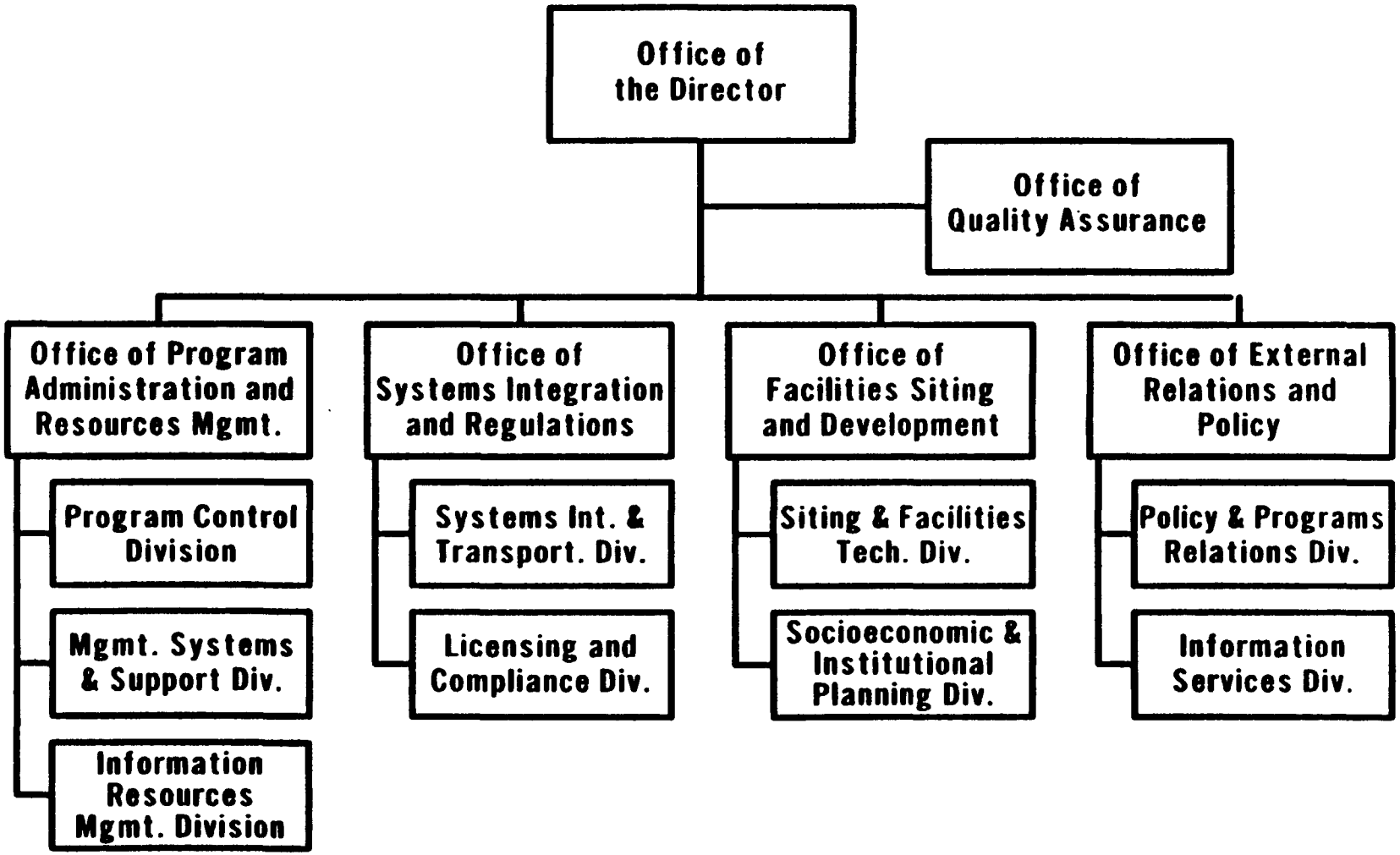
INTERNATIONAL ACTIVITIES

- AGREEMENT AND EXCHANGE
  - MULTINATIONAL ORGANIZATIONS
    - COMMISSION OF EUROPEAN COMMUNITIES (CEC)
    - INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)
    - ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT/NUCLEAR ENERGY AGENCY (OECD/NEA)
  - NATIONS
    - BELGIUM
    - CANADA
    - FEDERAL REPUBLIC OF GERMANY
    - FRANCE
    - JAPAN
    - SWEDEN
    - SWITZERLAND
    - UNITED KINGDOM

INTERNATIONAL ACTIVITIES (CONTINUED)

- COOPERATIVE ACTIVITIES
  - CANADA: ATOMIC ENERGY OF CANADA LIMITED (AECL)
    PROJECT AGREEMENT UNDER NEGOTIATION
  - SWEDEN: NATURAL ANALOG (POCOS DE CALDES)
    INTRAVAL
    STUDY PLAN REVIEW
  - SWITZERLAND: NAGRA
  - OECD/NEA: STRIPA
    THERMODYNAMIC DATA BASE
    PERFORMANCE ASSESSMENT
    IN-SITU TESTING
- SECTION 223 ACTIVITIES

OCRWM Organization Chart



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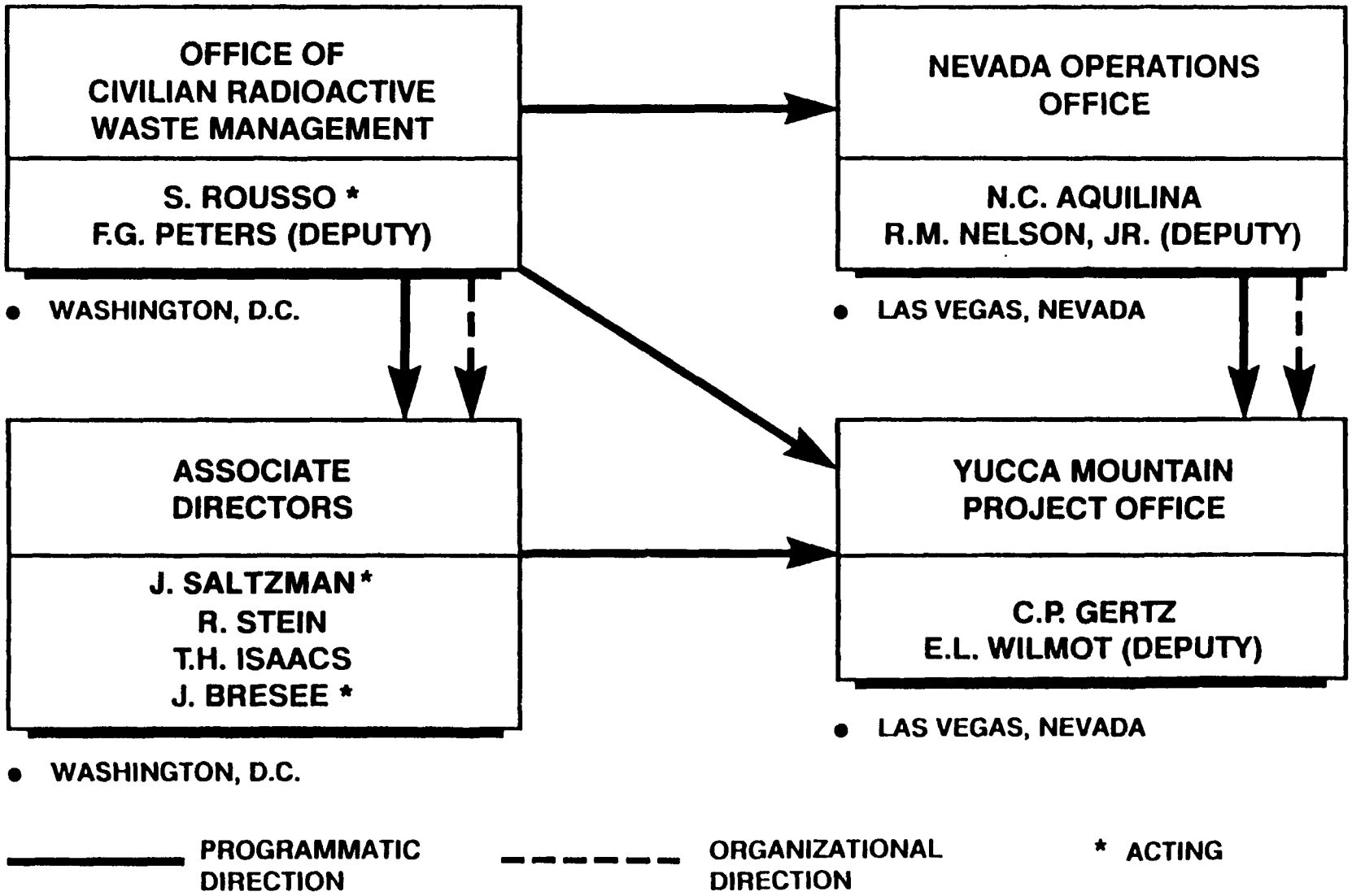
OCRWM/HQ - DOE NV ORGANIZATION



FEDERAL WASTE MANAGEMENT SYSTEM ELEMENTS

FEDERAL WASTE MANAGEMENT SYSTEM ELEMENTS

- REPOSITORY
- MONITORED RETRIEVABLE STORAGE
- TRANSPORTATION

0110-0102RJ 3/1/89

FEDERAL WASTE MANAGEMENT SYSTEM ELEMENTS

- REPOSITORY
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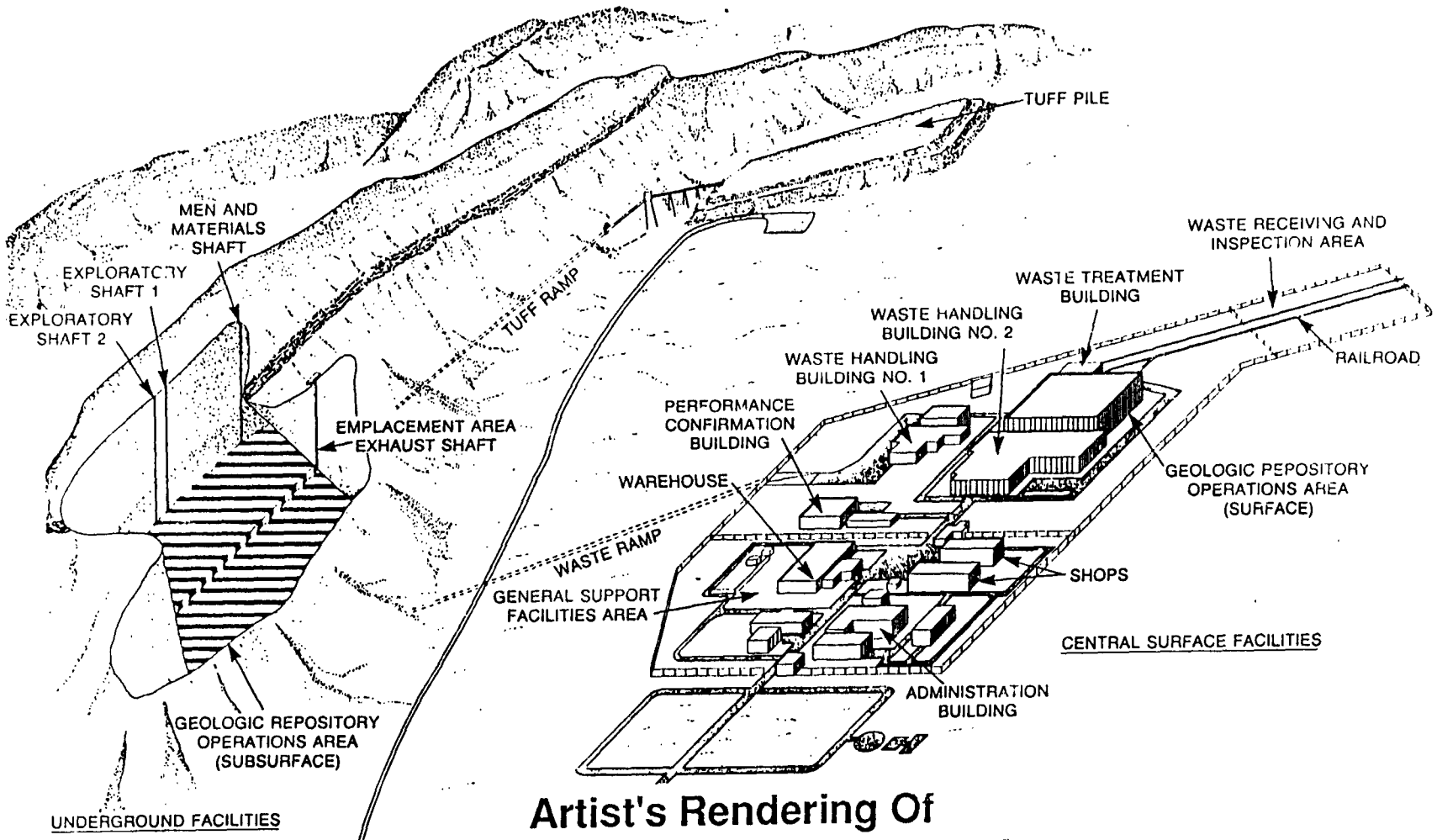


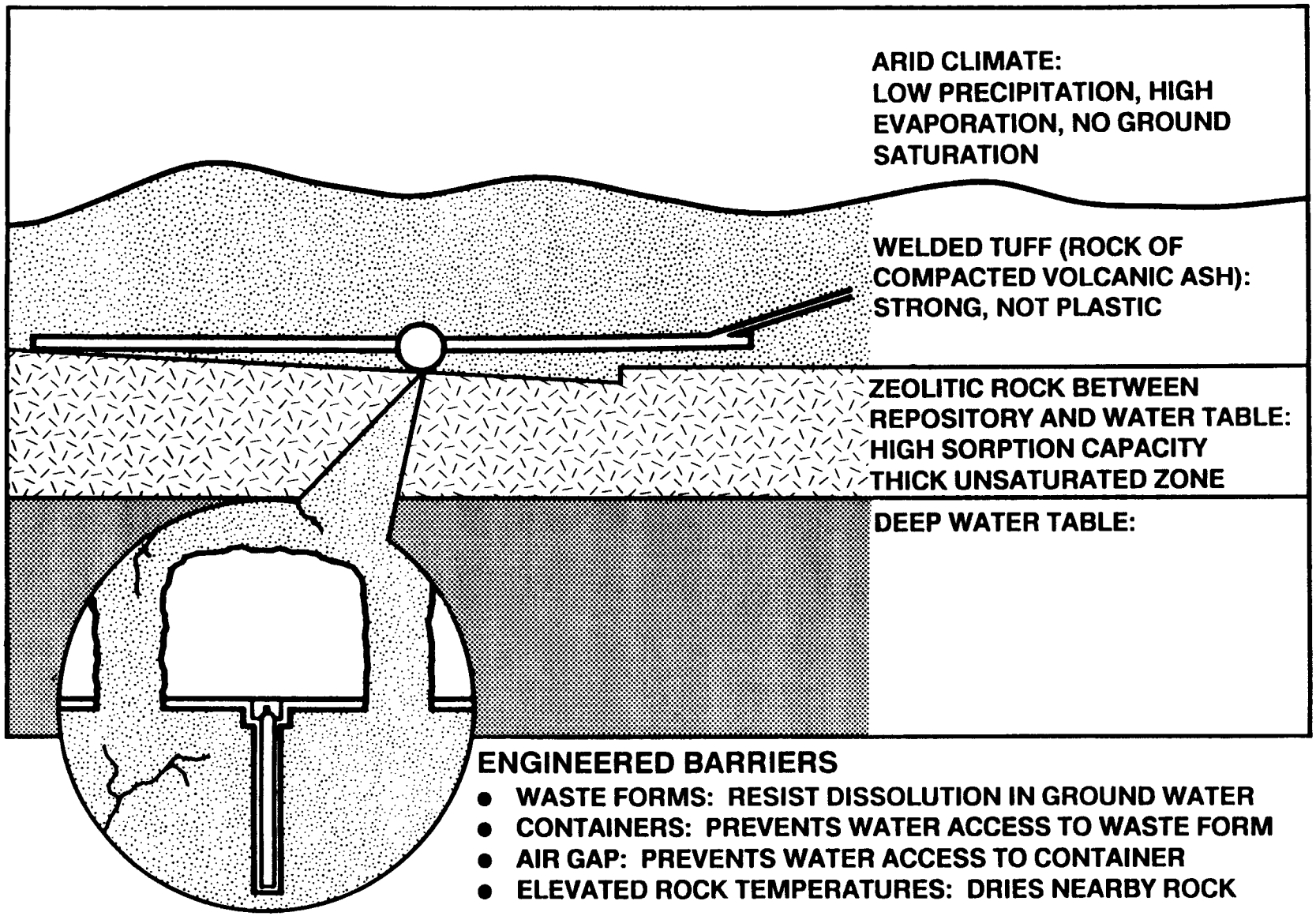
Artist's Rendering Of
Potential Yucca Mountain Repository

CGR 12 013

REPOSITORY OBJECTIVE

- PERMANENTLY ISOLATE SPENT FUEL AND HIGH LEVEL WASTE IN A MANNER THAT ASSURES PUBLIC HEALTH AND SAFETY
- CONFINE RADIOACTIVE MATERIALS BY USING NATURAL AND ENGINEERED BARRIERS
- SATISFY EPA REGULATIONS WITH REGARD TO ENVIRONMENTAL RELEASES

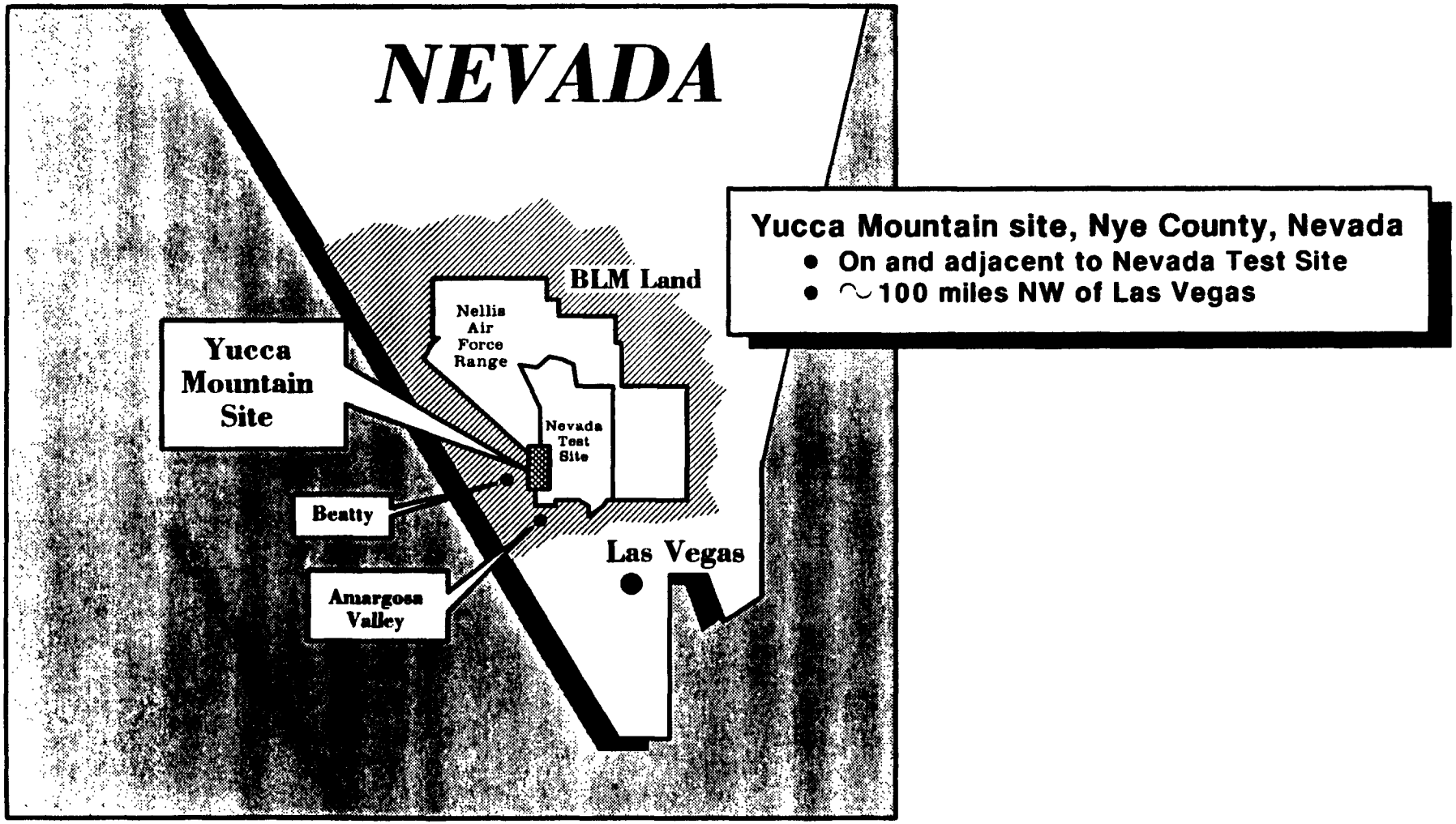
OBJECTIVES FOR THE COMPONENTS OF THE REPOSITORY SYSTEM



ENGINEERED BARRIERS

- WASTE FORMS: RESIST DISSOLUTION IN GROUND WATER
- CONTAINERS: PREVENTS WATER ACCESS TO WASTE FORM
- AIR GAP: PREVENTS WATER ACCESS TO CONTAINER
- ELEVATED ROCK TEMPERATURES: DRIES NEARBY ROCK

POTENTIAL REPOSITORY SITE



Yucca Mountain has been named for site characterization.

SITE CHARACTERIZATION PROGRAM

Objectives of Site Characterization Program

- Establish Geologic, Hydrologic, and Geochemical Conditions at a Candidate Site
- Provide Data Needed for Design of the Waste Package and the Repository
- Provide Data Needed for Performance Assessment of the Repository System

Need for SCP

1. Legislative Requirement

Nuclear Waste Policy Act

2. Regulatory Requirement

10 CFR 60

3. Program Requirement

To Guide Site Characterization Program

REQUIRED CONTENT OF DOCUMENTS TO BE SUBMITTED TO NRC AND TO STATE PRIOR TO SHAFT SINKING

SITE CHARACTERIZATION PLAN

- A GENERAL PLAN FOR SITE CHARACTERIZATION ACTIVITIES, INCLUDING:
  - DESCRIPTION OF THE SITE
  - DETAILED DESCRIPTION OF SITE CHARACTERIZATION ACTIVITIES
  - PLANS FOR DECONTAMINATION AND DECOMMISSIONING OF SITE
  - CRITERIA TO BE USED TO DETERMINE SITE SUITABILITY
  - ANY OTHER INFORMATION REQUIRED BY THE COMMISSION

WASTE PACKAGE PLAN

- A DESCRIPTION OF (1) THE POSSIBLE WASTE FORM OR PACKAGING, (2) THE RELATIONSHIP OF THE FORM OR PACKAGING AND THE GEOLOGIC MEDIUM, (3) A DESCRIPTION OF ACTIVITIES IN REGARD TO (2) ABOVE

REPOSITORY CONCEPTUAL DESIGN

- A SITE SPECIFIC CONCEPTUAL REPOSITORY DESIGN

SCP MILESTONES

• DOE ISSUES SCP CONSULTATION DRAFT (SCP/CD) TO NRC AND STATE	JANUARY 8, 1988
• GENERAL SESSION MEETING ON SCP/CD WITH NRC AND STATE	JANUARY 28-29, 1988
• NRC ISSUED DRAFT POINT PAPERS ON SCP/CD	MARCH 7, 1988
• DOE/NRC WORKSHOP ON DRAFT POINT PAPERS	MARCH 21-24, 1988
• DOE RESOLVES NRC CONCERNS AND OBJECTIONS	APRIL 1988-DECEMBER 1988
• DOE ISSUES SCP TO STATE, NRC, INTERESTED AND AFFECTED PARTIES	DECEMBER 15, 1988
• PUBLIC HEARINGS SCHEDULE	MARCH 20, 21, 23, 1989

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FEDERAL WASTE MANAGEMENT SYSTEM ELEMENTS

- REPOSITORY
- ➡ MONITORED RETRIEVABLE STORAGE
- TRANSPORTATION

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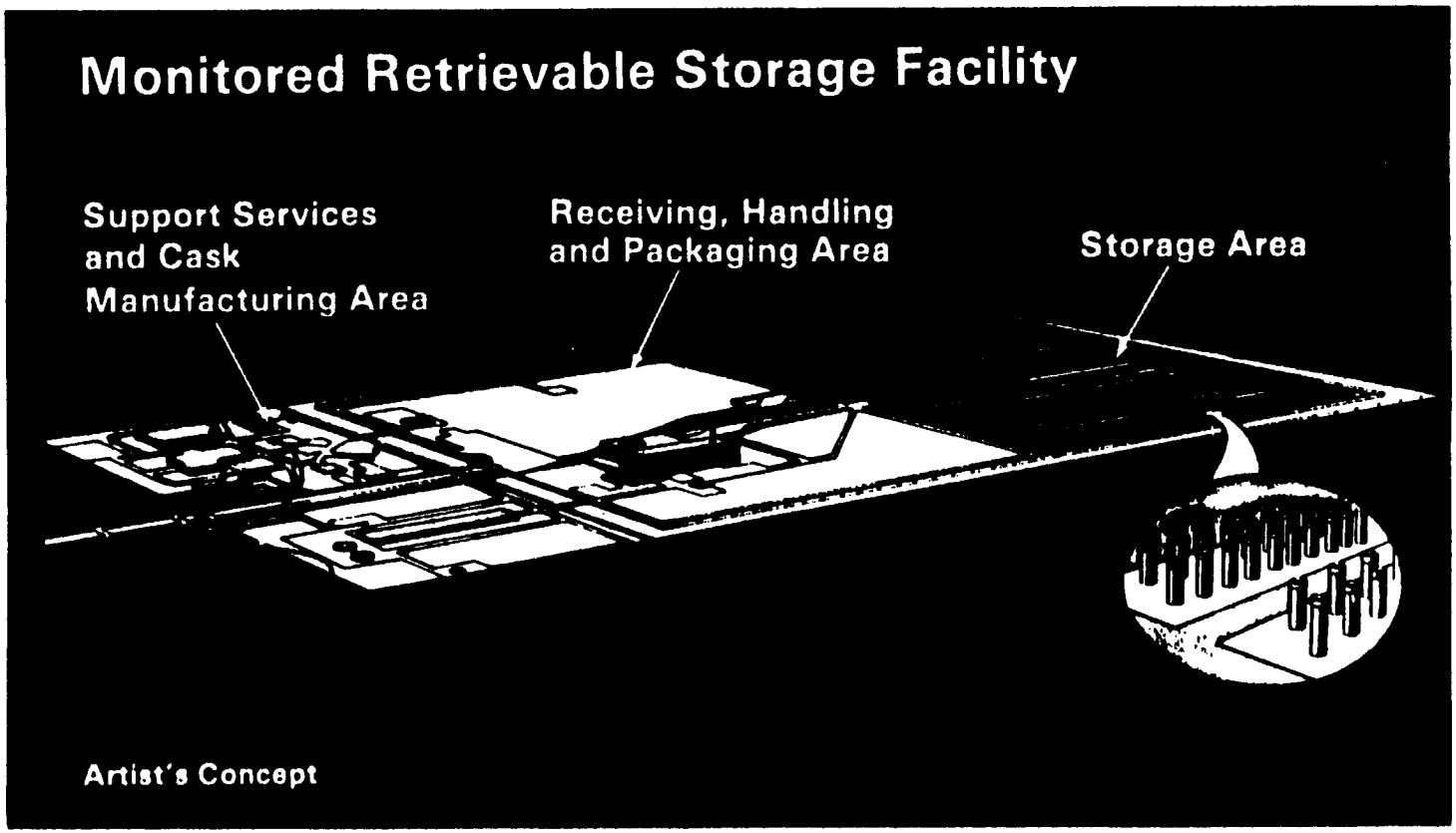
MONITORED RETRIEVABLE STORAGE (MRS)



The Amendments Act authorized DOE to site, construct and operate a Monitored Retrievable Storage (MRS) facility.

MRS

- ONE MRS AUTHORIZED
- TENNESSEE SITING PROPOSAL REVOKED

MRS LICENSING CONDITIONS

- MRS Construction May Not Begin Until NRC Authorizes Repository Construction
- Maximum Storage Prior to Repository Operation = 10,000 Metric Tons
- Maximum Quantity = 15,000 Metric Tons
- Acceptance Prohibited if:
  - NRC License revoked or
  - Construction stops

SITING THE MRS

- DOE MAY SELECT SITE AFTER REPOSITORY SITE APPROACH RECOMMENDED TO PRESIDENT
- PRIOR TO SELECTION (6 MONTHS)
  - NOTIFY STATE/TRIBE
  - HOLD ONE PUBLIC HEARING
- STATE MAY DISAPPROVE
- DISAPPROVAL MAY BE OVERRIDDEN BY CONGRESS

FEDERAL WASTE MANAGEMENT SYSTEM ELEMENTS

- REPOSITORY
- MONITORED RETRIEVABLE STORAGE
- ➡ TRANSPORTATION

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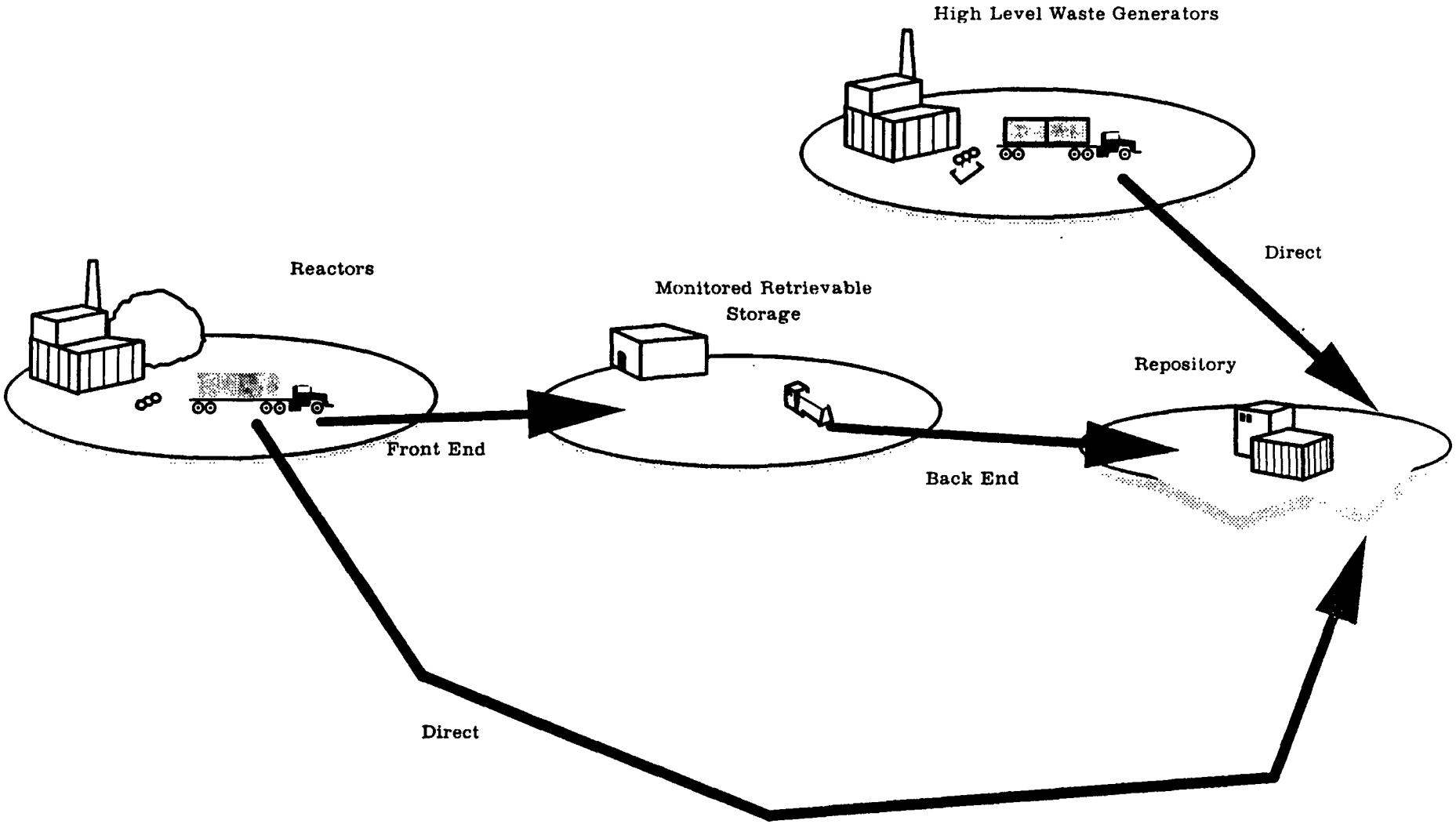
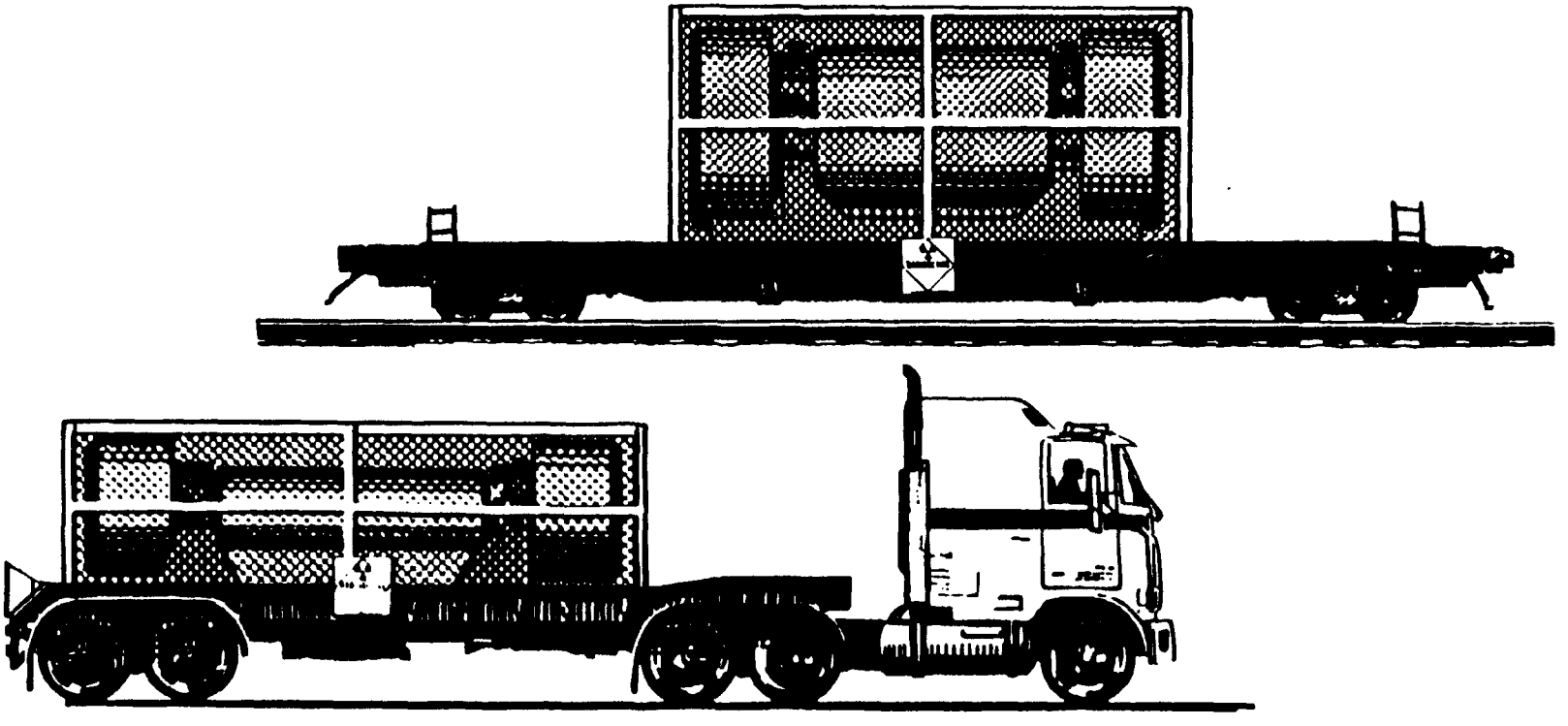
TRANSPORTATION SYSTEM DESCRIPTION



TRANSPORTATION



A safe and efficient transportation system is essential to the success of the waste management program. Working together, DOT, DOE, and the NRC have established an excellent record of safely transporting highly radioactive material.

OCRWM TRANSPORTATION REQUIREMENTS:

- USE NRC CERTIFIED TRANSPORTATION PACKAGE
- PRENOTIFY STATES/TRIBES UNDER NRC REGULATIONS
- PROVIDE TECHNICAL ASSISTANCE AND FUNDING TO TRAIN PUBLIC SAFETY OFFICIALS ON NUCLEAR WASTE TRANSPORTATION

0110-0102RJ 3/1/89

NWPA SPENT FUEL SHIPMENT ESTIMATES —1000 TO 1500 SHIPMENTS PER YEAR

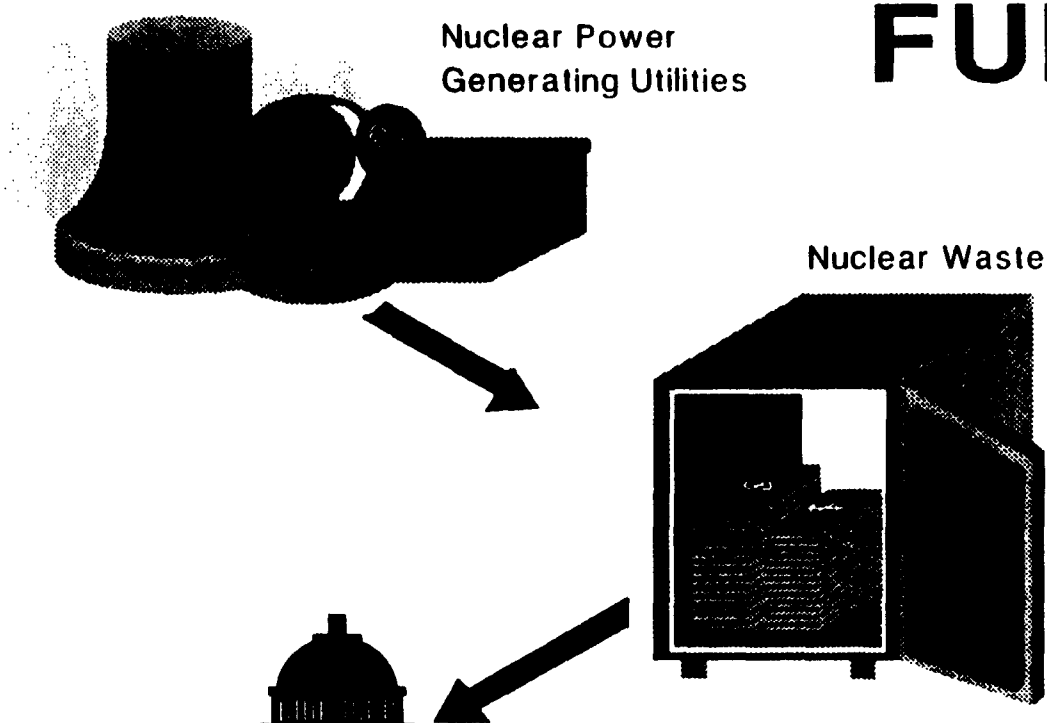
NUMBER OF SHIPMENTS VARIES WITH:

- **CASK DESIGN**
- **RAIL/TRUCK USAGE**
- **USE OF DEDICATED TRAINS**

PROGRAM FUNDING

FUTURE PLANS

FUNDING



The NWPA provided that nuclear power utilities pay into Nuclear Waste Fund (0.1¢/kWh)

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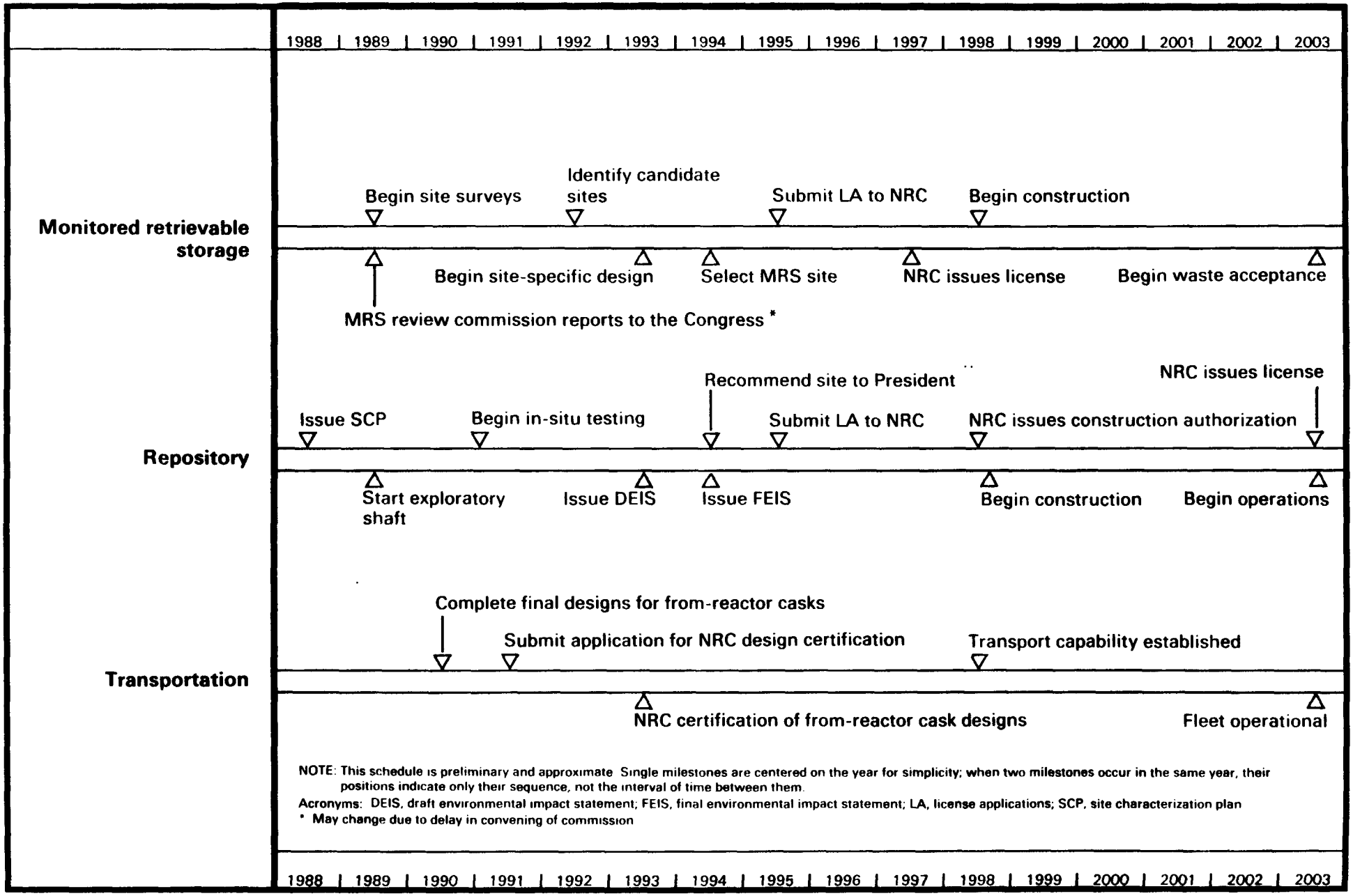


Preliminary schedule for the development of the waste-management system.

FUTURE PLANS (WHERE WE ARE GOING)

- **MILESTONES:**

— START OF EXPLORATORY SHAFT CONSTRUCTION	NOVEMBER 1989
— START OF INSITU TEST PHASE	DECEMBER 1990
— DRAFT ENVIRONMENTAL IMPACT STATEMENT	OCTOBER 1993
— FINAL ENVIRONMENTAL IMPACT STATEMENT	OCTOBER 1994
— SUBMITTAL OF SITE RECOMMENDATION REPORT (SRR) TO THE PRESIDENT	NOVEMBER 1994
— SUBMITTAL OF LICENSE APPLICATION TO NRC	JANUARY 1995

SUMMARY

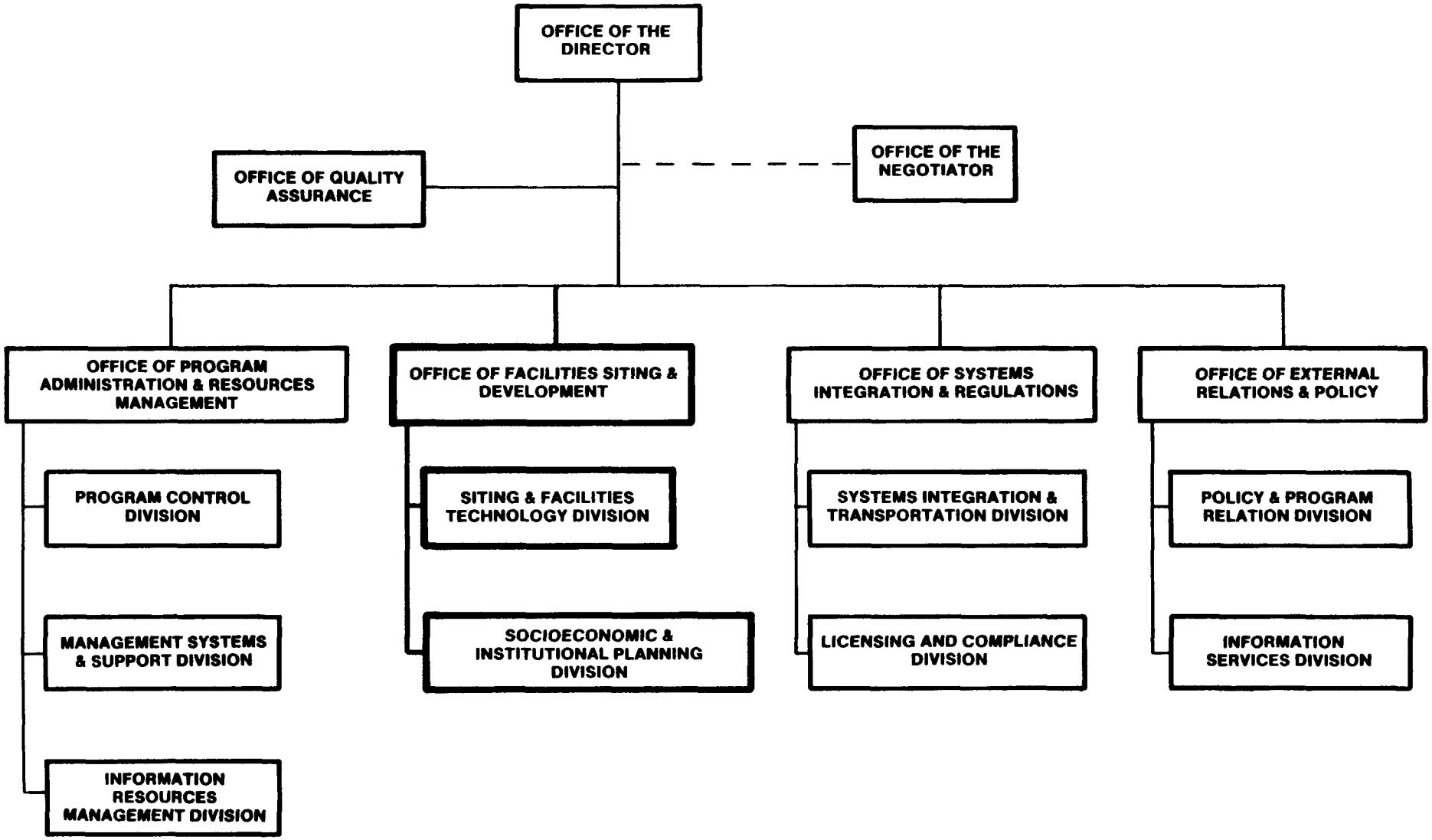
- SUBSTANTIAL EXPERIENCE AND PROGRAMMATIC RESOURCES HAVE BEEN DEVELOPED SINCE THE 1982 NWPA
- PROGRAM HAS BEEN STREAMLINED AND FOCUSED WITH NWPA, AS AMENDED
- SITE CHARACTERIZATION PLAN INTEGRATES NUMEROUS DISCIPLINES
- GOALS ARE TECHNICAL EXCELLENCE (AND INSTITUTIONAL OPENNESS)
- OBJECTIVES ARE TO MEET PROGRAM SCHEDULE AND TO ATTAIN TIMELY WASTE ACCEPTANCE

RESPONSIBILITIES OF THE OFFICE OF FACILITIES SITING AND DEVELOPMENT

JEROME D. SALTZMAN
ACTING ASSOCIATE DIRECTOR
OFFICE OF FACILITIES SITING AND DEVELOPMENT
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
U.S. DEPARTMENT OF ENERGY

PRESENTATION TO THE NUCLEAR WASTE TECHNICAL REVIEW BOARD

MARCH 7-8, 1989



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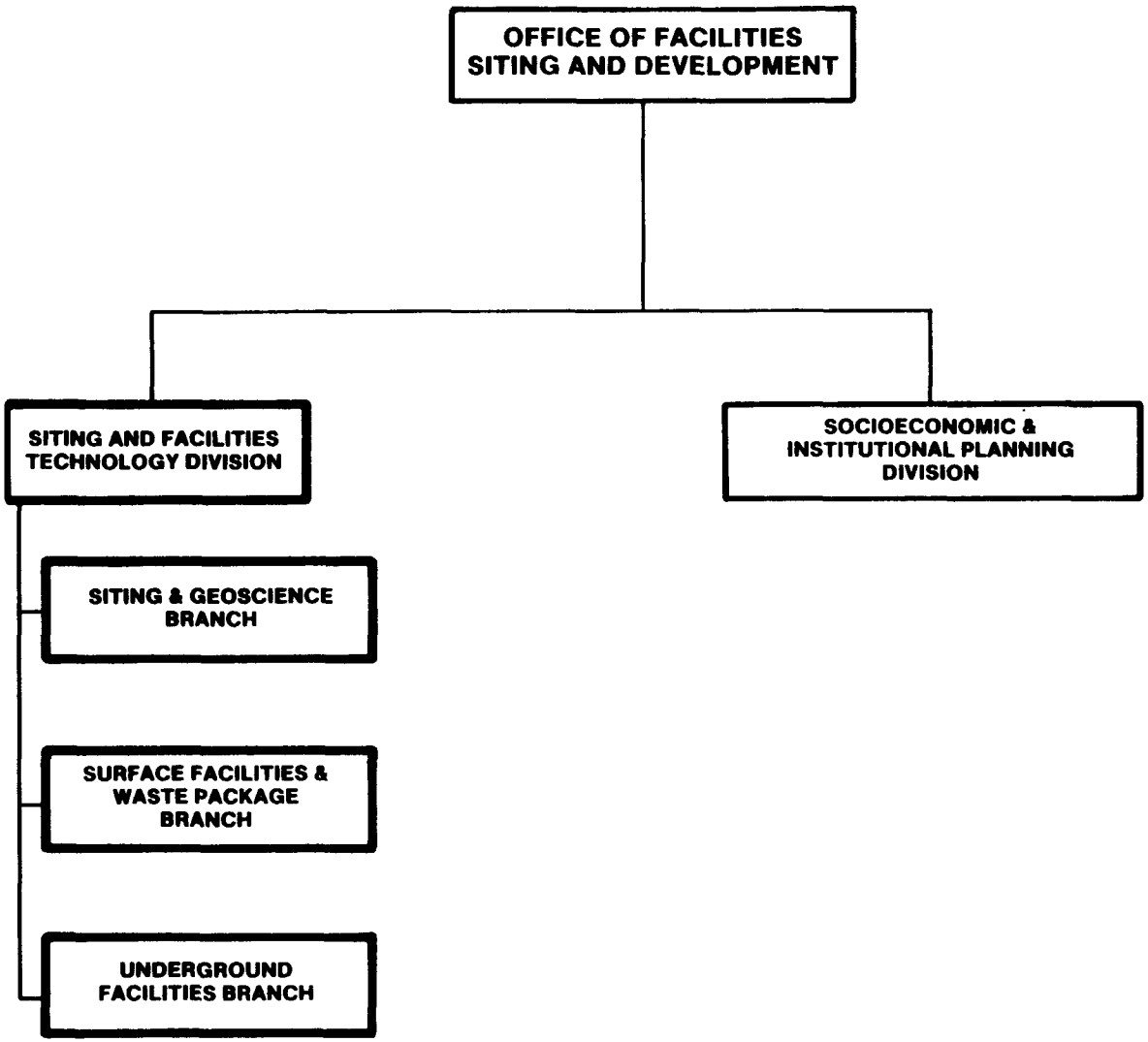

OFFICE OF FACILITIES SITING AND DEVELOPMENT
SITING AND FACILITIES TECHNOLOGY DIVISION
SOCIOECONOMIC & INSTITUTIONAL PLANNING DIVISION
SITING & GEOSCIENCE BRANCH
SURFACE FACILITIES & WASTE PACKAGE BRANCH
UNDERGROUND FACILITIES BRANCH

OFFICE OF FACILITIES SITING AND DEVELOPMENT MISSION

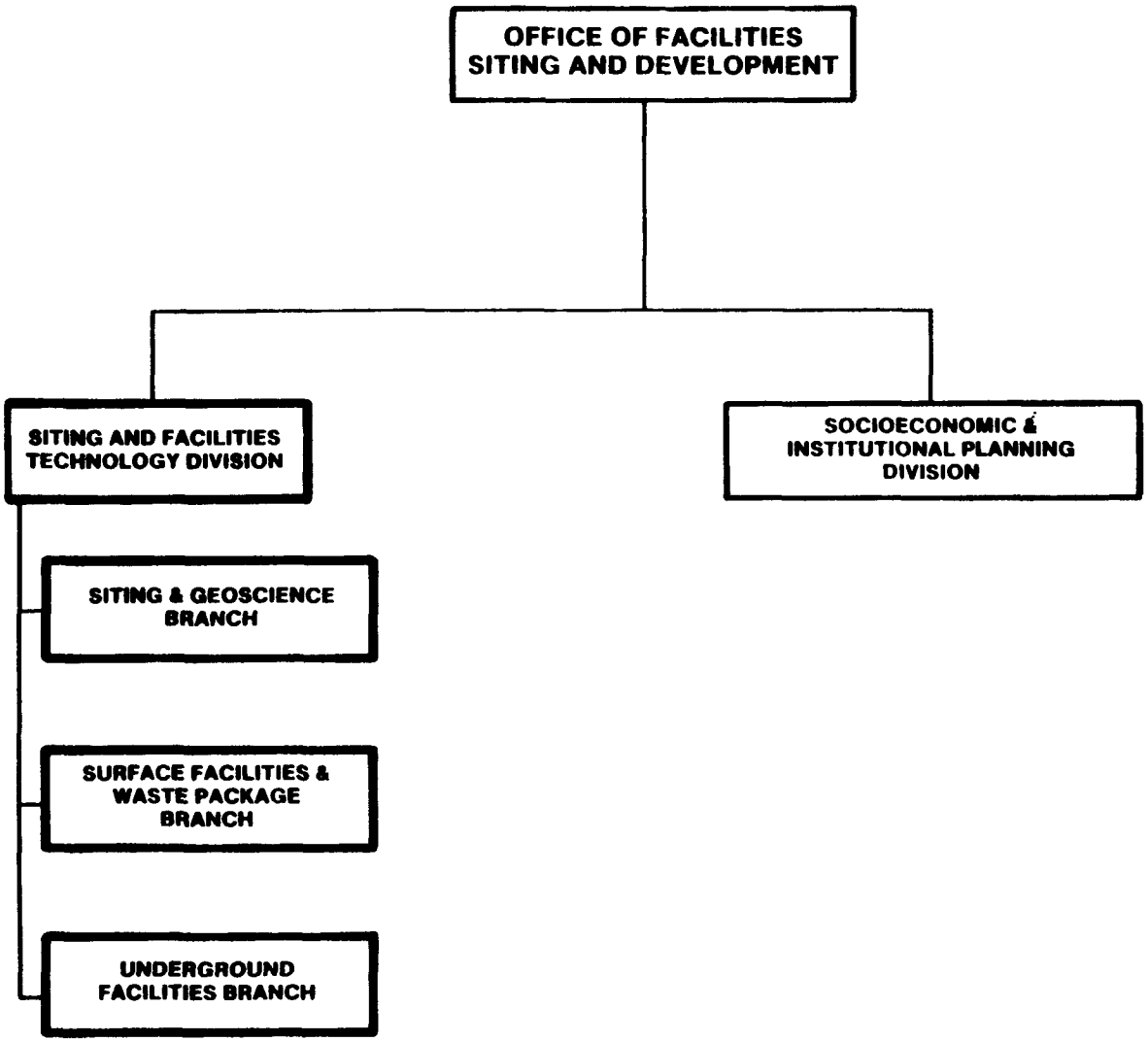
OFSD HAS PRIMARY RESPONSIBILITY FOR CHARACTERIZATION OF THE YUCCA MOUNTAIN SITE AND SITING OF A MONITORED RETRIEVABLE STORAGE FACILITY (MRS):

- **PROVIDING MANAGEMENT OVERSIGHT AND TECHNICAL DIRECTION OF THE PROGRAM'S GEOSCIENCE AND ENGINEERING ACTIVITIES**
- **DEVELOPING PROGRAMMATIC GUIDANCE ON POLICY AND PROCEDURES FOR SITE CHARACTERIZATION**
- **PROVIDING TECHNICAL OVERSIGHT FOR THE DESIGN AND CONSTRUCTION OF EXPLORATORY SHAFTS, SURFACE-BASED TESTING, WASTE PACKAGE DESIGN, AND DESIGN OF THE BARRIER SYSTEM AND SEALS**

0103-0043RJ 3/2/89

OFFICE OF FACILITIES SITING AND DEVELOPMENT MISSION (CONTINUED)

- PROVIDING TECHNICAL AND PROGRAMMATIC MANAGEMENT FOR THE DESIGN, DEVELOPMENT, AND CONSTRUCTION OF THE REPOSITORY AT YUCCA MOUNTAIN IF THE SITE IS FOUND TO BE SUITABLE
- PROVIDING MANAGEMENT OVERSIGHT FOR THE PRELIMINARY AND FINAL SITE SELECTION OF THE MRS FACILITY OTHER THAN A SITE IDENTIFIED BY THE NEGOTIATOR
- PROVIDING MANAGEMENT OVERSIGHT FOR THE TECHNICAL EVALUATION OF REPOSITORY OR MRS SITES THAT MAY BE IDENTIFIED BY THE NEGOTIATOR


OFFICE OF FACILITIES SITING AND DEVELOPMENT
SITING AND FACILITIES TECHNOLOGY DIVISION
SOCIOECONOMIC & INSTITUTIONAL PLANNING DIVISION
SITING & GEOSCIENCE BRANCH
SURFACE FACILITIES & WASTE PACKAGE BRANCH
UNDERGROUND FACILITIES BRANCH

MONITORED RETRIEVABLE STORAGE

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PRESENTATION TO THE
NUCLEAR WASTE TECHNICAL REVIEW BOARD
MARCH 7-8, 1989

WHAT IS MONITORED RETRIEVABLE STORAGE?

- MONITORED RETRIEVABLE STORAGE IS DRY STORAGE OF SPENT FUEL AT A CENTRAL FEDERAL FACILITY
- THE SPENT FUEL WOULD BE STORED ABOVE GROUND IN CONCRETE CASKS OR VAULTS EQUIPPED WITH TEMPERATURE AND RADIATION MONITORS
- SPENT FUEL WOULD BE EASILY RETRIEVABLE FOR SHIPMENT TO THE REPOSITORY
- THE DURATION OF STORAGE WOULD AVERAGE SEVERAL YEARS AT MOST

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WASTE FLOW THROUGH SYSTEM

- DOE WILL ACCEPT CIVILIAN SPENT NUCLEAR FUEL AT REACTOR SITES AROUND THE COUNTRY AND TRANSPORT IT TO AN MRS FACILITY
- FROM THE MRS FACILITY, THE SPENT FUEL WILL BE SHIPPED TO THE REPOSITORY, ASSUMED TO BE AT YUCCA MOUNTAIN, NEVADA
- THE REPOSITORY MAY ACCEPT SPENT FUEL SHIPPED DIRECTLY TO THE REPOSITORY FROM NEARBY REACTORS
- IN ADDITION, THE WASTE-MANAGEMENT SYSTEM WILL ACCEPT HIGH-LEVEL RADIOACTIVE WASTE, BUT ALL HIGH-LEVEL WASTE WILL BE SHIPPED DIRECTLY TO THE REPOSITORY

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BRIEF HISTORY OF STORAGE PROPOSALS IN THE UNITED STATES

- CONCEPT OF RETRIEVABLE STORAGE FIRST PROPOSED BY THE AEC IN 1972
  - REGIONAL FACILITIES FOR STORING HIGH-LEVEL WASTE FROM THE REPROCESSING OF COMMERCIAL SPENT FUEL IN RETRIEVABLE SURFACE STORAGE (RSS)
  - STORAGE WAS TO LAST ABOUT 100 YEARS
  - WASTE WAS TO BE STORED IN CONCRETE CASKS
  - CONCEPT IN PRINCIPLE ENDORSED BY THE NATIONAL ACADEMY OF SCIENCES IN 1975 REPORT
  - THE RSS CONCEPT WAS ABANDONED IN RESPONSE TO OBJECTIONS THAT IT PROVIDED ONLY A TEMPORARY SOLUTION INSTEAD OF PERMANENT DISPOSAL
- IN 1977, ERDA PROPOSED PROVIDING TEMPORARY AWAY-FROM-REACTOR (AFR) STORAGE IN FEDERAL FACILITIES. CONCEPT FOUNDERED BECAUSE OF CONGRESSIONAL OPPOSITION

MRS PROVISIONS IN THE NUCLEAR WASTE POLICY ACT OF 1982

- THE NUCLEAR WASTE POLICY OF 1982 (NWPA), SECTION 141, DIRECTED THE DOE TO
  - STUDY THE NEED FOR, AND THE FEASIBILITY OF, MONITORED RETRIEVABLE STORAGE
  - SUBMIT TO THE CONGRESS A SITE-SPECIFIC PROPOSAL FOR CONSTRUCTING ONE OR MORE MRS FACILITIES
- THE PROPOSAL WAS TO INCLUDE, FOR THE FIRST MRS FACILITY
  - AT LEAST THREE ALTERNATIVE SITES AND AT LEAST FIVE ALTERNATIVE COMBINATIONS OF SITES AND PROPOSED DESIGNS
  - A PLAN FOR INTEGRATING THE MRS FACILITY WITH THE DISPOSAL FACILITIES DEVELOPED UNDER THE NWPA
- THE MRS FACILITY WAS TO BE LICENSED BY THE NRC
- THE MRS FACILITY WAS TO BE SUBJECT TO THE NWPA PROVISIONS FOR PARTICIPATION BY STATES AND INDIAN TRIBES

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DOE RESPONSE TO MRS PROVISIONS OF NWPA

IN RESPONSE TO SECTION 141 OF THE NWPA, THE DOE

- PERFORMED AND PUBLISHED, IN 1985, A PRELIMINARY NEED-AND-FEASIBILITY ANALYSIS
- DEFINED THE FUNCTIONS AND REQUIREMENTS FOR AN MRS FACILITY THAT WOULD BE AN INTEGRAL PART OF THE TOTAL WASTE-MANAGEMENT SYSTEM
- ESTABLISHED A SITE-IDENTIFICATION APPROACH
- CONDUCTED A SITE-SCREENING PROGRAM
- DEVELOPED A CONCEPTUAL DESIGN FOR THE MRS FACILITY
- PREPARED A PROPOSAL FOR THREE ALTERNATIVE SITES AND SIX SITE-AND-DESIGN COMBINATIONS

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FUNCTIONS OF THE MRS FACILITY

- PRIMARY OBJECTIVE FOR THE MRS FACILITY PROPOSED IN 1987 WAS TO PERFORM SEVERAL FUNCTIONS THAT WOULD BE BENEFICIAL TO THE TOTAL WASTE-MANAGEMENT SYSTEM, PARTICULARLY
  - THE PREPARATION OF SPENT FUEL FOR EMPLACEMENT IN THE REPOSITORY
  - SERVING AS A TRANSPORTATION HUB
- TEMPORARY STORAGE WAS TO BE A SECONDARY OBJECTIVE

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RESTRICTIONS RECOMMENDED BY THE DOE

TO ALLAY CONCERNS THAT THE MRS FACILITY WOULD BECOME A DEFACTO REPOSITORY, THE DOE RECOMMENDED THAT THE APPROVAL OF ITS PROPOSAL BY THE CONGRESS SHOULD CONTAIN TWO LIMITING PROVISIONS:

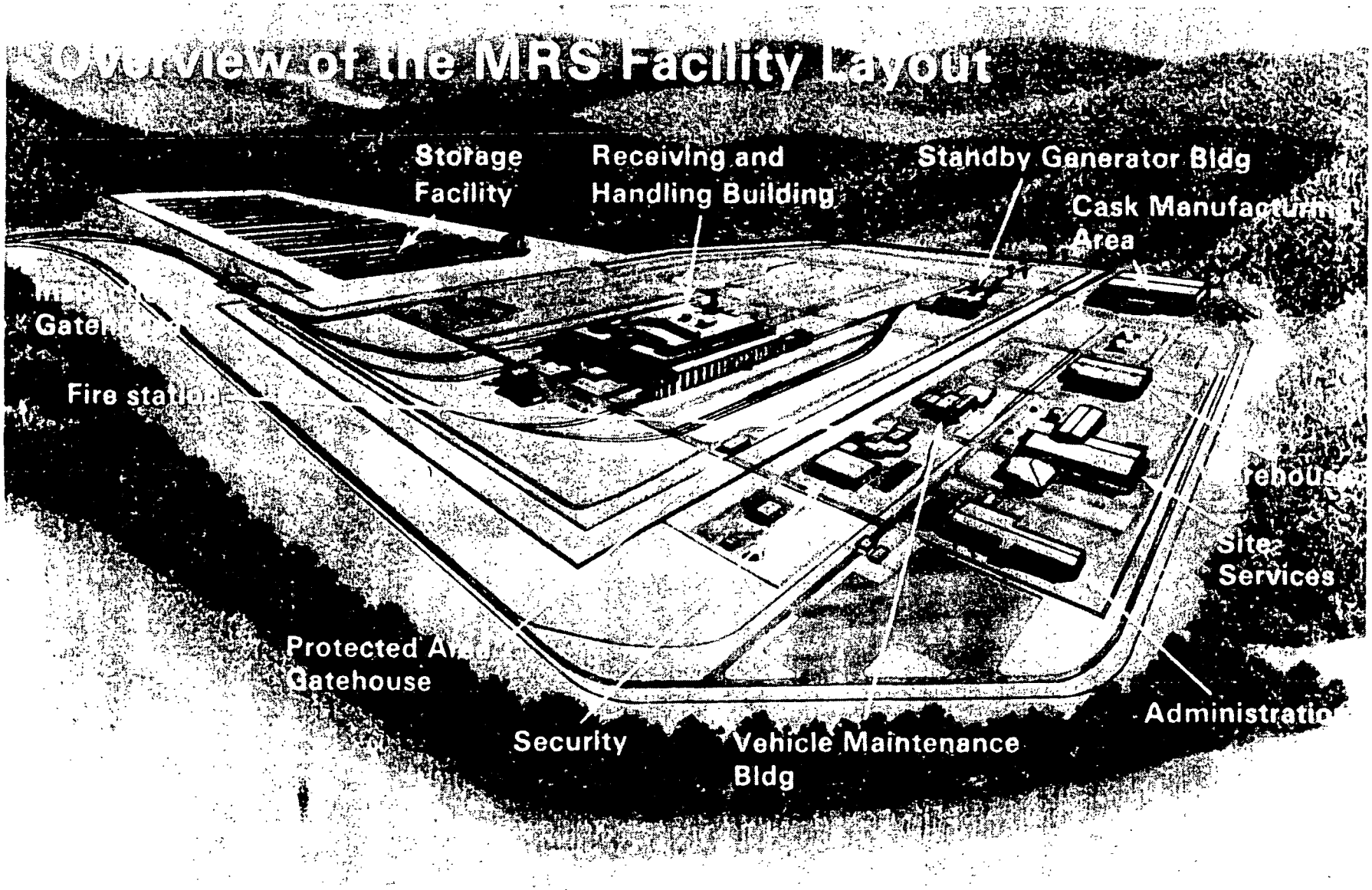
- **THE STORAGE CAPACITY OF THE MRS FACILITY SHOULD BE LIMITED TO 15,000 METRIC TONS OF HEAVY METAL**

  NO WASTE SHOULD BE ACCEPTED AT THE MRS FACILITY UNTIL A CONSTRUCTION AUTHORIZATION FOR THE FIRST REPOSITORY WAS RECEIVED FROM THE NUCLEAR REGULATORY COMISSION

COST AND SCHEDULE

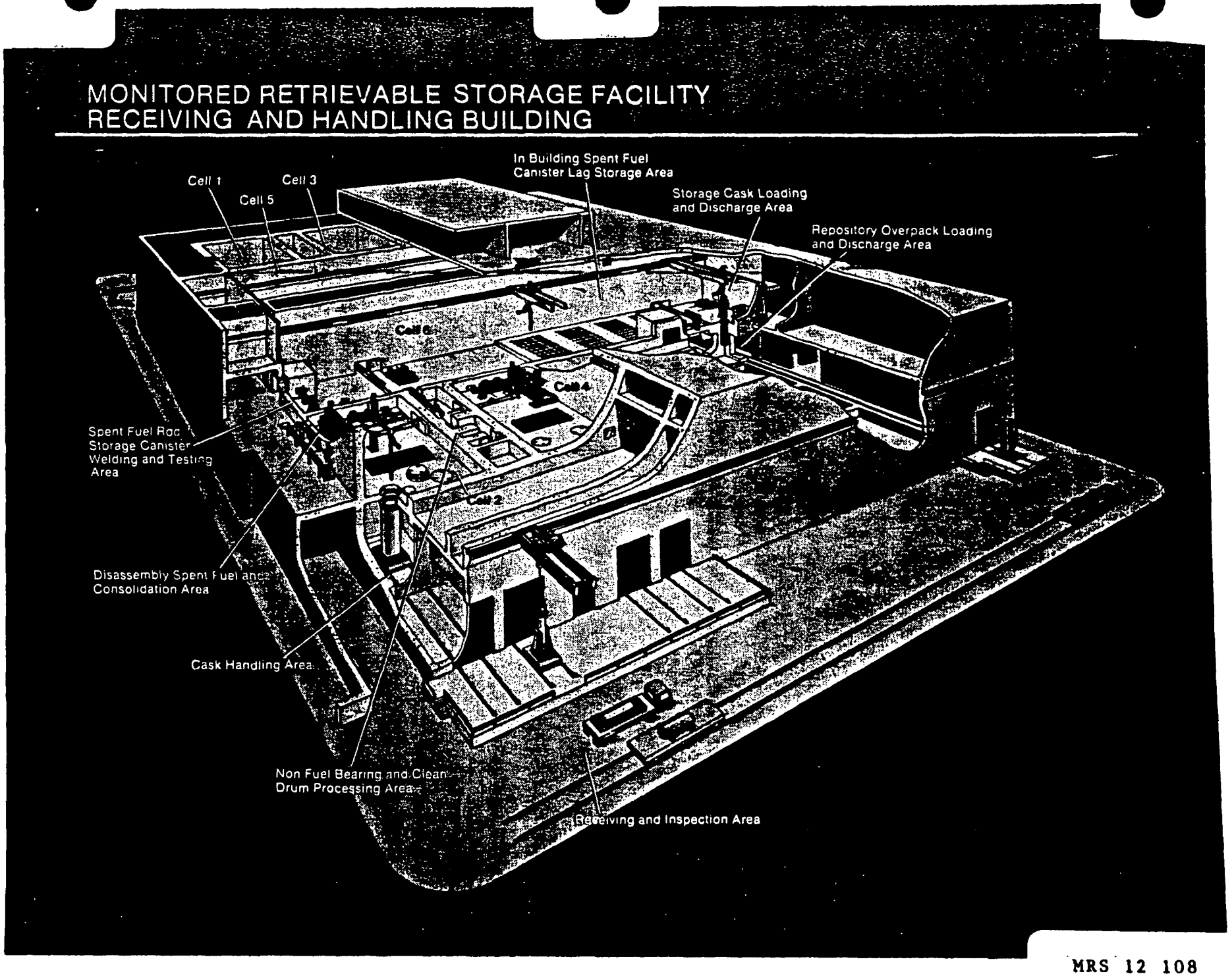
- **COST IMPACT ON THE TOTAL SYSTEM ESTIMATED AT $1.5 TO $1.6 BILLION**

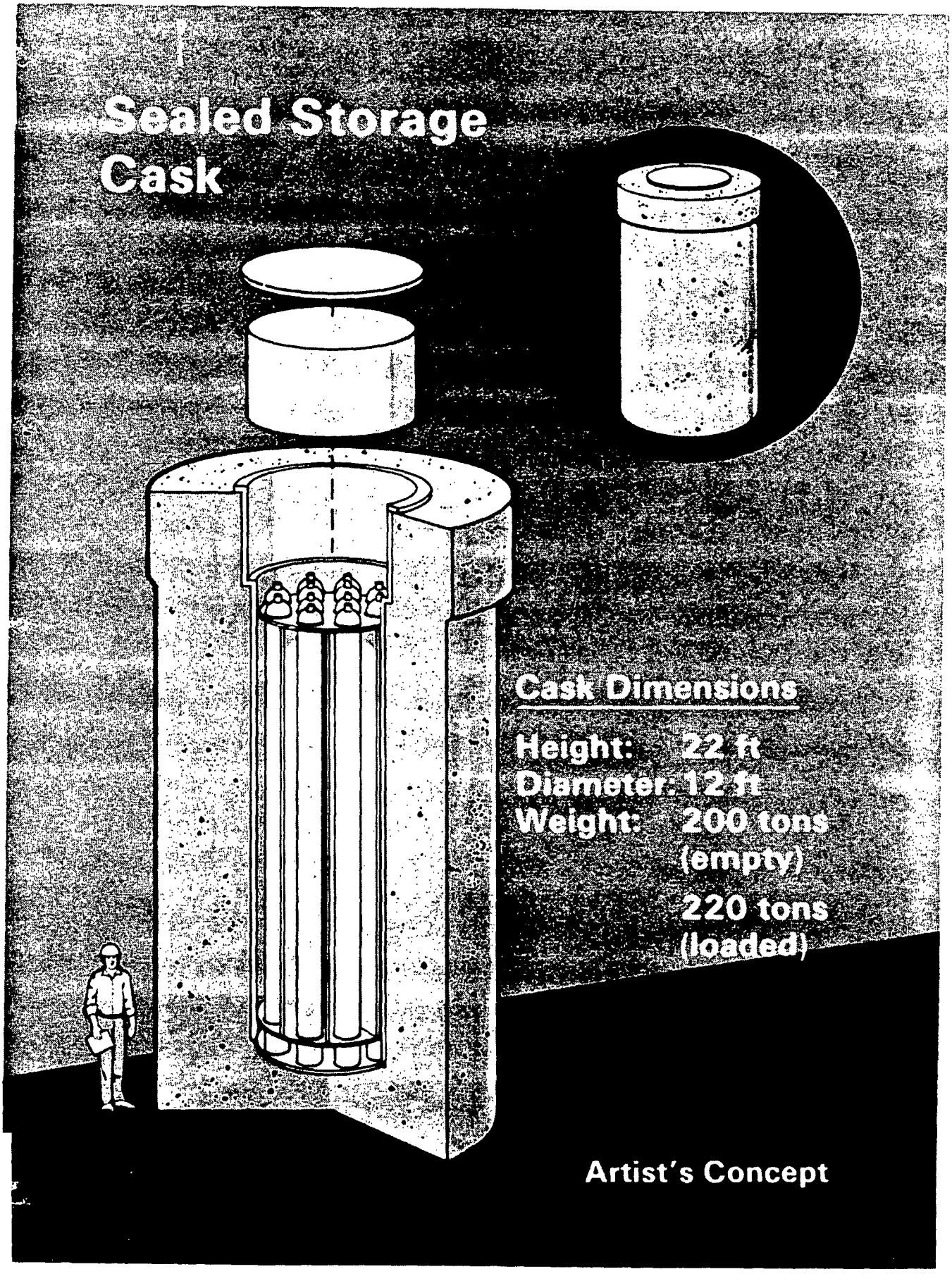
- **FACILITY EXPECTED TO START WASTE ACCEPTANCE IN 1998**


Overview of the MRS Facility Layout
Storage Facility
Receiving and Handling Building
Standby Generator Bldg
Cask Manufacturing Area
Gate
Fire stat
Site Services
Protected Area Gatehouse
Security
Vehicle Maintenance Bldg
Administratio

MRS 12 001

MONITORED RETRIEVABLE STORAGE FACILITY RECEIVING AND HANDLING BUILDING




Sealed Storage Cask
Cask Dimensions
Height: 22 ft
Diameter: 12 ft
Weight: 200 tons (empty)
220 tons (loaded)
Artist's Concept

ADVANTAGES IDENTIFIED FOR THE MRS FACILITY IN THE DOE PROPOSAL

AMONG THE ADVANTAGES IDENTIFIED IN THE MRS PROPOSAL ARE THE FOLLOWING:

1. ACCELERATED LARGE-SCALE WASTE ACCEPTANCE, ALLOWING THE DOE TO BEGIN ACCEPTING WASTE BY JANUARY 31, 1998
2. BENEFITS TO THE DEVELOPMENT OF THE OVERALL FEDERAL WASTE-MANAGEMENT SYSTEM BY PROVIDING TECHNICAL AND INSTITUTIONAL EXPERIENCE
3. BENEFITS TO THE TOTAL SYSTEM BY DEMONSTRATING THE ABILITY OF THE FEDERAL GOVERNMENT TO SAFELY ACCEPT, TRANSPORT, AND HANDLE SPENT FUEL AT HIGH ANNUAL RATES
4. IMPROVEMENTS IN SYSTEM RELIABILITY AND FLEXIBILITY
5. THE USE OF DEDICATED TRAINS FOR CROSS-COUNTRY SHIPMENT TO THE REPOSITORY

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MRS PROVISIONS OF THE AMENDMENTS ACT

THE AMENDMENTS ACT ANNULLED THE DOE PROPOSAL TO CONSTRUCT IN OAK RIDGE, TENNESSEE AND GIVES DOE DISCRETIONARY AUTHORITY TO: SITE, CONSTRUCT, AND OPERATE AN MRS FACILITY SUBJECT TO THE FOLLOWING CONDITIONS:

- **THE MRS REVIEW COMMISSION IS TO REPORT ON THE NEED FOR AN MRS FACILITY BY NOVEMBER 1, 1989**
- **THE DOE MAY NOT BEGIN A SURVEY AND EVALUATION OF SITES UNTIL THE MRS REVIEW COMMISSION SUBMITS ITS REPORT AND MAY NOT SELECT A SITE UNTIL DOE RECOMMENDS APPROVAL OF THE REPOSITORY SITE TO THE PRESIDENT**

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MRS PROVISIONS OF THE AMENDMENTS ACT (CONTINUED)

THE NRC LICENSE FOR THE MRS PROVIDES THAT:

- THE CONSTRUCTION OF THE MRS FACILITY CANNOT BEGIN UNTIL THE NRC HAS ISSUED A LICENSE FOR THE CONSTRUCTION OF THE REPOSITORY
- THE CONSTRUCTION OF, OR WASTE ACCEPTANCE AT, THE MRS FACILITY MUST CEASE IF THE REPOSITORY LICENSE IS REVOKED OR IF THE CONSTRUCTION OF THE REPOSITORY CEASES
- NO MORE THAN 10,000 MTHM OF WASTE CAN BE STORED AT THE MRS FACILITY UNTIL THE REPOSITORY BEGINS RECEIVING WASTE
- THE QUANTITY OF WASTE PRESENT AT THE MRS SITE AT ANY ONE TIME MAY NOT EXCEED 15,000 MTHM

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SITING PATHS ESTABLISHED BY THE AMENDMENTS ACT

THE AMENDMENTS ACT ESTABLISHED TWO PARALLEL PATHS FOR SITING AN MRS FACILITY:

- **SITING THROUGH A SURVEY-AND-EVALUATION PROCESS**
  - **PROCESS MAY BEGIN ONLY AFTER THE MRS REVIEW COMMISSION SUBMITS ITS REPORT**
  - **PREFERRED MRS SITE MAY BE SELECTED ONLY AFTER A REPOSITORY SITE HAS BEEN RECOMMENDED TO THE PRESIDENT**
  - **NO FURTHER CONGRESSIONAL ACTION OTHER THAN APPROPRIATION OF FUNDS IS NEEDED**
- **SITING THROUGH THE EFFORTS OF THE NUCLEAR WASTE NEGOTIATOR**
  - **NO RESTRICTION AS TO WHEN A SITE CAN BE SELECTED**
  - **THE NATURE AND EXTENT OF ANY CONDITIONS ON MRS OPERATION MAY DEPEND ON THE NEGOTIATED AGREEMENT**
  - **CONGRESSIONAL ACTION NEEDED TO APPROVE A NEGOTIATED AGREEMENT**

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THE MRS REVIEW COMMISSION

- AN MRS REVIEW COMMISSION HAS BEEN APPOINTED. ITS MEMBERS ARE
  - — DR. DALE E. KLEIN, DEPUTY DIRECTOR FOR THE CENTER OF ENERGY PHYSICS AT THE UNIVERSITY OF TEXAS IN AUSTIN
  - — DR. FRANK PARKER OF VANDERBILT UNIVERSITY
  - — ALEXANDER RADIN, FORMER EXECUTIVE DIRECTOR OF THE AMERICAN PUBLIC POWER ASSOCIATION
- THE COMMISSION IS TO SUBMIT BY NOVEMBER 1, 1989, A REPORT ON THE NEED FOR AN MRS FACILITY AS PART OF A WASTE-MANAGEMENT SYSTEM THAT ACHIEVES THE PURPOSES OF THE AMENDMENTS ACT
- THE COMMISSION HAS HELD SIX PUBLIC HEARINGS WITH MULTIPLE PARTICIPANTS
- THE COMMISSION IS CONSIDERING THE NECESSITY, APPROPRIATENESS, AND ADEQUACY OF THE RESTRICTIONS IMPOSED ON AN MRS FACILITY BY THE AMENDMENTS ACT
- TO SUPPORT THE COMMISSION AND TO ASSIST IN DETERMINING THE OPTIMAL CONFIGURATION FOR THE WASTE-MANAGEMENT SYSTEM, THE DOE IS COMPLETING A SERIES OF SYSTEM STUDIES

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SCHEDULE FOR THE MRS FACILITY

- THE DOE'S PRELIMINARY SCHEDULE SHOWS MRS OPERATIONS STARTING IN 2003 UNDER THE FOLLOWING ASSUMPTIONS:
  - MRS SITE IS SELECTED BY SURVEY AND EVALUATION
  - THE MRS FACILITY IS LIKE THE FACILITY DESCRIBED IN THE 1987 PROPOSAL
  - ALL FACILITIES AND EQUIPMENT ARE CONSTRUCTED AND OPERATIONAL BEFORE ANY SPENT FUEL IS RECEIVED AT THE MRS SITE
- IT MAY BE POSSIBLE TO ACCELERATE THE MRS SCHEUDLE BY DEVELOPING THE MRS FACILITY IN PHASES
  - FIRST PHASE MIGHT BY LIMITED TO FACILITIES FOR RECEIVING AND STORING SPENT FUEL
  - SECOND PHASE WOULD PROVIDE ANY ADDITIONAL CAPABILITIES DEEMED APPROPRIATE FOR THE FACILITY
  - ANOTHER OPTION IS TO USE DUAL-PURPOSE TRANSPORTATION-AND-STORAGE CASKS WHILE FACILITIES FOR SPENT-FUEL AND PREPARATION ARE BEING DEVELOPED

OPTIONS THAT MIGHT BE POSSIBLE WITH A NEGOTIATED MRS SITE

- THE DOE WILL ASSESS OPTIONS FOR MORE FLEXIBLE OPERATION THAT MIGHT BE AVAILABLE WITH A NEGOTIATED AGREEMENT FOR AN MRS FACILITY

- SITING THROUGH NEGOTIATION MAY ALLOW GREATER FLEXIBILITY AND HENCE MANY OF THE BENEFITS EXPECTED IN THE 1987 PROPOSAL

BENEFITS OF AN MRS FACILITY UNDER THE PROVISIONS OF THE AMENDMENTS ACT

- ENHANCE SYSTEM DEVELOPMENT AND PERFORMANCE
- MAY HELP ENHANCE SCHEDULE CONFIDENCE AND HELP ACHIEVE TIMELY AND ADEQUATE WASTE ACCEPTANCE
- HIGHER WASTE-ACCEPTANCE RATES
- REDUCE REQUIREMENTS FOR AT-REACTOR STORAGE