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FACIL:50-250 Turkey Point Plant, Unit 3, Florida Power and Light C 05000250
50-251 Turkey Point Plant, Unit 4, Florida Power and Light C 05000251
AUTH.NAME AUTHOR AFFILIATION
UHRIG,R.E. Florida Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Forwards response to NRC 820211 request for addl info re
NUREG-0737, Item II.K.3.2, safety effect of power operated
relief valve isolation sys. List of event tree initiating
events considered included.

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TITLE: Response to NUREG -0737/NUREG-0660 TMI Action Plan Rgmts (OL's)

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1. The first part of the report is a general statement of the purpose and scope of the study. It is followed by a brief review of the literature on the subject.

2. The second part of the report is a description of the methods used in the study. This includes a description of the subjects, the materials, and the procedures.

3. The third part of the report is a presentation of the results. This is followed by a discussion of the results and their implications.

4. The fourth part of the report is a conclusion. This is followed by a list of references.

The purpose of this study was to determine the effect of the independent variable on the dependent variable. The scope of the study was limited to the following conditions:

1. The subjects were all male college students.

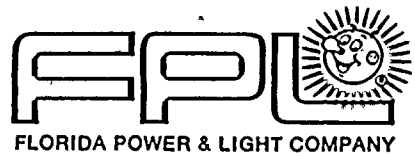
2. The materials were all standard.

3. The procedures were all standardized.

The results of the study showed that the independent variable had a significant effect on the dependent variable. The implications of these results are discussed in the following section.

1.

Independent Variable		Dependent Variable		Control Variable	
Level	Mean	Level	Mean	Level	Mean
1	1.5	1	1.5	1	1.5
2	2.0	2	2.0	2	2.0
3	2.5	3	2.5	3	2.5
4	3.0	4	3.0	4	3.0
5	3.5	5	3.5	5	3.5
6	4.0	6	4.0	6	4.0
7	4.5	7	4.5	7	4.5
8	5.0	8	5.0	8	5.0
9	5.5	9	5.5	9	5.5
10	6.0	10	6.0	10	6.0
11	6.5	11	6.5	11	6.5
12	7.0	12	7.0	12	7.0
13	7.5	13	7.5	13	7.5
14	8.0	14	8.0	14	8.0
15	8.5	15	8.5	15	8.5
16	9.0	16	9.0	16	9.0
17	9.5	17	9.5	17	9.5
18	10.0	18	10.0	18	10.0
19	10.5	19	10.5	19	10.5
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25	13.5	25	13.5	25	13.5
26	14.0	26	14.0	26	14.0
27	14.5	27	14.5	27	14.5
28	15.0	28	15.0	28	15.0
29	15.5	29	15.5	29	15.5
30	16.0	30	16.0	30	16.0
31	16.5	31	16.5	31	16.5
32	17.0	32	17.0	32	17.0
33	17.5	33	17.5	33	17.5
34	18.0	34	18.0	34	18.0
35	18.5	35	18.5	35	18.5
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37	19.5	37	19.5	37	19.5
38	20.0	38	20.0	38	20.0
39	20.5	39	20.5	39	20.5
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96	49.0	96	49.0	96	49.0
97	49.5	97	49.5	97	49.5
98	50.0	98	50.0	98	50.0
99	50.5	99	50.5	99	50.5
100	51.0	100	51.0	100	51.0



March 26, 1982
L-82-118

Office of Nuclear Reactor Regulation
Attention: Mr. Steven A. Varga, Chief
Operating Reactors Branch #1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Varga:

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 & 50-251
Post-TMI Requirements
NUREG-0737 Item II.K.3.2



Attached is our response to your request for additional information concerning NUREG-0737 Item II.K.3.2 which is contained in your letter of February 11, 1982. We trust that this additional information will allow you to complete your evaluation of this item with respect to Turkey Point Units 3 and 4.

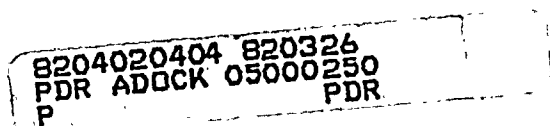
Very truly yours,

Robert E. Uhrig
Vice President
Advanced Systems & Technology

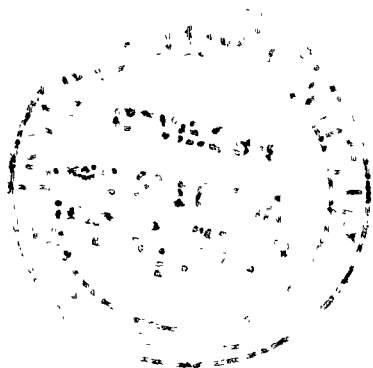
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Attachment

cc: J.P. O'Reilly, Region II
Harold F. Reis, Esquire



A046
S/11



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ATTACHMENT

Re: Turkey Point Units 3 & 4
Docket Nos. 50-250 and 50-251
Post-TMI Requirements
NUREG-0737 ITEM II.K.3.2

1. A calculation of safety valve failure rates based on past histories of the operating plants designed by the NSSS vendors.

As discussed in WCAP-9804, Appendix II, no attempt was made to identify a safety valve failure probability based on actual demand. The lack of sufficient data precludes a statistical approach. This was recognized in both the WASH-1400 and EPRI NP-801 studies which used an "engineering estimate" for the safety valve failure rate. These studies also used the PORV failure probability value for that of the safety valve. Indeed, when one considers the ASME code requirements, the strict adherence to quality assurance specifications (i.e., Appendix B to 10 CFR 50), the design and manufacture of the safety valve, it may be surmised that the PORV failure rate is overly conservative when applied to the safety valve.

2. An analysis of the probability of a small-break LOCA caused by a stuck-open safety valve using the safety valve failure rate calculated in Question 1. Since operating data indicate that some plants operate with the block valve shut and others block all PORV's some of the time, the analysis provided should account for the additional challenges to the safety valves when PORV(s) are blocked intentionally.

The sensitivity analyses as presented in Tables 3.9 and 3.10 do account for the additional challenges to the safety valves when the PORV's are intentionally blocked. The values of 10, 55 (baseline), and 90 percent for PORV isolation were used to gain insight into the range of safety valve failure frequency obtainable. The frequency of a safety valve failing open did increase (from a total of $.31\text{E-}05$ to $.15\text{E-}04$ total) over the range from 10 to 90 percent.

3. Further clarification of the sources and the method used to determine the initiator event frequencies. Specifically, describe why only 16 transient initiators are considered in the Westinghouse generic report. Describe the method used to group the transient initiators and to arrive at the resultant frequencies.

As discussed in Section 3.1, the transients chosen as initiating events are only those transients which have the potential for opening the PORV; i.e., while the EPRI NP-801 study uses 41 transient initiators, not all would lead to PORV lifting. Additionally, the system response to certain transients is similar and permits enveloping analyses. For example, the loss of main feedwater event (transient number T1) envelopes 10 of the EPRI stated events.



1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that proper record-keeping is essential for the integrity of the financial system and for the ability to detect and prevent fraud. The document also notes that accurate records are necessary for the preparation of financial statements and for the calculation of taxes.

2. The second part of the document describes the various methods used to collect and analyze data. It includes a detailed discussion of the different types of data that can be collected, such as financial data, operational data, and customer data. It also discusses the various techniques used to analyze this data, including statistical analysis, data mining, and machine learning.

3. The third part of the document discusses the importance of data security and privacy. It notes that as the amount of data collected and analyzed increases, the risk of data breaches and privacy violations also increases. Therefore, it is essential to implement strong security measures to protect data from unauthorized access and to ensure that data is used in a responsible and ethical manner.

4. The fourth part of the document discusses the importance of data quality. It notes that data that is inaccurate, incomplete, or inconsistent can lead to incorrect conclusions and decisions. Therefore, it is essential to implement measures to ensure that data is accurate, complete, and consistent. This includes implementing data validation rules, performing regular data audits, and ensuring that data is updated in a timely manner.

5. The fifth part of the document discusses the importance of data governance. It notes that data governance is the process of managing data as an organizational asset. It includes the development of policies and procedures for data collection, storage, use, and disposal. It also includes the implementation of controls to ensure that data is managed in a responsible and ethical manner.

6. The sixth part of the document discusses the importance of data literacy. It notes that as the amount of data collected and analyzed increases, the need for data literacy also increases. Data literacy is the ability to understand and use data effectively. It includes the ability to collect, analyze, and interpret data, as well as the ability to communicate data in a clear and concise manner.

7. The seventh part of the document discusses the importance of data innovation. It notes that data innovation is the process of using data to create new products, services, and business models. It includes the development of new data collection and analysis techniques, as well as the development of new data-driven products and services.

8. The eighth part of the document discusses the importance of data ethics. It notes that data ethics is the study of the moral principles that govern the use of data. It includes the development of guidelines and standards for the ethical use of data, as well as the implementation of controls to ensure that data is used in a responsible and ethical manner.

9. The ninth part of the document discusses the importance of data transparency. It notes that data transparency is the process of making data accessible and understandable to all stakeholders. It includes the development of policies and procedures for data transparency, as well as the implementation of controls to ensure that data is transparent and accessible.

10. The tenth part of the document discusses the importance of data collaboration. It notes that data collaboration is the process of sharing data and knowledge between different organizations. It includes the development of policies and procedures for data collaboration, as well as the implementation of controls to ensure that data is shared in a responsible and ethical manner.

The source used to determine the event frequencies was EPRI report NP-801 where applicable. Those events not covered by EPRI were determined through conservative engineering judgment and used as a basis WASH-1400 or other ongoing studies (i.e., Indian Point/Zion).

The following table gives the source for each event frequency considered (EPRI events are listed by number):

EVENT TREE INITIATING EVENTS CONSIDERED

<u>Transient Number</u>	<u>Transient Name</u>	<u>Source of Event Frequency</u>
T1	Loss of main feedwater, offsite power available	*Conservative Engineering Judgment
T2	Loss of main feedwater due to and coincident with loss of offsite A/C Power	EPRI-35
T3	Loss of main feedwater coincident with loss of all A/C power	Conservative Engineering Judgment
T4	Turbine trip	EPRI-33
T5	Large load rejection without turbine trip	Conservative Engineering Judgment
T6	MSIV closure - all loops	EPRI-18
T7A	Inadvertent safety injection - high head plants**	EPRI-9
T7B	Inadvertent safety injection - low head plants**	
T8	Main feedline rupture	Conservative Engineering Judgment
T9A	Main steamline rupture - high head plants**	
T9B	Main steamline rupture - low head plants**	
T10	CVCS malfunction resulting in power increase	EPRI-11

*Combination of EPRI 15, 16, 21, 22, 23, 24, 26, 27, 28, 29 transients

** High head plants are those with SI pumps capable of challenging the PORV's. Low head plants are the others.

1. The first part of the report deals with the general situation of the country and the progress of the work during the year.

2. The second part of the report deals with the results of the work during the year and the progress of the work during the year.

3. The third part of the report deals with the results of the work during the year and the progress of the work during the year.

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13. The thirteenth part of the report deals with the results of the work during the year and the progress of the work during the year.

14. The fourteenth part of the report deals with the results of the work during the year and the progress of the work during the year.

15. The fifteenth part of the report deals with the results of the work during the year and the progress of the work during the year.

EVENT TREE INITIATING EVENTS CONSIDERED
(cont'd)

<u>Transient Name</u>	<u>Transient Name</u>	<u>Source of Event Frequency</u>
T11	Partial loss of reactor coolant flow (1 loop)	EPRI-1
T12	Complete loss of reactor coolant flow	EPRI-14
T13	Locked (or sheared) reactor coolant pump rotor	Conservative Engineering Judgment
T14	Uncontrolled bank withdrawal resulting in power increase	EPRI-2
T15	Inadvertent PORV opening	EPRI-8
T16	Excessive steam generator tube leakage or tube rupture	EPRI-26

4. A justified estimate of how many multiple PORV openings per transient could be expanded with each initiator event.

The available data is insufficient to warrant calculation of the number of multiple openings for each initiator event. As discussed, the survey data is considered to be essentially complete only for those transients occurring after the issuance of Reference 7. An approximation of multiple PORV openings based on all transient initiators is discussed in the report.

5. An explanation of the analysis yielding the PORV failure rate of 1×10^{-3} per demand.

As stated in WCAP-9804, WASH-1400 (Reference 4 rather than Reference 3) estimates the probability of a PORV failing to reclose on demand to be approximately 10^{-2} , with lower and upper bounds of 10^{-3} and 10^{-1} , respectively. WASH-1400 treats these estimates as the median 5th and 95th percentiles of a lognormal distribution. Given the domestic Westinghouse data presented in Appendix 1 of WCAP-9804, the WASH-1400 distribution can be updated by applying Bayesian techniques. Statistical analysis yields a median estimate of approximately 10^{-3} per demand, which is the value used in the Westinghouse analysis.

6. Show that the assumptions made and credits taken for plant reconfigurations and non-design improvements in the Westinghouse generic report are appropriate for TP-3 and TP-4.

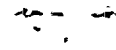
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The information provided to Westinghouse by the utility pertaining to plant reconfigurations and non-design improvements is reflected in Table 1.3. The effects on the study due to these changes is discussed in Sections 3.4.2 and 3.4.3 with the conclusions given in Section 4.0.



1. The first part of the document is a list of names and dates. The names are: John Doe, Jane Smith, and Bob Johnson. The dates are: 1/1/1980, 2/1/1980, and 3/1/1980.

2. The second part of the document is a list of names and dates. The names are: John Doe, Jane Smith, and Bob Johnson. The dates are: 1/1/1980, 2/1/1980, and 3/1/1980.

3. The third part of the document is a list of names and dates. The names are: John Doe, Jane Smith, and Bob Johnson. The dates are: 1/1/1980, 2/1/1980, and 3/1/1980.