VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

June 9, 2003

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

Serial No. 03-150A
SPSLIC/CGL R3
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
PROPOSED TECHNICAL SPECIFICATIONS CHANGE
BURIED FUEL OIL STORAGE TANK INSPECTION AND RELATED REPAIR
REQUEST FOR ADDITIONAL INFORMATION

In a letter dated September 5, 2002 (Serial No. 02-561), Virginia Electric and Power Company (Dominion) requested changes to the Surry Power Station Units 1 and 2 Technical Specifications (TSs). These changes include the addition of a 7-day allowed outage time for a buried fuel oil storage tank to permit the inspection and, if necessary, related repair of the tank during plant operation. Subsequently, in a letter dated April 16, 2003 (Serial No. 03-150), Dominion provided responses to an NRC request for additional information (RAI) regarding the proposed TS change. During staff review of the RAI response, the NRC determined that additional information was necessary to complete their review. A conference call was held on April 30, 2003, to discuss the additional questions. At the conclusion of the conference call, Dominion agreed to provide a written response to the NRC's additional RAI, and this response is provided in the attachment. We have evaluated the proposed TS change previously submitted with respect to the supplemental information provided herein and have determined that the supplemental information does not require revision of the No Significant Hazards Consideration or Environmental Assessment provided in our September 5, 2002 submittal.

If you have any further questions or require additional information, please contact Mr. Gary D. Miller at (804) 273-2771.

Very truly yours,

Leslie N. Hartz
Vice President – Nuclear Engineering

Attachment

A001

Commitments made in this letter:

1. The implementing procedure(s) for buried fuel oil tank inspection activities will specify that arrival of the first tanker truck will be within 12 hours following identification of the need for the offsite replacement fuel oil.

2. The implementing procedure(s) for buried fuel oil tank inspection activities will specify that the out-of-service tank will be returned to an available status in an expeditious manner, if a hurricane or severe thunderstorm/tornado condition is impending or in the event that EDG operation is required while a buried tank is out of service.

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SN: 03-150A
Docket Nos.: 50-280/281
Subject: RAI – Proposed TS Change
Buried Fuel Oil Storage Tank Inspection & Related Repair

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Leslie N. Hartz, who is Vice President - Nuclear Engineering, of Virginia Electric and Power Company. She has affirmed before me that she is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of her knowledge and belief.

Acknowledged before me this 9th day of June, 2003.

My Commission Expires: March 31, 2004.

Maggie McClure
Notary Public

(SEAL)

ATTACHMENT

Response to NRC Request for Additional Information -
Proposed Technical Specifications Change Request
Buried Fuel Oil Storage Tank Inspection/Repair

Including Figure 1 – Time Line and
Appendix A – EDG Fault Tree Excerpts

Surry Power Station Units 1 and 2
Virginia Electric and Power Company
(Dominion)

1. *The information that was requested in Q3 is critical in determining how much time is available for the licensee to obtain off-site fuel oil and refill the only remaining safety-related, seismic, Category 1 storage tank before the 17,500 gallons is depleted. Therefore a more complete response to the specific question that was asked is required in order to judge whether or not a 48 hour delivery contingency is appropriate for their specific situation. I only consider 17,500 gallons of fuel oil to be available because it is the only seismic, Category 1, safety-related source of fuel oil. The other sources that are discussed are good to know about, but they cannot be relied upon for the worst case scenarios that must be considered. The licensee needs to determine how much time they have available for getting more fuel oil to the site (including how much time is needed to begin filling the tank), and this is the time that should be proposed in the submittal (48 hours may not be appropriate).*

The following discussion demonstrates that the proposed TS change, along with clarifying committed actions contained in this letter, ensures the availability of sufficient fuel oil to support EDG operation. Figure 1 presents the key elements of the time line, which are discussed in the following paragraphs.

With one buried fuel oil tank taken out of service for inspection, the following TS-required seismic fuel oil sources will be available. The proposed TS 3.16.B.4.b requires $\geq$ 17,500 gallons in the in-service buried fuel oil tank. In addition, the existing TS 3.16.A.1 requires at least 290 gallons of fuel in each EDG's day tank. In the event that emergency power is required, the three EDGs will auto-start and run. For the purposes of addressing the worst case event, full load operation and the associated fuel consumption for the three EDGs is assumed. The minimum TS-required seismic fuel oil volumes will support approximately 29 hours of three EDG full load operation.

In addition to this worst case event, a more realistic event can be defined as one is which the available fuel oil in the seismic tanks is considered, along with estimated EDG loss of offsite power (LOOP) loads and associated fuel consumption for the three EDGs. In this case, the periodic test conducted once a shift verifies a buried fuel oil tank level of 18,000 gallons and a day tank level of 750 gallons for each of the EDGs. This available fuel oil supply will support approximately 40 hours of three EDG LOOP load operation.

Prior to removing a buried fuel oil tank from service for inspection, the proposed TS 3.16.B.4.a requires verification of availability of 50,000 gallons of replacement fuel oil offsite and transportation to deliver that volume of fuel oil within 48 hours. This verification is accomplished by contact from the station with Dominion's Oil Operations and Supply group located at Dominion's Innsbrook Technical Center. If needed, this fuel oil would be delivered by seven tanker trucks each carrying approximately 7,500 gallons from a terminal in Richmond, VA. The fuel oil carried by each tanker truck will support approximately 12 hours of three EDG full load operation (or 15 hours of three EDG LOOP load operation). Upon identification of the need for the offsite replacement fuel oil, the Oil Operations

and Supply group would be contacted a second time to initiate the delivery. Arrival of the first tanker truck onsite will be within 12 hours following notification of need. This delivery time commitment will be specified in the implementing procedure(s) for the buried fuel oil tank inspection activities. Upon arrival of a tanker truck onsite, necessary fuel oil testing for immediate acceptance criteria and tanker off-load could be completed within 3 hours (i.e., completion of testing within 2 hours and gravity feed to the buried fuel oil tank within 1 hour). Thus, the initial delivery of fuel oil would be available for use within 15 hours, and the delivery of the total 50,000 gallons will be complete within 48 hours as required by the proposed TS 3.16.B.4.a.

As noted in our April 16, 2003 letter, it is anticipated that the out-of-service buried fuel oil tank could be refilled and available within 12 hours. This 12-hour time frame assumes up to 8 hours to complete the activities identified in our letter, up to 2 hours to gravity fill the buried fuel oil tank from the above ground fuel oil storage tank, and an additional two hours for conservatism. In the event that the above ground tank is not available, the fuel oil from a tanker truck would be gravity fed to the buried fuel oil tank.

Another key consideration in the worst case event is the time for recovery of a LOOP event. Based on documented historical data through the year 1999, 57% of LOOP events are recovered within 1 hour and 98% are recovered within 25 hours, which is less than the worst case fuel depletion time of approximately 29 hours. This focus on a LOOP event is appropriate since, as indicated in our April 16, 2003 letter, the occurrence of earthquake or LOCA concurrent with a buried FO tank out of service is negligibly small (6E-8/year and 1.8E-8/year, respectively), and concern with respect to a severe weather event is essentially eliminated based on either predictability of the occurrence or the ability to return the out-of-service tank to available status.

2. *The licensee credits availability of fuel oil from Gravel Neck, but provides no information to demonstrate that this source is at all viable following a tornado or hurricane given the proximity of Gravel Neck to the Surry station. If there is more information in this regard, it should be provided. This source is not seismic, Category 1, safety-related and (as stated above) cannot be relied upon for certain event scenarios.*

Although the Gravel Neck fuel oil supply is not a seismic, safety-related source, it does constitute a third backup source of fuel oil from a defense-in-depth perspective. The backup sources to the seismic, safety-related buried fuel oil tank are 1) the above ground fuel oil storage tank, 2) the offsite replacement supply, and 3) the Gravel Neck supply. Given the proximity of Gravel Neck to Surry, a severe weather event could conceivably affect both locations. However, as stated in our April 16, 2003 letter one of the restrictions that will be exercised with respect to the proposed TS change is that a buried fuel oil tank will not be taken out of service with a severe weather forecast.

3. *In response to Q3, the licensee indicates that "Verification of the offsite replacement fuel supply is required should the above ground tank become inoperable." This is not acceptable. This verification should be performed before the redundant fuel oil tank is taken out of service for the extended maintenance activity and should be included in the list of restrictions/contingency measures. The licensee should also explain in detail how delivery of this offsite source of fuel oil is assured within the allotted time given the conditions that could exist in the vicinity of the site due to postulated hazards, such as earthquake and severe weather conditions (condition of roads for site access, accessibility of fuel oil connection, debris effects, flooding, etc.).*

The proposed TS 3.16.B.4.a requires that "prior to removing the tank from service, verify that 50,000 gallons of replacement fuel oil is available offsite and transportation is available to deliver that volume of fuel oil within 48 hours". The proposed TS change submittal (Serial No. 02-561) did not specifically indicate the rationale for having the offsite replacement fuel supply available, while our April 16, 2003 letter indicated that the reason the offsite supply availability is required is if the above ground tank should become inoperable. The sentence quoted in this question was provided as supplemental information to the proposed TS change requirement and could have been stated as "Prior verification of the offsite replacement fuel supply is required should the above ground tank become inoperable." Because the verification of availability of offsite replacement fuel oil will be a requirement of the TSs, it is not necessary to include it in the list of restrictions/contingency measures, which augments the requirements of the TSs.

As noted above in the response to Question 1, if the offsite replacement fuel supply is needed, it would be obtained through Dominion's Oil Operations and Supply group from a terminal in Richmond, VA. Travel to Surry Power Station from Richmond can be accomplished by diverse routes. The two most common courses of travel are an interstate route north of the James River and a secondary route south of the James River. Thus, there are different travel paths to access Surry from Richmond. These different travel paths do have a common leg, which is the last few miles immediately approaching Surry on Route 650. However, should it be necessary, it is anticipated that this short common distance could be cleared in sufficient time to permit access of a tanker truck.

Even with alternate fuel oil sources at different locations, as stated in our April 16, 2003 letter, one of the restrictions that will be exercised with respect to the proposed TS change is that a buried fuel oil tank will not be taken out of service with a severe weather forecast. In addition, relative to earthquake and as stated above in the response to Question 1, the occurrence of an earthquake concurrent with a buried FO tank being out of service is negligibly small (6E-8/year). Based on these considerations, reliance upon either the offsite replacement supply or the Gravel Neck supply is not expected, however both will be available as backup sources.

4. *The response to Q3 indicates that there is advance warning of approaching hurricanes and severe weather conditions that could result in tornado and/or snow or ice storms. The licensee indicates that a buried fuel oil tank could be returned to service if such impending conditions were to occur. The licensee also indicates that in the event that EDG operation is required while a buried tank is out of service, work on the out-of-service tank will be stopped or completed as appropriate to return the tank to service in an expeditious manner. These are very important considerations and should be included in the list of commitments to state if EDG operation is required or if a hurricane or severe weather is approaching while a buried fuel oil tank is out of service, work on the out of service tank will be stopped or completed as appropriate to return the tank to service in an expeditious manner.*

The implementation actions associated with this proposed TS change will be tracked in the Corrective Action System. These actions specify that the implementing procedure(s) being prepared to perform the tank inspection activities require that work on the out-of-service tank be stopped or completed, as appropriate, to expeditiously return the tank to an available status in the event that EDG operation is anticipated while a buried tank is out of service. This implementation action is being expanded to include an impending hurricane or severe thunderstorm/tornado condition. For this condition, the out-of-service tank will be returned to an available status in an expeditious manner. This implementation action is a commitment and will be specified in the implementing procedure(s) for the buried fuel oil tank inspection activities. The response to Question 1 above discussed the timing for an out-of-service tank to be made available.

5. *The response to Q5 indicated that there were 10 corrective maintenance activities resulting from test demands. Provide the causes for the four occurrences of low flow in the alert range and the one occurrence of low discharge pressure. Were these occurrences due to sludge?*

The documentation of the corrective maintenance activities addressing four occurrences of low flow and one occurrence of low discharge pressure during transfer pump test demands were reviewed. These occurrences were caused by mechanical wear, which resulted in decreasing flow or pressure. None of these occurrences was the result of sludge or sludge-like material.

6. *Regarding the response to Q6, provide additional information with respect to the fire risk that could be introduced due to the inspection activities, such as the use of flammable cleaning agents, weld repair activities, etc. In addition, provide information on how the potential fire risks will be minimized, as well as the references for procedures that will be used to address the potential fire risks.*

The fire risk associated with inspection and any related repair of a buried fuel oil tank will be minimal. After the fuel oil is drained out of the tank, the interior walls of the tank will be cleaned with high pressure water using a sparkless cleaning tool. As noted in our April 16, 2003 letter, it is anticipated that minor sludge accumulation on the tank bottom and minor surface corrosion on the tank walls may be seen. It is expected that the high pressure water will remove any minor surface corrosion. No grinding or welding repair is anticipated. However, if either grinding or welding is required, it would be performed after residual fuel oil is removed by cleaning and any fumes are dissipated, thus minimizing any risk of fire. Nonetheless, any activity that could introduce fire risk will be conducted in accordance with station procedures, including:

- Nuclear Protection Services Administrative Procedure VPAP-2401, titled Fire Protection Program, the purpose of which is to establish guidance for implementation of the fire protection policy and to identify the requirements and personnel responsibilities necessary to protect station structures, systems, and components. This procedure addresses fire-related considerations, such as control of combustibles and ignition sources. A welding and flame permit is required by this procedure for activities such as cutting, grinding, or welding. This permit identifies special precautions and circumstances requiring a fire watch.
- Nuclear Protection Services Administrative Procedure VPAP-1904, titled Confined Space Entry Program, the purpose of which is to establish the requirements, responsibilities, and methodology for confined space entry. Use of a confined space evaluation and entry permit includes testing for a hazardous atmosphere, including flammability.

7. *Provide the procedural references for Surry's 10CFR 50.65 (a)(4) program discussed in the response to Q4.*

The (a)(4) program is jointly owned and implemented by several groups. Operations oversees the risk management process to ensure safe plant operation. Planned maintenance risk is analyzed by Scheduling - Outage and Planning personnel. In the event of an emergent configuration, the Shift Technical Advisors (STAs) perform a reanalysis of risk and support Operations personnel in identifying and implementing risk management actions as needed. The respective implementing procedures for these organizations are as follows:

- Operations Administrative Procedure OPAP-0006, titled Shift Operating Practices, Section 6.13 - Risk Management at Power
- Outage and Planning Administrative Procedure DNAP-2000, titled Dominion Work Management Process, Attachment 7 - On-Line Maintenance Risk Assessment Factors
- Outage and Planning Administrative Procedure PLAP-2000, titled Supplemental Work Management Process, Section 6.13 - On-Line Maintenance Risk Assessment
- Station Safety and Licensing Administrative Procedure SEAP-0002, Shift Technical Advisor, Section 6.6 - Risk Management.

8. *In order to better understand the small risk impact of the proposed TS change, provide the following information:*

   a. *identification of the contribution to total CDF for cutsets involving the EDGs,*

   EDG failures and unavailability, due to any cause, contribute 3.07% of the total CDF.

   b. identification of the contribution to total CDF for LOOP,

   The LOOP event contributes 0.6% of the total CDF. Station blackout events contribute an additional 2.0%.

   c. the fault trees for EDGs including the fuel oil supply, and

   The fault tree for EDG No. 1 is included in Appendix A. It is representative of the trees for EDG Nos. 2 and 3 as well.

   d. discussion of the most important failures that can impact the EDGs including discussion of the reliability of the fuel oil supply system, as well as a description of the PRA model for the EDGs and the fuel oil supply system.

   Emergency Power System and Fuel Oil System Design Overview

   Surry is a two-unit site, and each unit has two emergency 4160 VAC buses. The Emergency Power System consists of three EDGs for the two units. Each EDG has 100% capacity and is connected to independent 4160 VAC buses. The No. 1 EDG and No. 2 EDG provide emergency power (to the H-buses) for Units 1 and 2, respectively. The No. 3 EDG serves as a backup or "swing" diesel (for the J-buses) for either Unit 1 or 2. In addition, the alternate AC (AAC) diesel generator is independent from the EDGs and their fuel source and provides power to one emergency bus on each unit (1J and 2H buses).

   As indicated in our TS change request submittal, each EDG has an independent day tank, which is filled by transferring fuel oil from either one of the two buried fuel oil storage tanks. The buried fuel oil storage tanks are gravity-fed from the above ground fuel oil storage tank. The two buried and one above ground fuel oil storage tanks are common to both units. The buried fuel oil tanks supply the EDG ready and standby fuel oil transfer pumps. Tank 2A supplies EDG ready pumps 1A, 1B, and 1C, while tank 2B supplies standby pumps 1D, 1E, and 1F. Pumps 1D, 1E, and 1F serve as the backup to pumps 1A, 1B, and 1C, respectively. Pumps 1A/1D, 1B/1E, and 1C/1F supply EDGs 1, 2, and 3, respectively. To summarize, each EDG has two independent fuel oil transfer pumps, which will replenish the day tank fuel oil from the underground storage tanks.

Surry PRA Model Overview Relative to EDGs and Fuel Oil System

The Surry PRA model credits the EDGs, as well as their auto-start signal and auto-load function. The EDG day tanks, the fuel oil transfer pumps, and the buried fuel oil tanks are credited. The model does not credit the above ground fuel oil storage tank, the Gravel Neck supply, or the offsite replacement fuel oil supply. These backup fuel oil sources were screened out of the model because the likelihood of their use is very low (i.e., they will not be required during the mission time of any plausible scenario).

Various failures in the fuel oil system can be postulated that could impact the EDGs. The EDG fuel oil supply system can fail due to random or common cause start or run failures of the fuel oil transfer pumps. The pumps can be defeated by random or common cause failures of their discharge check valves. The pumps may be unavailable due to maintenance or failed-open discharge relief valves. The pump strainers may experience plugging failures. The day tanks can fail or be isolated by failures of their fill header solenoid-operated valves or the tank level switches. The underground tanks may be unavailable due to maintenance or random failures. However, as noted in our April 16, 2003 letter, the EDG fuel oil system is subject to various tests and inspections, and it has been highly reliable. Nonetheless, these potential faults and maintenance unavailabilities are included in the PRA model.

Limited Risk Impact of the Proposed TS Change

The LOOP is a minor contributor to plant risk. While the potential frequency for a LOOP event is moderate, the extensive redundancy in the emergency power system and the fuel oil supply system limits the LOOP risk to a very low level. Furthermore and as noted in our April 16, 2003 letter, the buried fuel oil tank inspections will be performed on a frequency of once per 10 years, so the average annual unavailability of a buried fuel oil tank is very small. These various factors contribute to the limited CDF impact of the proposed TS change.

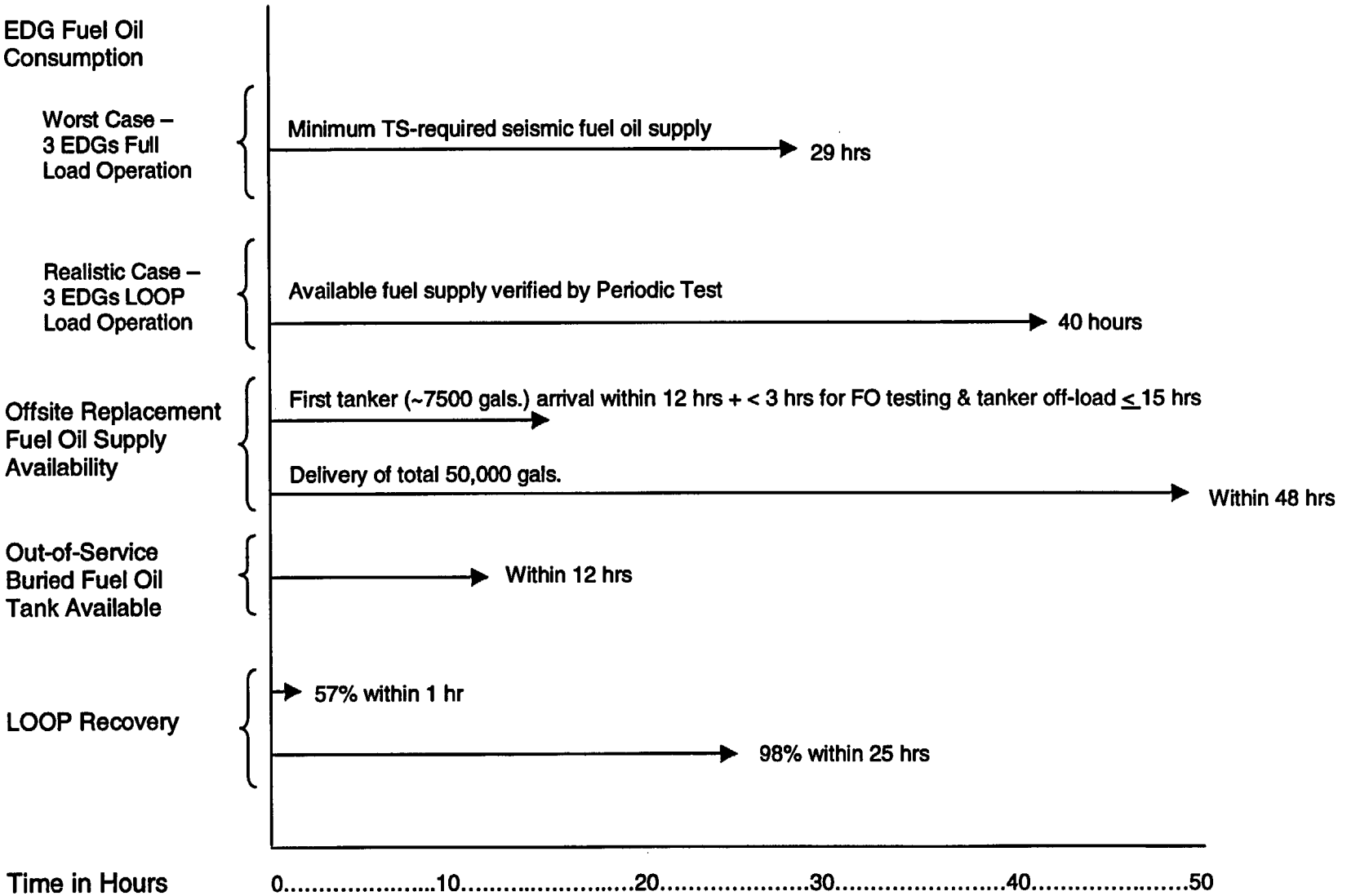
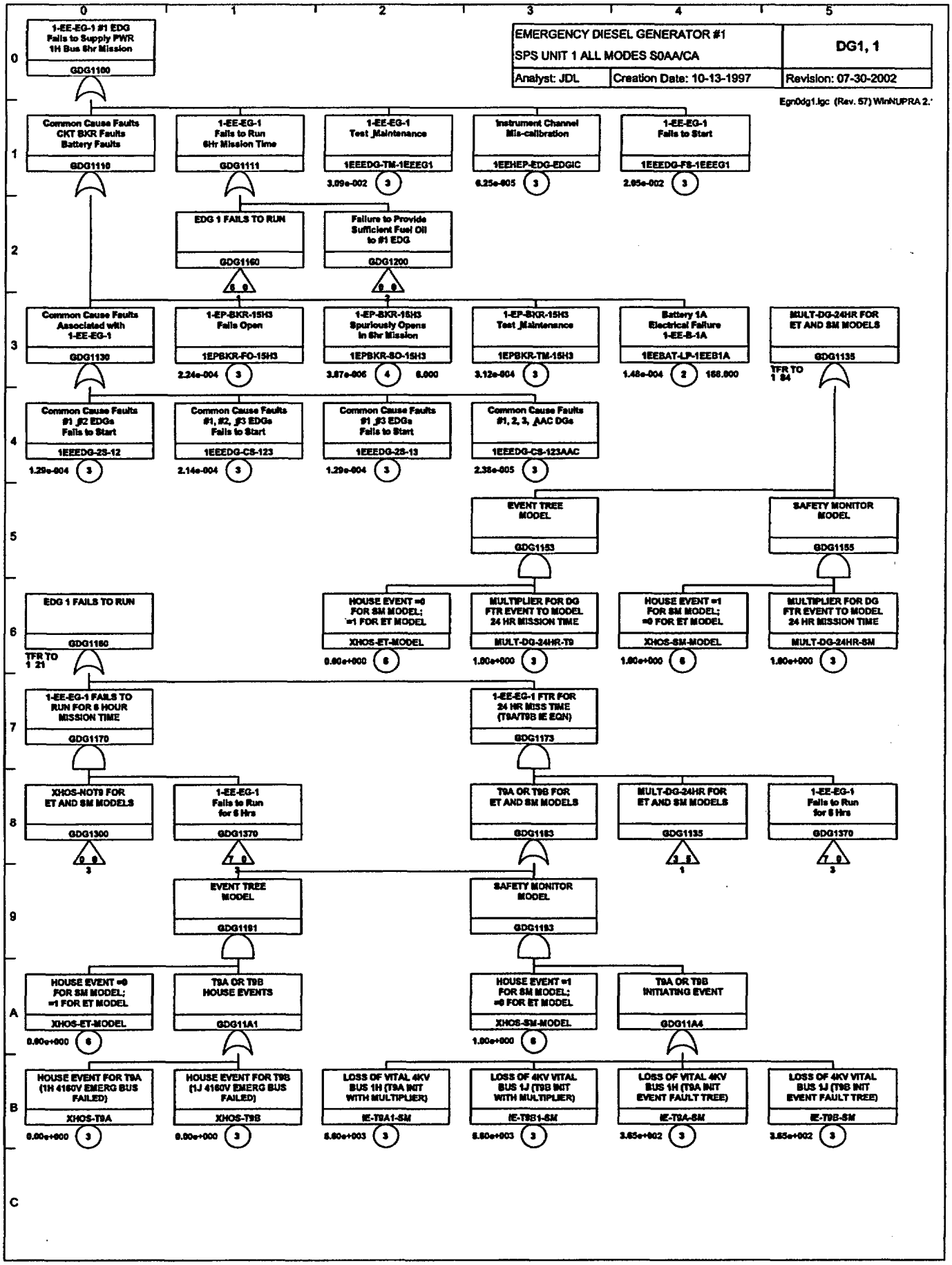
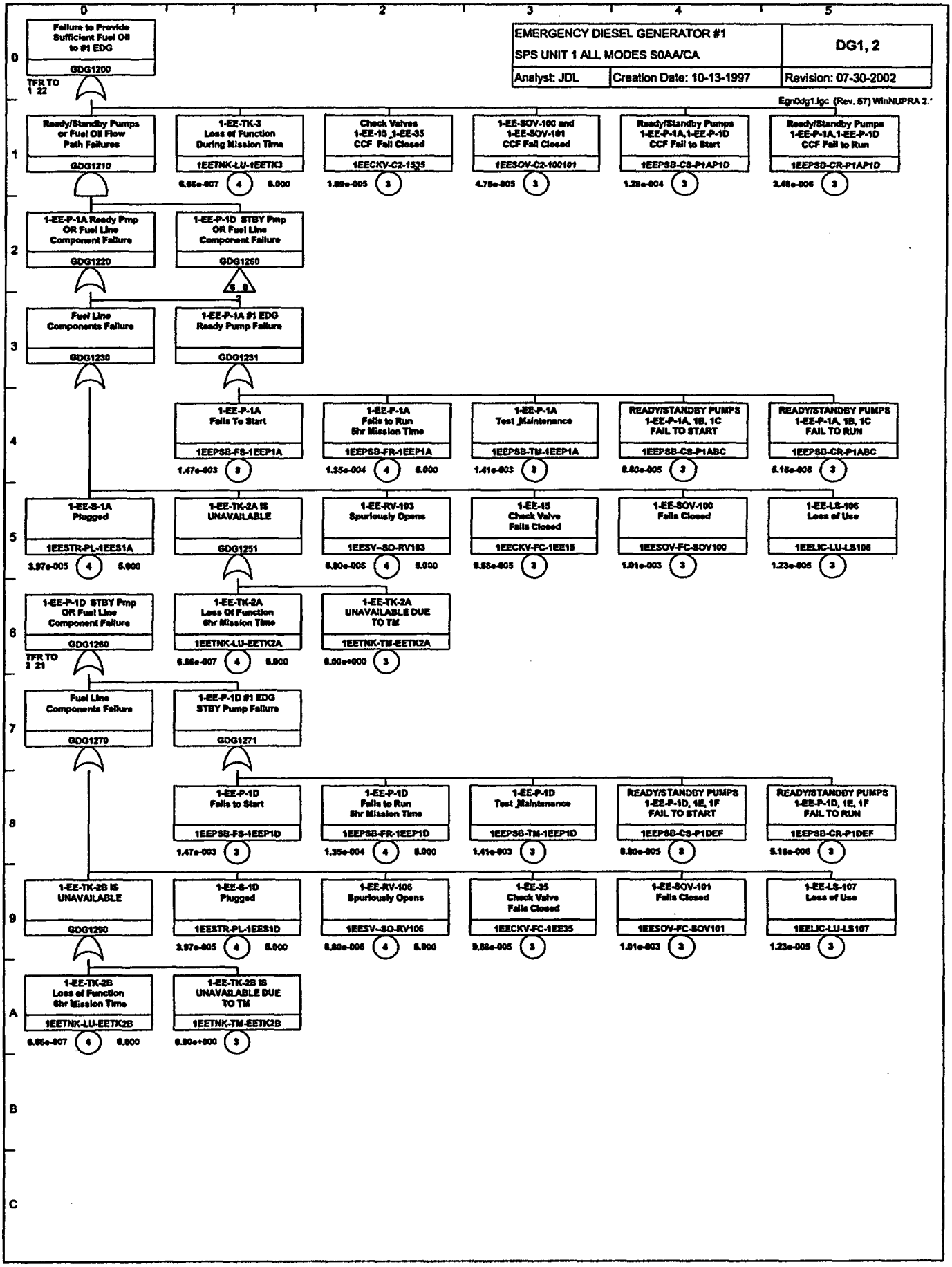


FIGURE 1 – TIME LINE

Appendix A

No. 1 EDG Fault Tree Excerpts from the Surry PRA Model


EMERGENCY DIESEL GENERATOR #1
SPS UNIT 1 ALL MODES S0AA/CA
DG1, 1
Analyst: JDL
Creation Date: 10-13-1997
Revision: 07-30-2002
Egn0dg1.lgc (Rev. 57) WinNUPRA 2.
1-EE-EG-1 #1 EDG Fails to Supply PWR 1H Bus 6hr Mission
GDG1100
Common Cause Faults CKT BKR Faults Battery Faults
GDG1110
1-EE-EG-1 Fails to Run 6Hr Mission Time
GDG1111
1-EE-EG-1 Test _Maintenance
1EEEDG-TM-1EEEG1
3.09e-002
Instrument Channel Mis-calibration
1EEHEP-EDG-EDGIC
6.25e-005
1-EE-EG-1 Fails to Start
1EEEDG-FS-1EEEG1
2.95e-002
EDG 1 FAILS TO RUN
GDG1160
Failure to Provide Sufficient Fuel Oil to #1 EDG
GDG1200
Common Cause Faults Associated with 1-EE-EG-1
GDG1130
1-EP-BKR-15H3 Fails Open
1EPBKR-FO-15H3
2.24e-004
1-EP-BKR-15H3 Spuriously Opens In 6hr Mission
1EPBKR-SO-15H3
3.87e-006
6.000
1-EP-BKR-15H3 Test _Maintenance
1EPBKR-TM-15H3
3.12e-004
Battery 1A Electrical Failure 1-EE-B-1A
1EEBAT-LP-1EEB1A
1.48e-004
168.000
MULT-DG-24HR FOR ET AND SM MODELS
GDG1135
TFR TO 1 84
Common Cause Faults #1 _#2 EDGs Fails to Start
1EEEDG-2S-12
1.29e-004
Common Cause Faults #1, #2, _#3 EDGs Fails to Start
1EEEDG-CS-123
2.14e-004
Common Cause Faults #1 _#3 EDGs Fails to Start
1EEEDG-2S-13
1.29e-004
Common Cause Faults #1, 2, 3, _AAC DGs
1EEEDG-CS-123AAC
2.38e-005
EVENT TREE MODEL
GDG1153
SAFETY MONITOR MODEL
GDG1155
EDG 1 FAILS TO RUN
GDG1160
TFR TO 1 21
HOUSE EVENT =0 FOR SM MODEL; =1 FOR ET MODEL
XHOS-ET-MODEL
0.00e+000
MULTIPLIER FOR DG FTR EVENT TO MODEL 24 HR MISSION TIME
MULT-DG-24HR-T9
1.00e+000
HOUSE EVENT =1 FOR SM MODEL; =0 FOR ET MODEL
XHOS-SM-MODEL
1.00e+000
MULTIPLIER FOR DG FTR EVENT TO MODEL 24 HR MISSION TIME
MULT-DG-24HR-SM
1.00e+000
1-EE-EG-1 FAILS TO RUN FOR 6 HOUR MISSION TIME
GDG1170
1-EE-EG-1 FTR FOR 24 HR MSS TIME (T9A/T9B IE EQN)
GDG1173
XHOS-NOT9 FOR ET AND SM MODELS
GDG1300
1-EE-EG-1 Fails to Run for 6 Hrs
GDG1370
T9A OR T9B FOR ET AND SM MODELS
GDG1183
MULT-DG-24HR FOR ET AND SM MODELS
GDG1135
1-EE-EG-1 Fails to Run for 6 Hrs
GDG1370
EVENT TREE MODEL
GDG1191
SAFETY MONITOR MODEL
GDG1193
HOUSE EVENT =0 FOR SM MODEL; =1 FOR ET MODEL
XHOS-ET-MODEL
0.00e+000
T9A OR T9B HOUSE EVENTS
GDG11A1
HOUSE EVENT =1 FOR SM MODEL; =0 FOR ET MODEL
XHOS-SM-MODEL
1.00e+000
T9A OR T9B INITIATING EVENT
GDG11A4
HOUSE EVENT FOR T9A (1H 4160V EMERG BUS FAILED)
XHOS-T9A
0.00e+000
HOUSE EVENT FOR T9B (1J 4160V EMERG BUS FAILED)
XHOS-T9B
0.00e+000
LOSS OF VITAL 4KV BUS 1H (T9A INIT WITH MULTIPLIER)
IE-T9A1-SM
5.80e+003
LOSS OF 4KV VITAL BUS 1J (T9B INIT WITH MULTIPLIER)
IE-T9B1-SM
5.80e+003
LOSS OF VITAL 4KV BUS 1H (T9A INIT EVENT FAULT TREE)
IE-T9A-SM
3.65e+002
LOSS OF 4KV VITAL BUS 1J (T9B INIT EVENT FAULT TREE)
IE-T9B-SM
3.65e+002


EMERGENCY DIESEL GENERATOR #1
SPS UNIT 1 ALL MODES S0AA/CA
DG1, 2
Analyst: JDL
Creation Date: 10-13-1997
Revision: 07-30-2002
Egn0dg1.fgc (Rev. 57) WinNUPRA 2.
Failure to Provide Sufficient Fuel Oil to #1 EDG
GDG1200
TFR TO 1 22
Ready/Standby Pumps or Fuel Oil Flow Path Failures
GDG1210
1-EE-TK-3 Loss of Function During Mission Time
1EETNK-LU-1EETK3
6.66e-007 4 6.000
Check Valves 1-EE-15 ,1-EE-35 CCF Fail Closed
1EECKV-C2-1535
1.69e-005 3
1-EE-SOV-100 and 1-EE-SOV-101 CCF Fail Closed
1EESOV-C2-100101
4.75e-005 3
Ready/Standby Pumps 1-EE-P-1A,1-EE-P-1D CCF Fail to Start
1EEPSB-CS-P1AP1D
1.28e-004 3
Ready/Standby Pumps 1-EE-P-1A,1-EE-P-1D CCF Fail to Run
1EEPSB-CR-P1AP1D
3.48e-006 3
1-EE-P-1A Ready Pmp OR Fuel Line Component Failure
GDG1220
1-EE-P-1D STBY Pmp OR Fuel Line Component Failure
GDG1260
Fuel Line Components Failure
GDG1230
1-EE-P-1A #1 EDG Ready Pump Failure
GDG1231
1-EE-P-1A Fails To Start
1EEPSB-FS-1EEP1A
1.47e-003 3
1-EE-P-1A Fails to Run 8hr Mission Time
1EEPSB-FR-1EEP1A
1.35e-004 4 6.000
1-EE-P-1A Test /Maintenance
1EEPSB-TM-1EEP1A
1.41e-003 3
READY/STANDBY PUMPS 1-EE-P-1A, 1B, 1C FAIL TO START
1EEPSB-CS-P1ABC
8.80e-005 3
READY/STANDBY PUMPS 1-EE-P-1A, 1B, 1C FAIL TO RUN
1EEPSB-CR-P1ABC
5.16e-006 3
1-EE-S-1A Plugged
1EESTR-PL-1EES1A
3.97e-005 4 6.000
1-EE-TK-2A IS UNAVAILABLE
GDG1251
1-EE-RV-103 Spuriously Opens
1EESV--SO-RV103
6.80e-006 4 6.000
1-EE-15 Check Valve Fails Closed
1EECKV-FC-1EE15
9.58e-005 3
1-EE-SOV-100 Fails Closed
1EESOV-FC-SOV100
1.91e-003 3
1-EE-LS-106 Loss of Use
1EELIC-LU-LS106
1.23e-005 3
1-EE-P-1D STBY Pmp OR Fuel Line Component Failure
GDG1260
TFR TO 2 21
1-EE-TK-2A Loss Of Function 8hr Mission Time
1EETNK-LU-EETK2A
6.66e-007 4 6.000
1-EE-TK-2A UNAVAILABLE DUE TO TM
1EETNK-TM-EETK2A
6.90e+000 3
Fuel Line Components Failure
GDG1270
1-EE-P-1D #1 EDG STBY Pump Failure
GDG1271
1-EE-P-1D Fails to Start
1EEPSB-FS-1EEP1D
1.47e-003 3
1-EE-P-1D Fails to Run 8hr Mission Time
1EEPSB-FR-1EEP1D
1.35e-004 4 6.000
1-EE-P-1D Test /Maintenance
1EEPSB-TM-1EEP1D
1.41e-003 3
READY/STANDBY PUMPS 1-EE-P-1D, 1E, 1F FAIL TO START
1EEPSB-CS-P1DEF
8.80e-005 3
READY/STANDBY PUMPS 1-EE-P-1D, 1E, 1F FAIL TO RUN
1EEPSB-CR-P1DEF
5.16e-006 3
1-EE-TK-2B IS UNAVAILABLE
GDG1290
1-EE-S-1D Plugged
1EESTR-PL-1EES1D
3.97e-005 4 6.000
1-EE-RV-106 Spuriously Opens
1EESV--SO-RV106
6.80e-006 4 6.000
1-EE-35 Check Valve Fails Closed
1EECKV-FC-1EE35
9.58e-005 3
1-EE-SOV-101 Fails Closed
1EESOV-FC-SOV101
1.91e-003 3
1-EE-LS-107 Loss of Use
1EELIC-LU-LS107
1.23e-005 3
1-EE-TK-2B Loss of Function 8hr Mission Time
1EETNK-LU-EETK2B
6.66e-007 4 6.000
1-EE-TK-2B IS UNAVAILABLE DUE TO TM
1EETNK-TM-EETK2B
6.90e+000 3