ATTACHMENT 3

EXTENDED POWER UPRATE – RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION IDENTIFIED DURING AUDIT OF THE SAFETY ANALYSES CALCULATIONS

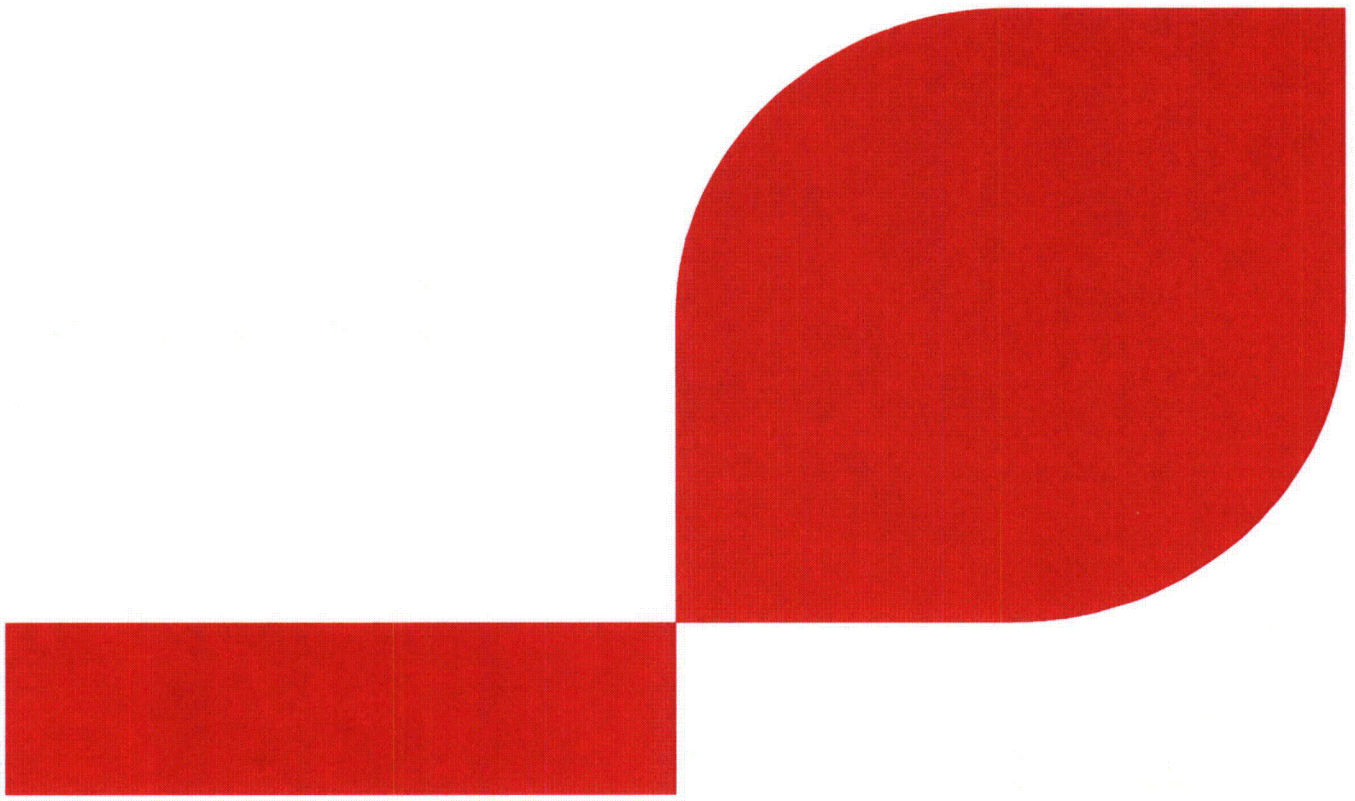
NON-PROPRIETARY VERSION

ANP-2903Q2(NP)
Revision 0

St. Lucie Nuclear Plant Unit 1 EPU Cycle
Realistic Large Break LOCA
Summary Report with Zr-4 Fuel Cladding

(Cover page plus 27 pages)

Controlled Document



ANP-2903Q2(NP)
Revision 0

St Lucie Nuclear Plant Unit 1 EPU Cycle Realistic Large Break LOCA Summary Report with Zr-4 Fuel Cladding

February 2012

AREVA NP Inc.

AREVA

Nature of Changes

Item	Page	Description and Justification
1.	All	This is a new document.

Table of Contents

This document contains a total of 27 pages.

List of Tables

Page

List of Figures

Page

1.0 INTRODUCTION

AREVA NP Inc. performed an RLBLOCA analysis for the St Lucie Nuclear Plant (SLA) Unit 1 Extended Power Uprate (EPU). The analysis supports operation for EPU Cycle and beyond with AREVA NP's HTP 14X14 fuel design using standard UO_2 fuel with 2%, 4%, 6% and 8% Gd_2O_3 and Zircaloy-4 cladding. The analysis was performed in compliance with the U.S. Nuclear Regulatory Commission (NRC) approved RLBLOCA Evaluation Model (EM) (Ref. [1]). Analysis results confirm the 10CFR50.46 (b) acceptance criteria presented in Section 3.0 are met and serve as the basis for operation of the St Lucie Nuclear Plant Unit 1 with AREVA NP fuel (Summary Report, Ref. [2]).

Florida Power and Light submitted the RLBLOCA Summary Report to the NRC for review. Section 2.0 contains AREVA NP Inc.'s responses to NRC questions posed during the audit held in Lynchburg, VA on January 30-31, 2012.

2.0 NRC REVIEW COMMENTS AND AREVA NP'S RESPONSES

2.1 NRC Audit Q1

Provide the estimated PCT impact for the Sleicher-Rouse correction for SBLOCA and RLBLOCA. Decribe how the estimates were developed.

Response

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[ ]

The impact of the update of the heat transfer correlation is evaluated for the St Lucie Plant.

[

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[

Figure 2-1: [ ]

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2.2 NRC Audit Q2

Issue the decay heat response that that was provided to the auditors during their visit.

Response

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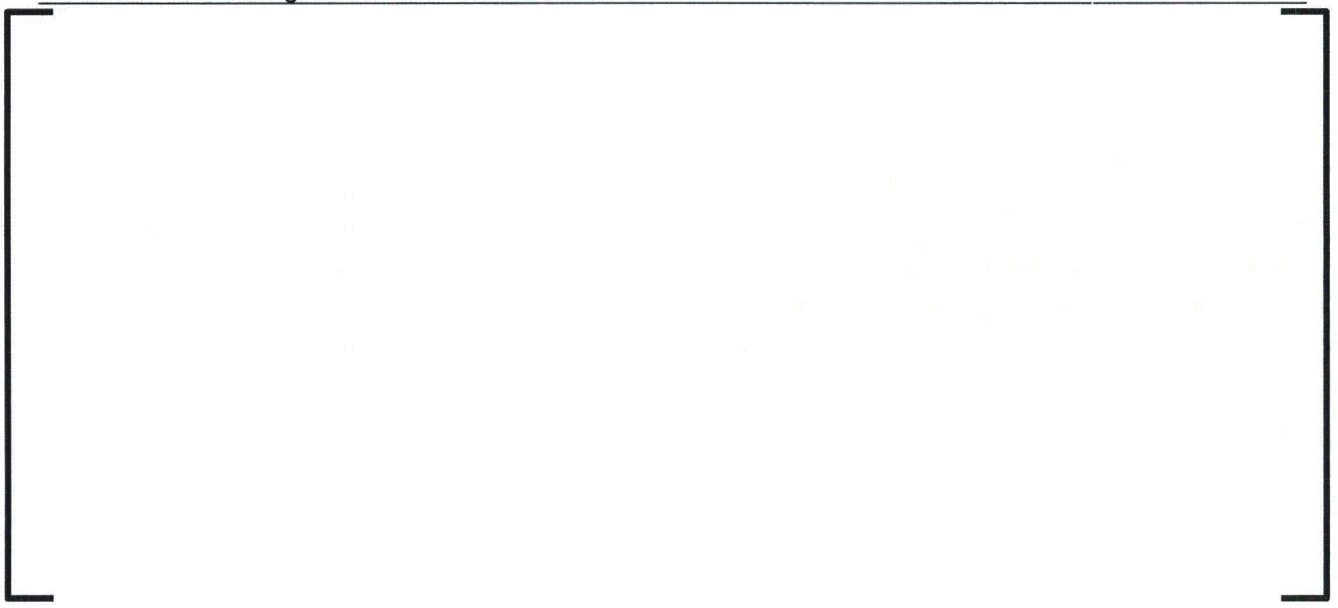

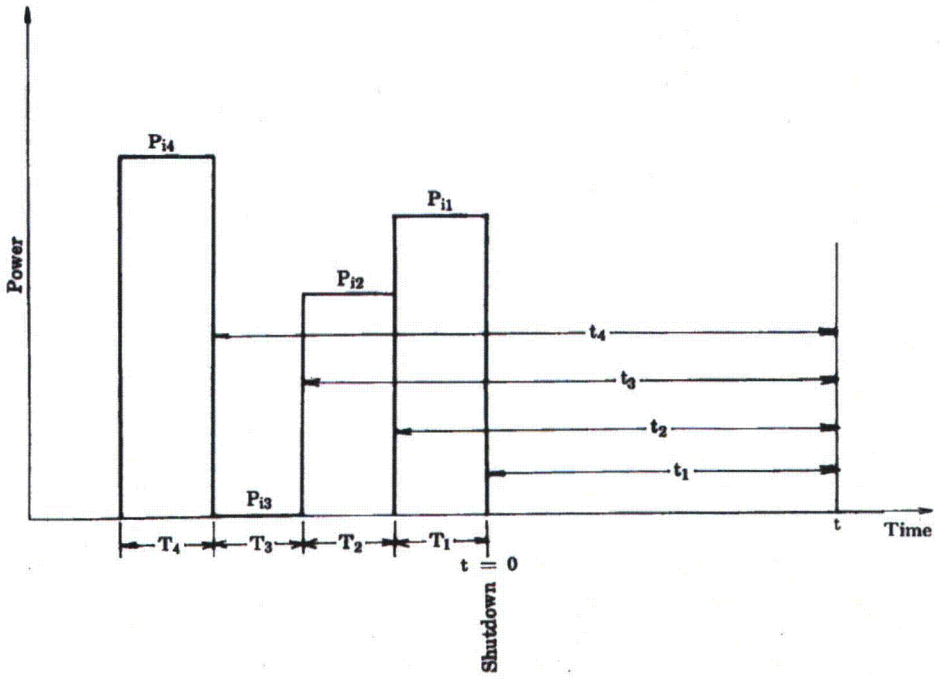

Figure 2-2: Example of Power History

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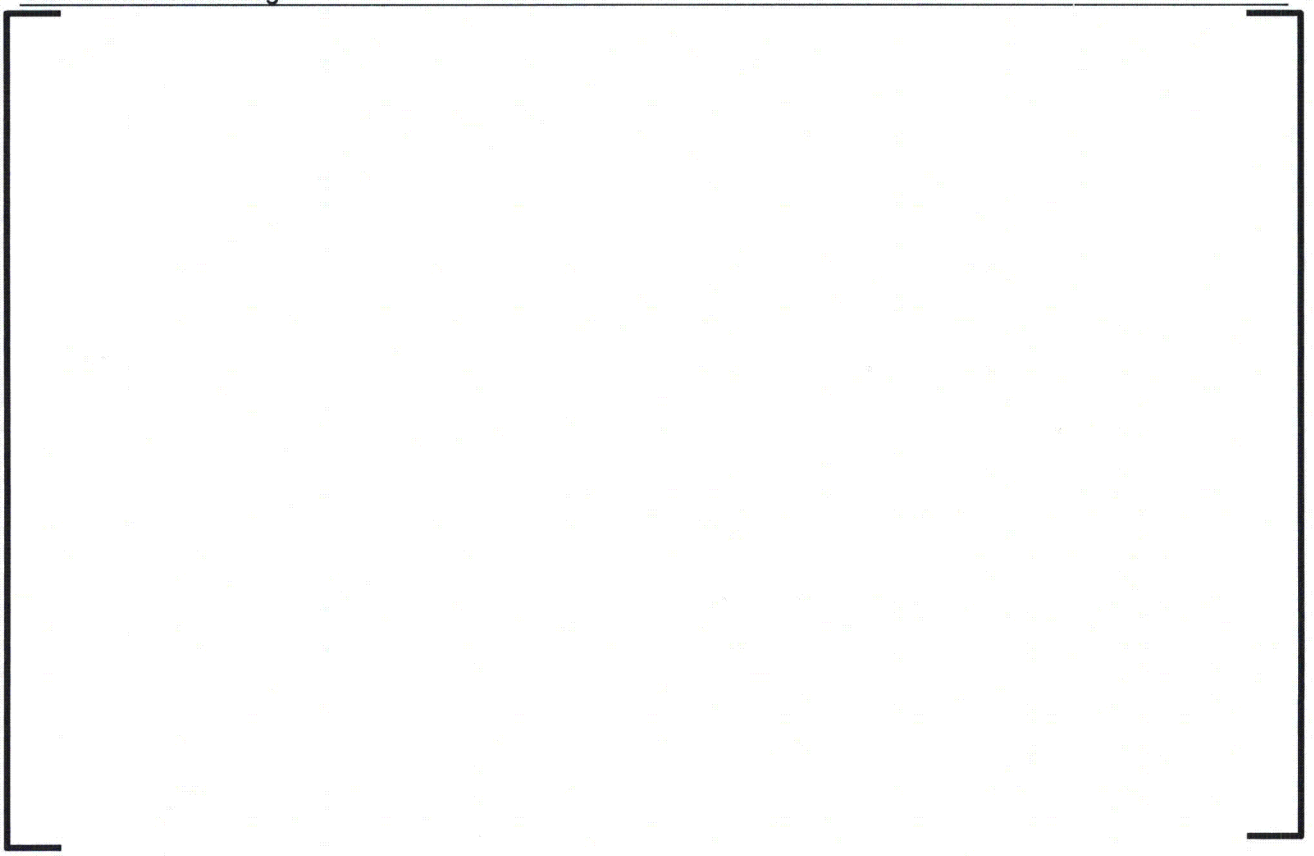

Figure 2-3: Decay Heat Curve, Burnup = 1 GWd/MTU

2.3 NRC Audit Q3

Provide a set of plots for the first 50-seconds of the limiting PCT case and the very late PCT case including:

a. PCT
b. Core inlet mass flux
c. Core exit mass flux
d. System pressure

Response

The limiting case is Case 32 with a PCT of 1667°F occurring at 9.6 seconds. Figure 2-4 displays the PCT in the fresh UO_2 rod for Case 32. Figure 2-5, Figure 2-6, and Figure 2-7 show the system pressure (upper plenum pressure), the core inlet mass flux, and the core outlet mass flux, respectively, for Case 32. [ ] Figure 2-8 displays the PCT in the fresh UO_2 rod for Case 46. Figure 2-9, Figure 2-10, and Figure 2-11 show the system pressure, the core inlet mass flux, and the core outlet mass flux, respectively, for Case 46.

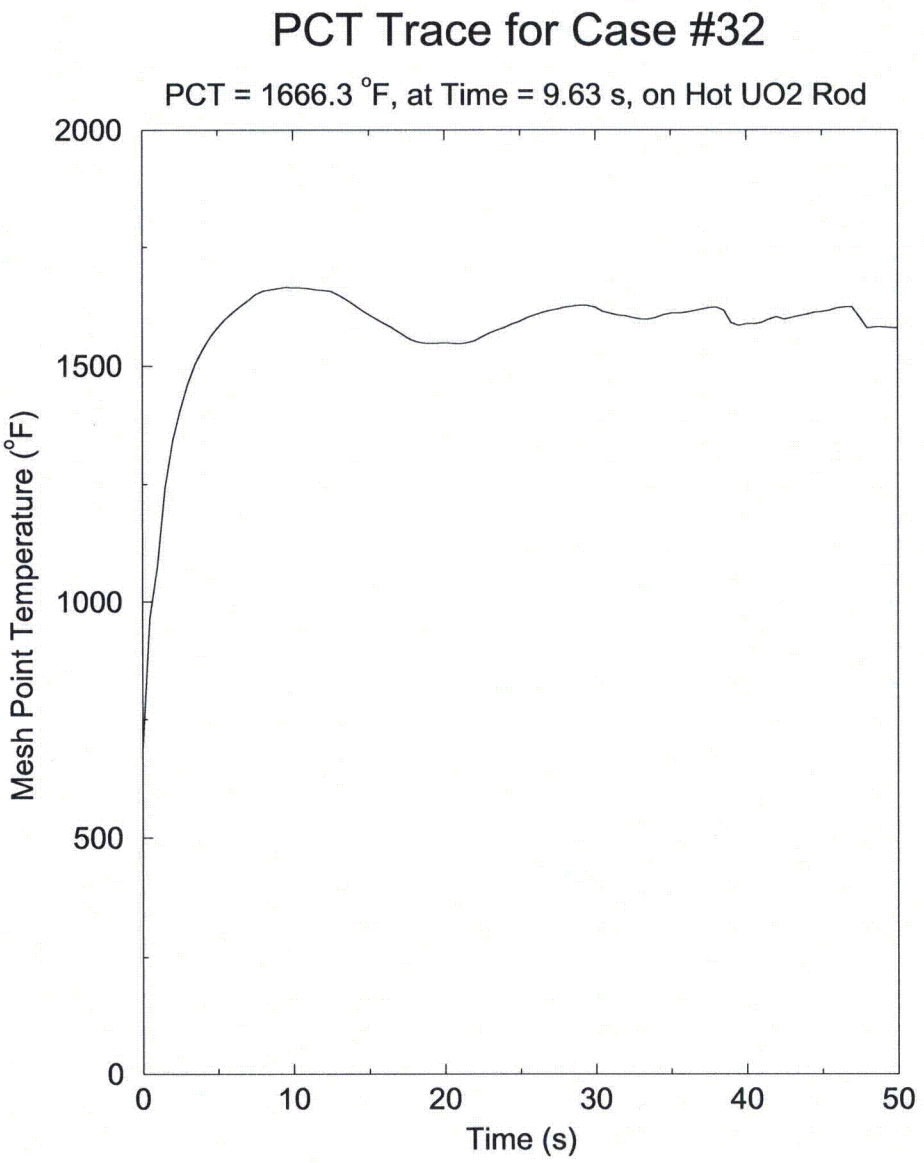

Figure 2-4: Case 32 PCT Trace

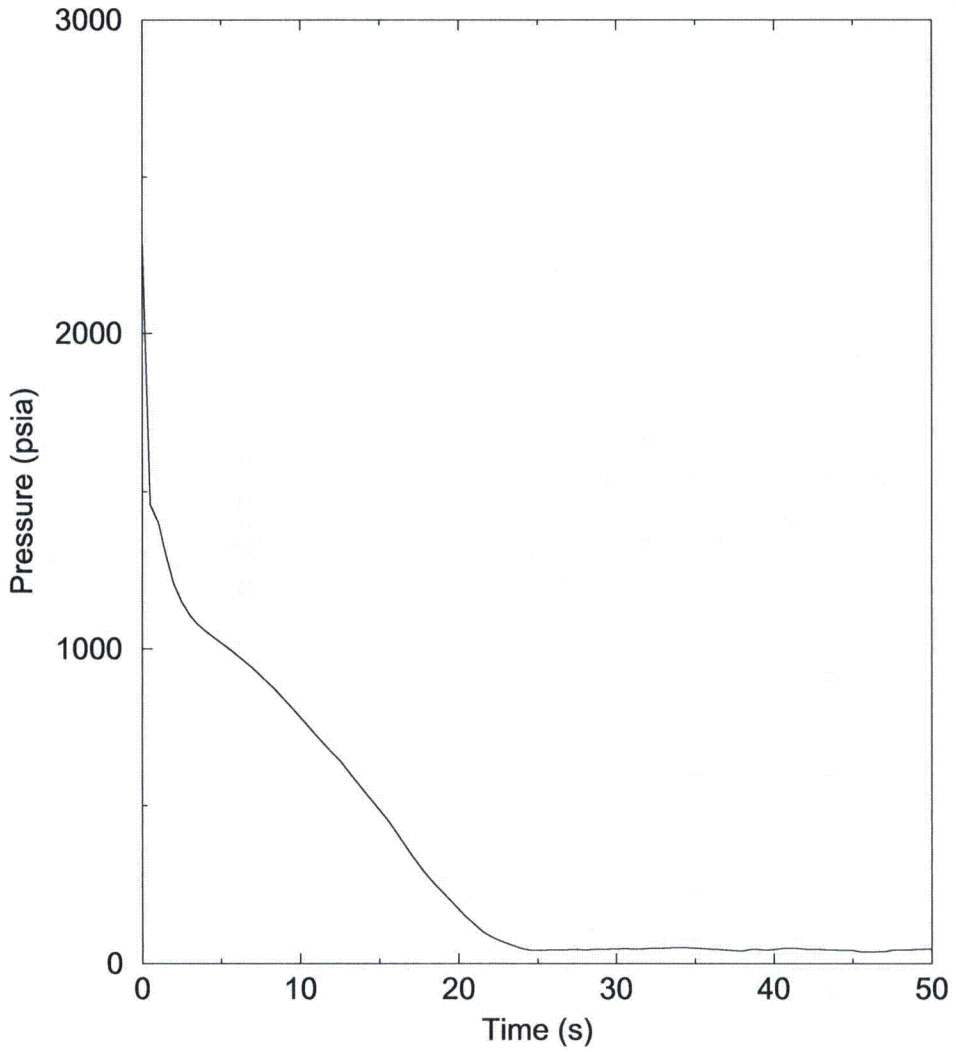

Figure 2-5: Case 32 Upper Plenum Pressure

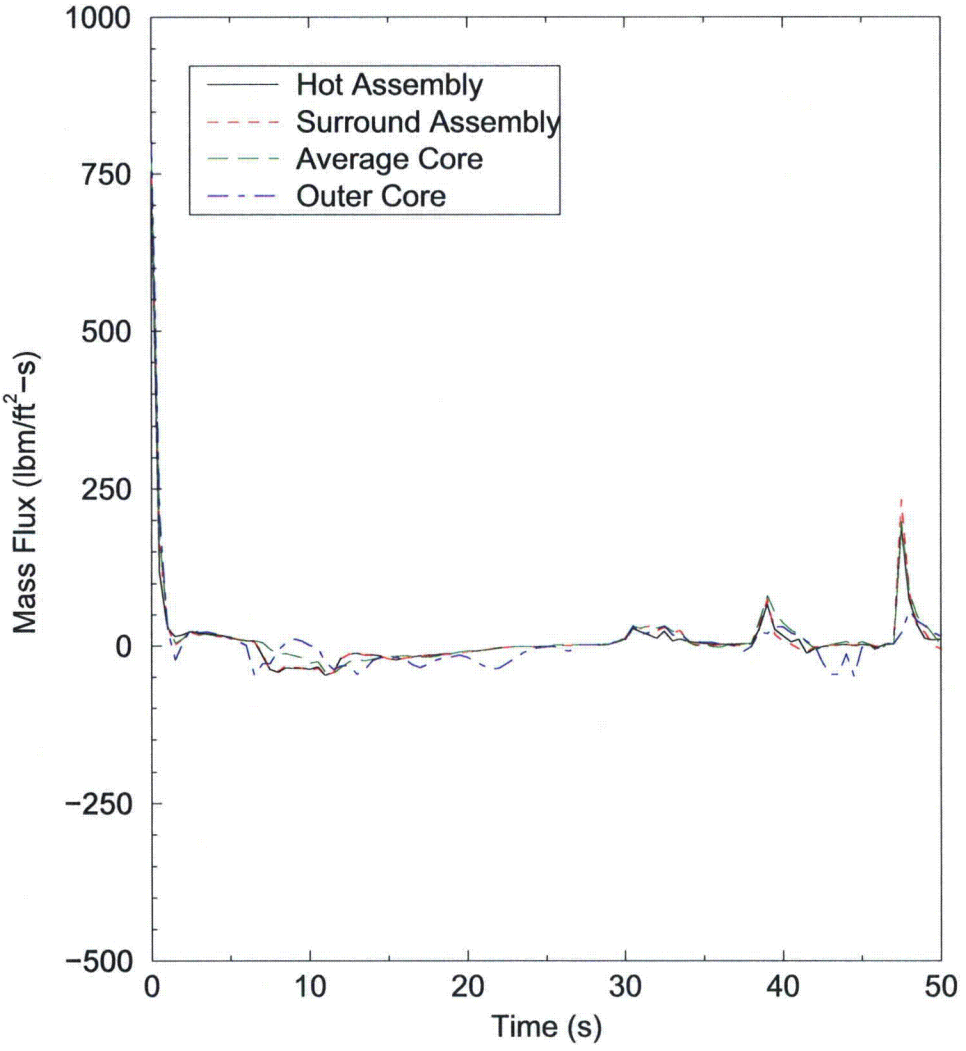

Figure 2-6: Case 32 Core Inlet Mass Flux

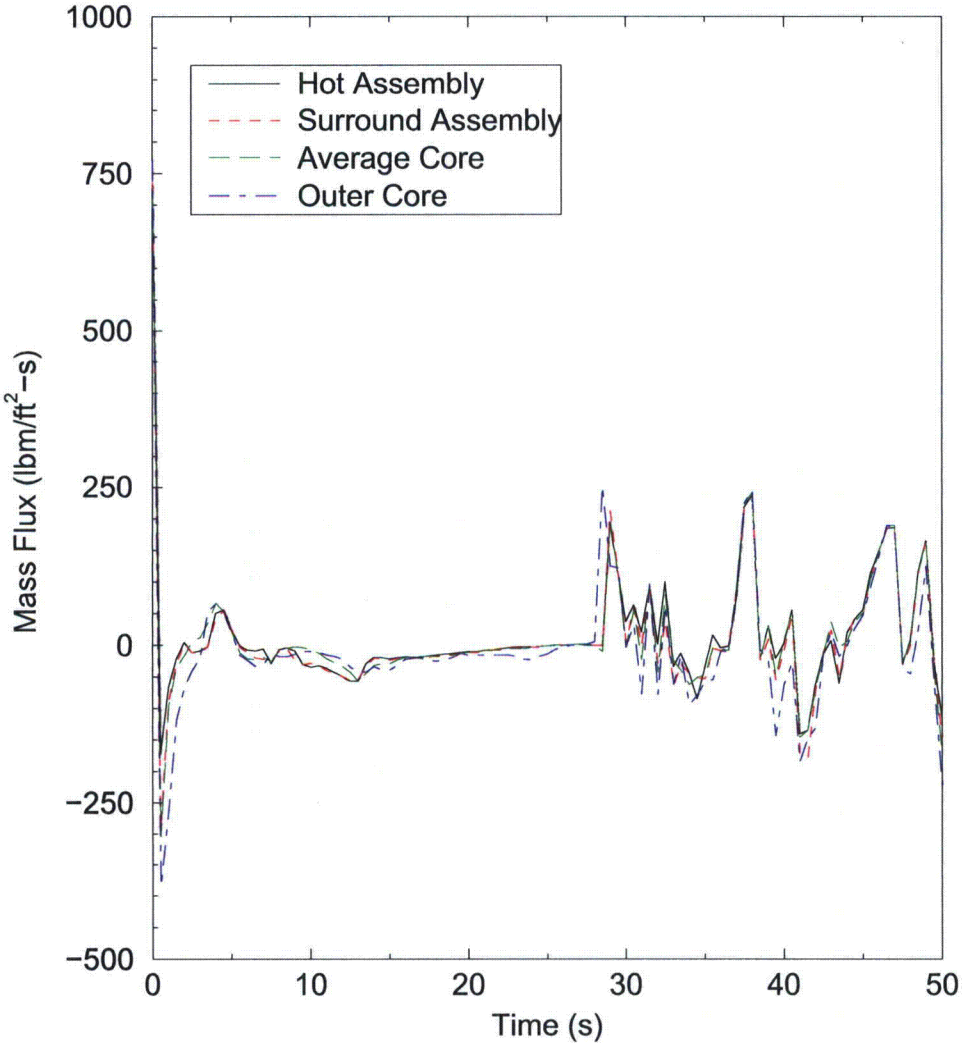

Figure 2-7: Case 32 Core Outlet Mass Flux

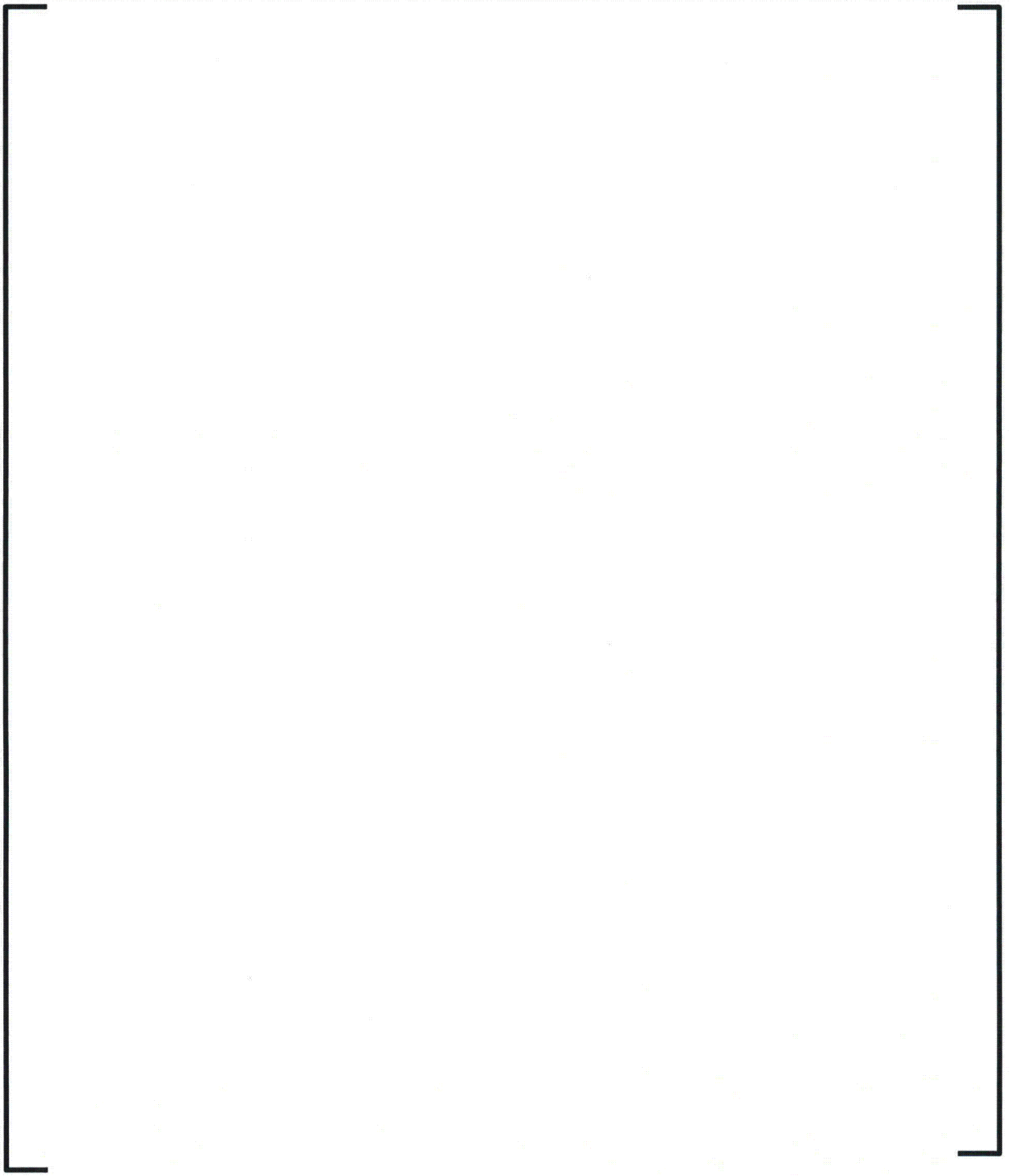

Figure 2-8: Case 46 PCT Trace

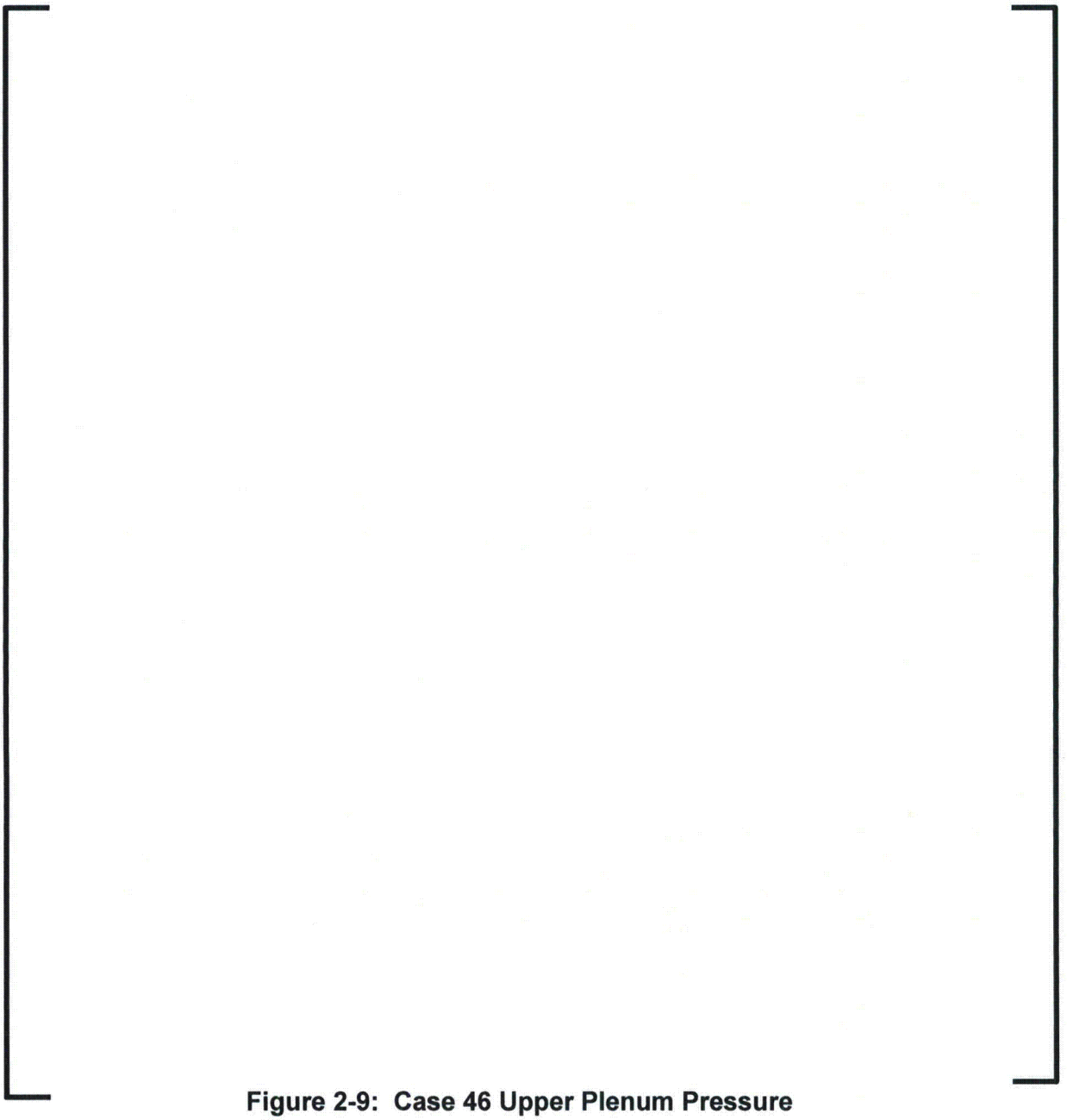

Figure 2-9: Case 46 Upper Plenum Pressure

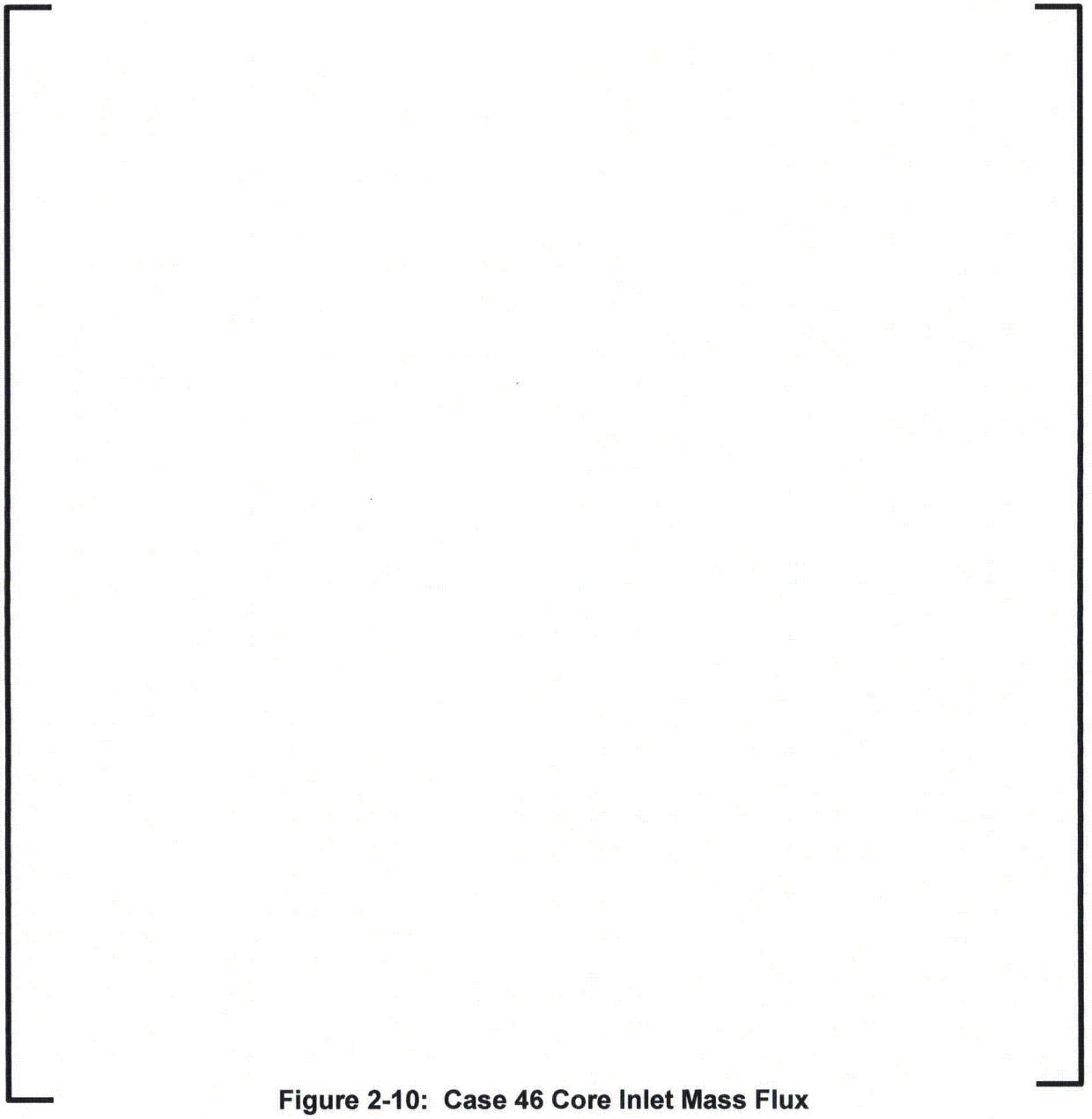

Figure 2-10: Case 46 Core Inlet Mass Flux

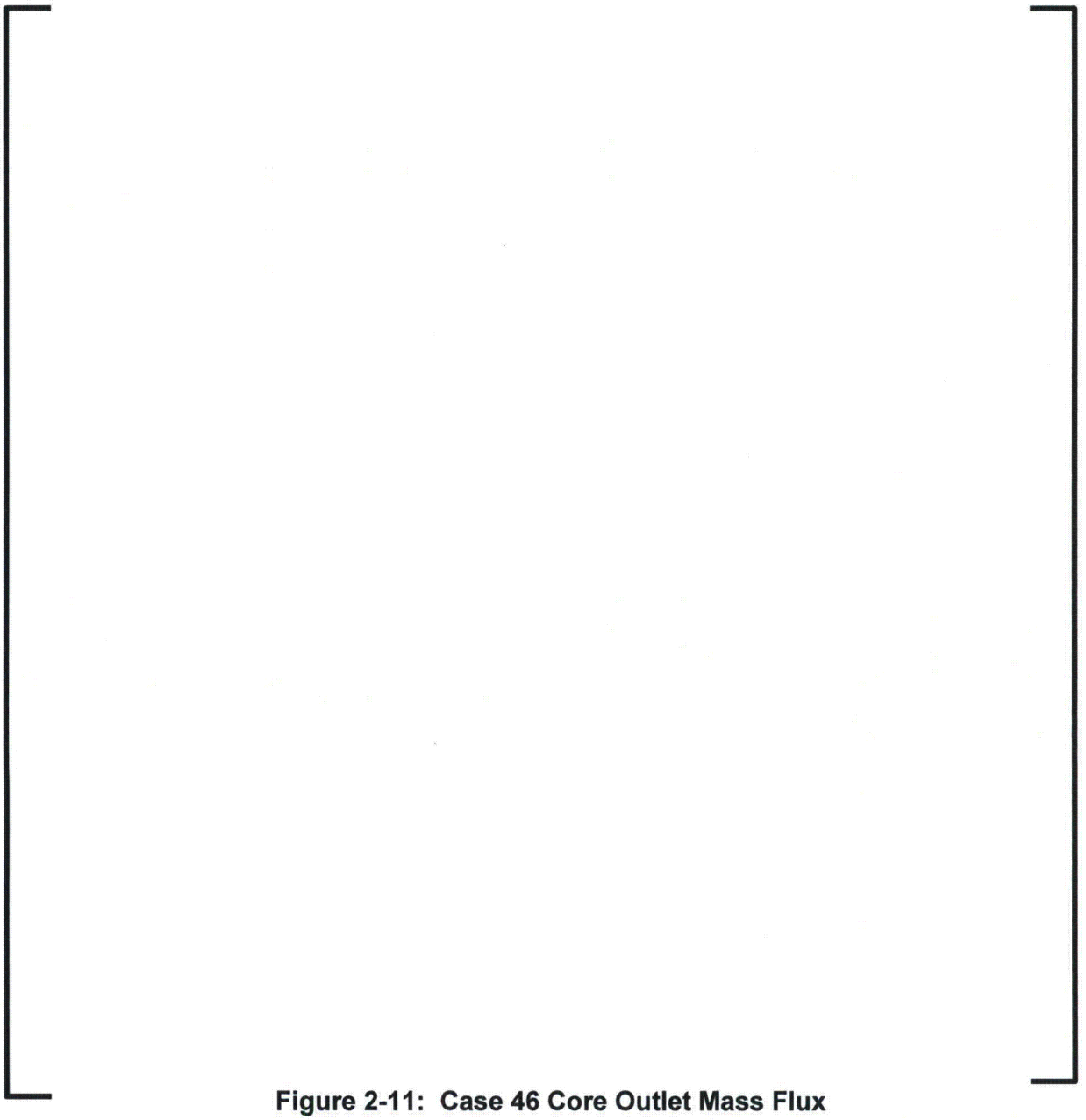

Figure 2-11: Case 46 Core Outlet Mass Flux

2.4 NRC Audit Q4

For the limiting case, provide a tabulated of the individual heat transfer coefficients at the PCT node, void fractions and the heat transfer coefficient multipliers used (0.1 second for the first second, 1 second after that, up to 50 seconds).

Response

[ ]

The void fraction and wall-to-liquid radiation, wall-to-vapor radiation, convection to vapor, and film boiling heat transfer coefficients are provided in Table 2-1 for the first 50 seconds of the limiting PCT transient. The heat transfer coefficients presented in the table are based on the saturation temperature. In addition, the summation of the four heat transfer coefficients is provided.

Table 2-1: Limiting PCT Case Void Fractions and Heat Transfer Coefficients, 0-50 seconds

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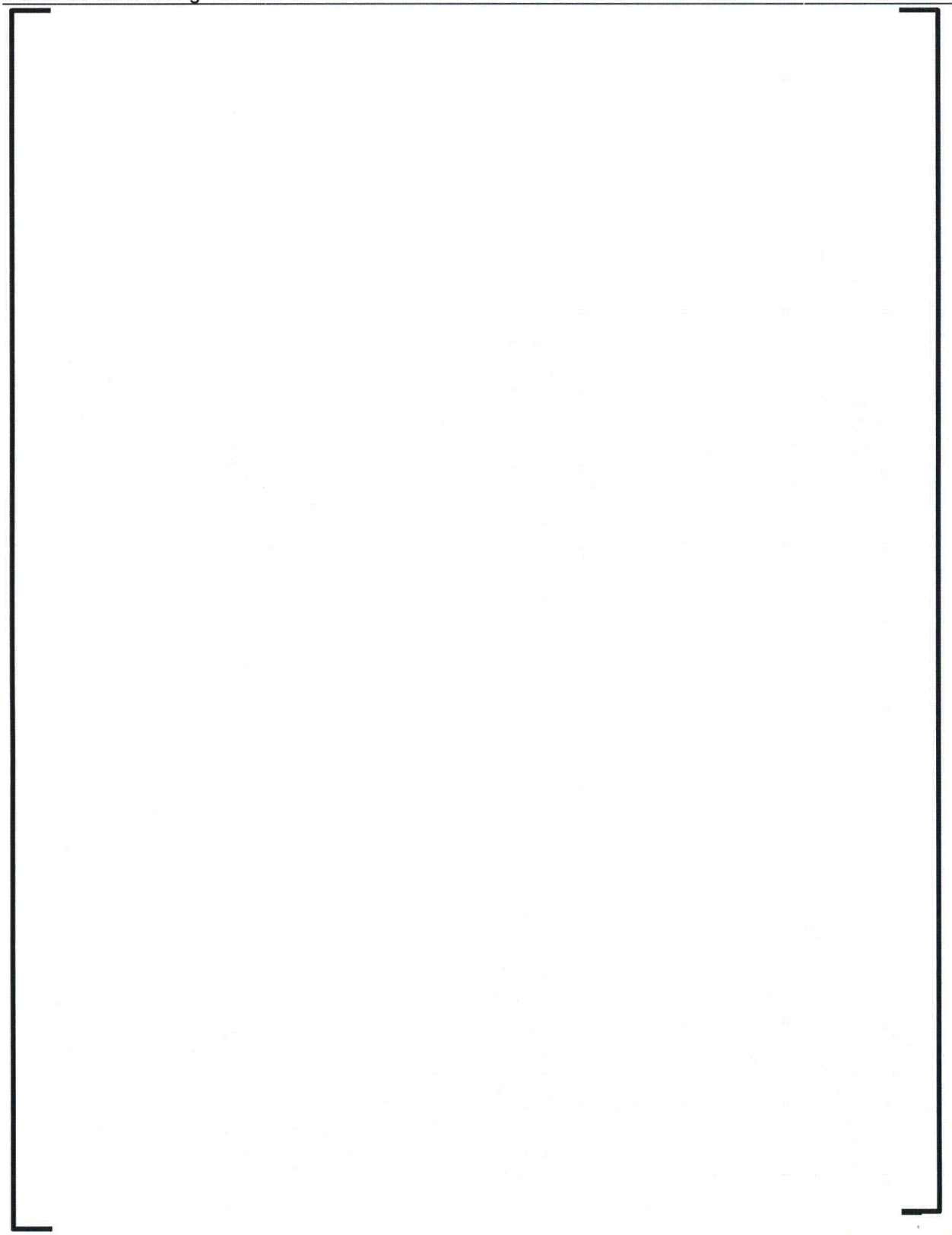

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3.0 REFERENCES

1. EMF-2103(P)(A)Revision 0, "Realistic Large Break LOCA Methodology," Framatome ANP, Inc.
2. ANP-2903(P) Revision 1, "St Lucie Nuclear Plant Unit 1 EPU Cycle Realistic Large Break LOCA Summary Report with Zr-4 Fuel Cladding."
3 ANP-3000(P) Revision 0, "St. Lucie Unit 1 EPU – Information to Support License Amendment Request."
4. ANSI/ANS-5.1-1979 American National Standard for Decay Heat Power in Light Water Reactors, American National Standards Institute, Inc., August 29, 1979.
5. Regulatory Guide 1.157, "Best Estimate Calculations of Emergency Core Cooling System Performance", May 1989.

ATTACHMENT 5

EXTENDED POWER UPRATE – RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION IDENTIFIED DURING AUDIT OF THE SAFETY ANALYSES CALCULATIONS

Affidavit to Withhold from Public Disclosure
Proprietary Information
Under 10 CFR 2.390

ANP-2903Q2(P)
Revision 0

St. Lucie Nuclear Plant Unit 1 EPU Cycle
Realistic Large Break LOCA
Summary Report with Zr-4 Fuel Cladding

(Cover page plus 3 pages)

AFFIDAVIT

COMMONWEALTH OF VIRGINIA)
) ss.
CITY OF LYNCHBURG)

1. My name is Gayle F. Elliott. I am Manager, Product Licensing, for AREVA NP Inc. (AREVA NP) and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3. I am familiar with the AREVA NP information contained in the report ANP-2903Q2(P), Revision 0, entitled "St Lucie Nuclear Plant Unit 1 EPU Cycle Realistic Large Break LOCA Summary Report with Zr-4 Fuel Cladding," dated February 2012 and referred to herein as "Document." Information contained in this Document has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

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

5. This Document has been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in this Document be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is

requested qualifies under 10 CFR 2.390(a)(4) "Trade secret and commercial or financial information."

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:

(a) The information reveals details of AREVA NP's research and development plans and programs or their results.

(b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.

(c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.

(d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.

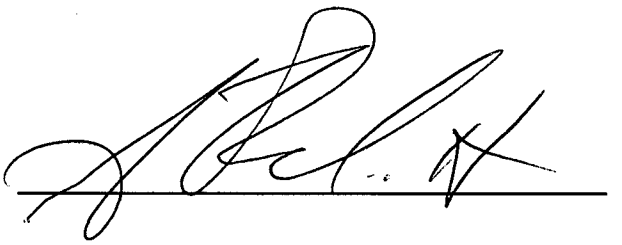
(e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

The information in the Document is considered proprietary for the reasons set forth in paragraphs 6(b) and 6(c) above.

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

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

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.



SUBSCRIBED before me this 17th
day of February 2012.

Kathleen A. Bennett

Kathleen Ann Bennett
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES: 8/31/15
Reg. # 110864

KATHLEEN ANN BENNETT
Notary Public
Commonwealth of Virginia
110864
My Commission Expires Aug 31, 2015