

**Westinghouse**

A BNFL Group company

# NRC WH-177 LTA Update Meeting

October 15 , 2003

# Meeting Agenda

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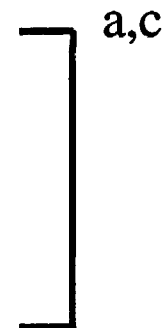
8:30 - 8:40	Introductions
8:40 - 8:50	Program Background (Goldenfield)
8:50 – 9:00	PIE Exam Results (Goldenfield)
9:00 - 9:10	Work Scope and Schedule (Goldenfield)
9:10 - 9:25	Design Comparisons (Settle)
9:25 - 9:45	Testing Program (Settle)
9:45 - 10:00	Compatibility Evaluation (Goldenfield)
10:15 - 10:30	Duke NRC Licensed Methodology (Goldenfield)
10:30 - 10:40	Licensing (Sisk)
10:40 - 10:50	Summary
10:50 - 11:30	Questions & Answers

# Background

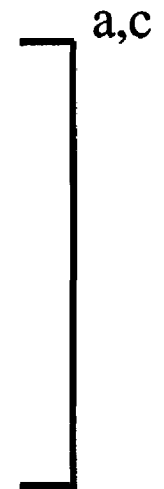
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## Westinghouse Experience with B&W Plants

- 4 LFAs for [TMI] <sup>a,c</sup> in early '90 (cycle 9 operation)



- 4 LFAs for TMI in mid '90s (cycles 11 and 12)



## Background (Con't)

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- Significant effort to understand grid-to-rod fretting since [ ]<sup>a,c</sup> failures
  - Focused team for 3 years

[ ]<sup>a,c</sup>

- New testing tools and methodologies developed

[ ]<sup>a,c</sup>

## Background (Con't)

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- Significant focus on improved 177-plant performance

[ ] a,c

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## WH-177 Program Scope

# Program Schedule

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MILESTONE	SCHEDULE	STATUS	a,c



# Program Work Scope

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# Design Scope

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- Design Scope



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## [ ]<sup>a,c</sup> PIE Exam Results

# [ ]<sup>a,c</sup> Lead Test Assembly Post-Irradiation Examination Results

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## Objectives

1. [ ]<sup>a,c</sup>
2. Gather performance data on the LTAs

**[ ]<sup>a,c</sup> Lead Test Assembly**  
**Post-Irradiation Examination Results**

## Completed Scope

$$[ \quad ]^{a,c}$$

# [ ]<sup>a,c</sup> Lead Test Assembly Post-Irradiation Examination Results

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## Completed Scope (continued)

- Fuel assembly LM10GA

—[

] <sup>a,c</sup>

- Fuel Assembly LM10G7

[

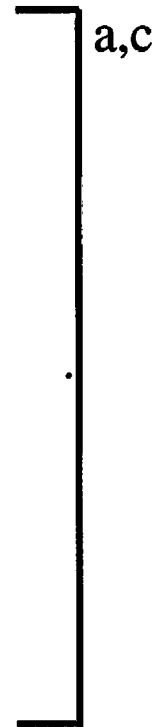
] <sup>a,c</sup>

# [<sup>a,c</sup> Lead Test Assembly Post-Irradiation Examination Results

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## Visual Results

- Fuel assembly LM10GA, Rod G4



<sup>a,c</sup>

# [Three Mile Island 1]<sup>a,c</sup> Lead Test Assembly Post-Irradiation Examination Results

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## Visual Results (continued)

- Fuel assembly LM10GA, Rod G2





**[ ]<sup>a,c</sup> Lead Test Assembly**  
**Post-Irradiation Examination Results**

## Visual Results (continued)

- Fuel assembly LM10G7, Non-Leaking rods E4, H3 and C8  

$$- [ \dots ]^{a,c}$$

# [ ]<sup>a,c</sup> Lead Test Assembly

## Post-Irradiation Examination Results

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### Root Cause

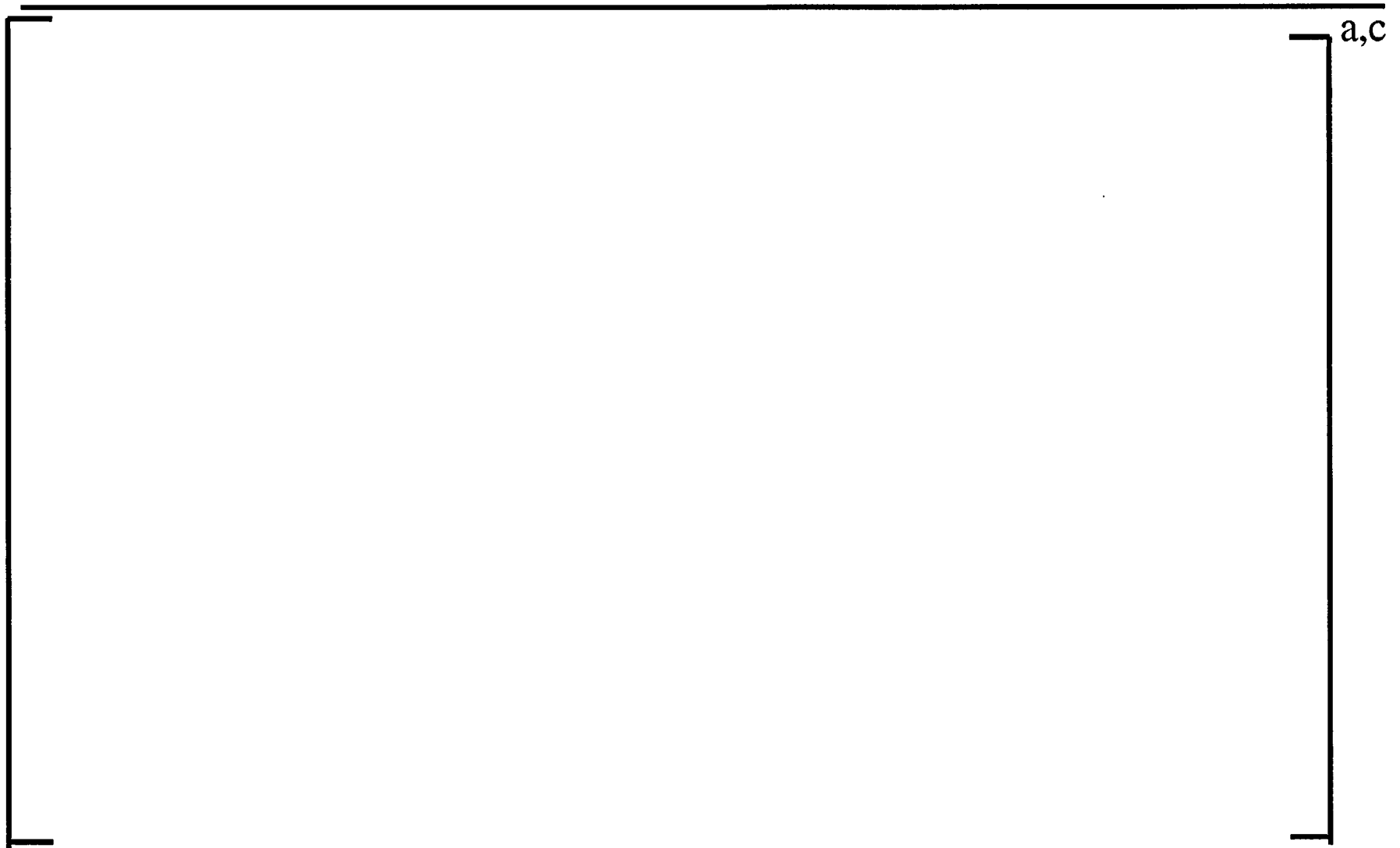
- Fuel assembly LM10GA, Rods G4 and G2
  - [ ]<sup>a,c</sup>
- Fuel Assembly LM10G7, Rods G4 and B9
  - [ ]

] <sup>a,c</sup>

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## WH-177 Design Features

# Reference Design



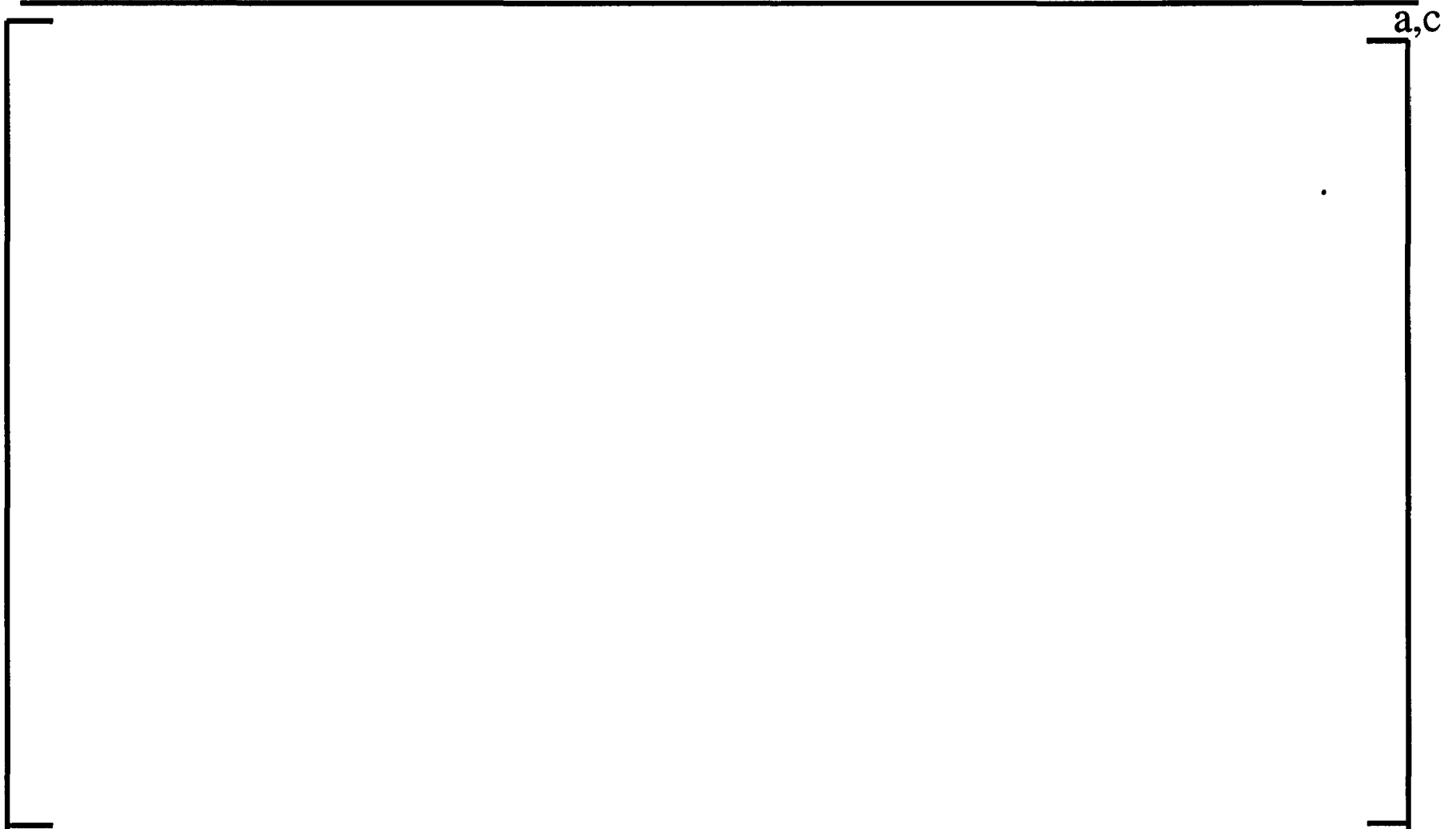
# Hardware Comparison

a,c

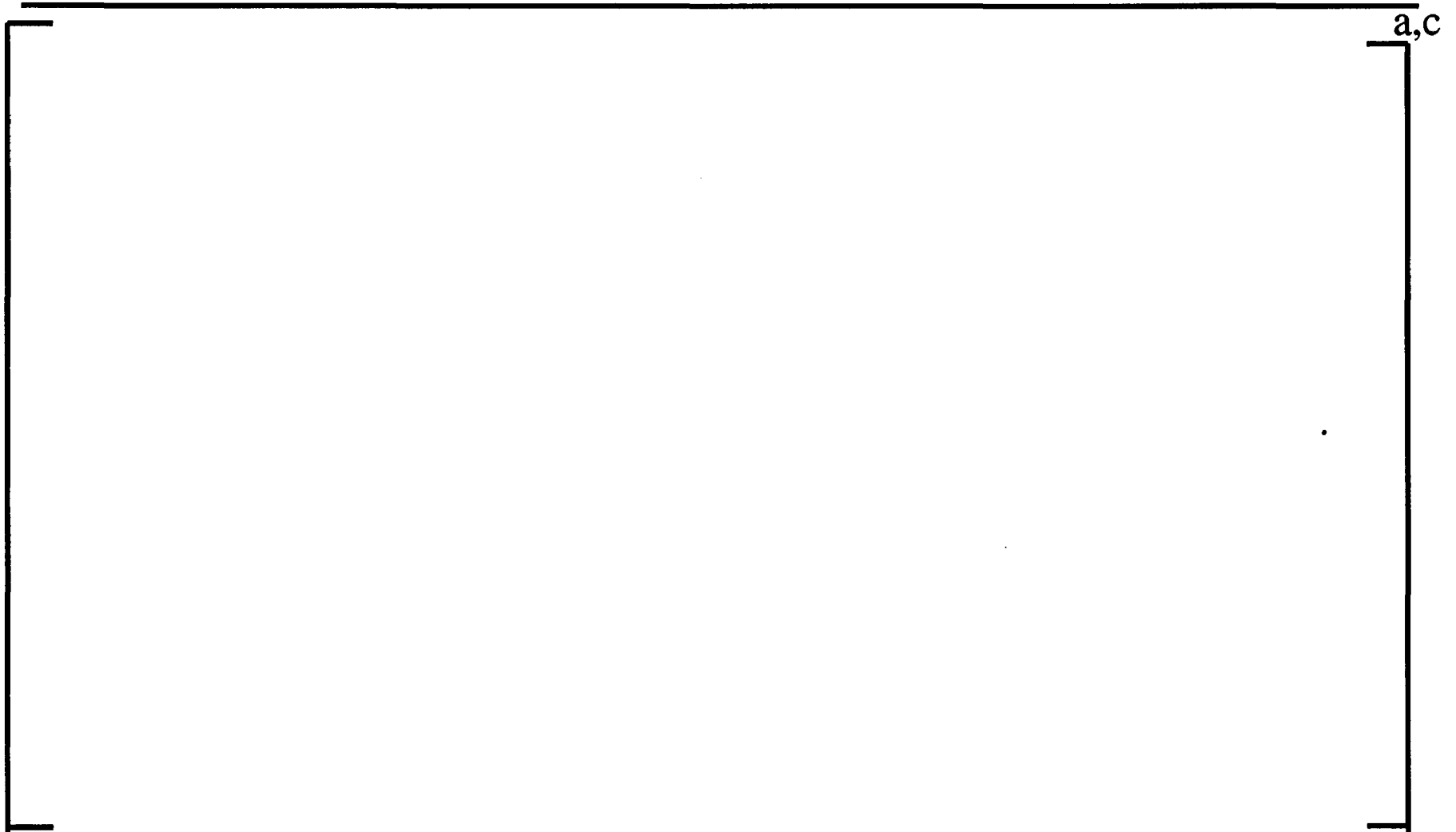
# Key Features of WH-177 LTA

a,c

# I-Spring Design



# Intermediate Support Grid (ISG)





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## Confirmatory Test Program

# Testing Program

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- Fuel Assembly Testing Program

[

] a,c

## Testing Program(Con't)

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- Component Testing - Mid-grid and ISG



# Testing Program(Con't)

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- Component Testing - Other Components

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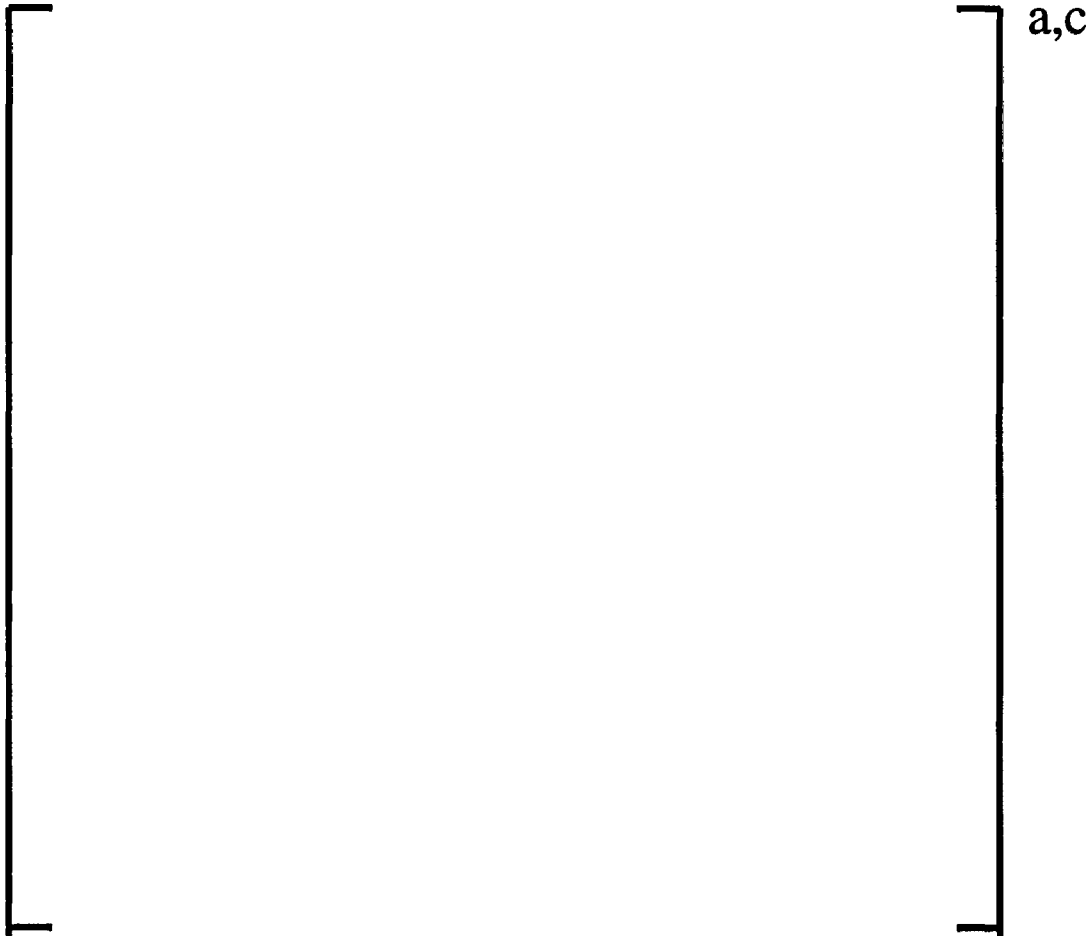
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a,c

# Testing Program(Con't)

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- Ocone PI Exam Plan



# Compatibility Evaluation

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- Mechanical/Plant Compatibility

- [ ]<sup>a,c</sup>-LTA designed and evaluated for [ ]<sup>a,c</sup> plant and fuel (MkB9 &10)
- No Mechanical / Plant compatibility issues at [ ]<sup>a,c</sup>
- New LTA - no significant changes except mid-grid, ISG and top nozzle
- Handling tool design compatibility completed, handling tool compatibility evaluation with modified nozzle to be performed on-site
- New fuel handling tool needed - same issue as at [ ]<sup>a,c</sup>
- Shipping container compatibility completed - no on-site issues

- Thermal Hydraulic Compatibility

- [ ]<sup>a,c</sup>
- [ ]<sup>a,c</sup>
- FACTS test will determine exact pressure drop

## Compatibility Evaluation (Cont'd)

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- Hydraulic compatibility
  - Duke analysis of transition core cross velocities
    - Significantly less than IFM/non-IFM successful transitions
  - Duke analysis of transition core DNBR penalties
    - Transition core LTA DNBR penalties applied in Duke TH analysis

# Irradiation Plan

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# [Duke]<sup>a,c</sup> NRC Licensed Methodology

a,c



# Licensing

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a,c

# Summary

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