Foxfire – Fuel Rod Design for the 21st Century

NRC Pre-Submittal Meeting

September 14, 2005

foxfire

Westinghouse Electric Company LLC
P.O. Box 355
Pittsburgh, PA 15230-0355

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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)

a,c

Criteria (Cont'd)

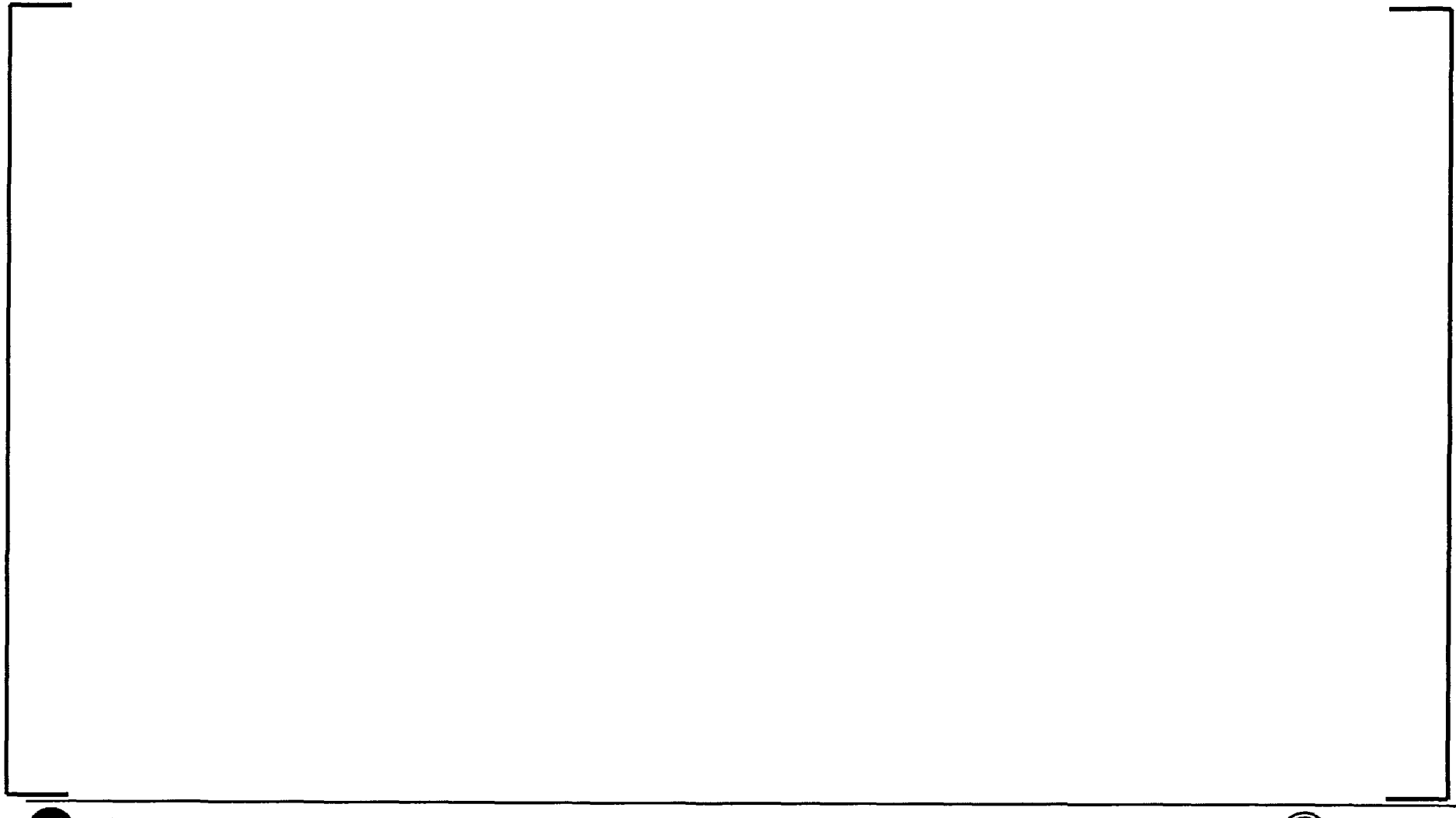
a,c

FRD System - Methodology

a,c

Code Outputs

a,c



Methodology

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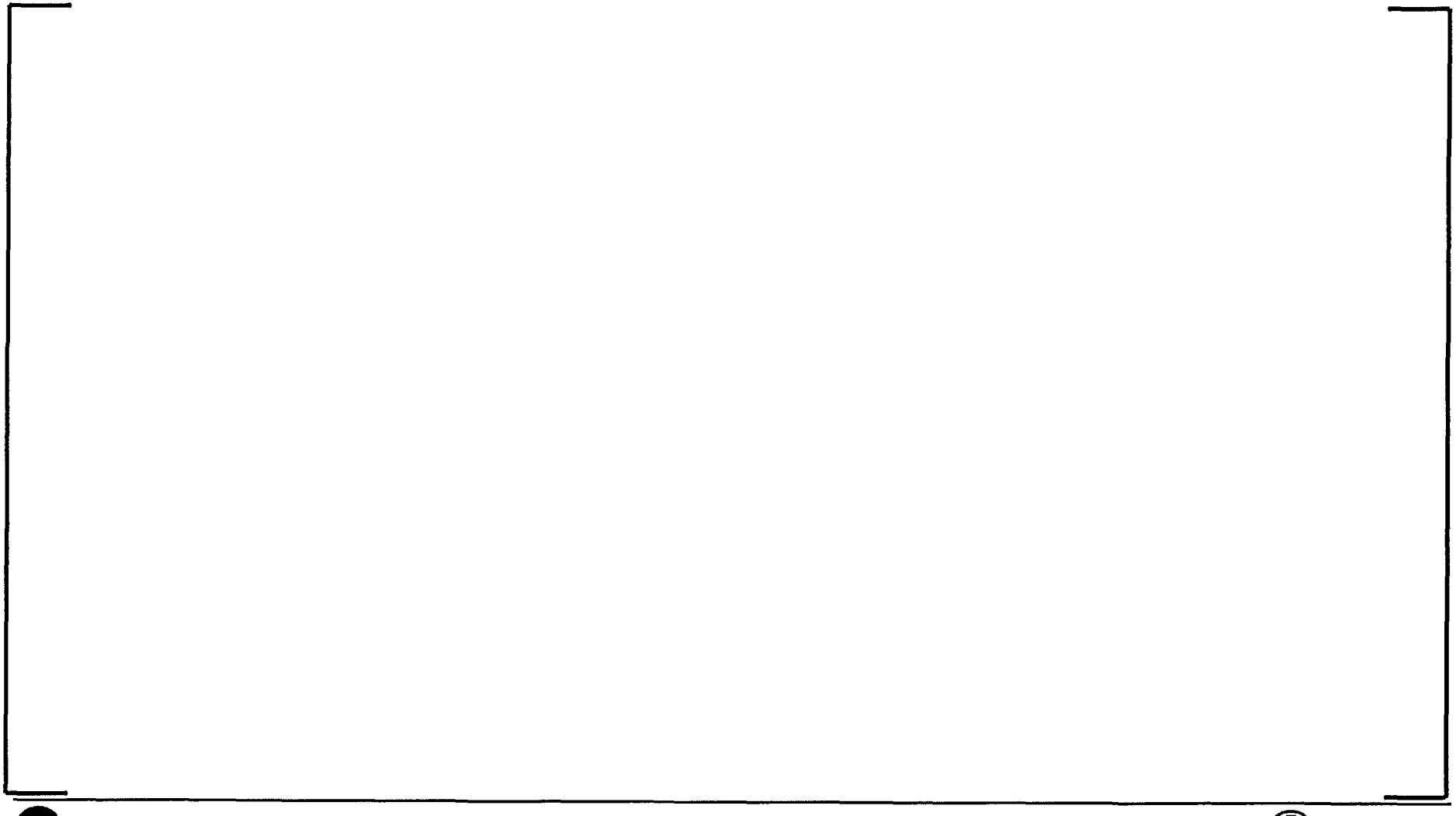

Statistical treatment of Uncertainties

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Statistical treatment of Uncertainties (Cont'd)

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Design - Models

FRD System - Models

a,c

Fuel Performance Model Systems

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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

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Mechanical Models

a,c

Mechanical Models

a,c

Gas Production, Release and Rod Pressure Models

a,c

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

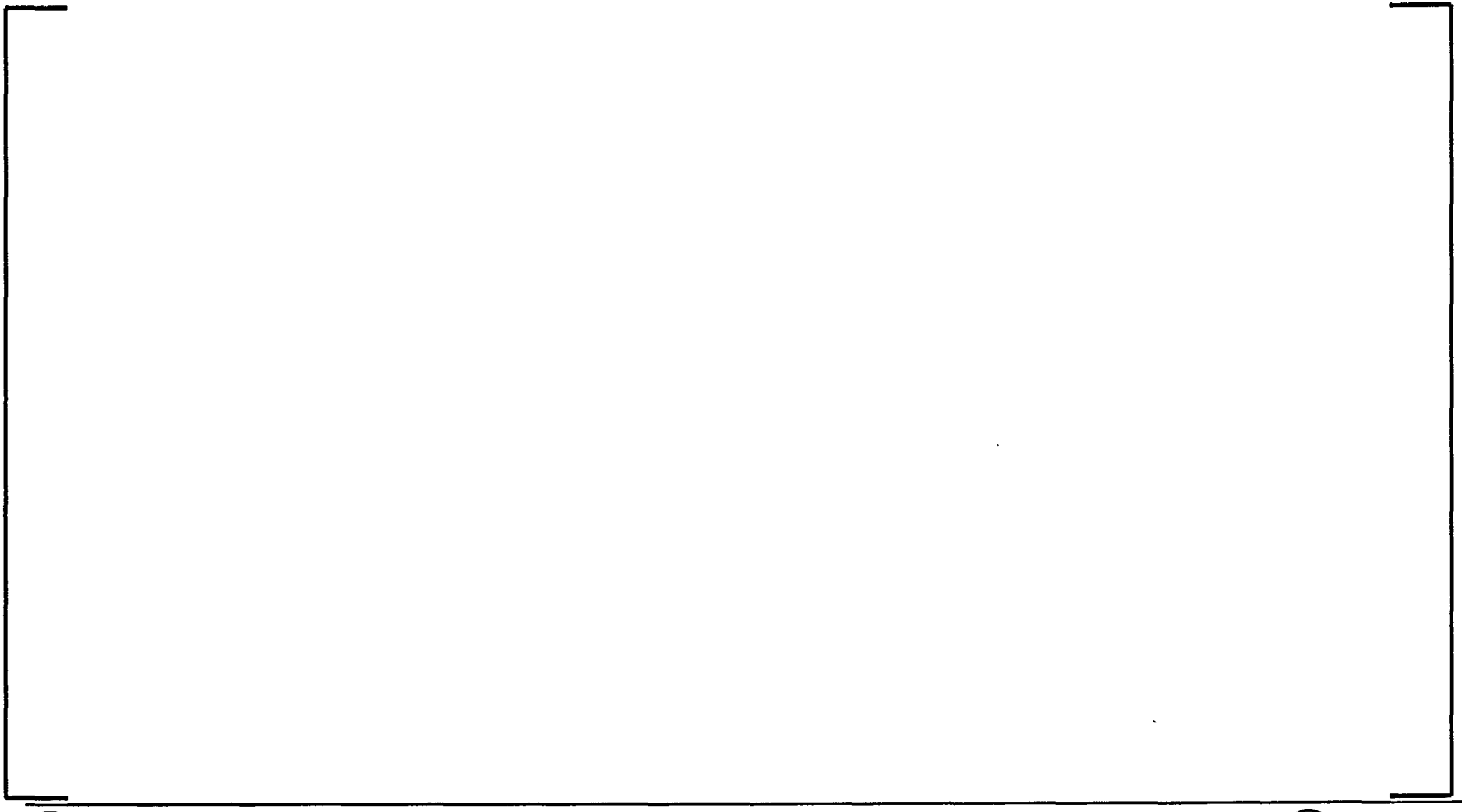
a,c

Calibration Database Matrix

a,c

Calibration Database Matrix

a,c



Calibration Database Matrix

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Calibration Database Matrix

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Design – Range of Applicability

Fuel Performance Product Matrix

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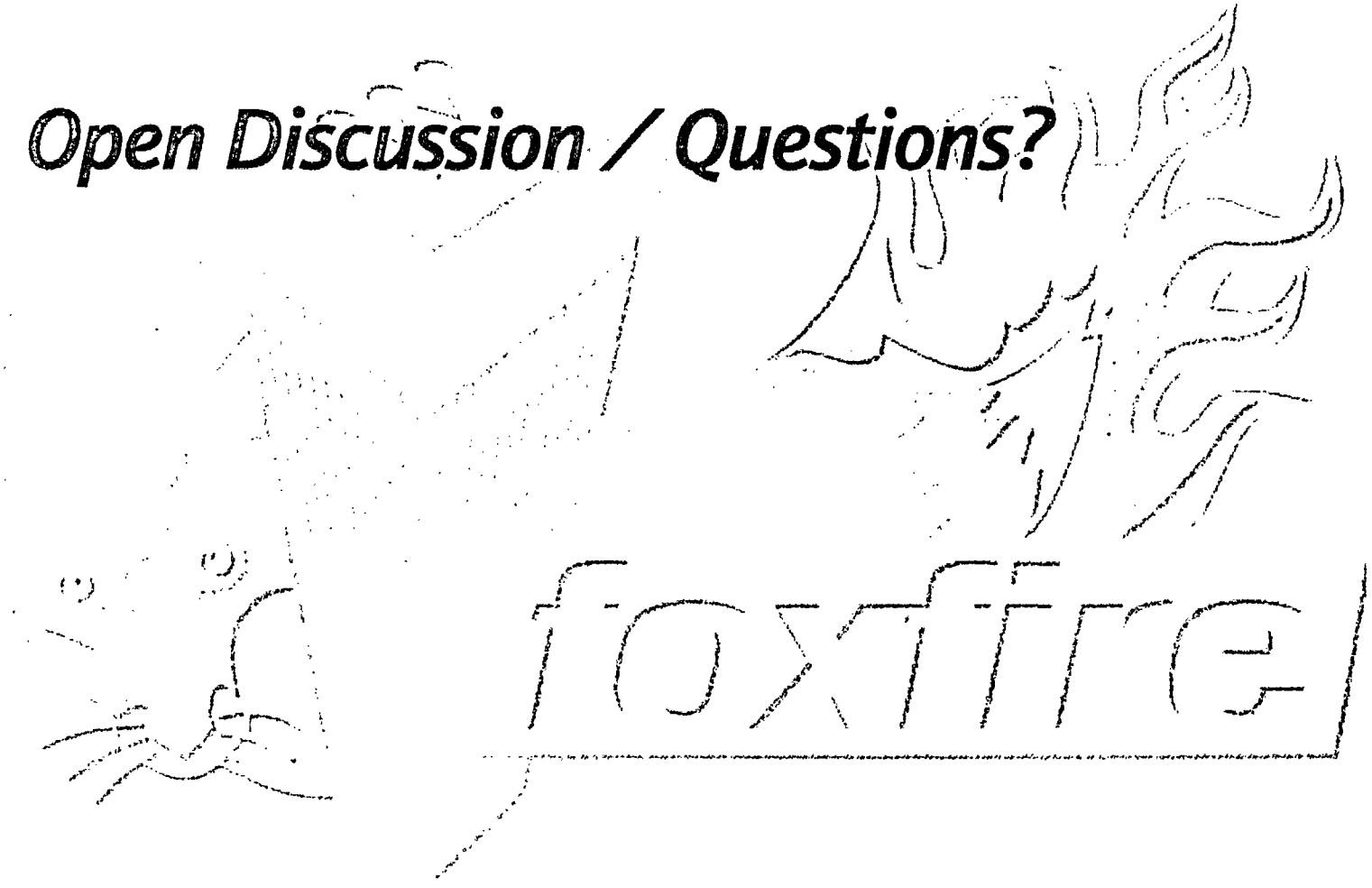
Open Discussion / Questions?