Foxfire – Fuel Rod Design for the 21st Century

NRC Pre-Submittal Meeting

September 14, 2005

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Purpose of Meeting

- To present a preliminary scope of the upcoming topical to the NRC.
- Outline the Fuel Rod Design Methodology which will be used
- Provide a matrix of models which will be updated and highlight the key models of interest.
- Provide a preliminary look at the data available for calibration
- Obtain feedback from the NRC on the scope, and strategy for preparing the final submittal

Agenda

- Meeting Introduction — 9:00-9:10
  - Purpose of Meeting
- FOXFIRE OVERVIEW — 9:10-9:30
  - Objective & Background
  - Code Source Matrix
- Design & System Overview — 9:30- 1000
  - Criteria & Methodology (defines the process of a given analysis)
  - Models (fuel performance models predict fuel behavior)
  - Code (combination of models, evaluate margin or design)
  - Database (calibration, testing, production)
    - Range of data
- Range of Applicability — 1000-1030
  - Fuel Performance Product Matrix (Zirconium based alloys)
- Open Discussion and Questions — 1100-1130

Objective & Background

Objective

a,c

Summary

a,c

Background

a,c

Base Code

a,c

Design - System Overview

FRD System

a,c

Design – Criteria & Methodology

Criteria

a,c

Criteria (Cont'd)

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Criteria (Cont'd)

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FRD System - Methodology

a,c

Code Outputs

a,c

Methodology

a,c

Statistical treatment of Uncertainties

a,c

Statistical treatment of Uncertainties (Cont'd)

a,c

Design - Models

FRD System - Models

a,c

Fuel Performance Model Systems

a,c

Fuel Performance Model Systems

a,c

Fuel Performance Model Systems

a,c

Key Models

Thermal Models

a,c

Thermal Models

a,c

Thermal Models

a,c

Thermal Models

a,c

Mechanical Models

a,c

Mechanical Models

a,c

Mechanical Models

a,c

Gas Production, Release and Rod Pressure Models

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Gas Production, Release and Rod Pressure Models

a,c

Design - Code

FRD System - Code

a,c

Design – Database

(Preliminary Matrix)

FRD System - Database

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Calibration Database Matrix

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Calibration Database Matrix

a,c

Calibration Database Matrix

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Calibration Database Matrix

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Calibration Database Matrix

a,c

Design – Range of Applicability

Fuel Performance Product Matrix

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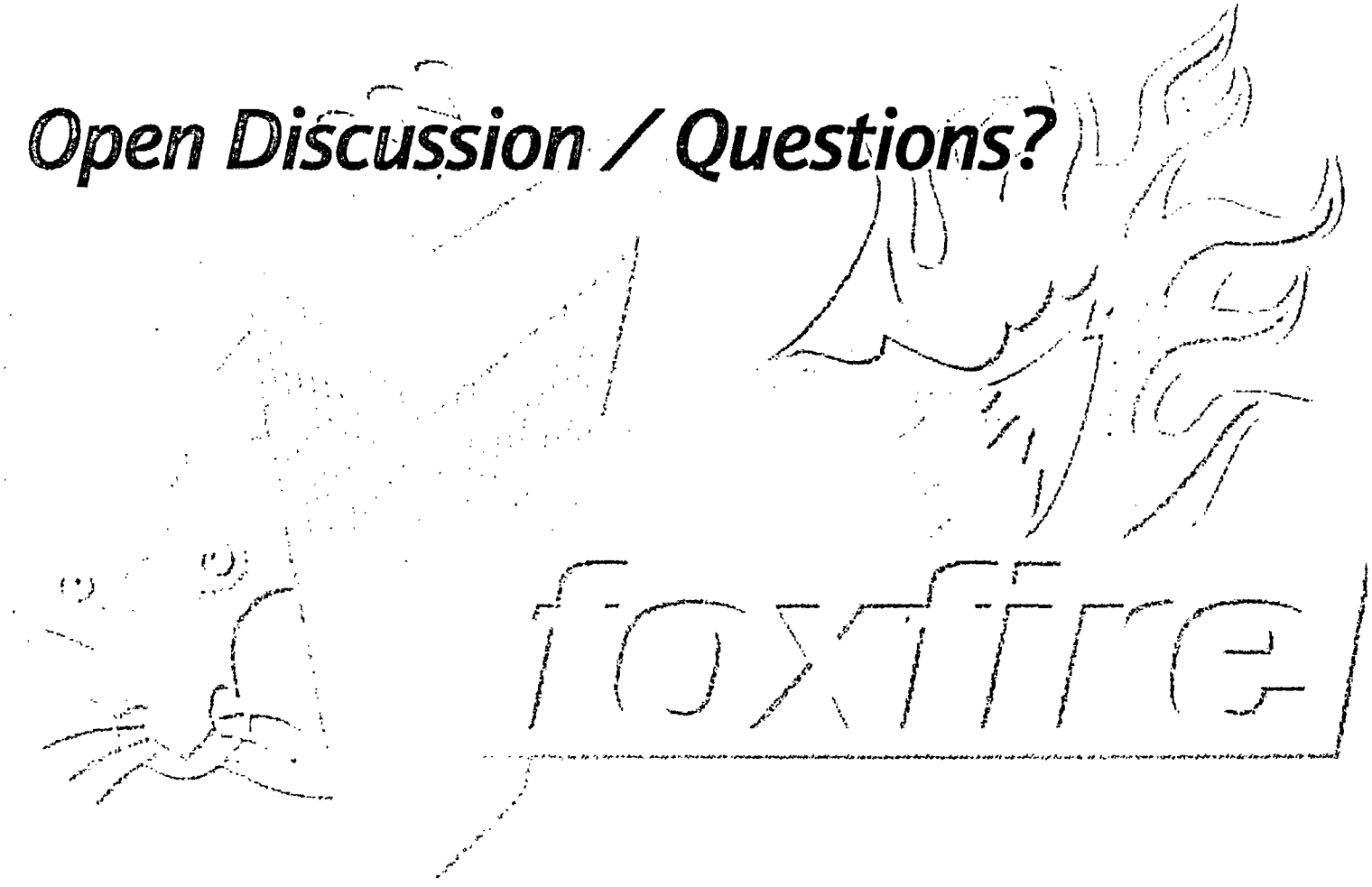
Open Discussion / Questions?