PROBABILISTIC RISK ASSESSMENT
OF UNIT 1 VITAL BUS TRANSFER SINGLE FAILURE

PURPOSE

Evaluate the risk associated with continuing plant operation with the present vital bus automatic transfer capability. As part of that evaluation, determine the annual probability of core damage and/or containment failure resulting from failures of vital 120 VAC buses 1, 2, 3, 3A, and 4. The evaluation addresses a single failure susceptibility in the 120 VAC system concerning automatic transfer between the two power sources for the Train A vital buses. This single failure susceptibility was identified in the recently completed SONGS 1 emergency core cooling system single failure analysis (Reference 1).

BACKGROUND

Vital buses 1, 2, 3, 3A, and 4 (hereafter referred to as the Train A vital buses) are normally powered through inverters 1, 2, 3, and 4 from DC Bus #1 (Reference 2). Vital 120 VAC buses 5, 6 and the Containment Spray Actuation System (CSAS) inverter bus (hereafter referred to as the Train B vital buses) are normally powered through inverters from DC Bus #2. The vital 120 VAC buses provide power to safety-related and non-safety related instrumentation, control circuits, and solenoid valves.

The vital 120 VAC buses are reliable power sources for essential plant instrumentation and controls. The random failure rate of the vital 120 VAC buses during normal operation is dominated by low probability events such as inverter failures, DC bus failure, and bus shorts.

The Train A vital buses also provide power for unqualified loads for components that are located inside containment or near the main steam/feedwater lines outside containment. A loss of coolant accident (LOCA) or main steam/feedwater line break (MSLB/MFLB) could cause shorting of these environmentally unqualified loads and challenge bus integrity.

The primary power source for the Train A vital buses is DC Bus #1 via four inverters. Each inverter is current limited. Single or multiple shorts on the Train A vital buses can cause a voltage drop on the buses that is sufficient to prevent the protective circuit breakers and fuses on the shorted loads from tripping and isolating the bus from the shorted loads. Upon detection of low voltage on a vital bus, the auto-transfer switch for that bus will rapidly transfer to the backup power source (480 volt motor control center no. 2). The backup power source has sufficient current capacity to trip/isolate the shorted loads on the 120 VAC vital buses.

Although all four Train A vital buses will automatically transfer from the primary to the backup source, the auto-transfer switches for vital buses 1, 2, 3, and 3A are not designed to automatically transfer back to the primary source should the backup source fail. The vital buses can be manually transferred back to their primary source by the operator in the control room.

Table 1 provides a listing of essential ECCS loads supplied from the Train A vital buses. The Train A vital buses may automatically transfer to the backup source during a LOCA or MSLB/MFLB event due to shorts of environmentally unqualified loads. Since the backup source is non-redundant, the ECCS single failure analysis identified the Train A vital buses as non-single failure proof.

This probabilistic risk assessment (PRA) estimates the annual probability of core damage or containment failure occurring during a design basis LOCA, MSLB, or MFLB due to failures of the Train A vital buses. The initiating events for which the Train A vital bus failures were evaluated include large LOCA, small LOCA, MSLB, and MFLB. Conditional loss of off-site power was considered for each of these events.

ASSUMPTIONS

The following assumptions were made in the analysis:

1. The mission time for uninterrupted supply of 120 VAC power from the vital buses is assumed to be 6 hours. After that time, brief losses of power (e.g., for manual retransfer back to the primary source) would be acceptable since all actuation signals and valve positioning operations would have been completed by that time.

2. Each environmentally unqualified load on the vital buses is fed through an individual overcurrent protection breaker and fuse. The protection breaker and fuse design is such that the non-safety related loads are coordinated to isolate on overcurrent without tripping safety-related loads or bus feeder breakers.

   To be of sufficient magnitude to affect the power source, a short circuit must exceed the trip ratings of both the individual load circuit breakers and the bus circuit breaker. The probability of a low voltage protection breaker failing to trip on overcurrent is 4×10^{-4} per demand (Reference 3, page 119). The probability of a low voltage fuse failing to blow on overcurrent is considered to be negligibly low (Reference 4). Therefore, the probability of a shorted load failing to isolate from a 120 VAC vital bus (when connected to its backup power supply) is assumed to be negligible.

3. If multiple, simultaneous shorts were to occur on a 120 VAC vital bus, the bus current may exceed the backup source feeder breaker overcurrent protection limit before the individual load breakers and/or fuses isolate the shorted loads. However, the likelihood of such multiple, simultaneous shorts is assumed to be negligible.

4. Environmentally unqualified loads on the vital 120 VAC buses are assumed to be unaffected by containment conditions following a small LOCA event having a break diameter of 3/8 inch or less.

5. Shorting of environmentally unqualified vital bus loads is assumed to begin within several seconds of a small LOCA, large LOCA, MSLB, or MFLB.

6. Instrumentation and equipment necessary for generation of a safety injection actuation signal or a containment spray actuation signal are powered from the affected Train A vital buses. However, these components are required to operate only for several seconds after a large LOCA or MSLB/MFLB. It is

unlikely that the vital buses would be disabled at such an early point in the accident. The probability of shorts occurring that require bus transfer in the first several seconds is assumed to be 0.01.

The Train B logic was assumed to fail with a probability of 1.0. This assumption results in a large conservatism in the evaluation of safety injection signal (SIS) actuation failure. In any case, the contribution of the SIS actuation failure scenarios to the total core damage probability is negligible.

7. Vital bus 4 is assumed to be adequately protected from failure caused by shorting of environmentally unqualified loads. The inverter for that bus has sufficient capacity to clear faults. The auto-transfer switch for vital bus 4 is also designed to automatically switch back from the backup power source to the primary source upon loss of the backup source.

8. A shorted load on a vital bus is assumed to clear if the bus power supply has sufficient current capacity. Failure to clear a load would require the concurrent failure of two breakers, and in most cases, at least one fuse. The probability of multiple breaker/fuse failures is considered negligible.

9. Vital buses 1, 2, 3, and 3A are each assumed to immediately fail if the associated auto-transfer switch fails to connect the respective bus to its backup source. The bus inverters (the primary power supply) are assumed not to have sufficient current capacity to clear a fault and may fail after a brief time in the current limited condition.

10. Environmentally unqualified loads are assumed to short in a sequential manner throughout the accident. This assumption maximizes the number of demands upon the bus transfer switches. It is also assumed that each transfer switch will be challenged once for every three environmentally unqualified loads on each bus.

11. For small break LOCA scenarios, the operators will have sufficient time to manually initiate safety injection and containment spray to prevent core damage and containment failure. Small LOCAs do not require immediate safety injection system actuation to prevent core damage. Existing operating procedures and operator training provide assurance that these systems would be manually activated in the unlikely event that the automatic initiation circuits fail.

12. Failure to automatically actuate containment spray is assumed to lead to containment failure. This assumption was made even though the SONGS 1 safety analysis demonstrates that the pressure rise in the containment due to failure of containment spray would not be significantly above the design limit. Short-term loss of containment spray is unlikely to result in a loss of containment integrity.

13. Following a small break LOCA, MSLB, or MFLB natural circulation continues in the Reactor Coolant System for a period of 30 minutes. This allows sufficient time for operator action to initiate steam generator makeup via the Auxiliary Feedwater System (AFWS) (i.e., to start the dedicated safe shutdown (DSD) diesel and power AFWS pump G10W from the DSD diesel in the event of a loss of normal power to pump G10W).

14. The following quantities of environmentally unqualified loads are powered from the Train A vital buses:

Vital Bus #1:	2 loads for LOCA 3 loads for MSLB/MFLB
Vital Bus #2:	4 loads for LOCA or MSLB/MFLB
Vital Bus #3: and 3A	6 loads for LOCA 9 loads for MSLB/MFLB

ANALYSIS

The sequences described below were considered for a large and small LOCA, MSLB, and MFLB events. The sequences are based upon the essential ECCS loads fed from the Train A vital buses (Table 1) which potentially may fail during an accident. Each sequence is developed and quantified via an event tree (Figures 1 through 4).

Large LOCA:

LL1: Large LOCA with subsequent SIS and containment spray failure (due to vital bus failure at the start of the accident). Core damage is assumed to occur due to delayed initiation of safety injection flow.

LL2: Large LOCA with high flow containment spray failure caused by closure of valve CV-517 (due to vital bus 3/3A failure) and independent failure of valve CV-518. High flow containment spray is assumed to be required for one hour following a LOCA. This sequence does not result in core damage, but potentially may result in radioactive releases due to containment failure.

LL3: Large LOCA with long-term recirculation cooling failure caused by loss of two of three flow indications of cold leg injection flow rate (due to vital bus 3/3A failure).

Small LOCA:

SL1: Small LOCA with AFWS failure to provide secondary heat removal caused by loss of Train A AFWS (due to loss of vital bus 3/3A) and concurrent failure of the Train B AFWS.

SL2: Small LOCA with long-term recirculation cooling failure due to loss of two of the three cold leg injection flow rate indicators (similar to sequence LL3).

Main Steam Line Break:

MSLB1: MSLB with SIS and containment spray failure at the beginning of the accident (similar to sequence LL1).

MSLB3: MSLB with high-flow containment spray failure (similar to sequence LL2, except that high-flow spray is required for 2 hours post-MSLB).

Main Feedwater Line Break:

MFLB1: MFLB with immediate containment spray failure (similar to the MSLB1 sequence, except that this sequence results only in containment failure).

MFLB2: MFLB with AFWS failure to provide secondary heat removal (similar to sequence MSLB3).

The fault trees developed to support the quantification of the event trees are provided in Figures 5 through 14. The component failure rates used in the fault trees were obtained from the SONGS 1 Partial PRA (Reference 4), except as noted otherwise. The frequency of MSLB and MFLB initiating events were extracted from the Oconee PRA (Reference 5) since those accidents were not analyzed in the SONGS 1 Partial PRA.

RESULTS

The fault trees and event trees for this analysis were solved using the PRA software (REBECA) being used to conduct the SONGS Individual Plant Examinations. Minimal failure combinations (i.e., cutsets) were calculated for each fault tree and event tree sequence. A truncation limit of 1×10^{-8} was used for the solution of each fault tree. A truncation limit of 1×10^{-10} was employed for each event tree sequence.

The results of the quantification of the event trees are provided in Tables 2 through 21. Table 2 summarizes the overall results of the analysis. The annual probability of core damage from failure of the Train A vital buses is estimated to be 5.5×10^{-7}. The annual probability of containment failure, without core damage exceeding design basis, is estimated to be 4.2×10^{-7}. The annual probability of core damage with containment failure is estimated to be 5.8×10^{-8}.

The dominant cutsets contributing to core damage and/or containment failure for each sequence are identified (in order of importance) in Tables 9 though 21. The dominant cutsets leading to core damage are comprised of failures of the vital bus 3 transfer switch and AFWS pump G10W, and failures of diesel generator B and DSD diesel given a loss of off-site power. These cutsets lead to core damage from a failure of AFWS supply to the steam generators. The dominant contributors to containment failure are comprised of failures of diesel generator B given a loss of off-site power leading to containment spray failure.

CONCLUSIONS

This PRA estimates that the annual probability of core damage due to the loss of the Train A vital buses is less than 6×10^{-7} per year. This contribution to the overall core damage frequency (estimated to be approximately 2×10^{-4} per year) is quite low, accounting for less than 0.3% of the total.

The annual probability of containment failure with core damage is estimated to be less than 5×10^{-7} per year. This contribution to design basis containment failure probability (estimated to be 1×10^{-4} per year) is low (0.5%). Also, there is large conservatism in the assumption that failure of containment spray will lead to containment failure.

The annual probability of core damage with containment failure is estimated to be less than 6×10^{-8} per year. This contribution to significant radioactive release probability is less than 6% of the NRC goal of 1×10^{-6} per year. As indicated above, there is large conservatism in the estimation of containment failure probability due to failure of containment spray.

REFERENCES

1. SONGS 1 Emergency Core Cooling System Single Failure Analysis, M41383 Rev. 0.

2. SONGS 1 One-line Diagram 5102174-46.

3. IEEE Std. 500-1984, "IEEE Guide to the Collection and Presentation of Electrical, Electronic, Sensing Component, and Mechanical Equipment Reliability Data for Nuclear-Power Generating Stations," Institute of Electrical and Electronic Engineers, 1983.

4. SONGS 1 Partial PRA, July 1987.

5. NSAC/60, "Oconee PRA, A Probabilistic Risk Assessment of Oconee Unit 3," Nuclear Safety Analysis Center and Duke Power Company, June 1984.

TABLE 1

Critical ECCS Loads on Train A 120 VAC Vital Buses
For First 6 Hours Post-Accident

Vital Bus	Load	Impact of Loss on ECCS Performance
1	PT-430	If lose 2 of 3 channels near front end of large break LOCA or MSLB, then would not get SI in sufficient time if train B SI lost.
1	CV-517	Lose hi flow containment spray for large break LOCA or MSLB during injection mode if CV-518 fails or train B vital 120 VAC buses lost.
1	CS Control A	Lose auto containment spray actuation signal for large break LOCA, MSLB, or MFLB if CS control power B and train B containment spray also lost.
2	PT-431	If lose 2 of 3 channels near front end of large break LOCA or MSLB, then would not get SI in sufficient time if train B SI is lost.
3/3A	PT-432	If lose 2 of 3 channels near front end of large break LOCA or MSLB, then would not get SI in sufficient time if train B SI lost.
3/3A	CS Control B	Lose auto containment spray actuation signal for large break LOCA, MSLB, or MFLB if CS control power A and train B containment spray also lost.
3/3A	FT-2114B/C	Lose 2 of 3 cold leg recirculation flow indicators for large and small break LOCA [note: FT-3114A on train B vital 120 VAC bus 5, however, may need more than one leg of flow indication].
3/3A	AFWAS A	Lose AFW auto-initiate and flow control for small break LOCA, MSLB, and MFLB if AFWAS B on train B vital 120 VAC bus 5 is also lost.

TABLE 1 (continued)

Vital Bus	Load	Impact of Loss on ECCS Performance
4	FY-1115A-F	Lose all cold leg recirculation flow control for large and small break LOCA if train B controllers on CSAS inverters also lost.

TABLE 2

Event Tree Accident Class Report for then VBT Series

Accident Class	Sequence Probability
Core Damage	5.53E-07
Containment Failure (no Core Damage)	4.23E-07
Containment Failure w/ Core Damage	5.77E-08

TABLE 3

Event Tree Dominant Sequences Report for then VBT Series

Top Event Probability: 9.761E-07

Sequence Title	Sequence Probability	Sequence Importance
MS•C2	3.23E-07	3.31E-01
S•LV	1.76E-07	1.80E-01
I•LV	1.76E-07	1.80E-01
MS•LV	1.28E-07	1.31E-01
L•CH	9.79E-08	1.00E-01
MS•C2•LV	4.88E-08	5.00E-02

TABLE 4

Event Tree Summary Report for the VBT Series

Top Event Probability: 9.761E-07

Event Tree Name	Event Tree Title Run Date& Time	Event Tree Probability	Number of Sequences	95 Percentile Median 5 Percentile
MS	CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MSLB 09-23-1990 11:23:06	5.02E-07	5	
SL	CORE DAMAGE DUE TO VITAL BUS FAILURE DURING SMALL LOCA 09-23-1990 11:24:53	1.85E-07	3	
MF	CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MFLB 09-23-1990 11:19:39	1.79E-07	4	
LL	CORE DAMAGE DUE TO VITAL BUS FAILURE DURING LARGE LOCA 09-23-1990 11:17:02	1.10E-07	5	

TABLE 5

Sequence-level Event Tree Report for VBTLL Data File
CORE DAMAGE DUE TO VITAL BUS FAILURE DURING LARGE LOCA
Top Event Probability: 1.102E-07

This file was created on 09-22-1990 at 17:50:44

Sequence Number	Sequence Title	#Cutsets	Probability	Accident Class	Cull Limit	95 Percentile
		Run Date	Time	File Name		Median
						5 Percentile
2	L•R	1	2.79E-09	CD	1.00E-10	
		09-23-1990	11:14:53	VBTLL02		
3	L•CH	7	9.79E-08	CTMT FAIL	1.00E-10	
		09-23-1990	11:15:42	VBTLL03		
4	L•CH•R	3	8.74E-09	CD/CTMT FL	1.00E-09	
		09-22-1990	20:23:21	VBTLL04		
5	L•KS	2	7.35E-10	CD	1.00E-10	
		09-23-1990	11:16:58	VBTLL05		

TABLE 6

Sequence-level Event Tree Report for VBTSL Data File
CORE DAMAGE DUE TO VITAL BUS FAILURE DURING SMALL LOCA
Top Event Probability: 1.852E-07

This file was created on 09-22-1990 at 17:52:03

Sequence Number	Sequence Title	#Cutsets / Run Date	Probability / Time	Accident Class / File Name	Cull Limit	95 Percentile / Median / 5 Percentile
2	S•R	2 09-23-1990	9.18E-09 11:23:52	CD VBTSL02	1.00E-10	-------- -------- --------
3	S•LV	55 09-23-1990	1.76E-07 11:24:44	CD VBTSL03	1.00E-10	-------- -------- --------

TABLE 7

Sequence-level Event Tree Report for VBTMS Data File
CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MSLB
Top Event Probability: 5.022E-07

This file was created on 09-22-1990 at 17:51:31

Sequence Number	Sequence Title	#Cutsets / Run Date	Probability / Time	Accident Class / File Name	Cull Limit	95 Percentile / Median / 5 Percentile
2	MS•LV	34 09-23-1990	1.28E-07 11:20:26	CD VBTMS02	1.00E-10	
3	MS•C2	8 09-23-1990	3.23E-07 11:21:19	CTMT FAIL VBTMS03	1.00E-10	
4	MS•C2•LV	24 09-23-1990	4.88E-08 11:22:11	CD/CTMT FL VBTMS04	1.00E-10	
5	MS•KS	2 09-23-1990	2.37E-09 11:23:02	CD VBTMS05	1.00E-10	

TABLE 8

Sequence-level Event Tree Report for VBTMF Data File
CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MFLB
Top Event Probability: 1.785E-07

This file was created on 09-22-1990 at 19:35:49

Sequence Number	Sequence Title	#Cutsets	Probability	Accident Class	Cull Limit	95 Percentile
		Run Date	Time	File Name		Median
						5 Percentile
2	I•LV	55	1.76E-07	CD	1.00E-10	
		09-23-1990	11:17:50	VBTMF02		
3	I•KC	2	2.37E-09	CTMT FAIL	1.00E-10	
		09-23-1990	11:18:44	VBTMF03		
4	I•KC•LV	1	1.77E-10	CD/CTMT FL	1.00E-10	
		09-23-1990	11:19:35	VBTMF04		

TABLE 9

Sequence-level Cutset Report for VBTLL02 Data File

Top Event: VBTLL02 Top Event Probability: 2.790E-09

This file was created on 9-23-1990 at 11:14:54

Rank	Cutset Importance	Cutset Probability
1	1.000E+00	2.790E-09

INIT-L---LL 9.300E-04 - INITIATING EVENT L FOR EVENT TREE 'VBTLL'
R-HUREPRE--U 1.000E-03 - OPERATORS FAIL TO SET RECIRC FLOW CONTROLLERS PER PROC
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

TABLE 10

Sequence-level Cutset Report for VBTLL03 Data File

Top Event: VBTLL03 Top Event Probability: 9.793E-08

This file was created on 9-23-1990 at 11:15:44

Rank	Cutset Importance	Cutset Probability	
1	5.603E-01	5.487E-08	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
2	1.899E-01	1.860E-08	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
3	1.425E-01	1.395E-08	
	I-SYINSTAIR	5.000E-03	- INSTRUMENT AIR FAILS
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
4	2.849E-02	2.790E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-C212C15--N	3.000E-03	- BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
4	2.849E-02	2.790E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-C212C02--P	3.000E-03	- BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
4	2.849E-02	2.790E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
5	2.184E-02	2.139E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	U-DGB----1HR	2.300E-03	- DIESEL GENERATOR B FT RUN FOR 1 HOUR
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 11

Sequence-level Cutset Report for VBTLL04 Data File

Top Event: VBTLL04 Top Event Probability: 8.742E-09

This file was created on 9-22-1990 at 20:23:22

Rank	Cutset Importance	Cutset Probability	
1	6.277E-01	5.487E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	R-HURECIRC	1.000E-01	- OPERATORS FAIL TO CONTROL RECIRC W/O FLOW INSTRUMENTS
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
2	2.128E-01	1.860E-09	
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	R-HURECIRC	1.000E-01	- OPERATORS FAIL TO CONTROL RECIRC W/O FLOW INSTRUMENTS
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
3	1.596E-01	1.395E-09	
	I-SYINSTAIR	5.000E-03	- INSTRUMENT AIR FAILS
	INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
	R-HURECIRC	1.000E-01	- OPERATORS FAIL TO CONTROL RECIRC W/O FLOW INSTRUMENTS
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

TABLE 12

Sequence-level Cutset Report for VBTLL05 Data File

Top Event: VBTLL05 Top Event Probability: 7.347E-10

This file was created on 9-23-1990 at 11:17:00

Rank	Cutset Importance	Cutset Probability
1	7.468E-01	5.487E-10

INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Rank	Cutset Importance	Cutset Probability
2	2.532E-01	1.860E-10

INIT-L---LL	9.300E-04	- INITIATING EVENT L FOR EVENT TREE 'VBTLL'
KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 13

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability
1	1.887E-01	3.330E-08

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

2	1.530E-01	2.700E-08

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

2	1.530E-01	2.700E-08

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

3	1.003E-01	1.770E-08

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

4	5.537E-02	9.770E-09

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

5	5.100E-02	9.000E-09

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-SV3110---J	1.000E-03	- SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

6	3.400E-02	6.000E-09

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability	
7	2.550E-02	4.500E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-XVG10WM--X	5.000E-04	- NO MINIFLOW - ONE OF 5 MANUAL VALVES LEFT CLOSED
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
8	2.346E-02	4.140E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
9	1.877E-02	3.312E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
10	1.530E-02	2.700E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
11	1.295E-02	2.285E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
12	1.020E-02	1.800E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
12	1.020E-02	1.800E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability	
12	1.020E-02	1.800E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-XVG10WL--X	2.000E-04	- NO LUBE OIL COOLING 1 OF 2 MANUAL VALVES LEFT CLOSED
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
12	1.020E-02	1.800E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-AV3110---M	2.000E-04	- CV-3110 CLOSED DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
13	1.003E-02	1.770E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
13	1.003E-02	1.770E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
14	9.181E-03	1.620E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-MPG10W-6HR	1.800E-04	- MTR-DRIVEN PP G10W FT RUN FOR 6 HR
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
15	8.446E-03	1.490E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
16	6.620E-03	1.168E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability
17	5.631E-03	9.936E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C026HO 6.000E-06 - BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS

Rank	Cutset Importance	Cutset Probability
17	5.631E-03	9.936E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-T1AUXC-6HI 6.000E-06 - >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

Rank	Cutset Importance	Cutset Probability
18	5.100E-03	9.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C02--P 3.000E-03 - BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Rank	Cutset Importance	Cutset Probability
18	5.100E-03	9.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C15--N 3.000E-03 - BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Rank	Cutset Importance	Cutset Probability
18	5.100E-03	9.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-CV387----P 1.000E-04 - CHECK VLV 387 FT OPEN ON DEM
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Rank	Cutset Importance	Cutset Probability
18	5.100E-03	9.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-XVG10WS--X 1.000E-04 - INSUFFICIENT FLOW TO PUMP G10W DUE TO MANUAL VALVE CLOSURE
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Rank	Cutset Importance	Cutset Probability
18	5.100E-03	9.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-XV389----X 1.000E-04 - MANUAL VLV 389 LEFT OPEN POST-MAINT
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability
19	3.711E-03	6.549E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---M 3.700E-03 - PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

20	3.400E-03	6.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-MXB42----V 1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

20	3.400E-03	6.000E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-DGDSDSW--V 1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

21	3.009E-03	5.310E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---S 3.000E-03 - MTR-DRIVEN PP G10W FT START ON DEM
U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

21	3.009E-03	5.310E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-AV3110---P 3.000E-03 - AIR-OPERATED VLV 3110 FT OPEN ON DEM
U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

22	2.815E-03	4.968E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C15--N 3.000E-03 - BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

22	2.815E-03	4.968E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C02--P 3.000E-03 - BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability
23	2.346E-03	4.140E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB----6HR 1.380E-02 - DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-DGDSDSW--V 1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

23	2.346E-03	4.140E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB----6HR 1.380E-02 - DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-MXB42----V 1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

24	2.244E-03	3.960E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-DGOSO----M 6.600E-03 - DSD DIESEL DOWN DUE TO MAINTENANCE
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

25	1.548E-03	2.732E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGB----6HR 1.380E-02 - DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-DGOSO----M 6.600E-03 - DSD DIESEL DOWN DUE TO MAINTENANCE
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

26	1.530E-03	2.700E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C14--N 3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
U-MXB42----V 1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

26	1.530E-03	2.700E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C14--N 3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
U-DGDSDSW--V 1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

27	1.258E-03	2.220E-10

INIT-I---MF 3.000E-03 - INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---M 3.700E-03 - PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on FT 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability	
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
28	1.020E-03	1.800E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
29	1.010E-03	1.782E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTMF02 Data File

Top Event: VBTMF02 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:17:52

Rank	Cutset Importance	Cutset Probability
30	1.003E-03	1.770E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-SV3110---J	1.000E-03	- SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

31	8.681E-04	1.532E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

32	7.039E-04	1.242E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

32	7.039E-04	1.242E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

33	6.732E-04	1.188E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE

33	6.732E-04	1.188E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

TABLE 14

Sequence-level Cutset Report for VBTMF03 Data File

Top Event: VBTMF03 Top Event Probability: 2.370E-09

This file was created on 9-23-1990 at 11:18:46

Rank	Cutset Importance	Cutset Probability	
1	7.468E-01	1.770E-09	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
2	2.532E-01	6.000E-10	
	INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
	KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 15
Sequence-level Cutset Report for VBTMF04 Data File

Top Event: VBTMF04 Top Event Probability: 1.770E-10

This file was created on 9-23-1990 at 11:19:36

Rank	Cutset Importance	Cutset Probability
1	1.000E+00	1.770E-10

INIT-I---MF	3.000E-03	- INITIATING EVENT I FOR EVENT TREE 'VBTMF'
KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 16

Sequence-level Cutset Report for VBTMS02 Data File

Top Event: VBTMS02 Top Event Probability: 1.281E-07

This file was created on 9-23-1990 at 11:20:29

Rank	Cutset Importance	Cutset Probability	
1	2.600E-01	3.330E-08	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
2	2.108E-01	2.700E-08	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
2	2.108E-01	2.700E-08	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
3	7.026E-02	9.000E-09	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-SV3110---J	1.000E-03	- SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
4	3.513E-02	4.500E-09	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-XVG10WM--X	5.000E-04	- NO MINIFLOW - ONE OF 5 MANUAL VALVES LEFT CLOSED
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
5	3.232E-02	4.140E-09	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
6	2.108E-02	2.700E-09	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTMS02 Data File

Top Event: VBTMS02 Top Event Probability: 1.281E-07

This file was created on 9-23-1990 at 11:20:29

Rank	Cutset Importance	Cutset Probability
7	1.784E-02	2.285E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
U-DGB----6HR 1.380E-02 - DIESEL GENERATOR B FT RUN FOR 6 HOURS
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

8	1.405E-02	1.800E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
U-C212C026HO 6.000E-06 - BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL

8	1.405E-02	1.800E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL
U-T1AUXC-6HI 6.000E-06 - >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

8	1.405E-02	1.800E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
L-XVG10WL--X 2.000E-04 - NO LUBE OIL COOLING 1 OF 2 MANUAL VALVES LEFT CLOSED
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

8	1.405E-02	1.800E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
L-AV3110---M 2.000E-04 - CV-3110 CLOSED DUE TO MAINTENANCE
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

9	1.265E-02	1.620E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
L-MPG10W-6HR 1.800E-04 - MTR-DRIVEN PP G10W FT RUN FOR 6 HR
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

10	1.163E-02	1.490E-09

INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
U-C212C14--N 3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-SX3-3----N 3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTMS02 Data File

Top Event: VBTMS02 Top Event Probability: 1.281E-07

This file was created on 9-23-1990 at 11:20:29

Rank	Cutset Importance	Cutset Probability	
11	7.756E-03	9.936E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
11	7.756E-03	9.936E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
12	7.026E-03	9.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-XV389----X	1.000E-04	- MANUAL VLV 389 LEFT OPEN POST-MAINT
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
12	7.026E-03	9.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-XVG10WS--X	1.000E-04	- INSUFFICIENT FLOW TO PUMP G10W DUE TO MANUAL VALVE CLOSURE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
12	7.026E-03	9.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-CV387----P	1.000E-04	- CHECK VLV 387 FT OPEN ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
13	3.232E-03	4.140E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
13	3.232E-03	4.140E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMS02 Data File

Top Event: VBTMS02 Top Event Probability: 1.281E-07

This file was created on 9-23-1990 at 11:20:29

Rank	Cutset Importance	Cutset Probability
14	2.133E-03	2.732E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB----6HR	1.380E-02 - DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGOSO----M	6.600E-03 - DSD DIESEL DOWN DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
15	2.108E-03	2.700E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C14--N	3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-MXB42----V	1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
15	2.108E-03	2.700E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C14--N	3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSDSW--V	1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
16	1.405E-03	1.800E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C026HO	6.000E-06 - BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-MXB42----V	1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
16	1.405E-03	1.800E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C026HO	6.000E-06 - BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSDSW--V	1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
16	1.405E-03	1.800E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-MXB42----V	1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-T1AUXC-6HI	6.000E-06 - >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
16	1.405E-03	1.800E-10
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGDSDSW--V	1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-T1AUXC-6HI	6.000E-06 - >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

Sequence-level Cutset Report for VBTMS02 Data File

Top Event: VBTMS02 Top Event Probability: 1.281E-07

This file was created on 9-23-1990 at 11:20:29

Rank	Cutset Importance	Cutset Probability	
17	1.391E-03	1.782E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
18	1.196E-03	1.532E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
19	9.695E-04	1.242E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
19	9.695E-04	1.242E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
20	9.274E-04	1.188E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
20	9.274E-04	1.188E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

TABLE 17

Sequence-level Cutset Report for VBTMS03 Data File

Top Event: VBTMS03 Top Event Probability: 3.230E-07

This file was created on 9-23-1990 at 11:21:21

Rank	Cutset Importance	Cutset Probability
1	5.480E-01	1.770E-07
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB------S	5.900E-02 - DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
2	1.858E-01	6.000E-08
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB------M	2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
3	1.393E-01	4.500E-08
	I-SYINSTAIR	5.000E-03 - INSTRUMENT AIR FAILS
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
4	4.273E-02	1.380E-08
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB----2HR	4.600E-03 - DIESEL GENERATOR B FT RUN FOR 2 HOURS
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
5	2.787E-02	9.000E-09
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
5	2.787E-02	9.000E-09
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C02--P	3.000E-03 - BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
5	2.787E-02	9.000E-09
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C15--N	3.000E-03 - BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
6	5.573E-04	1.800E-10
	C-SV3518-2HL	2.000E-05 - SOLENOID VLV 3518 ACTS/DE-ACTS SPUR W/I 2 HOURS
	INIT-MS--MS	3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

TABLE 18

Sequence-level Cutset Report for VBTMS04 Data File

Top Event: VBTMS04 Top Event Probability: 4.879E-08

This file was created on 9-23-1990 at 11:22:13

Rank	Cutset Importance	Cutset Probability
1	3.628E-01	1.770E-08
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM	
	U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
2	2.002E-01	9.770E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM	
	U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
3	1.230E-01	6.000E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE	
	U-DGDSD----V 1.000E-01 - OPERATOR FAILS TO START DSD DIESEL	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
4	6.788E-02	3.312E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------M 2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE	
	U-DGDSD--1DR 5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
5	3.628E-02	1.770E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM	
	U-DGDSDSW--V 1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
5	3.628E-02	1.770E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM	
	U-MXB42----V 1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	
6	2.394E-02	1.168E-09
	INIT-MS--MS 3.000E-03 - INITIATING EVENT MS FOR EVENT TREE 'VBTMS'	
	U-DGB------S 5.900E-02 - DIESEL GENERATOR B FT START ON DEM	
	U-DGOSO----M 6.600E-03 - DSD DIESEL DOWN DUE TO MAINTENANCE	
	U-OOCONLOOPZ 1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP	

Sequence-level Cutset Report for VBTMS04 Data File

Top Event: VBTMS04 Top Event Probability: 4.879E-08

This file was created on 9-23-1990 at 11:22:13

Rank	Cutset Importance	Cutset Probability	
7	1.845E-02	9.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C02--P	3.000E-03	- BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
7	1.845E-02	9.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C15--N	3.000E-03	- BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
8	1.342E-02	6.549E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
9	1.230E-02	6.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
9	1.230E-02	6.000E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
10	1.088E-02	5.310E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
10	1.088E-02	5.310E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMS04 Data File

Top Event: VBTMS04 Top Event Probability: 4.879E-08

This file was created on 9-23-1990 at 11:22:13

Rank	Cutset Importance	Cutset Probability	
11	1.018E-02	4.968E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C02--P	3.000E-03	- BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
11	1.018E-02	4.968E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-C212C15--N	3.000E-03	- BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
12	8.116E-03	3.960E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
13	4.550E-03	2.220E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
14	3.689E-03	1.800E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
14	3.689E-03	1.800E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
15	3.628E-03	1.770E-10	
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-SV3110---J	1.000E-03	- SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTMS04 Data File

Top Event: VBTMS04 Top Event Probability: 4.879E-08

This file was created on 9-23-1990 at 11:22:13

Rank	Cutset Importance	Cutset Probability	
16	3.412E-03	1.665E-10	
	I-SYINSTAIR	5.000E-03	- INSTRUMENT AIR FAILS
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
17	2.767E-03	1.350E-10	
	I-SYINSTAIR	5.000E-03	- INSTRUMENT AIR FAILS
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
17	2.767E-03	1.350E-10	
	I-SYINSTAIR	5.000E-03	- INSTRUMENT AIR FAILS
	INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

TABLE 19

Sequence-level Cutset Report for VBTMS05 Data File

Top Event: VBTMS05 Top Event Probability: 2.370E-09

This file was created on 9-23-1990 at 11:23:04

Rank	Cutset Importance	Cutset Probability
1	7.468E-01	1.770E-09

INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Rank	Cutset Importance	Cutset Probability
2	2.532E-01	6.000E-10

INIT-MS--MS	3.000E-03	- INITIATING EVENT MS FOR EVENT TREE 'VBTMS'
KSSHORTVB	1.000E-02	- VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 20

Sequence-level Cutset Report for VBTSL02 Data File

Top Event: VBTSL02 Top Event Probability: 9.177E-09

This file was created on 9-23-1990 at 11:23:54

Rank	Cutset Importance	Cutset Probability	
1	9.807E-01	9.000E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	R-HUREPRE--U	1.000E-03	- OPERATORS FAIL TO SET RECIRC FLOW CONTROLLERS PER PROC
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
2	1.929E-02	1.770E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	R-HUREPRE--U	1.000E-03	- OPERATORS FAIL TO SET RECIRC FLOW CONTROLLERS PER PROC
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

TABLE 21

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability
1	1.887E-01	3.330E-08
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---M	3.700E-03 - PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
2	1.530E-01	2.700E-08
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-AV3110---P	3.000E-03 - AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
2	1.530E-01	2.700E-08
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---S	3.000E-03 - MTR-DRIVEN PP G10W FT START ON DEM
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
3	1.003E-01	1.770E-08
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------S	5.900E-02 - DIESEL GENERATOR B FT START ON DEM
	U-DGDSD----V	1.000E-01 - OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
4	5.537E-02	9.770E-09
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------S	5.900E-02 - DIESEL GENERATOR B FT START ON DEM
	U-DGDSD--1DR	5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
5	5.100E-02	9.000E-09
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-SV3110---J	1.000E-03 - SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
	U-SX3-3----N	3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
6	3.400E-02	6.000E-09
	INIT-S---SL	3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------M	2.000E-02 - DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGDSD----V	1.000E-01 - OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
7	2.550E-02	4.500E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-XVG10WM--X	5.000E-04	- NO MINIFLOW - ONE OF 5 MANUAL VALVES LEFT CLOSED
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
8	2.346E-02	4.140E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
9	1.877E-02	3.312E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
10	1.530E-02	2.700E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
11	1.295E-02	2.285E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
12	1.020E-02	1.800E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
12	1.020E-02	1.800E-09	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability
12	1.020E-02	1.800E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
L-XVG10WL--X  2.000E-04 - NO LUBE OIL COOLING 1 OF 2 MANUAL VALVES LEFT CLOSED
U-SX3-3----N  3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
```

Rank	Cutset Importance	Cutset Probability
12	1.020E-02	1.800E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
L-AV3110---M  2.000E-04 - CV-3110 CLOSED DUE TO MAINTENANCE
U-SX3-3----N  3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
```

Rank	Cutset Importance	Cutset Probability
13	1.003E-02	1.770E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
U-DGB------S  5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-DGDSDSW--V  1.000E-02 - OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
U-OOCONLOOPZ  1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
```

Rank	Cutset Importance	Cutset Probability
13	1.003E-02	1.770E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
U-DGB------S  5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-MXB42----V  1.000E-02 - OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
U-OOCONLOOPZ  1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
```

Rank	Cutset Importance	Cutset Probability
14	9.181E-03	1.620E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
L-MPG10W-6HR  1.800E-04 - MTR-DRIVEN PP G10W FT RUN FOR 6 HR
U-SX3-3----N  3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
```

Rank	Cutset Importance	Cutset Probability
15	8.446E-03	1.490E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
U-C212C14--N  3.000E-03 - BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
U-DGDSD--1DR  5.520E-02 - DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
U-SX3-3----N  3.000E-03 - TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
```

Rank	Cutset Importance	Cutset Probability
16	6.620E-03	1.168E-09

```
INIT-S---SL   3.000E-03 - INITIATING EVENT S FOR EVENT TREE 'VBTSL'
U-DGB------S  5.900E-02 - DIESEL GENERATOR B FT START ON DEM
U-DGOSO----M  6.600E-03 - DSD DIESEL DOWN DUE TO MAINTENANCE
U-OOCONLOOPZ  1.000E-03 - CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
```

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
17	5.631E-03	9.936E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
17	5.631E-03	9.936E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
18	5.100E-03	9.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C02--P	3.000E-03	- BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
18	5.100E-03	9.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C15--N	3.000E-03	- BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-DGDSD----V	1.000E-01	- OPERATOR FAILS TO START DSD DIESEL
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
18	5.100E-03	9.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-CV387----P	1.000E-04	- CHECK VLV 387 FT OPEN ON DEM
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
18	5.100E-03	9.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-XVG10WS--X	1.000E-04	- INSUFFICIENT FLOW TO PUMP G10W DUE TO MANUAL VALVE CLOSURE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
18	5.100E-03	9.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-XV389----X	1.000E-04	- MANUAL VLV 389 LEFT OPEN POST-MAINT
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
19	3.711E-03	6.549E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
20	3.400E-03	6.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
20	3.400E-03	6.000E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
21	3.009E-03	5.310E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
21	3.009E-03	5.310E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
22	2.815E-03	4.968E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C15--N	3.000E-03	- BKR (CNTL) 4160V 12C15 FT CLOSE ON DEM
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
22	2.815E-03	4.968E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C02--P	3.000E-03	- BKR (CNTL) 4160V 12C02 FT OPEN ON DEM
	U-DGDSD--1DR	5.520E-02	- DIESEL GENERATOR DSD FT RUN FOR 24 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
23	2.346E-03	4.140E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
23	2.346E-03	4.140E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
24	2.244E-03	3.960E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
25	1.548E-03	2.732E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
26	1.530E-03	2.700E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
26	1.530E-03	2.700E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
27	1.258E-03	2.220E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB------M	2.000E-02	- DIESEL GANERATOR B OUT OF SERVICE DUE TO MAINTENANCE
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-MXB42----V	1.000E-02	- OPERATOR FAILS TO OPERATE MANUAL SWITCH B42
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
28	1.020E-03	1.800E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGDSDSW--V	1.000E-02	- OPERATOR FAILS TO ALIGN PP G10W TO BUS A4
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS
29	1.010E-03	1.782E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C14--N	3.000E-03	- BKR (CNTL) 4160V 12C14 FT CLOSE ON DEM
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-SX3-3----N	3.000E-03	- TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES

Sequence-level Cutset Report for VBTSL03 Data File

Top Event: VBTSL03 Top Event Probability: 1.765E-07

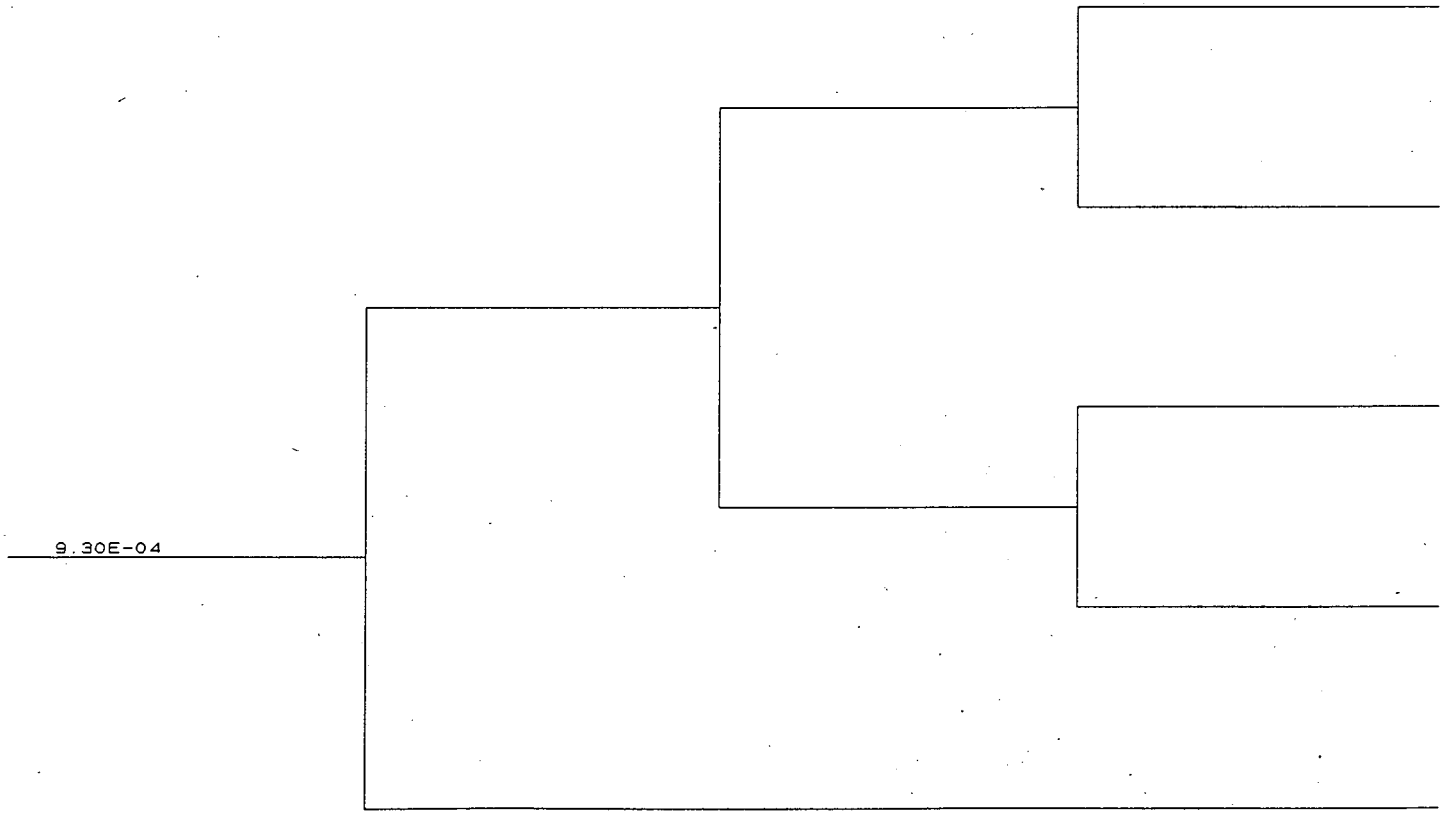
This file was created on 9-23-1990 at 11:24:47

Rank	Cutset Importance	Cutset Probability	
30	1.003E-03	1.770E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-SV3110---J	1.000E-03	- SOLENOID VLV 3110 FT DEACTUATE ON DEMAND
	U-DGB------S	5.900E-02	- DIESEL GENERATOR B FT START ON DEM
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
31	8.681E-04	1.532E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---M	3.700E-03	- PUMP G10W OUT OF SERVICE DUE TO MAINTENANCE
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
32	7.039E-04	1.242E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-MPG10W---S	3.000E-03	- MTR-DRIVEN PP G10W FT START ON DEM
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
32	7.039E-04	1.242E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	L-AV3110---P	3.000E-03	- AIR-OPERATED VLV 3110 FT OPEN ON DEM
	U-DGB----6HR	1.380E-02	- DIESEL GENERATOR B FT RUN FOR 6 HOURS
	U-OOCONLOOPZ	1.000E-03	- CONDITIONAL LOSS OF OFFSITE POWER GIVEN TURBINE TRIP
33	6.732E-04	1.188E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-C212C026HO	6.000E-06	- BKR (CNTL) 4160V 12C02 FT REM CLOSED 6 HOURS
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
33	6.732E-04	1.188E-10	
	INIT-S---SL	3.000E-03	- INITIATING EVENT S FOR EVENT TREE 'VBTSL'
	U-DGOSO----M	6.600E-03	- DSD DIESEL DOWN DUE TO MAINTENANCE
	U-T1AUXC-6HI	6.000E-06	- >4160V XFMR AUXC LOW/NO OUTPUT WITHIN 6 HOURS

FIGURE 1

CORE DAMAGE DUE TO VITAL BUS FAILURE DURING LARGE LOCA

LARGE LOCA	SIS/CSAS FAILURE	HIGH FLOW CONT. SPRAY FAILURE IN 1 HOUR	RECIRC FAILURE
L	KS	CH	R

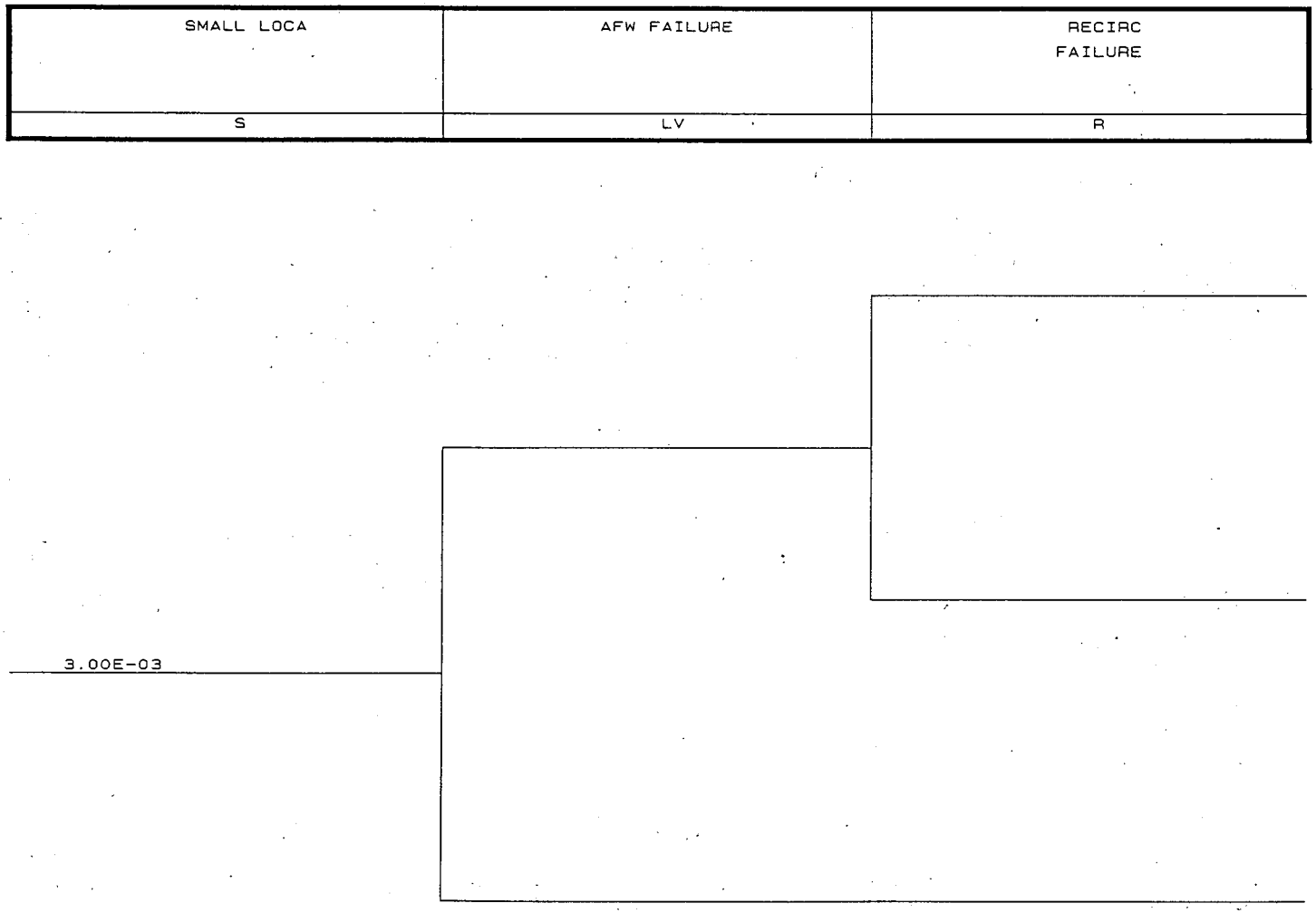


NUMBER	SEQUENCE DESIGNATION	ACCIDENT CLASS	SEQUENCE FREQUENCY
1	L	SAFE	
2	L-R	CD	2.79E-09
3	L-CH	CTMT FAIL	9.79E-08
4	L-CH-R	CD/CTMT FL	8.74E-09
5	L-KS	CD	7.35E-10

REBECA (C) ERIN Engineering and Research, Inc. Version 1.1 | Filename: VBTLL | Date: 09-22-90 | Total Probability: 1.10E-07

FIGURE 2

CORE DAMAGE DUE TO VITAL BUS FAILURE DURING SMALL LOCA



NUMBER	SEQUENCE DESIGNATION	ACCIDENT CLASS	SEQUENCE FREQUENCY
1	S	SAFE	
2	S-R	CD	9.18E-09
3	S-LV	CD	1.76E-07

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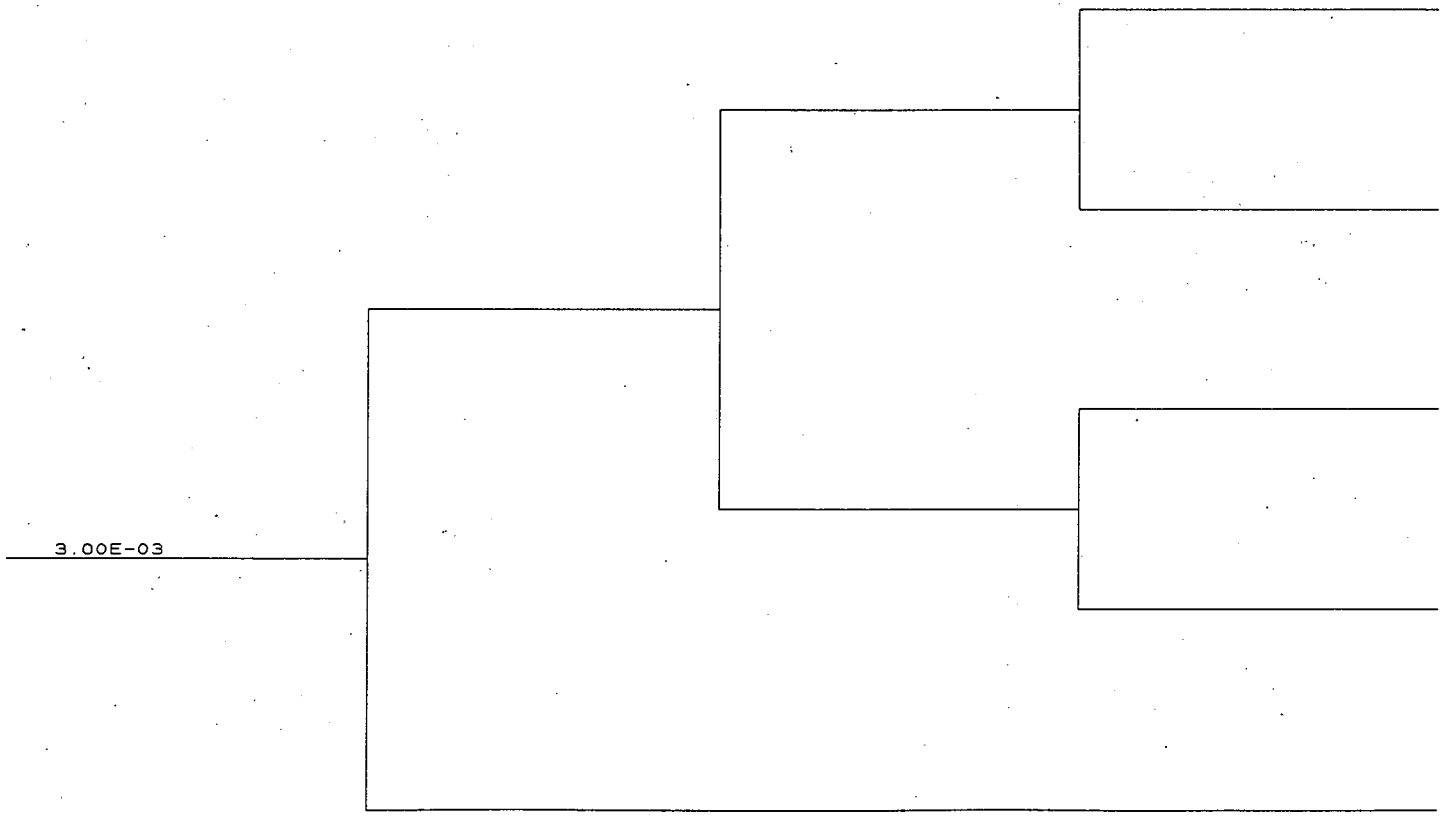
FIGURE 3

CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MSLB

MAIN STEAM LINE BREAK	SIS/CSAS FAILURE	HIGH FLOW CONT. SPRAY FAILURE IN 2 HOURS	AFW FAILURE
MS	KS	C2	LV

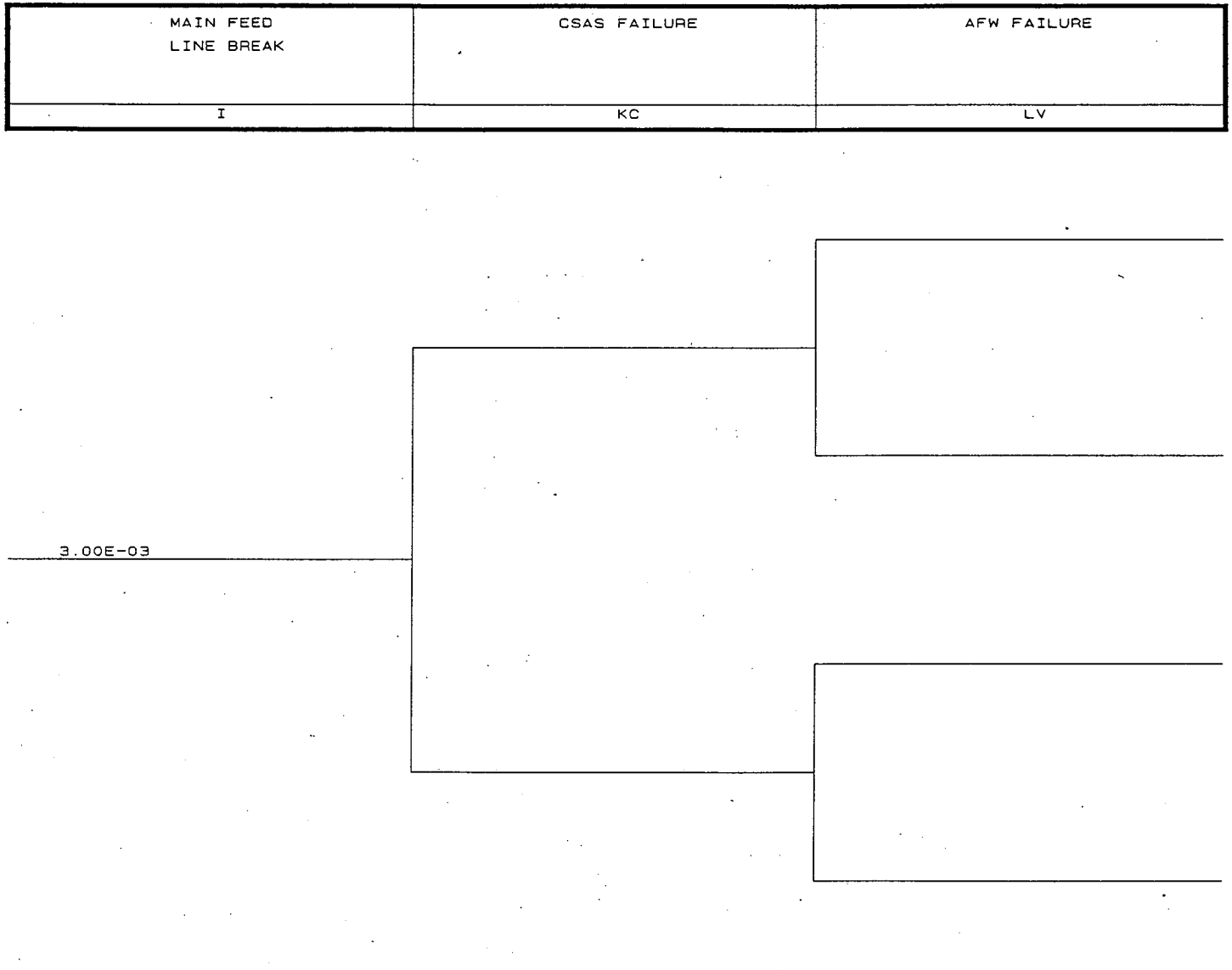


NUMBER	SEQUENCE DESIGNATION	ACCIDENT CLASS	SEQUENCE FREQUENCY
1	MS	SAFE	
2	MS-LV	CD	1.29E-07
3	MS-C2	CTMT FAIL	3.23E-07
4	MS-C2-LV	CD/CTMT FL	4.88E-08
5	MS-KS	CD	2.37E-09

REBECA (C) ERIN Engineering and Research, Inc. Version 1.1 | Filename: VBTMS | Date: 09-22-90 | Total Probability: 5.02E-07

FIGURE 4

CORE DAMAGE DUE TO VITAL BUS FAILURE DURING MFLB



NUMBER	SEQUENCE DESIGNATION	ACCIDENT CLASS	SEQUENCE FREQUENCY
1	I	SAFE	
2	I-LV	CD	1.76E-07
3	I-KC	CTMT FAIL	2.37E-09
4	I-KC-LV	CD/CTMT FL	1.77E-10

REBECA (C) ERIN Engineering and Research, Inc. Version 1.1 | Filename: VBTMF | Date: 09-22-90 | Total Probability: 1.79E-07

FIGURE 5

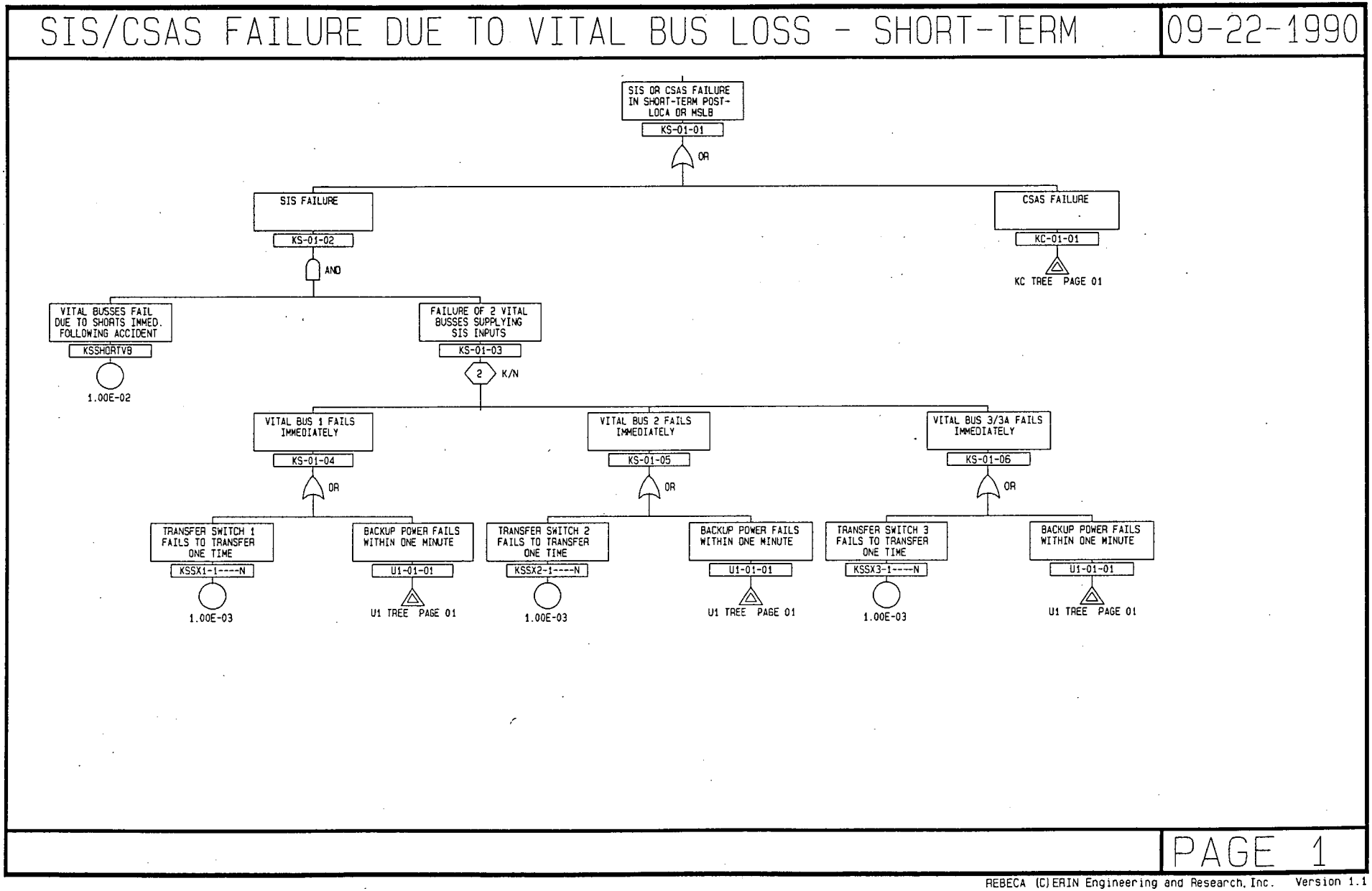


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FIGURE 6

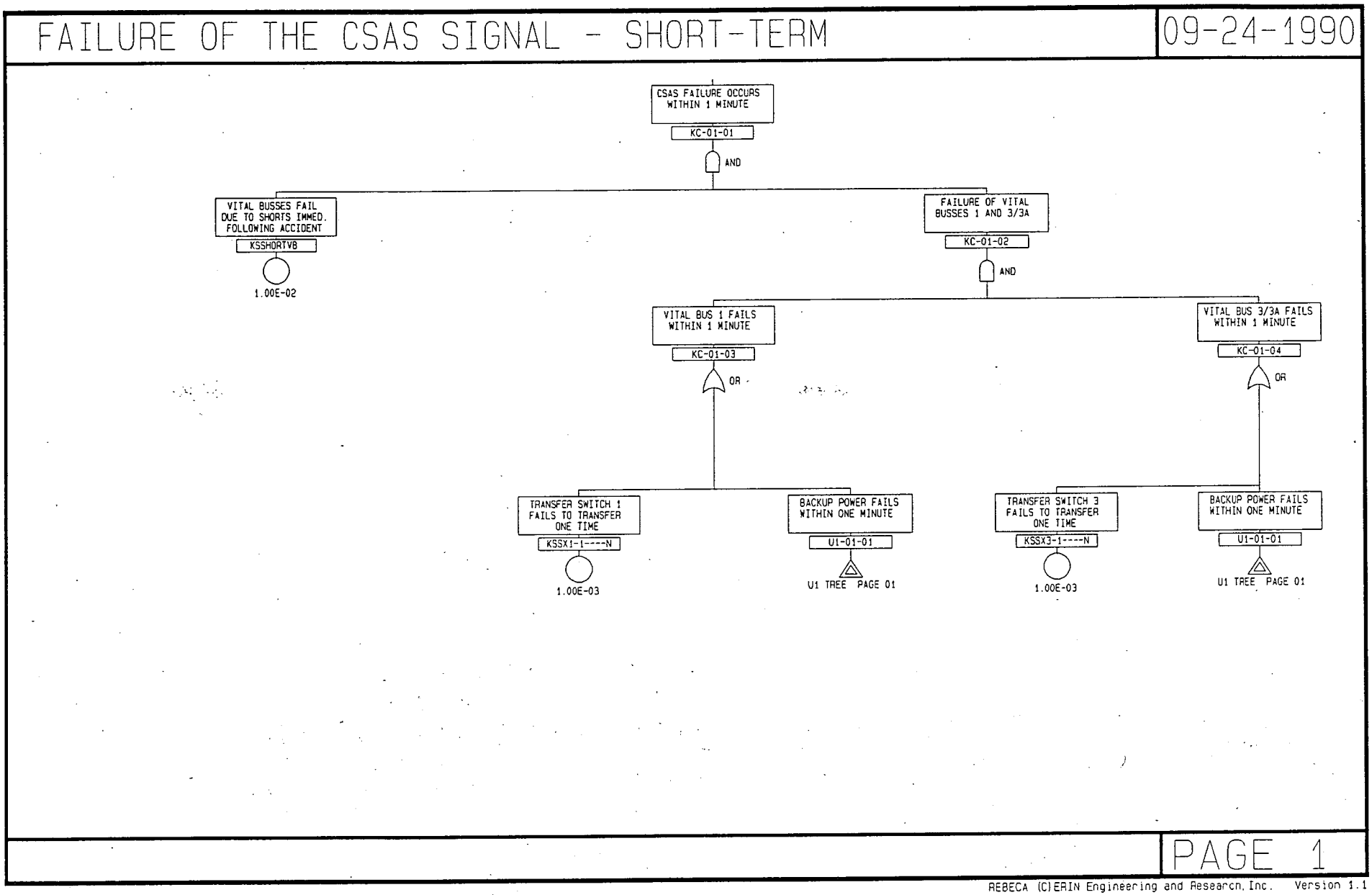

FAILURE OF THE CSAS SIGNAL - SHORT-TERM
09-24-1990
CSAS FAILURE OCCURS WITHIN 1 MINUTE
KC-01-01
AND
VITAL BUSSES FAIL DUE TO SHORTS IMMED. FOLLOWING ACCIDENT
KSSHORTV8
1.00E-02
FAILURE OF VITAL BUSSES 1 AND 3/3A
KC-01-02
AND
VITAL BUS 1 FAILS WITHIN 1 MINUTE
KC-01-03
OR
VITAL BUS 3/3A FAILS WITHIN 1 MINUTE
KC-01-04
OR
TRANSFER SWITCH 1 FAILS TO TRANSFER ONE TIME
KSSX1-1----N
1.00E-03
BACKUP POWER FAILS WITHIN ONE MINUTE
U1-01-01
U1 TREE PAGE 01
TRANSFER SWITCH 3 FAILS TO TRANSFER ONE TIME
KSSX3-1----N
1.00E-03
BACKUP POWER FAILS WITHIN ONE MINUTE
U1-01-01
U1 TREE PAGE 01
PAGE 1
REBECA (C)ERIN Engineering and Research, Inc. Version 1.1

FIGURE 7

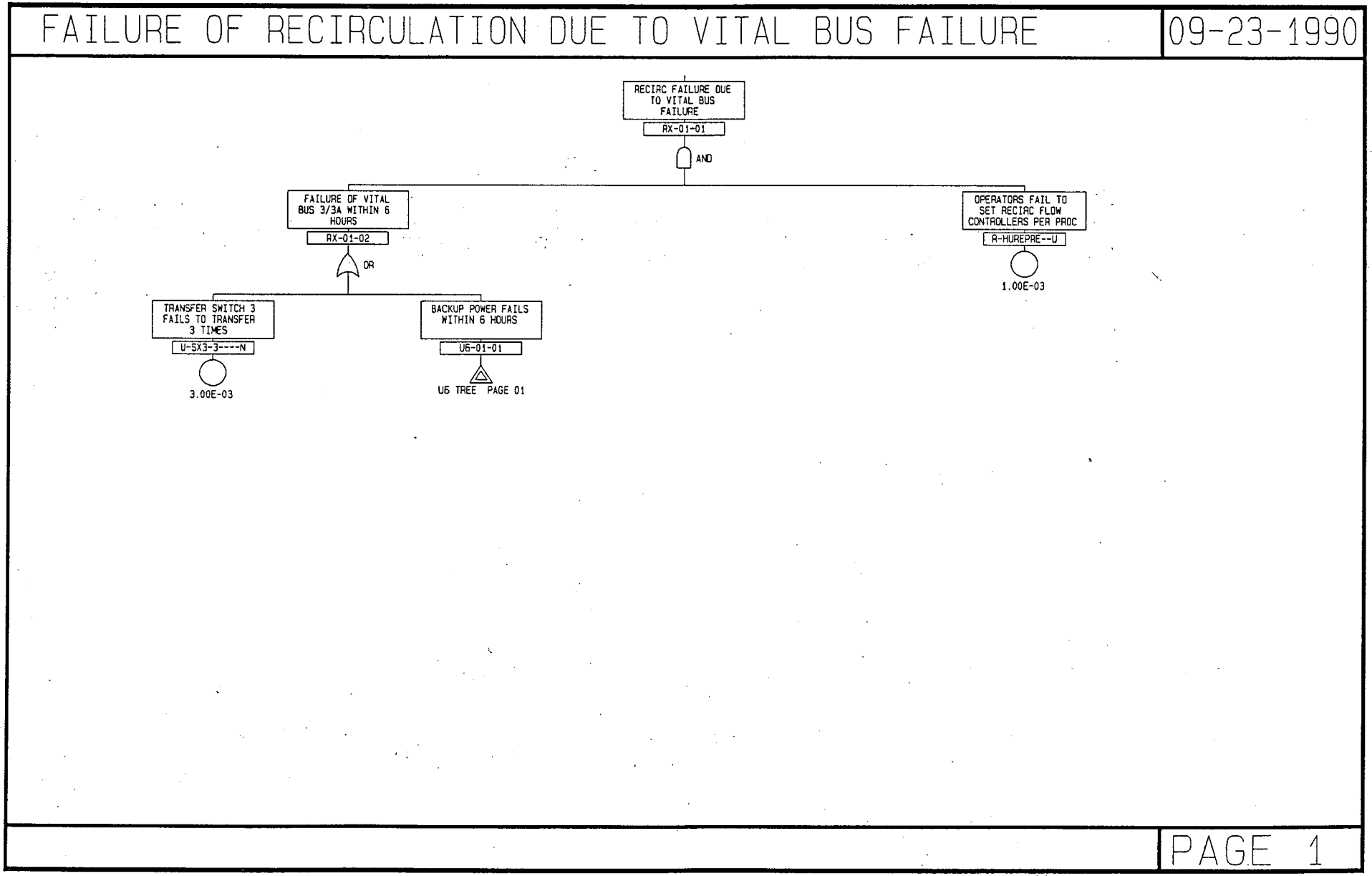
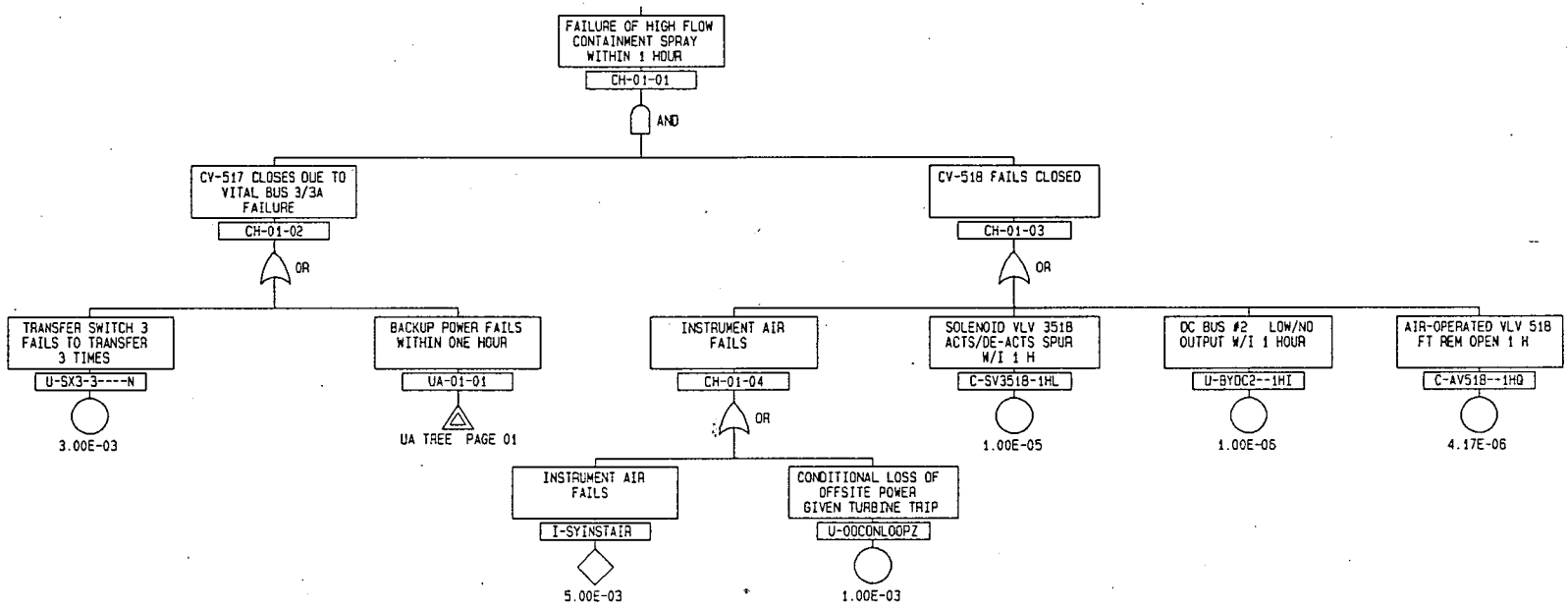

FAILURE OF RECIRCULATION DUE TO VITAL BUS FAILURE
09-23-1990
RECIRC FAILURE DUE TO VITAL BUS FAILURE
RX-01-01
AND
FAILURE OF VITAL BUS 3/3A WITHIN 6 HOURS
RX-01-02
OR
TRANSFER SWITCH 3 FAILS TO TRANSFER 3 TIMES
U-SX3-3----N
3.00E-03
BACKUP POWER FAILS WITHIN 6 HOURS
U6-01-01
U6 TREE PAGE 01
OPERATORS FAIL TO SET RECIRC FLOW CONTROLLERS PER PROC
R-HUREPRE--U
1.00E-03
PAGE 1
REBECA (C)ERIN Engineering and Research, Inc. Version 1.1

FIGURE 8

FAILURE OF HIGH FLOW CONTAINMENT SPRAY WITHIN 1 HOUR

09-22-1990



PAGE 1

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FIGURE 9

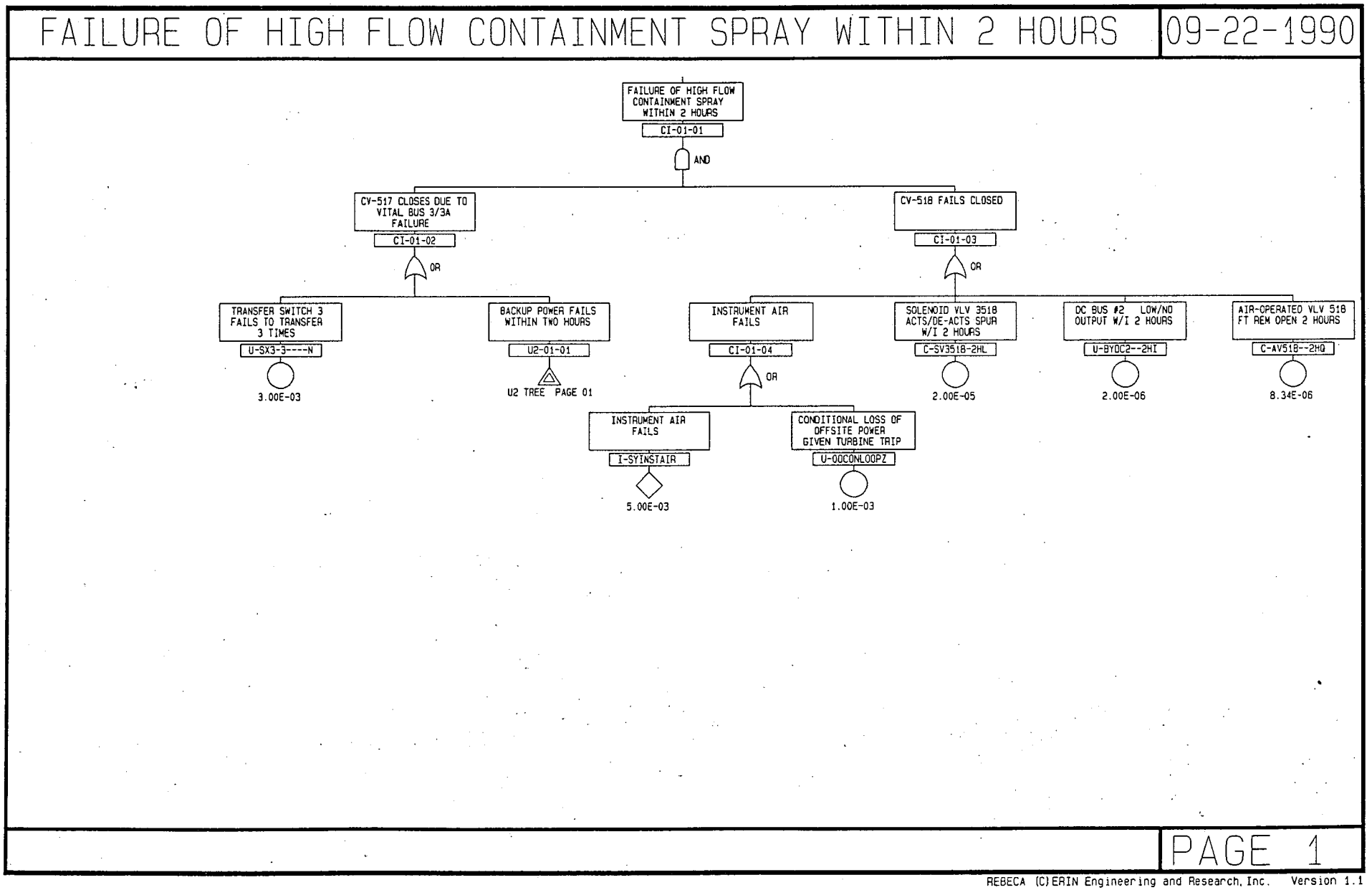

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FIGURE 10

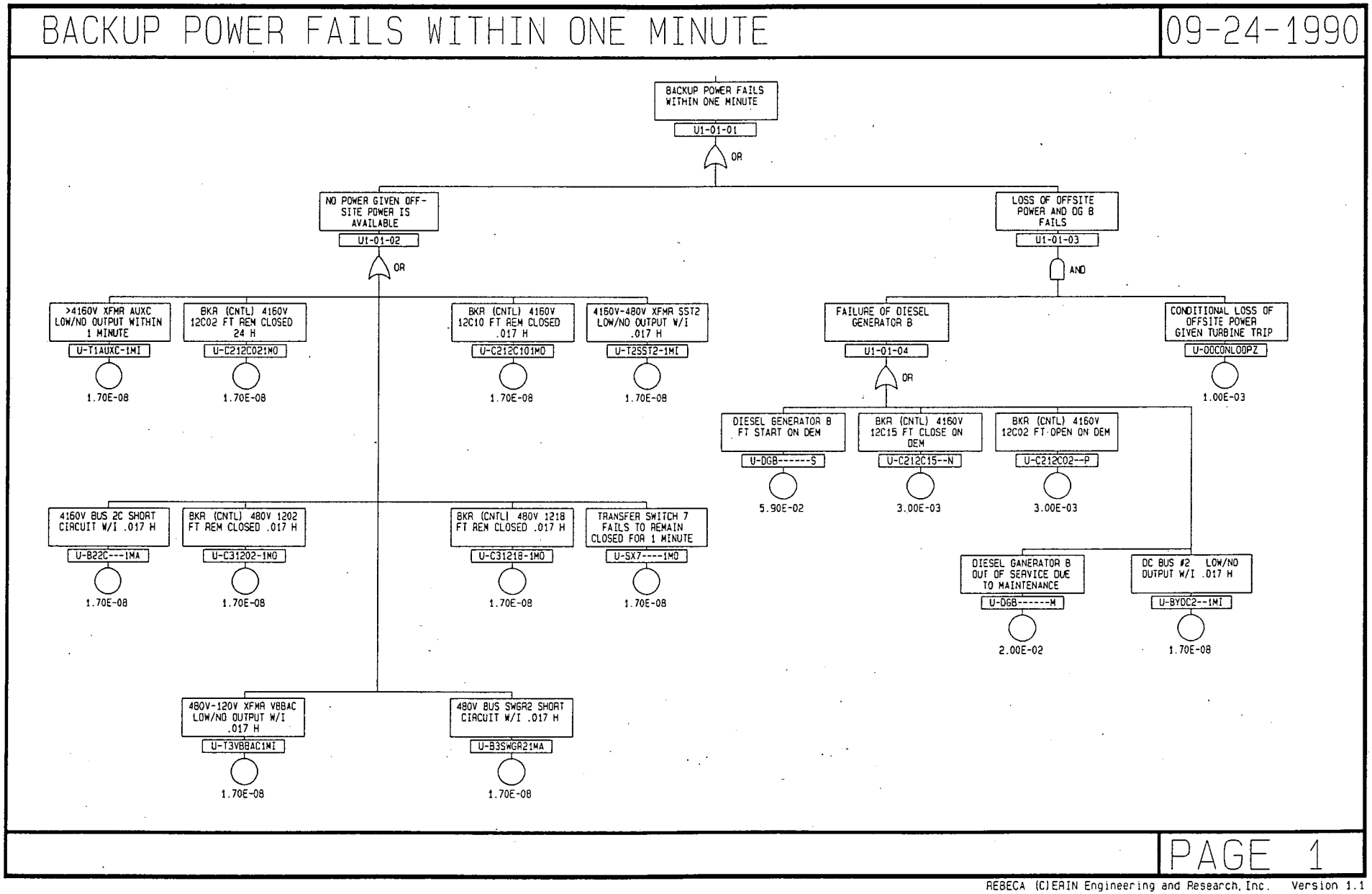

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FIGURE 11

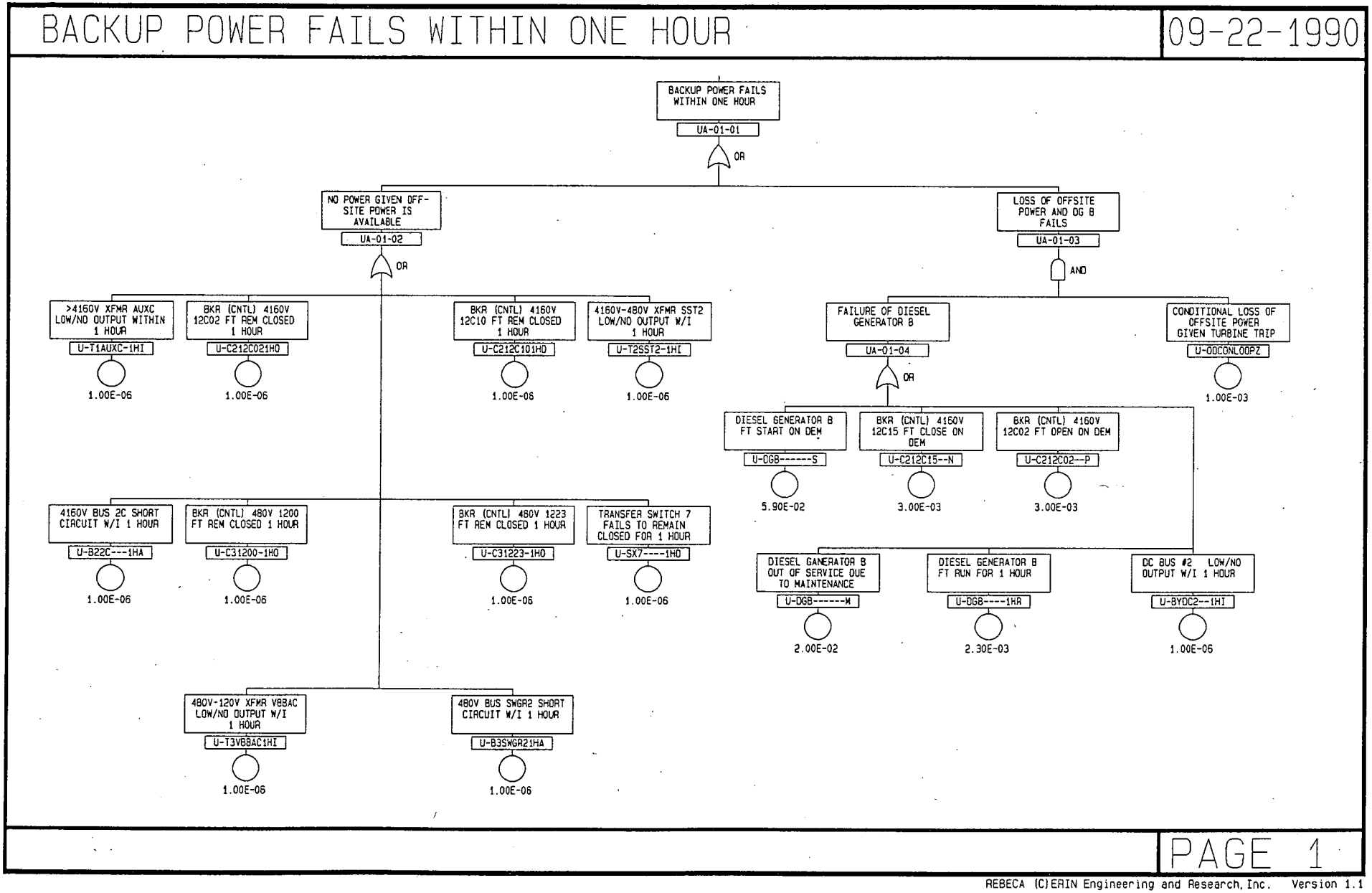

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FIGURE 12

BACKUP POWER FAILS WITHIN TWO HOURS

09-22-1990

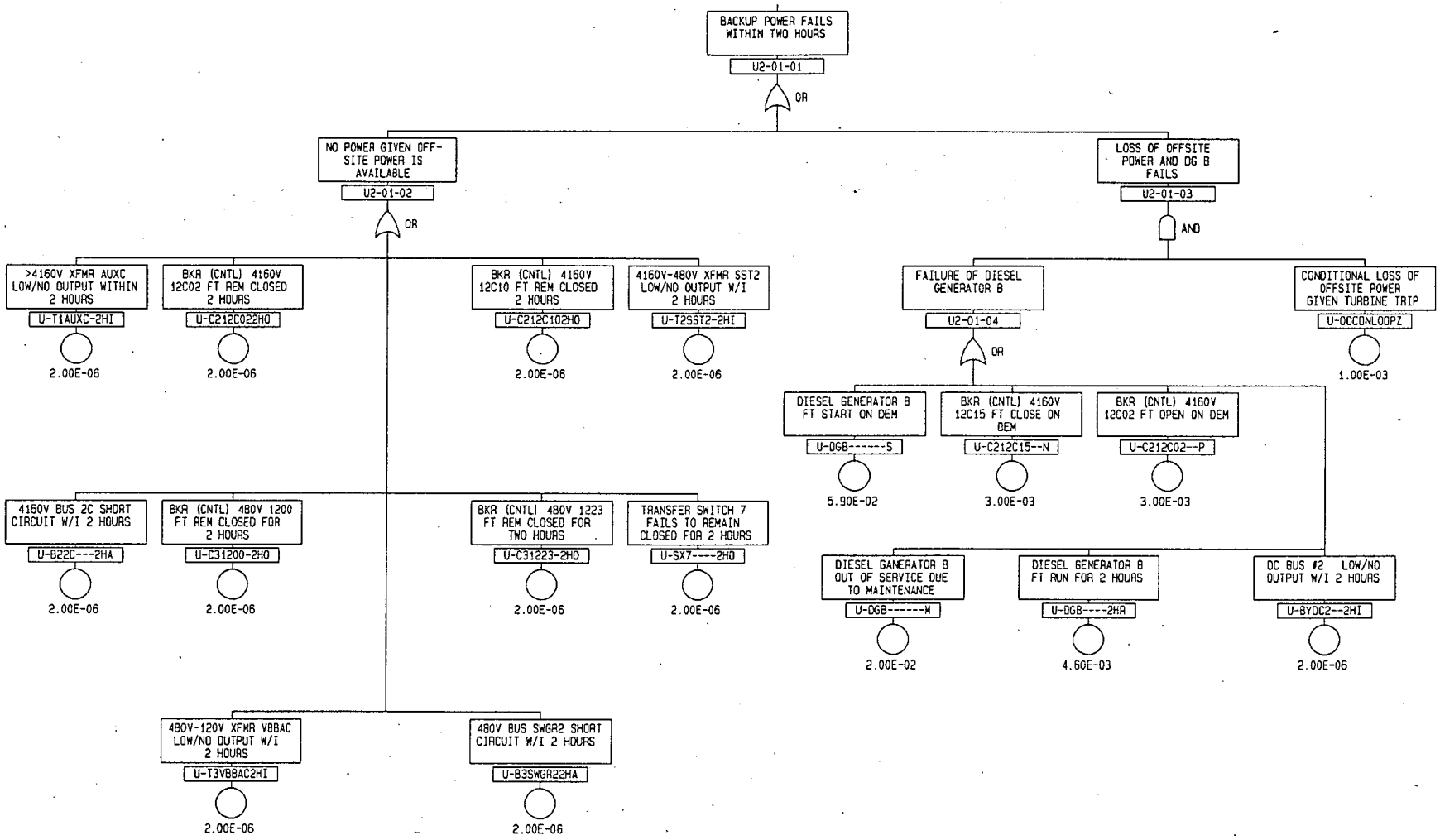

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FIGURE 13

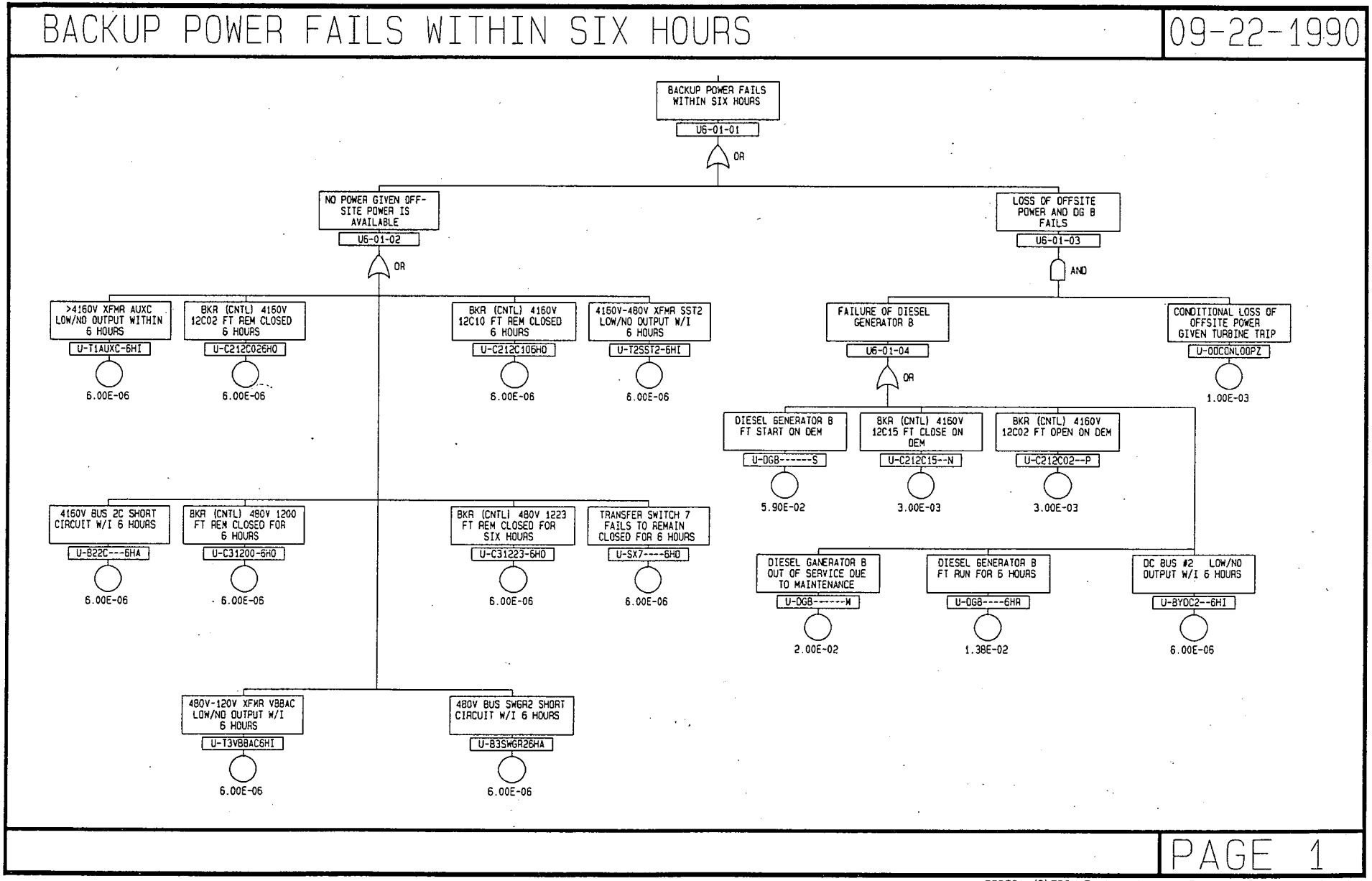

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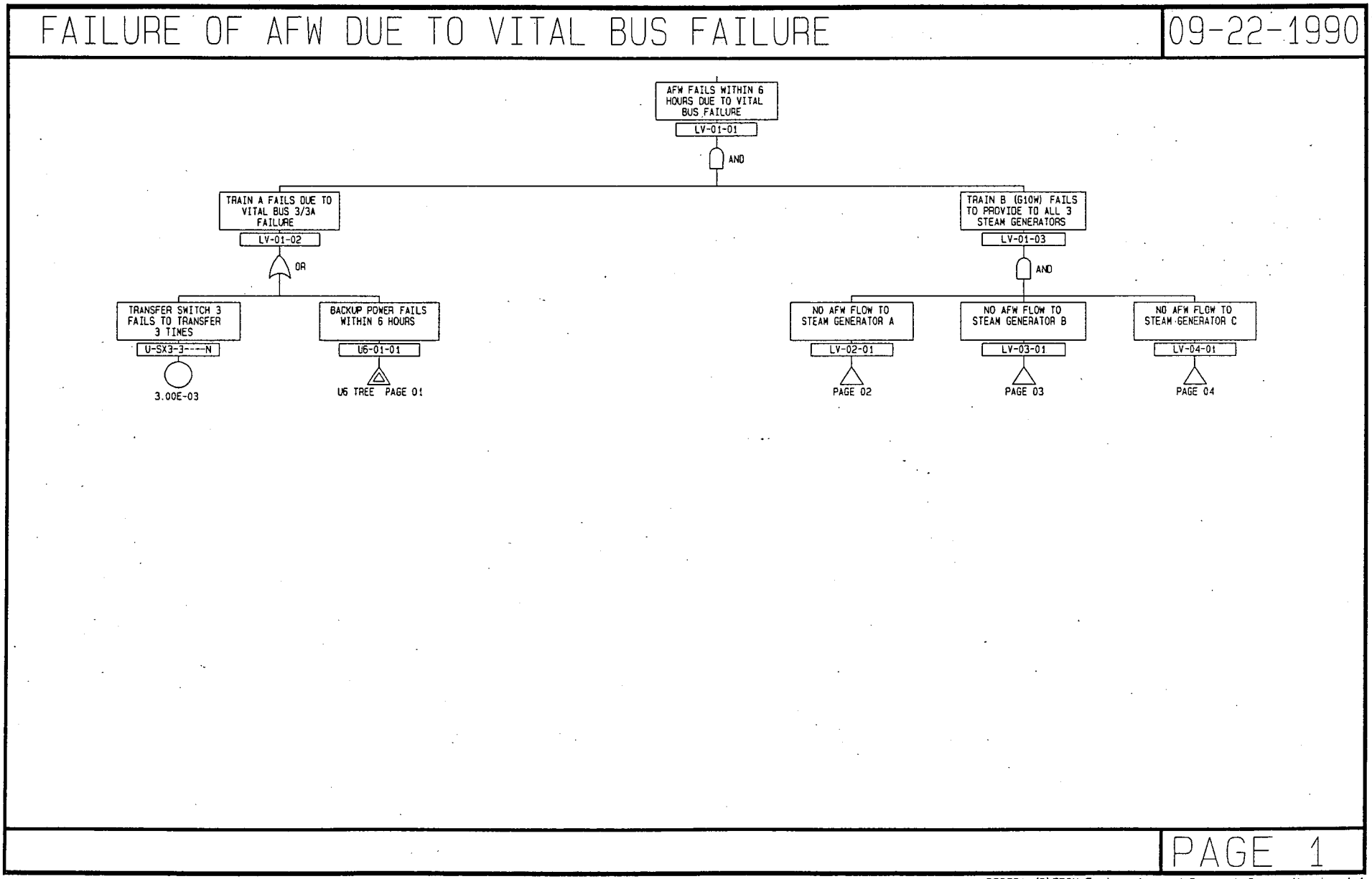
FIGURE 14



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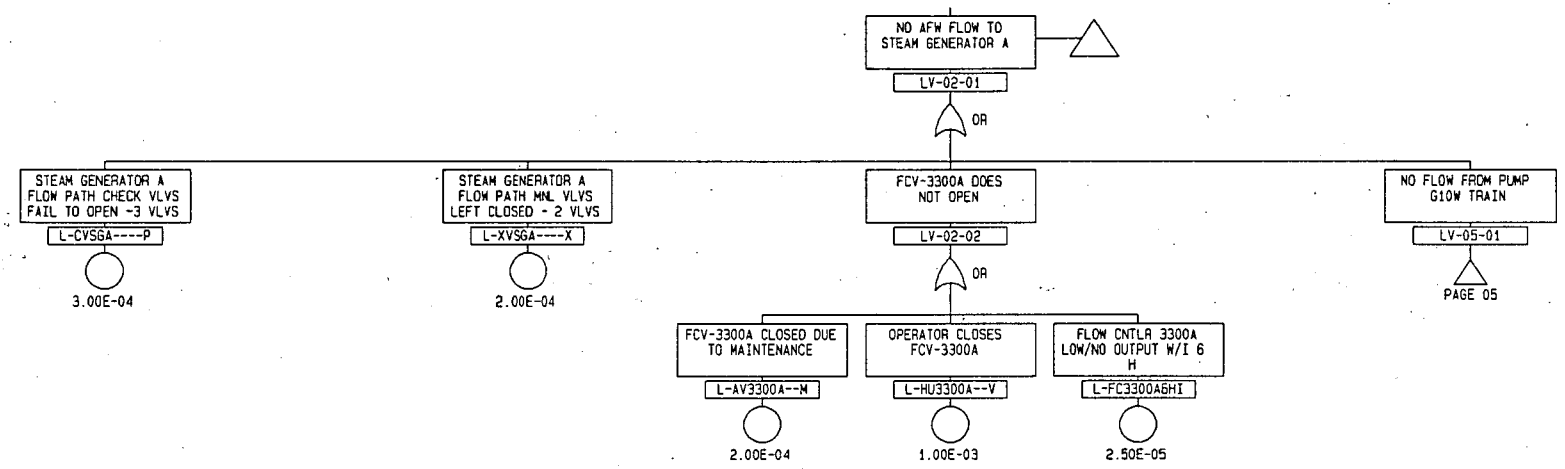
FAILURE OF AFW DUE TO VITAL BUS FAILURE

09-22-1990



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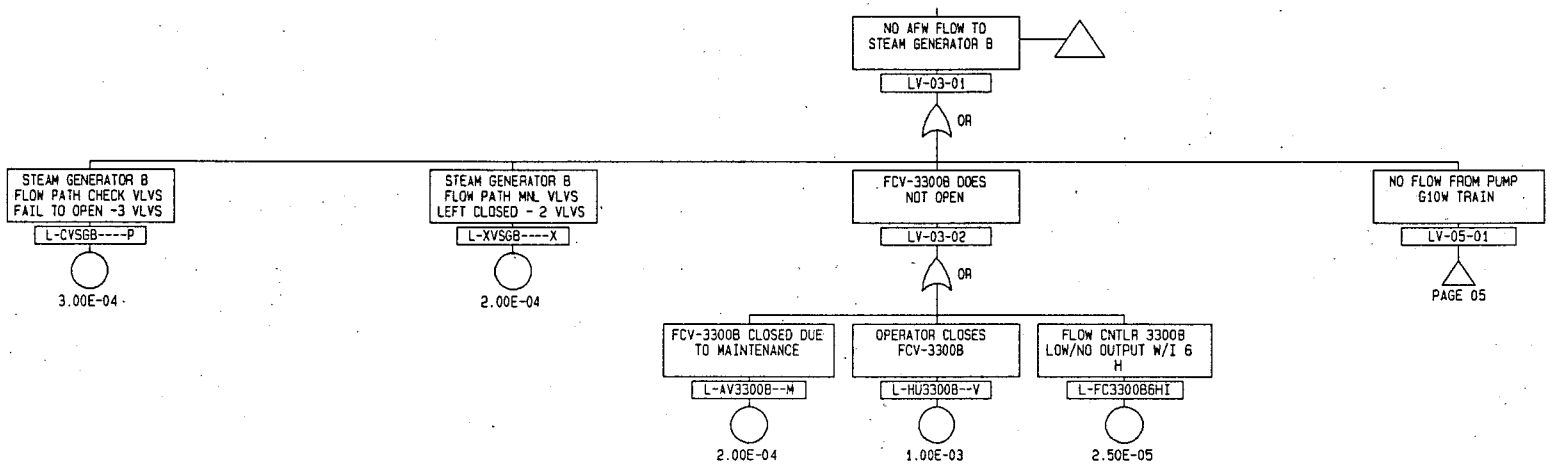
FAILURE OF AFW DUE TO VITAL BUS FAILURE

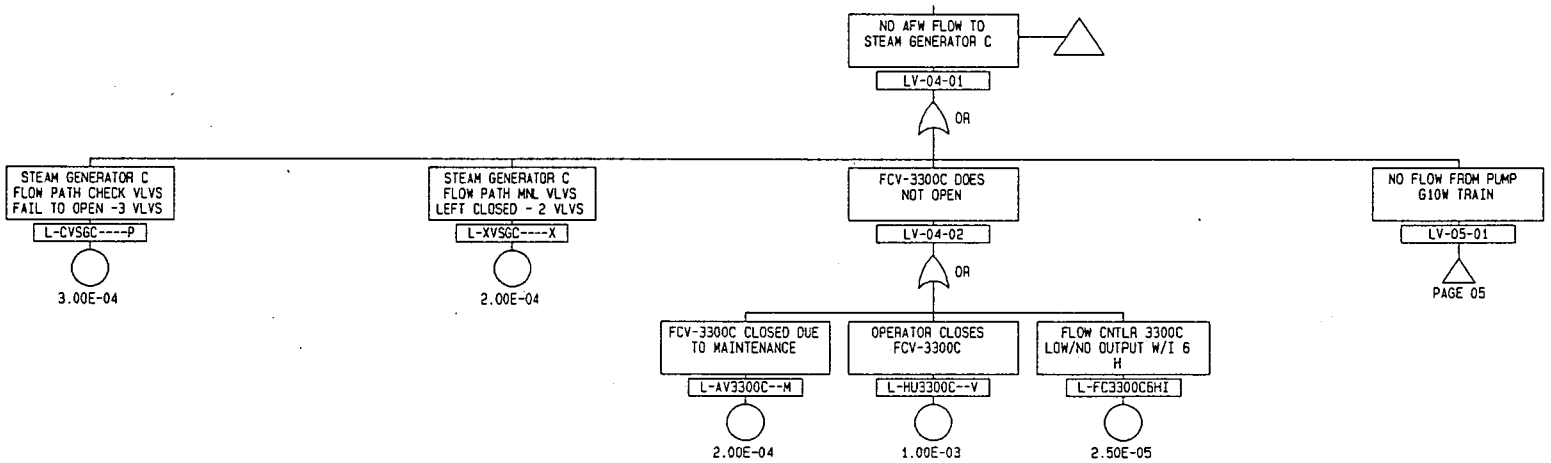
09-22-1990



REBECA (C)ERIN Engineering and Research, Inc. Version 1.1

FAILURE OF AFW DUE TO VITAL BUS FAILURE

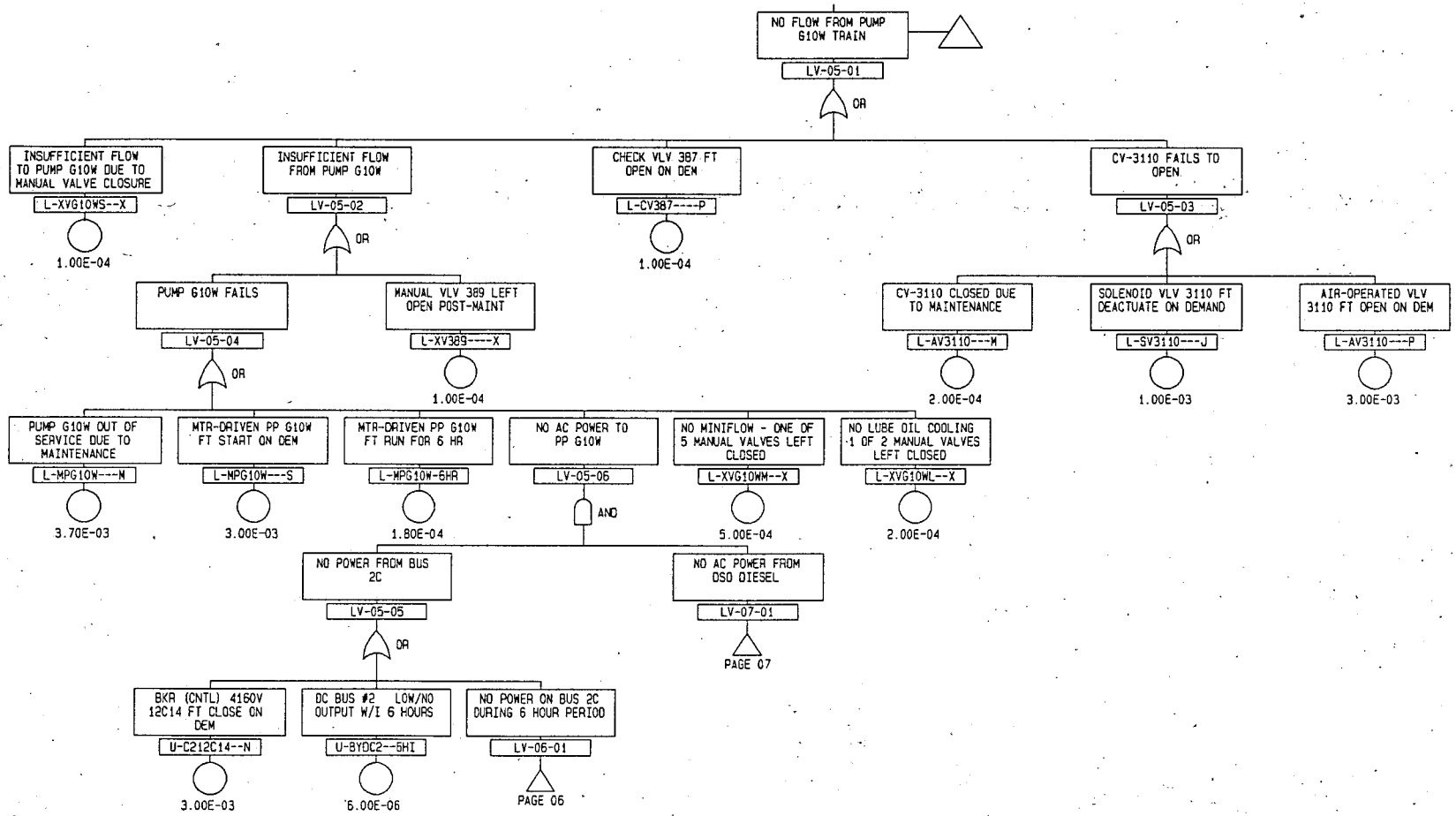
09-22-1990



REBECA (C)ERIN Engineering and Research, Inc. Version 1.1

FAILURE OF AFW DUE TO VITAL BUS FAILURE

09-23-1990

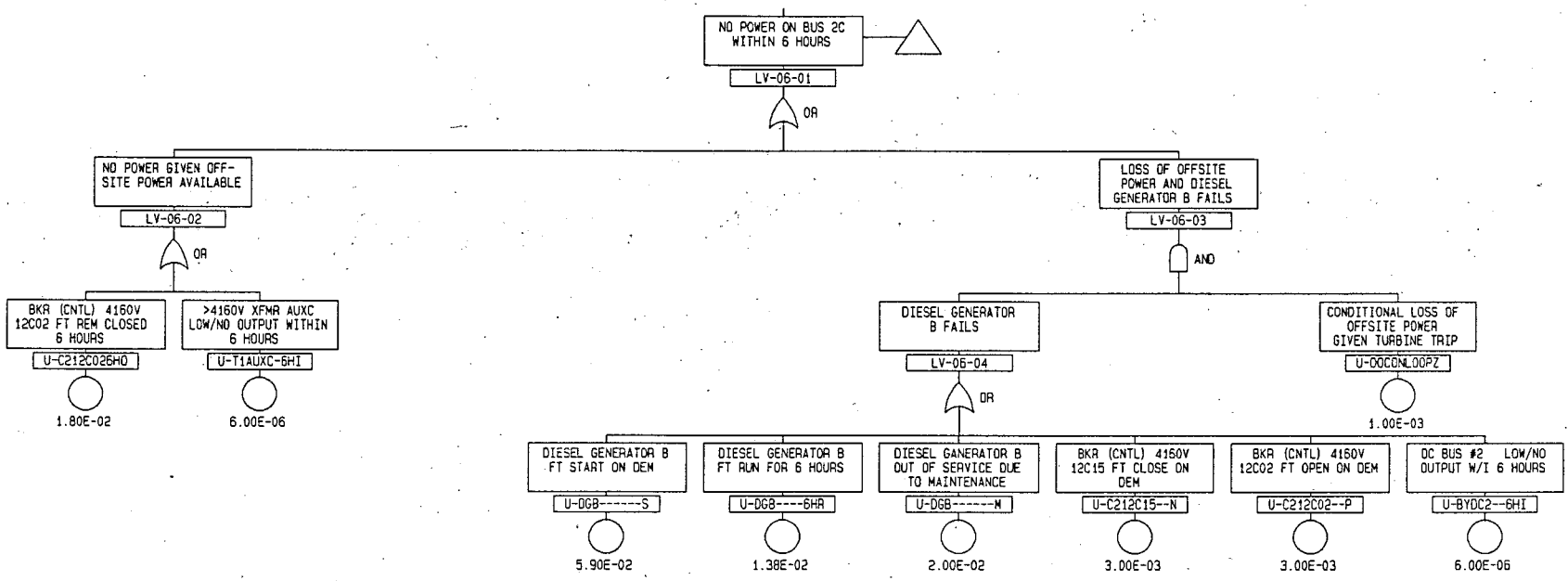


FAILURES OF AFWAS B ACTUATION SIGNAL ARE IGNORED

REBECA (C) EAIN Engineering and Research, Inc. Version 1.1

FAILURE OF AFW DUE TO VITAL BUS FAILURE

09-22-1990

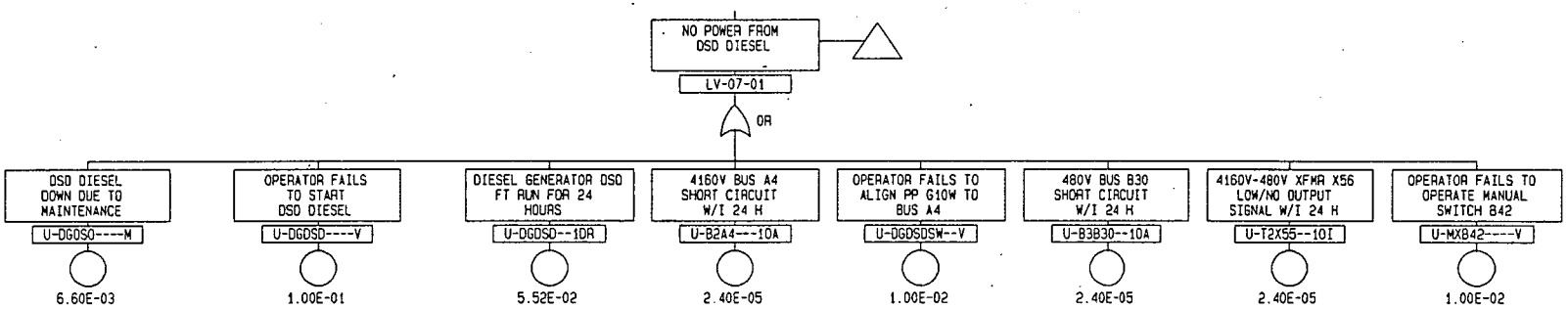


BUS FAILURES ARE IGNORED.

REBECA (C) ERIN Engineering and Research, Inc. Version 1.1

FAILURE OF AFW DUE TO VITAL BUS FAILURE

09-23-1990



AEBECA (C)ERIN Engineering and Research, Inc. Version 1.1