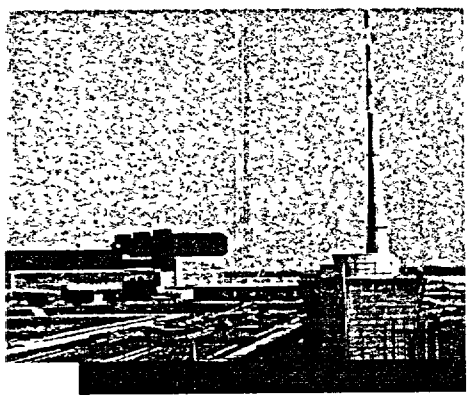
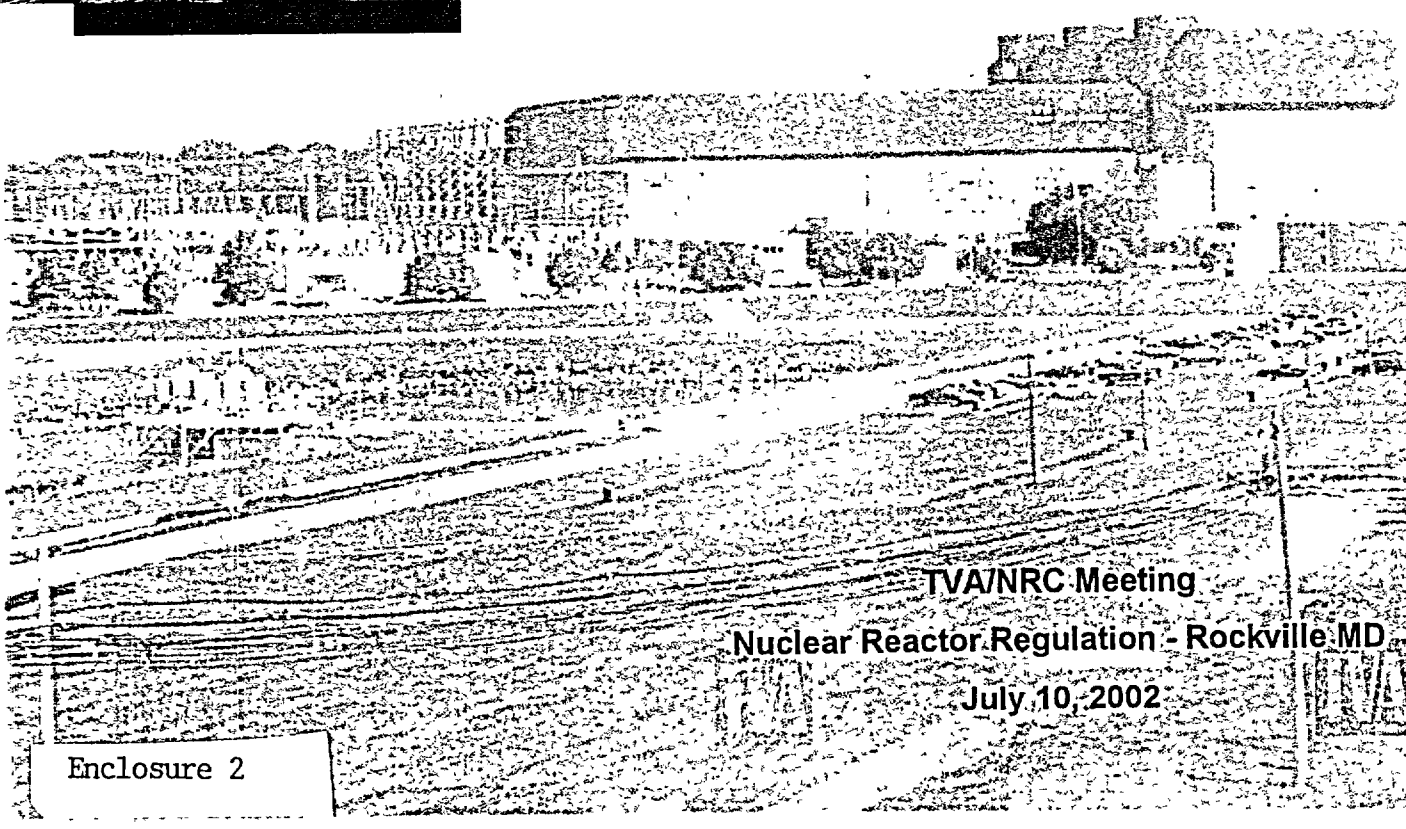
# Tennessee Valley Authority
# Browns Ferry Nuclear Plant Units 2 and 3
# Extended Power Uprate





**TVA/NRC Meeting**

**Nuclear Reactor Regulation - Rockville MD**

**July 10, 2002**

Enclosure 2

# Agenda

- Introduction/Meeting Objectives
- Background
- Project Overview
- Submittal Content
- Applicability of Methodology to BFN
- Summary and Conclusion

Tim Abney

# Introduction/Meeting Objectives

- Introduction

- Meeting Objectives
  - Describe Submittal Content
  - Discuss Other Required Changes to Licensing Basis
  - Provide Basis for Applicability of Constant Pressure Power Uprate Methodology to BFN

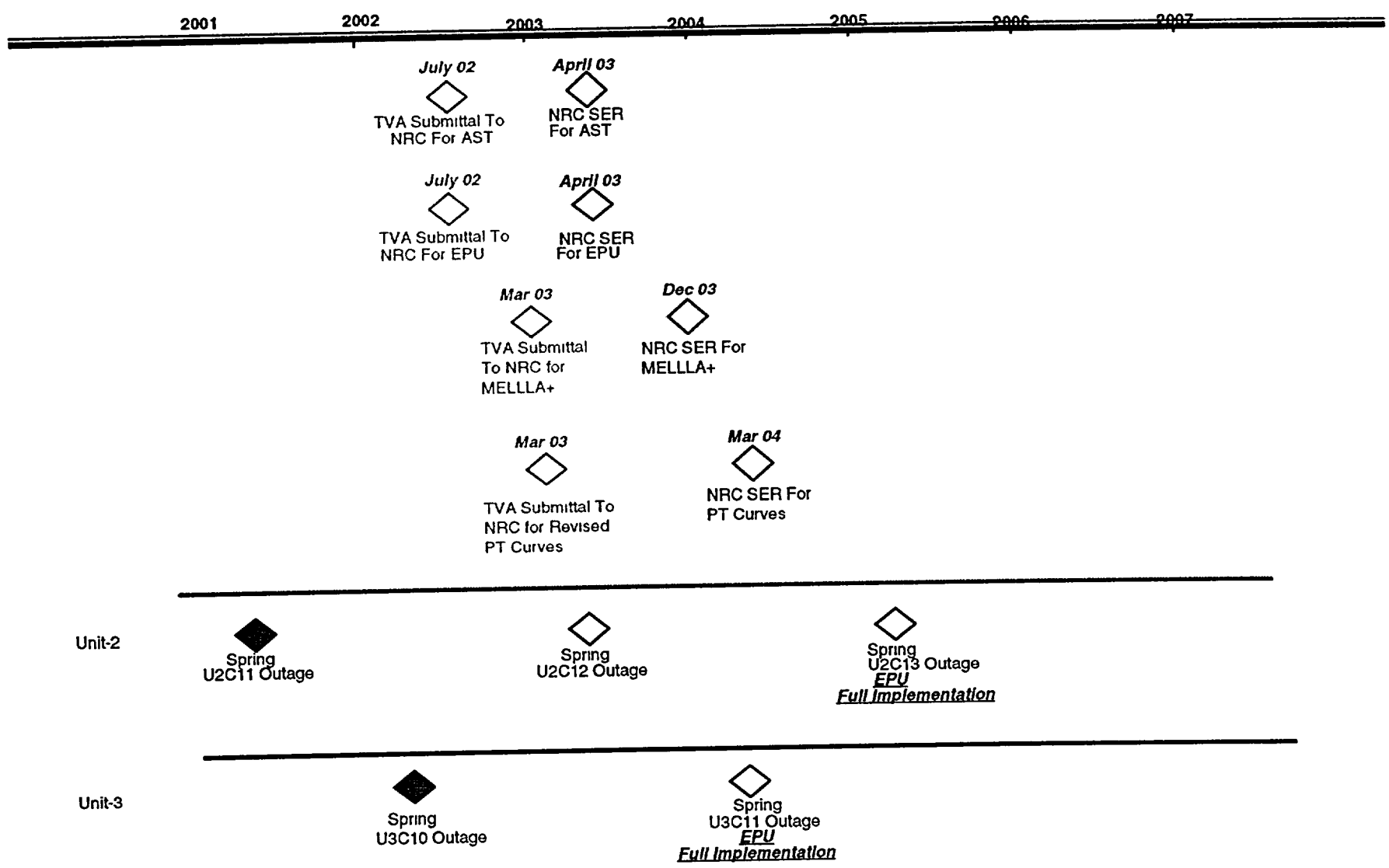
# Background

- TVA Board of Directors Approved Extended Power Uprate Project for Browns Ferry Units 2 and 3 in March of 2001
- TVA Met with NRC Staff December 5, 2001, to Describe the Extended Power Uprate Project and Schedule
- Submittal in Final Approval
  - Uses GE Constant Pressure Power Uprate (CLTR) Methodology
  - Incorporates Applicable RAI Questions from Previous Extended Power Uprates

# Background (Cont.)

- TVA Considered Environmental Impacts of Operation of all 3 BFN Units at 120% of Original Licensed Power for License Renewal Term and Issued Supplemental Environmental Impact Statement (SEIS)
  - Public Meetings Held March 6, 2001 and January 17, 2002
  - Draft SEIS Published in Federal Register December 14, 2001
  - TVA Board Record of Decision Published in Federal Register June 18, 2002

# Project Overview



# Submittal Content

- Consistent with Content and Level of Detail of GE Licensing Topical Report for Constant Pressure Power Uprate
  - Will Justify Exclusion of Large Transient Testing
  - Will Request Credit for Containment Overpressure for ECCS Suction NPSH
- Other Changes to Licensing Basis
  - Revised P/T Curves (Separate Submittal)
  - Alternative Source Term (Separate Submittal)

# Applicability Of Methodology to BFN

- BFN Analysis Supports Uprate to 3952 MWt
- Industry Experience in 1970s
  - Little Large Plant Experience
  - Rapid Plant Growth
    - BWR2 - 640 MWe (1969)
    - BWR3 - 850 MWe (1971)
    - BWR4 - 1100 MWe (1974)
    - BWR5 - 1150 MWe (planned)
    - BWR6 - 1500 MWe (planned)
  - Planned Plants Exceeded Rotating Equipment Experience Base

# Applicability Of Methodology to BFN (Cont)

- NRC Reg Guide 1.49 Revision 0 - May 1973
  - Construction Permit Applications Limited to 3800 MWt
  - Ultimate Power Level Limited to 4100 MWt
  - Limitation Applies Until Sufficient Experience Gained with Design, Construction, and Operation of Larger Plants

# Applicability Of Methodology to BFN (Cont)

- NRC Reg Guide 1.49 Revision 1 - December 1973.
  - Construction Permit Applications Limited to 3800 MWt Until January 1, 1979, at Earliest
  - 2% Allowance in Power Level Adequate for Instrument Errors (Maximum of 3876 MWt)
  - Radiological Analyses Limited to 4100 MWt
  - Acceptability to Increase Maximum Licensed Power Level to be Carefully Reviewed

# Applicability Of Methodology to BFN (Cont)

- Operating Experience Supports Power Uprates up to 20%
- Power Uprate Methodology Approved
  - ELTR (February 1996)
  - CLTR (June 2002)
- After Power Uprates, Large Plants Will Exceed 3800 MWt
- Operating Experience Base
  - Numerous Plants Licensed Power > 3200 MWt
    - About 30 Years of Operation at the Oldest Facilities
    - No Safety or Operational Problems Attributed to Plant Size
    - Plants are Currently Licensed and Operating at a Higher Power Density than Browns Ferry After EPU

# Applicability Of Methodology to BFN (Cont)

- Browns Ferry Uprate Power Density = 60.3 kw/l
- Currently Licensed Power Density (GE14 Fuel)
  - BWR3 = 42.2 kw/l
  - BWR4 = 60.9 kw/l
  - BWR6 = 64.9 kw/l
- Maximum Operating = 65.6 kw/l (Foreign Plant)
- GE Analysis Methodology
  - Methods Used Documented in PUSAR
  - Code Limitations and Restrictions Observed
  - Appropriate Use Confirmed
  - Power Uprate Audits Performed by NRC
- No LTR or SER Limitations on Core Power Level
- Methodology LTRs or SERs Specify Limits on Range of Applicability for Correlations

# Applicability Of Methodology to BFN (Cont)

- GE Analysis Methodology
  - Safety Analyses Consistent with 102% Power Requirement
  - Increase in Power Does Not Significantly Change Plant Response
  - Increase in Decay Heat Well Defined
  - Thermal-Hydraulic Conditions (Pressures, Temperatures, Flows, Void Fractions) Remain Within Experience Base
  - Thermal-Hydraulic Conditions Controlled by GEXL Correlation
    - NRC Approved
    - Not Changed for Changes in Core Power Level
  - Limitations on Bundle Power (MAPLHGR, LHGR and MCPR) Constrain Plant Operation

# Applicability Of Methodology to BFN (Cont)

- Reg Guide 1.49 Constrains Construction Permit Applications
- Substantial Body of Safe and Reliable Operation of Large Plants
- Analysis Methodology Applicable Above 3800 MWt
- Fuel Operating Limitations Appropriate
- No Technical Limitations Identified
- License Submittal Provides Comprehensive Evaluations

# Summary and Conclusion