Omaha Public Power District
444 South 16th Street Mall
Omaha, Nebraska 68102-2247

May 31, 2000
LIC-00-0057

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

Reference: Docket No. 50-285

SUJECT: Proprietary Material at Meeting on Licensing Methodology for Fort Calhoun Station Cycle 20 Reload

On May 31, 2000, Omaha Public Power District (OPPD) and Siemens Power Corporation (Siemens) will meet with the NRC Staff to discuss the licensing methodology and associated OPPD submittal to support the Fort Calhoun Station cycle 20 reload analysis with Siemens fuel. At this meeting, portions of the information to be presented are considered proprietary by Siemens.

Pursuant to 10 CFR 2.790, OPPD requests that the proprietary information presented and discussed at the meeting be withheld from public disclosure. Siemens Power Corporation considers this information to be proprietary as justified in the supporting affidavit (Enclosure 1). Enclosure 2 is the OPPD/Siemens presentation with the proprietary information enclosed in brackets. Enclosure 3 is the non-proprietary version of Enclosure 2 with the bracketed information deleted.

Please contact me if you have any questions.

Sincerely,

R. L. Phelps
Division Manager
Nuclear Engineering

RLP/TCM/tcm

c: E. W. Merschoff, NRC Regional Administrator, Region IV
L. R. Wharton, NRC Project Manager
W. C. Walker, NRC Senior Resident Inspector
Winston & Strawn

APO1

LIC-00-0057

Enclosure 1

Affidavit from Siemens Power Corporation Supporting
Proprietary Nature of Portions of OPPD/Siemens Presentation dated 5/31/00

AFFIDAVIT

STATE OF WASHINGTON)
) ss.
COUNTY OF BENTON)

1. My name is Jerald S. Holm. 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 the criteria applied by SPC to determine whether certain SPC information is proprietary. I am familiar with the policies established by SPC to ensure the proper application of these criteria.

3. I am familiar with the SPC information included with the letter LIC-00-0057, from R. L. Phelps of Omaha Public Power District to the U.S. Nuclear Regulatory Commission, which is referred to herein as "Document." Information contained in this Document has been classified by SPC as proprietary in accordance with the policies established by SPC 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 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 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 the Document be withheld from public disclosure.

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

(a) The information reveals details of SPC'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 SPC.

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

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

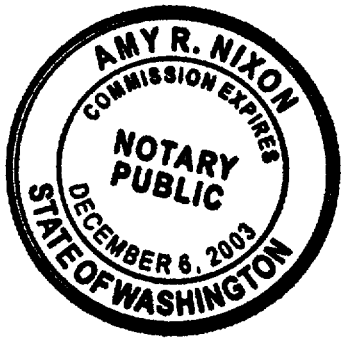
7. In accordance with SPC's policies governing the protection and control of information, proprietary information contained in this Document has been made available, on a limited basis, to others outside SPC only as required and under suitable agreement providing for nondisclosure and limited use of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

8. SPC 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.

Jerold S. Holm

SUBSCRIBED before me this 26th day of May, 2000.



Amy R. Nixon

Amy R. Nixon
NOTARY PUBLIC, STATE OF WASHINGTON
MY COMMISSION EXPIRES: 12/06/03

LIC-00-0057

Enclosure 3

Non-Proprietary Version of OPPD/Siemens Presentation dated 5/31/00

SIEMENS

OPPD/Siemens/NRC Meeting to Discuss Cycle 20 Reload Analyses

Meeting Agenda

- Purpose and Objectives for Meeting
- Background
- Analysis Scope for Cycle 20
- Shared Analyses
- Assembly Growth Model
- Gadolinia Benchmarking
- Submittals from OPPD
- Schedule

Purposes

- Describe the design of the Cycle 20 reload core
- Provide the analytical methodology
- State the computer codes employed
- Discuss planned NRC submittals

Objectives

- Reach understanding on methodology and computer codes to be used for Cycle 20
- Reach understanding on the NRC submittals required for Cycle 20
- Provide information on submittal schedule and requested review dates

Background

Fuel Failure Status at Fort Calhoun Station

- Current Cycle 19 fuel provided by Westinghouse
  - Original grid design fuel batches R, S, T (in spent fuel pool)
  - "Revised" grid design fuel batches U, W (in current core)
  - Inconel grid design batch X (in current core)
- Current fuel failures (predicted) - 60 as of 5/31
- Projected failures by end of cycle - ~100
- 5th cycle of Westinghouse fuel failures
- Revised grid design did not work
- Westinghouse fabrication contract cancelled

Description of Planned Cycle 20 Core Loading

- 53 New Siemens HTP grid
- 40 Inconel gridded batch "X" fuel assemblies
- 40 Zirconium gridded batch "T" fuel assemblies
  - Currently in SFP
  - "Original" grid design
  - Will be repaired this summer (start date 6/5/00)
  - Using donor rods from other batch "T" assemblies
    - Ensures current core design will remain valid
    - Replacing failed rods with similar energy rods

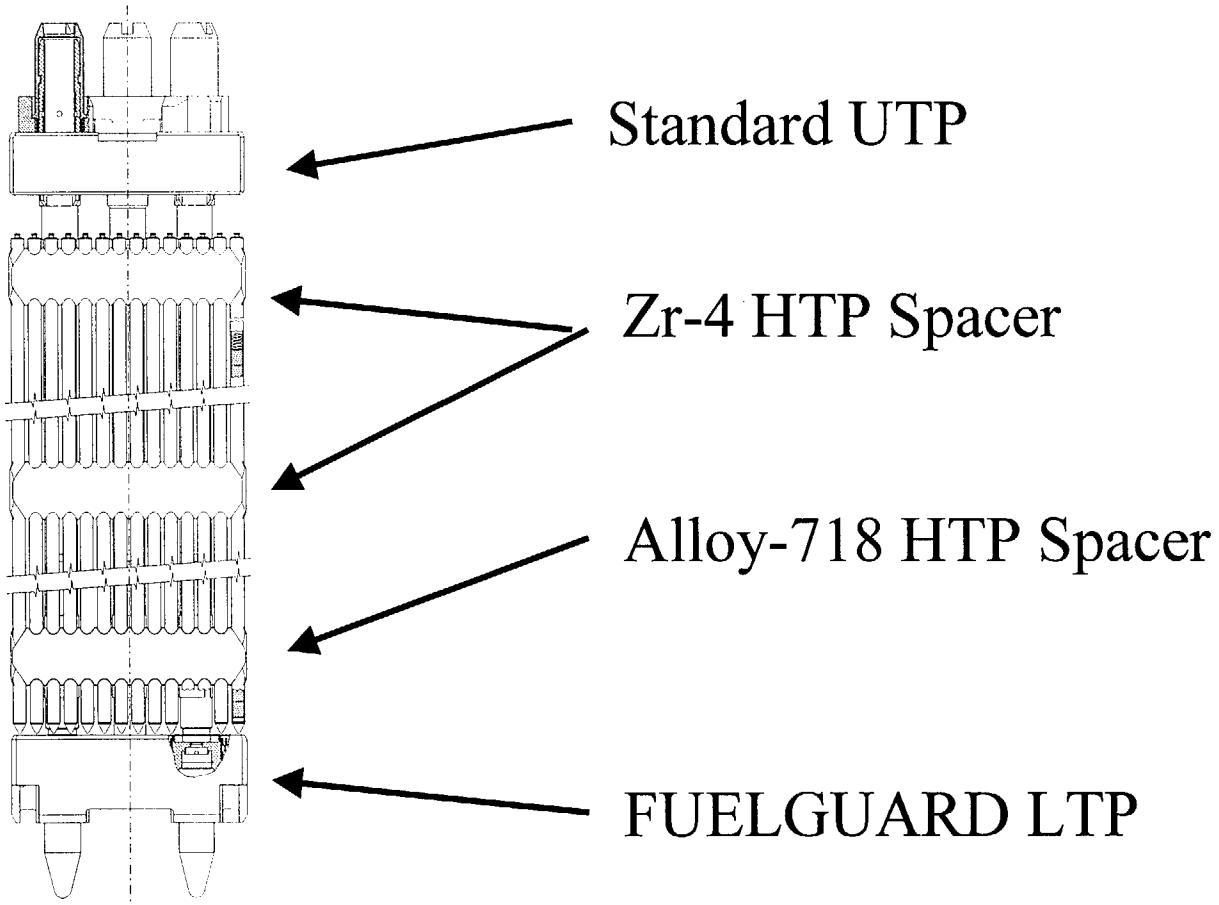
Changes for Cycle 20

- Siemens Power Corporation (SPC) is new fuel supplier
  - New analyses required
- Gadolinia is new burnable absorber
  - Benchmarking required
  - Biases and uncertainties examined

Cycle 20 Reload will be fretting resistant design

- Cycle 20 Reload to be fabricated by Siemens Power Corporation
- Fuel Design uses FUELGUARD™ lower tie plate and HTP spacers
  - FUELGUARD LTP provides protection against debris and also improves resistance to flow induced vibration fretting
  - HTP spacers provide line contact with rods, thus improving resistance to flow induced vibration fretting

Cycle 20 SPC Fuel Assembly



SPC experienced with FUELGUARD/HTP assembly designs

- SPC has been supplying the HTP spacer in reload quantities in the US since 1991
  - Over 1700 fuel assemblies worldwide
- SPC has been supplying reload quantities of the assemblies with the FUELGUARD LTP since 1993
  - Over 1400 fuel assemblies worldwide
- There have been no fretting failures at HTP spacers

Analysis Scope for Cycle 20

Neutronics

- OPPD to perform neutron cross-section development w/CASMO-3 (SPC version) instead of CASMO-3 (Studsvik version)
  - Very similar to experience base
  - Covered by OPPD-NA-8302-P, Rev. 4
  - OPPD to use MICBURN-3 (SPC version) to model Gadolinia burnout
  - SPC's guideline used
  - SPC to perform review of OPPD's design depletions
- OPPD continues to use SIMULATE-3 for safety analyses
  - Safety analyses inputs
  - Axial shape analyses
  - Neutronics input to SPC LOCA, CEA Ejection, Seized Rotor
  - Neutronics input to Setpoints
  - SPC's guidelines used

Mechanical

- SPC to perform mechanical analyses for SPC fuel
  - Methodology:
    - XN-NF-82-06(P)(A) Revision 1, and Supplements 2, 4, and 5
    - ANF-88-133(P)(A) and Supplement 1
  - Codes: RODEX2
  - Criteria: Defined in EMF-92-116(P)(A)
- OPPD input to SPC analysis:
  - Plant configuration
  - Neutronics data

Thermal-Hydraulics

- SPC to perform thermal-hydraulic compatibility analysis
  - Methodology: XN-NF-82-21(P)(A), Revision 1
  - Codes: XCOBRA-IIIC, Full Core Model
- SPC has measured component pressure drops for SPC and co-resident fuel
  - SPC fuel to be in high power locations
  - SPC fuel has higher flow resistance than co-resident fuel
- OPPD input to SPC analysis:
  - Co-resident fuel configuration
  - Neutronics data
  - Core layout

USAR Chapter 14 Transient Events

- OPPD to calculate system responses for most transient events
  - Methodology: OPPD-NA-8303(P) Rev. 4
  - Codes: CESEC
  - Criteria: Fuel Centerline Melt (FCM), RCS Pressurization ≤ 110% Design Pressure (2750 psia)

USAR Chapter 14 Transient Events (continued)

- SPC to calculate DNB performance using OPPD system response for core boundary conditions
  - Methodology:
    - XN-NF-82-21(P)(A) Revision 1
    - EMF-92-153(P)(A) and Supplement 1
    - XN-75-32(P)(A) Supplement 1, 2, 3, and 4
  - Codes: XCOBRA-IIIC
  - Criteria: MDNBR $\geq$ 1.14 (HTP Correlation)

USAR Chapter 14 Transient Events (continued)

- SPC to perform analysis of Reactor Coolant Pump Seized-Rotor Event
  - Methodology: ANF-89-151(P)(A)
  - Codes:
    - ANF-RELAP
    - XCOBRA-IIIC
    - RODEX2
  - Criteria: MDNBR, RCS pressurization
- OPPD input to SPC analysis:
  - Plant configuration
  - Neutronics data

USAR Chapter 14 Transient Events (continued)

- SPC to perform analysis of Control Rod Ejection Event
  - Methodology:
    - ANF-89-151(P)(A)
    - XN-NF-78-44(P)(A)
    - XN-NF-85-92(P)(A)
  - Codes:
    - ANF-RELAP
    - XCOBRA-IIIC
    - RODEX2
  - Criteria: MDNBR, FCM, pellet enthalpy, RCS pressurization
- OPPD input to SPC analysis:
  - Plant configuration
  - Neutronics data

Loss-of-Coolant Accidents

- SPC to perform LBLOCA analysis
  - Methodology: EMF-2087(P)(A)
  - Codes
    - RODEX2
    - RELAP4
    - RFPAC
    - TOODEE2
  - Criteria: 10 CFR 50.46
- OPPD input to SPC analysis:
  - Plant configuration
  - Neutronics data

Loss-of-Coolant Accidents (continued)

- SPC to perform SBLOCA analysis
  - Methodology: XN-NF-82-49(P)(A) Revision 1 Supplement 1
  - Codes:
    - ANF-RELAP
    - RODEX2
    - TOODEE2
  - Criteria: 10 CFR 50.46
  - OPPD input to SPC analysis:
    - Plant configuration
    - Neutronics data

Setpoint Analysis

- SPC to perform setpoints analysis
  - Methodology: XN-NF-507(P)(A), Supplements 1 and 2 or EMF-1961(P)
  - Codes:
    - XCOBRA-IIIC
    - RODEX2
  - Criteria: MDNBR and FCM limits

Setpoints Analysis (continued)

- OPPD input to SPC analysis:
  - TS/COLR requirements
  - Uncertainty data
  - Neutronics data
  - Core boundary conditions at time of MDNBR for limiting events
    - CEA withdrawal
    - CEA drop
    - Excess load
    - Loss of flow
    - RCS depressurization

Approach to Shared Analysis

Analysis Responsibilities Formalized

- Interactions between OPPD and SPC Ensure:
  - Only approved methodologies used (one exception)
  - Appropriate interfaces established, starting from formal agreement documents
    - Design interface document
    - Calculation plans
  - Assumptions inherent to data exchanges are mutually understood and documented

Examples of OPPD/SPC Interactions

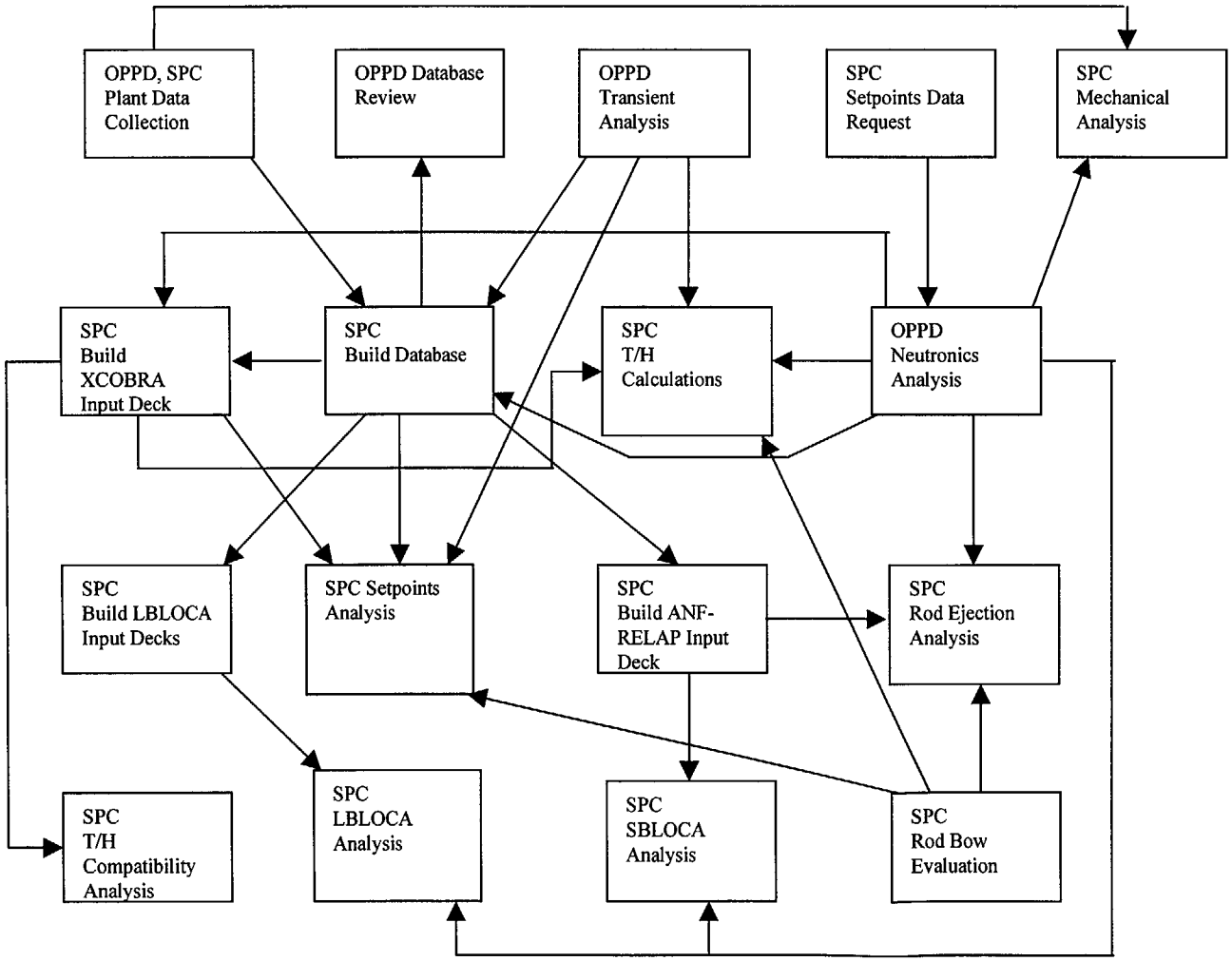
- Design interface document defining responsibilities and formally specifying the interface guidelines for the shared effort
  - Communications
  - Information supplied
  - Quality assurance
  - Formats for transferred data
  - Schedules

Examples of OPPD/SPC Interactions (continued)

- Meetings to discuss application of OPPD and SPC methodologies
  - Describe methodologies
  - Discuss separation of tasks
  - Define interface requirements
  - Identify areas of inconsistency and develop plans to address

Examples of OPPD/SPC Interaction (continued)

- Reload Analysis SPC/OPPD Interface Flowchart



Examples of OPPD/SPC Interactions (continued)

- Calculation plans
  - Define regulatory requirements and scope of work performed by each organization
- SPC data gathering at Ft. Calhoun Plant
  - Access to paper and electronic data for model development and analysis
  - Formal data requests and transmittals
  - Interaction with OPPD analysts and staff knowledgeable in plant systems
- Westinghouse assembly thermal hydraulic testing by SPC

Examples of OPPD/SPC Interactions (continued)

- Participation with OPPD and SPC internal reviews
  - Pre-calculation analysis reviews
  - Fuel design reviews
  - Review of design depletions and axial shape analysis
- Bi-weekly conference calls, project management
- Discussions at technical levels
- Exchanges and review of methodology, analysis guideline, calculation notebook, and cycle-specific documents
- OPPD review of SPC analysis products (calculation notebooks, reports)
- OPPD in-process evaluation of fuel manufacturing

Assembly Growth Model

Approved SPC assembly irradiation growth models are design specific

- Results in conservative assembly growth prediction
- UTL growth correlation based on assembly type
  - CE 14x14
  - CE 15x15
  - Westinghouse

CE 14x14 Assembly Growth Correlation

Fast Fluence, E21 n/cm^2, > 1 Mev

Ft. Calhoun is CE 14x14, but without holddown

- Proposed approach more conservative than correlation previously used by SPC for Ft. Calhoun

CE 15x15 Assembly Growth Correlation

Fast Fluence, E21 n/cm^2, > 1 Mev

15x15 correlation predicts higher growth

Ft. Calhoun application expected to be conservative

Gadolinia Benchmarking

Gadolinia Benchmarking

- Current benchmarking plans involve modeling the Babcock & Wilcox cold criticals using Gadolinia
  - Pin power peaking uncertainty
  - Reactivity uncertainty
- Bias and uncertainty update
  - MTC
  - ITC
  - Rod worth calculations
- SPC review of OPPD calculations
  - Design depletions
  - Axial shape analysis

Submittals to be made by OPPD

OPPD Submittals

- Change in referenced methodologies
  - The plant Technical Specifications will be updated with SPC's approved methodologies used for:
    - LB LOCA
    - SB LOCA
    - CEA Ejection
    - Seized Rotor
    - Thermal Hydraulics
    - Setpoints
  - Siemens assembly growth correlation
  - Other submittals as necessary (determined by discussion)

Methodologies Added to TS 5.9.5

- XN-NF-82-06(P)(A) Revision 1, and Supplements 2, 4, and 5
- ANF-88-133(P)(A) and Supplement 1
- XN-NF-82-21(P)(A) Revision 1
- EMF-92-153(P)(A) and Supplement 1
- XN-75-32(P)(A) Supplement 1, 2, 3, and 4
- XN-NF-621(P)(A) Revision 1
- ANF-89-151(P)(A)
- XN-NF-78-44(P)(A)
- XN-NF-85-92(P)(A)
- EMF-2087(P)(A)
- XN-NF-82-49(P)(A), Revision 1, Supplement 1
- XN-NF-507(P)(A), Supplements 1 and 2 or EMF-1961 (P)
- ANF-84-73 Revision 5 Appendix B (P)(A)*
- EMF-84-093(P)(A) Revision 1*

* Not used in first reload

Schedule

Planned Schedule for Work

- Submittal of Technical Specification Change to Referenced Methodologies by 7/31/00. Approval requested by 12/31/00.
- Submittal of Assembly Growth Correlation by 7/31/00 (To be submitted as a letter report). Approval requested by 10/31/00.
- Outage Start Date 3/17/01
- Cycle Startup Date 4/18/01
- Other items to be determined