May 8, 1997

Tennessee Valley Authority
ATTN: Mr. Oliver D. Kingsley, Jr.
President, TVA Nuclear and
Chief Nuclear Officer
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: MEETING SUMMARY - WATTS BAR - TO DISCUSS THE LEAD TEST ASSEMBLY PROJECT

Dear Mr. Kingsley:

This letter refers to the management meeting conducted at your request at the Region II Office May 1, 1997. The purpose of the meeting was to discuss the tritium production Lead Test Assembly Project for the Watts Bar facility.

It is our opinion that this meeting was beneficial and provided a better understanding of TVA's activities associated with the Watts Bar facility.

In accordance with Section 2.790 of the NRC's "Rules of Practice" Part 2, Title 10 Code of Federal Regulations, a copy of this letter and its enclosures will be placed in the Public Document Room.

Should you have any questions concerning this letter, please contact me.

Sincerely,

Original Signed by
M. S. Lesser

Mark S. Lesser, Chief
Reactor Project Branch 6
Division Reactor Projects

Docket Nos. 50-390, 50-391
License No. NPF-90 and
Construction Permit No. CPPR-92

Enclosures: 1. List of Attendees
2. Presentation Summary

cc w/encls: (See page 2)

cc w/encls:
Mr. O. J. Zeringue
Senior Vice President
Nuclear Operations
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Mr. J. A. Bailey, Vice President
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Mr. J. A. Scalice
Site Vice President
Watts Bar Nuclear Plant
Tennessee Valley Authority
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Spring City, TN 37381

General Counsel
Tennessee Valley Authority
ET 10H
400 West Summit Hill Drive
Knoxville, TN 37902-1499

Mr. R. R. Baron, Manager
Nuclear Assurance & Licensing
4J Blue Ridge
1101 Market Street
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Mr. P. Salas, Manager
Licensing & Industry Affairs
4J Blue Ridge
1101 Market Street
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Mr. P. L. Pace, Manager
Licensing and Industry Affairs
Watts Bar Nuclear Plant
Tennessee Valley Authority
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Spring City, TN 37381

Mr. R. T. Purcell, Plant Manager
Watts Bar Nuclear Plant
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P. O. Box 2000
Spring City, TN 37381

Michael H. Mobley, Director
Division of Radiological Health
3rd Floor, L and C Annex
402 Church Street
Nashville, TN 37243-1532

County Executive
Rhea County Courthouse
Dayton, TN 37321

County Executive
Meigs County Courthouse
Decatur, TN 37322

Distribution w/encls: (See page 3)

Distribution w/encls:
L. A. Reyes, RII
J. R. Johnson, RII
M. S. Lesser, RII
F. J. Hebdon, NRR
A. P. Hodgdon, OGC
B. K. Keeling, GPA/CA
G. M. Tracy, OEDO
R. E. Martin, NRR
P. A. Taylor, RII
W. C. Bearden, RII
C. F. Smith, RII
E. D. Testa, RII
D. H. Thompson, RII
J. H. Moorman, RII
PUBLIC

U.S. Nuclear Regulatory Commission
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, TN 37381

OFFICE	DRP/RII											
SIGNATURE / NAME	PTaylor:vyg											
DATE	05 / 7 / 97	05 /	/ 97	05 /	/ 97	05 /	/ 97	05 /	/ 97	05 /	/ 97
COPY?	(YES) NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO

OFFICIAL RECORD COPY DOCUMENT NAME: P:\WBCC.LIS

LIST OF ATTENDEES

Name	Title
NRC Staff	
J. R. Johnson	Director, Division of Reactor Projects (DRP), RII
C. F. Evans	Regional Council, Office of Regional Administrator, RII
M. S. Lesser	Branch Chief, Reactor Project Branch 6, DRP, RII
P. K. Vandoorn	Senior Resident Inspector, Branch 6, Watts Bar, DRP, RII
D. H. Thompson	Safeguards Inspector, Special Inspection Branch, Division of Reactor Safety (DRS), RII
W. C. Bearden	Reactor Inspector, Maintenance Branch, DRS, RII
P. A. Taylor	Project Engineer, Branch 6, DRP, RII
TVA Staff	
J. Scalice	Vice President, Watts Bar Site
P. Pace	Acting Manager, Site Licensing
J. Chardos	Project Manager, Lead Test Assembly Project
C. Faulkner	Supervisor, Reactor Site Engineering
F. Koontz Jr.	Engineering Specialist, Site Engineering
R. Salisbury	Communications Specialist, TVA
M. Clausen	Deputy Project Manager, Lead Test Assembly Project, Department of Energy

Enclosure 1

Tritium Producing Burnable Absorber Rod

TVA/Watts Bar Nuclear Plant

May 1, 1997

Tritium Producing Burnable Absorber Rod (TPBAR) Meeting Agenda

• Program Overview	John A. Scalice
• Technical Background	Frank A. Koontz
• Project Schedule	James S. Chardos
• LTA Licensing	Paul L. Pace

Program Overview

John A. Scalice

Program Overview

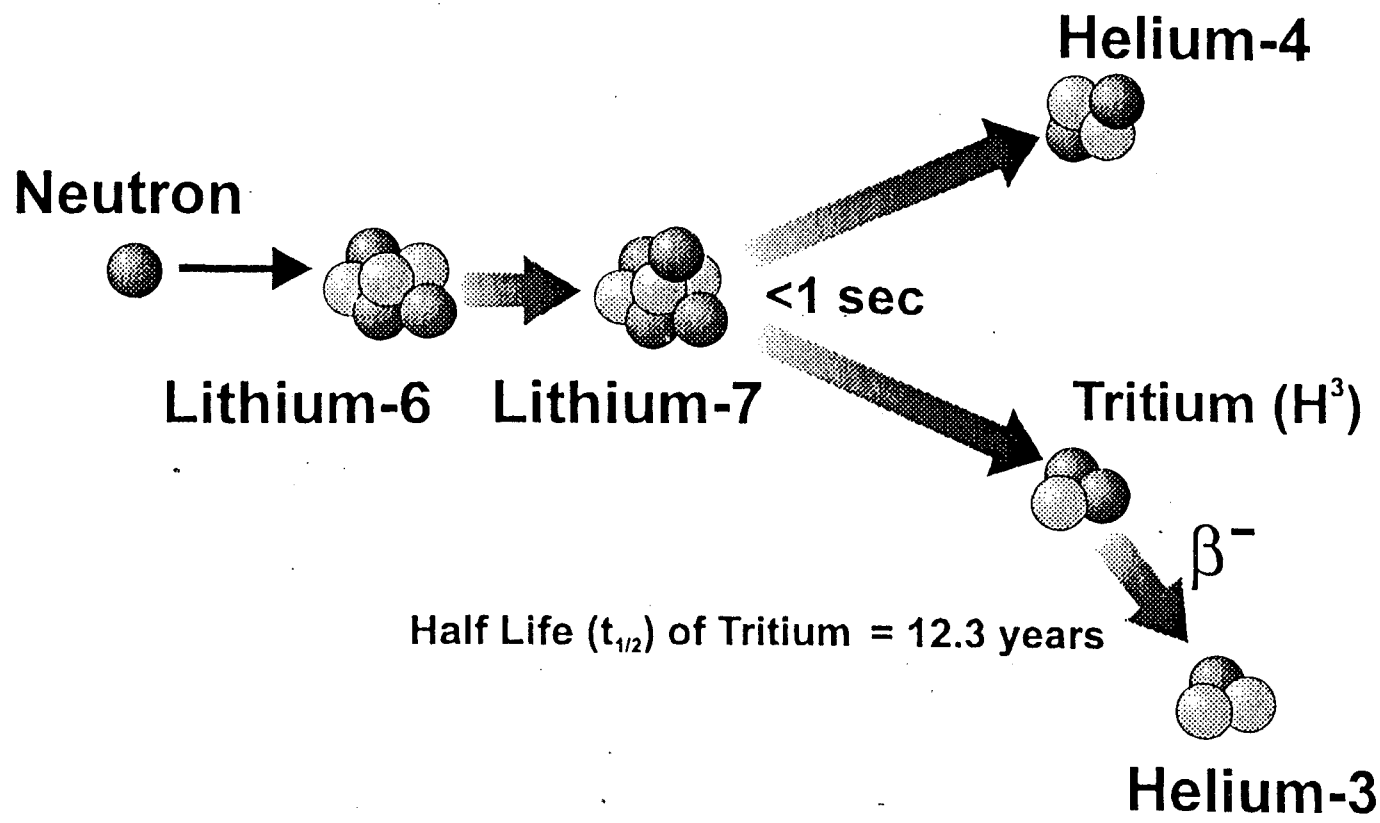
- National Defense Need
- Tritium Decays at a Rate of 5.5% per year
- Tritium is Rare on Earth. It Must be Man-Made with Reactors or Accelerators
- Tritium Production Stopped in 1988 When the Last of the Savannah River Reactors Shut Down
- Current Stockpile Being Supported with Recycled Tritium
- Based on Secretary of Energy's December 1995 Record of Decision for the Tritium Supply and Recycling Programmatic Environmental Impact Statement
  - Design, Build, and Test Critical Components of an Accerlerator for Production of Tritium
  - Initiate Purchase of a Commercial Light Water Reactor (CLWR) or Irradiation Services
- As Part of the CLWR Option, DOE issued a Request for Proposals (RFP) to Perform a Lead Test Assembly (LTA) Program.
  - TVA Responded to the RFP and Was Selected as the Host Utility Earlier This Year.
  - 4 LTAs Will be Inserted into the Watts Bar Reactor This Fall

Tritium Producing Burnable Absorber Rod

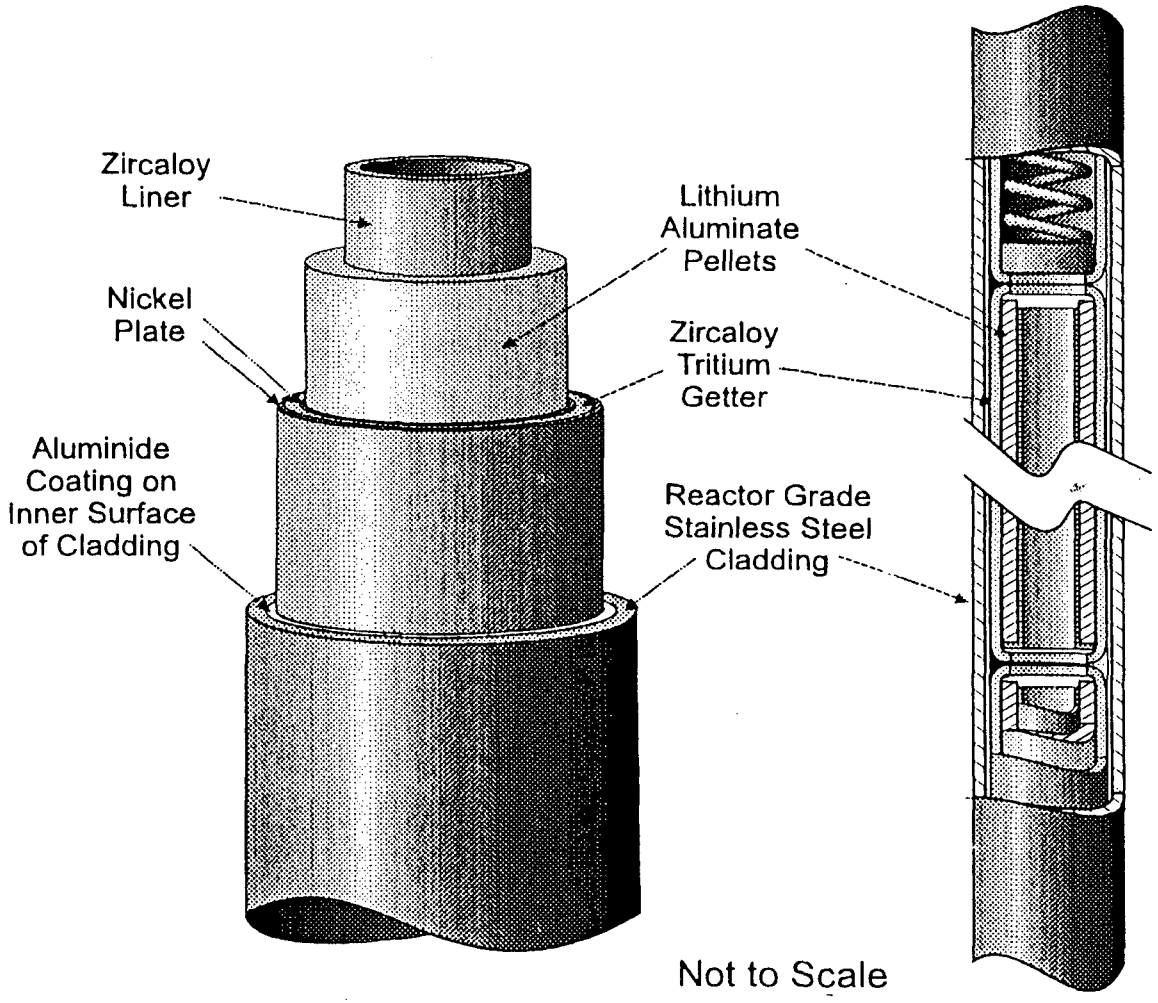
Technical Background

Frank A. Koontz

Production of Tritium from Lithium in a Reactor



Tritium-Producing Burnable Absorber Rod for Watts Bar Cycle 2 (TPBAR)



Functions of Tritium Producing Burnable Absorber Rod Components

- Stainless Steel Cladding - Similar to reactor burnable poison assembly rods. Contains all components.
- Aluminide Coating - Prevents diffusion of tritium through the stainless steel cladding into the reactor coolant. Also prevents hydrogen in the coolant from entering the rod. (Permeation Barrier)
- Zircaloy (zirconium alloy) Tritium Getter - Absorbs free tritium gas.
- Nickel Plate - Prevents oxidation of the tritium getter material.
- Lithium Aluminate Pellets - High-temperature ceramic material containing Lithium-6, the material that transmutes to tritium when a neutron is absorbed.
- Zircaloy Liner - Removes oxygen to improve tritium gettering.
- During and after irradiation, tritium is held in the ceramic, the tritium getter, and the liner until released by the extraction process.

Basic Concepts

Production: $^{6}Li + {}_{o}^{1}n \longrightarrow {}^{4}He + {}^{3}H + 4.8\ MeV$

Retention:

$2({}^{3}H_2O) + Zr \longrightarrow ZrO_2 + 2({}^{3}H_2)$ (Liner)

$^{3}H_2 + Zr \longrightarrow Zr^{3}H_2$ (Getter)

High PRF* (Barrier)

Distribution:

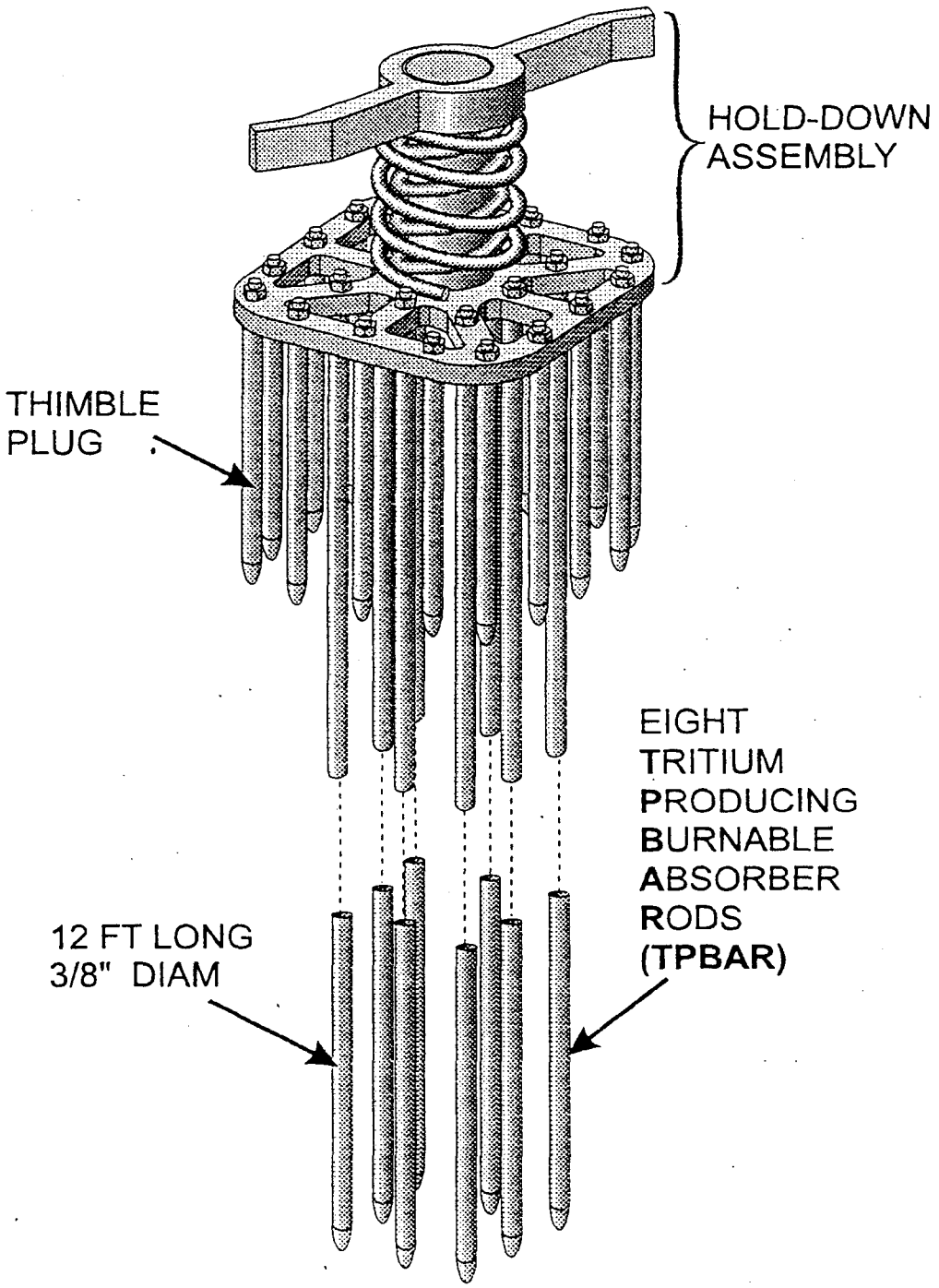
^{3}H in pellets

^{3}H in Zr liner

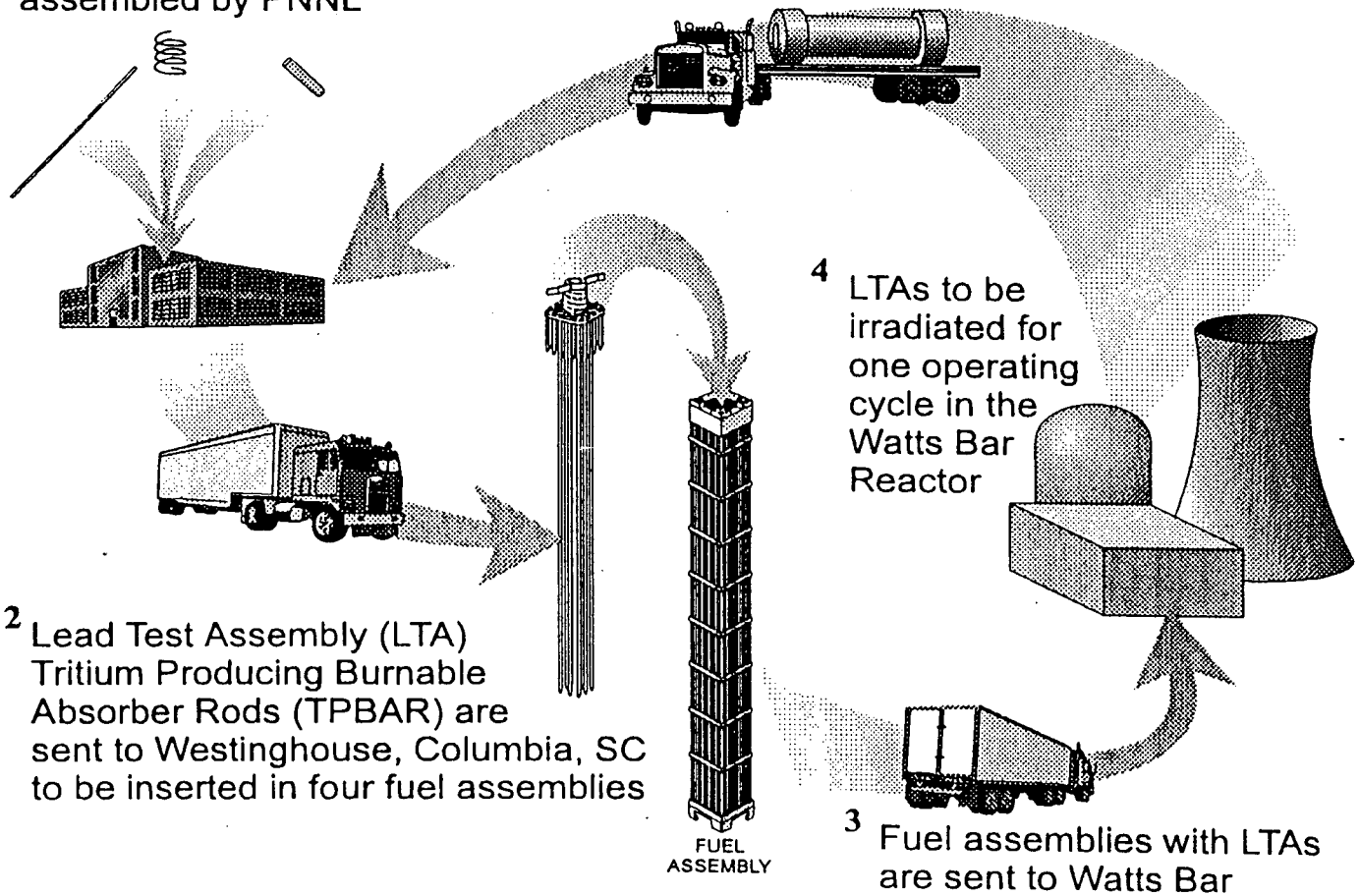
^{3}H in NPZ getter

* PRF (permeation reduction factor) = ratio of tritium permeability in bare stainless steel to that of a coated tube; i.e., high PRF means low tritium release.

Tritium Producing Burnable Absorber Assembly



Lead Test Assembly Cycle



DOE's Tritium-Producing Burnable Absorber Rod (TPBAR)

- The TPBARs perform the same function as the burnable absorber rods normally found in a commercial reactor.
- The TPBAR has essentially the same external dimensions as burnable absorber rods.
- The TPBAR substitutes Lithium-6 as the neutron-absorbing material in place of the usual Boron-10.
  - The Lithium-6 is in a ceramic form (lithium aluminate).
  - When Lithium-6 absorbs a neutron, it transmutes into tritium.
- The TPBAR's neutron-absorbing characteristics are very similar to those of rods containing Boron-10.
- TPBARs contain no fissile material, i.e., no uranium or plutonium.

LTA Operational Impacts

- Normal Operations
  - tritium releases represent an insignificant incremental increase in the total off-site exposures to the maximum exposed individual
- Refueling Operations
  - no new equipment/tools necessary for handling TPBARs
  - shipping performed by DOE in NRC and DOE approved cask
  - occupational exposure less than a few millirem
- Off-Normal
  - No TPBAR failures are predicted during Conditions I, II, III and IV except LBLOCA
  - Cladding Defects
    - minimal impact on core reactivity
    - no impact on coolant chemistry
    - off-site doses from cladding breach are insignificant

LTA Operation Impacts (cont'd)

- LBLOCA represents most limiting accident
  - like the fuel, TPBAR failure may occur during design basis LOCA
  - adequate core cooling is maintained
  - very small increase in calculated radiological consequences of the accident to off-site individuals
  - negligible contribution to combustible gas inventory (less than equivalent number of zirconium clad WABA rods)

LTA Operation Impacts (cont'd)

- Tritium Sampling
  - baseline sampling underway
  - continue weekly during irradiation
  - design limit of 6.7 Ci/rod/yr + current tritium production less than updated Environmental Impact Statement for WBN
- Contingency plans
  - currently being prepared
  - remain within Tech Spec
  - address early failures, late failures, refueling failures
- Security
  - monitored by DOE cleared personnel prior to insertion
  - self protecting following irradiation

Procedural Impacts Due to LTA

- Chemistry Manual
- Core Monitoring Procedures
- Security Procedures

Tritium Producing Burnable Absorber Rod

Schedule

James S. Chardos

TARGET ROD FABRICATION

- Schedule of Fabrication
  - all components delivered to PNNL by mid June
  - assembly of components and inspection by late July
  - NRC audit findings prior to shipment to be addressed by DOE/PNNL
- Receipt by Westinghouse
  - 32 Target rods to be shipped to Columbia from PNNL
  - target rods to be attached to hold down plates and drag tested
  - ship four LTA's and host fuel assemblies to WBN
- Receipt from Westinghouse
  - TVA will perform receipt inspection of LTA's (freedom of motion test)
  - after receipt inspection, store in an approved storage location

TARGET ROD INSTALLATION & REMOVAL

- Target Rod Installation and Removal Schedule
  - four LTA's and host assemblies to be loaded into WBN vessel during Cycle 2 reload
  - upon completion of Cycle 2, 4 LTA's to be stored in spent fuel pool until outage is complete (4/99)
  - DOE to remove 4 LTA's using licensed shipping casks and ship to PNNL for post irradiation examinations

Tritium Producing Burnable Absorber Rod

LTA Licensing

Paul L. Pace

Approval Format

- Technical Specification Amendment - TS Section 4.2 - Reactor Core Under the Design Features Section
- Amendment Request Issued - April 30, 1997
- Basis for Change - PNNL Technical Report
- No Significant Increase in Radiological Consequences
- Addresses NRR Review Issues Involving Operation Not Fabrication

Planned Public Meetings

- February 25, 1997 NRC/DOE Meeting in Rockville - Complete
- August 11, 1997 NRC/DOE Meeting in WBN Area
  - Expect Format to be Similar to Previous Public Meeting in Rockville
  - No Formal TVA Participation Anticipated

Unique Aspects of the LTA Project

- TPBAR Fabrication
- TPBAR Handling and Insertion into Fuel Assemblies
- Tritium Sampling
- Procedures for Shipment of LTAs after Irradiation
- Security Plan for LTAs