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SUBJECT: Submits response to questions raised on validation of DAPPER loadflow program against measurements taken at plant.

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April 23, 1996

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
DAPPER Load Flow Validation

Reference: 1) Letter from M. L. Marchi (WPSC) to Document Control Desk (NRC) dated September 27, 1995

During the February 15, 1996 phone call in regard to Reference 1 between Gary Harrington and Dave Will of WPSC and Rich Laufer and Peter Kang of NRC, two questions were raised on our Validation of the DAPPER Loadflow program against measurements taken at KNPP.

1) Why are the bus 6 results better than bus 5?

2) PSB1 calls for the measured versus calculated voltages to be within 3% of each other. It also assumes that the measured load data will be input to the program to calculate the bus voltages. In our initial response, we did not do that. We simply compared our calculated to measured currents and voltages. They asked if we could rerun the program as assumed for PSB1.

Response

1) Bus 6 results were better than bus 5 simply because the plant conditions at the time our measurements were taken were closer to the loadflow model assumptions on bus 6 than on bus 5. For example, the 125 horsepower charging pump C was assumed to be running on bus 52 but was actually off during the measurements. The heavier load overestimations of the model on bus 52 resulted in a larger calculated voltage drop on Station Service Transformer 52 and thus a lower bus 52 voltage.

2) The DAPPER loadflow model has been rerun as requested. The results have been tabulated on the attached table labelled "Calculated Vs. Measured Safeguards Bus Voltages and Currents, Adjusted - 1995". An error was noticed in the original table. The bus 5 measured current was shown as 140 Amperes. An updated copy of the original table is attached with the corrected value of 173 Amperes. The sum of the individual breaker ammeter readings gave the 140A value, however, the feeder breaker ammeter reading indicated 173A. The bus 51 and 52 ammeter is believed to be reading about 30A low, so the bus 5 ammeter reading is now shown as the measured value. The results show good agreement between calculated and measured voltages with a maximum error of 1.4%, well within the 3% criteria of PSB1. (NOTE: The DAPPER rerun, table revision, and this writeup took about 15 manhours)

If you have any questions or need additional information, please contact Mr. David Will at (414) 388-2560, extension 2244.

Sincerely,

Mark L. Marchi
Manager-Nuclear Business Group

DJW/jmf

Attach.

cc - US NRC Region III
US NRC Senior Resident Inspector

CALCULATED VS. MEASURED SFGDS BUS VOLTAGES AND CURRENTS, ADJUSTED-1995

	Voltages (in Volts)		Ratio		Currents (in Amperes)		Ratio	
Bus Name	Calculated	Measured	Calc/Measured		Calculated	Measured	Calc/Measured	
5	4236	4224	1.003		172	173	0.99	(see **)
51	492	493	0.998		111	77	1.44	(see **)
52	488	492	0.992		(see *)	(see *)	(see *)	
MCC 52A	488	487.3	1.001		45	45.1	1.00	
MCC 52B	487	488.5	0.997		35	35.4	0.99	
MCC 52C	487	486.9	1.000		51	48.7	1.05	
MCC 52D	487	486.6	1.001		23	22.6	1.02	
MCC 52E	487	487.6	0.999		86	86	1.00	
MCC 52F	485	484.7	1.001		94	94.4	1.00	
MCC 5262	488	487.6	1.001		0	0.35	0.00	
BRA-105	211	210	1.005		6	5.94	1.01	
6	4265	4265	1.000		132	134	0.99	
61	501	501	1.000		69	68	1.01	
62	495	497	0.996		(see *)	(see *)	(see *)	
MCC 62A	495	494.6	1.001		19	18.9	1.01	
MCC 62B	495	492.4	1.005		0	0.82	0.00	
MCC 62C	495	492.1	1.006		57	55.7	1.02	
MCC 62D	495	493.5	1.003		5	5.14	0.97	
MCC 62E	494	493.1	1.002		121	122	0.99	
MCC 62G	506	499	1.014		226	222.8	1.01	
MCC 62H	495	NA	NA		2	NA	NA	
MCC 62J	495	494.7	1.001		21	21	1.00	
BRB-105	214	211.3	1.013		4	4.26	0.94	

*Current values are for bus 51&52 combined and for bus 61&62 combined due to single ammeter.

**Bus 51 and 52 ammeter may read 30A low (or Bus 5 ammeter 30A high).

CALCULATED VERSUS MEASURED SAFEGUARDS BUS VOLTAGES AND CURRENTS-1995

	Voltages (in Volts)		Ratio		Currents (in Amperes)		Ratio	
Bus Name	Calculated	Measured	Calc/Measured		Calculated	Measured	Calc/Measured	
5	4236	4224	1.003		249	173	1.44	
51	494	493	1.002	(see **)	151	77	1.96	(see **)
52	475	492	0.965		(see *)	(see *)	(see *)	
MCC 52A	474	487.3	0.973		44	45.1	0.98	
MCC 52B	472	488.5	0.966		123	35.4	3.47	
MCC 52C	473	486.9	0.971		97	48.7	1.99	
MCC 52D	474	486.6	0.974		36	22.6	1.59	
MCC 52E	473	487.6	0.970		150	86	1.74	
MCC 52F	471	484.7	0.972		135	94.4	1.43	
MCC 5262	474	487.6	0.972		74	0.35	211.43	
BRA-105	202	210	0.962	(see ***)	112	5.94	18.86	(see ***)
6	4277	4265	1.003		239	134	1.78	
61	492	501	0.982	(see **)	143	68	2.10	(see **)
62	492	497	0.990		(see *)	(see *)	(see *)	
MCC 62A	491	494.6	0.993		27	18.9	1.43	
MCC 62B	492	492.4	0.999		0	0.82	0.00	
MCC 62C	490	492.1	0.996		155	55.7	2.78	
MCC 62D	490	493.5	0.993		31	5.14	6.03	
MCC 62E	490	493.1	0.994		193	122	1.58	
MCC 62G	502	499	1.006		241	222.8	1.08	
MCC 62H	491	NA	NA		2	NA	NA	
MCC 62J	491	494.7	0.993		26	21	1.24	
BRB-105	208	211.3	0.984	(see ***)	150	4.26	35.21	(see ***)

*Current values are for bus 51&52 combined and for bus 61&62 combined due to single ammeter.

**A 250 Hp CC Pump was assumed on for bus 61 and off for bus 51. The opposite occurred.

***A Design Change has removed load from these panels.