

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
PANEL ON STRUCTURAL GEOLOGY & GEOENGINEERING**

**SUBJECT: INTRODUCTION TO THE
SEALING PROGRAM**

PRESENTER: DR. JON M. WHITE

**PRESENTER'S TITLE
AND ORGANIZATION: GENERAL ENGINEER
U.S. DEPARTMENT OF ENERGY
LAS VEGAS, NEVADA**

**PRESENTER'S
TELEPHONE NUMBER: (702) 794-7276**

NOVEMBER 12-13, 1991

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
PANEL ON STRUCTURAL GEOLOGY & GEOENGINEERING**

**SUBJECT: INTRODUCTION TO THE
SEALING PROGRAM**

PRESENTER: DR. JON M. WHITE

**PRESENTER'S TITLE
AND ORGANIZATION: GENERAL ENGINEER
U.S. DEPARTMENT OF ENERGY
LAS VEGAS, NEVADA**

**PRESENTER'S
TELEPHONE NUMBER: (702) 794-7276**

NOVEMBER 12-13, 1991

10 CFR 60 Regulatory Requirements Considered in Sealing Program

- 60.112** Design a total system including seals to assure release of radioactive material is below EPA standard, which provides limits over a 10,000 year period
- 60.113 (a) (1)** Design of Engineered Barrier System to contain waste and limit future releases
- 60.134** Design of seals for shafts and boreholes
- General design criterion
 - Selection of materials and placement methods
 - Preferential pathways for radionuclide migration

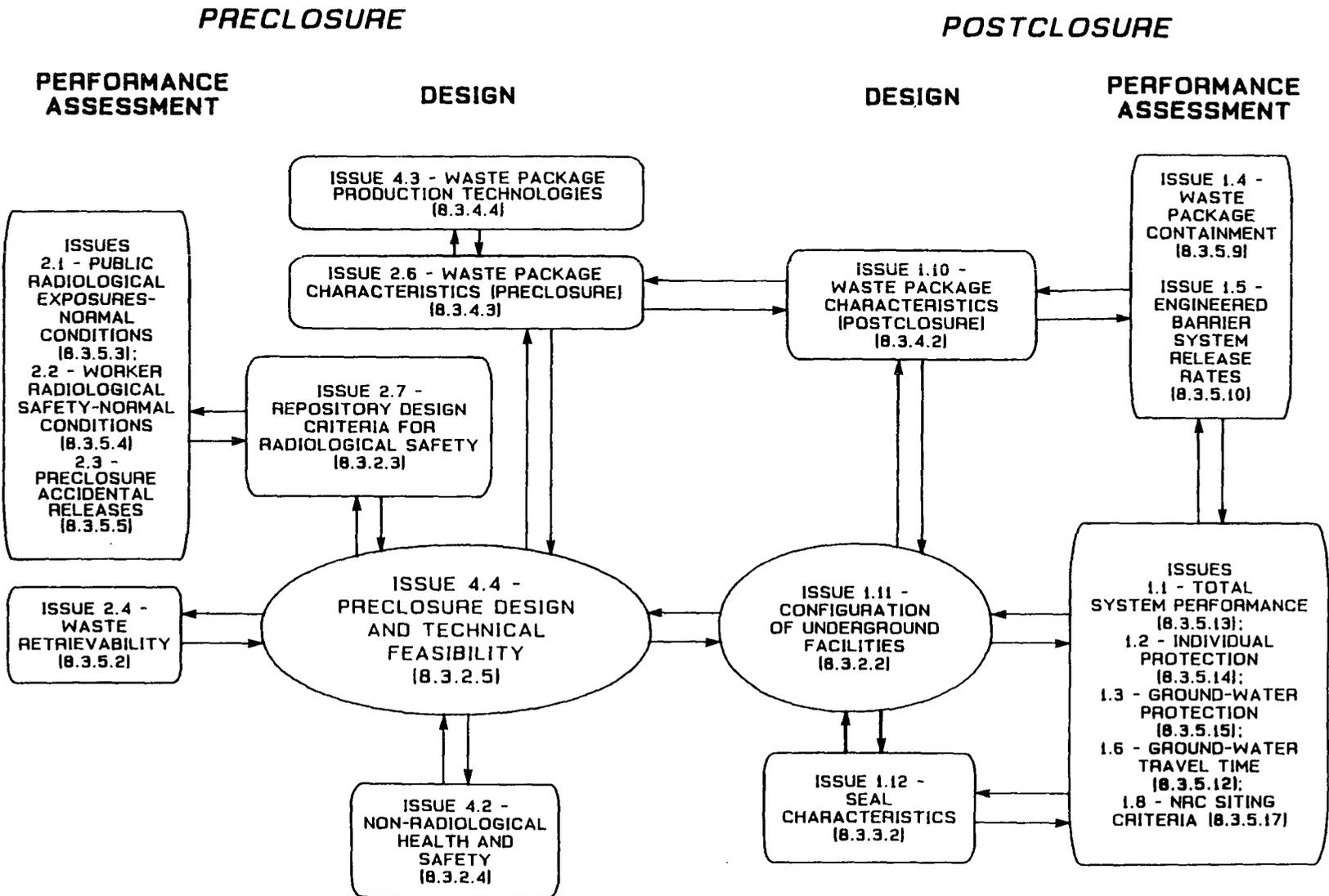
Sealing Program Perspective

- **Work covers 8 - 10 year period of development, research and design**
- **Much of foundation work has been completed**
- **Remaining effort requires site characterization data, in situ, and laboratory tests**

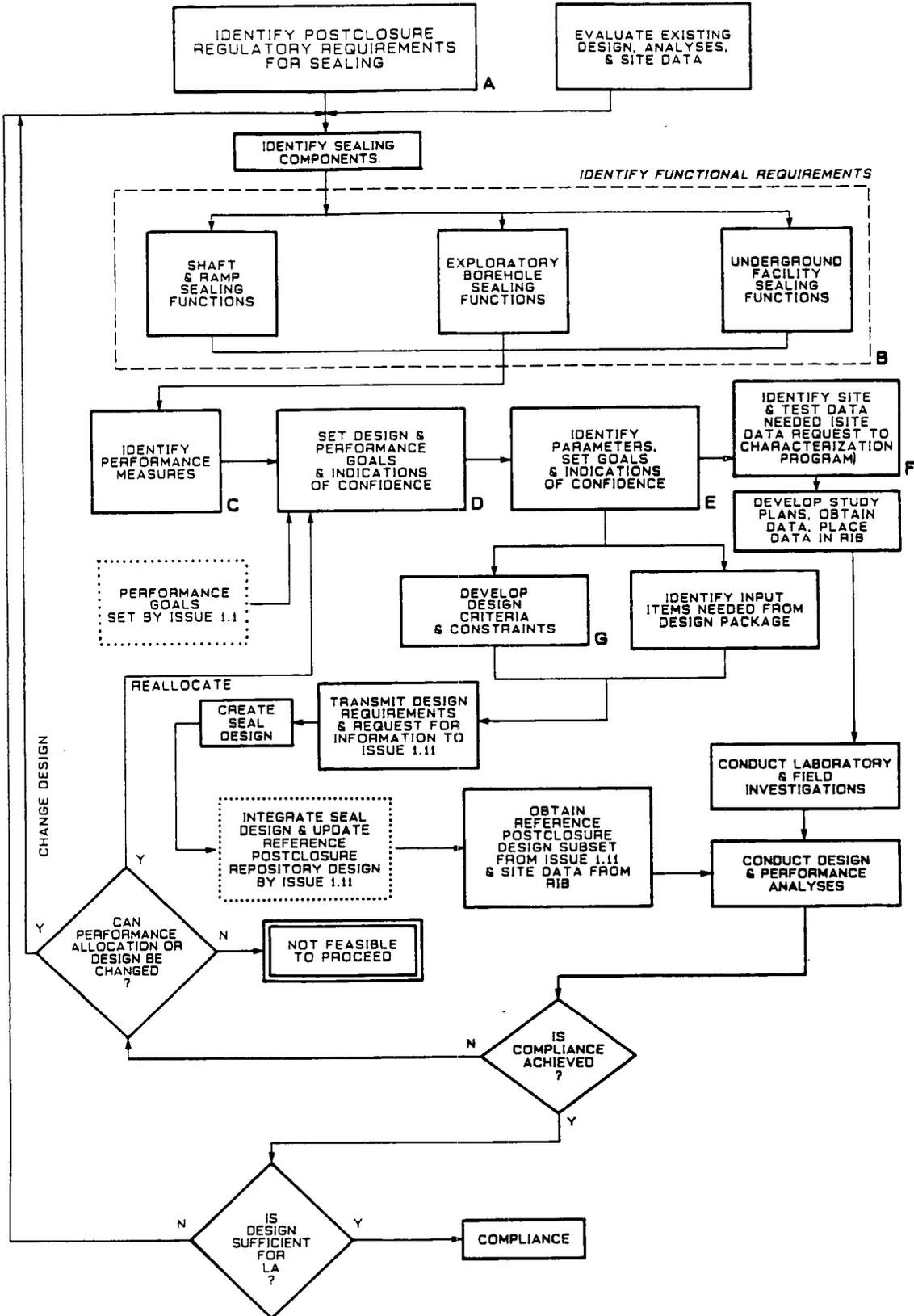
Candidate Features for Sealing

- **Exploratory boreholes**
- **Shafts and ramps**
- **Drifts**
- **Faults, fractures, joints, and shear zones**
- **Other water-producing zones**

Design and Performance Related Issues Used Directly in Performance Allocation



Seal Characteristics

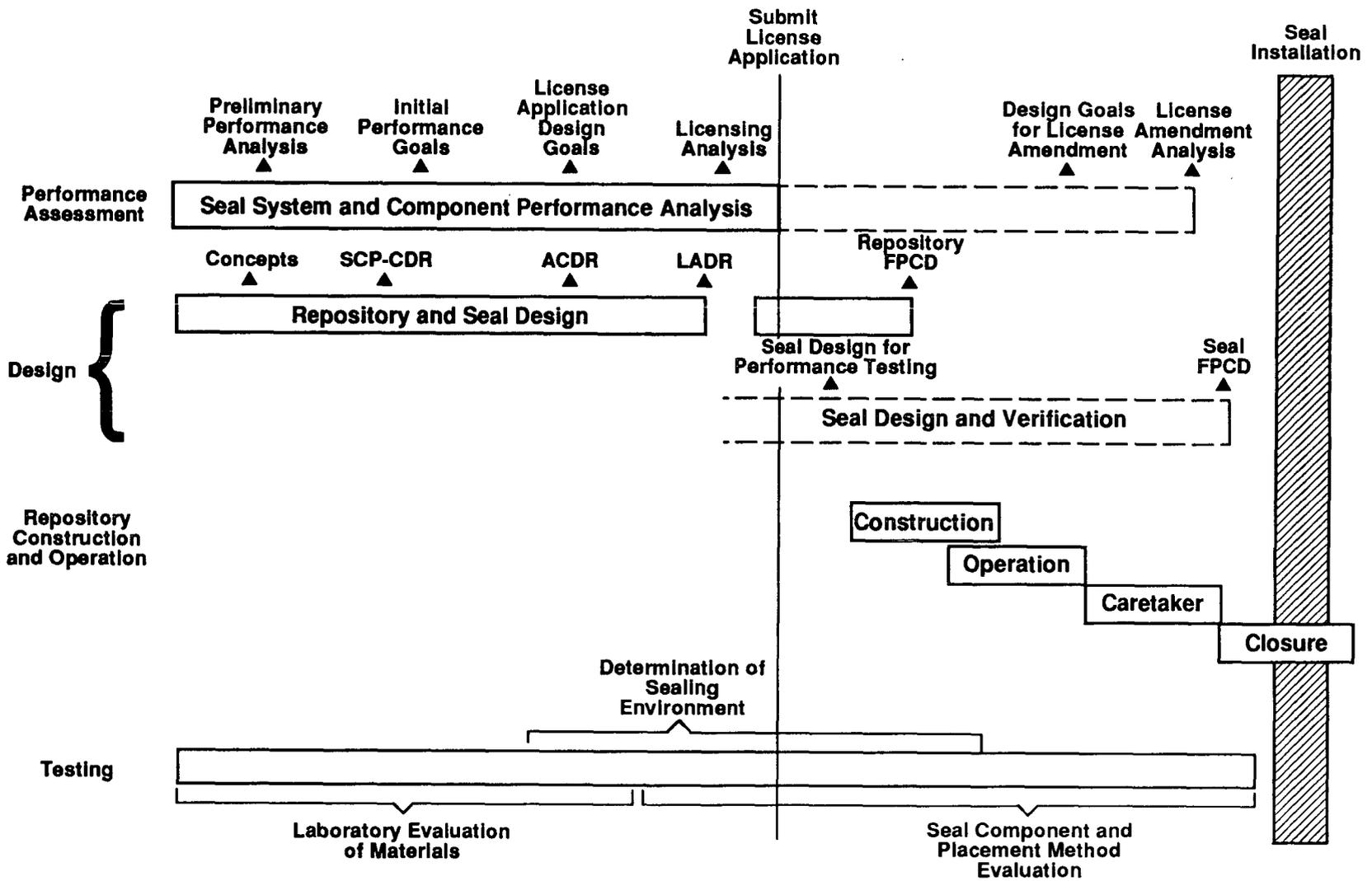


Tuesday a.m.

Tuesday p.m.

Wednesday a.m.

Anticipated Sequencing of Sealing Activities

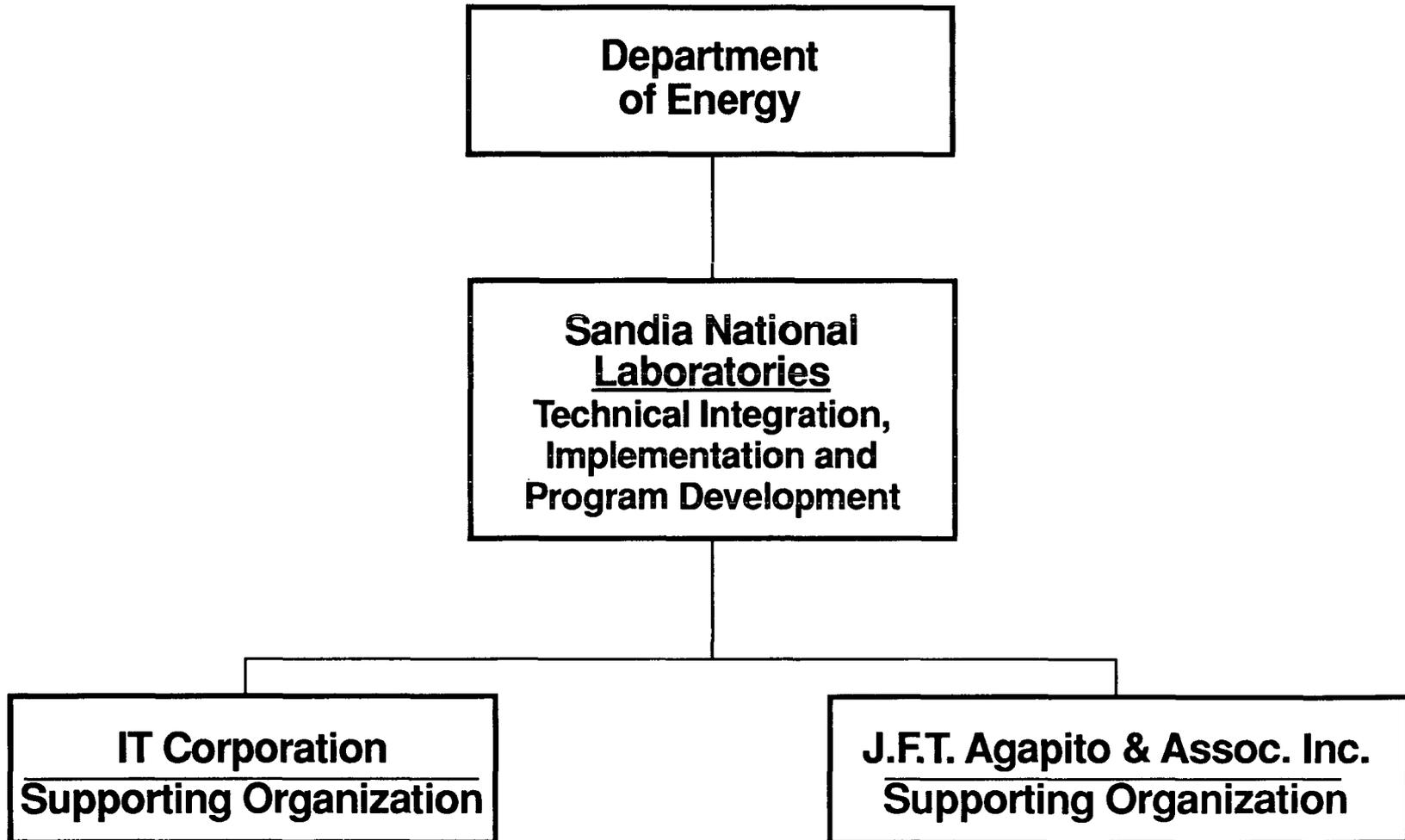


- SCP-CDR - Site Characterization Plan - Conceptual Design Report
- ACDR - Advanced Conceptual Design Report
- LADR - License Application Design Report
- FPCD - Final Procurement and Construction Design

Major Activities of Sealing Program

- **Requirements and performance analyses**
 - Performance goals and design requirements
 - Performance evaluation at each stage in the design process
- **Design**
 - Sealing concepts, definition
 - Conceptual designs for sealing components
 - License application design
- **Testing**
 - Materials evaluation
 - Seal environment determination
 - Performance evaluation
- **Closure operations**

Sealing Organization Chart



Structure of Presentation

