****MEMORANDUM****

TO: Public Docket Room

FROM: Lawerence T. Doerflein, Chief
Systems Branch

SUBJECT: E-MAIL CORRESPONDENCE BETWEEN NRC AND ENTERGY FROM JUNE 21 TO JULY 3, 2001

Attached to this memo are a series of email correspondence that took place between the NRC and Entergy personnel from the Indian Point Unit 3 between June 21 to July 3, 2001. The information contained within these e-mails was used during the course of an NRC special inspection, which will be documented in NRC inspection report 05000286/2001006.

Attachments: E-mail Correspondence From June 21 to July 3, 2001 Between The NRC And Entergy Personnel

ATTACHMENT 1
E-mail Correspondence From June 21 to July 3, 2001 Between The NRC And Entergy

Mail Envelope Properties
(3B0953C8.889 : 10 : 34966)

Subject: Re: Additional BUSFPCS data input requested on 5/18/01
Creation Date: 5/21/01 1:43PM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

nrc.gov
kp1_po.KP_DO
SRJ CC (Steve Jones)

Post Office	Route
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	9284	05/21/01 01:43PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 5/21/01 1:43PM
Subject: Re: Additional BUSFPCS data input requested on 5/18/01

Thanks for the data. On Friday you gave me some pump curves and also said that engineering had data that the backup spent fuel pool primary cooling pumps would have adequate NPSH up to 213F. The pump curves look to be for the PW makeup water pumps and not for the backup spent fuel pool cooling pumps. Therefore, I do not have any data to support the operability of the backup spent fuel pool cooling pumps at 213F. Is there more data coming?

GREG...

As per your additional requests/questions on the BUSFPCS event of 5/8, asked of me before you left on 5/18, here are the answers to those questions:

1. Did the operators enter the applicable Off-Normal Operating Procedure (ONOP-SFP-1) when BUSFPCS was lost at about 0230 on 5/8/01?

Answer: Yes. ONOP-SFP-1 was entered by the operating shift at 0240 on 5/8/01. This same ONOP was exited at 0310 on that same date. This is indicated in the UNIT LOG, on pages 145 and 147, of which you should have a copy in Book 1 of the material we prepared. This log is in the tab marked "Actual SFP Heatup Log" (which is Tab # 16 in Book 1). The entry condition for this is Symptom/Entry Condition # 2.1 "Unanticipated loss of Normal or Back-up Cooling Systems." The last procedure change (due to the SFPCS mod) added this revision to the entry conditions as of 9/27/99.
You should also have a copy of this ONOP procedure in your Book 2 of BUSFPCS materials under the Procedure section (Tab # 21).

2. What is the latest status of IP3 Reportability of this event under 50.72 and/or 50.73 guidelines?

Answer: I believe that Jim Comiotes may have given you our written position (on 5/18 just before you left) as to the reportability/non-reportability of this event under the various possible 50.72 ENS criteria and the NUREG-1022 event reporting guidance available. As you know we did conditionally report this event under 50.72 (b) (3) (v) (B) on 5/17/01 at 1446. You have a copy of this 8-hour ENS notification. If you did not receive our written memo position (licensing memo IP-LIC-01-030 dated 5/18/01) as to event reportability, please let me know ASAP and I will send this item to you via e-mail or fax.

3. How is the BUSFPCS described in the FSAR?

Answer: The update to the FSAR is not yet complete, but it is to be added ASAP pending completion of an engineering certification that the mod turnover process to operations is complete in all respects. The Design Basis

Document (DBD) update, Plant Equipment Data Base (PEDB) additions, and entry of this mod information into records are all apparently required before engineering certifies to licensing that an FSAR update can be made. I have a copy of the proposed BUSFPCS FSAR update if you need to see this information as to what is going to be added to the FSAR in the near future. This proposed change describes addition of a brief description of BUSFPCS into the FSAR on pages 9.3-11 and 9.5-8. There are also two proposed FSAR figure changes...Figure 9.3-2B and 9.6-9A. Let me know if want this information sent to you via fax.

4. Why is the BUSFPCS modification still open?

Answer: As per IP3 engineering procedure MCM-19, "Engineering Turnover and Closeout," the following items are still pending before formal engineering closeout of this modification for the BUSFPCS occurs:
(a) PEDB update (which is about 60% complete),
(b) Define PM's for this system and formally ensure entered into our overall PM program, and
(c) Enter this mod package information into IP3 records system. I received this up-to-date status of mod closure from the senior design engineer responsible for this mod when it was initially installed in late 1999.

Additionally...

I was also (when you left Friday 5/18) still researching a request from Steve Jones regarding a listing of ALL safety related components within the SFPCS system. I had some preliminary information but needed to verify CAT 1, CAT M, and Non-CAT status before I could give Steve a bottom line. If that information is still needed, then we can also provide it promptly after some further work to verify the data.

Finally, I had given you operations information concerning our test of M/U flow rate to the SFP itself from one Primary Water pump. This value was determined by test to be about 213.5 gpm. This value was attained using only one PW pump. Each pump is rated at about 150 gpm @ 125 psig. Due to the low system resistance, as the SFP was the only load lined up for service (as I understand that would have been the case on 5/8/01 as well), the flow rate was higher than the design pump flow rate which takes into account additional PW loads (beyond just the SFP) on the system. You should also have a copy of the Prim Water Pumps 31 and 32 (pump NPSH and capacity) ops curves to show this capability as well. I gave those to Lois James in the NRC office just before you left. We are planning to perform a test of the RWST make-up flow rates to the SFP itself on the basis of not interfering with outage priority work.

Please let me know ASAP if I have answered all your questions, we can send you any additional materials (e-mail or fax), or you need anything else as the week progresses.

Thanks much...

Ed...914-736-8970

P.S...I called your phone at Region I Headquarters on Sunday (5/20) afternoon about 1250, but was unable to leave a voice mail message as to my sending you this information as you had requested.

CC: Steve Jones

Mail Envelope Properties
(3B098CE9.889 : 10 : 34966)

Subject:	Re: Additional BUSFPCS data input requested on 5/18/01
Creation Date:	5/21/01 5:47PM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

nrc.gov
kp1_po.KP_DO
SRJ CC (Steve Jones)

Post Office	**Route**
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	9110	05/21/01 05:47PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 5/21/01 5:47PM
Subject: Re: Additional BUSFPCS data input requested on 5/18/01

When ONOP-SFP-1 was entered was 4.0 (or 5.0?) step 9.e.(1) Place FSB ventilation in "Emergency Mode" done? What was the basis for not entering the ONOP when the pool temperature exceeded 120F initially? What was the basis for exiting the ONOP at 0310?

>>> "Firth, Edwin" <EFirth@entergy.com> 05/20/01 12:48PM >>>

GREG...

As per your additional requests/questions on the BUSFPCS event of 5/8, asked of me before you left on 5/18, here are the answers to those questions:

1. Did the operators enter the applicable Off-Normal Operating Procedure (ONOP-SFP-1) when BUSFPCS was lost at about 0230 on 5/8/01?

Answer: Yes. ONOP-SFP-1 was entered by the operating shift at 0240 on 5/8/01. This same ONOP was exited at 0310 on that same date. This is indicated in the UNIT LOG, on pages 145 and 147, of which you should have a copy in Book 1 of the material we prepared. This log is in the tab marked "Actual SFP Heatup Log" (which is Tab # 16 in Book 1). The entry condition for this is Symptom/Entry Condition # 2.1 "Unanticipated loss of Normal or Back-up Cooling Systems." The last procedure change (due to the SFPCS mod) added this revision to the entry conditions as of 9/27/99.
You should also have a copy of this ONOP procedure in your Book 2 of BUSFPCS materials under the Procedure section (Tab # 21).

2. What is the latest status of IP3 Reportability of this event under 50.72 and/or 50.73 guidelines?

Answer: I believe that Jim Comiotes may have given you our written position (on 5/18 just before you left) as to the reportability/non-reportability of this event under the various possible 50.72 ENS criteria and the NUREG-1022 event reporting guidance available. As you know we did conditionally report this event under 50.72 (b) (3) (v) (B) on 5/17/01 at 1446. You have a copy of this 8-hour ENS notification. If you did not receive our written memo position (licensing memo IP-LIC-01-030 dated 5/18/01) as to event reportability, please let me know ASAP and I will send this item to you via e-mail or fax.

3. How is the BUSFPCS described in the FSAR?

Answer: The update to the FSAR is not yet complete, but it is to be added ASAP pending completion of an engineering certification that the mod turnover process to operations is complete in all respects. The Design Basis

Document (DBD) update, Plant Equipment Data Base (PEDB) additions, and entry of this mod information into records are all apparently required before engineering certifies to licensing that an FSAR update can be made. I have a copy of the proposed BUSFPCS FSAR update if you need to see this information as to what is going to be added to the FSAR in the near future. This proposed change describes addition of a brief description of BUSFPCS into the FSAR on pages 9.3-11 and 9.5-8. There are also two proposed FSAR figure changes...Figure 9.3-2B and 9.6-9A. Let me know if want this information sent to you via fax.

4. Why is the BUSFPCS modification still open?

Answer: As per IP3 engineering procedure MCM-19, "Engineering Turnover and Closeout," the following items are still pending before formal engineering closeout of this modification for the BUSFPCS occurs:
(a) PEDB update (which is about 60% complete),
(b) Define PM's for this system and formally ensure entered into our overall PM program, and
(c) Enter this mod package information into IP3 records system. I received this up-to-date status of mod closure from the senior design engineer responsible for this mod when it was initially installed in late 1999.

Additionally...

I was also (when you left Friday 5/18) still researching a request from Steve Jones regarding a listing of ALL safety related components within the SFPCS system. I had some preliminary information but needed to verify CAT 1, CAT M, and Non-CAT status before I could give Steve a bottom line. If that information is still needed, then we can also provide it promptly after some further work to verify the data.

Finally, I had given you operations information concerning our test of M/U flow rate to the SFP itself from one Primary Water pump. This value was determined by test to be about 213.5 gpm. This value was attained using only one PW pump. Each pump is rated at about 150 gpm @ 125 psig. Due to the low system resistance, as the SFP was the only load lined up for service (as I understand that would have been the case on 5/8/01 as well), the flow rate was higher than the design pump flow rate which takes into account additional PW loads (beyond just the SFP) on the system. You should also have a copy of the Prim Water Pumps 31 and 32 (pump NPSH and capacity) ops curves to show this capability as well. I gave those to Lois James in the NRC office just before you left. We are planning to perform a test of the RWST make-up flow rates to the SFP itself on the basis of not interfering with outage priority work.

Please let me know ASAP if I have answered all your questions, we can send you any additional materials (e-mail or fax), or you need anything else as the week progresses.

Thanks much...

Ed...914-736-8970

P.S...I called your phone at Region I Headquarters on Sunday (5/20) afternoon about 1250, but was unable to leave a voice mail message as to my sending you this information as you had requested.

CC: Steve Jones

Mail Envelope Properties
(3B0AB7FD.889 : 10 : 34966)

Subject:	Exit Meeting and additional documents
Creation Date:	5/22/01 3:03PM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)
JComiot CC (Comiotes, Jim)
PKokola CC (Kokolakis, Peter)

nrc.gov
kp1_po.KP_DO
DCL CC (David Lew)
LTD CC (Lawrence Doerflein)
SRJ CC (Steve Jones)
WHR CC (William Ruland)

Post Office	**Route**
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1941	05/22/01 03:03PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 5/22/01 3:03PM
Subject: Exit Meeting and additional documents

In talking with Jim Comiotes I understand that there are additional documents to be sent regarding your position on issues associated with the loss of SFP cooling. Also, there are documents and responses to questions that we asked for that are pending. We are also reviewing the additional information we received late Friday regarding reportability and factors considered in the Root Cause Analysis.

With all this information still pending Region I has decided that the Exit will not occur this week. We do not have a time as yet but should know later this week based on the quantity of additional information received from you and any additional questions.

Ed, please let me know what you think you owe Steve or me regarding information so I can cross check it with my list. Key areas include the ability of the primary BUSFP cooling pump to operate at temperatures above about 195F (NPSH), ONOP-SFP-1 basis for entry and exit (and what steps were performed or not performed and why), and previous test data on water delivery capabilities to the SFP.

Also, it was mentioned that when the SFP temperature was at 150 - 155F is was difficult to see to do work at the SFP. What specifically was the character of the reduced visibility and at what pool temperature did it begin and when did it clear up?

CC: Comiotes, Jim; David Lew; Kokolakis, Peter; Lawrence Doerflein; Steve Jones; William Ruland

Mail Envelope Properties
(3B0D0BBC.889 : 10 : 34966)

Subject:	IP3 SFP Questions
Creation Date:	5/24/01 9:25AM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
Sprussm (Sprussm@entergy.com)

nrc.gov
kp1_po.KP_DO
SRJ CC (Steve Jones)

Post Office	**Route**
kp1_po.KP_DO	entergy.com
	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	839	05/24/01 09:25AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Sprussm@entergy.com
Date: 5/24/01 9:25AM
Subject: IP3 SFP Questions

When I last talked to Jim Comiotes he said additional documents would be sent by fax or email on Wednesday. I have not received any so far.

Also, in the FSAR, Section 1.3, page 1.3-98, it says, regarding the SFP, "Both the water level and temperature are continuously monitored." Where is this monitor? Is it recorded somewhere?

CC: Steve Jones

Mail Envelope Properties
(3B0D155D.889 : 10 : 34966)

Subject: IP3 SFP system
Creation Date: 5/24/01 10:06AM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
Sprussm (Sprussm@entergy.com)

nrc.gov
kp1_po.KP_DO
SRJ CC (Steve Jones)

Post Office	Route
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	987	05/24/01 10:06AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Sprussm@entergy.com
Date: 5/24/01 10:06AM
Subject: IP3 SFP system

The normal SFP cooling pumps are powered from MCC 37 and 39. Are or can those MCC's be powered from a safety related power supply? What is done for normal spent fuel pool cooling in the case of a station blackout?

The backup SFP cooling pumps are powered from MCC E1 and E2. Can those MCC's be powered from a safety related power supply? I know the backup power supply for the backup system pumps is a portable generator.

CC: Steve Jones

Mail Envelope Properties
(3B0D57A5.B5F : 22 : 56159)

Subject: RE: IP3 SFP Questions
Creation Date: 5/24/01 2:48PM
From: "Prussman, Stephen" <SPrussm@entergy.com>

Created By: SPrussm@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)
SRJ CC (Steve Jones)

entergy.com
EPatruc CC (Patrucco, Edward)
DMain CC (Main, Dennis)
EFirth CC (Firth, Edwin)
PKokola CC (Kokolakis, Peter)
JComiot CC (Comiotes, Jim)

Post Office	Route
kp1_po.KP_DO	nrc.gov
	entergy.com

Files	Size	Date & Time
MESSAGE	7863	05/24/01 02:48PM
Header	1109	

Options
Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard

From: "Prussman, Stephen" <SPrussm@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/24/01 2:49PM
Subject: RE: IP3 SFP Questions

Greg

I left a voice mail about 1 asking you to call so I could make sure I delivered the documents wherever you were. I will E-mail the information shortly , about 3:30, when we have done a final review.

Once you have a chance to look at the documents, please call me at (914) 736-8856. We need to discuss your availability to meet with us on the information sent as well as when to schedule the exit.

Regarding your request in todays E-mail, the water level and temperature for the spent fuel are annunciated in the control room but there is no indication. The level and temperature are indicated in the spent fuel area.

A prior request for detail on our recent efforts determine flow capacity is responded to as follows:

1. Makeup from Primary Water Storage Tank - on 5/18/01 a clamp on flow meter was placed just upstream of check valve PW-36 on the pipe from primary water to the Spent Fuel Pool. Makeup to the SFP was initiated per SOP-SFP-001 and the flowmeter recorded a flow rate or 213.5 gpm with 31 Primary Water Makeup Pump running and 32 Primary Water Makeup Pump in Trip-Pullout. This flow has been documented on WR 01-01862-00.
2. Makeup from the RWST using the Refueling Water Purification Pump - on 5/21/01 SOP-SFP-1 was used to makeup to the SFP using the Refueling Water Purification Pump. The flow rate achieved on FI-656 (installed flow gauge downstream of the SFP Filter) was 60 gpm. This flow has been documented on WR 01-01862-00.
3. Fire Water Makeup - there are no tests that measure actual flow rates as it is undesirable to put water from the fire water system into the Spent Fuel Pool due to chemistry concerns. However calculation IP3-CALC-FP-01981, Rev.0 shows that
   the Hose Station at the 95' elevation of the FSB (Isolation Valve FP-398) is capable of supplying 100gpm with a flowing pressure of 65 psig at the isolation valve.

Periodic testing of the Fire Water System includes:

* Monthly inspections of Valve line-ups.
* 24 Month functional test of the Main Fire Pumps
* System flush & flow test (underground loop) every 3 years
* Flow test of each Hose Station every 3 years to verify no blockage.

You also requested more detail on the use of ONOP-SFP-1 during the loss of BUSFPCS on 5/8/01. As documented in the Unit log, CCR personnel entered

ONOP-SFP-1 at 0240 on 5/8/01 when they received the report that the BUSFPCS primary cooling loop had tripped. This was in accordance with entry condition 2.1, "Unanticipated loss of Normal or Back-up cooling systems". The ONOP steps were performed as follows:

Step 4.1 (VERIFY Power Available to at least one Spent Fuel Pit Pump) was performed even though it was recognized that the normal spent fuel pool cooling loop was secured for maintenance. (The maintenance activity on service water lines on the component cooling heat exchangers made the entire component cooling system unavailable as a heat sink. The component cooling system is the heat sink for the SFP heat exchanger.)

Step 4.2 (CHECK radiation monitors NORMAL) was performed and the radiation monitors were indicating normal conditions.

Step 4.3 (DISPATCH NPO to investigate the cause of the alarming condition) was performed. The CCR knew from the report by an NPO that the primary pumps on the BUSFPCS had tripped and that level had been lost in the evaporative cooling towers. An NPO was dispatched to the ecolochem trailer area since this is the makeup source for the evaporative cooling towers. A second NPO was dispatched to the Spent Fuel Pool area.

Step 4.4 (VERIFY component cooling water supply NORMAL) was not performed and was not applicable since component cooling was not available as a heat sink.

Step 4.5 (CHECK Fuel Transfer Tube Gate Valve is CLOSED) was performed - transfer tube gate valve had been closed following the core offload in preparation for lowering refueling cavity level to support ECCS full flow testing.

Step 4.6 (VERIFY a Spent Fuel Pit Pump operating properly) was not performed and not applicable since Spent Fuel Pit Pumps were known to be unavailable.

Step 4.7 (MONITOR Spent Fuel Pit level between 93'2" and 94' 2") was performed. SFP level was normal (no high or low level alarms present in the CCR).

Step 4.8 (Contact H.P. to initiate assessment of airborne conditions) was performed.

Step 4.9 (VERIFY Spent Fuel Pit temperature less 120*F AND stable OR decreasing) was performed. Temperature was greater than 120*F and increasing. Per procedure usage rules, the CRS went to the RNO column.

Step 4.9.RNO.a (ADJUST component cooling water flow to the Spent Fuel Pit Heat Exchangers per SOP-SFP-1) was not performed and not applicable due to unavailability of component cooling system.

Step 4.9.RNO.b (CONTINUE attempts to restore NORMAL cooling to the Spent Fuel Pit) was performed. The Work Control Manager directed Maintenance to expedite restoration of normal SFP cooling.

Step 4.9.RNO.c (At the direction of the SM/CRS ALIGN the Back-up Spent Fuel Pool Cooling System per SOP-SFP-3) was performed. This alignment consisted of restoration of demin water to the evaporative cooling towers since the remainder of the BUSFPCS was already aligned.

Step 4.9.RNO.d (At the direction of the SM/CRS initiate temporary Spent Fuel Pit heat exchanger cooling by connecting a temporary hose from any one of the following to cool the spent fuel heat exchanger: city water, primary water, fire water) was not performed based on SM/CRS decision - the problem with demin makeup was known and it was evident that it would be restored shortly.

Step 4.9.RNO.e (IF Spent Fuel Pit temperature will exceed 200 *F, THEN PERFORM the following...) was performed.

Step 4.9.RNO.e.1) (PLACE FSB ventilation in "EMERGENCY MODE" per SOP-V-2) was not applicable since FSB ventilation was already in the incident mode due to activities taking place in the Spent Fuel Pool.

Step 4.9.RNO.e.2) (VERIFY Spent Fuel Pit Make-up will be available per SOP-SFP-1 should it become necessary) was performed - makeup via Emergency Fill Using Diesel Fire Pump per SOP-SFP-1 section 4.3.3 was available. Primary water was also available as a makeup source.

Step 4.9.RNO.e.3) (Continue attempts to restore NORMAL Spent Fuel Pit cooling) was performed.

Step 4.10 (VERIFY normal level and cooling restored) was performed - at 0242 (per the unit log) BUSFPC system was restored.

Step 4.11 (Return to procedure and step in effect) was performed - at 0310 (per the unit log) the CCR exited ONOP-SFP-1 after receiving indication that SFP temperature had started to decrease.

Steve

-----Original Message-----
From: Gregory Cranston [mailto:GVC@nrc.gov]
Sent: Thursday, May 24, 2001 9:25 AM
To: Prussman, Stephen
Cc: Steve Jones
Subject: IP3 SFP Questions

When I last talked to Jim Comiotes he said additional documents would be =
sent by fax or email on Wednesday. I have not received any so far.

Also, in the FSAR, Section 1.3, page 1.3-98, it says, regarding the SFP, =
"Both the water level and temperature are continuously monitored." Where =
is this monitor? Is it recorded somewhere?

CC: Steve Jones <SRJ@nrc.gov>, "Comiotes, Jim" <JComiot@entergy.com>, "Kokolakis, Peter" <PKokola@entergy.com>, "Firth, Edwin" <EFirth@entergy.com>, "Main, Dennis" <DMain@entergy.com>, "Patrucco, Edward" <EPatruc@entergy.com>

Mail Envelope Properties
(3B0D6CA7.305 : 5 : 58117)

Subject: RE: IP3 SFP system
Creation Date: 5/24/01 4:17PM
From: "Prussman, Stephen" <SPrussm@entergy.com>

Created By: SPrussm@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)
SRJ CC (Steve Jones)

entergy.com
NMathur CC (Mathur, Naveen)
JGulati CC (Gulati, Jatinder)
LLee2 CC (Lee, Liz)
FGumble CC (Gumble, Floyd)
RPenny CC (Penny, Robert)
ABortz CC (Bortz, Artie)
JBenciv CC (Bencivenga, John)
EFirth CC (Firth, Edwin)
EPatruc CC (Patrucco, Edward)
DMain CC (Main, Dennis)
JComiot CC (Comiotes, Jim)

winston.com
mwetterh CC ('Mark Wetterhahn')
cfleming CC ('Cary Fleming')

Post Office	**Route**
kp1_po.KP_DO	nrc.gov
	entergy.com
	winston.com

Files	**Size**	**Date & Time**
MESSAGE	2576	05/24/01 04:17PM
MASTER.DOC	55296	
Header	1521	

Options
Expiration Date: None
Priority: Standard

Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Prussman, Stephen" <SPrussm@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/24/01 4:18PM
Subject: RE: IP3 SFP system

Attached is the document we discussed which will address the 5 concerns you had on violations. Once you have had a chance to review it, please call (914) 736-8856 so we can try to set up the meeting and possibly the next day the exit. Let me know if there is any problem opening it.

<<MASTER.DOC>>

I also wanted to respond to your questions below.

1. Normal SFP cooling pumps are powered from MCC37 and MCC39 which are fed from EDG 32 and EDG 33 respectively. ONOP-EL-4, LOSS OF OFFSITE POWER, provides instructions to restore power to the SFP cooling pumps if the RCS is less than 200 degrees F or if the reactor is defueled. When the RCS is above 200 degrees F ONOP-EL-7, LOSS OF 480V BUS - ABOVE COLD SHUTDOWN, provides instructions to restore power to SFP cooling pumps.

2. Backup SFP cooling pumps cannot be powered from a safety related power supply under existing procedures. If normal power is lost they are powered from a portable diesel generator. It would also be possible to power them from the Appendix R Diesel Generator but this is not a safety related power supply. (Appendix R D/G powers Busses 1 and 3 which in turn can be aligned to energize Busses 312 and 313 in accordance with SOP-EL-5A, 480 VOLT ELECTRICAL SYSTEM OPERATION. MCC E-1 is fed from Bus 312 and MCC E-2 is fed from Bus 313.)

One of the recipients of the earlier E-mail commented that my response was unclear. I gave the impression there was a level readout in the SFP area. What the surveillance looks at is whether the pool level is between the high and low floats the generate the CR annunciation.

-----Original Message-----
From: Gregory Cranston [mailto:GVC@nrc.gov]
Sent: Thursday, May 24, 2001 10:06 AM
To: Prussman, Stephen
Cc: Steve Jones
Subject: IP3 SFP system

The normal SFP cooling pumps are powered from MCC 37 and 39. Are or can =
those MCC's be powered from a safety related power supply? What is done =
for normal spent fuel pool cooling in the case of a station blackout?

The backup SFP cooling pumps are powered from MCC E1 and E2. Can those =
MCC's be powered from a safety related power supply? I know the backup =
power supply for the backup system pumps is a portable generator. =20

CC: Steve Jones <SRJ@nrc.gov>, "Comiotes, Jim" <JComiot@entergy.com>, "Main, Dennis" <DMain@entergy.com>, "Patrucco, Edward" <EPatruc@entergy.com>, "Firth, Edwin" <EFirth@entergy.com>, "'Cary Fleming'" <cfleming@winston.com>, "'Mark Wetterhahn'" <mwetterh@winston.com>, "Bencivenga, John" <JBenciv@entergy.com>, "Bortz, Artie" <ABortz@entergy.com>, "Penny, Robert" <RPenny@entergy.com>, "Gumble, Floyd" <FGumble@entergy.com>, "Lee, Liz" <LLee2@entergy.com>, "Gulati, Jatinder" <JGulati@entergy.com>, "Mathur, Naveen" <NMathur@entergy.com>

Response to Concerns Raised by the NRC
Relating to Fuel Pool Cooling

In response to the interruption in operation of the backup spent fuel pool cooling system on May 8, 2001 the NRC identified a number of concerns related to compliance with regulatory requirements. The responses to these issues are attached.

As background, the following information may be helpful in understanding the event and the attached evaluations:

- The Backup Spent Fuel Pool Cooling System (BUSFPCS) was an enhancement developed for IP3 t give greater flexibility during maintenance outages of the Spent Fuel Pool Cooling System (SFPCS) and Component Cooling Water (CCW) System and to increase plant operating margins and defense in depth.
- Installation of this system did not change the fundamental design basis of the facility that spent fuel integrity is based on assuring the maintenance of water level in the spent fuel pool.
- The design parameters for the BUSFPC system are appropriate for its intended purposes. It was designed with appropriate component redundancy, with consideration of reliability and the heat loads it would see in service, and could accommodate loss of normal power. However, as a backup system, there is no requirement to duplicate the design features of the primary spent fuel pool cooling system.
- The event has caused us to take a hard look at increasing system reliability. Design enhancements and changes to its operation have already been undertaken. Other changes to increase reliability are being investigated.

We would be pleased to clarify or discuss our responses to your indicated concerns.

A. RESPONSE TO NRC CONCERN REGARDING 10 CFR 50.59 EVALUATION OF BACKUP SPENT FUEL POOL COOLING

The NRC concern is that the licensee did not correctly assess the Nuclear Safety Evaluation (NSE) question regarding probability of malfunction in analyzing the Back Up Spent Fuel Pool Cooling (BUSFPC) design change. The NRC inquired whether an Unreviewed Safety Question (USQ) potential existed. The NRC identified that the NSE may be inadequate given the difference in capabilities betwee the BUSFPC and the Spent Fuel Pool Cooling (SFPC) systems. Specifically, the concern relates to the possibility that the BUSFPC system may lose functionality above 190°F whereas the SFPC system maintains its functionality to 200°F. In other words, if the temperature were postulated to exceed 190°F recoverability of spent fuel cooling using the BUSFPC system is less likely than if the main cooling system were utilized. As part of this response, the NRC questions on NPSH have been addressed.

A review of the NSE for this design change (NSE 98-3-019 Rev. 5) was conducted. Specific attention was paid to the discussion regarding the "malfunction of equipment important to safety" responses.

The safety function for the Spent Fuel Pool (SFP) is that the pool must retain sufficient water during all storage conditions to assure the spent fuel assemblies remain cooled. The NRC SER for IP3 states in Section 9.1.3 that the SFPC system "is a non-redundant, non-seismic designed system; however, failure of this system will not compromise safety. The normal makeup water supply to the pool is from a non-seismic designed system which uses the Primary Makeup Water Storage Tank as the source...In the event of a loss of pool water there are other available sources of makeup water nearby, such as fire protection system, which can be hooked up in a timely manner. We conclude that the Spent Fuel Coolin and Cleanup system is acceptable on the basis that there are alternate sources of water that can be use if the normal cooling system should fail." The SER acknowledges that the spent fuel pool cooling system can be lost. It is also clear from the above discussion in the NRC SER that the safety related pool inventory and various available non-safety systems can provide makeup water that ensures the safety o the spent fuel.

In terms of 10 CFR 50.59 evaluation, the recoverability of the BUSFPC system above 190°F versus the recoverability of the SFPC system up to 200°F is not germane to the evaluation of a "malfunction of equipment important to safety," The subject NSE appropriately focuses on the interaction of the BUSFP system on the safety related function of maintaining pool inventory in the SFP. It states "The BUSFPCS has no adverse effect on installed systems important to safety and cannot increase the probability of the malfunction." The remaining discussions regarding "malfunction" are also answered in context of malfunction to "equipment important to safety," i.e., the equipment necessary to maintain pool inventory and makeup water. Since the design recognized the potential for loss of cooling function existed and such loss was anticipated within the UFSAR and that this cooling function was not a safety related function, it properly did not address the cooling function "recoverability" differences between the BUSFPCS and the SFPCS within the context of "malfunction."

–

A further review of the design of the BUSFPC system was performed to evaluate its appropriateness. The design change documentation acknowledged the potential for the loss of makeup water to the secondary side. Additionally, the design provided for the availability of a backup source of makeup wate for quick recovery. This was provided via a staged hose from a nearby fire hydrant. Similarly, special provisions were made for the use of a standby diesel generator for a power loss scenario. These design features, coupled with increased operator monitoring of the BUSFPC system while it was in service as the sole decay heat removal provision, provided adequate assurance that the cooling system could be recovered in a timely manner (i.e., prior to a 190°F pool temperature). Based on the ARP-13 requireme to log pool temperature every 2 hours and notification to Engineering if the pool reached 150°F, actions

can be taken to restore pool cooling before the pool reaches 190°F. Thus functionality of the BUSFPCS would not be lost. However, as noted above, for 10 CFR 50.59 purposes, assuming that the spent fuel pool cooling function is lost is within the licensing basis of the facility. Consequently any discussion of comparative recoverability between the SFPCS and the BUSFPCS is not germane.

Regarding the specific question on the BUSFPCS primary pump NPSH, the pump sizing calculation was reviewed. The effect of increased pool temperature on the calculated available NPSH was determined. At 1500 gpm the required NPSH for the pump is 5.5' and the available NPSH at 190°F is 8.5'. Based on the primary pump design flow rates of 1500 gpm and a spent fuel pool level of 93'-8", the available NPS was determined at 2 degree increments between 190°F and 200°F. At approximately 196°F the availab NPSH is equal to the required NPSH for the pump at 1500 gpm. Therefore, the pump will continue to operate at design flow rates up to temperatures of 196°F.

In conclusion, the subject NSE did not violate 10 CFR 50.59 and the installation of the BUSFPCS did no require prior NRC approval.

B. RESPONSE TO NRC CONCERN REGARDING NOT RESETTINGTHE SPENT FUEL POOL TEMPERATURE ALARM

The NRC stated a concern that IP3 did not correctly establish and implement procedures for maintaining the FSAR and DBD when the spent fuel pool high temperature alarm was not reset during R-11.

FSAR Section 1.3 on page 1.3-98 states "both water level and temperature are continuously monitored. High and low levels in the pit (6"above or below the 93'-8" normal) are alarmed in the control room, as is high temperature of the water in the pit (135 degrees F)." FSAR Section 9.3 on page 9.3-13 states that "(t)emperature and level indications in the spent fuel pit warn the operator of the loss of cooling." Note that both of these temperature and level functions are provided by single instruments. They were not designed to be single failure proof. The DBD for Spent Fuel Pool Cooling states that the temperature instrument "provide(s) an alarm signal to alert of abnormally high SFP temperatures" and the level instrument "alerts personnel of high and low level conditions and possible loss of cooling."

The Backup Spent Fuel Pool Cooling System (BUSFPCS) was in service to provide sole cooling for the spent fuel pool during work required on the Service Water System (SWS) for R-11. The isolation for this service water repair required the flow be interrupted to both Component Cooling Water (CCW) heat exchangers. The Spent Fuel Pool heat exchanger is cooled by the 31 CCW loop. The SWS provides cooling to the CCW system. Since CCW also provides cooling for the RHR pumps and heat exchangers the work was scheduled for the core off load window when RHR would not be required. During this time all the fuel would be in the spent fuel pool and the backup spent fuel pool cooling system would provide the required cooling. During the outage planning process, this window was estimated to be 16 hours. This repair work actually took 28 hours to complete, with the system declared operable sometime later. This was the time period that the back up spent fuel pool system was the sole means for cooling the spent fuel pool.

A deliberate decision was made not to reset the temperature alarm for the spent fuel pool for the period when only the backup system would be in service. This decision was based on the factors discussed below. The alarm is normally set for 135 degrees F. RA-21, The Reactor Engineering Outage Activity Checklist, determines if the spent fuel pool high temperature alarm needs to be reset based on calculation for the decay heat removal capability of the pool during core off load and the heat up rate upon a loss of cooling.

During most of the core off load window (9 days), to maintain pool temperature as low as possible, both the normal and back up system were run concurrently and pool temperature was maintained at approximately 110 degrees F. It would not have been prudent to reset this alarm to a higher temperatur (165 to 170 degrees F) prior to fuel off load. Both the normal and backup spent fuel pool cooling system were scheduled to be in operation concurrently for most of the time leading to a predicted pool temperature of around 110 degrees F. The predicted temperature with only one cooling system in service was 140 to 150 degrees F. When the back up spent fuel pool cooling system was the only system in service temperature stabilized at 151 degrees F, which is within the tolerance of the temperature instrument. The decision was made not to reset the high temperature alarm because the window for the use of the back up system was such a short duration (expected to be 16 hours out of 9 days). It takes 10 to 12 hours to reset this alarm to a higher set point and then return this alarm to 135 degrees F. During the reset process no temperature indication of the pool would be available. The long time to calibrate is because the instrument that provides both the indication and alarm functions is a capillary type of temperature device. Resetting the alarm at this point would entail removal of the deck plate for the pool , removal of the bulb from the pool, determing the indicator leads, and deconning the bulb. Then the bulb would be adjusted by placing it in a water bath. The bath must be slowly heated an

the instrument checked for proper response and alarm. Then the bath is slowly cooled. More than one iteration may be required for proper setting and response. Thereafter, the bulb must be reinstalled in th pool, retermed, and a functional check of the alarm function performed. FME requirements for working this area also increase the time for this task. It was felt that the time we would be without both local indication (specified in the FSAR) and the alarm function (also specified in the FSAR) due to the need to set and reset the alarm was excessively long (10 to 12 hr.) in relation to the expected work window (16 hr.). Thus, resetting the alarm would not be conservative.

The better approach was to always maintain an indication (in addition to performing a surveillance using special 2 hour log when the temperature alarm was activated) of pool temperature. It was recognized that the polisher watch NPO performed rounds on the back up spent fuel pool cooling system every 4 hours at all times when the backup spent fuel system is in service. Part of the polisher watch NPO rounds involved completion of a log sheet to verify both primary and secondary back up spent fuel pool pump are in service and system temperatures were within specification. When the spent fuel pool high temperature alarm comes in at its setting of 135 degrees F, the Alarm Response Procedure directs the control room to establish a special log for spent fuel pool temperature. This logging is performed by an NPO (in this case the nuclear watch) who reads reading the local temperature indication at the pool and calls the readings to the control room every two hours. Maximum heat up rate was calculated to be 12.5 degrees F per hour based on standard review plan analytical methodology, which is conservative. This two-hour logging interval ensures a heat up of no more than 25 degrees F. The longest time frame before the control room would have notification of loss of pool cooling would result in a spent fuel pool temperature of 175 degrees F. This time is most likely to be less because it is unlikely that the operator doing the four-hour rounds on the backup system and the operator performing the special temperature log would be synchronized. Even a 25-degree rise in temperature provides adequate time to recover pool-cooling functions. Another benefit from requiring a special log is that this type of record keeping provides additional protection for missing a log round because both the reading taker and the reading logger are responsible for ensuring the data is acquired.

Another factor in the decision not to reset the alarm function for this window was the presence of personnel in the spent fuel pool area due to the increased amount of inspection work to be done in the pool this outage. During the time only the backup spent fuel pool cooling system was scheduled to be in service, it was recognized that the building should be manned around the pool area for essentially 24 hours/day, with both Entergy and Westinghouse staff familiar with pool conditions and requirements present. It was recognized that the continuous staffing of refueling personnel in the building in the vicinit of the primary loop cooling pump for the back up spent fuel pool cooling system and the temperature indicator for the pool would most likely be the first notification to the control room upon a loss of cooling. In fact, what actually happened was that the refueling SRO in the pool area and the NPO assigned to do the normal four hour rounds on the back up spent fuel pool cooling system called the control room within minutes of each other.

In conclusion, in the circumstances, the two sets of rounds being taken and the building being continuously manned was felt to be more conservative than resetting the alarm for this window.

C. RESPONSE TO NRC CONCERN RELATED TO 10CFR50, APPENDIX B, CRITERION 11 (TEST CONTROL)

The NRC raised a concern as to whether IP3 violated 10 CFR 50, Appendix B, Criterion 11, by not testing Spent Fuel Pool (SFP) make-up water rates to satisfy that these rates (from Primary Water System, Refueling Water Storage Tank (RWST) and Fire Protection/City Water) were sufficient to support SFP makeup requirements with design heat loads.

The licensing basis for make up to the SFP does not classify the SFP Makeup function as safety related. In numerous sections the FSAR states that the primary source of makeup water to the SFP is the Primary Water Storage Tank. Additional makeup water may be provided from the RWST or the City Water supply. The NRC SER for IP3 states in Section 9.1.3 that the SFP Cooling System "is a non-redundant, non-seismic designed system; however, failure of this system will not compromise safety. The normal makeup water supply to the pool is from a non-seismic designed system which uses the Primary Makeup Water Storage Tank as the source." It further states that "in the event of a loss of pool water there are other available sources of make-up water nearby, such as fire protection system, which can be hooked up in a timely manner." FSAR Section 9.5 states that the primary water source, Primary Water Storage Tank, is seismic Category I and the piping to the SFP is seismic Category II. Thus, the licensing basis recognizes multiple sources of make up water to the SFP. Procedure SOP-SFP-1 provides guidance to operators in using these makeup paths.

Consistent with the licensing basis classification as non safety, the makeup capability to the spent fuel pit was not assigned a quality assurance category and therefore not controlled by the QA program.

An SFP boiloff rate can be determined from Table 4.3 in the US Tool and Die thermal-hydraulic analysis for the IP3 SFP (Amendment 90 to the Technical Specifications). For 35E6 BTU/HR, a conservative value for heatload in the SFP, this rate would be 74.9 gpm with an equivalent reduction of SFP level of .63 FT/HR for a no makeup condition, i.e., the addition of 74.9 gpm would preclude loss of level for this conservative heat load.

A review of IP3 Startup Tests showed hydrostatic tests of the Primary Water System and the SFP Cooling System, but no testing on the capacity of the makeup Primary Water Makeup line to the SFP. However, IP3-CALC-FP-01981 rev. 0, approved on 11/20/97, determined that 100 gpm can be delivered to the fire water stand pipes which includes the station at 95' of the Fuel Storage Building. Additionally, an indication of the Primary Water System pumps ability to perform has been demonstrated on a refueling basis, at up to 120 gpm during delivery to the CVCS blender. This testing, per surveillance test 3PT-R23A, calibrates the primary water flow channel, F-111, which validates pump capability. Subsequent to the recent short term interruption of Backup SFP Cooling, a determination of the Primary Water and RWST makeup rates to the SFP were obtained the results of which are 213.5 gpm and 60 gpm respectively. Note both of these paths utilize the SFP Cooling Loop piping to reach the SFP.

There appears to be no regulatory basis to require a test to confirm the ability of the multiple sources to provide required makeup water to the SFP. In conclusion, no violation of Appendix B, Criterion 11, Test Control, is associated with the makeup capability of the SFP.

D. RESPONSE TO NRC CONCERN ABOUT PROCEDURAL SFP TEMPERATURE LIMIT OF 120 DEGREE F

The NRC was concerned that there was a failure to comply with an operating procedure constraint to lim the Spent Fuel Pool (SFP) to 120 degrees F during refueling. As part of this concern, the NRC wanted clarification about pool temperature limits. The NRC also had questions regarding the question of heat affected visibility.

During normal operation (i.e., non-refueling outage), the SFP temperature is typically 105 degree F or below. When a substantial fraction of the core is unloaded during a refueling outage, the temperature rises to a higher equilibrium temperature. Analyses have been performed and incorporated into the IP3 design basis to support operation in the SFP with a higher than normal heat load. The thermal-hydraulic analysis (U.S. Tool and Die (USTD) report 8721-000-0104) submitted in support of the SFP re-racking (Technical Specification (TS) Amendment 90) conservatively estimates maximum SFP temperature. Th analysis calculated a 150 degree F maximum during partial core offload (76 fuel assemblies relocated to the SFP) and 200 degree F during full-core offload. Full core offload is a special condition under which the heat load may be as high as 35 MBTU/hr. The bulk temperature rise to 200 degree F based on the USTD analysis very conservatively models the SFP as a single-point heat sink and uses a conservative estimate for decay heat (Branch Technical Position ASB 9.2 in the Standard Review Plan). The 150 degree F and 200 degree F values are in FSAR Section 9.3.

A subsequent and more realistic analysis by Westinghouse (WCAP-12313) was provided to support TS Amendment 98, related to an increase in the ultimate heat sink temperature. WCAP 12313 identified a 128 degrees F SFP temperature for partial core offload and 153 degree F SFP temperature for full core offload. The more realistic Westinghouse WCAP peak SFP temperature of 153 degrees F is representative of the expected peak temperature.

The original FSAR assumed a temperature of 150 degrees F for full-core offload based on the original SFP design basis assumption that fuel would be routinely shipped offsite for reprocessing, and there would never be more than 193 activated fuel assemblies in the SFP at a time. It should be noted that th above analyses assume the SFPCS is operating alone. With the SFPCS and the Backup Spent Fuel Pool Cooling System (BUSFPCS) in service together, the SFP temperature drops to well below 120 degree F.

All of these estimates are greater than the 120 degree F value because the value of 120 degree F as stated in Precautions and Limitations (P&L) of plant procedure SOP-SFP-001 is not a limit for pool operability. This was confirmed through a review of historical procedures. Plant procedure SOP-SFP-001 is for operation of the Spent Fuel Pool Cooling System (SFPCS). Refueling activities are the only time when the SFP temperature can be expected to exceed 120 degree F. During that time one thing th P&L provides for is protection of the demineralizer resins. The demineralizer resins would be damaged approximately 130 to 140 degrees F.

For fuel handling purposes, the value of 120 degree F is the desired condition, since visibility in SFP activities are optimal with a pool temperature below 130 degree F (the approximate point at which vapor discharge from the surface of the water becomes visible). The presence of vapor discharge may be compensated for through the use of devices such as the floating plexiglass window, underwater lights and the Westinghouse infrared Suretrack system. From the standpoint of plant safety, there is nothing t prevent SFP activity at elevated temperatures, as long as the operators are comfortable with SFP visibility. As an historical note, early refuelings at IP3 were usually performed with a SFP temperature

below 120 degrees F, due to an increased decay time prior to core offload. The decay time was a schedule consideration and not a safety consideration. The TS at the time (i.e., Amendment 13 in Marc 1978) were based on a 120-hour minimum decay time limit prior to offload. A 145-hour minimum decay time limit is currently in place.

Prior to offloading the core, the SFPCS was in operation so SOP-SFP-001 had been entered and was in use. The BUSFPCS had also been placed in service so plant procedure SOP-SFP-003 had also been entered. With the core offloaded, planned work on the service water system (the ultimate heat sink for the SFPCS) required the SFPCS to be taken out of service. SOP-SFP-001 was exited when the SFPCS was taken out of service. The 120 degree F limit was no longer applicable since the procedure had bee exited. When the loss of the BSFPCS was identified on May 8, 2001, procedure ONOP-SFP-001 was entered. All procedurally required steps were performed (for example, Step 4.4 checks CCW supply; bu this step was not applicable since primary SFP cooling was known not to be available). The ONOP was exited when the BUSFPCS cooling was restored. SOP-SFP-001 was re-entered when the SFPCS was available. When this occurred, pool temperature was greater than 120 degrees F. This did not violate the P&L because the plant was not in the refueling mode where the P&L was applicable. Therefore, the was never any procedural violation. IP3 recognizes that the P&L requirement is not clear with regard to implementation and need. Action to address these considerations is being taken as part of our correctiv action process.

In conclusion, the procedures are consistent with the limitations on pool temperature and system operation. The exit and entry into the procedures did not cause any P&L standards to be violated.

E. RESPONSE TO NRC CONCERNS ABOUT THE REPORTABILITY OF THE LOSS OF SPENT FUE POOL COOLING

DER-01-01878 documented the discovery of the temporary water factory not operating which resulted in loss of makeup water to the cooling tower of the Backup Spent Fuel Pool Cooling System (BUSFPCS). The BUSFPCS is designed to provide cooling during those periods of time when the Spent Fuel Pool Cooling System (SFPCS) is out of service due to maintenance. The BUSFPCS was in service because of outage maintenance. As a result of evaporation in the BUSFPCS cooling tower (heat sink), the loss o makeup water caused the secondary loop BUSFPCS pump to cavitate and reduced secondary loop pressure. As a result of this secondary loop pressure oscillation, the primary loop BUSFPCS pump tripped as a result of low differential pressure between the primary and secondary loop. The DER was reviewed for reportability when initiated and it was concluded that the loss of the BUSFPCS it was not reportable. The following review analyzes the reportability using the guidance of NUREG 1022, Rev. 2.

1. 10CFR50.72(b)(3)(ii) requires reporting of any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded or the plant being in an unanalyzed condition that significantly degrades plant safety.

   The degradation of safety barriers "applies to material (e.g., metallurgical or chemical) problems tha cause abnormal degradation of or stress upon the principal safety barriers" (NUREG 1022, Section 3.2.4). This was considered as not applicable. The plant is not in an unanalyzed condition since the plant has been designed for interruption of spent fuel pool cooling. FSAR Section 1.3, discusses the SFPCS design. The SFPCS was designed to remove the heat generated by stored fuel elements from the spent fuel pool. Alternate cooling capability via the addition of water to the fuel pool can be made available under anticipated malfunctions or failures.

2. 10CFR50.72(b)(3)(v) requires reporting for "any event or condition that at the time of discovery could have prevented the fulfillment of the safety function of structures or systems that are needed to (A) shutdown the reactor and maintain it in a safe shutdown condition, (B) remove residual heat, (C) control the release of radioactive material, (D) mitigate the consequences of an accident.

   The second paragraph in the NUREG-1022, Section 3.2.7 states that the "intent of these criteria is to capture events that would have been a failure of a safety system to properly complete a safety function, regardless of whether there was an actual demand." The fifth paragraph of the NUREG states that the "definition of the systems included in the scope of these criteria is provided in the rule themselves. It includes systems required by the TS to be operable to perform one of the four functions (A) through (D) specified in the rule." Examples 1 and 2 in NUREG 1022, Section 3.2.7 illustrate that events or conditions associated with a system not in the TS are not reportable because of that fact. Example 2 states "If such systems are required by Technical Specifications to be operational and the system is needed to fulfill one of the safety functions identified in this section of the rule then system level failures are reportable. If the system is not covered by Technical Specifications and is not required to meet the single failure criterion, then failures of the system are not reportable under this criterion." Based on the statements contained in NUREG 1022, Revision 2 it can be concluded that the reporting requirements are not applicable to SFPCS or it's backup. The SFPCS is not in IP3 TS and is not designed to be single failure proof. The only TS parameter associated with this event was the pool level which was maintained within limits at all times.

   Reportability was evaluated further in response to NRC concerns that this reporting criterion may be applicable as the result of loss of residual heat removal capability. The safety function which is applicable to IP3 is the spent fuel assemblies must be cooled and must remain covered with water

during all storage conditions. The NRC SER for IP3 states in Section 9.1.3 that the SFPCS "is a no redundant, non-seismic designed system; however, failure of this system will not compromise safety The normal makeup water supply to the pool is from a non-seismic designed system which uses the Primary Makeup Water Storage Tank as the source.....In the event of a loss of pool water there are other available sources of makeup water nearby, such as fire protection system, which can be hooked up in a timely manner. We conclude that the spent fuel cooling and cleanup system is acceptable on the basis that there are alternate sources of water that can be used if the normal cooling system should fail." The guidance of NUREG 1022, Section 3.2.7 states that in "determining the reportability of an event or condition that affects a system, it is not necessary to assume an additional random single failure in that system." Therefore, the loss of the BUSFPCS like the loss of the SFPCS would not be a loss of safety function. Other means exist to assure that the design basi is met. This is the basis for concluding that the safety function was not lost if it was postulated that the BUSFPCS was inoperable.

It is not necessary, however, to conclude the BUSFPCS lost its ability to perform its design function. Looking to NUREG 0800, Section 9.1.3 for guidance, that section states "The safety function of the system for refueling and normal operations is identified by reviewing the information provided in the SAR pertaining to the design bases and criteria and the safety evaluation section." The BUSFPCS was designed as a backup system to be used when maintenance was performed, taking the SFPCS out of service. With regard to the SFPCS, Section 9.3.3 of the FSAR says the "manually controlled loop may be shutdown safely for reasonable time periods, as shown in Table 9.3-3, for maintenance or replacement of malfunctioning components." Table 9.3-3 shows time to boiling. The BUSFPCS functions to extend the time of boiling and, because of the backup role, design differences from the SFPCS are not considered to result in a loss of function. The BUSFPCS was maintaining the SFP temperature in the range of 150 degree F when the primary loop pump tripped due to low differentia pressure. The BUSFPCS was designed as a manual system, as is the normal SFPCS, so manual action is allowed to restart the system if it should become unavailable. This criterion is analogous to tolerating loss of offsite power with manual action to realign the components to the diesel that is use for backup. The time for the pool temperature to rise was adequate to allow manual action to restar the system considering that rounds that looked at pool temperature, pool level (greater than 23 feet) whether primary or secondary pumps were running were made, per procedure, every 2 hours. Four hour rounds, by a different operator, monitors the makeup water pressure. As discussed earlier, a random failure, i.e., single failure, to make such rounds need not be postulated when evaluating reportability. Based on this assessment, a loss of BUSFPCS capability to perform it's function did no occur.

Overall, there was no loss of the safety function and ability to perform the functions necessary to maintain the spent fuel pool design functions. Therefore, the temporary loss of the BUSFPS is not considered to be a reportable in accordance with the regulation and regulatory guidance. This analysis is consistent with the analysis and conclusion made when the event occurred with the exception of the different concerns raised by the NRC.

Mail Envelope Properties
(3B0D7643.590 : 6 : 58768)

Subject: Risk
Creation Date: 5/24/01 4:59PM
From: "Prussman, Stephen" <SPrussm@entergy.com>

Created By: SPrussm@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

entergy.com
JFavara CC (Favara, John)
EFirth CC (Firth, Edwin)
PKokola CC (Kokolakis, Peter)
JComiot CC (Comiotes, Jim)
JCircle CC (Circle, Jeff)
CYeh CC (Yeh, Clem)
JBretti CC (Bretti, John)

winston.com
mwetterh CC ('Mark Wetterhahn')
cfleming CC ('Cary Fleming')

Post Office	**Route**
kp1_po.KP_DO	nrc.gov
	entergy.com
	winston.com

Files	**Size**	**Date & Time**
MESSAGE	2149	05/24/01 04:59PM
Header	1266	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Prussman, Stephen" <SPrussm@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/24/01 5:00PM
Subject: Risk

Greg

The memo on reportability that was given to you last Friday talked about risk I wanted to send you something to clarify what we did.

The assessment was made of this event using a PRA approach. Given the conditions, the probability of boiling is estimated to be 2.7E-7. This is not considered risk significant. This number was judged to be bounding and conservative in the sense that SFP boiling was considered the equivalent of core damage. While boiling is an undesirable event, mitigation of the event can still be accomplished by preventing fuel uncovery. The time available to recover SFP cooling to prevent uncovering the fuel is conservatively estimated as approximately 51.4 hours, or 2.1 days. This value is also very conservative because it does not take credit for any additional heat sinks. It assumes that all of the decay heat is transferred to the SFP. Not only does this additional time represent a substantial increase in the time available to diagnose a loss of SFP cooling, it also implies that the normal SFP cooling system or makeup would mostly likely be returned to service prior to uncovering the fuel. It should be further noted that while detection of SFP heatup prior to boiling would be mostly detectable by directly taking readings of the SFP temperature, the onset of boiling would be both visibly noticed and felt by personnel in the SFP Building. More importantly, however, boiling in the SFP would be eventually detected by annunciation of the SFP low level alarm on Panel SKF in the Control Room. The SFP low level setpoint corresponds to 22" from the top of the pit. Upon receiving this alarm, the operators would implement ARP-13, which directs that the cause of the low level condition be investigated and level be restored to normal by adding makeup. Assuming that the normal SFP level is approximately 16" below the top of the pit prior to the loss of SFP cooling, the low level alarm would be reached after level falls only about 6", or 22" below the top of the pit, which is still well above the top of the spent fuel. There are multiple pathways to add makeup water to the spent fuel pool.

CC: "'Cary Fleming'" <cfleming@winston.com>, "'Mark Wetterhahn'" <mwetterh@winston.com>, "Bretti, John" <JBretti@entergy.com>, "Yeh, Clem" <CYeh@entergy.com>, "Circle, Jeff" <JCircle@entergy.com>, "Comiotes, Jim" <JComiot@entergy.com>, "Kokolakis, Peter" <PKokola@entergy.com>, "Firth, Edwin" <EFirth@entergy.com>, "Favara, John" <JFavara@entergy.com>

Mail Envelope Properties
(3B0E46EC.889 : 10 : 34966)

Subject:	SFP Cooling Power Supplies
Creation Date:	5/25/01 7:50AM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
SPrussm (Prussman, Stephen)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	1164	05/25/01 07:50AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Prussman, Stephen
Date: 5/25/01 7:50AM
Subject: SFP Cooling Power Supplies

This is a followup to a previous question I asked regarding power supplies for the normal and backup SFPCS. If there is a loss of offsite power or station blackout can any of the SFPCS equipment be supplied with power? As I recall for the Backup SFPCS the temporary diesel generator supplies backup power to the secondary pumps and the cooling tower but not the primary pumps. Also, the temporary diesel is only on site when you know you will be using the Backup SFPCS. If you need to add water to the pool if it reaches boiling and you use the fire water system and fire hose located in the FSB, is that source of water supplied by the diesel driven fire pump?

Mail Envelope Properties
(3B13C143.8A6 : 1 : 14502)

Subject: RE: SFP Cooling Power Supplies
Creation Date: 5/29/01 11:32AM
From: "Prussman, Stephen" <SPrussm@entergy.com>

Created By: SPrussm@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

entergy.com
ABortz CC (Bortz, Artie)
AVai CC (Vai, Angelo)
AGalati CC (Galati, Anthony)
DMain CC (Main, Dennis)
EPatruc CC (Patrucco, Edward)
LLee2 CC (Lee, Liz)
SWilkie CC (Wilkie, Steve)
JComiot CC (Comiotes, Jim)

Post Office	Route
kp1_po.KP_DO	nrc.gov
	entergy.com

Files	Size	Date & Time
MESSAGE	3302	05/29/01 11:32AM
Header	1252	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Prussman, Stephen" <SPrussm@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/29/01 11:33AM
Subject: RE: SFP Cooling Power Supplies

Greg

In response to your questions please be advised:

Power for all equipment in the BUSFPCS comes from MCCs E1 and E2 located in the RAMS building. The electrical distribution system includes the capability to transfer the BUSFPCS to the rental diesel unit. This includes power for a primary pump, a secondary pump, the two cooling tower fans, the 120 V transformer, lighting at the skid, and motor space heaters. As noted in the prior response, the Appendix R diesel could be aligned to supply power but this has not been evaluated or proceduralized so it is not part of our current design.

If we planned to use the BUSFPCS, the rental diesel would be required if the amount of time the SFPCS would be out of service was excessive with regard to the pool heat up rate. This is consistent with FSAR section 9.3.3 "This manually controlled loop may be shutdown safely for reasonable time periods, as shown in Table 9.3-3, for maintenance or replacement of malfunctioning components." If staged, the rental diesel would be available to supply power following a loss of offsite power or station blackout (a loss of all onsite and offsite AC power). The failure of the rental diesel would not be postulated for a station blackout. If we were not planning to use BUSFPCS, the rental diesel would normally not be onsite.

The diesel driven fire pump is normally in standby and would be available on a loss of offsite power or station blackout. The pump is aligned to the fire water header which supplies the standpipe in the FSB and fire hydrant 39 (see FSAR Figures 9.6-9A&B). Therefore, fire water could provide direct makeup to the SFP or makeup to the BUSFPC tower on a loss of offsite power or station blackout.

The SFPCS equipment is powered by manual loading the associated MCCs on the emergency diesel buses. Therefore, they could be loaded on the emergency diesels for loss of offsite power but the emergency diesels would not be available for station blackout.

Steve Prussman

-----Original Message-----
From: Gregory Cranston [mailto:GVC@nrc.gov]
Sent: Friday, May 25, 2001 7:50 AM
To: Prussman, Stephen
Subject: SFP Cooling Power Supplies

This is a followup to a previous question I asked regarding power supplies =
for the normal and backup SFPCS. If there is a loss of offsite power or =
station blackout can any of the SFPCS equipment be supplied with power? =
As I recall for the Backup SFPCS the temporary diesel generator supplies =
backup power to the secondary pumps and the cooling tower but not the =
primary pumps. Also, the temporary diesel is only on site when you know =
you will be using the Backup SFPCS. If you need to add water to the pool =
if it reaches boiling and you use the fire water system and fire hose =
located in the FSB, is that source of water supplied by the diesel driven =
fire pump?=20

CC: "Comiotes, Jim" <JComiot@entergy.com>, "Wilkie, Steve" <SWilkie@entergy.com>, "Lee, Liz" <LLee2@entergy.com>, "Patrucco, Edward" <EPatruc@entergy.com>, "Main, Dennis" <DMain@entergy.com>, "Galati, Anthony" <AGalati@entergy.com>, "Vai, Angelo" <AVai@entergy.com>, "Bortz, Artie" <ABortz@entergy.com>

Mail Envelope Properties
(3B1506A6.889 : 10 : 34966)

Subject: IP3 SFP Heat Load Calc.
Creation Date: 5/30/01 10:41AM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
EFirth CC (EFirth@entergy.com)
SPrussm (Prussman, Stephen)

nrc.gov
kp1_po.KP_DO
JMT1 CC (James Trapp)
LTD CC (Lawrence Doerflein)
SRJ CC (Steve Jones)

Post Office	Route
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	2244	05/30/01 10:41AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Prussman, Stephen
Date: 5/30/01 10:41AM
Subject: IP3 SFP Heat Load Calc.

Calc IP3-CALC-FHS-03418, "R11 Spent Fuel Pit Heat Load Due to Core Offload," Rev. 0, dated 4/10/01, was performed to confirm that the R11 core offload would not result in a SFP heat load above 35 MBTU/hr or a SFP bulk temperature greater than 200 degF.

The Summary/Conclusions state that the, "Maximum SFP heat load is 33.36 MBTU/hr. Maximum SFP bulk temperature is 196.3 degF. Both parameters are within acceptance criteria noted above."

In Section 3.0 of the Calculation, page 3 of 12, it states, "The second criterion is satisfied by applying the heat load to the SFP equilibrium bulk temperature equation (from Page 16A of App. 8721-01 of Reference 6.3), with CCW temperature adjusted from 100 to 101 degF as per Reference 6.4. The equation, ..., then Tmax becomes 196.3 degF, thereby satisfying the second criterion."

The calculation appears to be based on the assumption that the normal spent fuel pool cooling system will be running since CCW temperature is the only cooling source mentioned in the bulk temperature calculation. Also, the bulk temperature calculated is 196.3 degF which is above the upper design temperature of 190 degF for the backup SFP cooling system and at a temperature where the Backup SFP cooling system primary pumps would loose NPSH.

Where is the calculation that shows that the Backup SFP cooling system satisfies the bulk temperature criterion and will keep the temperature low enough so as not to loose NPSH?

CC: EFirth@entergy.com; James Trapp; Lawrence Doerflein; Steve Jones

Mail Envelope Properties
(3B153BEE.A34 : 12 : 27188)

Subject: RE: IP3 SFP Heat Load Calc.
Creation Date: 5/30/01 2:28PM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	Route
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	2714	05/30/01 02:28PM
Header	855	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/30/01 2:29PM
Subject: RE: IP3 SFP Heat Load Calc.

Greg,
I believe I have answer for the question you posed. Pls call me 914-736-8970.
Thanks
Ed

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Wednesday, May 30, 2001 12:23 PM
> To: Firth, Edwin
> Subject: RE: IP3 SFP Heat Load Calc.
>
> There is a DER (01-01946) that states that the calc did not document that
> =
> the BUSFPCS could remove 35E6 Btu/hr, but the copy of the DER I have does
> =
> not address the bulk temperature.
>
> >>> "Firth, Edwin" <EFirth@entergy.com> 05/30/01 12:08PM >>>
> Greg...
> I got your question...I am pursuing ASAP to get you an answer.
> EGF
>
> > ----------
> > From: Gregory Cranston[SMTP:GVC@nrc.gov]=20
> > Sent: Wednesday, May 30, 2001 10:41 AM
> > To: Prussman, Stephen
> > Cc: Firth, Edwin; James Trapp; Lawrence Doerflein; Steve Jones
> > Subject: IP3 SFP Heat Load Calc.
> >=20
> > Calc IP3-CALC-FHS-03418, "R11 Spent Fuel Pit Heat Load Due to Core =3D
> > Offload," Rev. 0, dated 4/10/01, was performed to confirm that the R11 =
> =3D
> > core offload would not result in a SFP heat load above 35 MBTU/hr or a =
> SFP
> > =3D
> > bulk temperature greater than 200 degF.
> >=20
> > The Summary/Conclusions state that the, "Maximum SFP heat load is 33.36
> =
> =3D
> > MBTU/hr. Maximum SFP bulk temperature is 196.3 degF. Both parameters =
> are
> > =3D

> > within acceptance criteria noted above."
> >=20
> > In Section 3.0 of the Calculation, page 3 of 12, it states, "The second
> =
> =3D
> > criterion is satisfied by applying the heat load to the SFP equilibrium
> =
> =3D
> > bulk temperature equation (from Page 16A of App. 8721-01 of Reference =
> =3D
> > 6.3), with CCW temperature adjusted from 100 to 101 degF as per =
> Reference
> > =3D
> > 6.4. The equation, ..., then Tmax becomes 196.3 degF, thereby =3D
> > satisfying the second criterion."
> >=20
> > The calculation appears to be based on the assumption that the normal =
> =3D
> > spent fuel pool cooling system will be running since CCW temperature is
> =
> =3D
> > the only cooling source mentioned in the bulk temperature calculation.
> =
> =3D
> > Also, the bulk temperature calculated is 196.3 degF which is above the =
> =3D
> > upper design temperature of 190 degF for the backup SFP cooling system =
> and
> > =3D
> > at a temperature where the Backup SFP cooling system primary pumps would
> =
> =3D
> > loose NPSH.
> >=20
> > Where is the calculation that shows that the Backup SFP cooling system =
> =3D
> > satisfies the bulk temperature criterion and will keep the temperature =
> low
> > =3D
> > enough so as not to loose NPSH?
> >=20
>

Mail Envelope Properties
(3B165F28.E70 : 13 : 36464)

Subject: RE: IP3 SFP Heat Load Calc.
Creation Date: 5/31/01 11:10AM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	Route
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	5470	05/31/01 11:10AM
Header	879	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 5/31/01 11:11AM
Subject: RE: IP3 SFP Heat Load Calc.

Greg,

I believe the revision to the subject CALC which I fax'd to you last night has the necessary details to close out the question you had previously asked. Also, Page 3 of 13 of our IP3 response to the issues from the debrief also includes some details as to the NPSH availability of the BUSFPCS primary loop up to 196DegF. As I had mentioned yesterday the design reqts for the Normal SFPCS and the Back Up SFPCS are different in the respect that not only do they have a different max design temp that they support (196 vs 190), but they also have different UHS cooling criteria (for Normal SFPCS it is 196.3DegF at 95 DegF UHS {Hudson River water temp} vs. BU SFPCS having a 190DegF limit at 77DegF Wet Bulb outside air temp limit).

As far as the question you asked about whether we track or need to track the design wet bulb temp limit of 77DegF when running the BU SFPCS, here is the following information for consideration:

1. My review of the plant procedures we have for the system shop we do not per se log/track the wet bulb temp when running the BU SFPCS.
2. We do track outside air temp (from the CCR) via required logs for the BU SFPCS every 8 hours the system is in operation. Additionally, other log readings taken when this system is running ALL support proper monitoring of system performance in lieu of actual wet bulb temp monitoring.
3. The BU SFPCS procedure SOP-SFP-003 includes P&Ls involving: (1) 2.13 describing Functional testing before using this system to verify adequate thermal performance and (2) a Risk Assessment is performed for the use of the system in the time frame intended, with the SFP heat load considered before placing this system into service.
4. Operators were/are trained on this BUSFPCS (on an initial and as needed continuing basis) as to how to properly operate this system to maintain the SFP system within the limit (190DegF) specified for the SFP.
5. There was a QA DER that was written on this issue (recording WB temp) when the BU SFPCS was first installed. This DER was resolved in CARB by engineering that the monitoring of WB temp was not required because of the functional thermal performance test done just before BUSFPCS is put into service AND the fact we monitor other system parameters (including the ultimate indication of the SFP itself) to determine overall system effectiveness.
6. The design requirement of 77DegF WB temp is fully described in the DBD for the BU SFPCS (pages 3-14 and 3-15). This describes the low probability of occurrence of reaching a 77DegF WB temp for this geographic area.

Considering all of the above, the need for actual tracking of this parameter is reasonably offset by the other various criteria to consider in regards to the testing/operation/performance/overall monitoring of the BU SFPCS.

For your use as needed...thanks...
EGF...914-736-8970

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Wednesday, May 30, 2001 12:23 PM
> To: Firth, Edwin
> Subject: RE: IP3 SFP Heat Load Calc.
>
> There is a DER (01-01946) that states that the calc did not document that
> =
> the BUSFPCS could remove 35E6 Btu/hr, but the copy of the DER I have does
> =
> not address the bulk temperature.
>
> >>> "Firth, Edwin" <EFirth@entergy.com> 05/30/01 12:08PM >>>
> Greg...
> I got your question...I am pursuing ASAP to get you an answer.
> EGF
>
> > ----------
> > From: Gregory Cranston[SMTP:GVC@nrc.gov]=20
> > Sent: Wednesday, May 30, 2001 10:41 AM
> > To: Prussman, Stephen
> > Cc: Firth, Edwin; James Trapp; Lawrence Doerflein; Steve Jones
> > Subject: IP3 SFP Heat Load Calc.
> >=20
> > Calc IP3-CALC-FHS-03418, "R11 Spent Fuel Pit Heat Load Due to Core =3D
> > Offload," Rev. 0, dated 4/10/01, was performed to confirm that the R11 =
> =3D
> > core offload would not result in a SFP heat load above 35 MBTU/hr or a =
> SFP
> > =3D
> > bulk temperature greater than 200 degF.
> >=20
> > The Summary/Conclusions state that the, "Maximum SFP heat load is 33.36
> =
> =3D
> > MBTU/hr. Maximum SFP bulk temperature is 196.3 degF. Both parameters =
> are
> > =3D
> > within acceptance criteria noted above."
> >=20
> > In Section 3.0 of the Calculation, page 3 of 12, it states, "The second
> =
> =3D
> > criterion is satisfied by applying the heat load to the SFP equilibrium
> =
> =3D

> > bulk temperature equation (from Page 16A of App. 8721-01 of Reference =
> =3D
> > 6.3), with CCW temperature adjusted from 100 to 101 degF as per =
> Reference
> > =3D
> > 6.4. The equation, ..., then Tmax becomes 196.3 degF, thereby =3D
> > satisfying the second criterion."
> >=20
> > The calculation appears to be based on the assumption that the normal =
> =3D
> > spent fuel pool cooling system will be running since CCW temperature is
> =
> =3D
> > the only cooling source mentioned in the bulk temperature calculation.
> =
> =3D
> > Also, the bulk temperature calculated is 196.3 degF which is above the =
> =3D
> > upper design temperature of 190 degF for the backup SFP cooling system =
> and
> > =3D
> > at a temperature where the Backup SFP cooling system primary pumps would
> =
> =3D
> > loose NPSH.
> >=20
> > Where is the calculation that shows that the Backup SFP cooling system =
> =3D
> > satisfies the bulk temperature criterion and will keep the temperature =
> low
> > =3D
> > enough so as not to loose NPSH?
> >=20
>

Mail Envelope Properties
(3B1662C8.889 : 10 : 34966)

Subject:	RE: IP3 SFP Makeup
Creation Date:	5/31/01 11:27AM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	1254	05/31/01 11:27AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 5/31/01 11:27AM
Subject: RE: IP3 SFP Makeup

Thanks.

I have an additional question regarding City Water and fire protection water.

As I understand it the fire water that goes to the hose reel in the FSB that would supply makeup water to the SFP and the that goes to the fire hose that would supply makeup water to the BUSFPC system cooling tower can be supplied from a diesel fire pump that takes water from the Hudson and is not related to City Water. So loss of City Water would cause loss of water to the contractor water treatment system (and subsequent loss of primary water makeup to the cooling tower) but would not jeopardize fire water makeup to the cooling tower. Correct?

Mail Envelope Properties
(3B168802.889 : 10 : 34966)

Subject:	IP3 SFP design temperatures
Creation Date:	5/31/01 2:05PM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	1086	05/31/01 02:05PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 5/31/01 2:05PM
Subject: IP3 SFP design temperatures

As I recall the key design temperatures for the SFP are 150F for long term steady state conditions, 200F for short term evolutions such as core offloads, and 213F for emergency conditions. I thought I saw all of the numbers mentioned somewhere in the safety analysis, FSAR or Tech Specs. I don't have search capability here for the FSAR or Tech Specs.

Can you do a search on those three temperature numbers and let me know where they appear in those documents?

Thanks.

Mail Envelope Properties
(3B169F09.E12 : 15 : 40466)

Subject:	FW: IP3 SFP Makeup
Creation Date:	5/31/01 3:42PM
From:	"Firth, Edwin" <EFirth@entergy.com>
Created By:	EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	**Route**
kp1_po.KP_DO	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	3066	05/31/01 03:42PM
Header	841	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'gvc@nrc.gov'" <gvc@nrc.gov>
Date: 5/31/01 3:44PM
Subject: FW: IP3 SFP Makeup

Greg,
In case this did not make it the first time I sent it out due to a potentially faulty e-mail address.
EGF
> ----------
> From: Firth, Edwin
> Sent: Thursday, May 31, 2001 3:39 PM
> To: 'Gregory Cranston'
> Cc: Wilkie, Steve; Bortz, Artie; Galati, Anthony
> Subject: RE: IP3 SFP Makeup
>
> Greg...
> Based upon your question/issue raised below, here is the information
> to resolve it:
>
> 1. The fire water (make-up) that supplies the SFP fire hose station in the
> FSB and the make-up connection to the BUSFPCS cooling tower in the yard
> area can be supplied via either the diesel OR electric driven fire pumps.
> Each of these pumps has its own (large capacity) FWST as a suction source
> (and each FWST has a minimum volume of 300K gallons). These 2 FWSTs are
> filled via city water via a 10-inch header on site, which takes supply
> from a 16-inch header off of Broadway (off-site). The Hudson River does
> not come into play in these supplies, unless we would utilize both the
> full FWSTs capacity AND we would also be unable to x-tie fire water
> make-up from Unit 1/2 to the Unit 3 fire water supply (highly unlikely).
> The use of Hudson River would be a factor if we would elect to pursue
> getting an offsite local fire station pumper to take suction form the
> Hudson and connect into our fire water header as required for make-up.
>
> 2. Loss of city water, which causes loss of water to the contractor water
> treatment trailer/system, would not jeopardize the immediate needs of the
> fire water make-up supply to either the SFP in the FSB nor the BUSFPCS
> cooling tower supply in the yard. The fire pumps, via the large FWSTs,
> have ample capacity (at the design make-up rates) to more than handle a
> need for make-up until we could either x-tie from Unit 1/2 to Unit 3 OR
> pursue arrangement of a local fire station pumper suction from the Hudson
> River to the IP3 fire water system.
>
> Thus, loss of city water would not appear to be an issue for the ample
> support of SFP or BUSFPCS makeup supplies via the Fire water system.
>
> Thanks...
> EGF
>

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Thursday, May 31, 2001 11:27 AM
> To: Firth, Edwin
> Subject: RE: IP3 SFP Makeup
>
> Thanks.
>
> I have an additional question regarding City Water and fire protection =
> water. =20
>
> As I understand it the fire water that goes to the hose reel in the FSB =
> that would supply makeup water to the SFP and the that goes to the fire =
> hose that would supply makeup water to the BUSFPC system cooling tower can
> =
> be supplied from a diesel fire pump that takes water from the Hudson and =
> is not related to City Water. So loss of City Water would cause loss of =
> water to the contractor water treatment system (and subsequent loss of =
> primary water makeup to the cooling tower) but would not jeopardize fire =
> water makeup to the cooling tower. Correct?
>
>

Mail Envelope Properties
(3B17BF1B.889 : 10 : 34966)

Subject:	IP3 SFP Makeup
Creation Date:	6/1/01 12:13PM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	1328	06/01/01 12:13PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/1/01 12:13PM
Subject: IP3 SFP Makeup

Is the primary makeup water supply that provides makeup to the SFP should boiling occur considered a safety related water supply? The FSAR Section 1.3, GDC 61, page 1.3-95, says, "The primary source of makeup water to the spent fuel pit is the Primary makeup Water Storage Tank, which is a seismic Class I component. The pumps and most of the piping associated with his system are also seismic Class I. The makeup water loop to the Spent Fuel Pit is seismic Class II, as is the spent fuel pit cooling and cleanup loop. "

Was there correspondence with the NRC in conjunction with the Systematic Evaluation Program that classified the makeup water supply any differently?

Mail Envelope Properties
(3B17E6A3.516 : 3 : 50454)

Subject:	RE: IP3 SFP design temperatures
Creation Date:	6/1/01 3:00PM
From:	"Firth, Edwin" <EFirth@entergy.com>
Created By:	EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	**Route**
kp1_po.KP_DO	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	2855	06/01/01 03:00PM
Header	856	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/1/01 3:02PM
Subject: RE: IP3 SFP design temperatures

Greg,

As requested, I conducted a search of the three temperature values related to SFP activities. This search produced the following results:
1. 150 deg F appears in ARP-013 and page 7 of 35 of NSE 98-3-019-SFPC (Rev. 5). This temperature value applies strictly to that temperature limit at which the SFP can be maintained continuously without degradation to its concrete walls. The value of 150 deg F also appears in the FSAR (page 9.3-3) related to the SFP cooling loop, in that "The spent fuel pit pump and heat exchanger will handle the decay heat load from 76 freshly discharged fuel assemblies while maintaining the spent fuel pit water temperature below 150 deg F." This value further appears in the same previous context on page 9.3-13 of the FSAR as well. I could not find this value in the current ITS or ITS bases.
2. 200 deg F appears the FSAR in section 9.3.3.On page 9.3-3, mentioned that "With a full core discharge the water temperature is maintained below 200 deg F." This value is also mentioned on page 9.3-14 in a similar context related to max bulk temp with full core discharge. In Table 9.3.3, "Spent Fuel Cooling Loop Component Data", sheets 1 - 5 of 6. This value also appears in the FSAR on page 16.4-9 (section 16.4.5) involving SFP water temperature and thermal stresses in the walls of the SFP. By the way 212 deg F is also mentioned in this section as well. I could not find this value related to SFP in the ITS or ITS bases.
3. 213 deg F for emergency conditions does not appear in the FSAR nor TS. I also checked the various NSEs and CALCs and could not find this value either. I had our WPO Rx Engineering staff check the US Tool & Die document on SFP Thermal-Hydraulic Report (that you had mentioned to me earlier) and this showed no indication of the value of 213 deg F. This US Tool & Die document does list temps greater than 212 deg F. For example, the value of 241.8 deg F is indicated as that temperature in the SFP where boiling at the top of the Fuel racks will not occur unless SFP temp goes above that temp.

Hope this clarifies/answers your question.
EGF...914-736-8970

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Thursday, May 31, 2001 2:05 PM
> To: Firth, Edwin
> Subject: IP3 SFP design temperatures
>
> As I recall the key design temperatures for the SFP are 150F for long term
> =
> steady state conditions, 200F for short term evolutions such as core =
> offloads, and 213F for emergency conditions. I thought I saw all of the =

> numbers mentioned somewhere in the safety analysis, FSAR or Tech Specs. I
> =
> don't have search capability here for the FSAR or Tech Specs.=20
>
> Can you do a search on those three temperature numbers and let me know =
> where they appear in those documents? =20
>
> Thanks.
>

Mail Envelope Properties
(3B17E990.5BE : 21 : 50622)

Subject: RE: IP3 SFP Makeup
Creation Date: 6/1/01 3:13PM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	Route
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	1895	06/01/01 03:13PM
Header	843	

Options
Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/1/01 3:14PM
Subject: RE: IP3 SFP Makeup

Greg,
1. The primary makeup water supply that provides makeup to the SFP is NOT considered a safety related function.
You did quote the FSAR GDC 61 correctly, but that indicates the seismic classes only of the PWT up to the SFP itself.
As I recall from my Ops cert training, this makes sense I believe since the reason for not making Prim water safety related is that it is pure (non-borated) water and not having it available during accident analysis is actually better than having it available since you can avoid a potential reactivity issue with insertion of pure (non-borated) water into the Rx system.
2. The Systematic Eval program correspondence/information I believe you refer to is our MCM-6B reference document of "Safety System Function Sheets." FYI...I am faxing you the pertinent copies of these sheets for the SFPCS, BUSFPCS and the Prim water system ro reinforce our category calssifications of the various parts of these systems.
My best,
EGF...914-736-8970
> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Friday, June 01, 2001 12:13 PM
> To: Firth, Edwin
> Subject: IP3 SFP Makeup
>
> Is the primary makeup water supply that provides makeup to the SFP should
> =
> boiling occur considered a safety related water supply? The FSAR Section
> =
> 1.3, GDC 61, page 1.3-95, says, "The primary source of makeup water to the
> =
> spent fuel pit is the Primary makeup Water Storage Tank, which is a =
> seismic Class I component. The pumps and most of the piping associated =
> with his system are also seismic Class I. The makeup water loop to the =
> Spent Fuel Pit is seismic Class II, as is the spent fuel pit cooling and =
> cleanup loop. "
>
> Was there correspondence with the NRC in conjunction with the Systematic =
> Evaluation Program that classified the makeup water supply any
> differently?=
>
>

Mail Envelope Properties
(3B1BDC90.889 : 10 : 34966)

Subject:	IP3 SFP Temperature
Creation Date:	6/4/01 3:08PM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	953	06/04/01 03:08PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/4/01 3:08PM
Subject: IP3 SFP Temperature

I did get the other stuff you sent. Thanks.

Apparently the 212degF temperature for the fuel pool is in an Ebasco analysis which is mentioned in Attachment to MCM-4 Safety Screen for Alarm Response Procedure, ARP-13, Rev 27, dated 9/21/99.

Do you have any more specifics on that reference regarding why it was done, the title, date, etc.?

Mail Envelope Properties
(3B1CECE1.6B3 : 21 : 5811)

Subject:	RE: IP3 SFP Temperature
Creation Date:	6/5/01 10:27AM
From:	"Firth, Edwin" <EFirth@entergy.com>
Created By:	EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	**Route**
kp1_po.KP_DO	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1482	06/05/01 10:27AM
Header	848	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/5/01 10:30AM
Subject: RE: IP3 SFP Temperature

Greg,

This Ebasco analysis is entitled "Structural Evaluation of the Spent Fuel Storage Building for Storage of US Tool & Die Maximum Density Racks Containing 1345 Assemblies." It is dated 3/25/88. It was done to address/support a Spent Fuel Pool Structural/Thermal Analysis of the walls of the SFP resulting from temperature gradients. For accident conditions (loss of pool cooling) in this analysis a water temp of 212 deg F was used. Under these conditions, maximum liner and pool anchor strain were calculated, as well as strain-induced loads, maximum average shear and maximum bending moment. In all cases, the resultant values for the pool mat, the interior wall, the exterior wall and the canal mat were within allowable limits.
I am pursuing further details with engineering at this time to ensure we are as specific, yet concise as possible regarding your questions related to this analysis.

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Monday, June 04, 2001 3:08 PM
> To: Firth, Edwin
> Subject: IP3 SFP Temperature
>
> I did get the other stuff you sent. Thanks. =20
>
> Apparently the 212degF temperature for the fuel pool is in an Ebasco =
> analysis which is mentioned in Attachment to MCM-4 Safety Screen for Alarm
> =
> Response Procedure, ARP-13, Rev 27, dated 9/21/99.
>
> Do you have any more specifics on that reference regarding why it was =
> done, the title, date, etc.?
>

Mail Envelope Properties
(3B1CF70E.93C : 20 : 6460)

Subject: RE: IP3 SFP Temperature
Creation Date: 6/5/01 11:12AM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	Route
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	945	06/05/01 11:12AM
Header	848	

Options
Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/5/01 11:13AM
Subject: RE: IP3 SFP Temperature

Greg,

Related to the last e-mail I sent you about subject Ebasco analysis, I can fax you a copy of an NSE concerning "Incorporation of SFP Structural/Thermal Analysis into FSAR." This was written/approved in 1999 and made use of the Ebasco analysis in adding info into section 16.4.5 of the FSAR. If this NSE would be helpful/needed, pls let me know.
Thanks...
EGF

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Monday, June 04, 2001 3:08 PM
> To: Firth, Edwin
> Subject: IP3 SFP Temperature
>
> I did get the other stuff you sent. Thanks. =20
>
> Apparently the 212degF temperature for the fuel pool is in an Ebasco =
> analysis which is mentioned in Attachment to MCM-4 Safety Screen for Alarm
> =
> Response Procedure, ARP-13, Rev 27, dated 9/21/99.
>
> Do you have any more specifics on that reference regarding why it was =
> done, the title, date, etc.?
>

Mail Envelope Properties
(3B1D12A6.889 : 10 : 34966)

Subject: RE: IP3 SFP PRA
Creation Date: 6/5/01 1:11PM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

nrc.gov
kp1_po.KP_DO
JMT1 CC (James Trapp)
SRJ CC (Steve Jones)

Post Office	Route
	entergy.com
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	1857	06/05/01 01:11PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/5/01 1:11PM
Subject: RE: IP3 SFP PRA

Thanks. Also, there are a few other things I need to have available when I come up for the exit tomorrow.
I need a copy of your mod procedure and your Root Cause Analysis Procedure.

Also, regarding the PRA that Jeff Circle sent to Joe Deroy on May 10, 2001 in a memo, it states that, "It is consevatively assumed that core damage would commence upon pool boiling" and that boiling would occur in 5 hours based on conditions at the time of the event. The probability of boiling calc has one factor, NR-Fire, which is the "failure to align the fire protection system within five hours which is made up of failure to recognize the temperature increase and failuire to carry out procedures such as C-8 and ONOP-SFP-01." Based on the presentation of the formula it appears that this refers to aligning the fire protection system to provide makeup water to the BUSFPCS cooling tower and is not the alignment to make up water to the SFP itself. Is this the case? If this is the case, would the number given of 3.2E-4 change if there was only 3.75 hours instead of the 5 hours to align the fire protection system? If so, by how much. What is procedure C-8 which was referenced in the PRA?

CC: James Trapp; Steve Jones

Mail Envelope Properties
(3B1D27BC.33B : 4 : 9019)

Subject: RE: IP3 SFP PRA
Creation Date: 6/5/01 2:40PM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

Post Office	Route
kp1_po.KP_DO	nrc.gov

Files	Size	Date & Time
MESSAGE	1677	06/05/01 02:40PM
Header	840	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/5/01 2:41PM
Subject: RE: IP3 SFP PRA

Greg,
I have PRA answers and will also get you a copy of C-8 (Defense in depth plan for RO-11) ready when you come to IP3 for exit.
Thanks
Ed

> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Tuesday, June 05, 2001 1:11 PM
> To: Firth, Edwin
> Cc: James Trapp; Steve Jones
> Subject: RE: IP3 SFP PRA
>
> Thanks. Also, there are a few other things I need to have available when
> =
> I come up for the exit tomorrow.
> I need a copy of your mod procedure and your Root Cause Analysis
> Procedure.=
>
>
> Also, regarding the PRA that Jeff Circle sent to Joe Deroy on May 10, 2001
> =
> in a memo, it states that, "It is consevatively assumed that core damage =
> would commence upon pool boiling" and that boiling would occur in 5 hours
> =
> based on conditions at the time of the event. The probability of boiling
> =
> calc has one factor, NR-Fire, which is the "failure to align the fire =
> protection system within five hours which is made up of failure to =
> recognize the temperature increase and failuire to carry out procedures =
> such as C-8 and ONOP-SFP-01." Based on the presentation of the formula it
> =
> appears that this refers to aligning the fire protection system to provide
> =
> makeup water to the BUSFPCS cooling tower and is not the alignment to make
> =
> up water to the SFP itself. Is this the case? If this is the case, would
> =
> the number given of 3.2E-4 change if there was only 3.75 hours instead of
> =
> the 5 hours to align the fire protection system? If so, by how much. =
> What is procedure C-8 which was referenced in the PRA?
>
>

Mail Envelope Properties
(3B1D3D55.889 : 10 : 34966)

Subject: IP3 SFP temperature
Creation Date: 6/5/01 4:13PM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

nrc.gov
kp1_po.KP_DO
SRJ CC (Steve Jones)

Post Office	**Route**
kp1_po.KP_DO	entergy.com
	nrc.gov

Files	**Size**	**Date & Time**
MESSAGE	1016	06/05/01 04:13PM

Options
Expiration Date: None
Priority: Standard
Reply Requested: No
Return Notification: None

Concealed Subject: No
Security: Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/5/01 4:13PM
Subject: IP3 SFP temperature

Prior to bringing the normal SFP cooling system back on line the SFP temperature was stable at about 154F on the backup system. The normal SFP cooling was restored at about 5pm on May 8 and about 3 hours later, with both the normal and backup SFP cooling systems running, the SFP temperature was 118F. If when the normal SFP cooling system was returned to service the BUSFPCS was removed from service how long would it have taken to get the SFP temperature below 120F?

CC: Steve Jones

Mail Envelope Properties
(3B3201A3.889 : 10 : 34966)

Subject:	RE: IP3 SFP 2 hour Operator Rounds
Creation Date:	6/21/01 10:16AM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	996	06/21/01 10:16AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/21/01 10:16AM
Subject: RE: IP3 SFP 2 hour Operator Rounds

As a follow up to my previous question, if the 2 hour rounds did not monitor anything except SFP temperature, who and how often did someone monitor the operation of the BUSFPCS to verify cooling tower level was OK, pumps and fans running OK, etc.?

I will keep you posted on 50.59 progress. Still extensive reviews going on in Headquarters.

Mail Envelope Properties
(3B321139.889 : 10 : 34966)

Subject:	RE: IP3 Fuel Storage Building Ventilation
Creation Date:	6/21/01 11:22AM
From:	Gregory Cranston
Created By:	GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	884	06/21/01 11:22AM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 6/21/01 11:22AM
Subject: RE: IP3 Fuel Storage Building Ventilation

I have a question on the FSB ventilation. Can you give me the name and phone number of the system engineer. Basically I want to confirm that the FSB has a HEPA/charcoal filtered exhaust and I would also like to know what would cause the ventilation system to trip, is it safety related, and is it powered from a safety related bus?

Mail Envelope Properties
(3B322CD2.4B7 : 6 : 9399)

Subject: RE: IP3 SFP 2 hour Operator Rounds
Creation Date: 6/21/01 1:18PM
From: "Firth, Edwin" <EFirth@entergy.com>

Created By: EFirth@entergy.com

Recipients
nrc.gov
kp1_po.KP_DO
GVC (Gregory Cranston)

entergy.com
JDonnel CC (Donnelly, John)

Post Office	Route
kp1_po.KP_DO	nrc.gov
	entergy.com

Files	Size	Date & Time
MESSAGE	2038	06/21/01 01:18PM
Header	906	

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: "Firth, Edwin" <EFirth@entergy.com>
To: "'Gregory Cranston'" <GVC@nrc.gov>
Date: 6/21/01 1:20PM
Subject: RE: IP3 SFP 2 hour Operator Rounds

Greg,

I will answer all of the questions you asked over the past several e-mails with this one response.

1. The two hour "tours" mentioned as a result of the ARP-013 (SFP temp) actions are actually special log readings taken to record SFP temperature (by the Nuke watch) every two hours. No other readings/logs associated with the BUSFPCS are taken as per the actions of this ARP.

2. When the BUSFPCS is in operation, SOP-SFP-003 (Ops of the B/U SFPCS) is used and Attachment 6 of that procedure indicates the logs/rounds taken by nuke side and conventional side NPO watchstanders. These rounds are taken either every 4 hours or 8 hours in frequency depending upon the various system parameters listed. SFP temp is taken every 4 hours in this procedure. This procedure Attachment does not include logs/rounds for the contractor water trailer arrangement. These rounds/logs are taken separately by the Ecolochem operators at this facility. The assigned NPOs do not take logs/rounds of the contractor water facility.
I can fax you a copy of Attachment 6 to SOP-SFP-006 if needed.

3. I discussed the FSB ventilation system questions with the appropriate system engineer. Yes, there is a HEPA/charcoal filtered exhaust. FSB vent system supply fans trip via Rad Monitor R-5 high setpoint, if either supply fan trips, or the exhaust fan is shutdown. The fans are powered via MCC-37 off of 480V bus 6A. The system engineer is Zvi Eisenberg at 736-8666. I gave him a copy of these questions as well.

EGF... 736-8970
> ----------
> From: Gregory Cranston[SMTP:GVC@nrc.gov]
> Sent: Thursday, June 21, 2001 9:58 AM
> To: Firth, Edwin
> Subject: RE: IP3 SFP 2 hour Operator Rounds
>
> When the two hour tours were implemented per the Alarm Response Procedure
> =
> the rounds covered the SFP area and recorded SFP pool temperatures. Did =
> the tour also include any checks of the BUSFPC system controls/cooling =
> tower water level/contractor water treatment trailers/etc?
>
>

CC: "Donnelly, John" <JDonnel@entergy.com>

Mail Envelope Properties
(3B421D16.889 : 10 : 34966)

Subject: IP3 SFP
Creation Date: 7/3/01 3:29PM
From: Gregory Cranston

Created By: GVC@nrc.gov

Recipients
entergy.com
EFirth (Firth, Edwin)

Post Office	**Route**
	entergy.com

Files	**Size**	**Date & Time**
MESSAGE	7658	07/03/01 03:29PM

Options

Expiration Date:	None
Priority:	Standard
Reply Requested:	No
Return Notification:	None
Concealed Subject:	No
Security:	Standard

From: Gregory Cranston
To: Firth, Edwin
Date: 7/3/01 3:29PM
Subject: IP3 SFP

Per our discussion the following information is provided.

Unlike the normal SFP cooling system, which has a heat exchanger cooled by the safety related component cooling water (CCW) system, the BUSFPCS cooling tower requires a continuous supply of makeup water to make up for evaporation. The makeup water is provided from either the non-safety related primary water system (PWS), using a contractor water treatment system, or from a backup source which is the plant's fire water system (available but not hooked up). The licensee has identified a history of problems (electrical power supply and water quality) associated with the makeup water system that challenge the reliability of the makeup water to the BUSFPCS. Loss of makeup water to the cooling tower results in loss of NPSH to the secondary pumps, with a resultant loss of SFP cooling, in about 20 minutes. Consequently, the BUSFPCS is less reliable than the normal SFP cooling system.

The inspectors found weather related limitations associated with the BUSFPCS not applicable to the normal SFP cooling system that could affect the heat removal capability of the BUSFPCS. The required heat removal capacity of both systems is 35 MBTU/hr. The normal SFP cooling system accomplishes this by rejecting heat to the CCW water system, which is cooled by river water and does not fluctuate significantly on a day to day basis. However, the BUSFPCS is capable of removing 35 MBtu/hr only if the outside air wet bulb temperature is less than 77 degrees Fahrenheit. Though exceeding an outside air wet bulb temperature of 77 degrees Fahrenheit is not common, the requirement does place an added limitation on when the BUSFPCS is capable of meeting design requirements and available for use.

Per design, the SFP will remain below 200 degrees Fahrenheit with the normal SFP cooling system in operation and below 190 degrees Fahrenheit with the BUSFPCS in operation. Should normal SFP cooling be temporarily lost (with the BUSFPCS out of service) and then restored, cooling can be restored to the SFP at any pool temperature up to boiling (212 degrees Fahrenheit). However, should SFP cooling be lost when the BUSFPCS is in operation (with the normal SFP cooling system out of service) and then restored to service, SFP cooling can be only be restored as long as the pool temperature does not exceed about 196 degrees Fahrenheit.

As stated in the FSAR Update, Section 9.3.3, Spent Fuel Pit Cooling, assuming a full core offload and a loss of pool cooling commencing at the time of maximum pool bulk temperature, the pool temperature will increase at a rate of 14.6 degrees Fahrenheit/hr. Therefore, with normal SFP cooling in service, boiling will occur in about 50 minutes. However, with the BUSFPCS in service, the pool will reach 196 degrees Fahrenheit in about 24 minutes, at which time the BUSFPCS is lost and cannot be easily restored due to loss of NPSH on the primary pumps. As a result, boiling will occur which will continue until the normal SFP cooling is restored and/or core decay heat subsides with time.

As stated in FSAR Update, Section 9.5.1, Design Basis, Fuel and Waste Storage Decay Heat, "Criterion: Reliable decay heat removal systems shall be designed to prevent damage to the fuel in storage facilities and to waste storage tanks that could result in radioactivity release which

could result in undue risk to the health and safety to the public (GDC 67 of 7/16/67). The refueling water provides a reliable and adequate cooling medium for spent fuel transfer. Heat removal from the spent fuel pit is provided for by an auxiliary cooling system." Spent fuel pool cooling is part of the auxiliary cooling system as stated in FSAR Update Section 9.3.1, Design Basis.

10 CFR 50.59 allows the licensee to make changes to their facilities described in the FSAR, without Commission approval, unless the proposed change involves a change in the technical specifications or involves an unreviewed safety question. In 1999, the licensee modified the plant by installing a backup spent fuel pool cooling system. The BUSFPCS can be used as the sole source of SFP cooling commencing at the time of maximum pool bulk temperature. However, the BUSFPCS has significant limitations (such as a less reliable cooling source and the potential lack of recoverability on loss of SFP cooling) when compared to the normal SFP cooling system that increases the probability of the malfunction of equipment important to safety.

Considering the fact that heat removal from the spent fuel pool is important to safety, the inspectors determined, utilizing the revision of 10 CFR 50.59 that was applicable at the time the system was installed, that the probability of occurrence of an accident or malfunction of equipment important to safety previously evaluated in the safety analysis report may be increased and, therefore, constitutes an unreviewed safety question and is a violation of 10 CFR 50.59. Also, the proposed activity resulted in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the FSAR since loss of the BUSFPCS becomes non-recoverable at a spent fuel pool temperature in excess of about 196 degrees Fahrenheit.

In accordance with the NRC's Enforcement Policy, violations of 10 CFR 50.59 are dispositioned outside of the significance determination process because these violations impact the regulatory process. The result of this 10 CFR 50.59 violation, however, was assessed through the significance determination process. Use of the BUSFPCS with its significant limitations (such as a less reliable cooling source and the potential lack of recoverability on loss of SFP cooling) when compared to the normal SFP cooling system, created a credible impact on safety in that it is more susceptible to failure and could increase the probability or severity of a loss of SPF cooling event. Nonetheless, the use of the BUSFPCS was found to be of very low safety significance (Green) because makeup water was available to the SFP, to prevent uncovering the spent fuel bundles, should SFP boiling occur.

On March 13, 2001, a revision to 10 CFR 50.59 went into effect. In accordance with the revised rule, a licensee shall obtain a license amendment prior to implementing a proposed change if the change would result in more than a minimal increase in the likelihood of occurrence of a malfunction of a system important to safety previously evaluated in the FSAR. Since this change did result in a more than minimal increase, this is a preliminarily a Severity Level IV Non-Cited Violation.