# ACCELERATED DOCUMENT DISTRIBUTION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9406100325 DOC.DATE: 94/06/07 NOTARIZED: YES DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
BEMIS,P.R. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
CLIFFORD,J.W. NRC - No Detailed Affiliation Given

Withholding See Encls Granted 7/12/94 J.W.C.

SUBJECT: Forwards proprietary overhead slides to be presented during meeting w/NRC staff.Encl withheld ( ref 10CFR2.790(b)).

DISTRIBUTION CODE: AP01D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: SG+12
TITLE: Proprietary Review Distribution - Pre Operating License & Operating R

NOTES:

| | RECIPIENT ID CODE/NAME | | COPIES LTTR | COPIES ENCL | RECIPIENT ID CODE/NAME | COPIES LTTR | COPIES ENCL |
|---|---|---|---|---|---|---|---|
| | PDIV-3 LA | | 1 | 1 | PDIV-3 PD | 1 | 1 |
| | CLIFFORD,J | | 3 | 3 | | | |
| INTERNAL: | ACRS | | 6 | 6 | OGC/HDS1 | 1 | 0 |
| | REG FILE | 01 | 1 | 1 | | | |
| EXTERNAL: | NRC PDR | | 1 | 0 | | | |

R I D S / A D D S

R I D S / A D D S

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL 12

# ACCELERATED DOCUMENT DISTRIBUTION SYSTEM

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9406100325 DOC.DATE: 94/06/07 NOTARIZED: YES DOCKET #
FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
BEMIS,P.R. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
CLIFFORD,J.W. NRC - No Detailed Affiliation Given

See Encls

SUBJECT: Forwards proprietary overhead slides to be presented during meeting w/NRC staff.Encl withheld ( ref 10CFR2.790(b)).

DISTRIBUTION CODE: AP01D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: S6+12
TITLE: Proprietary Review Distribution - Pre Operating License & Operating R

NOTES:

| | RECIPIENT ID CODE/NAME | | COPIES LTTR | COPIES ENCL | RECIPIENT ID CODE/NAME | COPIES LTTR | COPIES ENCL |
|---|---|---|---|---|---|---|---|
| | PDIV-3 LA | | 1 | 1 | PDIV-3 PD | 1 | 1 |
| | CLIFFORD,J | | 3 | 3 | | | |
| INTERNAL: | ACRS | | 6 | 6 | OGC/HDS1 | 1 | 0 |
| | REG FILE | 01 | 1 | 1 | | | |
| EXTERNAL: | NRC PDR | | 1 | 0 | | | |

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2065) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL 12

R I D S / A D D S

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

*P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352-0968 • (509) 372-5000*

June 7, 1994
G02-94-134

Docket No. 50-397

U.S. Nuclear Regulatory Commission
Attn: Mr. J. W. Clifford
Mail Station 13 E16
Washington, D.C. 20555

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
**PRESENTATION TO NRC SCHEDULED FOR JUNE 6, 1994**

Attached is a copy of the overhead slides to be presented during the meeting with you and other members of the NRC staff. Siemans Power Corporation considers some of the information contained is the presentation material for the June 9, 1994 meeting between the US NRC and the Supply System to be proprietary. In accordance with the requirements of 10 CFR 2.790(b), an affidavit is attached to support the withholding of this information from public disclosure.

If you have any questions please call me or Marsha Eades at (509) 377-4277.

Sincerely,

P. R. Bemis (Mail Drop PE20)
Manager, Regulatory Programs

MGE/kd
Attachments

cc: LJ Callan - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Sr. Resident Inspector - 901A



Add/Change: NRC PDR 1 Encl 1 Wpkt Prop

STATE OF WASHINGTON )
)
COUNTY OF BENTON )

Subject: 6/6 Presentation to NRC

I. P. R. BEMIS, being duly sworn, subscribe to and say that I am the Manager, Regulatory Programs for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE 7 June, 1994

P. R. Bemis, Manager
Regulatory Programs

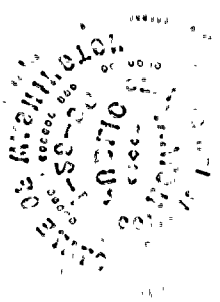
On this date personally appeared before me P. R. BEMIS, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 7th day of June 1994.

Notary Public in and for the
STATE OF WASHINGTON

Residing at Kennewick, WA

My Commission Expires 4/28/98



# AFFIDAVIT

STATE OF WASHINGTON )
) ss.
COUNTY OF BENTON )

I, R. A. Copeland being duly sworn, hereby say and depose:

1. I am Manager, Product Licensing, for Siemens Power Corporation ("SPC"), and as such I am authorized to execute this Affidavit.

2. I am familiar with SPC's detailed document control system and policies which govern the protection and control of information.

3. I am familiar with the presentation information transmitted in the letter from P. R. Bemis (WPPSS) to J. W. Clifford (USNRC), "Presentation to NRC Scheduled for June 9, 1994," dated June 7, 1994," referred to as "Document." Information contained in this Document has been classified by SPC as proprietary in accordance with the control system and policies established by SPC for the control and protection of information.

4. The Document contains information of a proprietary and confidential nature and is of the type customarily held in confidence by SPC and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in the Document as proprietary and confidential.

5. The Document has been made available to the U.S. Nuclear Regulatory Commission in confidence, with the request that the information contained in the Document will not be disclosed or divulged.

6. The Document contains information which is vital to a competitive advantage of SPC and would be helpful to competitors of SPC when competing with SPC.

7. The information contained in the Document is considered to be proprietary by SPC because it reveals certain distinguishing aspects of SPC licensing methodology which secure competitive advantage to SPC for fuel design optimization and marketability, and includes information utilized by SPC in its business which affords SPC an opportunity to obtain a competitive advantage over its competitors who do not or may not know or use the information contained in the Document.

8. The disclosure of the proprietary information contained in the Document to a competitor would permit the competitor to reduce its expenditure of money and manpower and to improve its competitive position by giving it valuable insights into SPC licensing methodology and would result in substantial harm to the competitive position of SPC.

9. The Document contains proprietary information which is held in confidence by SPC and is not available in public sources.

10. In accordance with SPC's policies governing the protection and control of information, proprietary information contained in the Document has been made available, on a limited basis, to others outside SPC only as required and under suitable agreement providing for nondisclosure and limited use of the information.

11. SPC policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

12. Information in this Document provides insight into SPC licensing methodology developed by SPC. SPC has invested significant resources in developing the methodology as well as the strategy for this application. Assuming a competitor had available the same background data and incentives as SPC, the competitor might, at a minimum, develop the information for the same expenditure of manpower and money as SPC.

THAT the statements made hereinabove are, to the best of my knowledge, information, and belief, truthful and complete.

FURTHER AFFIANT SAYETH NOT.

SUBSCRIBED before me this 7 day of June, 1994.

Susan K. McCoy
NOTARY PUBLIC, STATE OF WASHINGTON
MY COMMISSION EXPIRES: 1/10/96

# PRESENTATION TO THE NRC ON

# WNP-2 CYCLE 10 DESIGN ANALYSIS

# AND AUGMENTED STABILITY EVALUATIONS

Washington Public Power Supply System
June 9, 1994

# AGENDA

| | |
|---|---|
| Introduction and Schedule | DL Whitcomb |
| Cycle Design and Comparison | BM Moore |
| Confirmation of Corrective Actions | DE Bush |
| Evaluation of Stability Exclusion Regions | DE Bush |
| Revisions to Startup Plan | DL Whitcomb |
| Consideration of BWROG Revised ICAs | DL Whitcomb |
| Other Fuel Related Issues | DL Whitcomb |
| Summary | DL Whitcomb |

# PLANT STATUS

- Refueling Outage (R9) in progress.
- No fuel failures occurred during Cycle 9.
- Outage activities are slightly behind schedule.
- Restart scheduled for June 26, 1994.

# SCHEDULE

- Preparation of the COLR and FSAR Change Notice is in process.
- COLR will be submitted to POC the week of June 20, 1994.

# CYCLE DESIGNS AND COMPARISON

- Design Review for Cycle 10 Reload
  - Objective of Review
  - Scope of Review
  - Status of Review
- Comparison of Cycle 8 through Cycle 10
  - Core Configuration
    - Loading Patterns
    - 9x9-9X Assembly Flow Rate

# CYCLE DESIGNS AND COMPARISON
(Continued)

- Radial Peaking
  - Comparison to Other Plants
- Startup Control Rod Worths
  - Estimated Critical Position
  - Rod Worths
- MCPR Operating Limit Comparisons

# DESIGN REVIEW FOR CYCLE 10 RELOAD

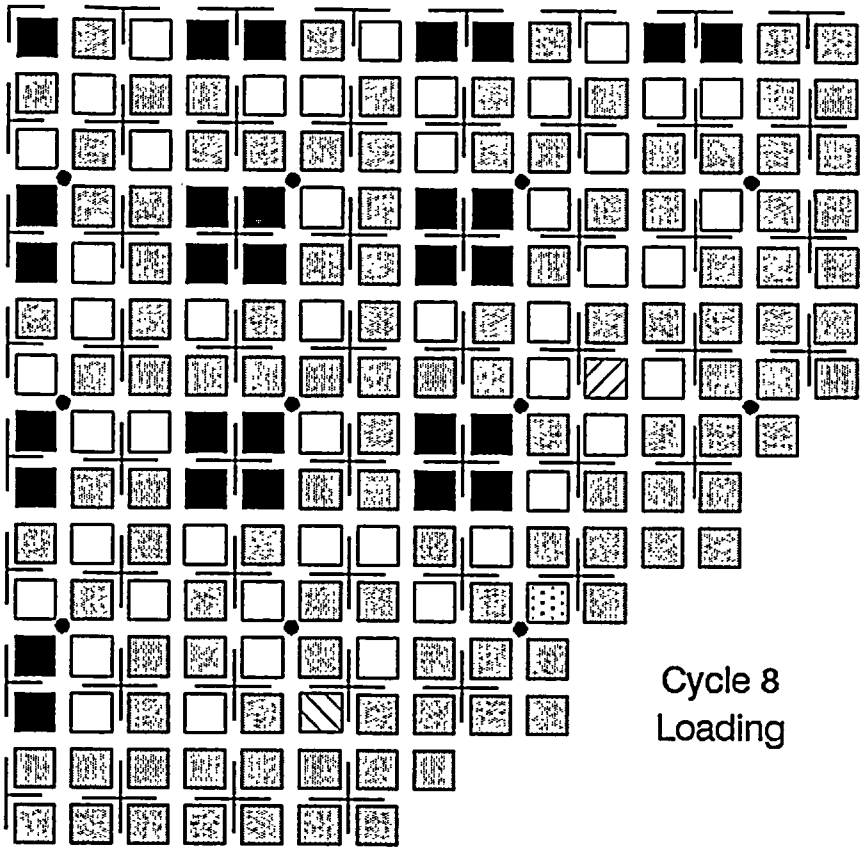
- Objective of Review
  - Emphasis on operating performance of the core in addition to meeting the licensing requirements.
  - Awareness of impact of core and fuel design changes on plant operations.
  - Attention to core stability and thermal hydraulic characteristics and assessing the adequacy of the stability margin.

# DESIGN REVIEW FOR CYCLE 10 RELOAD (Continued)

- Scope of Review
  - Stability Review
  - Reload Batch Design
  - Fuel Cycle Design
  - Core-wide Transient Analysis
  - Reload Analysis
  - Startup and Operations Report
  - Core Monitoring System Inputs
- All reviews are conducted with both Supply System personnel and outside consultants.

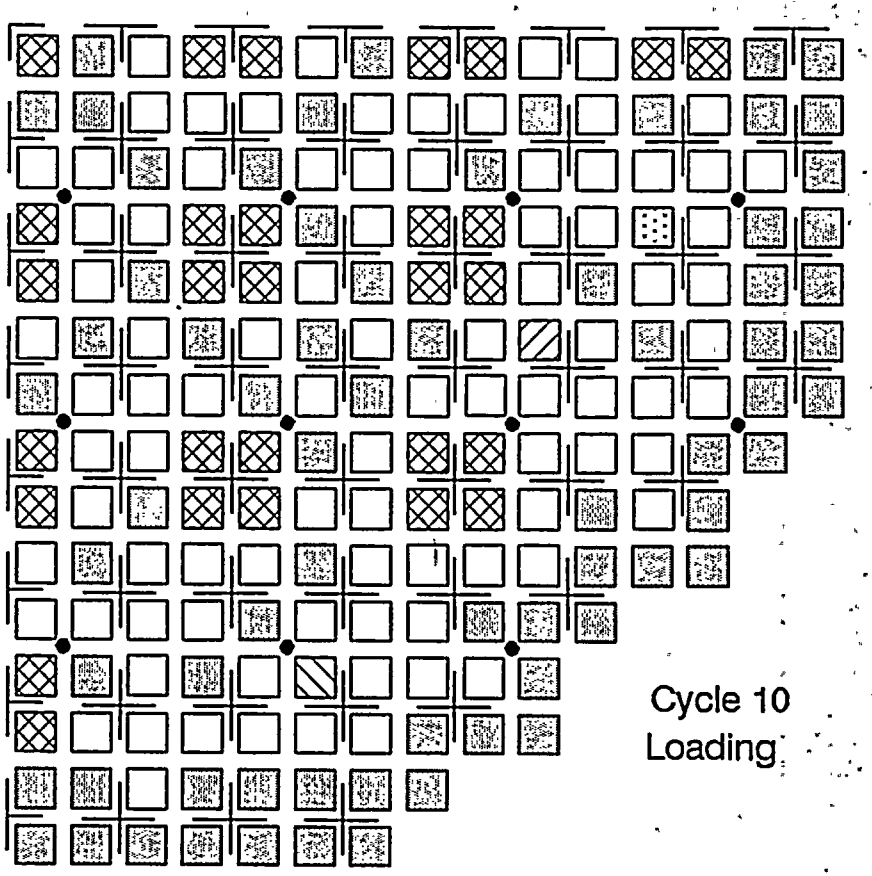
# DESIGN REVIEW FOR CYCLE 10 RELOAD (Continued)

- Status of Review
  - All reviews have been completed except the startup and operations report and the core monitoring system inputs.
  - There have been no findings that would preclude startup of WNP-2.



Cycle 8 Loading

| Assembly Type | Number of Assemblies | Description |
|---|---|---|
| | 116 | 8x8 in Control Cells |
| | 448 | 8x8 |
| | 188 | 9x9-9X |
| | 4 | SPC 9x9 LFAs |
| | 4 | GE-11 LFAs |
| | 4 | SVEA 96 LFAs |



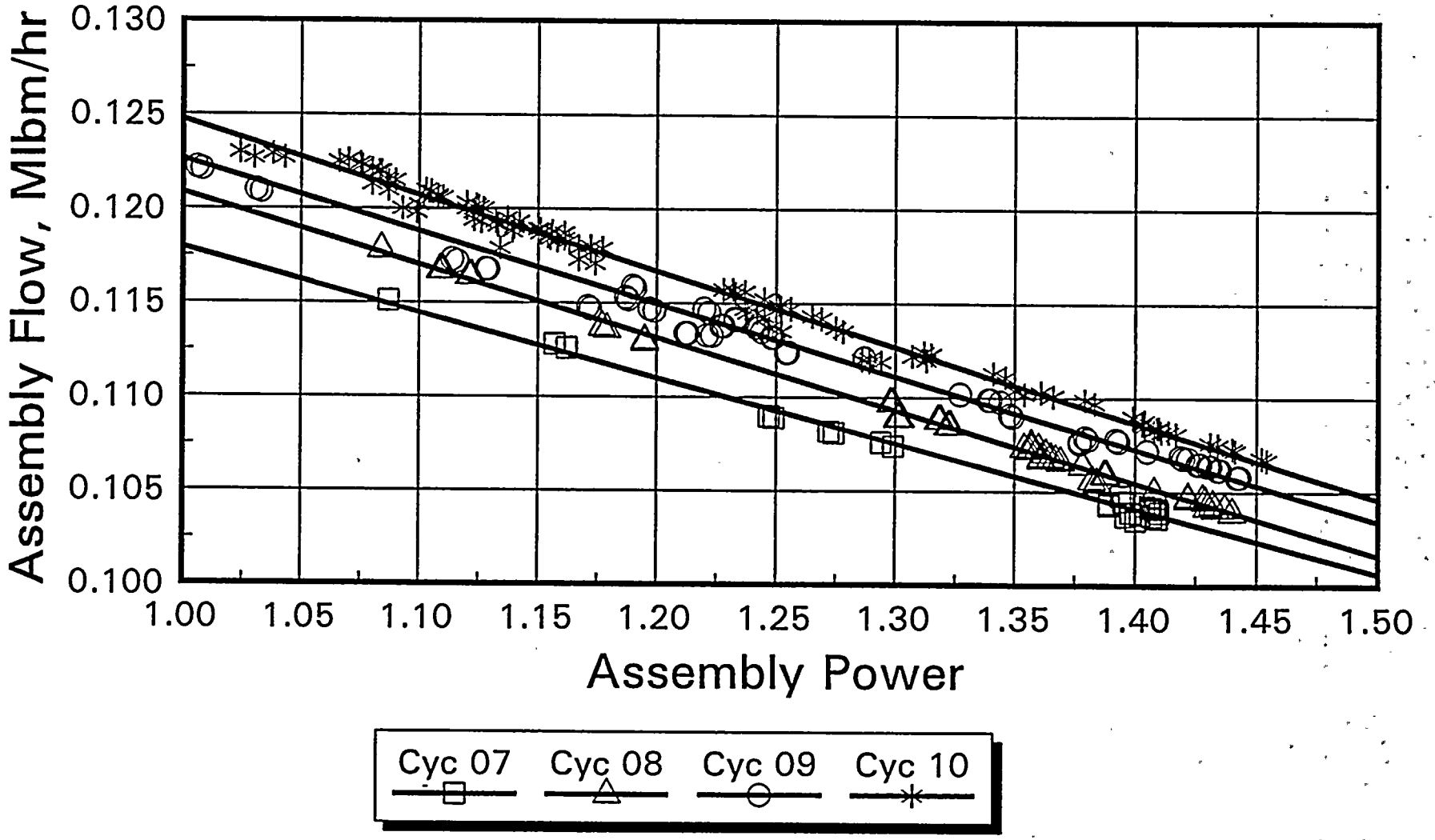
Cycle 10 Loading

| Assembly Type | Number of Assemblies | Description |
|---|---|---|
| | 280 | 8x8 |
| | 116 | 9x9-9X in Control Cells |
| | 356 | 9x9-9X |
| | 4 | SPC 9x9 LFAs |
| | 4 | GE-11 LFAs |
| | 4 | SVEA 96 LFAs |

BMM
04/21/94

# SPC 9x9-9X FLOW vs POWER

## Total Core Flow = 105.0 Mlbm/hr



# FULL POWER MCPR OPERATING LIMIT COMPARISONS

BOC - MOC:

| Condition Limit | Fuel Type | Cycle 8 | Cycle 9 | Cycle 10 |
|---|---|---|---|---|
| NSS RPT | 8x8 | 1.23 | 1.25 | 1.24 |
| Operable | 9x9-9X | 1.23 | 1.25 | 1.24 |

Note: The OLMCPRs are based on Control Rod Withdraw Error Analysis

# FULL POWER MCPR OPERATING LIMIT COMPARISONS
(Continued)

MOC - EOC:

| Condition Limit | Fuel Type | Cycle 8 | Cycle 9 | Cycle 10 |
|---|---|---|---|---|
| NSS RPT | 8x8 | 1.24 | 1.31 | 1.30 |
| Operable | 9x9-9X | 1.25 | 1.29 | 1.27 |

Note: The OLMCPRs for Cycles 8 and 9 were based on the Load Rejection Without Bypass Transient. For Cycle 10, the OLMCPR is based on Turbine Trip Without Bypass. The MCPR Safety Limit of 1.07 was determined for all three cycles.

# CONFIRMATION OF CORRECTIVE ACTIONS

- Summary of Commitments
  - ANNA must be operating and monitored whenever reactor power is greater than 25% and core flow is less than 50% rated. (Area of Increased Awareness).
    - Monitored decay ratio must be $< 0.6$
  - Power Distribution Controls
    - MCPR $> 2.2$
    - Total core peaking factor $< 3.4$
  - Maximum reactor thermal power at pump upshift $< 33\%$ rated.

# CONFIRMATION OF CORRECTIVE ACTIONS
(Continued)

- A startup plan must be prepared and approved by POC.
- Defines startup rod patterns planned between 25% reactor power and pump upshift.

- STAIF calculated decay ratio must be $< 0.5$ for the control rod pattern used at beginning of pump upshift.

# CONFIRMATION OF CORRECTIVE ACTIONS
(Continued)

- Review of Cycle 9 Pump Shift Results
  - Results
    - Comparison of calculated and measured decay ratio
    - Analysis of critical parameters.

# WNP-2 CYCLE 9 STARTUP & SHUTDOWN STABILITY CALCULATION RESULTS

| Date | % Rated Power/Flow | MCPR | Total Peaking | Radial Peaking | Core Ave Axial Peaking | Boiling Boundary (FT) | Core/Channel Decay Ratio |
|---|---|---|---|---|---|---|---|
| 06/22/93 | 30.0/27.7[4] | 2.39 | 2.81 | 1.56 | 1.43N9/12 | 4.75 | 0.12/0.05 |
| 06/24/93 | 32.7/31.2[3] | 2.62 | 2.79 | 1.50 | 1.32N9/12 | 4.12 | 0.13/0.08 |
| 06/24/93[1] | 30.0/27.6[4] | 2.56 | 2.77 | 1.51 | 1.34N8/12 | 4.31 | 0.13/0.09 |
| 07/02/93[2] | 29.0/25.0 | 2.73 | 3.08 | 1.60 | 1.60N7/12 | 5.48 | 0.09/0.06 |
| 07/02/93[2] | 29.0/25.0 | 2.74 | 3.30 | 1.60 | 1.66N6/12 | 4.92 | 0.11/0.11 |
| 07/02/93[2] | 29.0/25.0 | 2.72 | 3.56 | 1.65 | 1.72N6/12 | 4.21 | 0.28/0.23 |
| 08/13/93[1] | 30.0/27.6[4] | 2.92 | 2.78 | 1.48 | 1.37N8/12 | 4.38 | 0.15/0.07 |
| 02/03/94[2] | 29.0/25.0 | 2.68 | 2.64 | 1.69 | 1.44N7/12 | 5.09 | 0.31/0.12 |
| 02/03/94[2] | 29.0/25.0 | 2.90 | 2.47 | 1.57 | 1.43N7/12 | 4.89 | 0.30/0.12 |
| 02/03/94[2] | 29.0/25.0 | 2.93 | 2.35 | 1.56 | 1.42N9/12 | 5.26 | 0.29/0.10 |
| 02/03/94[2] | 29.0/25.0 | 2.97 | 2.37 | 1.53 | 1.47N10/12 | 5.41 | 0.25/0.08 |

Note: 1 - Used in Startup Plan
2 - Shutdown
3 - FCV Open
4 - FCV Closed

# WNP-2 DECAY RATIO DURING PUMP SHIFT
# CYCLE 9 DATA

| Date | Pump Shift Up/Down | Calc. Decay Ratio (STAIF) | Maximum APRM DR (ANNA) |
|---|---|---|---|
| 06/24/93 | up | .13 | .28-.32 |
| 08/13/93 | up | .15 | .15-.31 |

- The ANNA data shown are monitored values for the time period immediately prior to the pump frequency shift with the flow control valves closed.
- The commitment is to perform the pump shift with a monitored decay ratio less than 0.60; the STAIF calculational commitment is to predict a decay ratio less than 0.50.
- Calculated decay ratios are for conditions with flow control valve closed.

# CONFIRMATION OF CORRECTIVE ACTIONS
(Continued)

- Conclusions
  - Actual plant stability conditions (ANNA) are adequately predicted by STAIF.
  - Stability margins were adequate to ensure safe reactor startup and shutdown.

# CONFIRMATION OF CORRECTIVE ACTIONS (Continued)

- Confirmation of Corrective Actions for Cycle 10
  - Analysis Approach
    - Focused on establishing power distributions that were as close as possible to corrective action limits.
    - Examine exposure dependency.
    - Confirmed the use of shallow rods to shape power distribution.

Pump Up-Shift at Corrective Limits
During Cycle 10 (33.0% Power, 29.2% F, Subcooling = 33.0 BTU/lb)

| Case | Exposure (MWd/MTU) | MCPR | CMPF | Hot Channel Peaking | Core Average Power | | Core Average Boiling Boundary | STAIF Decay Ratio | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Axial | AO (%) | | Core | Hot Channel |
| 1 | 0 (Short) | 2.258 | 3.393 | 1.74 | 1.376 | -17.695 | 2.98 ft | 0.56 | 0.44 |
| 2 | 200 | 2.272 | 3.391 | 1.75 | 1.368 | -16.953 | 2.96 ft | 0.56 | 0.44 |
| 3 | 4000 | 2.423 | 3.394 | 1.85 | 1.380 | -17.801 | 3.01 ft | 0.62 | 0.35 |
| 4 | 4000 | 2.240 | 2.870 | 1.25 | 1.302 | -10.467 | 3.24 ft | 0.71 | 0.23 |
| 6 | 6020 | 2.448 | 2.569 | 1.39 | 1.286 | -4.752 | 3.58 ft | 0.69 | 0.21 |
| 7 | 6020 | 2.226 | 3.237 | 1.63 | 1.461 | 21.688 | 4.72 ft | 0.29 | 0.07 |

Case 4 Repeated with use of Shallow Rods

| Case | Exposure (MWd/MTU) | MCPR | CMPF | Hot Channel Peaking | Core Average Power | | Core Average Boiling Boundary | STAIF Decay Ratio | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Axial | AO (%) | | Core | Hot Channel |
| 4 | 4000 | 2.240 | 2.870 | 1.25 | 1.302 | -10.467 | 3.24 | 0.71 | 0.23 |
| 5 | 4000 | 2.196 | 2.880 | 1.34 | 1.456 | 3.250 | 4.21 ft | 0.37 | 0.13 |

# CONFIRMATION OF CORRECTIVE ACTIONS
(Continued)

- Conclusion
  - The applicability of the corrective actions committed to for use during Cycle 8 has been confirmed for use during Cycle 10.
  - Acceptable stability margin is projected for Cycle 10 using corrective actions.
  - Use of shallow rods to provide power distribution control will be continued.

# STABILITY EXCLUSION REGION EVALUATIONS

- Stability Licensing Commitments
  - Region A - Maintain decay ratios below 0.9 outside Region A - Supply System in March 31, 1989 Letter to NRC, G023-89-051.
  - ANNA must show decay ratios below 0.75 outside REGION B & C.
  - Siemens commitment to calculate decay ratios with both COTRAN and STAIF computer codes and use the higher of the two predictions was performed for Cycle 10.

# STABILITY EXCLUSION REGION EVALUATIONS
(Continued)

- Stability Codes used by Siemens
  - COTRAN
    - COTRAN is a 2D Kinetics Time Domain Code.
    - Prior to 1993, COTRAN was the only stability analysis used for reload core analyses.
    - XN-NF-691 (P)(A) and Supplement 1, "Stability Evaluation of Boiling Water Reactor Cores, Sensitivity Studies & Benchmark Analysis", August 1984.

# STABILITY EXCLUSION REGION EVALUATIONS
(Continued)

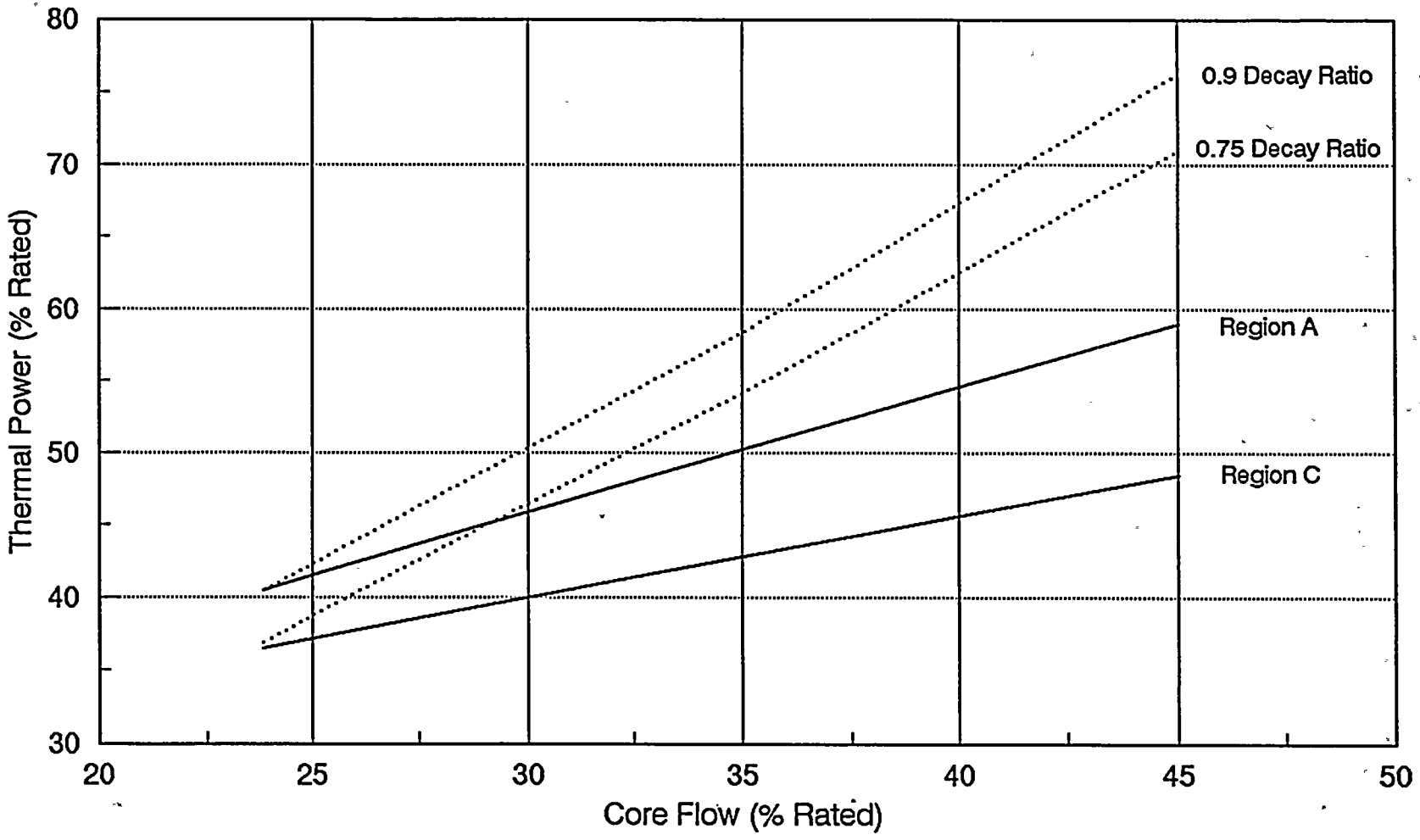
- STAIF

  - STAIF is a Frequency Domain Code.
  - Parallel Channel Hydrodynamics.
  - One Dimensional Neutronics with Reactivity Feedback for each Channel.
  - Detailed Recirculations Loops.
  - Topical Reports describing and benchmarking the STAIF code were submitted by Siemens and an SER was issued on April 14, 1994.

# CYCLE 10

## COTRAN DECAY RATIO

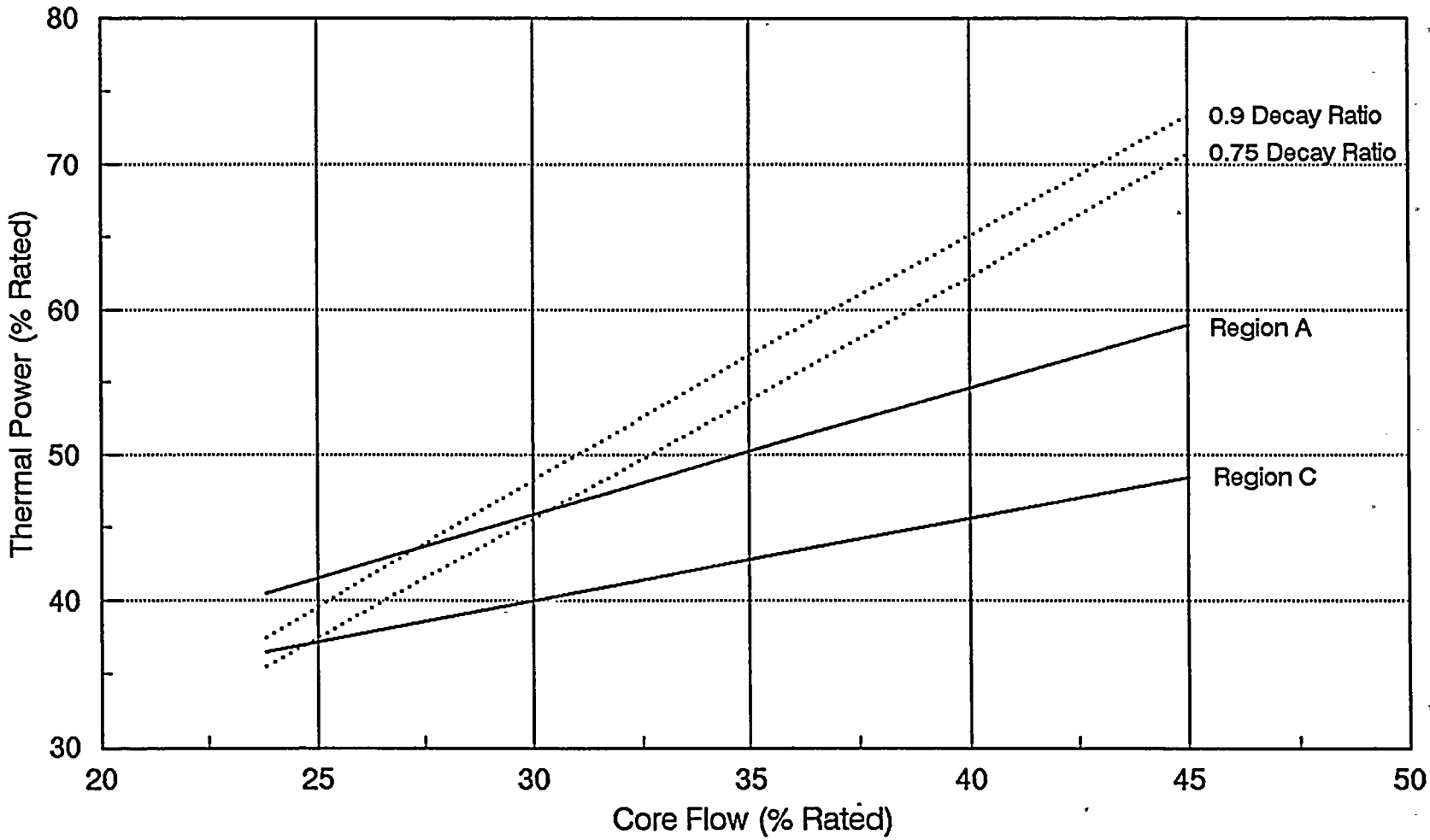
## Compared with Technical Specifications



# CYCLE 10

## STAIF DECAY RATIO

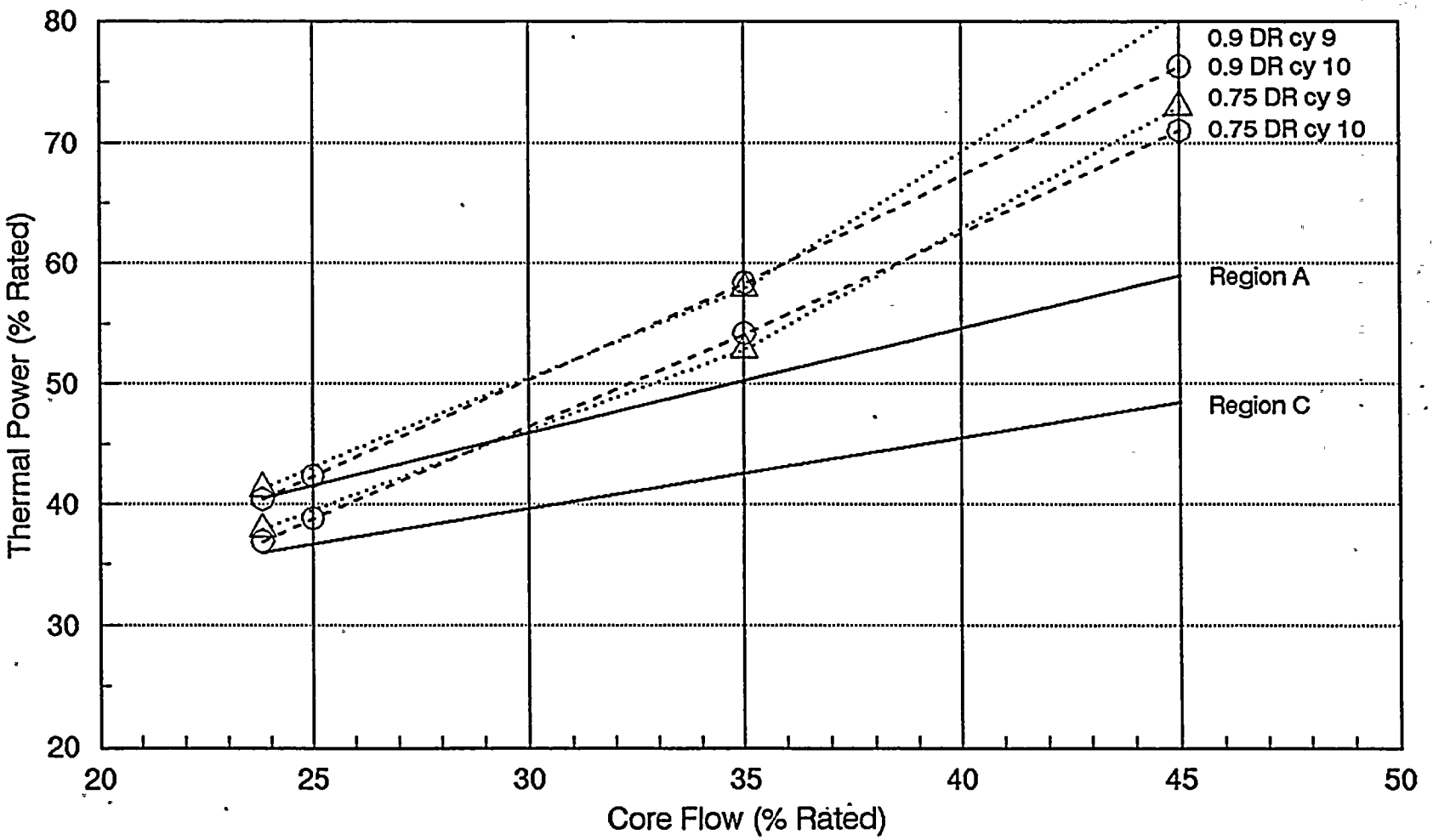
## Compared with Technical Specifications



# CYCLE 9 and 10

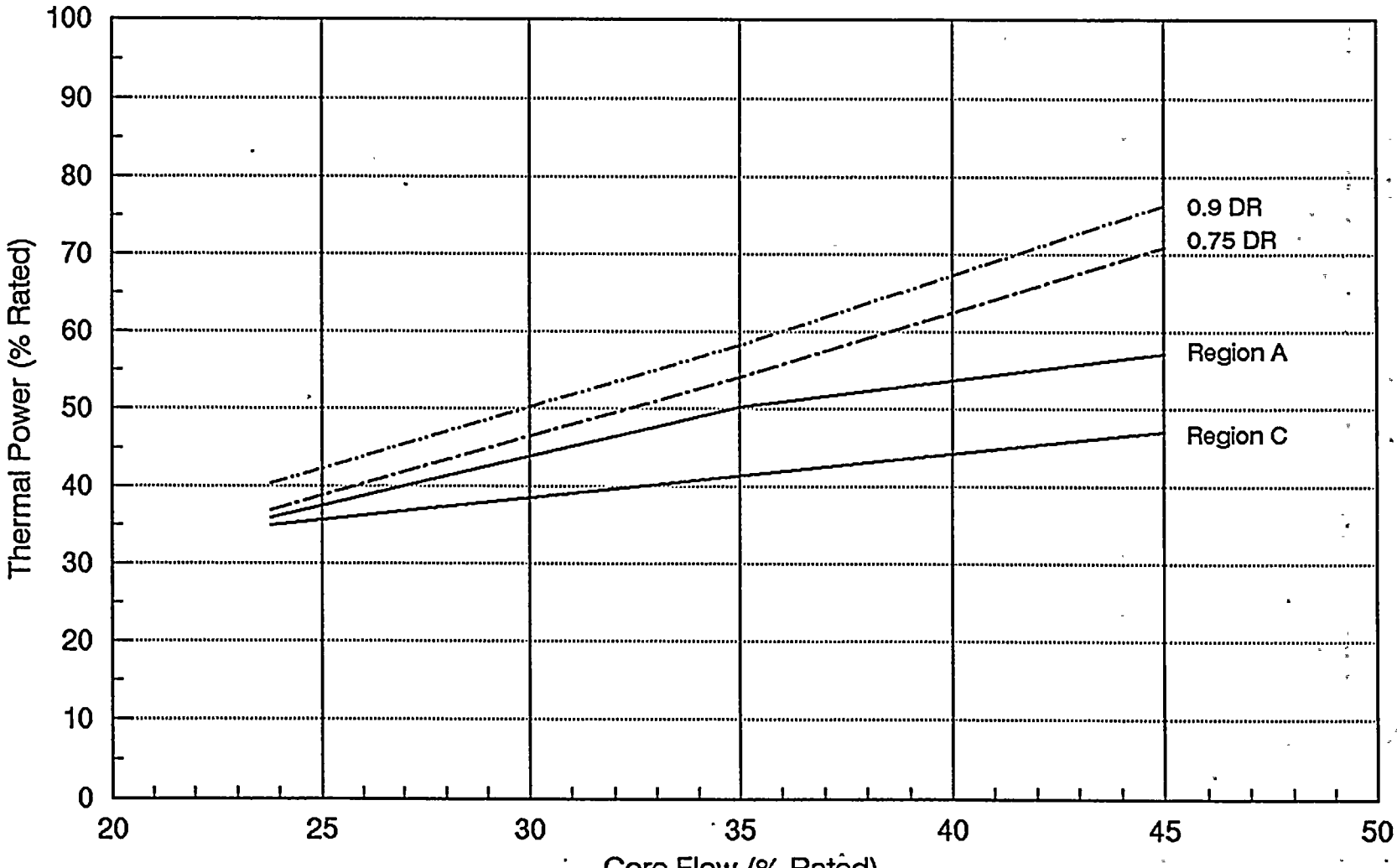
## COTRAN DECAY RATIO

## Compared with Technical Specifications



# ADMINISTRATIVE REGIONS

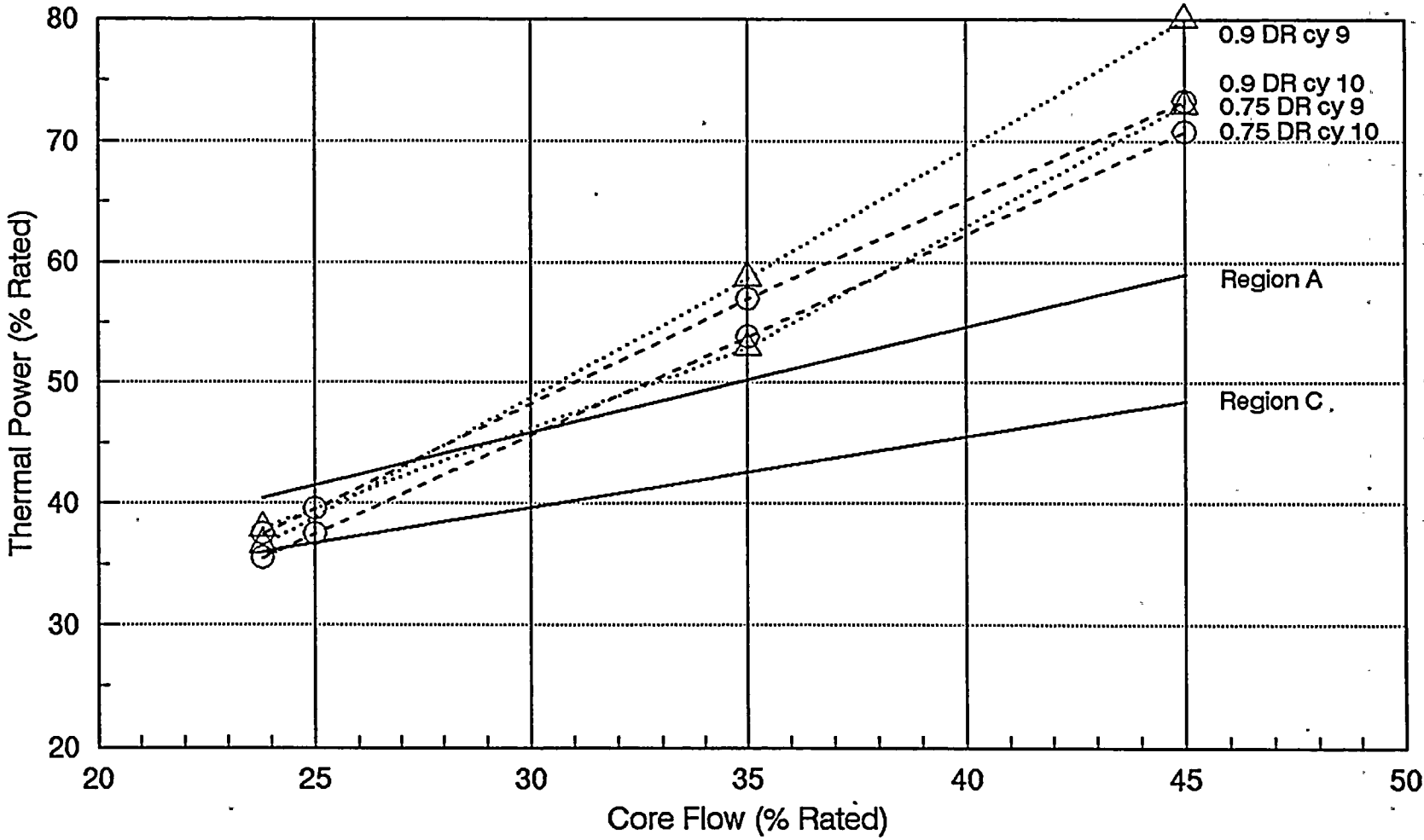
## CYCLE 10 COTRAN DECAY RATIO



# CYCLE 9 and 10

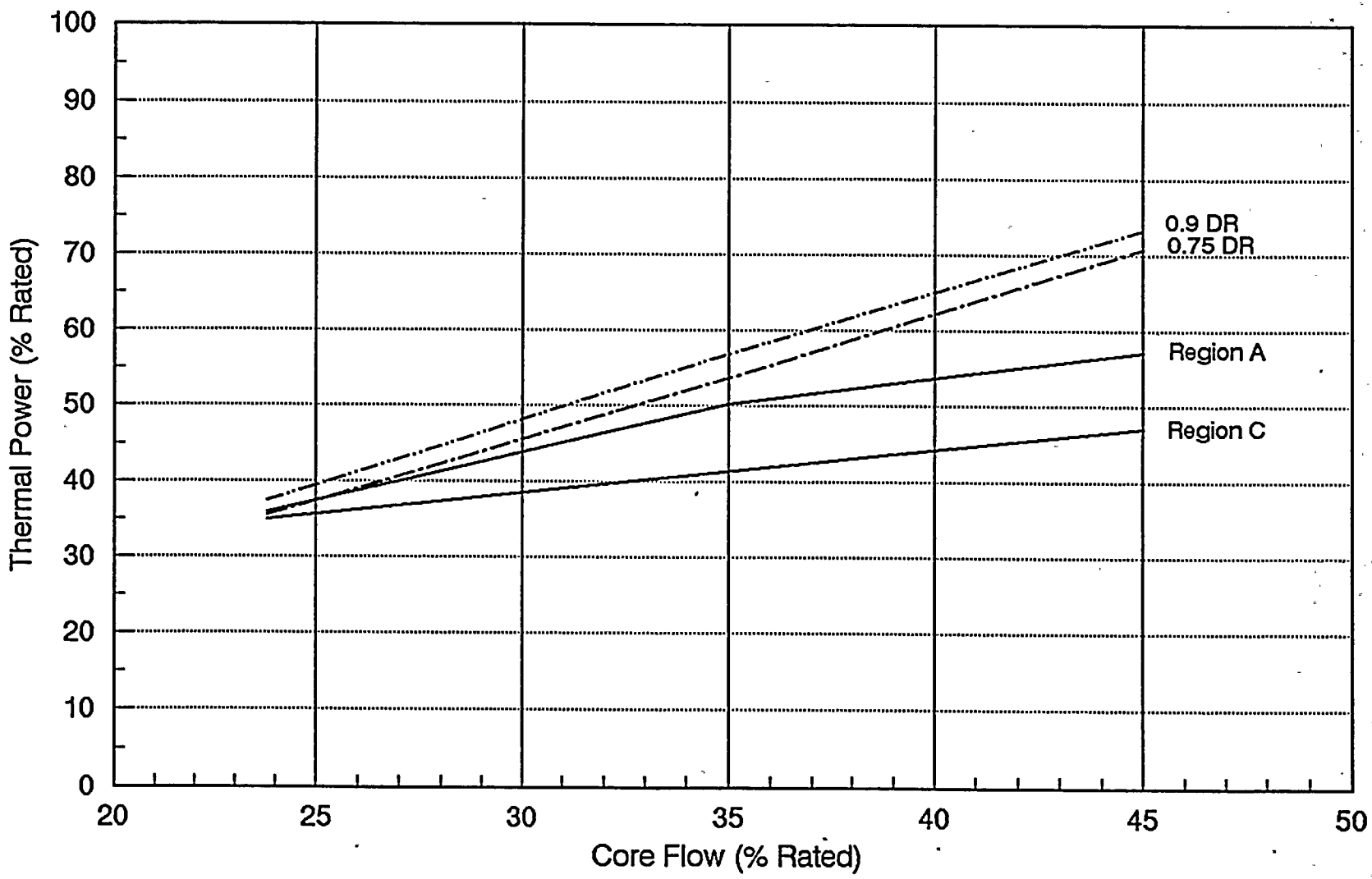
## STAIF DECAY RATIO

## Compared with Technical Specifications

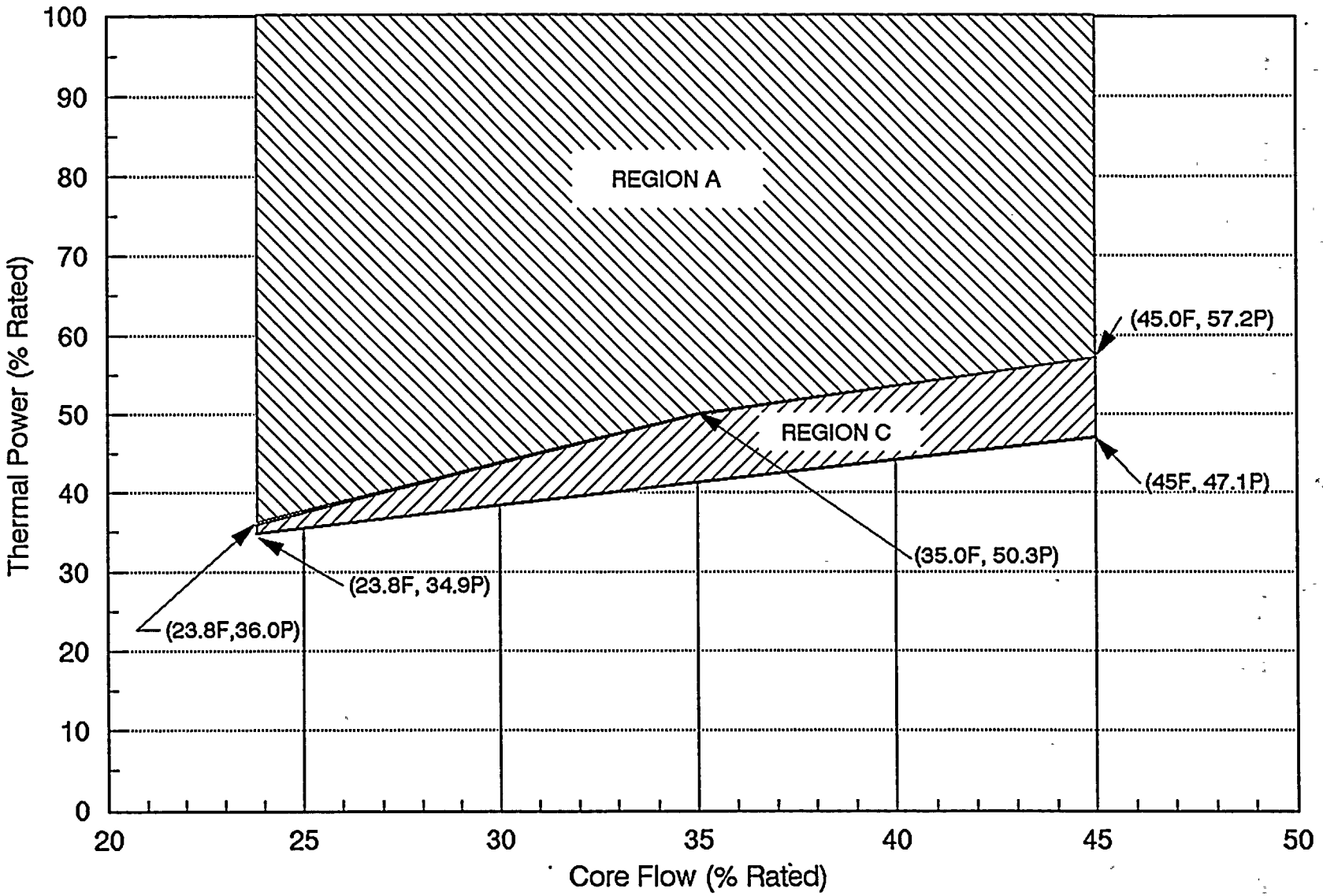


# ADMINISTRATIVE REGIONS

## CYCLE 10 STAIF DECAY RATIO



# ADMINISTRATIVE REGIONS



# PLANNED LICENSING ACTIONS

- Withdraw the May 10, 1993 request for Technical Specification changes to stability exclusion regions.
- Continue to apply the administrative regions to bound 0.9 and 0.75 STAIF calculated decay ratios.
- Resubmit the stability region definitions for power uprate.

# REVISIONS TO STARTUP PLAN

- Supply System use of STAIF to Support Plant Startup
- Startup Plan Process and Commitment Changes

# IN-HOUSE USE OF STAIF

- Supply System Procured STAIF From SPC
  - Eliminate the need for SPC support every startup.
  - Obtain a tool that can be utilized for other stability related evaluations.
  - On-line to provide rapid calculation turn around.
- Status
  - Code has been installed on Supply System work station and validation is in process.
  - Reactor state data is obtained directly from core monitoring system, i.e., POWERPLEX.
  - Staff training in the use of and interpretation of results is complete.
  - Will be used to support startup from R9.

# STARTUP PLAN AND COMMITMENT CHANGES

- Basis for Changes to Startup Plan Process
  - Strengthens organizational capability to evaluate stability concerns.
  - Allows for a more reliable startup.
  - More accurate plant conditions are used to perform the stability calculations.
  - Minimizes time in Area of Increased Awareness.

# STARTUP PLAN AND COMMITMENT CHANGES
(Continued)

- No Changes in the Following Areas:
  - ANNA operating and monitored when greater than 25% power and less than 50% core flow. Monitored DR $\leq$ 0.6.
  - Power distribution controls: MCPR > 2.2 and Total Core Peaking Factor < 3.4.
  - Pump upshift at < 33% Rated Thermal Power.
  - STAIF calculated DR < 0.5 for rod pattern at initiation of pump upshift.

# STARTUP PLAN AND COMMITMENT CHANGES
(Continued)

- Process Changes -- Approved by POC
  - Startup plan is now incorporated into PPM 9.3.12, Plant Power Maneuvering.
  - Preparation of a power ascension plan, which defines target power/flow statepoints, including control rod patterns, required prior to exceeding 25% power.
  - Power ascension plan will be approved by Reactor Engineering and Nuclear Engineering Managers.
  - POC has approved PPM 9.3.12 including the above changes.

# STARTUP PLAN AND COMMITMENT CHANGES
(Continued)

- Process Changes -- in Development
  - If pre-developed control rod patterns in the power ascension plan will not allow acceptable pump shift conditions, actions taken will be:

    1. Hold current thermal power.
       - Previously, power was reduced to less than 25% power.
    2. Using POWERPLEX, predict a control rod pattern that is projected to be acceptable.
    3. Perform STAIF DR calculation for new control rod pattern statepoint conditions using on-line STAIF.
    4. If DR $<0.5$, approve change to power ascension plan.
    5. Proceed with power ascension.

# CONSIDERATION OF BWROG REVISED ICAs

- Definition of ICA Operating Regions and Actions.
- Controlled Entry Region Operation.

NOTE: Supply System staff continues to evaluate the revised ICAs and will make a final decision after formal release.

# DEFINITION OF REVISED ICA OPERATING REGIONS AND ACTIONS

- Regions are based on BWROG region definitions in the proposed ICAs combined with existing Plant Technical Specifications and commitments.

- Region of increased awareness developed by the Supply System will be continued as an administrative control.

  - Region 1 - Scram Region, operating domain region below 40% core flow rate to the natural circulation line and above the 100% rated rod line or a rod line which bounds a DR $\geq$ 0.9 whichever is most conservative.

# DEFINITION OF REVISED ICA OPERATING REGIONS AND ACTIONS
(Continued)

- Region 2 - Exit Region, operating domain region below 45% core flow to the natural circulation line and above the 80% rod line or a rod line which bounds a DR $\geq$ 0.75 whichever is most conservative.

- Region 3 - Controlled Entry Region, operating domain region below 40% core flow to the natural circulation line and the 70% rod line or rod line which bounds a decay ratio of 0.6 whichever is most conservative.

# OPERATION IN CONTROLLED ENTRY REGION

- WNP-2 has a stability monitor (ANNA) developed by SPC.
- Two conditions are being considered:

  1. With ANNA operating and periodically monitored, DR must be $<0.6$. If DR $\geq 0.6$, initiate action to restore stability margin or immediately exit region (Option 3).

  2. With ANNA inoperable, (Option 1) maintain boiling boundary $\geq$4ft or (Option 2) maintain boiling boundary $\geq$3ft with CPR $>2.2$ and total peaking $<3.4$ .

# OPERATION IN CONTROLLED ENTRY REGION
(Continued)

- Preparation of preapproved Startup Plan including defined rod patterns with precalculated DRs would be eliminated.

- Plant Procedures and Training would be augmented as required to incorporate the training recommendations provided in the Revised ICAs and to implement the options selected.

# OTHER FUEL RELATED ISSUES

- Transition to ABB-CE
- Correction to Cycle 10 Channel Bow Submittal

# TRANSITION TO ABB-CE

- Contract approved January 1994.
- First reload received February 1996 to support Cycle 12 startup July 1, 1996.
- First project meeting held February 1994.
- Transfer of Plant specific design and operating data underway.
  - ABB will benchmark their methods beginning with Cycle 1.
  - Significant effort underway to ensure mixed core thermal hydraulics are properly addressed.

# TRANSITION TO ABB-CE
(Continued)

- Completion of generic licensing issues is very important
  - Revision of fuel design and reload specific Technical Specification may be required.

    1. 2.1.2, Safety Limit, Minimum Critical Power Ratio
    2. 3/4.2.6, 3/4.2.7, 3/4.2.8 Stability
    3. 5.3.1 Fuel Assemblies Design Features
    4. 6.9.3.2 Approved Analytical Methods

- SPC is cooperating in making the transition successful.

# REVISION TO CYCLE 10
# CHANNEL BOX BOW SUBMITTAL

- Problem:

  Four channels were not installed on the correct fuel assemblies during R5 channeling activities.

- Impact:

  - No channels exceeded 50 GWD/MTU exposure.
  - One channel and its projected exposure are not correctly shown on the Cycle 10 Channel Box Bow Submittal.

# REVISION TO CYCLE 10
# CHANNEL BOX BOW SUBMITTAL
# (Continued)

- Corrective Actions:
  - Removed and installed channel IDs verified during rechanneling of 39 assemblies.
  - Remaining 65 reused channel IDs are being verified.
  - Revise Channel Box Bow Submittal to correct channel ID and exposure.

# REVISION TO CYCLE 10
# CHANNEL BOX BOW SUBMITTAL
# (Continued)

- Correction to Table 1

| Row | Column | Current Assembly | Channel ID | Proj. EOC10 Exposure, MWD/MTU |
|---|---|---|---|---|
| 6 | 10 | UD5064 | 71806 | 29,399 |
| | | TO | | |
| 6 | 10 | UD5064 | 71771 | 28,482 |

# SUMMARY

- Power distributions were controlled during Cycle 8 and 9 startup and shutdown maneuvering to provide adequate stability margin and safe reactor operation.

- Cycle 10 analysis and reviews show that

  - The design is reasonable and consistent with other BWR plants.
  - Operating limits documented in the COLR will provide for safe Plant operation.
  - Adequate stability margins can be achieved to provide for safe plant operation.

# SUMMARY
(Continued)

- The insights provided by STAIF analyses to support definition of the exclusion regions will continue to be controlled administratively until the long term solution is implemented.