February 6, 1998

LICENSEE: Duke Energy Corporation

FACILITIES: Oconee Nuclear Station, Units 1 and 2

SUBJECT: MEETING SUMMARY - MEETING OF JANUARY 27, 1998, REGARDING CRITICAL HEAT FLUX AND UPDATED FINAL SAFETY ANALYSIS REPORT (UFSAR) CHAPTER 15 TOPICAL REPORTS (TAC NOS. M96728, M88660, M98661, M98662, M99349, M99350, AND M99351)

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(1) Meeting Notice by D.E. LaBarge, January 12, 1998
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On January 27, 1998, the staff met with Duke Energy Corporation (DEC) personnel to discuss the contents of DEC's topical reports dealing with conversion to Mark B-11 fuel at Oconee and changes to Chapter 15 of the Oconee UFSAR that were submitted for staff review.

Enclosure 1 lists the meeting participants. Enclosure 2 is the handout provided by DEC.

ORIGINAL SIGNED BY:
David E. LaBarge, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects - I/II
Office of Nuclear Reactor Regulation

Docket Nos. 50-269, 50-270, and 50-287

Enclosures:
1. Meeting Attendees
2. DEC Handout

cc w/encls: See next page

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OGC	HBerkow	AAttard	
ACRS	FRinaldi	THuang	
	DLaBarge	WJensen	
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DATE	2/5/98		2/6/98		/ /98	2/6 /98		/ /98		/ /97

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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MEETING WITH DUKE ENERGY CORPORATION

JANUARY 27, 1998

NAME	AFFILIATION
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Laurence Kopp	NRC/NRR/Reactor Systems Branch
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Robert Saint Clair	Duke Energy Corporation
Gregg Swindlehurst	Duke Energy Corporation
Peter Tam	NRC/NRR/Project Directorate II-2
Eric Weiss	NRC/NRR/Reactor Systems Branch

Enclosure 1

Oconee Transition to MkB11

- FCF MkB11: New 15x15 product: mixing vanes, .416"OD
- First full batch O3C19 (fuel delivery 2/2000)
- Cycle design begins 11/98.
- Four lead assemblies currently in 1st cycle O2C16
- End of 1st Cycle PIE scheduled for May '98

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Enclosure 2

Previous MkB11 NRC Interactions

- January 31, 1995 Duke and Framatome met with NRC to present the MkB11 development program and lead assembly analysis and irradiation plans.
- July 14, 1995 Framatome met with NRC and presented the BWU CHF correlation. As part of this presentation Framatome discussed a MkB11 mixing vane grid design change and an intent to use the BWU correlation on the MkB11 LTAs.
- August 15, 1995 Duke met with NRC and presented the status of supporting topicals and the then-current status of the MkB11 fuel assembly development program.
- May 1996 four lead MkB11 fuel assemblies began their irradiation in Oconee 2 cycle 16. This cycle will shut down in February of 1998, and the first cycle of post-irradiation-examination will be conducted during this outage.

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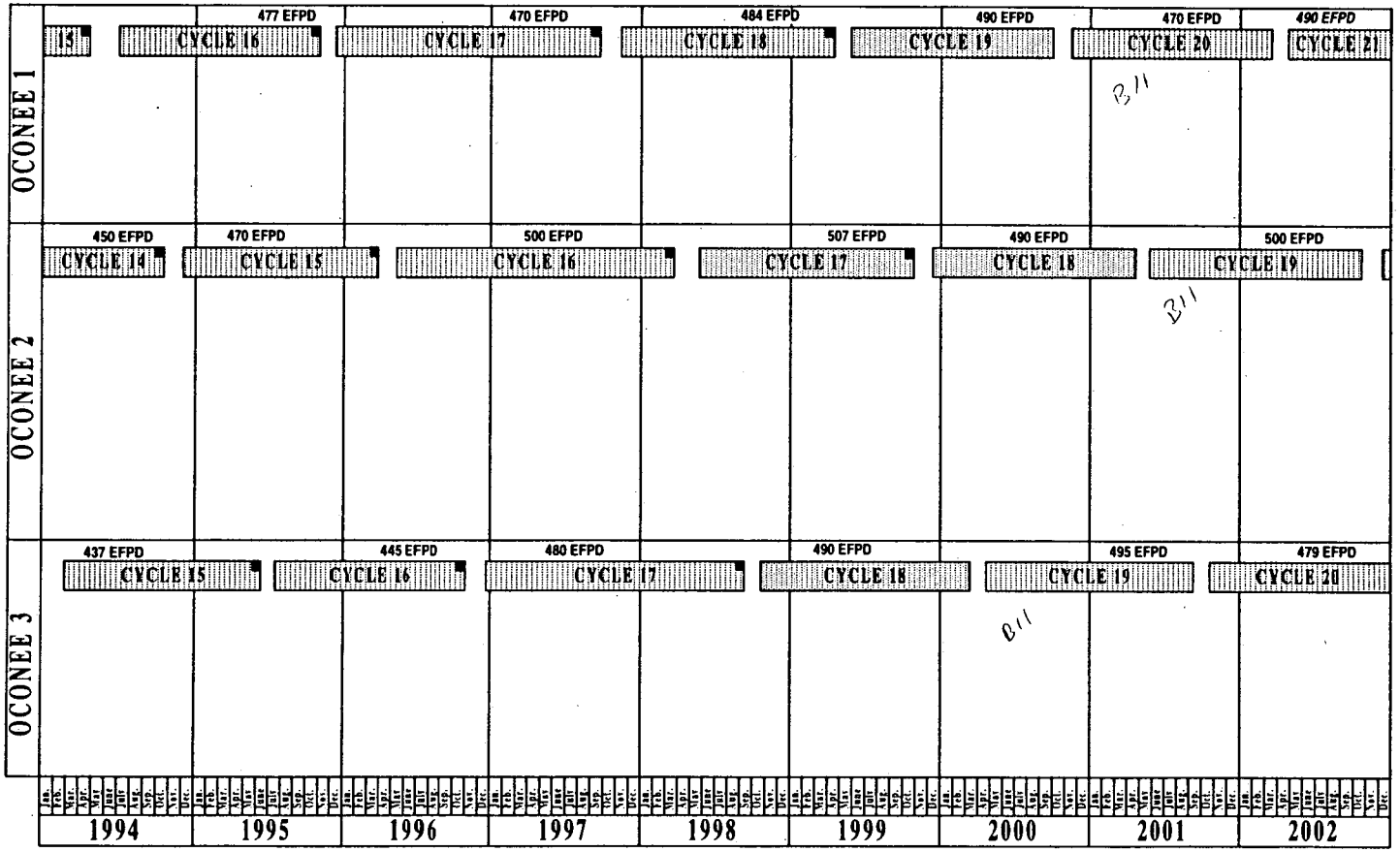
OCONEE Mk-B11 DESIGN SCHEDULE



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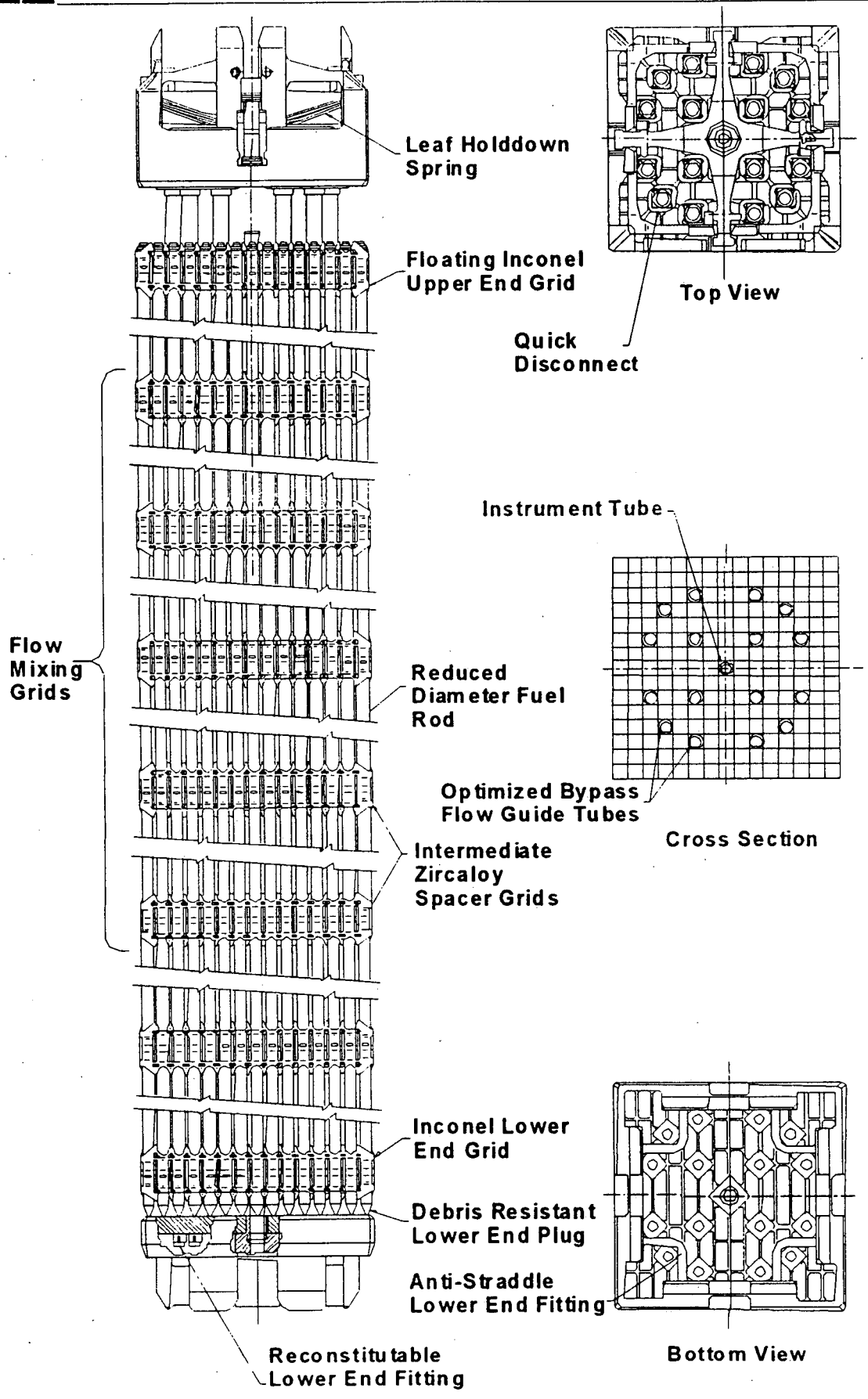
B11 FUEL ASSEMBLY



Oconee MkB11 Design Comparison with Current Fuel

Design Feature	Current Mk-B10L fuel assembly design	Mk-B11
Fuel assembly dry weight, lbs	1563	1480
Top nozzle design	Quick disconnect UEF	Quick disconnect UEF
Number of spacer grids	8	8
Type of spacer grids	**non-mixing vane**	**mixing vane**
CRGT ID, inches	0.498	0.498
IT ID, inches	0.441	0.441
Fuel rod cladding OD, inches	**0.430**	**0.416**
Cladding material	low tin Zircaloy-4	low tin Zircaloy-4
Fuel rod pre-pressure, psig	proprietary	unchanged
Pellet stack height, inches	**142.29**	**143.05**

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Oconee Topical Status

Topical Title	Submittal	SER Need Date
1. FCF MkB11 Fuel Assembly Design Topical (BAW-10229P)	9/30/97	12/98
2. FCF BWU Critical Heat Flux Correlations Addendum 1 (BAW-10199P)	9/96	1/98
3. Duke Thermal-Hydraulic Statistical Core Design Methodology, Addendum D (DPC-NE-2005)	4/22/97	10/98
4. Duke UFSAR Chapter 15 Transient Analysis Methodology (DPC-NE-3005-P)	7/30/97	10/98
5. Duke Thermal Hydraulic Transient Analysis Methodology Revision (DPC-NE-3000-P, Rev 2)	12/97	10/98

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CHF and TH Methods

- FCF BWU CHF Correlation Addendum 1 (BAW-10199P) uses same "universal" (polynomial) form.
  - New data on MkB11 (.416"OD mixing vane fuel) used to develop a performance factor (multiplier).
- Duke SCD Topical Addendum D (DPC-NE-2005) is identical in approach to previous addenda.
  - Explicit propagation of statepoints with VIPRE-01.

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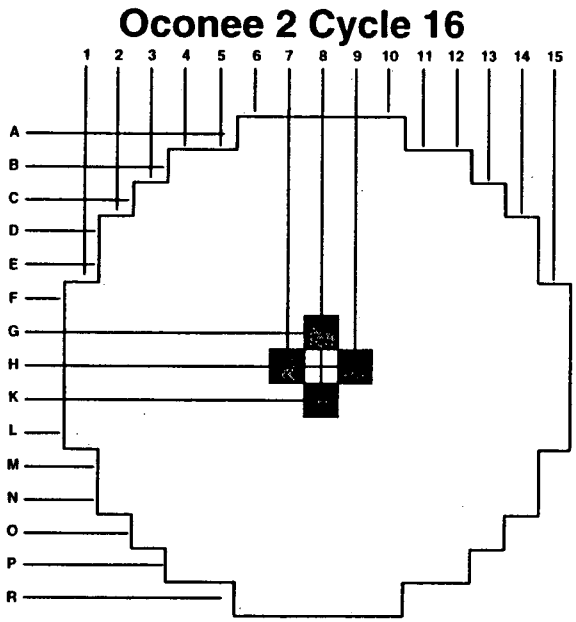
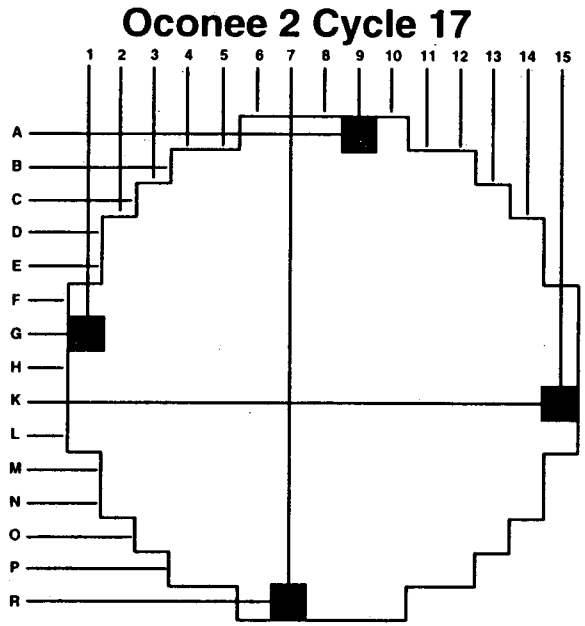
LTA Core Locations



LTA Cycle Average Max. Pin = 1.26



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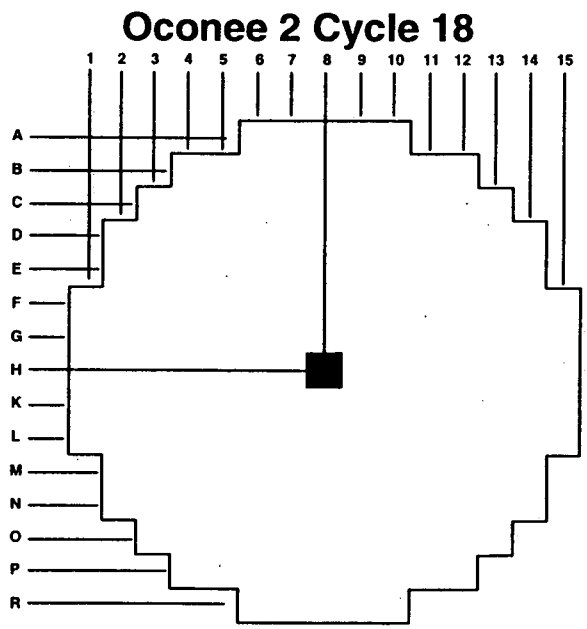

LTA Cycle Average Max. Pin = 0.99

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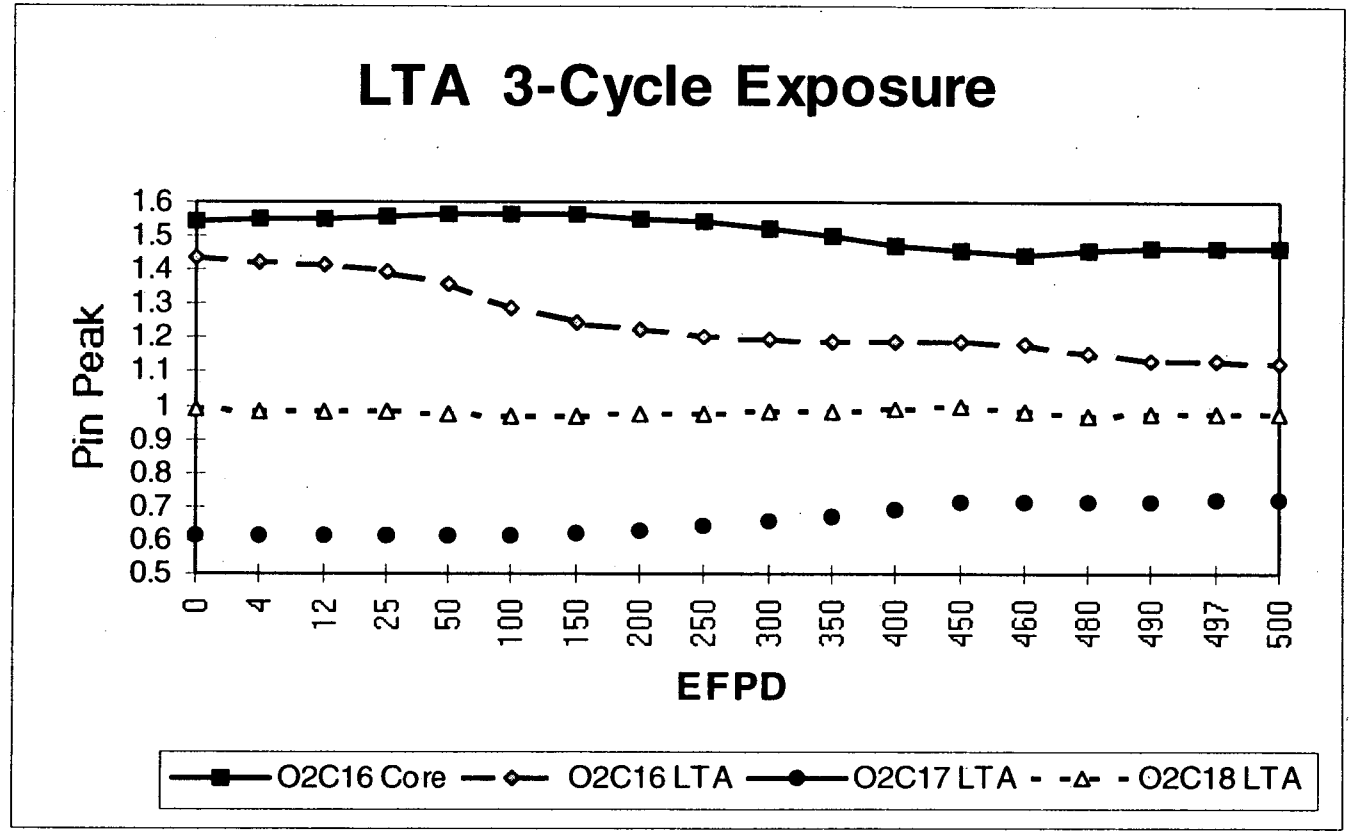

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O2EOC16 B11 PIE Scope

Inspection	# of FAs
Full length visuals	6
Fuel rod oxide/diameter	3
Fuel assembly growth/bow	6
Fuel assembly water channel	2
Guide tube oxide/width/plug gage	1
Spacer grid position	2

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Nuclear Design Changes

- FCF Mark B-11 fuel design.
- Use of SIMULATE-3K for Rod Ejection Accident (REA) analysis.

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Mark B-11 Design Model

- No changes from currently approved models except input parameters to describe B-11 fuel and utilization of SIMULATE-3K for REA analysis as described in DPC-NE-3005P.
- Uncertainty factors developed and approved in DPC-NE-1004A for B&W 177-assembly plants will be utilized.

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Application of Methods to B-11

- No new isotopes introduced by B-11.
- Utilizes the same burnable poisons at B-10.
- Previous validation of Mark-BW fuel at MNS/CNS produced no change in uncertainties from OFA fuel.
- Criteria for zero power physics tests, power escalation tests, reactivity anomalies, and power distributions will remain unchanged.

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DPC-NE-3005-P: UFSAR Chapter 15 Transient Analysis Methodology

- Submitted for NRC review 7/30/97 (review is underway)
- Requesting review complete by 10/98
  - Needed for Mk-B11 fuel assembly design (O3C19)
  - Needed for ITS conversion (analytical bases for T. S.)
- Same approach as NRC-approved McGuire/Catawba topical reports
- Modern methods to replace 1970s vintage B&W analyses
- Minor revision to DPC-NE-3000 submitted 12/23/97
  - Modeling related to the Mk-B11 fuel assembly
  - Modeling related to the BWU-Z CHF correlation
  - Minor methodology/model changes

DPC-NE-3005-P: UFSAR Chapter 15 Transient Analysis Methodology

Philosophical Approach

- Upgrade Chapter 15 analyses to be more modern
  (Duke already licensed McGuire/Catawba Ch. 15 reanalyses)
- Modern industry standard computer codes
- Most codes and models already reviewed and approved by the NRC
- Meaningful/limiting scenarios
- Modern acceptance criteria
- Consistent with technical specifications
- Conservative initial conditions
- Conservative boundary conditions
- Careful selection of single failures
- Careful modeling of control systems and operator actions
- High level of detail for NRC review
- First application of SIMULATE-3K for licensing
- First application of RETRAN 1D kinetics in a PWR
- Among the first applications of RETRAN-3D (limited scope)
- Scope and content discussed with NRC on 8/15/95

DPC-NE-3005-P: UFSAR Chapter 15 Transient Analysis Methodology

Comparison of Present and Future UFSAR Chapter 15

Present	Future
15.2 Startup Accident	Same (RCPs per T. S.)
15.3 Rod Withdrawal Accident at Rated Power	Other power levels also
15.4 Moderator Dilution Accident	Modern scenarios
15.5 Cold Water Accident (RCP startup)	One RCP per T. S.
15.6 Loss of Coolant Flow Accident (locked rotor also)	All RCP combinations
15.7 Control Rod Misalignment Accidents (Dropped rod)	Also statically misaligned rod
15.8 Loss of Electric Load Accidents	Turbine trip
15.9 Steam Generator Tube Rupture	Realistic scenario
15.12 Rod Ejection Accident	Same (3D)
15.13 Steam Line Break	Same (FW isolation) Also small SLB

DPC-NE-3005-P: UFSAR Chapter 15 Transient Analysis Methodology

Table of Contents

Summary: MkB11 Transition

- NRC support of FCF's CHF correlation and fuel assembly mechanical design topicals.
- NRC support of Duke's topical report review schedules
- NRC Support of Duke's planned submittals of reload reports and FSAR markups for the first batch of each unit.

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