

FOIA/PA REQUEST

From: NC WARN <NC-WARN@pobox.com>
To: TWFN_DO.twf2_po(FOIA)
Date: Fri, Jan 7, 2000 4:37 PM
Subject: request

Case No: 2000-0096
Date Rec'd: 1-7-00
Action Off: Pugh
Related Case: _____

Russell Powell, Chief
FOIA/PA Branch
Division of Freedom of Information and Publication Services Office of
Administration
U.S. Nuclear Regulatory Commission Washington, DC 20036

VIA E-MAIL: FOIA@NRC.GOV ATTACHMENTS, BY FAX:
(301) 415-5130

Dear Mr. Powell:

This is a followup to FOIA/PA 99-367 of 9-20-1999. It includes, as its last three items, the requests of that FOIA request because we have serious doubts as to whether all the information requested has been produced. Please note that a separate appeal related to FOIA/PA 99-367 may also be filed separately, clearly marked as an appeal, which this is not. Per conversation with NRC FOIA staff on January 6, 2000, we are filing this request to attempt to save time. Please note that item 75 below requests all updated or later versions of documents identified pursuant to any of the other items in this request.

On behalf of North Carolina Waste Awareness and Reduction Network (NC WARN), and pursuant to the Freedom of Information Act, 5 U.S.C. 552(b), et. seq., I hereby request that you make available copies of all documents in the U.S. Nuclear Regulatory Commission's possession which include, describe or discuss:

- 1) Each of the documents labeled as Attachments A, B, C, *, Z, AA, * EE (there are total of 31 attachments listed on pages ii and iii), including each entire document (the number of pages of each, for example 77 for attachment A, 33 for attachment EE, are shown on those pages) listed in Carolina Power & Light SF-0040 revision 0, which is apparently Exhibit 1 to NRC document #9905100006 in docket 50-400 (05000400) from J.H.O'Neill on behalf of Carolina Power & Light Co. dated 5/5/99. (Pages listing these will be forwarded also with hard copy. This request will be sent by E-mail to foia (@nrc.gov first.)
- 2) Each of the thirty-five (35) references shown on pages 1, 2 or 3 of the above-referenced document SF-0040, beginning with Harris Nuclear Plant Calculation CC-0039 (number 1) and continuing through number 13, Harris Nuclear Plant Design Basis Document, Component Cooling Water System, DBD 131 Revision 6, dated 6/19/97, through item 35. (Pages to be forwarded also with hard copy.)
- 3) Any information related to the condition stated on that above referenced page 1, that "This calculation is only valid for Spent Fuel Pool C and D heat loads up to 1.0 MBTU/hr and does not consider the effect of potential increases in core thermal power due to the Steam Generator Replacement/Power Uprate Project."
- 4) Any information concerning potential and/or actual increases in core

thermal power due to the Steam Generator Replacement/Power Uprate Project for the Shearon Harris Nuclear Plant or any other Westinghouse 3-loop PWR which has undergone or is planned to have steam generator replacement and/or any power uprate or change in core thermal power and/or steam power generated and/or electrical generating capacity (including and/or excluding station service loads).

- 5) Any information concerning spent fuel pool cooling capacity and/or capability for Spent Fuel Pool C and/or D heat loads equal to or exceeding 1.0 MBTU/hr at the Shearon Harris nuclear plant.
- 6) The name(s) of nuclear plants, NRC docket numbers, specific legal proceedings, rulemakings, or other activities of NRC and/or known to NRC, where PROTO-FLOW* 3.04, PROTO-HX* 3.02 and/or previous and/or later versions of those programs have been used.
- 7) The PROTO-FLOW* 3.04 and/or PROTO-HX* 3.02 programs
- 8) Inputs to the above-referenced programs.
- 9) Each of the ten case alignments referred to on page 3 of SF-0040
- 10) Each fouling factor for each and/or any of the heat exchanger thermal models in SF-0040 (mentioned, e.g., in the latter part of section 4.0 on page 3 thereof)
- 11) Any and/or all of the Modified CCWS pipe sections listed in Table 1 of SF-0040.
- 12) Any and/or all of the bases and assumptions in Section 4.1 of SF-0040.
- 13) Design data sheet values (and/or the design data sheets), inferred flow and heat load values from other design basis documents, or calculated values, (first paragraph of section 4.2 of SF-0040)
- 14) Each (and/or any combination(s)) of the heat loads on page 8 of SF-0040.
- 15) Each reference (and/or any combinations(s) and/or any or all of the references) to Table 3 of SF-0040.
- 16) The heat removal capacity of the SFP heat exchangers (Note 1 to Table 4, page 10 of SF-0040)
- 17) Any system alignment(s) other than "most major system alignments" (last paragraph of page 14 of SF-0040) for which sufficient CCWS flow to cooled components and/or the Spent Fuel Pool(s) (and/or any or all of the Spent Fuel Pools) may not be available, and/or is not available and/or will not be available.
- 18) The zero percent flow margin(s) shown in table 7b (page 17) of SF-0040, including SFP Hx A (and/or Spent Fuel Pool Heat Exchanger A), and/or SFP HX D (and/or Spent Fuel Pool Heat Exchanger D).
- 19) The Estimate[s] of Transient Spent Fuel Pool Thermal Performance, section 4.8 of SF-0040
- 20) Each reference or calculation (or any of them) to Table 8a and or Table 8b, pages 29-30 of SF-0040, Summary of CCWS Steady-State Thermal Capacity.
- 21) The reason(s) for each of the revisions listed for Revision 6 of Calculation No. E-6000 which is Exhibit 3 to the document referenced in item (1) above, NRC Docket 50-400, item 9905100006.
- 22) Pool D SFP cleanup referred to on slide 3 of item E/6 supplied under FOIA/PA 99-367
- 23) Disposal of low-density Boraflex racks * stored in the 'C' pool, (same reference)
- 24) CCW upgrades (same reference, slide 3 of item E/6 supplied under FOIA 99-367

- 25) The engineering analysis referred to on slide 6 of item E/6, 2d item, including the title(s), date(s) and nature and/or basis of any such analysis
- 26) The power uprate CCW upgrade (last item on slide 6 of item E/6)
- 27) The amount of additional cooling capacity required to provide adequate cooling to C and D pools when they are at maximum capacity (last item on slide 6 of E/6), and any different calculation(s) thereof by anyone.
- 28) The CCW upgrade that "licensee intends", (3d item of slide 6 of E/6)

- 29) Any notes or other information relating to the meetings 3/3 and/or 7/16/98 (1st item of slide 8 of E/6, FOIA 99-367)
- 30) The names of all technical staff who attended the 3/3/98 meeting (see item 2, slide 8 E/6, FOIA 99-367)
- 31) The names of all technical staff who attended the 7/16/98 meeting (same reference)
- 32) All other persons who attended each of these meetings or either of them
- 33) The current (as of July 1996) spent fuel pool heatload analysis for the Harris nuclear plant (item 1, document E/9, FOIA 99-367)
- 34) Any updated analyses since July 1996 (e.g. the one promised by March 1997 or so, 2d paragraph of E/9, and any subsequent analysis or analyses.
- 35) HNP FSAR revisions related to full-core offloads (item 2 of E/9) and the related HNP FSAR portions referred to in the letter(s) dated July 1, 1996 and the letter that is item E/9 of FOIA 99-367
- 36) HNP FSAR item(s) reflecting as-installed spent fuel pool configuration (item 3, E/9, FOIA 99-367); original design of HNP spent fuel pool (fuel storage) configuration, and FSAR item(s) current in July 1996 showing the SFP configuration.
- 37) The projected CCW heat loads shown on page 10 of the 3/3/98 CP&L "Project Status" item E/10 of FOIA 99-367
- 38) The initial power uprate of 4.5% (see note tied to 2002 heat load number, same page)
- 39) The actual numbers of BTUs for these projections (the numbers appear to be missing from the margin(s) of the chart (same reference, p.10 item E/10, FOIA 99/367)
- 40) The Maximum CCW capability without upgrades (see note, tied to horizontal line on same reference, p.10, E/10, FOIA 99-367)
- 41) How the maximum CCW capability was derived or calculated (see item 40 above)
- 42) The "existing design assumptions" (tied to 1998 bar, p.10 item E/10, FOIA 99/367)
- 43) The BNP/RNP Transshipment referred to in note tied to 2001 bar, p.10 of item E/10, FOIA 99/367; also, the amount by which the 2001 bar exceeds the 2000 bar (MBTU/hr)
- 44) Fuel pool cooling phase 2, including any determination(s) or calculations or estimates of CCW system upgrades required to support power uprate (last item, p.21, E/10, FOIA 99/367)
- 45) CCW system upgrades and/or cooling capacity required to cool pools C and D at full capacity under CP&L's license amendment request if both pools are filled.
- 46) The 1.5% potential final phase of power uprate (see note tied to 2004 bar on page 10 of item E/10, 99-367)

- 47) Unit specific RWST's, next to last item on page 3, item E/11 FOIA 99/367
- 48) Separate CCW systems, last item, page 3, item E/11, FOIA 99-367
- 49) Any studies of the CCW system operational margin at SHNPP, particularly the one referred to in top item of page 5 of E/11, FOIA 99-367
- 50) The "comprehensive multi-system thermal-hydraulic model" (see item 2, same page)
- 51) Any studies of or information on the "impact of SGR and [/or] power uprate (item 3, Same page
- 52) Transshipment schedule, item 4, same page
- 53) Two phase approach, item 5, same page
- 54) Rebalance of CCW, and/or why it is required, item 2, page 6, E/11 FOIA 99-367
- 55) Rebalance of ESW, and/or why it is required, item 3, same page
- 56) Operational margin, item 1, same page
- 57) The computerized hydraulic model(s) and all hand calculation(s) used in the original methodology, (see p.7, upper left item, E/11 FOIA 99/367

- 58) The thermal performance (including numerical results) so calculated or derived (same reference)
- 59) The comprehensive model (see upper right item, same page)
- 60) Off-design performance, (see lower right item, same page)
- 61) Any extension of the Unit 1 CCW system (item 1, page 8, E/11 FOIA 99-367
- 62) Upgrades to Harris CCW system, including impeller upgrades, helper heat exchangers (item 2, p 9, E/11 FOIA 99-367)
- 63) Any calculation(s) or estimate(s) of performance of the upgrades (ref. Item 62)
- 64) Heatup calculations for the north [C and/or D] pools, item 1, page 10, E/11 FOIA 99-367
- 65) UHS evaluation(s) (see Item 2, same page)
- 66) Fuel Handling Building HVAC evaluations (see Item 3, same page)
- 67) Minimum Time to Offload evaluations (see item 4, same page)
- 68) Interim methodology to control pool heat load (see item 1, page 11, E/11, FOIA 99-367)
- 69) Development of the 10 CFR 50.59 evaluation (see item 1, page 12, E/11 FOIA 99-367)
- 70) Each RAI related to CP&L's license amendment request, and CP&L's entire response(s) to each (see 5th RAI, and list in letter, item E/29, FOIA 99-367)
- 71) Any information from the manufacturer of the HNP spent fuel pool cooling heat exchangers as to their capacity, construction, QA/QC, design, operation or margin, including the margin stated in item c1, page 3, top paragraph, from CP&L; any other information related to any of the above
- 72) Flow instrumentation accuracy related to spent fuel pool cooling, CCW, ESW, or other cooling systems at Harris, including similar or same instrumentation used at any nuclear plant(s), and/or manufacturers' or other's test data of flow instrumentation accuracy (see, Allegation 2, same page, bottom, same reference, but not limited to that reference)
- 73) NRC's "independent review" referred to in paragraph 2 of item C3, FOIA 99-367

74) NRC and/or NRC contractor or NEI or INPO or other review of SF-0040 any or any of its assumptions or references (see item 1 above, reference to SF-0040)

75) Any later revisions or earlier versions of any of the documents and/or items requested above and/or requested below.

X) Actual or projected heat loads and/or heat production from spent fuel assemblies and/or

any other source, in spent fuel pools at the Shearon Harris reactor site, including any calculations and/or data of any kind (including sources of such data and all references used) used to calculate or estimate such loads, explicitly including any documents or information whatsoever relating to any of the estimated heat loads and/or the "maximum CCW Capability without system upgrades" shown on the viewgraph "Projected CCW Heat Loads" (apparently paginated as "10" and dated 1/2/98 in Carolina Power & Light's 7/16/98 "10 CFR 50.55a Alternative Plan for Harris Spent Fuel Pool [sic] 'C' and 'D' " a set of viewgraphs from a CP&L/NRC Staff meeting on 7/16/98).

Y) actual or projected heat removal capacity from any and/or all spent fuel pools at the Shearon Harris reactor site near Bonsal NC.

Z) actual RHR, Service Water System, and/or CCW heat removal capacity under operating, shutdown or accident conditions at Harris, or any calculations or projections of any and/or all of these, including any of the calculations, numbers, charts, or projections of RHR, SWS and/or CCW system heat removal capacity and/or heat transfer capability, including any and all supporting calculations, assumptions, referenced documents, information or procedures for calculating any and/or all of the above, including all such information relating to the 1999 CP&L heat removal calculations presented or referred to at the May 9, 1999 Prehearing Conference of the ASLB held in Chapel Hill NC, and/or any other calculations or projections of any of the above performed by NRC, CP&L or anyone else, the dates thereof, and/or any criteria or procedures or memoranda related to such calculation(s), projection(s) and/or estimate(s)..

This request covers but is not limited to all draft and final reports, correspondence, viewgraphs (vu-graphs, etc.) or copies thereof, memoranda, notes, records of telephone contacts, electronic communications including fax transmissions and Email, or other written or computer records, whether in paper or computer files including CDs.

Pursuant to our request, please provide all documents and communications prepared or utilized by, in the possession of or routed through the NRC related to each or any of the above items..

For any portion of the request that you deem appropriate to deny, NC-WARN requests that you describe the information that is denied, identify the exception to the FOIA on which you rely, and explain how that exception applies to the withheld information.

Pursuant to NRC regulations at 10 CFR 9.41, NC-WARN requests that any searching and copying fees incurred as a result of this search be waived, and provides the following information in response to the eight criteria listed in Section 9.41(b):

1) Purpose of request:

The purpose of the request is to gather information on the heat loads from spent fuel stored, and/or proposed to be stored, at the Harris nuclear plant site, and the ability to meet those heat loads and how such ability was and/or has been calculated, including the reasons for any re-calculations and all methods and data used.

The requested information is currently not available in the NRC's Public Document Room.

2) Extent to which NC-WARN will extract and analyze the substantive content of the records:

NC-WARN is qualified to make use of the requested information. Our staff and cooperating experts have demonstrated the ability to interpret information and communicate that information in a form comprehensible to the general public. Members of NC-WARN have published articles in news media of general circulation in North Carolina including the Raleigh News & Observer, Chapel Hill (NC) Herald. NC-WARN is quoted as a reliable source of information on nuclear issues in newspapers and on radio and television across the North Carolina. NC-WARN was a key source of information to the public concerning low-level radioactive waste issues during the State of North Carolina's now-withdrawn membership in the Southeast LLRW Compact. NC-WARN was first to inform the general public of plans for a significant expansion of spent nuclear powerplant fuel storage proposed on 1998 for the Shearon Harris nuclear plant near Apex NC.

NC-WARN has a working relationship with attorneys, physicists, nuclear engineers, medical doctors, and other respected professionals who contribute to the full understanding of technical records.

3) Nature of the specific activity or research in which the records will be used and NC-WARN's qualifications to utilize the information for the intended use in such a way that it will contribute to public understanding:

NC-WARN seeks the requested information solely to contribute to and help shape the public debate on adequate worker and public health and safety. NC-WARN intends to use the information in order to advance the concerns for public understanding and safety.

4) Likely impact on the public's understanding of the subject as compared to the level of understanding of the subject prior to disclosure:

Since complete information on the above-referenced items is not available to the general public, NC-WARN will be able to provide the first comprehensive review of this information, which can impact public health and safety.

5) Size and nature of the public to whose understanding a contribution

will be
made:

NC-WARN's information is regularly reported in news media reaching millions of citizens in North Carolina ranging from Winston-Salem, Greensboro, Apex, Chapel Hill, Pittsboro, Raleigh, Fayetteville and Charlotte for examples, including over 3 million people and including the general public as well as public officials and specialists in health and safety related issues.

6) Means of distribution of the requested information NC-WARN provides information via reports, news releases, press conferences, newsletters, e-mail and other means. NC-WARN has been a key provider of information on nuclear, toxics and other health- and safety-related issues since 1990.

7) Whether free access to information will be provided:

NC-WARN will provide access to information received under this request freely.

8) No commercial interest by NC-WARN or any other party:

NC-WARN is a nonprofit organization (501(c)3) and has zero commercial interest, nor is party to any commercial interest in the above-requested information. To NC-WARN's best knowledge, no other commercial interest is involved with this request.

Sincerely,

Jim Warren
Executive Director

1/07/2000

xc: Senator John Edwards
Representative David Price

Exhibit 1

Title/Approval Sheet

SYSTEM# 4065

CALC. TYPE Mechanical

CAROLINA POWER & LIGHT COMPANY

SE-0040
(CALCULATION #)

FOR

Spent Fuel Pools C and D Activation Project Thermal-Hydraulic Analysis
(TITLE INCLUDING STRUCTURE/SYSTEM/COMPONENT)

FOR

SHEARON HARRIS NUCLEAR POWER PLANT X
NUCLEAR ENGINEERING DEPARTMENT

QUALITY CLASS X A B C D E

REV. NO.	RESPONSIBLE ENGINEER	DATE	<input checked="" type="checkbox"/> DESIGN VERIFIED BY <input type="checkbox"/> ENGINEERING REVIEW BY	DATE	APPROVED BY RESPONSIBLE SUPERVISOR
0	John S. Sorey	11/27/98	John A. Minner	10/27/98	R. St. Lawrence
					11-10-98
REASON FOR CHANGE					
REASON FOR CHANGE					

Computed by:	Date:	CAROLINA POWER & LIGHT COMPANY		Calculation ID: SF-0040
Est/County:				
Checked by:	Date:			No. of 32
Project No.:		CALCULATION SHEET		Rev 0
Project Title: Spent Fuel Pools C and D Activation Project		File:		
Calculation Title: Spent Fuel Pools C and D Activation Project Thermal-Hydraulic Analysis				

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Calculation Title: Spent Fuel Pools C and D Activation Project Thermal-Hydraulic Analysis				

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P	Calculation SF-0040, Revision 0, Evaluation of CCW System LOCA-Containment Sump Recirculation (RHR Only) Alignment Hydraulic Performance	18
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Project Title: Spent Fuel Pools C and D Activation Project				
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1.0 PURPOSE

The purpose of this calculation is to document the thermal hydraulic capacity of the Component Cooling Water System (CCWS) to support the activation of Spent Fuel Pools C and D at CP&L's Harris Nuclear Plant (HNP). This calculation is only valid for Spent Fuel Pool C and D heat loads up to 1.0 METU/hr and does not consider the effect of potential increases in core thermal power due to the Steam Generator Replacement/Power Upgrade Project.

2.0 REFERENCES

- (1) Harris Nuclear Plant Calculation CC-0039 Revision 0, Development of Component Cooling Water System PROTO-FLO Thermal-Hydraulic Model
- (2) Harris Nuclear Plant Calculation SW-0088 Revision 0, Development of Emergency Service Water System PROTO-FLO Thermal-Hydraulic Model
- (3) Harris Nuclear Plant Calculation HNP-M/MECH-1011 Revision 2, Pump Degradation Limits for ESW, CCW & ESCW, dated 5/10/97
- (4) Stone & Webster Feasibility Study for Pool Cooling and Clean-Up of Harris Nuclear Plant Spent Fuel Pools C & D, Revision 0, prepared 10/6/97
- (5) Preliminary Harris Nuclear Plant Drawing CAR 2166-G-412 Rev 11, dated 10/6/97
- (6) Preliminary Harris Nuclear Plant Drawing CAR 2165-G-255 Rev 16, dated 4/4/97
- (7) Preliminary Harris Nuclear Plant Drawing CAR 2165-G-127 Rev 15, dated 10/4/97
- (8) Crane Technical Paper 410, ©1988 Crane Company
- (9) Harris Nuclear Plant Calculation NSSS-38 Revision 2, RHR Heat Exchanger and Pump Cooler Cooling Water Outlet Temperatures, dated 4/30/97
- (10) Harris Nuclear Plant Engineering Service Request 9700536 Rev 0, Emergency Service Water System - FSAR Table 9.2.1-5 Supporting Documentation, dated 10/16/97
- (11) Harris Nuclear Plant Engineering Service Request 9600126 Rev 0, Spent Fuel Pool Cooling System, dated 3/5/97
- (12) Harris Nuclear Plant Final Safety Analysis Report Section 9.2.2 Component Cooling System Table 9.2.2-3 Amendment No. 35 (Superseded by RAF 2160)
- (13) Harris Nuclear Plant Design Basis Document, Component Cooling Water System, DBD-131 Revision 6, dated 6/19/97

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- (14) Harris Nuclear Plant Calculation CC-0038 Revision 0, CCW Heat Exchanger Performance During Post-Accident Recirc Alignment, dated 4/21/97
- (15) Harris Nuclear Plant Calculation SW-0085 Revision 0, Ultimate Heat Sink Analysis, dated 1/6/96
- (16) Harris Nuclear Plant Calculation CC-0037 Revision 2, CCW Flow Rates for Various Valve Alignments, dated 4/8/97
- (17) Reactor Coolant Pumps, Technical Manual VM-MRF
- (18) Harris Nuclear Plant Design Basis Document, Service Water System - Traveling Screens and Screen Wash System - Waste Processing Building Cooling Water System, DBD-128, Revision 6, dated 6/18/97
- (19) Harris Nuclear Plant Technical Specification Section 3/4.7.5 Ultimate Heat Sink, Tech Spec Interpretation 95-03
- (20) Harris Nuclear Plant Calculation SW-0078 Revision 4, ESW System Performance Evaluation, dated 6/11/96
- (21) Harris Nuclear Plant Calculation HNP-M/MECH-1008, Revised Containment Analysis for an Increase in the Initial Temperature from 120°F to 135°F Revision 1, dated 4/8/97
- (22) Harris Nuclear Plant Calculation CC-0020, Revision 1, Component Cooling Water System Performance, dated 9/3/96
- (23) Meeting Minutes of 11/25/97 Meeting Between CP&L and Proto-Power Corporation
- (24) Harris Nuclear Plant Engineering Services Request - Action Item, ESR 9500442 Revision 0 A1#2, dated 8/11/97
- (25) Harris Nuclear Plant Final Safety Analysis report Amendment no. 45 p. 5.4.7-10I, "Boration and Inventory Control"
- (26) Harris Nuclear Plant Calculation HNP-F/NFSA-0026 Revision 0, Maximum Decay Heat Load for Spent Fuel Pools A, B & C Through the End of Year 2001, dated 4/16/98
- (27) Not Used
- (28) CP&L-Harris Nuclear Plant Letter 10003481-Model-00, Estimated Impact of Power Uprate, dated November 6, 1997
- (29) Harris Nuclear Plant Calculation SW-0080 Revision 5, ESW Flow Requirements Based on Reservoir Level, dated 5/2/97

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Calculation Title: Spent Fuel Pools C and D Activation Project Thermal-Hydraulic Analysis				

- (30) Harris Nuclear Plant Operating Procedure OP-145, Section 8.9
- (31) Harris Nuclear Plant Final Safety Analysis Report Table 9.2.1.1-7, Amendment 15
- (32) Westinghouse letter QQL-290, dated 6/5/79
- (33) Harris Nuclear Plant Engineering Service Request 9700272 Revision 0, dated 5/6/97
- (34) Harris Nuclear Plant Calculation 9-FHB-2 Revision 1, Fuel Handling Building Air Conditioning System, dated 5/24/86
- (35) Harris Nuclear Plant Engineering Service request 9700252 Revision 0, Evaluation of EPT-174 Data, dated 4/7/97

3.0 ENGINEERING ANALYSIS SOFTWARE

This calculation was performed using PROTO-FLO™ 3.04 and PROTO-HX™ 3.02. The default PROTO-FLO™ database, CCW2.DBD (dated 10/14/98, Size 800KB) is included in Attachment (A).

4.0 CALCULATION

Reference (1) was used as a starting point for the analysis of the CCWS system to determine thermal and hydraulic margins. The default benchmarked PROTO-FLO™ database, CCW.DBD, was modified to create a new PROTO-FLO™ default database, CCW2.DBD, which incorporates the proposed CCWS tie-ins for the fuel pool C and D heat exchangers as well as other modifications defined in Table 1. Case alignments for:

- Startup Operations (A CCWS Train Operating)
- Normal Operations (A CCWS Train Operating)
- Hot Shutdown at 350°F (A and B CCWS Trains Operating)
- Safe Shutdown at 350°F (A CCWS Train Operating, Split),
- Refueling: Core Shuffie (A CCWS Train Operating, Single Failure),
- Refueling: Full Core Offload (A CCWS Train Operating, Single Failure),
- Refueling: Abnormal Full Core Offload (A CCWS Train Operating, Single Failure),
- LOCA: Safety Injection Phase (A and B CCWS Trains Operating, Split),
- LOCA: Containment Sump Recirculation with CCWS Nonessential Header Isolated [Recirc(a)] (A CCWS Train Operating, Single Failure) and
- LOCA: Containment Sump Recirculation with Limited Fuel Pool Cooling [Recirc(b)] (A CCWS Train Operating, Single Failure).

were developed to capture all the major CCWS system operating conditions. All heat exchanger thermal models use design fouling factors rather than IST results to ensure that design basis conditions can be met even with extreme fouling conditions. CCW pump degradation to the 10% IST limit, Reference (3), was included for the flow margin portion of this analysis.

AC
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See following pages
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Decision Process

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where is it?

There are other pages
in

- Preliminary study of the CCW system identified operational margin *How much?*
- Comprehensive multi-system thermal/hydraulic model was created *where is it?*
- Impact of SGR and Power Uprate *(steam generator replacement)*
- Review of transshipment schedule
- Two phase approach

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about
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through it.
1-07-2000



Jim Warren, Executive Director
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