ER 2001-2843

ENTERGY

CALCULATION COVER PAGE
ENGINEERING DEPARTMENT
RIVER BEND STATION

CALC. NO. - REV. ADDENDUM
G13.18.4.6-011 , Rev. 0
ATTACHMENT NO. N/A
JOB No. G13.18.4.6
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TITLE:

NSW System One Pump Capacity Verification for Supporting Components Required Following a Postulated Fire in Fire Area PT-1.

CALCULATION STATUS:	☒ APPROVED	☐ PENDING ON IMPLEMENTATION OF: PENDING ON CONFIRMATIONS	CANCELED

SYSTEM NO.: 118	MARK NO.: SWP

CLASSIFICATION: ☐ SAFETY RELATED	NON-SAFETY RELATED: ☒ QAPA ☐ NON-QAPA

PURPOSE / SCOPE / OBJECTIVE:

The objective of this calculation is to use the NSW System KY Pipe Model to determine if one NSW pump has sufficient capacity to provide design flow into the components required for safe shutdown of the reactor under 10CFR50 Appendix R Analysis of Fire in Area PT-1.

CONCLUSIONS:

See page 11

SOFTWARE USED FOR CALCULATION: ☒ YES ☐ NO **SDDF #:** PLI-900240

Manufacturer: University of Kentucky Civil Engineering Software Center. **Name:** PYPIE2 **Version/Release No.** 1.01

KEYWORDS: NSW one pump operation & Fire Area PT-1	Licensing/Design Basis Impact ☐ Addressed in DCA No.______ ☐ Licensing/Design Basis Impact Checklist included ☒ None - Reason:______

REVIEW & APPROVAL

[signature] 12-7-01 (Signature/Date) Preparer Ghodrat Javaherian KCN 0725	[signature] 0897 12/7/01 (Signature/KCN/Date) ☒ Reviewer (non-safety)	[signature] 12-12-01 (Signature/Date) Supervisor Scott F. Martin KCN 0273

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REVISION HISTORY

Revision No.	Section Page No.	Description of Change
0	All	Original revision.

REFERENCE DOCUMENTATION

I. Relationships: Other Calculations, Procedures, Drawings, etc. Identify how documents are affected by only selecting one Relationship Code and one Relationship Status.

Relationship Code	Doc NO.	Rev	EFFECT (Check One) Relationship Status
☒ Related ☐ Supercedes ☐ Voids	1. G13.18.4.6 -005	2	☒ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other
☒ Related ☐ Supercedes ☐ Voids	2. G13.18.4.0*043	1	☐ Reference ☒ Supplements ☐ Pending ☐ As-built ☐Other
☒ Related ☐ Supercedes ☐ Voids	3. AOP-0016	12	☒ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________
☒Related ☐ Supercedes ☐ Voids	4. AOP-0053	5A	☒ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________
☒ Related ☐ Supercedes ☐ Voids	5. AOP-009	12	☒Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________
☒ Related ☐ Supercedes ☐ Voids	6. G13.18.3.6*012	0	☒ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________
☐ Related ☐ Supercedes ☐ Voids			☐ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________
☐ Related ☐ Supercedes ☐ Voids			☐ Reference ☐ Supplements ☐ Pending ☐ As-built ☐Other ____________

II. Cross References: Applicable codes, standards, & references (non-RBS).

Document No.	Rev	Document No.	Rev
1. Section 9A.2.5.7.2.5 of the USAR	10	2. Post Fire Safe Shutdown Analysis, Criterion 240.201A,	3
			0

1. Definition of Terms and Variables:

N/A

2. System description

The Normal Service Water (NSW) System provides cooling water to remove heat from safety and non safety-related components during normal plant operation. The NSW System utilizes three 50% capacity pumps, Each pump has a capacity of approximately 31,500 gpm. In emergency situations, both divisions of the Standby Service Water System initiate to provide cooling water to safety-related components needed for the Reactor Safe Shutdown. The SSW System utilizes two 50% capacity pumps in each division (only one division is required for Reactor Safe Shutdown). Each pump has a capacity of approximately 7,690 gpm. The SSW System initiates the following conditions: 1) NSW System low pressure indication (less than 76 psi) that can be due to the Loss Of-Site Power (LOP) or loss of two out of three NSW pumps; 2) RPCCW low pressure (less than 54 psi).

In the event of the loss of two NSW pumps without LOP (unlikely event, two component failure at the same time), NSW pressure will drop below 76 psi, which initiates the SSW System. This means that SWP-MOV96A/B and MOV57A/B automatically close to isolate the NSW System from the SSW System. SWP-MOV40A-D (SSW pumps' discharge isolation valves) and SWP-MOV55A/B (SSW pumps' return isolation valves) automatically open. Then, after 30 to 60 seconds, all the SSW pumps start to provide cool water to both divisions.

In the event of fire in Area PT-1, per Post Fire Safe Shutdown Analysis, Criterion 240.201A, Rev. 3, cables providing power to SWP-MOV55A/B, MOV40A-D, MOV501A/B, MOV511A/B and all four SSW pumps will be damaged. SWP-MOV55A/B, MOV40A-D, MOV501A, MOV511A will stay in the closed position, MOV501B, MOV511B will stay open, and pumps will not start. In this event, the NSW System pumps are credited for Reactor Safe Shutdown.

Failure of one of the two operating pumps will automatically start the third standby pump. In the event one of the NSW pump is out of service for maintenance activities and one of the two operating pump fails, only one NSW pump will be operating. As discussed in the above, in the event of fire in area PT-1, the SSW will be isolated from the NSW System within 30 seconds (time for MOV96A/B and MOV57A/B to close). Operating one NSW pump in run-out value for 30 seconds will not affect pump operation.

Operations actions are required to open MOV96A and MOV57A to allow NSW into Div. I safety-related components. CCP Heat Exchangers will be isolated and operator manual actions will be required to open MOV511A and MOV501A. If, due to fire, this can not be accomplished the RPCCW System must be shutdown and the NSW System must be directed into the SFC Heat Exchangers and RHR Pump Seal Coolers per AOP-0016. Div. II divisional isolation valves will be closed per AOP-0016, "Loss of SSW System".

3.0 Objective

The objective of this calculation is to ensure that one NSW pump is capable of providing design flow into the required components for Reactor Safe Shutdown in the event of fire in area PT-1.

4.0 Assumptions/Design Input:

4.1. Operating one NSW pump for the first 30 seconds before the NSW is isolated from the SSW, will put the pump in run-out condition. Based on the pump curve (Attachment - 1), pump performance beyond 40,000 gpm will be controlled by the NPSH available and motor horsepower. To determine the effect of this line-up on the pump, NSW KY Pipe Model Case-1was run (see conclusion).

4.2. The following components supplied by the SWP System are required for Post-Fire Shutdown for a fire in area PT-1:
RHR Heat Exchangers E12-EB001A and 1C
SFC-E1A
E12-PC002A
EGS-EG1A (It is not required but SWP flow will be running through it)
E22-S001 (It is not required but SWP flow will be running through it)
LSV-C3A
HVK-CHL1A or 1C
HVR-UV2
HVR-UC3
HVR-UC5
HVR-UC6
HVR-UC7
HVR-UC8
HVR-UC11A

4.3. For Cases 5 and 6, the check valve in line number 720 (supply to the HVR-UC1A) was removed in response to the model output "warning". The model requires that all nodes have a pressure reference. This change does not affect the results. There is no flow in line 720.

4.4. Plant heat load during this scenario is at a minimum. A Design Basis Accident is not postulated. RHR heat load will be at a maximum due to the Suppression Pool Cooling Mode when steam from the SRV's is dumped into the suppression pool.

4.5. Operating the NSW System with one pump will initiate the SSW System.

5. Methodology:

The methodology for determining if one NSW System is capable of providing design flow into the required components is to use the NSW KY Pipe Model of Reference I-1 and I-2. The valve alignment will be changed according to References I-3, 4 and 5. The scenario analyzed will be a loss of two NSW pumps with a fire in Area PT-1. The component flows predicted by the KY Pipe model will be compared to the component design flows to determine if one NSW system is capable of providing adequate cooling to all heat loads.

One NSW pump operation will be analyzed for the following cases:

1. From time 0 to 30 seconds, before MOV96A/B and MOV57A/B are closed, all of the safety and non safety-related components are line-up. Pump flows and system pressures where PI21series are located will be evaluated to determine if the SSW will be initiated and if the pump will cavitate.

2. MOV96B and MOV57B are closed. Operator action will open MOV96A and MOV57A to provide NSW flow into Div. I of the SSW System. RHR Heat Exchangers are isolated. Due to fire in Area PT-1, MOV501A and MOV511A will stay closed (no flow into the CCP Heat Exchangers). Operators will close Div. II divisional cross-tie valves per AOP-0016.

3. MOV96A and MOV57A are open to provide NSW flow into Div. I of the SSW System. RHR Heat Exchangers isolation valves are also open. Operators will manually open MOV501A and MOV511A to provide flow into the CCP Heat Exchangers. Operators will close Div. II divisional cross-tie valves per AOP-0016.

4. MOV96A and MOV57A are open to provide NSW flow into Div. I of the SSW System. RHR Heat Exchangers isolation valves are open. Operators can not open MOV501A and MOV511A manually. Operators shut down the RPCCW System and MOV504A and MOV510A are open to direct NSW flow into the SFC Heat Exchangers and the RHR Pump Seal Cooler. Operators will close Div. II divisional cross-tie valves per AOP-0016.

5. For Case 3, Operators will isolate CCS Heat Exchangers and Radwaste Building HVN Chillers to ensure that required components receive design flow.

6. For Case 4, Operators will isolate Radwaste Building HVN Chillers to ensure that required components receive design flow.

The valve line-up is taken from References I-3, 4 and 5. Valve line-up is shown in Table-1.

TABLE - 1
NSW SYSTEM COMPONENTS LINEUP

Valve Number	Line Number	Position Case 1	Position Case 2	Position Case 3	Position Case 4	Position Case 5	Position Case 6	Description
MOV77A	203(CV)	Open	Open	Open	Open	Open	Open	Supply to HPCS cooler
MOV77B	204(CV)	Open	Closed	Closed	Closed	Closed	Closed	Supply to HPCS cooler
MOV506A	276(CV)	Open	Open	Open	Open	Open	Open	Return from HPCS cooler
MOV506B	282(CV)	Open	Closed	Closed	Closed	Closed	Closed	Return from HPCS cooler
MOV501A	380	Closed	Closed	Open	Closed	Open	Closed	CCP heat exchanger supply
MOV501B	379	Open	Open*	Open*	Open*	Open*	Open*	CCP heat exchanger supply
MOV511A	397	Closed	Closed	Open	Closed	Open	Closed	CCP heat exchanger return
MOV511B	398	Open	Open *	Open*	Open*	Open*	Open*	CCP heat exchanger return
MOV171	564	Open	Open	Open	Open	Open	Open	A aux bldg unit cooler return
MOV172	566	Open	Open	Open	Open	Open	Open	A aux bldg unit cooler supply
MOV173	552	Open	Open	Open	Open	Open	Open	B aux bldg unit cooler return
MOV174	522	Open	Open	Open	Open	Open	Open	B aux bldg unit cooler supply
MOVF068A	412(CV)	Closed	Closed	Open	Open	Open	Open	RHR heat exchanger return
MOVF068B	405(CV)	Closed	Closed	Open	Open	Open	Open	RHR heat exchanger return
MOV73A	576(CV)	Open	Open	Open	Open	Open	Open	Supply to HVR-UC5
MOV74A	590	Open	Open	Open	Open	Open	Open	Return from HVR-UC5
MOV73B	561(CV)	Open	Closed	Closed	Closed	Closed	Closed	Supply to HVR-UC5
MOV74B	563	Open	Closed	Closed	Closed	Closed	Closed	Return from HVR-UC5
MOV510A	706	Closed	Closed	Closed	Open	Closed	Open	Supply to fuel pool cooler
MOV510B	719	Closed	Closed	Closed	Closed	Closed	Closed	Supply to fuel pool cooler
MOV504A	718	Closed	Closed	Closed	Open	Closed	Open	Return from fuel pool cooler
MOV504B	705	Closed	Closed	Closed	Closed	Closed	Closed	Return from fuel pool cooler
MOV27A	255	Open	Open	Open	Open	Open	Open	Supply to HVK-CHL1A
MOV27B	222	Closed	Closed	Closed	Closed	Closed	Closed	Supply to HVK-CHL1B
MOV27C	240	Closed	Closed	Closed	Closed	Closed	Closed	Supply to HVK-CHL1C
MOV27D	207	Closed	Closed	Closed	Closed	Closed	Closed	Supply to HVK-CHL1D
MOV57A	189(CV)	Open	Open	Open	Open	Open	Open	SSW/NSW isolation
MOV57B	179(CV)	Open	Closed	Closed	Closed	Closed	Closed	SSW/NSW isolation
MOV96A	160	Open	Open	Open	Open	Open	Open	SSW/NSW isolation
MOV96B	168	Open	Closed	Closed	Closed	Closed	Closed	SSW/NSW isolation
MOV129	290	Open	Open	Open	Open	Closed	Closed	Supply to HVN-CHL2 isolation
V11	21	Open	Open	Open	Open	Closed	Open	Return from CCS-E1A
V12	24	Open	Open	Open	Open	Closed	Open	Return from CCS-E1B
V13	27	Open	Open	Open	Open	Closed	closed	Return from CCS-E1C

Note: MOV40A-D, MOV55A/B, MOV81A/B, MOV5A/B, MOV4A/B, MOV507A/B, MOV502A/B and MOV503A/B positions will not change for Cases 1 through 6.

* Even though these valves are open, there will not be any flow into the CCP Heat Exchangers because MOV96B and MOV57B are closed.

6.0 CALCULATION:

Table - 2 summarizes the flows predicted by the KYPIPE Model based on one NSW pump operating and providing flow into NSW and Div. I components.

TABLE - 2

Components	Design Flow (gpm)	Case –1	Case –2	Case –3	Case –4	Case –5	Case –6	KYPIPE Line Number
Div. I								
Containment Unit Cooler 1HVR-UC1A	540	—	—	—	—	—	—	720
RHR Heat Exchangers A and C	5800	—	—	5800	5800	5800	5800	410
Diesel Generator Cooler 1EGT-E1A	700	1042	1359	924	1174	1203	1233	273
Control Building Chillers 1HVK-CHL1A	630	772*	786*	763*	780	781*	783*	262
Control Building Chillers 1HVK-CHL1C	630	—	—	—	—	—	—	247
Aux Building Unit Coolers 1HVR-UC2	50	52	68	46	58	59	61	593
Aux Building Unit Coolers 1HVR-UC3	100	121	159	106	136	139	143	598
Aux Building Unit Coolers 1HVR-UC6	235	**233**	305	**204**	262	266	276	621
Aux Building Unit Coolers 1HVR-UC7	150	**147**	193	**129**	166	169	174	611
Aux Building Unit Coolers 1HVR-UC8	120	163	184	121	157	160	165	568
Aux Building Unit Coolers 1HVR-UC11A	410	**367**	482	**312**	414	421	435	635
RHR Pump A Seal Cooler	20	—	—	—	**13**	—	**14**	715
Fuel Pool Cooler 1SFC-E1A	2000	—	—	—	**1518**	—	**1595**	710
LSV Compressor 1LSV-E3CA	60	60	60	60	60	60	60	754
Cross Divisional Components								
Aux Building Unit Cooler HVR-UC5	182	241	260	**173**	223	227	234	577
Drywell Unit Coolers UC1A, B, C, D, E, F	2004	2276	2490	**1672**	2013	2181	2115	417
HPCS Diesel Generator Cooler 1E22-S001	800	**688**	882	**600**	**762**	**781**	800	279
Div. II								
Containment Unit Cooler 1HVR-UC1B	540	—	—	—	—	—	—	738
RHR Heat Exchangers Band D	5800	—	—	—	—	—	—	403
Diesel Generator Cooler 1EGT-E1A	700	744	—	—	—	—	—	284
Control Building Chillers 1HVK-CHL1B	630	—	—	—	—	—	—	229
Control Building Chillers 1HVK-CHL1D	630	—	—	—	—	—	—	214
Aux Building Unit Coolers 1HVR-UC4	90	105	—	—	—	—	—	538
Aux Building Unit Coolers 1HVR-UC9	210	**195**	—	—	—	—	—	553
Aux Building Unit Coolers 1HVR-UC10	37	**35**	—	—	—	—	—	548
Aux Building Unit Coolers 1HVR-UC11B	410	**355**	—	—	—	—	—	688
RHR Pump B Seal Cooler	20	—	—	—	—	—	—	703
Fuel Pool Cooler 1SFC-E1B	2000	—	—	—	—	—	—	697
LSV Compressor 1LSV-E3CB	60	60	—	—	—	—	—	755
NSW								
CCP-E1A Heat Exchanger	5000	—	—	—	—	—	—	384
CCP-E1B Heat Exchanger	5000	5219	—	**4624**	—	6028	—	390
CCP-E1C Heat Exchanger	5000	5231	—	**4635**	—	6043	—	395

Suppression Pool Cooler SPC-E1	2500	---	---	---	---	---	---	757
Main Turbine Lube Oil Cooler TML-E1A	1200	**1126**	**1392**	**1072**	1243	1369	1297	34
Main Turbine Lube Oil Cooler TML-E1B	1200	---	---	---	---	---	---	37
Alternator Cooler GMH-E2	240	**180**	**223**	**171**	**199**	**219**	**207**	123
Hydrogen Coolers GMH-E1A	960	1158	1432	1102	1278	1409	1335	127
Hydrogen Coolers GMH-E1B	960	1181	1460	1124	1304	1439	1361	131
Hydrogen Coolers GMH-E1C	960	1160	1434	1103	1280	1410	1336	135
Hydrogen Coolers GMH-E1D	960	1184	1464	1126	1307	1440	1364	139
TPCCW Heat Exchanger CCS-E1A	9250	---	---	---	---	---	---	28
TPCCW Heat Exchanger CCS-E1B	9250	**4832**	**5971**	**4599**	**5332**	---	5566	25
TPCCW Heat Exchanger CCS-E1C	9250	**6035**	**7459**	**5745**	**6660**	---	6952	22
Hydraulic Cooler TMB-E1A	50	**46**	**58**	**44**	52	57	54	95
Hydraulic Cooler TMB-E1B	50	---	---	---	---	---	---	100
Hydraulic Power Unit C85-TXD002A	40	60	76	57	67	74	70	107
Hydraulic Power Unit C85-TXD002B	40	---	---	---	---	---	---	110
Turbine Building Chiller HVN-CHL1A	4000	---	---	---	---	---	---	57
Turbine Building Chiller HVN-CHL1B	4000	**3898**	**4470**	**3786**	4145	4411	4263	72
Turbine Building Chiller HVN-CHL1C	4000	4098	4697	3980	4357	4636	4480	85
Steam Jet Air Ejector Intercooler ARC-E3A	131	---	---	---	---	---	---	152
Steam Jet Air Ejector Intercooler ARC-E3B	131	**117**	**145**	**111**	**129**	142	135	149
Radwaste Building Chiller HVN-CHL2A	1200	1214*	1364	1213*	1255	---	---	329
Radwaste Building Chiller HVN-CHL2B	1200	**1193***	1349	**1192***	1242	---	---	316
Radwaste Building Chiller HVN-CHL2C	1200	---	---	---	---	---	---	301
HVT-CUR1	70	**47**	**59**	**45**	**53**	**58**	**55**	116
SWP-P7C		45316	40249	46149	43313	40867	42265	13

* Note: The reason total flow through components is not equal to the pump flow, is because the re-circulation loops check valves of the HVK and Radwaste chillers are open.

7. Conclusions:

The results of Case-1 of the NSW KY-Pipe Model indicate that pressures at Pipe Nodes 155, 156 and 166, where the pressure transmitter PI21 series are located, are 81.07 psi, 80.74 psi and 78.91 psi, respectively. These pressures are very close to the SSW System initiation pressure of 76 psi. Also, pump suction pressure at Pipe Node 10 is 16.51 psi or 38.11 ft. Per pump curve (Attachment 7) the required NPSH for 45,316 gpm is about 37 ft. Comparing the required NPSH of 37 ft to the actual NPSH of 38.11 ft for flow of 45,316 gpm reveals that during Case-1, the pump will not be cavitated.

Comparing the results of all six Cases of pump performance and flow distribution, the following can be determined:

If the SSW System does not initiate, Operations action is required to close SWP-MOV57B and MOV96B to isolate Div. II of the SSW System from the NSW System and close the Div. II divisional cross-tie valves (Case-2).

If the SSW System is initiated, Operations action is required to open SWP-MOV57A and MOV96A to allow NSW flow into Div. I of the SSW System and close the Div. II divisional cross-tie valves (Case-2).

Operating RHR Heat Exchangers and CCP Heat Exchangers without isolating any other non safety-related component will pull the pump to the run-out condition and cavitation (Case-3).

Keeping CCP Heat Exchangers isolated, operating RHR Heat Exchangers, and providing NSW into the SFC Heat Exchangers and RHR Pump Seal Coolers will protect the pump and provide sufficient flow into the safety-related components (Case-4).

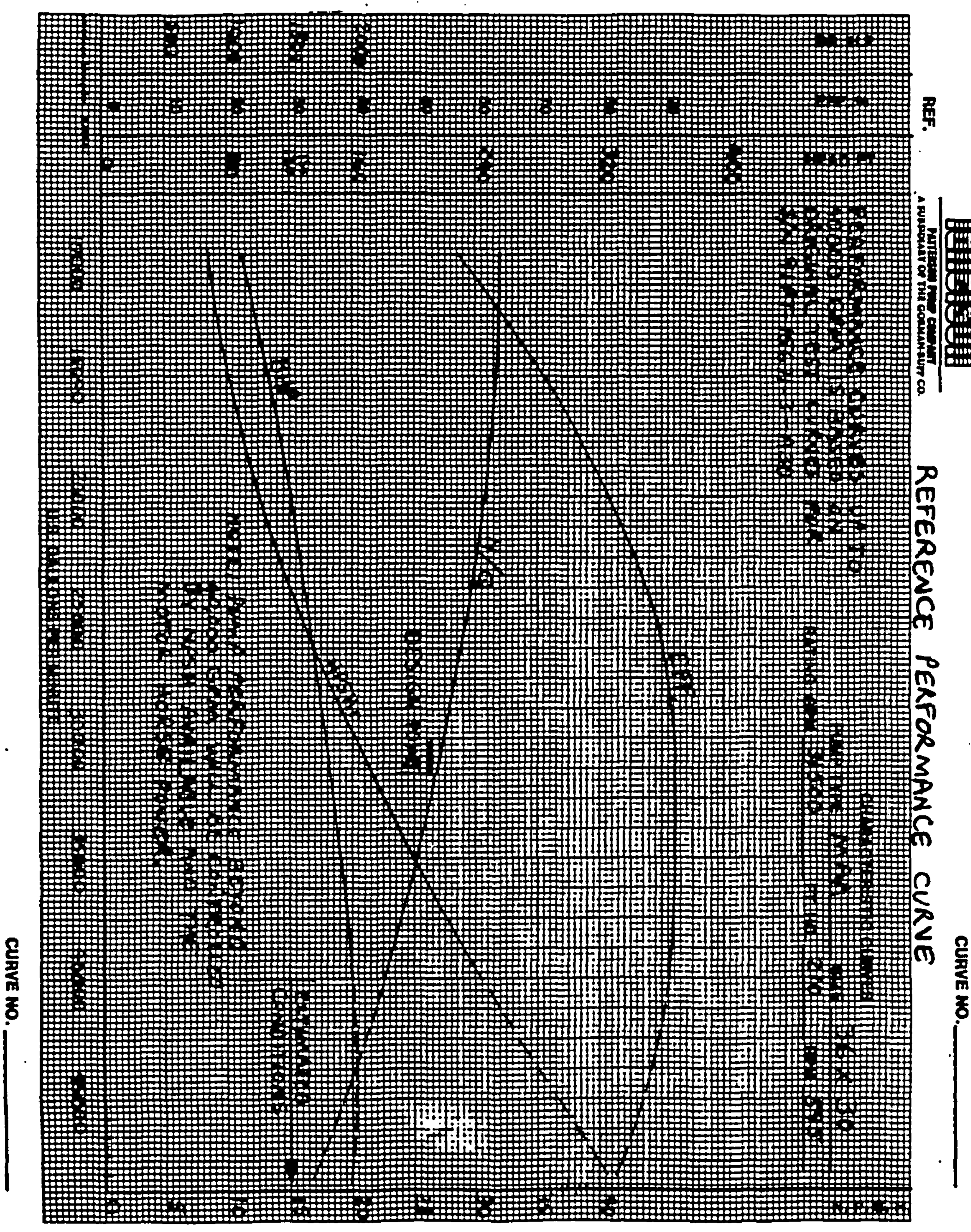
Operating RHR Heat Exchangers and CCS Heat Exchangers at the same time requires isolation of the CCS Heat Exchangers and Radwaste Building Chillers (Case-5). This case will protect the pump and provide sufficient flow into the safety-related components.

Case-6 was run to determine the effect of isolating the CCP Heat Exchangers and Radwaste Building Chillers on Case-4 line-up. Results revealed that the HVK re-circulation pump reaches the run-out value; this is due to the NSW pump not being able to provide sufficient flow for this component line-up. In the next model run, the CCS Heat Exchangers were put back into operation; the results show that the HVK re-circulation pump operated in the normal range.

It is concluded that the NSW pump should be operated around 40,000 to 42,000 gpm to ensure that all of the components receive sufficient flow.

Case-5 or Case-6 is the recommended component line-up. The only safety-related components that do not receive design flow are the HPCS Diesel Generator, the SFC Heat Exchangers and the RHR Pump Seal Coolers. These components have been analyzed in Calculation G13.18.4.0*048 for a flow rate of less than the documented 781 gpm, 1,595 gpm and 14 gpm, respectively.

With the correct component line-up, one NSW pump will be able to provide sufficient flow through the required components for reactor shutdown in the case of fire in Area PT-1.


REFERENCE PERFORMANCE CURVE
REF.
CURVE NO.
CURVE NO.

CALCULATION CHECKLIST

YES	NO	N/A	FORMAT	EDP-AA-20 SECTION
X			Cover Page completed.	6.4.1
X			Table of Contents completed (as required).	6.4.2
X			Revision History Sheet completed (as required).	6.4.3
X			Revisions are identified with revision lines in right margin.	6.4.3
X			Applicable Documents Page completed.	6.4.4
X			Definitions established (as required).	6.4.5
X			Calculation/revision/addendum/page numbers are identified correctly.	6.4.90
			CONTENTS	
X			Previous calculation for the required analysis exists.	6.3
X			Calculation is appropriately titled for the intended scope.	6.4.1-2
X			Purpose and scope are clearly and adequately established.	6.4.1-6, 7.1
X			Safety classification is correct for the identified scope.	6.4.1-5
X			Topics/documents/equipment for cross-reference/retrieval are identified.	6.4.1-11
X			Calculation is clear and comprehensible.	6.1
X			Applicable codes, standards, etc. are identified.	6.4.4-2
X			RBS references are identified.	6.4.4-2
X			Affected documents are identified	6.4.4-2
X			Inputs and sources are identified, appropriate, and correct.	7.2.2-1
X			Assumptions are identified and appropriate.	7.2.2-2
X			Inputs derived from field walkdown have been witnessed/verified	7.2.2-5
		X	Engineering judgments are identified and appropriate.	7.2.2-6
		X	Calculation methodology is identified and supported by technical bases.	7.2.3
X			Conclusion is appropriate and is justified by calculation.	7.3
X			Confirmations are identified and indicated as required on Cover Page.	7.5.7
X			Directions for Confirmations are included.	7.5.8-3
X			Calculation data is appropriately included, attached, or referenced.	7.4
		X	Programs and software are identified and have been verified and validated.	8.0
X			Methods/calculations use to check results are identified and included.	
X			Results are accurate and in accordance with the established methodology.	
	X		Certification by Professional Engineer is required.	11.7
			VENDOR CALCULATIONS	
		X	Calculation is performed in accordance with EDP-AA-20.	10.2
		X	Calculation content and format are acceptable.	10.2
		X	Vendor, preparer, reviewer, and approver are clearly identified.	10.3
X			Design verification review has been completed (as applicable).	

Design Verification Record

Document Number: G13.18.4.6-011 Revision: 0

DESIGN VERIFICATION RECORD

METHOD

Verification methods to be used:

__x__ Design Review
____ Qualification Testing
____ Alternate Calculations

DOCUMENT(S) REVIEWED: (Attach Additional Sheet(s), if needed)

Document Number	Revision	Document Title

SUMMARY OF REVIEW: (Attach Additional Sheet(s), if needed)

Design Verification Completed By: N/R Date:

Comment Resolutions Accepted By: N/R Date:

Engineering Supervisor: N/R Date:

ENTERGY	CALCULATION COVER PAGE ENGINEERING DEPARTMENT RIVER BEND STATION	CALC. NO. - REV. ADDENDUM G13.18.4.6*011, Rev. 0 ATTACHMENT No. : N/A JBI NO. G13.18.4.6 PAGE 261 OF 261

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CMNT No.	Coment	Resolution	ACPT Y/N	INIT/DATE