NUREG/CR-3922
ORNL/NOAC-224
Vol. 2

Survey and Evaluation of System Interaction Events and Sources

Appendices C and D

Prepared by G. A. Murphy/NOAC
M. L. Casada, M. D. Muhlheim, M. P. Johnson,
J. J. Rooney, J. H. Turner/JBFA

Nuclear Operations Analysis Center
Oak Ridge National Laboratory

JBF Associates, Inc.

Prepared for
U.S. Nuclear Regulatory Commission

GPO Printed copy price: $6.50

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Manuscript Completed: December 1984
Date Published: January 1985

Prepared by
G. A. Murphy, Nuclear Operations Analysis Center
M. L. Casada, M. D. Muhlheim, M. P. Johnson,
J. J. Rooney, J. H. Turner, JBF Associates, Inc.

Nuclear Operations Analysis Center
Oak Ridge National Laboratory
Oak Ridge, TN 37831

Subcontractor:
JBF Associates, Inc.
1000 Technology Park Center
Knoxville, TN 37932

Prepared for
Division of Safety Technology
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN B0789

This report describes the first phase of an NRC-sponsored project that identified and evaluated system interaction events that have occurred at commercial nuclear power plants in the United States. The project included (1) an assessment of nuclear power plant operating experience data sources, (2) the development of search methods and event selection criteria for identifying system interaction events, (3) a review of possible events, and (4) a final evaluation and categorization of the events. The report, organized in two volumes, outlines each of these steps and presents the results of the project. Volume 1 contains an introduction to the project, describes the process by which the project identified and evaluated the system interaction events, and presents the results and recommendations from that evaluation. Volume 1 also contains appendixes that review the data sources used in identifying events and outlines the information collected for each event. Volume 2 provides a description of each adverse system interaction event and lists the references for the events.

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Appendix C

EVENT LIST

Appendix C contains the 235 event descriptions sorted alphabetically by plant name and within plant name, by event date.

LIST OF ACRONYMS AND ABBREVIATIONS

AC	alternating current
ADS	automatic depressurization system
AE	Architect Engineer
AFW	auxiliary feedwater (system)
ANO 1	Arkansas Nuclear Unit 1
AUX	auxiliary
B&W	Babcock & Wilcox
BAST	boric acid storage tank
BKR	breaker
BLDG	building
BRG	bearing
BTY	battery
BWR	boiling-water reactor
CCW	component cooling water (system)
CE	Combustion Engineering
CHG	charging
CI	containment isolation
CIRC	circulating
CNMT	containment
CO_2	carbon dioxide
COMPRES	compressor
CONC	concentration
CONTR	control
CR	control room
CRD	control rod drive
CS	containment spray (system)
CST	condensate storage tank
CVCS	chemical and volume control system
DBA	design basis accident
DC	direct current
DELTA-P	differential pressure
DEMIN	demineralizer
DEPRES	depressurization
DG	diesel generator
DIFF	differential
DISCH	discharge
DIV	division
ECCS	emergency core cooling system
EDG	emergency diesel generator
ELEV	elevation
ELEC	electrical
EMERG	emergency
EQUIP	equipment
ERCW	essential raw cooling water
ERRON	erroneous
ESF	engineered safety features
ESFAS	engineered safety features actuation system
ESS	engineered safeguard system
EXH	exhaust

EXP	expansion
FCU	fan coil unit
FM	frequency modulation
FW	feedwater
GA	General Atomic
GE	General Electric
GEN	generator
GRAD	gradient
H_2	hydrogen
HDR	header
HELB	high-energy line break
HI	high
HPCI	high-pressure coolant injection (system)
HPSI	high-pressure safety injection (system)
HTGR	high-temperature gas-cooled reactor
HVAC	heating, ventilation, and air conditioning
HX	heat exchanger
I&C	Instrumentation and Controls
I/P	current/pressure
ICS	integrated control system
IE	Inspection & Enforcement
IEB	Inspection & Enforcement Bulletin
IN	inch
INDIC	indication
INIT	initiation
INJ	injection
INPO	Institute for Nuclear Power Operation
INST	instrument
INV	invertor
ISOL	isolation
KV	kilovolt
LER	Licensee Event Report
LNP	loss-of-normal power
LOCA	loss-of-coolant accident
LOP	loss of (electric) power
LOSP	loss of offsite (electric) power
LPCI	low-pressure coolant injection (system)
MCC	motor control center
MG	motor-generator
MFW	main feedwater (system)
MK	Mark
MOD	modification
MOV	motor-operated valve
MSL	main steam line
MSLB	main steam line break
MULT	multiple
N_2	nitrogen
NaOH	sodium hydroxide
NDT	nondestructive testing
NEG	negative
NNI	nonnuclear instrumentation
NPP	nuclear power plant

NUCL	nuclear
OBE	operating basic earthquake
OS	offsite
PAMS	postaccident monitoring system
PD	positive displacement
PORV	power-operator relief valve
psig	pounds per square inch gauge (pressure)
PRESS	pressure
PWR	pressurized-water reactor
PZR	pressurizer
RAD	radiation
RAS	recirculation actuation signal
RB	reactor building
RBCCW	reactor building closed cooling water (system)
RBEDT	reactor building equipment drain tank
RCIC	reactor core isolation cooling (system)
RCP	reactor coolant pump
RCS	reactor coolant system
RECIRC	recirculation
REF	reference
REL	related
REQD	required
RHR	residual heat removal (system)
RPS	reactor protection system
RWST	refueling/borated water storage tank
RX	reactor
SCSS	Sequence Coding and Search System
SD	shutdown
SDV	scram discharge volume
SEC	secondary
SEP	Systematic Evaluation Program
SG	steam generator
SGTS	standby gas treatment system
SFAS	safety features actuation system
SI	safety injection
SIAS	safety injection actuation system
SIL	Service Information Letter (GE)
SIS	safety injection signal
SOER	significant operating event report
SSE	safe shutdown earthquake
SW	service water (system)
SWS	service water system
SYS	system
T-HOT	RCS hot leg temperature
TBN	turbine
TEMP	temperature
TRN	train
UNQUAL	unqualified
UPS	uninterruptible power supply
UV	undervoltage
VCT	volume control tank
VDC	volts dc

VLVS	valves
W/D	withdraw
WEST	Westinghouse
W/O	without
XFMR	transformer

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 1 PLANT TYPE: B&W PWR
EVENT DATE: 1/18/1973 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (PWR)
SUBSYSTEM OCCURRENCE

REACTOR BUILDING HVAC (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: UNKNOWN

INITIATING EVENT: LOSS OF ONE TRAIN OF SERVICE WATER SYSTEM

PROPAGATION: BOTH TRAINS OF REACTOR BUILDING (RB) COOLERS WOULD FAIL

DEPENDENCY: TWO TRAINS OF RB COOLERS SUPPLIED BY THE SAME TRAIN OF SERVICE WATER

UNDESIRABLE RESULT: LOSS OF REACTOR BUILDING COOLING DUE TO A SINGLE FAILURE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0019 EVENT NO 1

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 1 PLANT TYPE: B&W PWR
EVENT DATE: 9/06/1977 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING HVAC
SUBSYSTEM OCCURRENCE

REACTOR AUXILIARY BUILDING HVAC
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR AUXILIARY BUILDING HVAC
TOTAL SYSTEM OCCURRENCE

MULTIPLE ESF SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA PLUS LOSS OF OFFSITE POWER

PROPAGATION: NORTH AND SOUTH EQUIPMENT ROOMS AND BATTERY ROOMS CAN EXCEED DESIGN TEMPERATURES

DEPENDENCY: OPERABILITY OF EQUIPMENT IN REDUNDANT AREAS CANNOT BE ASSURED DUE TO HIGH TEMP

UNDESIRABLE RESULT: ACCIDENT CAN CREATE CONDITIONS LEADING TO SUBSEQUENT SAFETY EQUIPMENT FAILURES

REMARKS: ADEQUATE QUALIFIED COOLING WAS NOT AVAILABLE. NEW COOLERS PURCHASED.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0103 EVENT NO 2

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 3/01/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING CONTAINMENT PURGE OPERATIONS

PROPAGATION: ALL CONTAINMENT ISOLATION VALVES FOR PURGE SUBJECTED TO LOCA AND FAIL TO CLOSE

DEPENDENCY: DELTA P FROM LOCA IN CONTAINMENT GREATER THAN DESIGN FOR CLOSURE FROM FULL OPEN

UNDESIRABLE RESULT: LOCA DURING PURGING RESULTS IN LOSS OF CONTAINMENT ISOLATION CAPABILITY

REMARKS: PURGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0100 L0094 EVENT NO 3

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 9/16/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 0 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: WITH UNIT 2 SHUT DOWN, UNIT 1 TRIPPED CAUSING DEMAND FOR OFFSITE POWER

PROPAGATION: ALL LOADS TRANSFERRED TO THE BUS TIE AUTO-TRANSFORMER, OVERLOADING IT

DEPENDENCY: OFFSITE POWER FOR BOTH UNITS CAME THRU INADEQUATE BUS TIE AUTO-TRANSFORMER

UNDESIRABLE RESULT: LOSS OF UNIT 1 SUPPLY CAUSES LOSS OF OFFSITE POWER FOR BOTH UNITS

REMARKS: BUS TIE AUTO-TRANSFORMER SETPOINTS WERE NOT CHANGED TO SUPPORT TWO UNITS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: I-291 M1001 L0153 EVENT NO 4

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 9/16/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: PREOPERATIONAL/STARTUP/POWER ASCENSION TESTS

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
SUBSYSTEM OCCURRENCE

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

CONTAINMENT SPRAY
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: BOTH ESF BUSES DEENERGIZED DUE TO TRANSFORMER FAILURE

PROPAGATION: WHILE DG STARTED, ALL POWER TO VITAL AC INSTRUMENT BUSES FAILED DUE TO ERROR

DEPENDENCY: SI OCCURRED AS DESIGNED BUT LOP CAUSED RAS TOO SOON, REALIGNED ECCS TO SUMP

UNDESIRABLE RESULT: COULD FAIL ALL ECCS TRAINS. POTENTIAL EXISTS FOR DAMAGING ECCS PUMPS

REMARKS: RWST LOST 50000 GALLONS TO SUMP. ALTERNATE POWER SOURCE SWITCHES WERE SET WRONG

CORRECTIVE ACTION: OTHER CATEGORY: 6

REFERENCES: I-291 M1001 L0132 EVENT NO 5

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 9/16/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: OTHER

INITIATING EVENT: LOSS OF NORMAL POWER FROM UNIT GENERATOR WITH AUXILIARY AND ESF STARTING LOADS

PROPAGATION: LOADS WOULD TRANSFER TO STARTUP TRANSFORMER CAUSING DEGRADED VOLTAGE

DEPENDENCY: LOW VOLTAGE OPERATION WOULD NOT TRANSFER TO DG'S AND COULD CAUSE FUSE FAILURES

UNDESIRABLE RESULT: ESF EQUIPMENT COULD BE DISABLED BY LOW VOLTAGE OPERATIONS

REMARKS: POTENTIAL EVENT RECOGNIZED IN REVIEWING THE ACTUAL EVENT AT ANO ON 09/16/78

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: I-291 M1001 L0153 EVENT NO 6

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 4/07/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: HOT SHUTDOWN

INITIATING SYSTEM AND COMPONENT

STEAM GENERATOR BLOWDOWN (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR BLOWDOWN (PWR)
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: PROCEDURE ERROR-SG BLOWDOWN DEMINERALIZER VALVE TO AFW PUMP SUCTION LEFT OPEN

PROPAGATION: FW FLASHED FORCING HOT WATER INTO BLOWDOWN TANKS & DEMIN-STEAM BOUND AFW PUMPS

DEPENDENCY: AFW PUMP SUCTION WAS PARALLELED TO SG BLOWDOWN RETURN AND CST

UNDESIRABLE RESULT: TOTAL LOSS OF AUXILIARY FEEDWATER SYSTEM

REMARKS: LOSS OF OFFSITE POWER TRANSIENT PRIOR TO EVENT CAUSED SHUTDOWN

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L1006 A0010 I-249 EVENT NO 7

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARKANSAS NUCLEAR 2 PLANT TYPE: CE PWR
EVENT DATE: 8/03/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: ACTUATION OF FIRE SUPPRESSION SYSTEM IN AUX BLDG FIRE ZONE

PROPAGATION: PROLONGED OPERATION OF FIRE SUPPRESSION SYSTEM WITHOUT OPER ACTION CAUSES FLOOD

DEPENDENCY: CABLE SPREADING ROOM NOT PROTECTED FROM FLOODING, WATER WOULD RUN INTO ROOM

UNDESIRABLE RESULT: LOSS OF SAFETY RELATED EQUIPMENT

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 3

REFERENCES: L2036 EVENT NO 8

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ARNOLD PLANT TYPE: GE BWR
EVENT DATE: 3/06/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DRYWELL/ TORUS HVAC AND PURGE (BWR)
VALVES

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA OCCURRING DURING DRYWELL PURGE OPERATIONS

PROPAGATION: PRESSURE SURGE CAUSES OVERTRAVEL AND LOSS OF VALVE SEATING CAPABILITY

DEPENDENCY: FULLY OPEN PURGE VALVES INADEQUATE FOR LOCA CONDITIONS

UNDESIRABLE RESULT: LOSS OF CAPABILITY OF PURGE VALVES TO ISOLATE CONTAINMENT IN CASE OF LOCA

REMARKS: DESIGN CHANGED TO LIMIT VALVES TO 30% OPEN

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0048 EVENT NO 9

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMPERATURE

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0083 L1008 EVENT NO 10

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 1/17/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

REACTOR VESSEL
BLOWERS/COMPRESSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR VESSEL
BLOWERS/COMPRESSORS

RESIDUAL HEAT REMOVAL (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
PUMPS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: REACTOR VESSEL VENT EDUCTOR IN SERVICE FOR REFUELING

PROPAGATION: EDUCTOR CAUSED HIGH NEG PRESS IN RCS-PULLED WATER AND ENTRAINED AIR FROM SG'S

DEPENDENCY: RCS LEVEL AND SG LEVEL DEPENDENT ON NEG PRESS FROM VENT EDUCTOR

UNDESIRABLE RESULT: RHR PUMPS BECAME AIR-BOUND - LOSS OF BOTH RHR PUMPS FOR A SHORT TIME

REMARKS: OCCURRED DURING PREPERATIONS FOR REFUELING

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L0135 EVENT NO 11

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 4/11/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: REFUELING

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: OPERATION OF RHR SYSTEM DURING REFUELING SHUTDOWN WITH LOW REACTOR WATER LEVEL

PROPAGATION: TWO RHR PUMPS BECOME AIR BOUND DURING OPERATION

DEPENDENCY: LOW REACTOR WATER LEVEL DOES NOT PROVIDE ADEQUATE RHR PUMP SUCTION

UNDESIRABLE RESULT: LOSS OF FORCED FLOW DURING REFUELING RHR OPERATION

REMARKS: CONSEQUENCES ARE NOT SEVERE. MODIFICATIONS ARE TO BE MADE TO CORRECT PROBLEM

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L0021 EVENT NO 12

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 8/27/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: PORV CONTROL FAILURE AFTER SECONDARY SYS HELB CAUSES SAFETY INJECTION ACTUATION

PROPAGATION: RCS PRESSURE RISES TO HIGHER THAN CHG PUMP DESIGN INJ PRESS;PUMPS OVERHEAT

DEPENDENCY: RECIRC VALVES PROTECT CHG PUMPS, BUT SIAS CLOSES RECIRC VALVES

UNDESIRABLE RESULT: LOSS OF MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS BEING MET

REMARKS: GENERIC W PROBLEM. PUMP FAILURES DEPEND ON SPECIFIC DESIGN HEAD FOR CHG PUMPS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0053 I-017 EVENT NO 13

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 9/12/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

COMPONENT COOLING WATER
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

COMPONENT COOLING WATER
PIPES/FITTINGS

RESIDUAL HEAT REMOVAL (PWR)
HEAT EXCHANGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

COMPONENT COOLING WATER
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: UNKNOWN

INITIATING EVENT: EARTHQUAKE WOULD STRESS AND BREAK 2-IN BRANCH LINE OFF 24-IN RBCCW LINE

PROPAGATION: BREAK WOULD REQUIRE ISOLATION OF WHOLE 24-IN RBCCW HEADER

DEPENDENCY: 24 INCH RBCCW HEADER FEEDS RHR HEAT EXCHANGERS

UNDESIRABLE RESULT: LOSS OF RHR

REMARKS: PIPE SUPPORTS WILL BE MODIFIED TO ALLEVIATE OVERSTRESS CONDITION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:20

REFERENCES: L2026 EVENT NO 14

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 10/03/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
PUMPS

AUXILIARY FEEDWATER (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: MAIN STEAM LINE BREAK WHICH DEPRESS ALL STEAM GENERATORS AND FAILS TO AFW PUMP

PROPAGATION: MOTOR DRIVEN AFW PUMPS WILL FACE LOW PRESSURE AND TRIP ON RUNOUT

DEPENDENCY: NO RUNOUT PROTECTION PROVIDED FOR MOTOR-DRIVEN AFW PUMPS,DEPEND ON SG PRESSURE

UNDESIRABLE RESULT: LOSS OF AFW DUE TO PUMP RUNOUT & NO STEAM TO TURBINE-DRIVEN AFW PUMPS

REMARKS: IE BULLETIN 80-04 ADDRESSED THIS. ORIFICES WILL BE INSTALLED IN AFW LINES

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:11

REFERENCES: L0071 I-031 EVENT NO 15

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BEAVER VALLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/21/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
I&C/TRANSMITTERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
ACCUMULATORS/RESERVOIRS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: FAILURE OF VCT LEVEL TRANSMITTER HIGH STOPS LETDOWN FLOW CAUSING LOW TANK LEVEL

PROPAGATION: LOSS OF SUCTION DAMAGES MULTIPLE CHG PUMPS SINCE FAILURE ALSO STOPS SWITCHOVER

DEPENDENCY: LEVEL TRANSMITTER CONTROLS LEVEL AND SUCTION SWITCHOVER TO RWST

UNDESIRABLE RESULT: REDUNDANT CHG PUMPS DAMAGED. THESE PUMPS ARE ALSO HI HEAD SAFETY INJECTION

REMARKS: WESTINGHOUSE NOTIFICATION OF POTENTIAL FAILURE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 5

REFERENCES: L0121 A0020 A0021 EVENT NO 16

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BELLEFONTE 1 PLANT TYPE: B&W PWR
EVENT DATE: 11/01/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

REACTOR BUILDING HVAC (PWR)
HEAT EXCHANGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (PWR)
HEAT EXCHANGERS

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
HEAT EXCHANGERS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA WHEN REACTOR BUILDING COOLER TUBES ARE CLEAN

PROPAGATION: HIGH CONTAINMENT TEMPERATURE MAY CAUSE BOILING IN REACTOR BLDG HX'S

DEPENDENCY: ERCW SUBJECT TO ADVERSE ENVIRONMENT-CAUSING FAILURE

UNDESIRABLE RESULT: LOCA CAN DEGRADE REACTOR BUILDING COOLING AND OTHER ERCW SUPPORTED SYSTEMS

REMARKS: ERCW PRESSURE IS TOO LOW FOR ACCIDENT CONDITIONS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0107 EVENT NO 17

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BELLEFONTE 1 PLANT TYPE: B&W PWR
EVENT DATE: 11/12/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: GAS BUILDUP IN CVCS MAKEUP TANK OUTLET LINE TO TRAIN A MAKEUP PUMPS

PROPAGATION: REDUCED SUCTION HEAD TO PUMPS CAUSES PUMP DAMAGE

DEPENDENCY: TRAIN A PUMPS TIED TO MAKEUP TANK THRU A DEFECTIVE PIPING DESIGN

UNDESIRABLE RESULT: LOSS OF ALL TRAIN A MAKEUP PUMPS

REMARKS: ALSO AFFECTS DOCKET NO. 439

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 2

REFERENCES: C14 EVENT NO 18

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BIG ROCK POINT PLANT TYPE: GE BWR
EVENT DATE: 10/31/1977 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE STARTUP

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
VALVES

AUXILIARY STEAM
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

SECONDARY CONTAINMENT (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: IMPROPER PROCEDURE USED DURING VALVE LINEUP FOR RCS POWER OPERATION

PROPAGATION: WATER BACK FLOWED FROM RCS INTO PLANT HEATING SYSTEM EXTERNAL TO CNMT

DEPENDENCY: CONTAINMENT IS ALWAYS BREACHED WHEN PLANT HEATING SYSTEM IS CONNECTED TO RCS

UNDESIRABLE RESULT: FLOW CAUSED WATER HAMMER IN STEAM SUPPLY LINE, MINOR RELEASE OF RADIOACTIVITY

REMARKS: PROCEDURES MODIFIED; TWO STEAM SUPPLY VALVES LOCKED CLOSED

CORRECTIVE ACTION: OTHER CATEGORY:22

REFERENCES: E0004 L2007 EVENT NO 19

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BIG ROCK POINT PLANT TYPE: GE BWR
EVENT DATE: 8/22/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
TOTAL SYSTEM OCCURRENCE

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA COULD RESULT IN FLASHING IN RX VESSEL LEVEL SENSOR REFERENCE LEG

PROPAGATION: COULD PREVENT AUTO INIT OF SCRAM, CNMT ISOL,CORE SPRAY, AND AUTO DEPRES.

DEPENDENCY: ESFAS AND RPS DEPENDENT ON DEGRADED RX VESSEL LEVEL SENSOR.

UNDESIRABLE RESULT: LOCA CAN DEGRADE MULTIPLE SYSTEMS REQUIRED TO RESPOND

REMARKS: DESIGN DEFICIENCY GENERIC TO GE. SENSORS AND SETPOINTS MODIFIED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 8

REFERENCES: L2004 E0004 L2005 EVENT NO 20

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 1 PLANT TYPE: GE BWR
EVENT DATE: 3/22/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONSTRUCTION ACTIVITY
TEST/CALIBRATION ACTIVITY

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

MULTIPLE SYSTEMS
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

MULTIPLE SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 1,4 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: CABLE PENETRATION LEAK TESTING WITH OPEN FLAME RESULTING IN FIRE

PROPAGATION: FIRE SPREAD INTO CABLE SPREADING ROOM AND CABLE TRAYS IN RX BLDG

DEPENDENCY: POWER/CONTROL CABLES FOR MULTIPLE SAFETY SYSTEMS IN COMMON AREA

UNDESIRABLE RESULT: FIRE CAUSED RX TRIP AND DEGRADED RHR, ECCS AND AUXILIARY SYSTEMS

REMARKS: IEB 75-04 & 04A. FIRE BURNED OUT OF CONTROL 7 HOURS. AFFECTED UNITS 1 & 2

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:15

REFERENCES: L0122 M2001 EVENT NO 21

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 1 PLANT TYPE: GE BWR
EVENT DATE: 8/09/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

ENGINEERED SAFETY FEATURES ACTUATION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

MULTIPLE ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR DRYWELL (BWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA CAUSES HIGH AMBIENT TEMP CONDITIONS IN DRYWELL

PROPAGATION: HEATUP OF RX VESSEL LEVEL INST REFERENCE LEG CAUSES ERROR IN INDICATION

DEPENDENCY: RX VESSEL LEVEL REF LEG SUBJECT TO HIGH TEMP DURING LOCA

UNDESIRABLE RESULT: FAILURE OF MULTIPLE LEVEL INSTRUMENTS - SLOW RESPONSE OF ESF

REMARKS: GE SIL 299. SPECIFIC SYSTEMS AFFECTED NOT PROVIDED

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0180 EVENT NO 22

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 1 PLANT TYPE: GE BWR
EVENT DATE: 2/01/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DRYWELL/ TORUS HVAC AND PURGE (BWR)
MECHANICAL FUNCTION ITEMS

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA OCCURRING DURING DRYWELL PURGE OPERATIONS

PROPAGATION: DRYWELL PRESSURE SURGE CAUSES FAILURE OF DUCTS OR DAMPERS

DEPENDENCY: INADEQUATE DUCT STRENGTH OR ISOLATION VALVE CAPABILITY FOR PURGE SYSTEM

UNDESIRABLE RESULT: LOSS OF CONTAINMENT INTEGRITY

REMARKS: PURGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0031 L0032 EVENT NO 23

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 1 PLANT TYPE: GE BWR
EVENT DATE: 2/10/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

COMPONENT COOLING WATER
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

COMPONENT COOLING WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR DRYWELL (BWR)

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA FROM RECIRC LINE BREAK IMPINGES ON RBCCW LINE CAUSING IT TO BREAK

PROPAGATION: IF RBCCW ISOLATION VALVE FAILS, DRYWELL ATMOSPHERE IS UNISOLATED

DEPENDENCY: RBCCW LINE SUBJECT TO RECIRC LINE BREAK DAMAGE AND ONLY ONE ISOL VALVE EXISTS

UNDESIRABLE RESULT: LOCA PLUS SINGLE FAILURE CAUSES LOSS OF CONTAINMENT INTEGRITY

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: L0035 L0123 EVENT NO 24

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 3 PLANT TYPE: GE BWR
EVENT DATE: 3/04/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW PRESSURE COOLANT INJECTION (BWR)
I&C/GENERAL

LOW PRESSURE COOLANT INJECTION (BWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

LOW PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA PLUS LPCI LOOP SELECTION LOGIC FAILURE

PROPAGATION: LPCI FLOWS SENT TO BROKEN LOOP - ALL 4 PUMPS EXCEED RUNOUT FLOW

DEPENDENCY: PUMPS DO NOT HAVE RUNOUT PROTECTION AND ARE DEPENDENT ON LOOP SELECTION LOGIC

UNDESIRABLE RESULT: LPCI OPERATION COULD DAMAGE RHR PUMPS, DEFEATING LONG TERM OPERABILITY

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L0108 EVENT NO 25

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BROWNS FERRY 3 PLANT TYPE: GE BWR
EVENT DATE: 6/28/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

LIQUID RADWASTE
VESSELS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LIQUID RADWASTE
VESSELS

CONTROL ROD DRIVE (BWR)
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTROL ROD DRIVE (BWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RBEDT NOT ALLOWING WATER TO DRAIN FROM SCRAM DISCHARGE VOLUME

PROPAGATION: HIGH WATER LEVEL IN EAST SCRAM DISCHARGE VOLUME WITH NO AUTO SCRAM SIGNAL GEN

DEPENDENCY: REACTOR BLDG EQUIP DRAIN TANK CAUSES SDV TO NOT DRAIN PROPERLY

UNDESIRABLE RESULT: LOSS OF ABILITY TO SCRAM

REMARKS: SUBSEQUENT EVALUATION IDENTIFIED OTHER POTENTIAL PROBLEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:18

REFERENCES: A0009 I-018 I-246 I-236 I-225 EVENT NO 26

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 1 PLANT TYPE: GE BWR
EVENT DATE: 9/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ENGINEERED SAFETY FEATURES ACTUATION
I&C/SENSORS

MULTIPLE ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR DRYWELL (BWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA CAUSES HIGH AMBIENT TEMP CONDITIONS IN DRYWELL

PROPAGATION: HEATUP OF RX LEVEL INST REFERENCE LEG CAUSES ERROR IN INDICATION

DEPENDENCY: RX LEVEL REF LEG SUBJECT TO HIGH TEMP DURING LOCA

UNDESIRABLE RESULT: FAILURE OF MULT LEVEL INSTR-SLOW RESPONSE OF ESF

REMARKS: GE SIL 299. EVENT JUDGED TO NOT SIGNIFICANTLY IMPAIR SAFETY SYSTEM RESPONSE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0092 EVENT NO 27

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 1 PLANT TYPE: GE BWR
EVENT DATE: 11/08/1979 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CIRCULATING WATER (OPEN CYCLE)
MOTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY GENERATOR I&C
I&C/SWITCHES

EMERGENCY POWER GENERATION
CIRCUIT BREAKER/FUSES

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: WITH DG IN LOCAL MANUAL MODE, CIRC WATER PUMP MOTOR FAILS DEGRADING BUS VOLTAGE

PROPAGATION: DG OUTPUT BREAKER TRIPS, THEN GETS SIMUL. OPEN & CLOSE SIGNALS CAUSING LOCKOUT

DEPENDENCY: WHEN DG IN LOCAL MANUAL & LOP, CONTROLS GIVE ERRONEOUS SIGNALS

UNDESIRABLE RESULT: FAILURE OF BREAKER TO CLOSE AFTER LOAD SHED RESULTS IN LOSS OF EMERGENCY BUS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L1020 EVENT NO 28

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 2 PLANT TYPE: 3E BWR
EVENT DATE: 2/27/1975 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PLANT MONITORING
I&C/INDICATORS

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: OVERPRESSURE IN REACTOR CAUSES ADS VALVES TO OPEN

PROPAGATION: TRICKLE CURRENT THRU RELAY INDICAT LIGHTS FEED SOLENOID COILS-VALVES WON'T CLOSE

DEPENDENCY: RELAY INDICATING LIGHTS & ADS VALVES' SOLENOID COILS HAVE SAME POWER SOURCE

UNDESIRABLE RESULT: ONCE OPENED, ADS VALVES CAN'T BE CLOSED CAUSING RX PRESSURE TRANSIENT

REMARKS: PROBLEM WAS DISCOVERED DURING PREOP TESTING OF ADS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L1010 EVENT NO 29

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 2 PLANT TYPE: GE BWR
EVENT DATE: 9/17/1975 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

LOW PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 3 DISCOVERY: UNKNOWN

INITIATING EVENT: LOSS OF OFFSITE POWER WITH A SLOW REDUCTION OF REACTOR PRESSURE

PROPAGATION: ESF LOGIC INITIATES LPCI AND CORE SPRAY SIMULTANEOUSLY

DEPENDENCY: LOP WITH SLOW REDUCTION OF RX PRESS PRODUCE ESF ACTUATION LOGIC ERROR

UNDESIRABLE RESULT: FAILURE OF ONE OR MORE DIESEL GEN AFTER LOP

REMARKS: PERMISSIVE LOGIC ERROR-DETAILS UNCLEAR

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0109 EVENT NO 30

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 2 PLANT TYPE: GE BWR
EVENT DATE: 1/05/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

ENVIRONMENT (EXTERNAL TO ANY STRUCTURE)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING HVAC
SUBSYSTEM OCCURRENCE

LEAK MONITORING
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: OUTSIDE TEMPERATURE DROPPED 20F THUS VENTILATION SYSTEM TEMP DROPPED

PROPAGATION: LEAK DETECTION CIRCUIT RECEIVED HIGH DELTA-TEMP SIGNAL, ISOLATED

DEPENDENCY: LEAK DETECTION IS DELTA-TEMP, NOT ABSOLUTE TEMPERATURE

UNDESIRABLE RESULT: HPCI UNAVAILABLE-TURBINE STEAM SUPPLY ISOLATED 3 TIMES

CORRECTIVE ACTION: OTHER CATEGORY:22

REFERENCES: L2034 EVENT NO 31

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: BRUNSWICK 2 PLANT TYPE: GE BWR
EVENT DATE: 4/05/1977 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

REACTOR BUILDING HVAC (BWR)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (BWR)
TOTAL SYSTEM OCCURRENCE

LEAK MONITORING
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RX BLDG HEATING OFF,INLET AIR TEMPERATURE TO HPCI ROOM LOWER THAN HPCI ROOM AIR

PROPAGATION: HIGH DIFF TEMP SENSED AS STEAM LINE BREAK

DEPENDENCY: LOW RX BLDG AIR TEMP CAN INITIATE HPCI STEAM LINE BREAK LOGIC

UNDESIRABLE RESULT: HPCI LOST DUE TO ISOL SIGNAL FROM STEAM LINE BREAK LOGIC

REMARKS: LER INDICATED THIS WAS SECOND OCCURRENCE-ALSO ON 12/21/76, BUT NO HPCI ISOL

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0131 EVENT NO 32

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 1 PLANT TYPE: CE PWR
EVENT DATE: 5/23/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: LOAD CHANGE DURING POWER OPERATION

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: LOSS OF FEEDWATER TRIP

PROPAGATION: QUENCHING OF STEAM IN FW PIPING BY AFW CAUSED WATER HAMMER DAMAGE TO FW HDR VLVS

DEPENDENCY: COMMON FW HDR FOR MAIN AND AUX FW CAN CONTAIN STEAM DURING LOSS OF FW TRIP

UNDESIRABLE RESULT: DAMAGE TO AFW FLOW PATH WHEN AFW DEMANDED

REMARKS: WATER HAMMER EVENTS ALSO AT SURRY 1,TURKEY PT.2&3,GINNA 1,IND PT. 2 (SEE REF 2)

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:12

REFERENCES: L0139 M1001 EVENT NO 33

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 1 PLANT TYPE: CE PWR
EVENT DATE: 5/20/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

ESSENTIAL COMPRESSED AIR
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL COMPRESSED AIR
HEAT EXCHANGERS

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: TUBE FAILURE IN INSTRUMENT AIR COMPRESSOR AFTERCOOLER ALLOWED AIR INTO SWS

PROPAGATION: AIR ACCUMULATED ON SHELL SIDE OF IDLE SWS HX WHILE HX OUT OF SERVICE

DEPENDENCY: TRAPPED AIR SWEPT INTO COMMON SW HEADER WHEN HX BROUGHT BACK ON LINE

UNDESIRABLE RESULT: BOTH TRAINS OF SERVICE WATER DISABLED DUE TO COMMON HEADER IN TURBINE BLDG

REMARKS: NUMEROUS HARDWARE AND PROCEDURAL CHANGES RESULTED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 2

REFERENCES: A0014 L2054 I-127 EVENT NO 34

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 1 PLANT TYPE: CE PWR
EVENT DATE: 8/12/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

ESSENTIAL COMPRESSED AIR
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL COMPRESSED AIR
HEAT EXCHANGERS

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: INSTRUMENT AIR AFTER COOLER TUBES FAIL ALLOWING AIR INGRESS INTO SERVICE WATER

PROPAGATION: AIR IN BOTH SERVICE WATER TRAINS CAUSED LOW FLOW

DEPENDENCY: INSTRUMENT AIR AND SERVICE WATER INTERFACE AT COMPRES COOLER-AIR AT HIGHER PRESS

UNDESIRABLE RESULT: LOSS OF SERVICE WATER & POTENTIAL LOSS OF ALL SAFETY-RELATED EQUIPMENT SERVED

REMARKS: COOLER TUBES WERE CRACKED FROM OVER-ROLLING.

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 2

REFERENCES: L1035 EVENT NO 35

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 1 PLANT TYPE: CE PWR
EVENT DATE: 11/05/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN CONDENSER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EQUIPMENT DRAINAGE (INCLUDING VENTS)
PIPES/FITTINGS

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: TURBINE BUILDING

RESULT TYPE: 1,2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: CONDENSER LEAK OR FLOOD OF CONDENSER PIT WITH HEAVY FLOW INTO EQUIPMENT DRAINS

PROPAGATION: CONDENSER LEAKS, EQUIP DRAINS BACKFLOW-FLOOD SERVICE WATER PUMP ROOM-PUMPS FAIL

DEPENDENCY: SERVICE WATER PUMP ROOM AND CONDENSER PIT ARE CONNECTED VIA UNISOLATIBLE DRAINS

UNDESIRABLE RESULT: TOTAL LOSS OF SERVICE WATER DUE TO FLOODING DAMAGE TO PUMPS AND OTHER EQUIPMENT

REMARKS: SERVICE WATER PUMP ROOM IS 12 FT. IN ELEV HIGHER THAN CONDENSER PIT.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 4

REFERENCES: L1026 I-148 I-120 A0016 EVENT NO 36

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 2 PLANT TYPE: CE PWR
EVENT DATE: 10/17/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
PUMPS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: AIR USED TO TRANSFER RESINS GETS IN PURIFICATION SYSTEM LINES

PROPAGATION: AIR LEAKS INTO RHR SYSTEM AND BOTH PUMPS BECOME AIRBOUND AND CAVITATE

DEPENDENCY: RHR SYSTEM AND PURIFICATION SYSTEM HAVE A CROSS-CONNECTION WHICH WAS OPEN

UNDESIRABLE RESULT: LOSS OF RHR COOLING WHILE IN COLD SHUTDOWN

REMARKS: CAN HAPPEN ONLY IN COLD SHUTDOWN AS THAT IS ONLY WHEN CROSS-CONNECTION IS OPENED

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L1041 M2001 EVENT NO 37

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 2 PLANT TYPE: CE PWR
EVENT DATE: 11/05/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN CONDENSER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EQUIPMENT DRAINAGE (INCLUDING VENTS)
PIPES/FITTINGS

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: TURBINE BUILDING

RESULT TYPE: 1,2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: CONDENSER LEAK OR FLOOD OF CONDENSER PIT WITH HEAVY FLOW INTO EQUIPMENT DRAINS

PROPAGATION: CONDENSER LEAKS, EQUIP DRAINS BACKFLOW-FLOOD SERVICE WATER PUMP ROOM-PUMPS FAIL

DEPENDENCY: SERVICE WATER PUMP ROOM AND CONDENSER PIT ARE CONNECTED VIA UNISOLATIBLE DRAINS

UNDESIRABLE RESULT: TOTAL LOSS OF SERVICE WATER DUE TO FLOODING DAMAGE TO PUMPS AND OTHER EQUIPMENT

REMARKS: SERVICE WATER PUMP ROOM IS 12 FT. IN ELEV HIGHER THAN CONDENSER PIT.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 4

REFERENCES: L1027 I-148 I-120 EVENT NO 38

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 2 PLANT TYPE: CE PWR
EVENT DATE: 7/20/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

RAW SERVICE WATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RAW SERVICE WATER
VALVES

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

COMPONENT COOLING WATER
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SERVICE WATER HEAT EXCHANGER DISCHARGE HEADER BUTTERFLY VALVE FAILED

PROPAGATION: FLOW OF SALT WATER CAUSED VALVE DISK TO MOVI TO THE CLOSED POSITION

DEPENDENCY: COMMON DISCHARGE HEADER FROM SERVICE WATER HX TO DISCHARGE CANAL

UNDESIRABLE RESULT: LOSS OF SW AND ONE TRAIN OF COMPONENT COOLING WATER

REMARKS: POINT BEACH 1 & 2 AND FT. CALHOUN HAVE SIMILAR DESIGNS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: A0017 L2053 EVENT NO 39

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CALVERT CLIFFS 2 PLANT TYPE: CE PWR
EVENT DATE: 10/19/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

POTABLE AND SANITARY WATER
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

POTABLE AND SANITARY WATER
PIPES/FITTINGS

REACTOR POWER CONTROL (PWR)
ELECTRICAL/I&C FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR POWER CONTROL (PWR)
ELECTRICAL/I&C FUNCTION ITEMS

CONTROL ROD DRIVE (PWR)
CONTROL ROD DRIVES

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: CONTROL ROOM TOILET PLUGS & OVERFLOWS. WATER SEEPS THRU FLOOR TO SPREADING ROOM

PROPAGATION: WATER DRIPS ON CONTROL ROD CABINETS SHORTING EQUIP - ONE CONTROL ROD DROPS

DEPENDENCY: TOILET IS ABOVE SPREADING ROOM AND FIRE BARRIER WALLS ARE NOT WATER TIGHT

UNDESIRABLE RESULT: SHORTING OF CONTROL ROD EQUIP-UNDESIRED ROD DROP-POTENTIAL FLUX TILT OR SCRAM

REMARKS: CROWBAR LEFT IN TOILET DRAIN CAUSED CLOGGING

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 4

REFERENCES: L2038 A0023 EVENT NO 40

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CLINTON 1 PLANT TYPE: GE BWR
EVENT DATE: 6/26/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HVAC FAN FAILURE CAN PROPEL MISSILE THRU FAN HOUSING

PROPAGATION: SAFETY-RELATED EQUIPMENT CAN BE DAMAGED BY MISSILE

DEPENDENCY: SAFETY-RELATED CABLES UNPROTECTED FROM POTENTIAL MISSILES

UNDESIRABLE RESULT: DEGRADATION OF ONE OR MORE SAFETY SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 16

REFERENCES: C07 EVENT NO 41

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CONNECTICUT YANKEE PLANT TYPE: WEST PWR
EVENT DATE: 5/08/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2,3 DISCOVERY: UNKNOWN

INITIATING EVENT: LOCA WITH LOSS OF OFFSITE POWER COINCIDENT WITH SAFETY INJECTION SIGNAL

PROPAGATION: DIESEL GENERATORS OVERLOAD DUE TO PRESENCE OF NON-SAFETY LOADS

DEPENDENCY: NON-SAFETY LOADS NOT SHED UPON SI SIGNAL

UNDESIRABLE RESULT: ESF SYSTEMS COULD FAIL DUE TO LOP

REMARKS: SINCE CHG PUMPS NOT REQD, DESIGN CHANGED TO TRIP OR BLOCK OPERATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0093 L0096 EVENT NO 42

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CONNECTICUT YANKEE PLANT TYPE: WEST PWR
EVENT DATE: 8/25/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

OPERATION ACTIVITY
PERSONNEL

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR POWER CONTROL (PWR)
I&C/SWITCHES

OPERATION ACTIVITY
PERSONNEL

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR POWER CONTROL (PWR)
I&C/SWITCHES

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 2,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: OPERATOR KEYED PORTABLE FM TRANSCEIVER IN CONTROL ROOM NEAR POWER RANGE INSTR

PROPAGATION: STRONG FM RADIO SIGNALS INITIATED TBN LOAD RUNBACK AND AUTO ROD W/D STOP SIGNAL

DEPENDENCY: CONTROL ROOM INSTRUMENTATION SUSCEPTIBLE TO STRONG FM SIGNALS

UNDESIRABLE RESULT: RX TRANSIENTS MAY RESULT FROM ACTUATION OF PORTABLE FM TRANSCEIVERS

REMARKS: RADIOS ARE IN COMMON USE IN NPP'S - NEED PERSONNEL DISCIPLINE TO LIMIT USE IN CR

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: L0126 EVENT NO 43

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CONNECTICUT YANKEE PLANT TYPE: WEST PWR
EVENT DATE: 1/29/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2,3 DISCOVERY: REVIEW OF PROCEDURE/TEST RESULTS

INITIATING EVENT: LOSS OF POWER FOLLOWED BY AUTOMATIC AND MANUAL DG LOADING & THEN A LOCA

PROPAGATION: LOCA GENERATED SIAS SIGNAL WOULD PLACE ADDITIONAL LOADS ON DG CAUSING OVERLOAD

DEPENDENCY: EMERGENCY POWER MAY FAIL DUE TO NON ESSENTIAL LOADS

UNDESIRABLE RESULT: DEGRADATION OF SYSTEMS DEPENDENT ON EMERGENCY POWER DUE IN PART TO NONSAFETY EQP

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 1

REFERENCES: L0043 EVENT NO 44

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: COOK 2 PLANT TYPE: WEST PWR
EVENT DATE: 3/26/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR AUXILIARY BUILDING HVAC
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING HVAC
HEAT EXCHANGERS

CONTAINMENT ICE CONDENSER (PWR)
HEAT EXCHANGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ICE CONDENSER (PWR)
HEAT EXCHANGERS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 0 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: TEMP GRAD INDUCED AIR CURRENTS CAUSED ICE MIGRATION IN BASKETS NEAR CRANE WALL

PROPAGATION: ICE LOSS COULD PREVENT ADEQUATE STEAM CONDENSATION ON LOCA THUS RB OVERPRESSURE

DEPENDENCY: CRANE WALL IS NEAR STEAM GENERATORS WHICH HEAT-UP WALL

UNDESIRABLE RESULT: POTENTIAL SERVICE ICE LOSS IN ICE CONDENSER LEADING TO RB OVERPRESSURE

REMARKS: LOSS OF 17 AIR HANDLING UNITS CAUSED GREATER EFFECT THAN ANTICIPATED

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L1031 EVENT NO 45

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: COOPER PLANT TYPE: GE BWR
EVENT DATE: 10/16/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: UNKNOWN

INITIATING EVENT: ANY EVENT DAMAGING CABLES UNDER PANEL 9-3

PROPAGATION: BOTH DIVISION I AND DIVISION II CABLES ARE ROUTED THRU RISER UNDER PANEL

DEPENDENCY: INSTALLATION ERROR ROUTED A SINGLE DIV I CABLE IN DIV II RISER

UNDESIRABLE RESULT: VIOLATES REDUNDANCY REQUIREMENT FOR SAFETY SYSTEMS (SYSTEMS NOT SPECIFIED)

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 15

REFERENCES: L0014 EVENT NO 46

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CRYSTAL RIVER 3 PLANT TYPE: B&W PWR
EVENT DATE: 2/07/1977 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CONTAINMENT SPRAY
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT SPRAY
VALVES

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: CONTAINMENT SPRAY SYSTEM VALVE TESTED WITHOUT MANUALLY ISOLATING NAOH TANK

PROPAGATION: NAOH DRAINED INTO DECAY HEAT REMOVAL SYSTEM, DILUTING RCS BORON CONCENTRATION

DEPENDENCY: CONTAINMENT SPRAY PUMP SUCTION REMAINED CONNNECTED TO RHR DURING TEST

UNDESIRABLE RESULT: UNTERIMINATED DILUTION COULD RESULT IN INADVERTENT CRITICALITY

CORRECTIVE ACTION: OTHER CATEGORY:22

REFERENCES: L0101 L0102 EVENT NO 47

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: CRYSTAL RIVER 3 PLANT TYPE: B&W PWR
EVENT DATE: 2/26/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

DC POWER
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

NON-NUCLEAR INSTRUMENTATION
TOTAL SYSTEM OCCURRENCE

REACTOR POWER CONTROL (PWR)
I&C/CONTROLLERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR POWER CONTROL (PWR)
TOTAL SYSTEM OCCURRENCE

FEEDWATER CONTROL
TOTAL SYSTEM OCCURRENCE

PRESSURIZER (PWR)
VALVES

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: 24 VDC NNI POWER FAILED-LOST 70% OF NNI INSTRUMENTATION

PROPAGATION: POWER FAILURE CAUSED PORV TO LATCH OPEN AND ICS TO DEMAND 103% POWER

DEPENDENCY: NON-NUCLEAR INSTRUMENT POWER AFFECTS PORV AND INTEGRATED CONTROL SYSTEM

UNDESIRABLE RESULT: LO FW/HI STEAM FLOWS, SG BOILS DRY, PORV LATCHES OPEN, RAPID DEPRESS, SIAS

REMARKS: MULT. INSTRUMENTS FAILED-PAMS, PZR LEVEL, RCS FLOW T-HOT, SG PRESS, MFW FLOW

CORRECTIVE ACTION: OTHER CATEGORY:14

REFERENCES: L1004 I-036 I-270 I-257 I-108 EVENT NO 48

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 12/23/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

EMERGENCY POWER GENERATION
ENGINES, INTERNAL COMBUSTION

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

ENGINEERED SAFETY FEATURES ACTUATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

ALL ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: UNKNOWN

INITIATING EVENT: LOCA AND A LOSP OCCURRING LATER AFTER DG HAS BEEN MANUALLY STOPPED

PROPAGATION: ESFAS SEQUENCER WILL NOT RESTART PUMPS EVEN THOUGH DG RESTARTS ON ACTUAL LOSP

DEPENDENCY: STOPPING DG REQUIRES BLOCKING SAFETY ACTUATION SIGNAL TO DG - AFFECTS SEQUENCER

UNDESIRABLE RESULT: FOR THIS EVENT, ESFAS SEQUENCER WILL NOT RESTART ESSENTIAL PUMPS GIVEN LOSP

REMARKS: DESIGN CHANGE CORRECTED THIS ERROR. SEE EVENT ON 02/24/77

CORRECTIVE ACTION: DESIGN CHANGE, MODIFICATION CATEGORY: 1

REFERENCES: L0104 EVENT NO 49

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 2/24/1977 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: ESFAS MANUAL INITIATION AND A LATER LOSS OF OFFSITE POWER

PROPAGATION: ALL EDG LOADS WOULD BE APPLIED AT ONE TIME, SEQUENCER WOULD NOT WORK

DEPENDENCY: EDG'S COULD BE OVERLOADED, DUE TO STARTUP SURGES

UNDESIRABLE RESULT: LOSP IN THIS SEQUENCE COULD RESULT IN EDG FAILURES

REMARKS: PROBLEM DUE TO CHANGES TO CORRECT EARLIER SEQUENCER DEFECT-12/23/76

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0105 EVENT NO 50

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 6/07/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: REVIEW OF PROCEDURE/TEST RESULTS

INITIATING EVENT: LOSS OF POWER WHEN OPERATOR BACKFEEDS NONESSENTIAL BUS AND THEN SFAS SIGNAL

PROPAGATION: UNLESS LOSS OF POWER ON BUS, SFAS SEQUENCER WILL NOT OPERATE

DEPENDENCY: LOADS WILL OCCUR AS INITIATED WITHOUT SEQUENCING, THREATENING ESSENTIAL BUS

UNDESIRABLE RESULT: CONNECTION BETWEEN BUSES CAN CAUSE FAILURE OF ESSENTIAL BUS DURING LOSP

REMARKS: PROCEDURE CHANGE. A DESIGN CHANGE MAY BE REQUIRED

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 1

REFERENCES: L0095 EVENT NO 51

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 4/19/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: REFUELING

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: POWER LOST WHILE 2 ESF CHANNELS PLACED ON ONE POWER SUPPLY FOR MAINTENANCE WORK

PROPAGATION: INADVERTENT ACTUATION OF ALL SFAS LEVELS & RHR RECIRC SUCTION TO SUMP

DEPENDENCY: INADEQUATE CONTROL OF MAINTENANCE WORK DURING OUTAGE

UNDESIRABLE RESULT: DEGRADATION OF RHR, WOULD ALSO HAPPEN TO ECCS AND CNMT SPRAY IF OPERATING

REMARKS: OTHER INADVERTENT SWITCHOVERS HAVE OCCURRED PREVIOUSLY

CORRECTIVE ACTION: OTHER CATEGORY: 6

REFERENCES: I-023 I-251 L0151 M0005 M0006 EVENT NO 52

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 7/09/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
I&C/GENERAL

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
I&C/GENERAL

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

MULTIPLE SYSTEMS
MISCELLANEOUS EQUIPMENT

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: REVIEW OF PROCEDURE/TEST RESULTS

INITIATING EVENT: SFAS TRIP COINCIDENT WITH LOSS OF OFFSITE POWER

PROPAGATION: POTENTIAL EXISTS FOR LOADING DG INSTANTEOUSLY (W/O SEQUENCING)

DEPENDENCY: SPECIFIC COMBINATION AND TIMING DEFEATS SEQUENCER, OVERLOADING DG

UNDESIRABLE RESULT: LOSP AND SFAS CAN OVERLOAD DG, CAUSING DEGRADATION OF EMERGENCY POWER

REMARKS: SPECIFIC COMBINATION REQD FOR PROBLEM CONSIDERED EXTREMELY UNLIKELY

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0114 L0115 EVENT NO 53

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DAVIS-BESSE 1 PLANT TYPE: B&W PWR
EVENT DATE: 7/30/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

SEC CONT RECIRC AND EXHAUST
BLOWERS/COMPRESSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

SEC CONT RECIRC AND EXHAUST
BLOWERS/COMPRESSORS

SECONDARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

SECONDARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

SEC CONT RECIRC AND EXHAUST
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: WITH SUPPLY FAN RUNNING, CNMT PURGE EXH FAN TRIPPED, OVERPRESS BLEW OUT PANEL

PROPAGATION: WITH BLOW-OUT PANEL OPEN, SHIELD BLDG INTEGRITY IS LOST, CAN'T MAINTAIN NEG PRES

DEPENDENCY: OVER-PRESSURIZATION OF AREA AND BLOW OUT PANEL OPENS

UNDESIRABLE RESULT: POTENTIAL FAILURE OF SHIELD BLDG TO CONTROL LEAKAGE

REMARKS: EXHAUST FAN TRIP ON 13.8 KV TRANSFER AFTER CONDENSER FAILURE & SCRAM

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L1014 EVENT NO 54

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DIABLO CANYON 1 PLANT TYPE: WEST PWR
EVENT DATE: 10/06/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

UNKNOWN
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

CONTROL ROOM PANELS
TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: EVENT CAUSING DAMAGE TO CLASS I CIRCUITS IN CONTROL ROOM PANELS

PROPAGATION: MULTIPLE REDUNDANT CLASS I CIRCUITS ARE DAMAGED

DEPENDENCY: REDUNDANT CIRCUITS ARE NOT ADEQUATELY SEPARATED

UNDESIRABLE RESULT: LOSS OF CONTROL OR MONITORING OF SAFETY SYSTEMS/PARAMETERS

REMARKS: SPECIFIC SYSTEM NOT IDENTIFIED. ALSO SAME ERROR AT UNIT 2

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:15

REFERENCES: L0010 EVENT NO 55

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DIABLO CANYON 2 PLANT TYPE: WEST PWR
EVENT DATE: 10/06/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

UNKNOWN
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: EVENT CAUSING DAMAGE TO CLASS I CIRCUITS IN CONTROL ROOM PANELS

PROPAGATION: MULTIPLE REDUNDANT CLASS I CIRCUITS ARE DAMAGED

DEPENDENCY: REDUNDANT CIRCUITS WERE NOT ADEQUATELY SEPARATED

UNDESIRABLE RESULT: LOSS OF CONTROL OR MONITORING OF SAFETY SYSTEMS/PARAMETERS

REMARKS: SPECIFIC SYSTEMS NOT IDENTIFIED. SAME ERROR OCCURRED AT UNIT 1.

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:15

REFERENCES: L0010 EVENT NO 56

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DRESDEN 2 PLANT TYPE: GE BWR
EVENT DATE: 2/02/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

DC POWER
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DC POWER
BATTERIES/CHARGERS

DC POWER
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

DC POWER
SUBSYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURE

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: ANY EVENT CAUSING DAMAGE TO DC CABLE FROM CHARGER TO BATTERY

PROPAGATION: CABLE CONNECTING MAIN DC BUS TO RESERVE BUS COULD ALSO BE DAMAGED

DEPENDENCY: INSTALLATION ERROR ALLOWED REDUNDANT SOURCES OF DC POWER TOO CLOSE TOGETHER

UNDESIRABLE RESULT: POTENTIAL FAILURE OF DC POWER SUPPORTING SAFETY SYSTEMS

REMARKS: ERROR FOUND DURING NRC REQUESTED REVIEW OF DC BUSES

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:15

REFERENCES: L0013 EVENT NO 57

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DRESDEN 2 PLANT TYPE: GE BWR
EVENT DATE: 12/23/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

FIRE DETECTION
I&C/SENSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

FIRE DETECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: HPCI ROOM FIRE PROTECTION SYSTEM ACTUATED DUE TO HIGH HUMIDITY AND STEAM

PROPAGATION: WATER ENTERED HPCI OIL SYSTEM

DEPENDENCY: HPCI CAN FAIL DUE TO FIRE SYSTEM ACTUATION

UNDESIRABLE RESULT: HPCI NOT OPERABLE

REMARKS: SIMILAR TO EVENT AT DRESDEN 3

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0060 A0024 EVENT NO 58

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DRESDEN 3 PLANT TYPE: GE BWR
EVENT DATE: 7/19/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

LIQUID RADWASTE
VESSELS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LIQUID RADWASTE
VESSELS

CONTROL ROD DRIVE (BWR)
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTROL ROD DRIVE (BWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: RBEDT NOT ALLOWING WATER TO DRAIN FROM SCRAM DISCHARGE VOLUME

PROPAGATION: HIGH WATER LEVEL IN WEST SCRAM DISCHARGE VOLUME WITH NO AUTO SCRAM SIGNAL GEN

DEPENDENCY: REACTOR BLDG EQUIP DRAIN TANK CAUSES SDV TO NOT DRAIN PROPEELY

UNDESIRABLE RESULT: LOSS OF ABILITY TO SCRAM ASSOCIATED CONTROL RODS

REMARKS: FOUND DURING TEST REQUIRED BY IEB 80-17. VENT LINES MODIFIED.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 18

REFERENCES: A0009 I-018 I-236 L0152 EVENT NO 59

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: DRESDEN 3 PLANT TYPE: GE BWR
EVENT DATE: 11/30/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE STARTUP

INITIATING SYSTEM AND COMPONENT

FIRE DETECTION
I&C/SENSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

FIRE PROTECTION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: HPCI ROOM FIRE PROTECTION SYSTEM ACTUATED DUE TO HIGH HUMIDITY AND STEAM

PROPAGATION: FIRE SUPRESSION SYSTEM FLOODED HPCI ROOM

DEPENDENCY: HPCI CAN FAIL DUE TO FIRE SYSTEM ACTUATION

UNDESIRABLE RESULT: HPCI NOT OPERABLE

REMARKS: HPCI ROOM HAS HISTORY OF HI HUMIDITY-ALSO TEMP VENTILATION WAS NOT OPERATING

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0059 EVENT NO 60

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/21/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

COMPONENT COOLING WATER SUBSYSTEM OCCURRENCE

COMPONENT COOLING WATER SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

COMPONENT COOLING WATER TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: REVIEW OF PROCEDURE/TEST RESULTS

INITIATING EVENT: RUPTURE OF COMPONENT COOLING WATER AT CHARGING PUMP 1B

PROPAGATION: BOTH COMPONENT COOLING WATER TRAINS WOULD LOSE INVENTORY

DEPENDENCY: BOTH CCW TRAINS WERE CONNECTED TO SAME CHARGING PUMP

UNDESIRABLE RESULT: LOSS OF BOTH CCW TRAINS WOULD FAIL MULTIPLE SAFETY SYSTEMS

REMARKS: PROCEDURE DID NOT SPECIFY THAT ONLY ONE TRAIN SHOULD SUPPORT A PUMP AT ONE TIME

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:13

REFERENCES: L0037 EVENT NO 61

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/22/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0077 EVENT NO 62

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/13/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SECONDARY SYS HELB CAUSING SI ACTUATION AND PORV CONTROL FAILURE

PROPAGATION: RCS PRESSURE HIGHER THAN CHG PUMP DESIGN INJ PRESS;PUMPS OVERHEAT

DEPENDENCY: RECIRC VALVES PROTECT CHG PUMPS, BUT SIAS CLOSES RECIRC VALVES

UNDESIRABLE RESULT: LOSS OF MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS MET

REMARKS: GENERIC W PROBLEM. PUMP FAILURES DEPENDS ON SPECIFIC DESIGN HEAD

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0055 I-017 EVENT NO 63

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/12/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: MAINTENANCE/MODIFICATION

INITIATING EVENT: ANY FAILURE CAUSING LOSS OF 1 TRAIN OF SERVICE WATER

PROPAGATION: ONE TRAIN OF SW FAILS AND REDUNDANT TRAIN PUMPS OVERHEAT AND FAIL

DEPENDENCY: TRAIN A SERVICE WATER COOLS TRAIN B PUMPS & LUBE OIL COOLERS-AND VICE VERSA

UNDESIRABLE RESULT: POTENTIAL TOTAL LOSS OF SERVICE WATER & LOSS OF SAFETY-RELATED EQUIPMENT SERVED

REMARKS: IDENTICAL DESIGN PROBLEM ON UNIT 2 - LER 364/80-001

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L1038 EVENT NO 64

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 12/09/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURES

RESULT TYPE: 1,4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT

PROPAGATION: SAFETY RELATED PIPING, CONDUIT OR EQMT ATTACHED TO 38 INADEQUATELY BUILT WALLS

DEPENDENCY: CONSTRUCTION INADEQUACIES ALLOWED DEVIATION FROM APPROVED DESIGNS

UNDESIRABLE RESULT: DAMAGE TO MULTIPLE SAFETY SYSTEMS DUE TO EARTHQUAKE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L0172 EVENT NO 65

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/22/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

NON-NUCLEAR INSTRUMENTATION
I&C/TRANSMITTERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
ACCUMULATORS/RESERVOIRS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: VCT LEVEL TRANSMITTER FAILS HIGH STOPPING LETDOWN FLOW

PROPAGATION: NO LETDOWN, VCT LOW LEVEL, NO SWITCH TO RWST, LOSS OF SUCTION DAMAGES CHG PUMPS

DEPENDENCY: LEVEL TRANSMITTER CONTROLS LEVEL AND SUCTION SWITCHOVER TO RWST

UNDESIRABLE RESULT: REDUNDANT CHG PUMPS DAMAGED. THESE PUMPS ARE ALSO HI HEAD SAFETY INJECTION

REMARKS: WESTINGHOUSE NOTIFICATION OF POTENTIAL FAULIRE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 5

REFERENCES: L0120 A0020 A0021 EVENT NO 66

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 2 PLANT TYPE: WEST PWR
EVENT DATE: 11/12/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
UNSPECIFIED COMPONENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: MAINTENANCE/MODIFICATION

INITIATING EVENT: ANY FAILURE CAUSING LOSS OF 1 TRAIN OF SERVICE WATER

PROPAGATION: ONE TRAIN OF SW FAILS AND REDUNDANT TRAIN PUMPS OVERHEAT AND FAIL

DEPENDENCY: TRAIN A SERVICE WATER COOLS TRAIN B PUMPS & LUBE OIL COOLERS-AND VICE VERSA

UNDESIRABLE RESULT: POTENTIAL TOTAL LOSS OF SERVICE WATER & LOSS OF SAFETY-RELATED EQUIPMENT SERVED

REMARKS: IDENTICAL DESIGN PROBLEM ON UNIT 1

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 13

REFERENCES: L1044 EVENT NO 67

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FARLEY 2 PLANT TYPE: WEST PWR
EVENT DATE: 12/09/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURE:

RESULT TYPE: 1,4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT

PROPAGATION: SAFETY RELATED PIPING, CONDUIT OR EQMT ATTACHED TO 27 INADEQUATELY BUILT WALLS

DEPENDENCY: CONSTRUCTION INADEQUACIES ALLOWED DEVIATION FROM APPROVED DESIGNS

UNDESIRABLE RESULT: DAMAGE TO MULTIPLE SAFETY SYSTEMS DUE TO EARTHQUAKE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L0171 EVENT NO 68

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FERMI 2 PLANT TYPE: GE BWR
EVENT DATE: 3/10/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR BUILDING HVAC (BWR)
MECHANICAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (BWR)
MECHANICAL FUNCTION ITEMS

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: UNKNOWN

INITIATING EVENT: SEISMIC EVENT

PROPAGATION: NON-SEISMIC HVAC DUCT FALLS ON SAFETY-RELATED EQUIPMENT DURING SEISMIC EVENT

DEPENDENCY: NON-SEISMIC HVAC DUCT ERECTED OVER SAFETY-RELATED EQUIPMENT

UNDESIRABLE RESULT: LOSS OF SAFETY-RELATED EQUIPMENT

REMARKS: AFFECTS EQUIPMENT IN REACTOR AND AUXILIARY BUILDINGS. NOTED DURING CONSTRUCTION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: C21 EVENT NO 69

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FT. CALHOUN 1 PLANT TYPE: CE PWR
EVENT DATE: 5/19/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

AUXILIARY FEEDWATER (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
PUMPS

AUXILIARY FEEDWATER (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: LOSP PLUS A BREAK IN THE STEAM SUPPLY LINE TO TURBINE-DRIVEN AFW PUMP

PROPAGATION: STEAM WOULD CAUSE FAILURE OF REDUNDANT ELECTRIC AFW PUMP

DEPENDENCY: TURBINE-DRIVEN AND MOTOR-DRIVEN AFW PUMPS LOCATED IN SAME AREA

UNDESIRABLE RESULT: LOSS OF AUX FEEDWATER DURING LOSS OF OFFSITE POWER

REMARKS: FOUND DURING REVIEW OF INPO SOER 81-17

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0029 EVENT NO 70

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: FT. ST. VRAIN PLANT TYPE: GA HTGR
EVENT DATE: 5/17/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: LOSP WITH ONE DG OUT OF SERVICE AND ONE RUNNING TIED TO BUS

PROPAGATION: LOSP OVERLOAD RUNNING DG DUE TO ALL PLANT LOADS SHIFTING TO THAT DG

DEPENDENCY: DG PARALLELED WITH OFFSITE POWER AND CONNECTED TO ALL PLANT LOADS

UNDESIRABLE RESULT: OVERLOAD OF RUNNING DG, TRIPS OFF, LEAVING PLANT WITH NO AC POWER

REMARKS: RECOMMENDED RUN DG UNLOADED OR ONLY CONNECTED TO EMERGENCY LOADS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 1

REFERENCES: L0148 A0022 EVENT NO 71

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: GINNA PLANT TYPE: WEST PWR
EVENT DATE: 4/22/1971 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
TOTAL SYSTEM OCCURRENCE

CVCS/HIGH PRESSURE SAFETY INJECTION
I&C/INDICATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
I&C/INDICATORS

INTERMEDIATE PRESSURE INJECTION (PWR)
VALVES

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: VOLTAGE LOST ON ALL 480 V SAFEGUARD BUSES DURING STATION BLACKOUT TESTING

PROPAGATION: NO POWER TO INSTRUMENT BUS THEREFORE ALL BAST LEVEL CHANNELS INOPERABLE

DEPENDENCY: INTERLOCK PREVENTED 4 VALVES IN SI SUCTION TO BAST FROM OPENING

UNDESIRABLE RESULT: LOSS OF ALL 480 V BUSES AND LOSS OF SI PUMP SUCTION

REMARKS: POWER SUPPLY FOR LEVEL CHANNELS CHANGED TO BATTERY SUPPLY (UPS)

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 14

REFERENCES: E0005 L2014 EVENT NO 72

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: GINNA PLANT TYPE: WEST PWR
EVENT DATE: 10/21/1973 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL CONDUCTORS

CVCS/HIGH PRESSURE SAFETY INJECTION
ELECTRICAL/I&C FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL CONDUCTORS

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

INTERMEDIATE PRESSURE INJECTION (PWR)
PUMPS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: POWER LOST ON INSTRUMENT BUS (SUPPOSEDLY UPS) DURING LOSP

PROPAGATION: BUS FAILURE CAUSED LOSS OF BORIC ACID STORAGE TANK LEVEL INDICATION

DEPENDENCY: BAST LEVEL CONTROLS SI PUMP SUCTION SWITCH TO RWST, TRANSFERRED EARLY

UNDESIRABLE RESULT: PREMATURE TRANSFER OF SUCTION DUE TO POWER LOSS

REMARKS: REASON POWER LOST IS UNKNOWN. MAYBE RELATED TO LOSP

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 14

REFERENCES: L2011 L2012 L2013 E0005 EVENT NO 73

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: GINNA PLANT TYPE: WEST PWR
EVENT DATE: 11/14/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
TOTAL SYSTEM OCCURRENCE

CONTROL ROD DRIVE (PWR)
CIRCUIT BREAKER/FUSES

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTROL ROD DRIVE (PWR)
CIRCUIT BREAKER/FUSES

REACTOR PROTECTION
GENERATORS

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURES

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: INADVERTENT ACTUATION OF FIRE SPRINKLER SYSTEM

PROPAGATION: WATER REACHED RPS MG SET SWITCHGEAR AND CRD POWER SUPPLY

DEPENDENCY: SPRINKLER SYSTEM CAN WET SAFETY-RELATED COMPONENTS

UNDESIRABLE RESULT: DEGRADATION OF SAFETY SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0063 A0024 EVENT NO 74

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: GRAND GULF 1 PLANT TYPE: GE BWR
EVENT DATE: 7/14/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: CONSTRUCTION

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR AUXILIARY BUILDING
PENETRATIONS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: INADVERTENT REPEATED ACTUATION OF ECCS PENETRATION ROOM CO2 SYSTEM

PROPAGATION: BUILDUP OF CO2 PRESSURE BLEW OFF LOCKED DOOR TO AUX BUILDING

DEPENDENCY: DESIGN OF ECCS ROOM INADEQUATE TO VENT EXCESS CO2 PRESSURE

UNDESIRABLE RESULT: DAMAGE TO SAFETY-RELATED STRUCTURE BY FIRE PROTECTION ACTUATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0128 EVENT NO 75

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: GRAND GULF 1 PLANT TYPE: GE BWR
EVENT DATE: 8/04/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC ELECTRICAL CONDUCTORS

DC POWER
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (BWR)
PUMPS

LOW VOLTAGE AC (LESS THAN 600V)
CIRCUIT BREAKER/FUSES

PLANT MONITORING
I&C/INDICATORS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: COMPUTER CABLE IMPROPERLY CONNECTED (INSTAL. ERROR) 120VAC TO DIV 1 125VDC BUS

PROPAGATION: RHR PUMP FAILED TO START;SW BKR TRIPPED; ERRON TRIP INDIC FOR DIV1 BUSSES

DEPENDENCY: MISCONNECTION OF CABLE PROVIDED CONNECTION BETWEEN 120VAC POWER AND 125VDC

UNDESIRABLE RESULT: DAMAGE & FAILURE OF NUMEROUS INSTS-POTENTIAL UNDESIRED EQUIP & HUMAN ACTIONS

REMARKS: INCORRECT ALARMS ON CR PANELS FOR DIV 1 BUSES COULD MISLEAD OPERATOR

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:22

REFERENCES: L1032 EVENT NO 76

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 3/30/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

DC POWER
BATTERIES/CHARGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

DC POWER
BATTERIES/CHARGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA AND LOSP WITH FAILURE OF DG A OR C BATTERY

PROPAGATION: BATTERY LOSS CAUSES LOSS OF DC POWER REQD TO TRIP NON-ESF LOADS OFF DG B BUSES

DEPENDENCY: BTY LOSS FAILS DG FOR ITS TRAIN (A OR C) AND CAUSES OVERLOAD OF DG B

UNDESIRABLE RESULT: LOCA AND LOSP WITH SINGLE BTY FAILURE CAUSES LOSS OF TWO EDG

REMARKS: MOD WILL TRIP BKRS ON LOSS OF DC POWER. SAME DESIGN ERROR APPLIES TO UNIT 2.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0097 EVENT NO 77

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 9/10/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DRYWELL/ TORUS HVAC AND PURGE (BWR)
MECHANICAL FUNCTION ITEMS

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING DRYWELL PURGE OPERATIONS

PROPAGATION: PRESSURE SURGE CAUSES PURGE VALVES TO OVERTRAVEL AND LOSS OF SEATING CAPABILITY

DEPENDENCY: PURGE VALVES INADEQUATE FOR LOCA CONDITIONS

UNDESIRABLE RESULT: LOSS OF CAPABILITY OF PURGE VALVES TO ISOLATE CONTAINMENT IN CASE OF LOCA

CORRECTIVE ACTION: OTHER CATEGORY: 9

REFERENCES: L0045 EVENT NO 78

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 1/29/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC SUBSYSTEM OCCURRENCE

EMERGENCY GENERATOR COOLING SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION GENERATORS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA/LOSP ON ONE UNIT CAUSES TRANSFER OF SUPPLY BKR POWER TO OPPOSITE UNIT

PROPAGATION: SUPPLY BREAKERS WILL NOT TRANSFER - NO AC POWER AVAILABLE

DEPENDENCY: BREAKERS DESIGNED FOR AC CONTROL POWER, BUT NO AC AVAILABLE ON LOSP

UNDESIRABLE RESULT: POWER LOST TO STANDBY SERVICE WATER FOR DG, CAUSING DG TO BE INOPERABLE

REMARKS: FOUND DURING IEB79-27 INVESTIGATION. DESIGN CHANGE MADE TO DC CONTROL POWER

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0175 I-036 EVENT NO 79

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 5/24/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

LOW PRESSURE CORE SPRAY (BWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

LOW PRESSURE CORE SPRAY (BWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: RECIRC LINE BREAK PLUS MCC FAILURE WHEN OPERATING WITH LEAKY RHR ISOL VALVE

PROPAGATION: LEAKY VALVE WILL ALLOW RHR HX TO PRESSURIZE

DEPENDENCY: EVENT DISABLES 2 RHR TRAINS AND 1 TRAIN OF CORE SPRAY DUE TO LEAKY VALVE

UNDESIRABLE RESULT: DBA WOULD RESULT IN FAILURE OF REDUNDANT EQUIPMENT REQUIRED TO RESPOND

REMARKS: OPERATION WITH LEAKY VALVE VIOLATED THE SINGLE FAILURE CRITERIA

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:13

REFERENCES: L0020 EVENT NO 80

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 7/11/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE STARTUP

INITIATING SYSTEM AND COMPONENT

REACTOR BUILDING HVAC (BWR)
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (BWR)
HEAT EXCHANGERS

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
GENERATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
GENERATORS

LOW PRESSURE COOLANT INJECTION (BWR)
VALVE OPERATORS

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 0 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: COOLING WATER TO LPCI INVERTER ROOM COOLER ISOLATED-RESULT HIGH AMBIENT TEMP

PROPAGATION: HIGH AMBIENT TEMP TRIPS TRAIN B LPCI INVERTER CAUSING FAILURE OF TRAIN B VALVES

DEPENDENCY: LPCI INVERTERS ARE IN SAME ROOM AND COOLED BY SAME HVAC SYSTEM

UNDESIRABLE RESULT: POTENTIAL FAILURE OF LPCI/RHR FUNCTION

REMARKS: LER SAYS UNIT 1 AND 2 INVERTERS ARE IN THE SAME ROOM.

CORRECTIVE ACTION: OTHER CATEGORY: 13

REFERENCES: L1017 EVENT NO 81

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 1 PLANT TYPE: GE BWR
EVENT DATE: 11/05/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

SECONDARY CONTAINMENT (BWR)
TOTAL SYSTEM OCCURRENCE

LEAK MONITORING
I&C/SWITCHES

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE COOLANT INJECTION (BWR)
TOTAL SYSTEM OCCURRENCE

REACTOR CORE ISOLATION COOLING (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: MSL OR SCRAM DISCHARGE BREAK IN PIPE CHASE & STEAM IS VENTED INTO TORUS ROOM

PROPAGATION: LEAK DETECT SYS SENSES HIGH ROOM TEMP-GIVES ISOLATION SIGNAL TO HPCI & RCIC

DEPENDENCY: TORUS ROOM & PIPE CHASE ARE CONNECTED FOR VENTING OF PIPE CHASE

UNDESIRABLE RESULT: ERRONEOUS ISOLATION OF HPCI & RCIC ON MAIN STEAM LINE OR SCRAM DISCHARGE BREAK

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:23

REFERENCES: L1034 EVENT NO 82

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 2 PLANT TYPE: GE BWR
EVENT DATE: 3/30/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

DC POWER
BATTERIES/CHARGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

DC POWER
BATTERIES/CHARGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA AND LOSP WITH FAILURE OF DG A OR DG C BATTERY

PROPAGATION: BATTERY LOSS CAUSES LOSS OF DC POWER REQD TO TRIP NON-ESF LOADS OFF DG B BUSES

DEPENDENCY: BTY LOSS FAILS DG FOR ITS TRAIN (A OR C) AND CAUSES OVERLOAD OF DG B

UNDESIRABLE RESULT: LOCA AND LOSP WITH SINGLE BTY FAILURE CAUSES LOSS OF TWO EDG

REMARKS: MOD WILL TRIP BKRS ON LOSS OF DC POWER. SAME DESIGN ERROR APPLIES TO UNIT 1.

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0097 EVENT NO 83

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 2 PLANT TYPE: GE BWR
EVENT DATE: 1/28/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTAINMENT ISOLATION
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

MULTIPLE ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

MULTIPLE ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA PLUS TORUS GRAVITY FILL ISOLATION VALVE FAILURE

PROPAGATION: FLOW PATH EXISTS TO ALLOW TORUS WATER VIA CORE SPRAY SUCTION PIPING TO CST

DEPENDENCY: INVENTORY LOSS DURING A LOCA COULD AFFECT MULTIPLE COOLING SYSTEMS

UNDESIRABLE RESULT: SINGLE FAILURE HAS POTENTIAL TO DEGRADE MULTIPLE SAFETY SYSTEMS DURING LOCA

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:22

REFERENCES: L0041 EVENT NO 84

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 2 PLANT TYPE: GE BWR
EVENT DATE: 8/25/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONTROL ROD DRIVE (BWR)
VESSELS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EQUIPMENT DRAINAGE (INCLUDING VENTS)
TOTAL SYSTEM OCCURRENCE

REACTOR CORE ISOLATION COOLING (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR CORE ISOLATION COOLING (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SCRAM DISCHARGE VOLUME VALVE LEAKED

PROPAGATION: COOLANT RELEASED TO RCIC ROOM AND TO OPEN AREAS OF REACTOR BUILDING

DEPENDENCY: FLOOR DRAINAGE SYSTEM DID NOT STOP STEAM FLOW

UNDESIRABLE RESULT: LOSS OF RCIC AND AMBIENT TEMP ABOVE LIMITS FOR ELEC EQUIP LOCATED NEAR RCIC

REMARKS: FIRE PROTECTION ACTUATED IN RCIC ROOM

CORRECTIVE ACTION: OTHER CATEGORY: 4

REFERENCES: A0001 EVENT NO 85

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 2 PLANT TYPE: GE BWR
EVENT DATE: 8/25/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

LOW VOLTAGE AC (LESS THAN 600V)
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW VOLTAGE AC (LESS THAN 600V)
MISCELLANEOUS EQUIPMENT

REACTOR DRYWELL (BWR)
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR DRYWELL (BWR)
I&C/SENSORS

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: LOAD SHEDDING OF DRYWELL CHILLERS ON HIGH DRYWELL PRESSURE

PROPAGATION: INABILITY TO USE CHILLERS TO REDUCE PRESSURE IN DRYWELL

DEPENDENCY: SHEDDING OF CHILLER LOADS PREVENTED CLEARING HIGH DRYWELL PRESS SCRAM SIGNAL

UNDESIRABLE RESULT: SCRAM SIGNAL PREVENTED ISOLATION OF SDV LEAK. ALLOWED UNCONTROLLED SDV LEAK.

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: A0001 EVENT NO 86

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: HATCH 2 PLANT TYPE: GE BWR
EVENT DATE: 2/03/1984 EXPERIENCE: ACTUAL
OPERATING STATUS: UNKNOWN

INITIATING SYSTEM AND COMPONENT

CONTAINMENT COMBUSTIBLE GAS CONTROL
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

TORUS/ SUPPRESSION POOL (BWR)
PIPES/FITTINGS

CONTAINMENT COMBUSTIBLE GAS CONTROL
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

TORUS/ SUPPRESSION POOL (BWR)
PIPES/FITTINGS

CONTAINMENT COMBUSTIBLE GAS CONTROL
PIPES/FITTINGS

TYPE OF COUPLING: SPATIAL PLANT AREA: TORUS/ SUPPRESSION POOL (BWR)

RESULT TYPE: 1,2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: FAILURE OF N2 VAPORIZER IN TORUS/DRYWELL INERTING SYSTEM

PROPAGATION: COLD LIQUID N2 ENTERED PURGE LINE AND IMPINGED ON TORUS VENT HEADER

DEPENDENCY: PURGE LINE OUTLET LOCATED DIRECTLY ABOVE TORUS VENT HEADER

UNDESIRABLE RESULT: VENT HEADER DAMAGED(CRACKED) BY DRYWELL INERTING SYSTEM

REMARKS: CRACKING DUE TO COOLING HEADER BELOW NDT POINT

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: I-297 I-296 EVENT NO 87

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: INDIAN POINT 2 PLANT TYPE: WEST PWR
EVENT DATE: 10/19/1977 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

LOW VOLTAGE AC (LESS THAN 600V)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

CONTAINMENT ISOLATION
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SHORT CIRCUIT OR FOREIGN VOLTAGE TO AIR EJECTOR DIVERSION LINE CNMT ISOL VALVE

PROPAGATION: BOTH CONTAINMENT ISOLATION VALVES FAIL TO CLOSE

DEPENDENCY: BOTH VALVES SUPPLIED BY SINGLE POWER CIRCUIT

UNDESIRABLE RESULT: LOSS OF CONTAINMENT ISOLATION FUNCTION FOR THIS LINE

CORRECTIVE ACTION: OTHER CATEGORY:13

REFERENCES: L0012 EVENT NO 88

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: INDIAN POINT 2 PLANT TYPE: WEST PWR
EVENT DATE: 6/26/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0085 EVENT NO 89

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: INDIAN POINT 2 PLANT TYPE: WEST PWR
EVENT DATE: 10/17/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRIMARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

EQUIPMENT DRAINAGE (INCLUDING VENTS)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

REACTOR VESSEL
VESSELS

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SERVICE WATER LEAKS FROM CONTAINMENT FAN COOLERS AND PIPES

PROPAGATION: INOPERATIVE CONTAINMENT SUMP PUMPS, NO HIGH WATER ALARMS

DEPENDENCY: IN-CONTAINMENT LEAKAGE UNDETECTED-SUBMERGE LOWER PART OF VESSEL

UNDESIRABLE RESULT: FLOOD WETTED LOWER 9 FEET OF REACTOR VESSEL WHILE AT OPERATING TEMPERATURE

REMARKS: POSSIBLE THERMAL SHOCK TO RX VESSEL

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: I-012 I-242 EVENT NO 90

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: INDIAN POINT 3 PLANT TYPE: WEST PWR
EVENT DATE: 6/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0084 EVENT NO 91

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: KEWAUNEE PLANT TYPE: WEST PWR
EVENT DATE: 11/05/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE STARTUP

INITIATING SYSTEM AND COMPONENT

DEMINERALIZED WATER
CHEMICAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DEMINERALIZED WATER
CHEMICAL FUNCTION ITEMS

CONDENSATE STORAGE
ACCUMULATORS/RESERVOIRS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONDENSATE STORAGE
ACCUMULATORS/RESERVOIRS

AUXILIARY FEEDWATER (PWR)
FILTERS, NON-I&C

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: MAKE-UP WATER DEMINERALIZERS LEAK RESIN BEADS

PROPAGATION: RESINS ACCUMULATE IN CONDENSATE STORAGE TANKS-FILTERS ON AFW PUMP SUCTION PLUG

DEPENDENCY: MAKE-UP SUPPLIES CS TANKS. CS TANKS ARE PREFERRED WATER SOURCE FOR AFW PUMPS

UNDESIRABLE RESULT: LOSS OF AFW (PUMP SUCTION FILTERS INSTALLED TO PREVENT DAMAGE FROM TRASH IN SW)

REMARKS: THERMAL DECOMP OF RESIN COULD HAVE AFFECTED FW VALVES OR OTHER COMPONENTS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L1040 M2001 EVENT NO 92

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: KEWAUNEE PLANT TYPE: WEST PWR
EVENT DATE: 6/26/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

PLANT MONITORING
I&C/INDICATORS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATS UP SG LEVEL REFERENCE CAUSING INACCURATE SG LEVEL SIGNALS (HIGH)

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECT TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM RESPONSES REQUIRED TO MITIGATE ACCIDENT

REMARKS: GENERIC W PROBLEM. ALSO PROVIDES HIGH INDICATION TO OPERATOR

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0081 EVENT NO 93

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MAINE YANKEE PLANT TYPE: CE PWR
EVENT DATE: 1/25/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: REACTOR TRIP, LOSS OF MAIN FEEDWATER AND AUTO INITIATION OF AFW SYSTEM

PROPAGATION: COLD AFW CAUSED HIGH THERMAL STRESS AND CONDENSED STEAM IN FW LINES

DEPENDENCY: AUXILIARY FEEDWATER SYSTEM CAN PUMP COLD WATER TO SG

UNDESIRABLE RESULT: HIGH THERMAL STRESS AND WATER HAMMER DAMAGED AFW PIPING

REMARKS: MODIFICATIONS TO MFW & AFW DID NOT CONSIDER PREVIOUS GENERIC SAFETY CONCERNS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:12

REFERENCES: M1009 EVENT NO 94

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MCGUIRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/22/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MAIN STEAM
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATS UP SG LEVEL REFERENCE CAUSING INACCURATE SG LEVEL SIGNALS (HIGH)

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECT TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM RESPONSES REQUIRED TO MITIGATE ACCIDENT

REMARKS: GENERIC W PROBLEM. ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0073 EVENT NO 95

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MCGUIRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 2/12/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: HYDROGEN CONTROL SYSTEM FOR PD CHARGING PUMP PULSATION DAMPER FAILED

PROPAGATION: HYDROGEN FROM PULSATION DAMPENER ENTERED SUCTION OF BOTH CENTRIFUGAL PUMPS

DEPENDENCY: COMMON SUCTION OF CHARGING PUMPS CAN CAUSE GAS BINDING OF ALL THREE PUMPS

UNDESIRABLE RESULT: ALL CAPABILITY FOR CHARGING FLOW LOST. ALSO CAUSES LOSS OF HPSI.

CORRECTIVE ACTION: OTHER CATEGORY: 2

REFERENCES: L0002 L1029 I-197 A0021 EVENT NO 96

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MIDLAND 1 PLANT TYPE: B&W PWR
EVENT DATE: 7/11/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (PWR)
HEAT EXCHANGERS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA OR MSLB WHICH RAISES CONTAINMENT TEMPERATURE

PROPAGATION: HI AMBIENT TEMP CAUSES BOILING OF SERVICE WATER SUPPLY TO CNMT AIR COOLERS

DEPENDENCY: SERVICE WATER LINES IN CNMT SUSCEPTIBLE TO HI AMBIENT TEMP

UNDESIRABLE RESULT: REDUCED COOLING COULD AFFECT LONG TERM OPERATION OF MULT SAFETY SYSTEMS

REMARKS: EXTRA PUMP ADDED TO INCREASE SW PRESSURE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0144 EVENT NO 97

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MIDLAND 1 PLANT TYPE: B&W PWR
EVENT DATE: 7/22/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

AUXILIARY FEEDWATER (PWR)
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOSS OF OFFSITE POWER

PROPAGATION: TWO STEAM SUPPLY VALVES TO THE AFW TURBINE CLOSE ON LOSS OF OFFSITE POWER

DEPENDENCY: NO DC POWER SUPPLY TO AFW TURBINE VALVES

UNDESIRABLE RESULT: LOSS OF AFW TURBINE-DRIVEN PUMP WHEN OFFSITE POWER IS LOST

REMARKS: SAME DESIGN DEFICIENCY APPLIES TO MIDLAND 2

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: C12 EVENT NO 98

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MIDLAND 2 PLANT TYPE: B&W PWR
EVENT DATE: 7/22/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

AUXILIARY FEEDWATER (PWR)
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOSS OF OFFSITE POWER

PROPAGATION: TWO STEAM SUPPLY VALVES TO THE AFW TURBINE CLOSE ON LOSS OF OFFSITE POWER

DEPENDENCY: NO DC POWER SUPPLY TO AFW TURBINE VALVES

UNDESIRABLE RESULT: LOSS OF AFW TURBINE-DRIVEN PUMP WHEN OFFSITE POWER IS LOST

REMARKS: SAME DESIGN DEFICIENCY APPLIES TO MIDLAND 1

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: C12 EVENT NO 99

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 1 PLANT TYPE: GE BWR
EVENT DATE: 5/01/1971 EXPERIENCE: ACTUAL
OPERATING STATUS: UNKNOWN

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
HEAT EXCHANGERS

DC POWER
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

DC POWER
ELECTRICAL CONDUCTORS

RESIDUAL HEAT REMOVAL (BWR)
VALVES

MAIN STEAM
VALVES

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SERVICE WATER HEAT EXCHANGER LEAKED

PROPAGATION: LEAK FLOODED AREA, SHORTING DC MOTOR CONTROL CENTER

DEPENDENCY: MCC IS LOCATED NEAR HX BUT NOT PROTECTED AGAINST FLOODING

UNDESIRABLE RESULT: NUMEROUS VALVE MOTOR BURNOUTS IN RWCU, RHR AND MAIN STEAM SYSTEMS

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: L2027 EVENT NO 100

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 1 PLANT TYPE: GE BWR
EVENT DATE: 9/14/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

REACTOR PROTECTION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ALL ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: STATION POWERED FROM RESERVE STATION SERVICE TRANSFORMER

PROPAGATION: BUS TIE BREAKER OPENED, LOSS OF POWER TO ECCS LOADS

DEPENDENCY: LOSS OF NORMAL POWER LOGIC WILL NOT SENSE LOP FOR CERTAIN BKR SETUPS

UNDESIRABLE RESULT: LOSS OF ECCS

REMARKS: LOGIC CHANGED TO ELIMINATE THIS POSSIBILITY

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: E0003 L2009 EVENT NO 101

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 1 PLANT TYPE: GE BWR
EVENT DATE: 4/03/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
I&C/RELAYS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
I&C/RELAYS

EMERGENCY POWER GENERATION
CIRCUIT BREAKER/FUSES

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
CIRCUIT BREAKER/FUSES

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: AFTER LOSS OF NORMAL POWER, TIME RELAY TRIPS LOADS AND FAILS TO REOPEN

PROPAGATION: A RELAY FAILURE PREVENTS ALL 4160V & SOME 480V BREAKER RECLOSURE TO EMERG BUSES

DEPENDENCY: TIME DELAY RELAY GIVES TRIP SIGNAL TO BREAKERS

UNDESIRABLE RESULT: POTENTIAL LOSS OF POWER AND NO EMERGENCY POWER TO SAFETY SYSTEMS

REMARKS: SINGLE RELAY FAILURES FAILS ALL 4160V BRKRS-2ND RELAY INSTALLED IN LNP CIRCUITS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L1028 E0003 EVENT NO 102

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 2 PLANT TYPE: CE PWR
EVENT DATE: 7/05/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

LOW VOLTAGE AC (LESS THAN 600V)
ELECTRICAL/I&C FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: DEGRADED GRID VOLTAGE DUE TO LIGHT LOAD WITH UNIT IN SD & IMPROPER XFMR SETTINGS

PROPAGATION: 480V MCC VOLTAGES INSUFFICIENT TO PULL IN MOTOR CONTACTORS-CONTR PWR FUSES BLOW

DEPENDENCY: ESFAS UV RELAYS SET TOO LOW TO ASSURE TRANSFER TO EMERG POWER

UNDESIRABLE RESULT: OPERABILITY OF ESFAS EQUIPMENT NOT ASSURED UNDER SIMILAR LOW VOLTAGE CONDITIONS

REMARKS: ESFAS UV RELAY SETPOINTS RAISED-PARTIAL CAUSE OF 7-21-76 EVENT

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: M1010 EVENT NO 103

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 2 PLANT TYPE: CE PWR
EVENT DATE: 7/21/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

EMERGENCY POWER GENERATION
I&C/RELAYS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
I&C/RELAYS

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
I&C/RELAYS

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: START OF LARGE LOAD CAUSED EMERG BUS VOLTAGE TO DROP BELOW NEW UV RELAY SETTINGS

PROPAGATION: HI INRUSH CURRENT OF ESFAS LOADS CAUSED UV TRIP TO ACTUATE-SHEDDING SAME LOAD

DEPENDENCY: LOAD SHED FROM EMERG BUSES ON TRANSIENT UV AFTER EMERG BUSES ENERGIZED FROM DG'S

UNDESIRABLE RESULT: DG ON LINE & EMERG BUSES ENERGIZED,BUT ESFAS EQUIP TRIPPED FROM UNDERVOLTAGE

REMARKS: UV RELAY CHANGED DUE TO 7-5-76 EVENT

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: M1010 EVENT NO 104

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 2 PLANT TYPE: CE PWR
EVENT DATE: 1/02/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

DC POWER
PERSONNEL

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DC POWER
ELECTRICAL CONDUCTORS

TURBINE GENERATOR I&C
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

TURBINE GENERATOR I&C
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

CONTAINMENT ISOLATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: OPERATOR MISTAKENLY USED 125 VDC CONTROL SWITCH

PROPAGATION: THIS DEENERGIZED 125 VDC BUS CAUSING 4 REACTOR TRIP BREAKERS TO OPEN

DEPENDENCY: TURBINE TRIP AND AUX LOAD TRANSFER REQUIRE DC POWER

UNDESIRABLE RESULT: FAILURE OF TURBINE TRIP AND LOP TO AUXILIARY LOADS

REMARKS: NUMEROUS ADDITIONAL PROBLEMS DESCRIBED IN REPORT

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: A0015 EVENT NO 105

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 2 PLANT TYPE: CE PWR
EVENT DATE: 1/08/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: HOT SHUTDOWN

INITIATING SYSTEM AND COMPONENT

COMPRESSED GAS
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRESSURIZER (PWR)
VESSELS

CORE FLOODING ACCUMULATOR (PWR)
ACCUMULATORS/RESERVOIRS

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRESSURIZER (PWR)
VESSELS

CORE FLOODING ACCUMULATOR (PWR)
ACCUMULATORS/RESERVOIRS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: AUDIO/VISUAL ALARM

INITIATING EVENT: PERSONNEL LEFT 2 NITROGEN ISOL VALVES TO PRESSURIZER OPEN FOLLOWING COOLDOWN

PROPAGATION: STEAM FROM PRESSURIZER LEAKED TO SAFETY INJ TANK OVER-PRESSURIZING TANK

DEPENDENCY: LEAK PATH FROM PRESSURIZER TO SI TANKS VIA HIGH PRESS NITROGEN SYSTEM

UNDESIRABLE RESULT: POTENTIAL DILUTION OR DAMAGE TO SI TANKS FROM HIGH PRESS STEAM FROM PRESSURIZER

REMARKS: SI TANKS AND NITROGEN LINE MAY NOT WITHSTAND RCS OVER PRESS-POSSIBLE SMALL LOCA

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L1022 EVENT NO 106

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MILLSTONE 2 PLANT TYPE: CE PWR
EVENT DATE: 12/05/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FUEL BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FUEL BUILDING
STRUCTURAL FUNCTION ITEMS

FUEL BUILDING HVAC
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

FUEL BUILDING HVAC
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: FUEL BUILDING

RESULT TYPE: 2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT DURING FUEL MOVEMENT IN FUEL BUILDING

PROPAGATION: TEMPORARY SHIELD WALL COLLAPSE CAUSES DAMAGE TO FUEL BLDG HVAC SYSTEM

DEPENDENCY: NON SEISMIC WALL INSTALLED NEAR SAFETY EQUIPMENT

UNDESIRABLE RESULT: POTENTIAL FOR FUEL DAMAGE RELEASE WITHOUT OPERABLE FUEL BLDG HVAC

CORRECTIVE ACTION: OTHER CATEGORY:21

REFERENCES: L0170 EVENT NO 107

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MONTICELLO PLANT TYPE: GE BWR
EVENT DATE: 3/01/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DRYWELL/ TORUS HVAC AND PURGE (BWR)
MECHANICAL FUNCTION ITEMS

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

REACTOR DRYWELL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: NRC NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING DRYWELL PURGE OPERATIONS

PROPAGATION: DRYWELL PRESSURE SURGE CAUSES FAILURE OF DUCTS OR DAMPERS

DEPENDENCY: INADEQUATE DUCT STRENGTH OR ISOLATION VALVE CAPABILITY FOR PURGE SYSTEM

UNDESIRABLE RESULT: LOSS OF CONTAINMENT INTEGRITY

REMARKS: DESIGN DID NOT CONSIDER LOCA FORCES IN VALVE CLOSURE DESIGN

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 9

REFERENCES: L0051 EVENT NO 108

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: MONTICELLO PLANT TYPE: GE BWR
EVENT DATE: 3/03/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: RHR SERVICE WATER PUMP SHAFT PACKING FAILED, PRESSURING SEAL WATER SUPPLY

PROPAGATION: CHECK VALVE IN SEAL WATER SUPPLY SYSTEM FAILED ALLOWING PRESSURE TO OTHER RHR SW

DEPENDENCY: RHR SERVICE WATER PUMPS SHARE SEAL WATER SUPPLY

UNDESIRABLE RESULT: LOSS OF BOTH RHR SW PUMPS CAUSES LOSS OF HEAT REMOVAL FROM TWO RHR TRAINS

REMARKS: ONE RHR SW LOOP WAS ISOLATED AND MADE OPERABLE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 13

REFERENCES: L0004 EVENT NO 109

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NINE MILE POINT 1 PLANT TYPE: GE BWR
EVENT DATE: 10/14/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTAINMENT SPRAY
I&C/SWITCHES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT SPRAY
PUMPS

CONTAINMENT SPRAY
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT SPRAY
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 0 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: PLACEMENT OF CONTAINMENT SPRAY PUMP CONTROL SWITCH IN LOCKOUT

PROPAGATION: ADDITIONAL CONTAINMENT SPRAY PUMP WOULD NOT AUTO START

DEPENDENCY: LOCKOUT SWITCH ACTUATION AFFECTS BOTH PUMPS

UNDESIRABLE RESULT: BOTH CONTAINMENT SPRAY PUMPS IN THAT TRAIN FAIL TO AUTO START

REMARKS: TWO OTHER CS PUMPS EXIST IN OTHER TRAIN

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0015 EVENT NO 110

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NINE MILE POINT 1 PLANT TYPE: GE BWR
EVENT DATE: 1/07/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

EMERGENCY GENERATOR BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY GENERATOR BUILDING
STRUCTURAL FUNCTION ITEMS

EMERGENCY POWER GENERATION
I&C/CONTROLLERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
I&C/CONTROLLERS

TYPE OF COUPLING: SPATIAL PLANT AREA: EMERGENCY GENERATOR BUILDING

RESULT TYPE: 2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: PIECE OF BAILING WIRE FELL INTO CONTROL CABINET, SHORTING DG VOLTAGE REGULATOR

PROPAGATION: SHORTED V-REGULATOR BLOWS FUSE, DIESEL GENERATOR OUTPUT BREAKER TRIPS

DEPENDENCY: WIRE USED TO SECURE FIRE PROOFING FRAMES DIRECTLY ABOVE DG CONTROL CABINET

UNDESIRABLE RESULT: POTENTIAL LOSS OF DIESEL GENERATOR

REMARKS: WIRE AND FRAMES MAY NOT BE SEISMIC QUALIFIED-ALSO POTENTIAL FOR SIMILAR EVENTS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L1015 EVENT NO 111

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NINE MILE POINT 1 PLANT TYPE: GE BWR
EVENT DATE: 1/29/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

SECONDARY CONTAINMENT (BWR)
STRUCTURAL FUNCTION ITEMS

DRYWELL/ TORUS HVAC AND PURGE (BWR)
MISCELLANEOUS EQUIPMENT

SAFETY SYSTEMS/COMPONENTS AFFECTED

DRYWELL/ TORUS HVAC AND PURGE (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: HUMAN

RESULT TYPE: 5 DISCOVERY: NRC NOTIFICATION

INITIATING EVENT: LOSS OF COOLANT ACCIDENT PROCEDURES CALL FOR VENTING CONTAINMENT

PROPAGATION: VENTING PROCEDURE REQUIRES ACCESS TO REACTOR BUILDING

DEPENDENCY: REACTOR BLDG WILL NOT BE ACCESSIBLE DUE TO LOCA

UNDESIRABLE RESULT: LOCA REQUIRES VENTING AND PREVENTS VENTING UNDER CURRENT PROCEDURE

REMARKS: FOUND IN PROCEDURE REVIEW BY RESIDENT INSPECTOR. PROCEDURE/DESIGN CHANGES MADE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:19

REFERENCES: L0030 EVENT NO 112

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 10/05/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
CIRCUIT BREAKER/FUSES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LEAK MONITORING
PUMPS

LEAK MONITORING
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

LEAK MONITORING
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: MAINTENANCE/MODIFICATION

INITIATING EVENT: PERSONNEL OPENED BREAKER TO REMOVE POWER FROM A CNMT AIR AND PARTICULATE PUMP

PROPAGATION: LOSS OF POWER OCCURRED TO BOTH TRAINS OF CONTAINMENT AIR & PARTICULATE MONITORS

DEPENDENCY: THE TRAINS SHARED A COMMON POWER SUPPLY

UNDESIRABLE RESULT: ANY LOSS OF POWER CAUSES LOSS OF CONTAINMENT ATMOSPHERE MONITORING

REMARKS: SYSTEM-CONTAINMENT ATMOSPHERE PARTICULATE AND GAS MONITORING

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0011 EVENT NO 113

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0159 EVENT NO 114

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 9/17/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

STEAM GENERATOR PRESSURE RELIEF (PWR)
I&C/CONTROLLERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

STEAM GENERATOR PRESSURE RELIEF (PWR)
SUBSYSTEM OCCURRENCE

PRESSURIZER (PWR)
SUBSYSTEM OCCURRENCE

REACTOR POWER CONTROL (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK (FW OR MS) IN CERTAIN PLANT LOCATIONS

PROPAGATION: ADVERSE ENVIRONMENT FROM BREAK CAN CAUSE CONTROL SYSTEM FAILURES

DEPENDENCY: CONTROL SYSTEMS SUSCEPTIBLE TO HELB CONDITIONS LOCATED SUBJECT TO HELB IMPACT

UNDESIRABLE RESULT: POTENTIAL FOR SG PORV, PZR PORV, AUTO ROD CONTROL, AND FW CONTROL FAILURES

REMARKS: PLANT SPECIFIC EVALUATION NECESSARY TO DETERMINE SAFETY EFFECT. NOT GIVEN.

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:10

REFERENCES: L0088 L0089 I-277 EVENT NO 115

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/09/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SECONDARY SYS HELB CAUSING SI ACTUATION AND PORV CONTROL FAILURE

PROPAGATION: RCS PRESSURE HIGHER THAN CHG PUMP DESIGN INJECTION PRESS; PUMPS OVERHEAT

DEPENDENCY: RECIRC VALVES PROTECT CHG PUMPS, BUT SIAS CLOSES RECIRC VALVES

UNDESIRABLE RESULT: LOSS OF MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS MET

REMARKS: GENERIC W PROBLEM. PUMP FAILURES DEPENDS ON SPECIFIC DESIGN HEAD

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0056 I-017 EVENT NO 116

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/14/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SI ACTUATION FOLLOWED BY LOSS OF OFFSITE POWER

PROPAGATION: OUT OF PHASE TRANSFER OF DG'S TO BUSES DAMAGES SAFETY EQUIPMENT

DEPENDENCY: NO LOGIC TO PREVENT DG TRANSFER BEFORE RESIDUAL VOLTAGE COLLAPSES

UNDESIRABLE RESULT: DAMAGE TO SAFETY EQUIPMENT FOLLOWING LOSP

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0116 EVENT NO 117

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/22/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

NON-NUCLEAR INSTRUMENTATION
I&C/TRANSMITTERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
ACCUMULATORS/RESERVOIRS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: VCT LEVEL TRANSMITTER FAILS HIGH STOPPING LETDOWN FLOW

PROPAGATION: NO LETDOWN, VCT LOW LEVEL, NO SWITCH TO RWST, LOSS OF SUCTION DAMAGES CHG PUMPS

DEPENDENCY: LEVEL TRANSMITTER CONTROLS LEVEL AND SUCTION SWITCHOVER TO RWST

UNDESIRABLE RESULT: REDUNDANT CHG PUMPS DAMAGED. THESE PUMPS ARE ALSO HI HEAD SAFETY INJECTION

REMARKS: WESTINGHOUSE NOTIFICATION OF POTENTIAL FAULIRE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 5

REFERENCES: L0119 A0020 A0021 EVENT NO 118

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 2 PLANT TYPE: WEST PWR
EVENT DATE: 6/27/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0075 EVENT NO 119

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 2 PLANT TYPE: WEST PWR
EVENT DATE: 7/03/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TRANSFORMERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

PLANT DRAINAGE
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SWITCHYARD

RESULT TYPE: 2,4,5 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FIRE IN B PHASE MAIN TRANSFORMER ACTUATED DELUGE SYSTEM

PROPAGATION: TRANSFORMER RUPTURED, SPILLING OIL INTO SURROUNDING PIT

DEPENDENCY: XFMR PIT DRAIN TOO SMALL TO REMOVE FLAMING OIL AND DELUGE WATER QUICKLY

UNDESIRABLE RESULT: PIT OVERFLOWED, SPILLING FLAMING OIL TO SURROUNDINGS-HAMPERED FIRE FIGHTING

REMARKS: POSSIBLE GENERIC PROBLEM-DRAINS TOO SMALL TO REMOVE FIRE DELUGE,CAUSING FLOODING

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 4

REFERENCES: I-151 L0129 EVENT NO 120

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: NORTH ANNA 3 PLANT TYPE: B&W PWR
EVENT DATE: 2/08/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: MSLB PLUS AUX FEEDWATER FLOW TO AFFECTED SG UNDER RUNOUT CONDITIONS

PROPAGATION: CONTAINMENT PRESSURE INCREASES TO DESIGN PRESSURE

DEPENDENCY: AFW INJECTION AFTER MSLB CAN CAUSE LONG TERM BLOWDOWN

UNDESIRABLE RESULT: LONG TERM BLOWDOWN CAN CAUSE CONTAINMENT DESIGN PRESSURE TO BE EXCEEDED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: I-031 I-275 EVENT NO 121

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OCONEE 3 PLANT TYPE: B&W PWR
EVENT DATE: 12/07/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (PWR)
FILTERS, NON-I&C

REACTOR BUILDING HVAC (PWR)
FILTERS, NON-I&C

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1,2 DISCOVERY: UNKNOWN

INITIATING EVENT: FEEDWATER SYSTEM LEAK IN PENETRATION ROOM

PROPAGATION: WATER ENTERED BOTH TRAINS OF REACTOR BUILDING VENTILATION SYSTEM FILTERS

DEPENDENCY: BOTH TRAINS OF RB FILTERS LOCATED IN SAME AREA AND SUBJECT TO LEAKS

UNDESIRABLE RESULT: REDUNDANT RB FILTER TRAINS FAILED

REMARKS: LEAK HAD BEEN REPAIRED A MONTH PRIOR TO DISCOVERY OF FILTER FAILURES

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L0009 EVENT NO 122

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OCONEE 3 PLANT TYPE: B&W PWR
EVENT DATE: 11/10/1979 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL/I&C FUNCTION ITEMS

NON-NUCLEAR INSTRUMENTATION
I&C/INDICATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
I&C/INDICATORS

RESIDUAL HEAT REMOVAL (PWR)
I&C/INDICATORS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: NON-CLASS IE INV TRIPPED DUE TO BLOWN FUSE & FAILED TO TRANSFER LOAD

PROPAGATION: RCS INSTRUMENTATION FED FROM NNI INVERTER

DEPENDENCY: CONTROL ROOM RCS AND DECAY HEAT INSTR FED FROM NON-CLASS IE SOURCE

UNDESIRABLE RESULT: LOSS OF INDICATION FOR SYSTEMS REQD FOR SHUTDOWN

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 14

REFERENCES: I-036 I-270 I-108 I-257 EVENT NO 123

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OCONEE 3 PLANT TYPE: B&W PWR
EVENT DATE: 3/03/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONDENSATE AND FEEDWATER
VALVES

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURE:

RESULT TYPE: 2 DISCOVERY: UNKNOWN

INITIATING EVENT: FEEDWATER VALVE LEAKS

PROPAGATION: HEAT AND MOISTURE DAMAGE TO EMERGENCY POWER SWITCHING LOGIC CABLES FROM VALVE

DEPENDENCY: CLOSE PROXIMITY OF EMERGENCY POWER SWITCHING LOGIC CABLES TO FEEDWATER VALVE

UNDESIRABLE RESULT: POTENTIAL FOR LOGIC FAILURE & SAFETY EQUIP W/O EMERGENCY ELECTRIC POWER

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L1001 EVENT NO 124

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 9/18/1973 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TRANSFORMERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TRANSFORMERS

EMERGENCY POWER GENERATION
ENGINES, INTERNAL COMBUSTION

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: ATTEMPT TO TRANSFER POWER FROM AUX TRANS TO STARTUP TRANS. 4160V BUS LOST POWER.

PROPAGATION: DG STARTED,RX TRIPPED.OS POWER RESTORED AND LOST AGAIN. DG FAILED TO RESTART.

DEPENDENCY: DG LOCKED OUT AFTER A FAST START DUE TO A DESIGN DEFICIENCY

UNDESIRABLE RESULT: LOSS OF POWER TO STATION LOADS

REMARKS: DG LOGIC CIRCUITS MODIFIED. STARTUP TRANS CURRENT RATIO SETTINGS CHANGED.

CORRECTIVE ACTION: OTHER CATEGORY: 1

REFERENCES: E0007 L2017 EVENT NO 125

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 12/20/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: PRESSURE RELIEF TO MARK I CONTAINMENT TORUS IN CERTAIN RELIEF VALVE SEQUENCES

PROPAGATION: STRESSES CREATED ON TORUS COULD EXCEED ACCEPTABLE LEVELS

DEPENDENCY: TORUS CAN BE DAMAGED FROM SPECIFIC RELIEF VALVE SEQUENCES

UNDESIRABLE RESULT: DAMAGE TO TORUS COULD DEGRADE MULTIPLE SAFETY SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:17

REFERENCES: L0106 EVENT NO 126

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 5/02/1979 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
TOTAL SYSTEM OCCURRENCE

ISOLATION CONDENSER (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR VESSEL
I&C/INDICATORS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RX SCRAM AND CLOSURE OF ALL RECIRC LOOP DISCH VALVES PER PROCEDURES

PROPAGATION: INADEQUATE FLOW FROM ISOL COND TO ANNULUS VIA RECIRC DISCH VALVE BYPASS LINE

DEPENDENCY: REACTOR VESSEL WATER LEVEL INDICATION MEASURES ANNULUS WATER LEVEL

UNDESIRABLE RESULT: ANAMOLOUS RV LEVEL INDICATIONS TO OPER-ANNULUS VS CORE SHROUD LEVEL DIFFERENT

REMARKS: CORE LEVEL NEVER LOW. APPLIES ONLY TO NON-JET PUMP BWR PLANTS.

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:22

REFERENCES: I-283 L0125 M1003 EVENT NO 127

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 9/30/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

LOW PRESSURE CORE SPRAY (BWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

LOW PRESSURE CORE SPRAY (BWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: INADVERTENT ACTUATION OF FIRE PROTECTION SYSTEM (DUE TO MAINT ERROR)

PROPAGATION: CORE SPRAY SYSTEM DECLARED INOPERABLE DUE TO WATER INTRUSION TO SPRAY PUMPS

DEPENDENCY: CORE SPRAY SYSTEM WAS THOUGHT TO BE PROTECTED FROM WATER INTRUSION. IT WAS NOT.

UNDESIRABLE RESULT: ACTUATION OF FIRE PROTECTION SYSTEM DISABLES EQUIPMENT REQD FOR SAFETY

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: L0176 EVENT NO 128

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 2/18/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
I&C/SENSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH PRESSURE CORE SPRAY (BWR)
I&C/SWITCHES

REACTOR PROTECTION
I&C/SWITCHES

SAFETY SYSTEMS/COMPONENTS AFFECTED

HIGH PRESSURE CORE SPRAY (BWR)
TOTAL SYSTEM OCCURRENCE

REACTOR PROTECTION
VALVE OPERATORS

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FIRE PROTECTION DELUGE ACTUATED DUE TO HIGH AMBIENT FROM HOT MOTOR BRG

PROPAGATION: WATER ENTERED SEVERAL SWITCHES IN CS AND RPS

DEPENDENCY: SAFETY-RELATED SWITCHES SUBJECT TO FIRE DELUGE SPRAY

UNDESIRABLE RESULT: GROUNDED I&C COMPONENTS IN CORE SPRAY AND REACTOR PROTECTION SYSTEMS

REMARKS: PLANT MODIFICATION INITIATED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0058 EVENT NO 129

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 1/18/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONTROL ROD DRIVE (BWR)
PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL ROD DRIVE (BWR)
PUMPS

LOW PRESSURE CORE SPRAY (BWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

LOW PRESSURE CORE SPRAY (BWR)
PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: A VENT LINE ON CRD PUMP A BROKE OFF DURING MAINTENANCE

PROPAGATION: WATER SPRAYED ON CORE SPRAY PUMP A BELOW THE VENT LINE

DEPENDENCY: CORE SPRAY PUMPS ARE LOCATED BELOW THE CRD PUMPS AND CAN BE AFFECTED BY LEAKAGE

UNDESIRABLE RESULT: SAFETY SYSTEM (CORE SPRAY) AFFECTED BY NONSAFETY SYSTEM (CRD PUMP)

REMARKS: B CRD PUMP TRIPPED OFFLINE ALSO

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: L0001 EVENT NO 130

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 3/06/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: REFUELING

INITIATING SYSTEM AND COMPONENT

ELECTRICAL HEAT TRACING
HEATERS, ELECTRIC

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ELECTRICAL HEAT TRACING
HEATERS, ELECTRIC

REACTOR BUILDING HVAC (BWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (BWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: WASTE MANAGEMENT BUILDING

RESULT TYPE: 1,2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: PLASTIC SENSING LINE ON SGTS FAN FLOW SWITCH DAMAGED BY EXCESSIVE HEAT

PROPAGATION: LOW FLOW SIGNAL CAUSED FAN INLET & OUTLET VALVES TO CLOSE-LOSS OF ONE SGTS TRN

DEPENDENCY: PLASTIC FLOW SWITCH SENSING LINE ROUTED TOO CLOSE TO CABINET SPACE HEATER

UNDESIRABLE RESULT: LOSS OF ONE TRAIN OF SGTS-ALTERNATE TRAIN OPERABLE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0145 EVENT NO 131

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 3/07/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

LOW VOLTAGE AC (LESS THAN 600V)
CIRCUIT BREAKER/FUSES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR BUILDING HVAC (BWR)
SUBSYSTEM OCCURRENCE

REACTOR BUILDING HVAC (BWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: MAINTENANCE/MODIFICATION

INITIATING EVENT: CIRCUIT BKR RACKED OUT ON ONE TRAIN OF SGTS WITH ALTERNATE TRAIN OPERATING

PROPAGATION: CTRL PWR LOST TO SOLENOIDS ON AIR-OPERATED INLET & OUTLET VALVES-VALVES OPENED

DEPENDENCY: DISCHARGE OF OPERATING SGTS MAY RECIRCULATE THRU OTHER TRAIN

UNDESIRABLE RESULT: DEGRADATION OF ONE SGTS TRAIN BY ALTERNATE TRAIN

REMARKS: RACKING OUT CIRCUIT BKR DISCONNECTS CONTROL POWER XFMER-COMMON DESIGN

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 13

REFERENCES: L0146 EVENT NO 132

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: OYSTER CREEK PLANT TYPE: GE BWR
EVENT DATE: 4/06/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

REACTOR BUILDING HVAC (BWR)
HEATERS, ELECTRIC

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR BUILDING HVAC (BWR)
HEATERS, ELECTRIC

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOSS OF DG #1 DURING LOSS OF OFFSITE POWER

PROPAGATION: POWER LOST TO MCC SUPPLYING CONTROL POWER TO HEATING COILS TO BOTH SGTS TRAINS

DEPENDENCY: SINGLE POWER SOURCE TO REDUNDANT SGTS TRAINS

UNDESIRABLE RESULT: SGTS CHARCOAL FILTER EFFICIENCY COULD BE REDUCED IF HEATERS OFF

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0147 EVENT NO 133

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PALISADES PLANT TYPE: CE PWR
EVENT DATE: 9/08/1971 EXPERIENCE: ACTUAL
OPERATING STATUS: UNKNOWN

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC ELECTRICAL CONDUCTORS

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRESSURIZER (PWR)
VALVES

TYPE OF COUPLING: HUMAN

RESULT TYPE: 3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: TECHNICIAN DEENERGIZED BREAKER TO RPS

PROPAGATION: POWER LOST TO ELECTROMAGNETIC RELIEF VALVE PILOT VALVE SOLENOID CONTROL CIRCUIT

DEPENDENCY: NONSTANDARD DESIGNATION OF CONTACTS. TECHNICIAN MISLED BY DRAWINGS

UNDESIRABLE RESULT: RELIEF VALVE OPENED. RCS PRESSURE DROPPED TO 1280 PSIA IN 2-3 MIN FROM BLOWDOWN

REMARKS: MOV USED TO ISOLATE RELIEF VALVE. RPS BREAKER CLOSED.

CORRECTIVE ACTION: OTHER CATEGORY:19

REFERENCES: E0001 L2002 EVENT NO 134

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PALISADES PLANT TYPE: CE PWR
EVENT DATE: 3/12/1972 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

TURBINE GENERATOR
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR PROTECTION
I&C/RELAYS

HIGH VOLTAGE AC (GREATER THAN 35KV)
I&C/RELAYS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MEDIUM VOLTAGE AC (35KV TO 600V)
SUBSYSTEM OCCURRENCE

ALL ESF SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: PILOT WIRE TRIP OPENED BOTH GENERATOR OUTPUT BREAKERS. RX SCRAMMED MANUALLY

PROPAGATION: MANUAL SCRAM DID NOT TRANSFER PLANT POWER FROM GENERATOR TO STARTUP TRANSFORMER

DEPENDENCY: ESF BUS TRANSFER TO STARTUP TRANS DOESNT OCCUR FOR MANUAL SCRAM

UNDESIRABLE RESULT: ONE HALF G? ENGR SAFEGUARDS SYSTEM WAS UNAVAILABLE.

REMARKS: POWER WAS MANUALLY TRANSFERRED. UNIT PROTECTION SCHEME MODIFIED.

CORRECTIVE ACTION: OTHER CATEGORY: 1

REFERENCES: E0001 L2001 EVENT NO 135

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PALISADES PLANT TYPE: CE PWR
EVENT DATE: 9/16/1977 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL COMPRESSED AIR
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

CONTAINMENT ISOLATION
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: UNKNOWN

INITIATING EVENT: LOSS OF AIR SUPPLY TO CONTAINMENT PURGE ISOLATION VALVE SEALS

PROPAGATION: SEAL RINGS DEPRESSURIZE IN ALL SIX CONTAINMENT ISOLATION VALVES

DEPENDENCY: NO REDUNDANT AIR SUPPLY PROVIDED

UNDESIRABLE RESULT: CONTAINMENT ISOLATION FUNCTION FAILS

REMARKS: REDUNDANT AIR SOURCE TO BE PROVIDED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0038 EVENT NO 136

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PALISADES PLANT TYPE: CE PWR
EVENT DATE: 8/19/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
GENERATORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL COMPRESSED AIR
PUMPS

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA WITH CONCURRENT LOSS OF OFFSITE POWER PLUS ONE DIESEL GENERATOR FAILURE

PROPAGATION: LOSP CAUSES INST AIR LOSS, HX VALVES OPEN FULLY, FULL SW FLOW DEMANDED

DEPENDENCY: INCREASED SW FLOW DEMAND CAUSES OPERATING LH SW PUMP(S) TO TRIP DUE TO RUNOUT

UNDESIRABLE RESULT: LOSS OF ALL SERVICE WATER DURING A LOCA

REMARKS: DISCOVERED IN SEP REVIEW

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L0026 L0027 EVENT NO 137

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PALISADES PLANT TYPE: CE PWR
EVENT DATE: 11/30/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

DC POWER
BATTERIES/CHARGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW VOLTAGE AC (LESS THAN 600V)
SUBSYSTEM OCCURRENCE

DC POWER
BATTERIES/CHARGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

CONTAINMENT COMBUSTIBLE GAS CONTROL
RECOMBINERS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA PLUS HYDROGEN RECOMBINERS ONLINE OR STATION BATTERIES DISCHARGED

PROPAGATION: CABLES AND FEEDER BREAKERS TO MCC-1 AND MCC-2 BECOME OVERLOADED

DEPENDENCY: MCC'S NOT DESIGNED TO TAKE LOADS POSSIBLE UNDER THESE CONDITIONS

UNDESIRABLE RESULT: SYSTEMS REQUIRED TO MITIGATE LOCA NOT AVAILABLE

REMARKS: MCC-1 & 2 FEED H2 RECOMBINERS,BATTERY CHARGERS AND OTHER SAFETY SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L0023 EVENT NO 138

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PEACH BOTTOM 2 PLANT TYPE: GE BWR
EVENT DATE: 4/11/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
VALVES

COMPONENT COOLING WATER
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

COMPONENT COOLING WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT OCCURS

PROPAGATION: RBCCW HEAT EXCHANGER DAMAGED BY SEISMIC EVENT. HEAT EXCHANGER LEAKS

DEPENDENCY: SEISMIC QUALIFIED VALVE IS NORMALLY OPEN, ALLOWING FLOW TO UNQUAL RBCCW

UNDESIRABLE RESULT: LOSS OF EMERGENCY SERVICE WATER

REMARKS: VALVES WERE LOCKED CLOSED-OPERATORS TRAINED FOR APPROPRIATE RESPONSE DURING LOP

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:20

REFERENCES: L2025 EVENT NO 139

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PEACH BOTTOM 2 PLANT TYPE: GE BWR
EVENT DATE: 4/17/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH PRESSURE COOLANT INJECTION (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

SECONDARY CONTAINMENT (BWR)
STRUCTURAL FUNCTION ITEMS

CONDUIT AND CABLE TRAY
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (BWR)

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: HPCI STEAM SUPPLY LINE BREAK IN OUTBOARD ISOLATION VALVE ROOM

PROPAGATION: OVERPRESSURES CONCRETE BLOCK WALL. MAY CAUSE WALL TO FAIL

DEPENDENCY: BLOCK WALL SUPPORTS CONDUITS CONTAINING ENGINEERED SAFEGUARD CABLES

UNDESIRABLE RESULT: PIPEBREAK IN HPCI LINE DEGRADES ENGINEERED SAFEGUARD SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0040 EVENT NO 140

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PILGRIM 1 PLANT TYPE: GE BWR
EVENT DATE: 8/16/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MEDIUM VOLTAGE AC (35KV TO 600V)
CIRCUIT BREAKER/FUSES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: UNKNOWN

INITIATING EVENT: SEISMIC EVENT CAUSES LOSP AND FAILURE TO TRIP OF AUXILIARY TRANSFORMER BREAKERS

PROPAGATION: DIESEL GENERATOR BREAKERS FAIL TO AUTO CLOSE DUE TO A.T. BKRS FAILING CLOSED

DEPENDENCY: DG BKRS DEPEND ON SUCCESSFUL TRIP OF NON SEISMIC AUX TRANSFORMER BREAKERS

UNDESIRABLE RESULT: SEISMIC EVENT CAN CAUSE LOSS OF OFFSITE AND EMERGENCY POWER

REMARKS: SEISMICALLY QUALIFIED TRIP BREAKERS TO BE SUPPLIED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:20

REFERENCES: L0046 EVENT NO 141

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PILGRIM 1 PLANT TYPE: GE BWR
EVENT DATE: 1/21/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONDUIT AND CABLE TRAY
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: FIRES IN CERTAIN AREAS OF THE PLANT (UNSPECIFIED LOCATIONS)

PROPAGATION: ADEQUATE SEPARATION WAS NOT PROVIDED FOR REDUNDANT ECCS DIVISION CABLING

DEPENDENCY: COMMON LOCATION FOR REDUNDANT ECCS CABLES

UNDESIRABLE RESULT: SINGLE FIRE COULD FAIL REDUNDANT ECCS DIVISIONS

REMARKS: DOESN'T ADDRESS RHR. FIRE WOULDN'T CAUSE LOCA BUT MIGHT REQUIRE RHR

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:15

REFERENCES: L0007 EVENT NO 142

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PILGRIM 1 PLANT TYPE: GE BWR
EVENT DATE: 10/08/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

TURBINE BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

TURBINE BUILDING
STRUCTURAL FUNCTION ITEMS

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

REACTOR CORE ISOLATION COOLING (BWR)
TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: TURBINE BUILDING

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: TORNADO, SEISMIC, OR PIPE BREAK OUTSIDE CNMT COLLAPSE MASONRY WALLS

PROPAGATION: COLLAPSE OF WALLS DAMAGES OR FAILS SAFETY-RELATED COMP, ELECTRIC POWER, CONTROLS

DEPENDENCY: TURBINE & REACTOR BLDG MASONARY WALLS ARE LOCATED NEAR SAFETY-RELATED EQUIPMENT

UNDESIRABLE RESULT: FAILURE OF NUMEROUS SAFETY & SAFETY-RELATED SYSTEMS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L1033 L0167 EVENT NO 143

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: POINT BEACH 1 PLANT TYPE: WEST PWR
EVENT DATE: 3/27/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING CONTAINMENT PURGE OPERATIONS

PROPAGATION: ALL CONTAINMENT ISOLATION VALVES FOR PURGE SUBJECTED TO LOCA AND FAIL TO CLOSE

DEPENDENCY: DELTA P FROM LOCA IN CONTAINMENT GREATER THAN DESIGN FOR CLOSURE FROM FULL OPEN

UNDESIRABLE RESULT: LOCA DURING PURGING RESULTS IN LOSS OF CONTAINMENT ISOLATION CAPABILITY

REMARKS: PURGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0157 EVENT NO 144

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: POINT BEACH 1 PLANT TYPE: WEST PWR
EVENT DATE: 7/14/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTROL BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL BUILDING
STRUCTURAL FUNCTION ITEMS

DC POWER
BATTERIES/CHARGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

DC POWER
BATTERIES/CHARGERS

CONTROL ROOM PANELS
ELECTRICAL/I&C FUNCTION ITEMS

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT STRONG ENOUGH TO COLLAPSE SEVERAL BLOCK WALLS IN THE CONTROL BLDG

PROPAGATION: WALLS COLLAPSE DAMAGING BATTERIES, ELECTRICAL PANELS, AND CONTROL BOARDS

DEPENDENCY: WALLS DO NOT MEET REVISED SEISMIC CRITERIA

UNDESIRABLE RESULT: POTENTIAL LOSS OF SAFETY EQUIPMENT NEEDED FOR A SAFE SHUTDOWN

REMARKS: RESULT OF IE BULLETIN 80-11 INVESTIGATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L0169 I-024 EVENT NO 145

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: POINT BEACH 2 PLANT TYPE: WEST PWR
EVENT DATE: 12/19/1974 EXPERIENCE: ACTUAL
OPERATING STATUS: REFUELING

INITIATING SYSTEM AND COMPONENT

INTERMEDIATE PRESSURE INJECTION (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: HUMAN

RESULT TYPE: 4 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: PROCEDURES WERE NOT REVIEWED AFTER TWO MANUAL VALVES WERE PUT BETWEEN 2 SI BANKS

PROPAGATION: VALVES WERE LEFT OPEN DURING A SI PUMP TEST

DEPENDENCY: FUNCTIONAL DEPENDENCY BETWEEN RCS AND RHR INTRODUCED BY HUMAN ERROR

UNDESIRABLE RESULT: RHR AND RCS WERE MOMENTARILY PRESSURIZED TO 1400 PSIG

CORRECTIVE ACTION: OTHER CATEGORY: 19

REFERENCES: L2024 EVENT NO 146

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: POINT BEACH 2 PLANT TYPE: WEST PWR
EVENT DATE: 3/27/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING CONTAINMENT PURGE OPERATIONS

PROPAGATION: ALL CONTAINMENT ISOLATION VALVES FOR PURGE SUBJECTED TO LOCA AND FAIL TO CLOSE

DEPENDENCY: DELTA P FROM LOCA IN CONTAINMENT GREATER THAN DESIGN FOR CLOSURE FROM FULL OPEN

UNDESIRABLE RESULT: LOCA DURING PURGING RESULTS IN LOSS OF CONTAINMENT ISOLATION CAPABILITY

REMARKS: PURGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0157 EVENT NO 147

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PRAIRIE ISLAND 1 PLANT TYPE: WEST PWR
EVENT DATE: 8/30/1975 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RESIDUAL HEAT REMOVAL (PWR)
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: LEAKAGE IN RHR PIT

PROPAGATION: FLOODING/LEAKAGE WOULD AFFECT BOTH TRAINS OF RHR

DEPENDENCY: PATHS EXIST FOR FLOW TO LEAK INTO PIT FOR REDUNDANT RHR EQUIPMENT

UNDESIRABLE RESULT: DEGRADATION OR LOSS OF RHR DUE TO SINGLE EVENT

REMARKS: JUNCTION BOXES SEALED, PENETRATIONS SHIELDED, VENT DUCT RAISED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 4

REFERENCES: L0016 EVENT NO 148

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: PRAIRIE ISLAND 1 PLANT TYPE: WEST PWR
EVENT DATE: 4/12/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
I&C/CONTROLLERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRESSURIZER (PWR)
I&C/CONTROLLERS

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SMALL LOCA CAUSES PRESSURIZER PRESSURE DROP BUT PZR LEVEL REMAINS UNCHANGED

PROPAGATION: SMALL LOCA MAY NOT CAUSE PZR LEVEL DECREASE

DEPENDENCY: SAFETY INJECTION ACTUATION REQUIRES COINCIDENT LOW PRESSURE AND LEVEL IN PZR

UNDESIRABLE RESULT: AUTO ACTUATION OF REQD SAFETY SYSTEM DOES NOT OCCUR

REMARKS: PROCEDURE WAS REVISED TO REQUIRE MANUAL ACTUATION ON LOW PRESSURE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:22

REFERENCES: L0050 EVENT NO 149

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: QUAD CITIES 1 PLANT TYPE: GE BWR
EVENT DATE: 6/10/1972 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CIRCULATING WATER (OPEN CYCLE)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CIRCULATING WATER (OPEN CYCLE)
PIPES/FITTINGS

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
PUMPS

EMERGENCY GENERATOR COOLING
PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: TURBINE BUILDING

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: MAINT ERROR SHUT CIRC WATER VALVE-WATER HAMMER RUPTURED RUBBER EXP JOINT

PROPAGATION: TURBINE BLDG FLOODED AFFECTING RHR SERVICE WATER & DIESEL COOLING WATER PUMPS

DEPENDENCY: SW AND DIESEL COOLING PUMPS ARE LOCATED IN CONDENSER PUMP ROOM WITH NONSAFETY EQ

UNDESIRABLE RESULT: LOSS OF SW THUS RHR. LOSS DIESEL COOLING THUS DIESELS 1 AND 1/2 (SWING DIESEL)

REMARKS: CHANGES: SAFETY-REL EQ IN WATER-TIGHT VAULTS, FLOOD ALARMS WITH CIRC PUMP TRIPS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L1043 EVENT NO 150

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: QUAD CITIES 1 PLANT TYPE: GE BWR
EVENT DATE: 12/30/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONTROL AND SERVICE AIR
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (BWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: MAINTENANCE WORK LEFT AIR SYSTEM CONNECTION TO SERVICE WATER PUMP SUCTION VALVE

PROPAGATION: AIR LEAKED INTO COMMON HEADER FOR RHR SERVICE WATER

DEPENDENCY: AIR BINDING OF ALL SERVICE WATER PUMPS POSSIBLE DUE TO COMMON SUCTION

UNDESIRABLE RESULT: MAINTENANCE ERROR RESULTED IN DEGRADATION OF REDUNDANT EQUIPMENT

REMARKS: DATE GIVEN IS REPORT DATE

CORRECTIVE ACTION: OTHER CATEGORY: 2

REFERENCES: L0179 EVENT NO 151

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: QUAD CITIES 1 PLANT TYPE: GE BWR
EVENT DATE: 6/22/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
I&C/RELAYS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: UNIT 2 LOSP WHILE UNIT 1 DG OOS,LEAVING DG1/2 & DG2 FOR EMERGENCY PWR BOTH UNITS

PROPAGATION: DG1/2 TRIPPED UPON RHR SW PMP START DUE TO UNBLOCKED PROTECTIVE RELAY SIGNAL

DEPENDENCY: DG PROTECTIVE RELAY NOT BLOCKED DURING AUTO-START SEQUENCE

UNDESIRABLE RESULT: UNIT 1 NO DG,(BUT HAD OFFSITE PWR),UNIT 2 ONLY ONE DG W/NO OFF-SITE POWER

REMARKS: PRIMARY SOURCE OF OFFSITE POWER DOWN FOR ELECTIVE MAINTENANCE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: M1004 L0133 EVENT NO 152

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: QUAD CITIES 2 PLANT TYPE: GE BWR
EVENT DATE: 5/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONDUIT AND CABLE TRAY
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

ALL ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: DAMAGE TO CABLE TRAYS (FIRE, IMPACT, ETC.)

PROPAGATION: REDUNDANT ESS DIVISIONS FAIL DUE TO LOSS OF POWER

DEPENDENCY: BOTH DIVISIONS OF ENGINEERED SAFEGUARD SYSTEM POWER CABLES IN SAME TRAY

UNDESIRABLE RESULT: FAILURE OF REDUNDANT PORTIONS OF ESS WILL AFFECT MULTIPLE SAFETY SYSTEMS

REMARKS: SPECIFIC SAFETY SYSTEMS NOT NAMED

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 15

REFERENCES: L0008 EVENT NO 153

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: RANCHO SECO PLANT TYPE: B&W PWR
EVENT DATE: 9/20/1974 EXPERIENCE: ACTUAL
OPERATING STATUS: PREOPERATIONAL/STARTUP/POWER ASCENSION TESTS

INITIATING SYSTEM AND COMPONENT

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
SUBSYSTEM OCCURRENCE

NON-NUCLEAR INSTRUMENTATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

NON-NUCLEAR INSTRUMENTATION
SUBSYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: DURING MAINTENANCE TO CORRECT A SHORT CIRCUIT AN INVERTER WAS DISCONNECTED

PROPAGATION: SEVERAL FLOW CONTROLLERS AND RECORDERS DID NOT FUNCTION

DEPENDENCY: MULTIPLE CONTROL DEVICES AND OPERATOR DISPLAYS DEPENDED ON SINGLE POWER SOURCE

UNDESIRABLE RESULT: FAILURES CAUSE PRESSURE TRANSIENT TO 2400 PSIG AND INHIBITED RECOVERY

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L0018 EVENT NO 154

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: RANCHO SECO PLANT TYPE: B&W PWR
EVENT DATE: 3/20/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

DC POWER
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE SYSTEMS
I&C/INDICATORS

MULTIPLE SYSTEMS
I&C/CONTROLLERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
VESSELS

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: MAINTENANCE/MODIFICATION

INITIATING EVENT: LOSS OF POWER TO 4 DC POWER SUPPLIES FOR NNI DUE TO MAINTENANCE ERROR

PROPAGATION: OPERATORS AND ICS RECEIVED FAULTY INFORMATION-MAIN FW FLOW WENT TO ZERO

DEPENDENCY: CONTROL ROOM NNI AND ICS SIGNALS LOST UPON LOSS OF DC RELAY POWER

UNDESIRABLE RESULT: RX TRANSIENT WITH ERRONEOUS RCS AND PLANT INDICATION AND LACK OF CONTROL

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:14

REFERENCES: L0130 M1005 EVENT NO 155

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: RANCHO SECO PLANT TYPE: B&W PWR
EVENT DATE: 11/01/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOW VOLTAGE ON THE OFFSITE POWER GRID

PROPAGATION: CAN CAUSE LOSS OF ONSITE POWER DISTRIBUTION DUE TO UNDERVOLTAGE RELAY SETPTS

DEPENDENCY: DESIGN ERROR DID NOT ADDRESS LOW ENOUGH POTENTIAL GRID VOLTAGE

UNDESIRABLE RESULT: NONSAFETY OFFSITE POWER SYSTEM CAN DEGRADE ONSITE POWER DISTRIBUTION

REMARKS: DISCOVERED IN REVIEW REQUESTED BY NRC

CORRECTIVE ACTION: OTHER CATEGORY: 1

REFERENCES: L0044 EVENT NO 156

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: RANCHO SECO PLANT TYPE: B&W PWR
EVENT DATE: 2/19/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MATERIAL AND EQUIPMENT HANDLING
HANDLING EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MATERIAL AND EQUIPMENT HANDLING
HANDLING EQUIPMENT

REACTOR VESSEL
VESSELS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR VESSEL
VESSELS

MULTIPLE SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SLING ON RB POLAR CRANE BROKE-3000 LB LOAD FELL INTO FUEL TRANSFER CANAL

PROPAGATION: LOAD STRUCK REACTOR VESSEL SEAL PLATE, SHEARING OFF A STUD AND BOLT

DEPENDENCY: CRANE CAN TRANSPORT LOADS DIRECTLY ABOVE MANY SAFETY-RELATED ITEMS IN RX BLDG

UNDESIRABLE RESULT: DROPPED LOADS COULD DAMAGE RX VESSEL & INTERNALS, CR DRIVES, AND SPENT FUEL RODS

REMARKS: DROPPING LOAD INTO RX VESSEL COULD HAVE LEAD TO DAMAGE TO INTERNALS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:23

REFERENCES: L1018 EVENT NO 157

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 5/01/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
MECHANICAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRIMARY COOLANT (PWR)
PUMPS

SEAL WATER
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
PUMPS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RCP C SHAFT SEAL FAILED, ASSOCIATED SEAL LEAKOFF ISOL VALVE WAS NOT CLOSED

PROPAGATION: SEAL LEAKOFF FLOW BACK-PRESSURED RCP A&B LEAKOFF PREVENTING SEAL LEAKOFF FLOW

DEPENDENCY: COMMON SEAL LEAKOFF LINE CAUSED INTERACTION AMONG REACTOR COOLANT PUMPS

UNDESIRABLE RESULT: LOSS OF CAPABILITY TO OPERATE UNDAMAGED REACTOR COOLANT PUMPS

REMARKS: RCP C WAS RUN TO EQUALIZE RCS CONDITIONS, SEAL DEGRADED,CAUSED LOC[illegible]

CORRECTIVE ACTION: ADMINISTRATIV[illegible] JRE CHANGE CATEGORY:22

REFERENCES: M1007 EVENT NO 158

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 6/13/1977 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONTROL AND SERVICE AIR

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RUPTURED DIAPHRAGM IN CHARGING PUMP SUCTION VALVE

PROPAGATION: AIR ENTERED COMMON SUCTION, CAUSING AIR BINDING OF TWO CHARGING PUMPS

DEPENDENCY: COMMON SUCTION FOR CHARGING PUMP SUBJECT TO AIR INTRUSION

UNDESIRABLE RESULT: FAILURE OF, AND POTENTIAL FOR DAMAGE TO, REDUNDANT CHARGING PUMPS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L0165 EVENT NO 159

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 6/25/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0082 EVENT NO 160

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 1/13/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

PRIMARY CONTAINMENT (PWR)
I&C/TRANSMITTERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
TOTAL SYSTEM OCCURRENCE

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: UNKNOWN

INITIATING EVENT: SERVICE WATER LEAK DURING LOCA - CNMT PRESSURE HIGHER THAN SWS PRESSURE

PROPAGATION: RAD CONTAMINATION ENTERS SW SYSTEM AND IS CARRIED OUTSIDE CONTAINMENT VIA SW

DEPENDENCY: SWS AT LOWER PRESSURE THAN CNMT, NO RADIATION MONITORS ON SWS '

UNDESIRABLE RESULT: LOSS OF CNMT INTEGRITY WITH UNMONITORED RELEASE PATH DURING LOCA

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L0033 L0034 EVENT NO 161

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 1/29/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: HOT SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CONTAINMENT ISOLATION
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

CVCS/HIGH PRESSURE SAFETY INJECTION
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
SUBSYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: AUTOMATIC ISOLATION OF CVCS LETDOWN LINE AFTER SPURIOUS SAFETY INJECTION

PROPAGATION: OUTER ISOL VLVS CLOSED FASTER THAN INNER VLVS-SURGE BLEW OFF END CAP

DEPENDENCY: OPERATOR HAD NO INDICATION OF LETDOWN FLOW. LETDOWN RESTARTED.

UNDESIRABLE RESULT: LOCA-6000 GAL OF REACTOR COOLANT RELEASED TO CONTAINMENT

REMARKS: END CAP LOCATED BETWEEN INNER AND OUTER ISOL VLVS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: L5003 EVENT NO 162

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ROBINSON 2 PLANT TYPE: WEST PWR
EVENT DATE: 4/19/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONDENSATE AND FEEDWATER
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: AFW DISCH CHK VALVES AND MOTOR OPER ISOL VALVE LEAKED MAIN FW INTO AFW SYSTEM

PROPAGATION: HI PRESS/TEMP FEEDWATER FLASHED TO STEAM IN AFW PUMPS

DEPENDENCY: AFW PUMPS RELY ON ISOL VALVES TO PREVENT STEAM INTRUSION

UNDESIRABLE RESULT: LOSS OF AFW WHEN PUMPS TRIPPED ON LOW DISCHARGE PRESS DUE TO STEAM BINDING

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 2

REFERENCES: I-294 EVENT NO 163

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 2/06/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: CONSTRUCTION

INITIATING SYSTEM AND COMPONENT

EQUIPMENT DRAINAGE (INCLUDING VENTS)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

TURBINE BUILDING
STRUCTURAL FUNCTION ITEMS

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
ELECTRICAL CONDUCTORS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SEVERE STORM CAUSED HIGH WATER CONDITION IN DELAWARE RIVER

PROPAGATION: WATER BACKED THROUGH A 24-INCH LINE IN THE INCOMPLETE SUMP PUMP SYSTEM

DEPENDENCY: WATER FLOWED INTO TURBINE BLDG AND THRU A CONSTRUCTION BLOCKOUT INTO AUX BLDG

UNDESIRABLE RESULT: VITAL BUS AND 2-4KV BREAKERS IN AUX BLDG WERE DAMAGED BY ARCING DUE TO WATER

CORRECTIVE ACTION: OTHER CATEGORY: 4

REFERENCES: L2032 EVENT NO 164

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/07/1978 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

RESIDUAL HEAT REMOVAL (PWR)
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RESIDUAL HEAT REMOVAL (PWR)
MISCELLANEOUS EQUIPMENT

RADIATION MONITORING
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
VALVES

REACTOR BUILDING HVAC (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: HIGH BACKGROUND RADIATION TRIPS SERVICE WATER RADIATION MONITORS

PROPAGATION: SW VALVES ISOLATE COOLING WATER TO CONTAINMENT FAN COIL UNITS

DEPENDENCY: SW RAD MONITORS ARE LOCATED NEAR RHR PIPING WHICH IS RADIOACTIVE

UNDESIRABLE RESULT: FAN COIL UNITS INOPERABLE

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: L1009 EVENT NO 165

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 7/10/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIAGE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0076 EVENT NO 166

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 9/07/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONDENSATE AND FEEDWATER
PIPES/FITTINGS

STEAM GENERATOR PRESSURE RELIEF (PWR)
I&C/CONTROLLERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

STEAM GENERATOR PRESSURE RELIEF (PWR)
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK (FEEDWATER) NEAR SG PORV CONTROL SYSTEM

PROPAGATION: ADVERSE ENVIRONMENT CAUSES SG PORV FAILURE

DEPENDENCY: SG PORV CONTROLS SUSCEPTIBLE TO HELB CONDITIONS AND LOCATED IN HELB AREA.

UNDESIRABLE RESULT: OPERATOR ACTIONS ARE REQUIRED TO MITIGATE POTENTIAL SG PORV FAILURE AND AFW LOSS

REMARKS: OTHER THREE GENERIC W CONCERNS (PZR PORV, MFW, AND ROD CONTROL) NOT AT SALEM

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:10

REFERENCES: L0090 I-277 EVENT NO 167

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/21/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
I&C/TRANSMITTERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
ACCUMULATORS/RESERVOIRS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: FAILURE OF VCT LEVEL TRANSMITTER HIGH STOPS LETDOWN FLOW CAUSING LOW TANK LEVEL

PROPAGATION: LOSS OF SUCTION DAMAGES MULTIPLE CHG PUMPS SINCE FAILURE ALSO STOPS SWITCHOVER

DEPENDENCY: LEVEL TRANSMITTER CONTROLS LEVEL AND SUCTION SWITCHOVER TO RWST

UNDESIRABLE RESULT: REDUNDANT CHG PUMPS DAMAGED. THESE PUMPS ARE ALSO HI HEAD SAFETY INJECTION.

REMARKS: WESTINGHOUSE NOTIFICATION OF POTENTIAL FAILURE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 5

REFERENCES: L0150 EVENT NO 168

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SALEM 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/06/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

LOW VOLTAGE AC (LESS THAN 600V)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW VOLTAGE AC (LESS THAN 600V)
ELECTRICAL CONDUCTORS

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
GENERATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

VITAL INSTRUMENT, CONTROL, AND COMPUTER AC
GENERATORS

ENGINEERED SAFETY FEATURES ACTUATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURES

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: POWER CABLE FOR CABINET FAN CAUSED ELECTROMAGNETIC NOISE WHEN ENERGIZING FAN

PROPAGATION: NOISE TRIPPED VITAL INVERTER-LOSS OF BUS PLUS UNIT CONDITIONS (LO T-AVG) GAVE SI

DEPENDENCY: POWER CABLE FOR CABINET FAN IS LOCATED NEAR INVERTER (VITAL INSTRUMENT POWER)

UNDESIRABLE RESULT: SPURIOUS TRIPS OF VITAL INVERTER AND LOSS OF POWER TO SAFETY-RELATED INSTRUMENTS

REMARKS: COULD BE GENERIC TO ALL INVERTERS AT SALEM-CNMT FCU & BIT INLET VALVES FAILED

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L1037 EVENT NO 169

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 3/12/1968 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

CVCS/HIGH PRESSURE SAFETY INJECTION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: SECONDARY CONTAINMENT (PWR)

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FIRE IN ELECTRICAL PENETRATION CAUSED BY OVERLOADED PZR HEATER CABLES

PROPAGATION: FIRE CAUSED GROUND ON A BUS AND REQUIRED ISOLATING ENTIRE BUS

DEPENDENCY: UNDAMAGED EQUIPMENT DE-ENERGIZED DUE TO LOCATION OF FIRE

UNDESIRABLE RESULT: FIRE AND FIRE FIGHTING DISABLE MULTIPLE EQUIPMENT

REMARKS: PROBLEM DURING SHUTDOWN DUE FAILURE IN BORON ADDITION SYSTEM DUE TO FIRE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L0177 EVENT NO 170

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 9/02/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
MISCELLANEOUS EQUIPMENT

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: SIS FOLLOWED BY USE OF SI BLOCK SWITCH OR RETURN TO NORMAL PARAMETERS AND LOSP

PROPAGATION: SIS SEQUENCER WILL NOT RELOAD SAFETY INJECTION LOADS

DEPENDENCY: PREVIOUS SHUTOFF OF SIS CAUSES SEQUENCER AND EMERGENCY POWER FAILURE

UNDESIRABLE RESULT: SAFETY SYSTEMS FAIL DUE TO LOSS OF POWER

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0155 EVENT NO 171

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 1/16/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MULTIPLE ECCS SYSTEMS
SUBSYSTEM OCCURRENCE

MULTIPLE ECCS SYSTEMS
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE ECCS SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SAFETY INJECTION ACTUATES AND LOSS OF POWER OCCURS. SI PARAMETERS OSCILLATE

PROPAGATION: SEQUENCER WILL RESET IF OSCILLATION OCCURS WITHIN 21 SECONDS OF LOP

DEPENDENCY: SEQUENCER RESET IS SUSCEPTIBLE TO PARAMETER OSCILLATION

UNDESIRABLE RESULT: LOSS OF POWER TO ESF EQUIP- SEQUENCER WILL NOT AUTO LOAD EQUIP

REMARKS: THIS DEFECT WAS IDENTIFIED DURING ANALYSIS OF EARLIER PROBLEM (9/2/80).

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0174 EVENT NO 172

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 1 PLANT TYPE: WEST PWR
EVENT DATE: 7/17/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

COMPRESSED GAS
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL COMPRESSED AIR
TOTAL SYSTEM OCCURRENCE

COMPRESSED GAS
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

GASEOUS RADWASTE (PWR)
RECOMBINERS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 0 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: INST AIR BACK-LEAKAGE (AT AFW VALVES) INTO NITROGEN SYSTEM

PROPAGATION: HIGH OXYGEN IN WASTE GAS RECOMBINERS-EXPLOSION AND TANK DAMAGE PLUS RELEASE

DEPENDENCY: NITROGEN IS BACKUP TO INST AIR FOR SEVERAL SAFETY-RELATED VALVES

UNDESIRABLE RESULT: RADIOLOGICAL RELEASE AND DAMAGE TO WASTE GAS EQUIP FROM EXPLOSION

REMARKS: NO CHECK VALVES TO SEPARATE NITROGEN AND INST AIR WHICH IS AT HIGHER PRESS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 2

REFERENCES: L2023 I-216 EVENT NO 173

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 2 PLANT TYPE: CE PWR
EVENT DATE: 1/16/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING CONTAINMENT PURGE OPERATIONS

PROPAGATION: ALL CONTAINMENT ISOLATION VALVES FOR PURGE SUBJECTED TO LOCA AND FAIL TO CLOSE

DEPENDENCY: DELTA P FROM LOCA IN CONTAINMENT GREATER THAN DESIGN FOR CLOSURE FROM FULL OPEN

UNDESIRABLE RESULT: LOCA DURING PURGING RESULTS IN LOSS OF CONTAINMENT ISOLATION CAPABILITY

REMARKS: PRUGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0158 EVENT NO 174

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 2 PLANT TYPE: CE PWR
EVENT DATE: 3/14/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: OTHER

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
PERSONNEL

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PERSONNEL

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: BACKFLUSHING OF PURIFICATION SYS FILTER WITH N2 W/O ISOLATING SHUTDOWN COOLING

PROPAGATION: NITROGEN ENTERED RHR SUCTION LINE CAUSING LOSS OF SHUTDOWN COOLING

DEPENDENCY: MAINTENANCE OPERATIONS IN NONSAFETY SYSTEM CONNECTED TO SAFETY SYSTEM

UNDESIRABLE RESULT: DEGRADATION OF RHR BY ACTIVITIES INVOLVING NONSAFETY EQUIPMENT

REMARKS: NO IRRADIATED FUEL WAS IN CORE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 2

REFERENCES: L0117 I-127 EVENT NO 175

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 3 PLANT TYPE: CE PWR
EVENT DATE: 1/16/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OCCURRING DURING CONTAINMENT PURGE OPERATIONS

PROPAGATION: ALL CONTAINMENT ISOLATION VALVES FOR PURGE SUBJECTED TO LOCA AND FAIL TO CLOSE

DEPENDENCY: DELTA P FROM LOCA IN CONTAINMENT GREATER THAN DESIGN FOR CLOSURE FROM FULL OPEN

UNDESIRABLE RESULT: LOCA DURING PURGING RESULTS IN LOSS OF CONTAINMENT ISILATION CAPABILITY

REMARKS: PURGING WAS RESTRICTED TO LOW PRESSURE CONDITIONS FOR RCS

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0158 EVENT NO 176

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SAN ONOFRE 3 PLANT TYPE: CE PWR
EVENT DATE: 12/17/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR PROTECTION
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ALL ESF SYSTEMS
SUBSYSTEM OCCURRENCE

ALL ESF SYSTEMS
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ALL ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

INTERMEDIATE PRESSURE INJECTION (PWR)
TOTAL SYSTEM OCCURRENCE

CONTAINMENT SPRAY
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: FAILURE OF A SINGLE PIN IN THE PLANT PROTECTION SYSTEM

PROPAGATION: DE-ENERGIZES BISTABLE RELAY MATRIX, CAUSING ACTUATION OF SIAS AND RAS

DEPENDENCY: SIMULTANEOUS ACTUATION CAUSES ESF SYSTEM TO TRANSFER SUCTION TO SUMP PREMATURELY

UNDESIRABLE RESULT: INTERRUPTION OF AND POTENTIAL DAMAGE TO ESF COOLING SYSTEMS

REMARKS: IN ACTUAL EVENT, ACTUATION OCCURRED DUE TO INDEPENDENT FAILURES-STUDY FOUND PIN

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 6

REFERENCES: L0163 L0156 EVENT NO 177

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/29/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0072 EVENT NO 178

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/25/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
I&C/SWITCHES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONDENSATE AND FEEDWATER
I&C/SWITCHES

RESIDUAL HEAT REMOVAL (PWR)
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
SUBSYSTEM OCCURRENCE

CONTAINMENT SPRAY
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: LIMIT SWITCH ON FEEDWATER VALVE FAILS TO ACTUATE

PROPAGATION: SWITCH INTERLOCK NOT SATIS, RHR VALVE WON'T OPEN, TRAIN OF RHR & CS INOPERABLE

DEPENDENCY: RHR VALVE IS INTERLOCKED (CONTROL LOGIC TO OPEN) WITH FEEDWATER VALVE

UNDESIRABLE RESULT: ONE TRAIN (EACH) OF RHR & CONTAINMENT SPRAY INOPERABLE

REMARKS: INTERLOCK BETWEEN FEEDWATER AND RHR NOT EXPLAINED

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:22

REFERENCES: L1005 EVENT NO 179

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/13/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: PORV CONTROL FAILURE AFTER SECONDARY SYS HELB CAUSES SI ACTUATION

PROPAGATION: RCS PRESSURE HIGHER THAN CHG PUMP DESIGN INJECTION PRESS; PUMPS OVERHEAT

DEPENDENCY: RECIRC VALVES PROTECT CHG PUMPS, BUT SIAS CLOSES RECIRC VALVES

UNDESIRABLE RESULT: LOSS OF MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS MET

REMARKS: GENERIC W PROBLEM. PUMP FAILURES DEPENDS ON SPECIFIC DESIGN HEAD

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0052 I-017 EVENT NO 180

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/14/1980 EXPERIENCE: POTENTIAl
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

MULTIPLE ECCS SYSTEMS
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

RESIDUAL HEAT REMOVAL (PWR)
PUMPS

CONTAINMENT SPRAY
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1,2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT STRONG ENOUGH TO COLLAPSE SEVERAL BLOCK WALLS IN THE AUXILARY BLD

PROPAGATION: WALLS COLLAPSE DAMAGING OR FAILING ALL RHR & CNMT SPRAY PUMPS & A CHARGING PUMP

DEPENDENCY: WALLS ARE LOCATED NEAR SAFETY-RELATED EQUIPMENT

UNDESIRABLE RESULT: POTENTIAL LOSS OF SAFETY EQUIPMENT NEEDED FOR A SAFE SHUTDOWN

REMARKS: RESULT OF IE BULLETIN 80-11 INVESTIGATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L1039 EVENT NO 181

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 12/12/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY GENERATOR I&C
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOSS OF OFFSITE POWER WHEN A DIESEL GENERATOR IS RUNNING BUT NOT LOADED

PROPAGATION: LOADS NOT STRIPPED FROM BUS; DG BKR CLOSES TO LOADED BUS

DEPENDENCY: WITH DG RUNNING, LOGIC DOES NOT STRIP LOADS PRIOR TO CLOSURE OF OUTPUT BREAKER

UNDESIRABLE RESULT: LOSS OF EMERGENCY POWER AFTER LOSS OF OFF SITE POWER

REMARKS: LOGIC MODIFIED. PERMISSIVE NOW ASSURES LOAD STRIPPING PRIOR TO DG BKR CLOSURE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0112 EVENT NO 182

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/18/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
I&C/SWITCHES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT SPRAY
TOTAL SYSTEM OCCURRENCE

INTERMEDIATE PRESSURE INJECTION (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: UNKNOWN

INITIATING EVENT: LOSS OF COOLANT ACCIDENT

PROPAGATION: HIGH AMBIENT TEMP, SUMP LEVEL SENSOR BELLOWS-BOIL & RUPTURE-FALSE SIGNAL (LOW)

DEPENDENCY: SUMP LEVEL SUSCEPTIBLE TO HI TEMP BUT LOCATED IN AREA OF POTENTIAL HI TEMP

UNDESIRABLE RESULT: PREVENTS AUTO SWITCH OF ECCS SUCTION TO SUMP LOCA DEGRADES SYS REQ TO RESPOND

REMARKS: FALSE LEVEL SIGNAL WOULD GO TO OPERATOR ALSO, POTENTIAL HUMAN RESPONSE ERROR

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0028 EVENT NO 183

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 1 PLANT TYPE: WEST PWR
EVENT DATE: 12/01/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
SHOCK SUPPRESSORS AND SUPPORTS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
SHOCK SUPPRESSORS AND SUPPORTS

CONTROL BUILDING HVAC
HEAT EXCHANGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTROL BUILDING HVAC
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1,2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT CAUSES PRESSURE BOUNDARY FAILURE IN MECH EQMT ROOM FIRE PROTECTION

PROPAGATION: WATER SPRAY COULD DAMAGE ELECTRICAL EQMT, DISABLING CONTROL ROOM HVAC CHILLERS

DEPENDENCY: ORIGINAL DESIGN REQUIRED STRUCTURAL, BUT NOT PRESSURE BOUNDARY INTEGRITY

UNDESIRABLE RESULT: SEISMIC EVENT WOULD DEGRADE HVAC REQUIRED FOR CONTROL ROOM HABITABILITY

REMARKS: PIPING IS NORMALLY DRY, BUT DELUGE VALVE IS NONSEISMIC ALSO

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: L0164 EVENT NO 184

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SEQUOYAH 2 PLANT TYPE: WEST PWR
EVENT DATE: 8/06/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

RESIDUAL HEAT REMOVAL (PWR)
I&C/RELAYS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
VALVES

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RHR-SUMP ISOL VALVE OPENED BECAUSE SOLID STATE RELAY CONTACTS WERE REVERSED

PROPAGATION: LEAK PATH EXISTED FROM RCS THRU RHR RECIRCULATION PIPING TO CONTAINMENT SUMP

DEPENDENCY: RHR HAS CONNECTION WITH SUMP FOR ECCS RECIRCULATION PHASE

UNDESIRABLE RESULT: RCS PRESSURE BOUNDARY BREACHED-8000 GALS. OF COOLANT TRANSFERRED TO CNMT SUMP

REMARKS: TEST PROCEDURE INADEQUATE AND SPSS CONTACTS REVERSED.

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 6

REFERENCES: A0011 L0181 EVENT NO 185

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ST. LUCIE 1 PLANT TYPE: CE PWR
EVENT DATE: 11/25/1975 EXPERIENCE: ACTUAL
OPERATING STATUS: PREOPERATIONAL/STARTUP/POWER ASCENSION TESTS

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW VOLTAGE AC (LESS THAN 600V)
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: SPECIAL TEST/INSPECTION

INITIATING EVENT: LOSS OF OFF SITE POWER (OCCURRED DELIBERATELY IN LOSP TEST)

PROPAGATION: AB BUS FAILED TO LOAD TO ALLOW REPOWERING BY EMERGENCY POWER

DEPENDENCY: LOAD SHED RELAY WAS ENERGIZE-TO-ACTUATE AND ONLY PROVIDED WITH OFF SITE POWER

UNDESIRABLE RESULT: LOSP PREVENTS BUS LOAD SHEDDING REQUIRED TO RE-ENERGIZE BUS

REMARKS: DATE GIVEN IS REPORT DATE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0178 EVENT NO 186

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ST. LUCIE 1 PLANT TYPE: CE PWR
EVENT DATE: 3/31/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SEISMIC EVENT CAUSES FAILURE OF NON CLASS IE TRANSFORMER DISCONNECT CONTACTS

PROPAGATION: CONTACTS COULD DISLODGE CAUSING SHORT CIRCUIT ON BUS, DEFEATING EMERGENCY POWER

DEPENDENCY: NORMAL AND EMERGENCY POWER SHARE BUS WITH NON CLASS IE CONTACTS

UNDESIRABLE RESULT: NONSAFETY SYSTEM CAN CAUSE LOSS OF SAFETY BUS DURING SEISMIC EVENT

REMARKS: SAME DESIGN USED AT UNIT 2

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:20

REFERENCES: L0098 EVENT NO 187

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ST. LUCIE 1 PLANT TYPE: CE PWR
EVENT DATE: 6/11/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

STEAM GENERATOR BLOWDOWN (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR BLOWDOWN (PWR)
PIPES/FITTINGS

COMPONENT COOLING WATER
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

COMPONENT COOLING WATER
VALVES

PRIMARY COOLANT (PWR)
PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: STEAM LEAK FROM FLANGED CONNECTION IN A BLOWDOWN LINE

PROPAGATION: STEAM SHORTED TERMINAL BOARD CAUSING CCW VALVE TO FAIL CLOSE

DEPENDENCY: TERMINAL BOARD FOR CCW VALVE SUSCEPTIBLE TO HUMIDITY LOCATED NEAR A STEAM SOURCE

UNDESIRABLE RESULT: LOSS OF CCW TO REACTOR COOLANT PUMPS & REACTOR TRIP

REMARKS: CORRECTIVE ACTION NOT KNOWN

CORRECTIVE ACTION: OTHER CATEGORY:23

REFERENCES: AC803 EVENT NO 188

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ST. LUCIE 1 PLANT TYPE: CE PWR
EVENT DATE: 10/23/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

CVCS/HIGH PRESSURE SAFETY INJECTION
I&C/CONTROLLERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PIPES/FITTINGS

CVCS/HIGH PRESSURE SAFETY INJECTION
VESSELS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 0 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: VOLUME CONTROL TANK LEVEL INSTR REF LEG EMPTY,CAUSING LEVEL CONTROL FAILURES

PROPAGATION: DUE TO ERRONEOUS LEVEL INDICATION VCT WAS PUMPED DRY AND CHG PUMPS FAILED

DEPENDENCY: VCT FEEDS ALL THREE CHARGING PUMPS AND HAS HYDROGEN COVER GAS

UNDESIRABLE RESULT: ALL THREE CHARGING PUMPS BECAME VAPOR BOUND WHEN VCT WAS PUMPED DRY

REMARKS: HYDROGEN WAS ADMITTED TO PUMP SUCTIONS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 5

REFERENCES: L2020 A0021 A0020 I-127 EVENT NO 189

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ST. LUCIE 2 PLANT TYPE: CE PWR
EVENT DATE: 1/24/1978 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL/I&C FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MEDIUM VOLTAGE AC (35KV TO 600V)
ELECTRICAL CONDUCTORS

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 2,4 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SEISMIC EVENT CAUSES FAILURE ON NON CLASS IE TRANSFORMER DISCONNECT CONTACTS

PROPAGATION: CONTACTS COULD DISLODGE CAUSING SHORT CIRCUIT ON BUS, DEFEATING EMERGENCY POWER

DEPENDENCY: NORMAL AND EMERGENCY POWER SHARE BUS WITH NON IE CONTACTS

UNDESIRABLE RESULT: NONSAFETY SYSTEM CAN CAUSE LOSS OF SAFETY BUS DURING SEISMIC EVENT

REMARKS: SAME DESIGN USED AT UNIT 1

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:20

REFERENCES: L0099 EVENT NO 190

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 9/19/1974 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

AUXILIARY FEEDWATER (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: INSTALLATION

INITIATING EVENT: PIPE RUPTURE ON ONE TRAIN OF AUXILIARY FEEDWATER

PROPAGATION: LOSS OF FW FLOW IN ONE TRAIN CAUSES LOSS IN REDUNDANT TRAIN

DEPENDENCY: CROSS CONN BETWEEN TRAINS W/O ISOL VALVES ALLOWS BREAK TO AFFECT BOTH TRAINS

UNDESIRABLE RESULT: LOSS OF REDUNDANT TRAINS OF AFW DUE TO SINGLE PIPING FAILURE

REMARKS: ALSO AFFECTS UNIT 2

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 13

REFERENCES: L0017 EVENT NO 191

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 1/17/1977 EXPERIENCE: ACTUAL
OPERATING STATUS: PREOPERATIONAL/STARTUP/POWER ASCENSION TESTS

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

ESSENTIAL RAW COOLING/ SERVICE WATER
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

ESSENTIAL RAW COOLING/ SERVICE WATER
TOTAL SYSTEM OCCURRENCE

RESIDUAL HEAT REMOVAL (PWR)
HEAT EXCHANGERS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: MAINTANENCE LEFT DRAIN VALVES OPEN ON SERVICE WATER LINES IN A VALVE PIT

PROPAGATION: WHEN SW ISOL VALVE OPENED, DRAIN VALVES FLOODED PIT SUBMERGING VALVE MOTOR OPER

DEPENDENCY: ALL 4 SW VALVES TO RHR HEAT EXCHANGERS LOCATED IN SAME PIT-NO LEVEL INSTR IN PIT

UNDESIRABLE RESULT: POTENTIAL LOSS OF SERVICE WATER TO HEAT EXCHANGERS

REMARKS: VALVES OPEN ON ESFAS SIGNAL

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:23

REFERENCES: L1042 M2001 EVENT NO 192

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 3/23/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA WITH OR WITHOUT LOSS OF OFFSITE POWER

PROPAGATION: POTENTIAL UNDER POWER CONDITION COULD OCCUR ON EMERGENCY BUS

DEPENDENCY: DESIGN ERROR ALLOWS BUS FAILURE BY REQUIRING LOAD SHEDDING NOT IN PROCEDURES

UNDESIRABLE RESULT: LOCA CAN CAUSE FAILURE OF EMERGENCY BUSES DUE TO OVERLOADING

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0049 EVENT NO 193

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0079 EVENT NO 194

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 8/29/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MAIN STEAM
PIPES/FITTINGS

STEAM GENERATOR PRESSURE RELIEF (PWR)
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

STEAM GENERATOR PRESSURE RELIEF (PWR)
SUBSYSTEM OCCURRENCE

PRESSURIZER (PWR)
SUBSYSTEM OCCURRENCE

REACTOR POWER CONTROL (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 0 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK (FEEDWATER OR STEAM) IN SPECIFIC LOCATIONS

PROPAGATION: ADVERSE ENVIRONMENT FROM BREAK CAN CAUSE CONTROL SYSTEM FAILURES

DEPENDENCY: SOME CONTROLS(SG PORV,PZR PORV,AUTO ROD CONTROL) LOCATED SUBJECT TO BREAK

UNDESIRABLE RESULT: CONTROL FAILURES CONTRIBUTE TO ACCIDENT. PROCEDURES CHANGED.

REMARKS: EVENT NOT OUTSIDE EXISTING ANALYSES BUT REPRESENTS UNANTICIPATED FAILURE MODES

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:10

REFERENCES: L0086 L0087 I-277 EVENT NO 195

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/12/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
I&C/RELAYS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

BORATED/ REFUELING WATER STORAGE (PWR)
VALVES

PRIMARY COOLANT (PWR)
CHEMICAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

BORATED/ REFUELING WATER STORAGE (PWR)
TOTAL SYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
CHEMICAL FUNCTION ITEMS

CORE FLOODING ACCUMULATOR (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: DURING MAINTENANCE A LOCKED-IN SIAS SIGNAL OPENED RWST & BIT ISOL VALVES TO RCS

PROPAGATION: RWST GRAVITY FED INTO RCS REDUCING BORON CONC WITHOUT CNMT INTEGRITY MAINTD

DEPENDENCY: PROCEDURES DID NOT PRECAUTION AGAINST GRAVITY FLOW DURING VALVE CYCLING

UNDESIRABLE RESULT: PRESS IN BOTH SI ACCUMULATORS DEGRADED & RCS BORON CONCENTRATION DILUTED

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:22

REFERENCES: L5005 EVENT NO 196

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/11/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SECONDARY SYS HELB CAUSING SI ACTUATION AND PORV CONTROL FAILURE

PROPAGATION: RCS PRESSURE HIGHER THAN CHG PUMP DESIGN INJECTION PRESS; PUMPS OVERHEAT

DEPENDENCY: RECIRC VALVES PROTECT CHG PUMPS, BUT SIAS CLOSES RECIRC VALVES

UNDESIRABLE RESULT: LOSS OF MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS MET

REMARKS: GENERIC W PROBLEM. PUMP FAILURES DEPENDS ON SPECIFIC DESIGN HEAD

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0054 I-017 EVENT NO 197

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 10/16/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
PUMPS

AUXILIARY FEEDWATER (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: MAIL STEAM LINE BREAK DEPRESSURES ALL STEAM GENERATORS AND FAILS TO AFW PUMPS

PROPAGATION: MOTOR DRIVEN AFW PUMPS WILL FACE LOW PRESSURE AND TRIP ON RUNOUT

DEPENDENCY: NO RUNOUT PROTECTION PROVIDED FOR MOTOR-DRIVEN AFW PUMPS,DEPEND ON SG PRESSURE

UNDESIRABLE RESULT: LOSS OF AFW DUE TO PUMP RUNOUT & NO STEAM TO TD AFW PUMPS

REMARKS: IE BULLETIN 80-04 ADDRESSED THIS. ORIFICES WILL BE INSTALLED IN AFW LINES

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:11

REFERENCES: L0070 I-031 EVENT NO 198

APPENDIX C -- SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 11/14/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
ELECTRICAL CONDUCTORS

EMERGENCY POWER GENERATION
GENERATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

ALL SYSTEMS REQUIRING EMERGENCY POWER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SAFETY INJECTION SIGNAL CAUSES EDG START, THEN OFFSITE POWER LOST

PROPAGATION: EDG WILL ATTEMPT TO CLOSE ON BUS WITH RESIDUAL VOLTAGE. OUT OF PHASE TRANSFER

DEPENDENCY: EDG CAN EXPERIENCE DAMAGE FROM CLOSURE. SI MOTORS MAY NOT BE ADEQUATELY POWERED

UNDESIRABLE RESULT: LOSP CAN CAUSE DAMAGE AND POTENTIAL FAILURE OF EMERGENCY POWER IN THIS EVENT

REMARKS: TIME DELAY PROVIDED FOR CLOSING OF DG OUTPUT BRKRS AFTER OFFSITE BRKRS OPEN

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0162 EVENT NO 199

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/22/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

NON-NUCLEAR INSTRUMENTATION
I&C/TRANSMITTERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
ACCUMULATORS/RESERVOIRS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: VCT LEVEL TRANSMITTER FAILS HIGH, STOPPING LETDOWN FLOW

PROPAGATION: NO LETDOWN, VCT LOW LEVEL, NO SWITCH TO RWST, LOSS OF SUCTION DAMAGES CHG PUMPS

DEPENDENCY: LEVEL TRANSMITTER CONTROLS LEVEL AND SUCTION SWITCHOVER TO RWST

UNDESIRABLE RESULT: REDUNDANT CHG PUMPS DAMAGED. THESE PUMPS ARE ALSO HI HEAD SAFETY INJECTION

REMARKS: WESTINGHOUSE NOTIFICATION OF POTENTIAL FAILURE

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 5

REFERENCES: L0064 EVENT NO 200

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 1 PLANT TYPE: WEST PWR
EVENT DATE: 7/24/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FUEL BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FUEL BUILDING
STRUCTURAL FUNCTION ITEMS

FUEL POOL COOLING AND CLEANUP
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

FUEL POOL COOLING AND CLEANUP
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 1,2 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT STRONG ENOUGH TO COLLAPSE SEVERAL BLOCK WALLS IN THE FUEL BLDG

PROPAGATION: WALLS COLLAPSE DAMAGING INTEGRITY OF SPENT FUEL POOL

DEPENDENCY: WALLS ARE LOCATED NEAR SPENT FUEL POOL

UNDESIRABLE RESULT: POTENTIAL LOSS OF SPENT FUEL POOL INTEGRITY

REMARKS: RESULT OF IE BULLETIN 80-11 INVESTIGATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L0166 L0168 I-024 EVENT NO 201

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 2 PLANT TYPE: WEST PWR
EVENT DATE: 9/19/1974 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

AUXILIARY FEEDWATER (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: INSTALLATION

INITIATING EVENT: RUPTURE OF EITHER TRAIN OF AUXILIARY FEEDWATER SYSTEM

PROPAGATION: LOSS OF FW FLOW IN ONE TRAIN CAUSES LOSS IN REDUNDANT TRAIN

DEPENDENCY: CROSS CONN BETW TRAINS W/O ISOL VALVES ALLOWS BREAK TO AFFECT BOTH TRAINS

UNDESIRABLE RESULT: LOSS OF REDUNDANT TRAINS OF AFW DUE TO SINGLE PIPING FAILURE

REMARKS: ALSO AFFECTS UNIT 1

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:13

REFERENCES: L0017 EVENT NO 202

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 2 PLANT TYPE: WEST PWR
EVENT DATE: 4/29/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

ESSENTIAL RAW COOLING/ SERVICE WATER PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: DURING A MODIFICATION OF THE B SERVICE WATER PUMP, WATER WAS RELEASED NEARBY

PROPAGATION: THE WATER SPLASHED ON THE A SW TRAIN, CAUSING A SHORT AND DISABLING PUMP A

DEPENDENCY: CLOSE LOCATION OF THE TWO SW PUMPS ALLOWED WATER RELEASED FROM ONE TO FAIL OTHER

UNDESIRABLE RESULT: LOSS OF SW DISABLED TWO REDUNDANT CHARGING PUMPS

REMARKS: NOTE SAYS "MISSING DRIP SHIELD REPLACED". MAY BE MAINTENANCE ERROR

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L0003 EVENT NO 203

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 2 PLANT TYPE: WEST PWR
EVENT DATE: 5/28/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: UNKNOWN

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

EMERGENCY GENERATOR FUEL
VESSELS

FIRE PROTECTION
VALVES

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY GENERATOR FUEL
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: DIESEL FUEL OIL TANK FOAM DISTRIBUTOR CONNECTED TO FIRE WATER MAIN

PROPAGATION: CONNECTING VALVE LEFT OPEN

DEPENDENCY: FIRE WATER ENTERED DIESEL FUEL OIL SYSTEM

UNDESIRABLE RESULT: DEGRADATION OF EMERGENCY DG SYSTEM

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 3

REFERENCES: I-151 L0062 A0024 EVENT NO 204

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 2 PLANT TYPE: WEST PWR
EVENT DATE: 9/12/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: ROUTINE SHUTDOWN

INITIATING SYSTEM AND COMPONENT

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR AUXILIARY BUILDING
STRUCTURAL FUNCTION ITEMS

AUXILIARY FEEDWATER (PWR)
MOTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: SAFEGUARDS BUILDING ROOF LEAKED

PROPAGATION: WATER LEAKED ONTO AUXILIARY FEEDWATER SYSTEM PUMP MOTOR

DEPENDENCY: PUMP SUSCEPTIBLE TO WATER AND NOT PROTECTED FROM LEAKAGE

UNDESIRABLE RESULT: AUX FEED PUMP DEGRADED DUE TO WATER INLEAKAGE

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L2037 EVENT NO 205

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SURRY 2 PLANT TYPE: WEST PWR
EVENT DATE: 11/18/1983 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
PUMPS

AUXILIARY FEEDWATER (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: AUX FEED WATER HEADER CHECK VALVES LEAK DUE TO STEAM CUTS ON THEIR SEATS

PROPAGATION: LEAK OF HOT WATER FROM MAIN FEED HEADER TO AFW PUMP CASING VAPOR BINDS PUMPS

DEPENDENCY: AUX FEED WATER LINES CONNECT TO MAIN FEED HEADER

UNDESIRABLE RESULT: LOSS OF AUX FEEDWATER DUE TO VAPOR BINDING OF PUMPS

REMARKS: TWO OF THREE PUMPS FAILED, POTENTIAL FOR ALL THREE TO FAIL

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 2

REFERENCES: L1023 A0025 EVENT NO 206

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SUSQUEHANNA 1 PLANT TYPE: GE BWR
EVENT DATE: 3/06/1975 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

REACTOR OVERPRESSURE PROTECTION (BWR)
VALVES

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

MULTIPLE ESF SYSTEMS
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: LOCA OR ACTUATION OF MAIN STEAM SAFETY/RELIEF VALVES-DISCHARGE TO TORUS

PROPAGATION: AIR BUBBLE CLOSES POOL SWELL-POTENTIAL DAMAGE

DEPENDENCY: TORUS DAMAGE COULD AFFECT MULTIPLE SYSTEMS DEPENDENT ON TORUS FOR WATER SUPPLY

UNDESIRABLE RESULT: ACCIDENT CAN DAMAGE REDUNDANT TRAINS OF SYSTEMS REQD TO RESPOND

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 17

REFERENCES: L0110 EVENT NO 207

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: SUSQUEHANNA 1 PLANT TYPE: GE BWR
EVENT DATE: 11/01/1977 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

ENGINEERED SAFETY FEATURES ACTUATION
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

ENGINEERED SAFETY FEATURES ACTUATION
ELECTRICAL CONDUCTORS

ENGINEERED SAFETY FEATURES ACTUATION
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

ENGINEERED SAFETY FEATURES ACTUATION
TOTAL SYSTEM OCCURRENCE

MULTIPLE ESF SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: SPATIAL PLANT AREA: MISCELLANEOUS/ UNKNOWN STRUCTURES

RESULT TYPE: 1 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: DAMAGE OCCURS TO SAFETY RELATED CONTROL CABLES

PROPAGATION: DAMAGE CAN ALSO OCCUR TO CONTROL CABLES OF REDUNDANT TRAINS

DEPENDENCY: REDUNDANT TRAIN CABLES LOCATED WITHIN SIX INCHES

UNDESIRABLE RESULT: CONTROL CABLES FOR REDUNDANT EQUIPMENT COULD BE DAMAGED BY SINGLE EVENT

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:15

REFERENCES: L0039 EVENT NO 208

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: THREE MILE ISLAND 1 PLANT TYPE: B&W PWR
EVENT DATE: 1/23/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

LOW VOLTAGE AC (LESS THAN 600V)
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

LOW VOLTAGE AC (LESS THAN 600V)
SUBSYSTEM OCCURRENCE

LOW VOLTAGE AC (LESS THAN 600V)
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

INTERMEDIATE PRESSURE INJECTION (PWR)
SUBSYSTEM OCCURRENCE

COMPONENT COOLING WATER
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,4 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: FAILURE OF ONE 480V BUS WITH ESAS ACTUATION AND OFFSITE POWER AVAILABLE

PROPAGATION: SECOND 480V BUS COULD OVERLOAD CAUSING LOSS OF CLOSED COOLING SUPPORT FOR ECCS

DEPENDENCY: WITH STATED CONDITIONS, TWO BUSES CAN FAIL DUE TO ONE OVERLOAD

UNDESIRABLE RESULT: DEGRADATION OF ECCS SYSTEMS DURING ESAS ACTUATION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0042 EVENT NO 209

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: THREE MILE ISLAND 1 PLANT TYPE: B&W PWR
EVENT DATE: 1/17/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

HIGH VOLTAGE AC (GREATER THAN 35KV)
TOTAL SYSTEM OCCURRENCE

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

MULTIPLE SAFETY SYSTEMS
MISCELLANEOUS EQUIPMENT

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OTHER

INITIATING EVENT: ESFAS OCCURS STARTING EDG AND SUBSEQUENTLY LOSP OCCURS

PROPAGATION: DG BREAKER CLOSURE OCCUR WITH RESIDUAL VOLTAGE AND LOAD ON BUS

DEPENDENCY: BKR CLOSURE ONLY REQUIRES DG SPEED AND VOLTAGE SIGNALS

UNDESIRABLE RESULT: LOSP AFTER DG START CAN CAUSE DAMAGE TO DG AND EXCESSIVE VOLTAGE DIP

REMARKS: FOUND DUE TO INPO SOER REVIEW

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0113 EVENT NO 210

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: THREE MILE ISLAND 1 PLANT TYPE: B&W PWR
EVENT DATE: 2/25/1982 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FUEL BUILDING HVAC
MISCELLANEOUS EQUIPMENT

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FUEL BUILDING HVAC
MISCELLANEOUS EQUIPMENT

CONTROL BUILDING HVAC
MECHANICAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTROL BUILDING
TOTAL SYSTEM OCCURRENCE

CONTROL BUILDING HVAC
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT OCCURS, DAMAGING COMPUTER ROOM DUCT IN FUEL BUILDING

PROPAGATION: NO RADIATION SIGNAL INTERLOCK EXISTS, SO CONTAMINATION SPREADS INTO CONTROL BLDG

DEPENDENCY: CONTROL ROOM HVAC NOT ISOLATED FROM POTENTIALLY HIGH RADIATION AREA

UNDESIRABLE RESULT: CONTROL ROOM HABITABILITY NOT ASSURED FOR SEISMIC EVENT

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:21

REFERENCES: L0024 L0025 EVENT NO 211

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: THREE MILE ISLAND 2 PLANT TYPE: B&W PWR
EVENT DATE: 8/28/1975 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTROL BUILDING
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL BUILDING
STRUCTURAL FUNCTION ITEMS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: CONTROL BUILDING

RESULT TYPE: 1,4 DISCOVERY: ROUTINE TEST/INSPECTION

INITIATING EVENT: SEISMIC EVENT

PROPAGATION: HOLLOW BLOCK WALLS FALL ON SAFETY RELATED ELECTRICAL CIRCUITS

DEPENDENCY: WALLS THAT COULDN'T BE QUALIFIED USED NEAR SAFETY CIRCUITS

UNDESIRABLE RESULT: SEISMIC EVENT DAMAGES SEIMICALLY QUALIFIED SAFETY SYSTEMS

REMARKS: FOUND DURING ROUTINE INSPECTION OF CONTROL BLDG

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: L0173 EVENT NO 212

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: THREE MILE ISLAND 2 PLANT TYPE: B&W PWR
EVENT DATE: 3/28/1979 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

NON-NUCLEAR INSTRUMENTATION
I&C/SENSORS

OPERATION ACTIVITY
PERSONNEL

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
MISCELLANEOUS EQUIPMENT

REACTOR CORE
FUEL ELEMENTS

TYPE OF COUPLING: HUMAN

RESULT TYPE: 1,3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: DURING RX/TURBINE TRIP SEQUENCE, PORV STUCK OPEN CAUSING SMALL LOCA

PROPAGATION: RCS LOSSES CAUSED SIAS, OPERATOR UNAWARE OF PORV STATUS DUE TO INADEQUATE INST

DEPENDENCY: OPERATOR ACTED ON INADEQUATE INSTRUMENTS AND SHUT DOWN SAFETY INJECTION

UNDESIRABLE RESULT: LOSS OF RCS INVENTORY AND SHUT OFF OF ECCS CAUSED FUEL DAMAGE

REMARKS: AFW FAILED ALSO BUT NOT DUE TO SYSTEM INTERACTION

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 19

REFERENCES: I-280 I-048 L0065 M1001 EVENT NO 213

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TROJAN PLANT TYPE: WEST PWR
EVENT DATE: 5/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRIMARY COOLANT (PWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVES

PRIMARY CONTAINMENT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: LOCA OCCURS DURING CONTAINMENT PURGING OPERATION

PROPAGATION: PURGE DUCTING CAN FAIL, INTERFERING WITH PURGE ISOLATION VALVE CLOSURE

DEPENDENCY: DUCT DESIGN DID NOT CONSIDER LOCA CONDITIONS DURING PURGE OPERATION

UNDESIRABLE RESULT: LOCA DURING PURGE CAN DEFEAT CONTAINMENT INTEGRITY

REMARKS: PURGE SUPPLY VALVE, EXHAUST VALVE AND H2 VENT VALVE AFFECTED

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 9

REFERENCES: L0047 EVENT NO 214

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TROJAN PLANT TYPE: WEST PWR
EVENT DATE: 6/21/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: B

REFERENCES: L0080 EVENT NO 215

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TROJAN PLANT TYPE: WEST PWR
EVENT DATE: 5/08/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MISCELLANEOUS/ UNKNOWN STRUCTURES
STRUCTURAL FUNCTION ITEMS

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

SAFETY SYSTEMS/COMPONENTS AFFECTED

MULTIPLE SAFETY SYSTEMS
UNSPECIFIED COMPONENT

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 1 DISCOVERY: DESIGN CALCULATION/VERIFICATION

INITIATING EVENT: SEISMIC EVENT (OBE OR SSE)

PROPAGATION: COLLAPSE OR WEAKENING OF MASONRY WALLS

DEPENDENCY: SAFETY-RELATED PIPING OR EQUIPMENT DEPEND ON WALLS FOR SUPPORT

UNDESIRABLE RESULT: DAMAGE TO SAFETY-RELATED COMPONENTS IN DESIGN BASIS EVENT

REMARKS: DESIGN DEFICIENCY IN MASONRY WALLS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: I-024 I-051 I-271 EVENT NO 216

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TROJAN PLANT TYPE: WEST PWR
EVENT DATE: 4/19/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

PRIMARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTAINMENT ISOLATION
VALVE OPERATORS

PRIMARY CONTAINMENT (PWR)
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT ISOLATION
VALVE OPERATORS

PRIMARY COOLANT (PWR)
VALVE OPERATORS

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 3 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FLOODING OF CNMT SUMP SUBMERGED CNMT ISOL VALVE OPERATOR FOR RCS DRAIN TANK LINE

PROPAGATION: VALVE OPERATOR WATER DAMAGED & FAILED TO CLOSE RCS DRAIN TANK NOT ISOLATED

DEPENDENCY: VALVE AND OPERATOR ARE LOCATED IN THE SUMP SUCH THAT FLOODING/SPRAY FAIL OPER

UNDESIRABLE RESULT: POTENTIAL FAILURE TO ISOLATE RCS DRAIN TANK FOLLOWING AN ACCIDENT

REMARKS: THERE MAY BE MORE SAFETY-RELATED EQUIP IN CNMT THAT CAN BE FLOODED OR SPRAYED

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L1024 EVENT NO 217

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TROJAN PLANT TYPE: WEST PWR
EVENT DATE: 7/28/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
SUBSYSTEM OCCURRENCE

CONTAINMENT COMBUSTIBLE GAS CONTROL
ELECTRICAL/I&C FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CONTAINMENT COMBUSTIBLE GAS CONTROL
ELECTRICAL/I&C FUNCTION ITEMS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FIRE SYSTEM DELUGE ACTUATED BY WELDING SMOKE

PROPAGATION: SHORT-CIRCUITED CONTROL POWER XFMR TO HYDROGEN RECOMBINER

DEPENDENCY: HYDROGEN RECOMBINER POWER SUPPLY IN AREA SUBJECT TO FIRE DELUGE SPRAY

UNDESIRABLE RESULT: HYDROGEN RECOMBINER INOPERABLE DUE TO FIRE PROTECTION SYSTEM

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY: 3

REFERENCES: I-151 L0061 A0024 EVENT NO 218

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TURKEY POINT 3 PLANT TYPE: WEST PWR
EVENT DATE: 11/17/1972 EXPERIENCE: ACTUAL
OPERATING STATUS: COLD SHUTDOWN

INITIATING SYSTEM AND COMPONENT

MISCELLANEOUS/ UNKNOWN STRUCTURES
ACCUMULATORS/RESERVOIRS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MISCELLANEOUS/ UNKNOWN STRUCTURES
ACCUMULATORS/RESERVOIRS

EQUIPMENT DRAINAGE (INCLUDING VENTS)
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

MEDIUM VOLTAGE AC (35KV TO 600V)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 2 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: HEAVY RAIN STORMS

PROPAGATION: PLUGGED YARD CATCH BASIN FLOODED-WATER BACKED THROUGH FLOOR DRAINS

DEPENDENCY: DRAIN SYSTEM EMPTIES INTO YARD CATCH BASIN

UNDESIRABLE RESULT: POTENTIAL LOSS OF 4160 VOLT SWITCHGEAR-BOTH ROOMS WERE PARTIALLY FLOODED

REMARKS: OUTFALL FROM CATCH BASIN DIDN'T EXTEND TO CANAL-OUTFALL COVERED WITH ROCK & SAND

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 4

REFERENCES: L2030 EVENT NO 219

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TURKEY POINT 3 PLANT TYPE: WEST PWR
EVENT DATE: 6/26/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
PIPES/FITTINGS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0160 EVENT NO 220

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TURKEY POINT 4 PLANT TYPE: WEST PWR
EVENT DATE: 6/26/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT RESULTING IN HIGH AMBIENT TEMP

PROPAGATION: HEATUP OF REF LEG, SG LEVEL INSTR FAILS HIGH, DELAYS RPS TRIP ON SG LO LO LEVEL

DEPENDENCY: STEAM GENERATOR LEVEL REFERENCE LEG SUBJECTED TO HIGH AMBIENT TEMP

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM REQUIRED TO MITIGATE ACCIDENT

REMARKS: ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR-GENERIC W PROBLEM

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0161 EVENT NO 221

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: TURKEY POINT 4 PLANT TYPE: WEST PWR
EVENT DATE: 9/06/1982 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

PRESSURIZER (PWR)
VALVES

NON-NUCLEAR INSTRUMENTATION
I&C/COMPUTATION MODULES

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRESSURIZER (PWR)
SUBSYSTEM OCCURRENCE

PRIMARY COOLANT (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: PRESSURIZER SPRAY VALVE LEAK CAUSED CURRENT/PNEUMATIC CONVERTER TO FAIL

PROPAGATION: I/P CONVERTER FAILURE OPENED PRESSURIZER SPRAY VALVE

DEPENDENCY: SPATIAL DEPENDENCY BETWEEN LEAKY VALVE AND I/P CONVERTER

UNDESIRABLE RESULT: RCS EXPERIENCED RAPID DECREASE IN PRESSURE

CORRECTIVE ACTION: REPAIR/REPLACEMENT CATEGORY:23

REFERENCES: L2021 EVENT NO 222

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: VERMONT YANKEE PLANT T_PE: GE BWR
EVENT DATE: 1/30/1976 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

RECIRCULATING WATER (BWR)
PIPES/FITTINGS

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

SAFETY SYSTEMS/COMPONENTS AFFECTED

TORUS/ SUPPRESSION POOL (BWR)
STRUCTURAL FUNCTION ITEMS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SEVERE LOCA PLUS UNRESTRICTED FLOW FROM BROKEN PIPE

PROPAGATION: LOCA FORCES CAUSE SURPRESSION POOL SWELL

DEPENDENCY: POOL SWELL LOADS MAY DAMAGE CONTAINMENT STRUCTURE

UNDESIRABLE RESULT: POSSIBLE LOSS OF CONTAINMENT INTEGRITY

REMARKS: FOR 19 MARK I CNMTS, 18 PROCEDURE CHANGES, VERMONT YANKEE DESIGN CHANGE

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:17

REFERENCES: M1008 EVENT NO 223

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: WATTS BAR 1 PLANT TYPE: WEST PWR
EVENT DATE: 6/13/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

MAIN STEAM
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT

PROPAGATION: HEATS UP SG LEVEL REFERENCE CAUSING INACCURATE SG LEVEL SIGNAL (HIGH)

DEPENDENCY: HIGH SIGNAL DELAYS TRIP BY RPS FOR SG LO LO LEVEL

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM RESPONSES REQUIRED TO MITIGATE ACCIDENT

REMARKS: GENERIC W PROBLEM. ALSO PROVIDES HIGH LEVEL INDICATION TO OPERATOR

CORRECTIVE ACTION: OTHER CATEGORY: 8

REFERENCES: L0074 EVENT NO 224

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: WATTS BAR 1 PLANT TYPE: WEST PWR
EVENT DATE: 8/08/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
PIPES/FITTINGS

INTERMEDIATE PRESSURE INJECTION (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

INTERMEDIATE PRESSURE INJECTION (PWR)
TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: UNKNOWN

INITIATING EVENT: FIRE PROTECTION PIPE RUPTURES DURING SEISMIC EVENT DUE TO IMPROPER SUPPORTS

PROPAGATION: WATER FROM PIPE RUPTURE SPILLS ON SAFETY INJECTION PUMP UNDER PIPE

DEPENDENCY: PIPE THAT IS NOT PROPERLY SUPPORTED IS LOCATED DIRECTLY OVER PUMP

UNDESIRABLE RESULT: FAILURE OF SAFETY INJECTION PUMP DUE TO FLOODING DURING SEISMIC EVENT

REMARKS: ALSO AFFECTS WATTS BAR 2

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: C10 EVENT NO 225

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: WATTS BAR 2 PLANT TYPE: WEST PWR
EVENT DATE: 8/08/1983 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

FIRE PROTECTION
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

FIRE PROTECTION
PIPES/FITTINGS

INTERMEDIATE PRESSURE INJECTION (PWR)
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

INTERMEDIATE PRESSURE INJECTION (PWR)
PUMPS

TYPE OF COUPLING: SPATIAL PLANT AREA: REACTOR AUXILIARY BUILDING

RESULT TYPE: 2 DISCOVERY: UNKNOWN

INITIATING EVENT: FIRE PROTECTION PIPE RUPTURES DURING SEISMIC EVENT DUE TO IMPROPER SUPPORTS

PROPAGATION: WATER FROM PIPE RUPTURE SPILLS ON SAFETY INJECTION PUMP UNDER PIPE

DEPENDENCY: PIPE THAT IS NOT PROPERLY SUPPORTED IS LOCATED DIRECTLY OVER PUMP

UNDESIRABLE RESULT: FAILURE OF SAFETY INJECTION PUMP DUE TO FLOODING DURING SEISMIC EVENT

REMARKS: ALSO AFFECTS WATTS BAR 1

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:21

REFERENCES: C10 EVENT NO 226

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: WPPSS 1 PLANT TYPE: B&W PWR
EVENT DATE: 6/11/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HVAC FAN FAILURE CAN PROPEL MISSILE THRU FAN HOUSING

PROPAGATION: SAFETY-RELATED EQUIPMENT CAN BE DAMAGED BY MISSILE

DEPENDENCY: SAFETY-RELATED CABLES UNPROTECTED FROM POTENTIAL MISSILES

UNDESIRABLE RESULT: DEGRADATION OF ONE OR MORE SAFETY SYSTEMS

REMARKS: ALSO AFFECTS DOCKET NO. 513

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:16

REFERENCES: C11 EVENT NO 227

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: WPPSS 4 PLANT TYPE: B&W PWR
EVENT DATE: 6/11/1981 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CONTROL BUILDING HVAC
BLOWERS/COMPRESSORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
ELECTRICAL CONDUCTORS

MULTIPLE SAFETY SYSTEMS
ELECTRICAL CONDUCTORS

TYPE OF COUPLING: SPATIAL PLANT AREA: UNKNOWN

RESULT TYPE: 2 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HVAC FAN FAILURE CAN PROPEL MISSILE THRU FAN HOUSING

PROPAGATION: SAFETY-RELATED EQUIPMENT CAN BE DAMAGED BY MISSILE

DEPENDENCY: SAFETY-RELATED CABLES UNPROTECTED FROM POTENTIAL MISSILES

UNDESIRABLE RESULT: DEGRADATION OF ONE OR MORE SAFETY SYSTEMS

REMARKS: ALSO AFFECTS DOCKET NO. 460

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:16

REFERENCES: C11 EVENT NO 228

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 1 PLANT TYPE: WEST PWR
EVENT DATE: 7/13/1979 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

MAIN STEAM
PIPES/FITTINGS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

REACTOR PROTECTION
I&C/SENSORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

AUXILIARY FEEDWATER (PWR)
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: SPATIAL PLANT AREA: PRIMARY CONTAINMENT (PWR)

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: HIGH ENERGY LINE BREAK IN CONTAINMENT

PROPAGATION: HEATS UP SG LEVEL REFERENCE CAUSING INACCURATE SG LEVEL SIGNALS (HIGH)

DEPENDENCY: HIGH SIGNAL DELAYS TRIP BY RPS FOR SG LO LO LEVEL. AFW INITIATION DELAYED ALSO

UNDESIRABLE RESULT: ACCIDENT DEGRADES SYSTEM RESPONSES REQUIRED TO MITIGATE ACCIDENT

REMARKS: GENERIC W PROBLEM. ALSO PROVIDES HIGH INDICATION TO OPERATOR

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY: 8

REFERENCES: L0078 EVENT NO 229

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 1 PLANT TYPE: WEST PWR
EVENT DATE: 5/23/1980 EXPERIENCE: POTENTIAL
OPERATING STATUS: NOT APPLICABLE

INITIATING SYSTEM AND COMPONENT

PRESSURIZER (PWR)
VALVES

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

CVCS/HIGH PRESSURE SAFETY INJECTION
PUMPS

SAFETY SYSTEMS/COMPONENTS AFFECTED

CVCS/HIGH PRESSURE SAFETY INJECTION
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1,3 DISCOVERY: AE/VENDOR NOTIFICATION

INITIATING EVENT: SECONDARY SYS HELB CAUSES SI ACTUATION. SUBSEQUENTLY PORV CONTROL IS LOST

PROPAGATION: CHG PUMPS INJECT AGAINST HIGHER PRESSURE THAN DESIGN. PUMPS OVERHEAT

DEPENDENCY: ACCIDENT CONDITION NOT CONSIDERED. SIAS CLOSES RECIRC VALVES FOR CHG PUMPS

UNDESIRABLE RESULT: DAMAGE CAN OCCUR TO MULTIPLE CHG PUMPS PRIOR TO SI SHUTOFF CONDITIONS MET

REMARKS: GENERIC W PROBLEM. DEPENDS ON DESIGN HEAD OF SPECIFIC CHG PUMPS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 7

REFERENCES: L0057 EVENT NO 230

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 2 PLANT TYPE: WEST PWR
EVENT DATE: 5/25/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

CONDENSATE AND FEEDWATER
HEAT EXCHANGERS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

NON-NUCLEAR INSTRUMENTATION
I&C/TRANSMITTERS

CONDENSATE AND FEEDWATER
HEAT EXCHANGERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
PUMPS

INTERMEDIATE PRESSURE INJECTION (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: HIGH AUXILIARY FEEDWATER FLOW RATE PRODUCED A WATER HAMMER

PROPAGATION: WATER HAMMER CAUSED 2 STEAM LINE TRANSMITTERS TO SPIKE SIGNALING A HI DELTA-P

DEPENDENCY: HIGH STEAM LINE DELTA-P ON 2 LOOPS CAUSED A FEEDWATER PUMP TRIP

UNDESIRABLE RESULT: FEEDWATER PUMP TRIP PRODUCED A SAFETY INJECTION ACTUATION

CORRECTIVE ACTION: ADMINISTRATIVE/PROCEDURE CHANGE CATEGORY:12

REFERENCES: L5004 EVENT NO 231

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 2 PLANT TYPE: WEST PWR
EVENT DATE: 9/19/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

DC POWER
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DC POWER
CIRCUIT BREAKER/FUSES

EMERGENCY POWER GENERATION
GENERATORS

SAFETY SYSTEMS/COMPONENTS AFFECTED

EMERGENCY POWER GENERATION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: LOSS OF POWER TO DC BUS WHILE AN EDG IS TIED TO GRID

PROPAGATION: NUMEROUS BKRS FAILED TO OPEN, EDG TRIED TO SUPPORT ALL LOADS, OVERHEATED

DEPENDENCY: BREAKERS REQUIRE DC POWER TO OPEN

UNDESIRABLE RESULT: LOSS OF DC POWER DAMAGED EMERGENCY PWR SYSTEM

REMARKS: LOP OCCURRED DUE TO HUMAN ERROR

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY: 1

REFERENCES: L0124 M0004 M0005 EVENT NO 232

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 2 PLANT TYPE: WEST PWR
EVENT DATE: 9/19/1976 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

DC POWER
ELECTRICAL CONDUCTORS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

DC POWER
ELECTRICAL CONDUCTORS

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

PRIMARY COOLANT (PWR)
VALVES

REACTOR PROTECTION
SUBSYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: LOSS OF POWER TO DC BUS

PROPAGATION: TURBINE TRIP OCCURRED BUT GENERATOR REMAINED ON GRID DUE TO GEN BKRS NOT OPENING

DEPENDENCY: GEN BKRS REQUIRE DC PWR. MFW PUMPS ONLY TRIP WHEN GEN TRIPS. MFW PUMPS CONTINUED

UNDESIRABLE RESULT: SEVERE OVERFEEDING OCCURRED, SI ACTUATED AND PRESSURE ROSE TO SV SETTING

REMARKS: SAFETY VALVE RELIEVED TO CONTAINMENT (2500 GAL)

CORRECTIVE ACTION: OTHER CATEGORY: 1

REFERENCES: L0124 M0004 M0005 EVENT NO 233

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 2 PLANT TYPE: WEST PWR
EVENT DATE: 9/03/1980 EXPERIENCE: ACTUAL
OPERATING STATUS: HOT SHUTDOWN

INITIATING SYSTEM AND COMPONENT

AUXILIARY FEEDWATER (PWR)
PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

MAIN STEAM
I&C/TRANSMITTERS

SAFETY SYSTEMS/COMPONENTS AFFECTED

STEAM GENERATOR (PWR)
PIPES/FITTINGS

AUXILIARY FEEDWATER (PWR)
PIPES/FITTINGS

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 4 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: FAILED FEEDWATER PUMP CAUSED AFW PUMPS TO START WHICH LEAD TO A WATER HAMMER

PROPAGATION: WATER HAMMER SPIKED 2 STM LINE PRESS TRANSMITTERS INITIATING A SAFETY INJECTION

DEPENDENCY: THROTTLING AUX FD IN 2C & 2D INCREASED FLOW TO 2A & 2B TRAPPING STM BUBBLE IN 2B

UNDESIRABLE RESULT: SIAS CAUSED INJECTION FROM BIT AND DECREASED LIFE OF INJECTION NOZZLES

REMARKS: POTENTIAL EXISTED FOR STRUCTURAL DAMAGE TO STEAM PIPING & SUPPORT STRUCTURES

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:12

REFERENCES: L5006 EVENT NO 234

APPENDIX C - SYSTEM INTERACTION EVENTS

PLANT: ZION 2 PLANT TYPE: WEST PWR
EVENT DATE: 12/11/1981 EXPERIENCE: ACTUAL
OPERATING STATUS: STEADY STATE OPERATION

INITIATING SYSTEM AND COMPONENT

AUXILIARY FEEDWATER (PWR)
PUMPS

SYSTEMS/COMPONENTS BETWEEN WHICH THE DEPENDENCY OCCURRED

AUXILIARY FEEDWATER (PWR)
PUMPS

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

SAFETY SYSTEMS/COMPONENTS AFFECTED

AUXILIARY FEEDWATER (PWR)
TOTAL SYSTEM OCCURRENCE

TYPE OF COUPLING: FUNCTIONAL

RESULT TYPE: 1 DISCOVERY: OPERATIONAL ABNORMALITY

INITIATING EVENT: RX TRIP DUE TO GENERATOR TRIP (TURBINE-DRIVEN AFW PUMP OUT OF SERVICE)

PROPAGATION: MOTOR-DRIVEN AFW PUMPS FAIL TO AUTO START; ERRONEOUS LOSS OF SUCTION TRIP

DEPENDENCY: SPLIT HEADER ARRANGEMENT CAUSES TEMPORARY PRESS REDUCTION IN SUCTION LINES

UNDESIRABLE RESULT: FAILURE OF MOTOR-DRIVEN AFW PUMPS TO AUTO START

REMARKS: TIME RELAY INSTALLED ON PUMP STARTING CIRCUITRY OF MOTOR-DRIVEN PUMPS

CORRECTIVE ACTION: DESIGN CHANGE/MODIFICATION CATEGORY:22

REFERENCES: A0002 L1045 EVENT NO 235

Appendix D

EVENT REFERENCES

This appendix contains the references for the events in Appendix C. The "REFERENCE NO." given here corresponds to the reference field in Appendix C. The format for each reference type is given in Table D.1.

Table D.1. Formats for event references

Document type	First character of reference No.	Report No.	Reference description
AEOD Reports	A	As assigned by AEOD	Report title
Construction Deficiency	C	As assigned by CER pilot program	Contains NRC Document Control Systems (DCS) number and report subject
Systematic Evaluation Program Reports	E	NUREG number	NUREG title
Inspection and Enforcement Bulletins, Circulars, and Information Notices	I	IEB-IE Bulletin IEC-IE Circular IEN-IE Information Notice	Document title
Licensee Event Reports (including LER predecessors)	L	None	Contains plant docket number, LER number (or letter date, if no LER number), and NSIC accession number in the following format: Docket No./LER No. AN: XXXXXX

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
A0001	AEOD/C403	CASE STUDY REPORT FOR THE EDWIN I. HATCH UNIT NO. 2 PLANT SYSTEMS INTERACTION EVENT ON AUGUST 25, 1982
A0002	AEOD/E213	TRIP OF TWO AUXILIARY FEEDWATER PUMPS FROM LOW SUCTION AT ZION UNIT 2 ON 12/11/81
A0003	AEOD/C101	REPORT ON SAINT LUCIE 1 NATURAL CIRCULATION COOLDOWN ON 06/11/80
A0009	AEOD/C001	BROWNS FERRY 3 PARTIAL FAILURE TO SCRAM EVENT ON 06/28/80
A0010	AEOD/C003	LOSS OF OFFSITE POWER EVENT AT ARKANSAS NUCLEAR ONE UNITS 1 AND 2 ON 04/07/80
A0011	AEOD/C206	INADVERTENT LOSS OF REACTOR COOLANT AT SEQUOYAH 1 AND 2 ON 02/11/81 AND 08/06/81
A0014		REPORT ON CALVERT CLIFFS LOSS OF SERVICE WATER ON 05/20/80
A0015	AEOD/C104	LOSS OF 125V DC BUS AT MILLSTONE 2 ON 01/02/81
A0016	AEOD/E304	INVESTIGATION OF BACKFLOW PROTECTION IN COMMON EQUIPMENT AND FLOOR DRAIN SYSTEMS TO PREVENT FLOODING OF VITAL EQUIPMENT IN SAFETY-RELATED COMPARTMENTS
A0017	AEOD/E311	LOSS OF SALT WATER FLOW TO SERVICE WATER HEAT EXCHANGER AT CALVERT CLIFFS 2 ON 06/20/82
A0020	AEOD/E314	LOSS OF ALL 3 CHARGING PUMPS DUE TO EMPTY COMMON REFERENCE LEG IN THE LIQUID LEVEL TRANSDUCERS FOR THE VOLUME CONTROL TANK
A0021	AEOD/E317	LOSS OF HIGH PRESSURE INJECTION
A0022	AEOD/E401	TEMPORARY LOSS OF ALL POWER DUE TO RELAY FAILURES IN DG LOAD SHEDDING CIRCUITRY

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
A0023	AEOD/E412	ADVERSE SYSTEM INTERACTION WITH DOMESTIC WATER SYSTEMS AT CALVERT CLIFFS 2 ON 10/19/83
A0024	AEOD/E204	EFFECTS OF FIRE PORTECTION SYSTEM ACTUATION ON SAFETY-RELATED EQUIPMENT"
A0025	AEOD/C404	STEAM BINDING OF AUXILIARY FEEDWATER PUMPS
C07	CDR:49	DCS:8206150150 'INSUFFICIENT FAN HOUSING THICKNESS AT CLINTON 1'
C10	CDR:104	DCS:8308180308 'HIGH PRESSURE FIRE PROTECTION PIPE NOT SEISMICALLY SUPPORTED OVER SAFETY INJECTION SYSTEM PUMP AT WATTS BAR 1 AND 2'
C11	CDR:58	DCS:8307280345 'MISSILE PENETRATION FOR BUFFALO FORGE FANS AT WPPSS 1 AND 2'
C12	CDR:144	DCS:8307289272 'LACK OF DC BACKED POWER FOR FOGG INTERLOCK RELAYS AT MIDLAND 1 AND 2'
C14	CDR:158	DCS:8304010447 'ROUTING OF MAKEUP TANK OUTLET LINES DEFICIENT AT BELLEFONTE 1 AND 2'
C21	CLR:218	DCS:8203230147 'NONSEISMIC EQUIPMENT ERECTED OVER SEISMIC EQUIPMENT AT FERMI 2'
E0001	NUREG-0820	INTEGRATED PLANT SAFETY ASSESSMENT SYSTEMATIC EVALUATION PROGRAM PALISADES PLANT
E0003	NUREG-0824	INTEGRATED PLANT SAFETY ASSESSMENT SYSTEMATIC EVALUATION PROGRAM MILLSTONE 1 PLANT
E0004	NUREG-0828	INTEGRATED PLANT SAFETY ASSESSMENT SYSTEMATIC EVALUATION PROGRAM BIG ROCK POINT PLANT
E0005	NUREG-0821	INTEGRATED PLANT SAFETY ASSESSMENT SYSTEMATIC EVALUATION PROGRAM GINNA

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
E0007	NUREG-0822	INTEGRATED PLANT SAFETY ASSESSMENT SYSTEMATIC EVALUATION PROGRAM OYSTER CREEK PLANT
I-012	IEB 80-24	PREVENTION OF DAMAGE DUE TO LEAKS INSIDE CONTAINMENT (10/17/80 INDIAN POINT 2 EVENT)
I-017	IEB 80-18	MAINTENANCE OF MIN. FLOW THRU CENTRIFUGAL CHARGING PUMPS AFTER SECONDARY SIDE HIGH ENERGY LINE RUPTURE
I-018	IEB 80-17	FAILURE OF CONTROL RODS TO INSERT DURING A SCRAM AT A BWR
I-023	IEB 80-12	DECAY HEAT REMOVAL SYSTEM OPERABILITY
I-024	IEB 80-11	MASONRY WALL DESIGN
I-031	IEB 80-04	ANALYSIS OF PWR MAIN STEAM LINE BREAK WITH CONTINUED FEEDWATER ADDITION
I-036	IEB 79-27	LOSS OF NON-CLASS-1-E I&C POWER SYSTEM BUS DURING OPERATION
I-048	IEB 79-05	NUCLEAR INCIDENT AT THREE MILE ISLAND
I-051	IEB 79-02	PIPE SUPPORT BASE PLATE DESIGNS USING CONCRETE EXPANSION ANCHOR BOLTS
I-108	IEC 79-02	FAILURE OF 120 VOLT VITAL AC POWER SUPPLIES
I-120	IEC 78-06	POTENTIAL COMMON MODE FLOODING OF ECCS EQUIPMENT ROOMS AT BWR'S
I-127	IEN 83-77	AIR/GAS ENTRAINMENT EVENTS RESULTING IN SYSTEM FAILURES
I-148	IEN 83-44	POTENTIAL DAMAGE TO REDUNDANT SAFETY EQUIPMENT FROM BACKFLOW THRU EQUIPMENT AND FLOOR DRAIN SYSTEM
I-151	IEN 83-41	ACTUATION OF FIRE SUPPRESSION SYSTEM CAUSING INOPERABILITY OF SAFETY-RELATED EQUIPMENT

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
I-197	IEN 82-19	LOSS OF HIGH HEAD SAFETY INJECTION EMERGENCY BORATION & REACTOR COOLANT MAKEUP CAPABILITY
I-216	IEN 81-27	FLAMMABLE GAS MIXTURES IN WASTE GAS DECAY TANKS IN PWR PLANTS
I-225	IEN 81-12	GUIDANCE ON ORDER ISSUED JANUARY 9, 1981 REGARDING AUTOMATIC CONTROL ROD INSERTION ON LOW CONTROL AIR PRESSURE
I-236	IEN 80-43	FAILURES OF THE CONTINUOUS WATER LEVEL MONITOR FOR THE SCRAM DISCHARGE VOLUME AT DRESDEN UNIT NO. 2
I-242	IEN 80-37	CONTAINMENT COOLER LEAKS & REACTOR CAVITY FLOODING AT INDIAN POINT 2
I-246	IEN 80-30	POTENTIAL FOR UNACCEPTABLE INTERACTION BETWEEN CRD SCRAM FUNCTION & NON-ESSENTIAL CONTROL AIR AT CERTAIN GE BWR'S
I-249	IEN 80-23	LOSS OF SUCTION TO EMERGENCY FEEDWATER PUMPS
I-251	IEN 80-20	LOSS OF DECAY HEAT REMOVAL CAPABILITY AT DAVIS-BESSEE 1 WHILE REFUELING
I-257	IEN 80-10	PARTIAL LOSS OF NON-NUCLEAR INSTRUMENT SYSTEM POWER SUPPLY DURING OPERATION
I-270	IEN 79-29	LOSS OF NON SAFETY-RELATED REACTOR COOLANT SYSTEM INSTRUMENTATION DURING OPERATION
I-271	IEN 79-28	OVERLOADING OF STRUCTURAL ELEMENTS DUE TO PIPE SUPPORT LOADS
I-275	IEN 79-24	OVERPRESSURIZATION OF CONTAINMENT OF PWR AFTER MAIN STEAM LINE BREAK
I-277	IEN 79-22	QUALIFICATION OF CONTROL SYSTEMS
I-280	IEN 79-16	NUCLEAR INCIDENT AT THREE MILE ISLAND

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
I-283	IEN 79-13	INDICATION OF LOW WATER LEVEL AT OYSTER CREEK
I-291	IEN 79-04	DEGRADATION OF ENGINEERED SAFETY FEATURES
I-294	IEN 84-06	STEAM BINDING OF AUXILIARY FEEDWATER PUMPS
I-296	IEB 84-01	CRACKS IN BWR MARK I CONTAINMENT VENT HEADERS
I-297	IEN 84-17	PROBLEMS WITH LIQUID NITROGEN COOLING COMPONENTS BELOW NIL DUCTILITY TEMPERATURE
L0001		219/83-003 AN:181646
L0002		369/82-015 AN:172979
L0003		281/81-026 AN:166303
L0004		263/81-002 AN:165456
L0007		293/80-001 AN:154694
L0008		265/79-011 AN:150365
L0009		287/78-019 AN:146523
L0010		275/LETTER TO NRC, 11/02/78 AN:145378 (ALSO APPLIES TO DOCKET 323)
L0011		338/78-107 AN:145365
L0012		247/77-2-24 AN:143277
L0013		237/78-004 AN:142701
L0014		298/78-033 AN:142294
L0015		220/76-028 AN:119514
L0016		282/75-001 AN:107409
L0017		280/74-001 AN:95911 (ALSO APPLIES TO DOCKET NO. 281)

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0018		312/74-003 AN:95410
L0019		313/LETTER TO AEC, 01/18/83 AN:77971
L0020		321/80-053 AN:158292
L0021		334/80-023 AN:156200
L0023		255/82-044 AN:180005
L0024		289/82-001 AN:173370
L0025		289/82-001-R1 AN:177357
L0026		255/82-024 AN:175994
L0027		255/82-024-R1 AN:176762
L0028		327/82-070 AN:174154
L0029		285/82-012 AN:173957
L0030		220/82-002 AN:172961
L0031		259/80-011R3 AN:169869
L0032		259/80-011 AN:155192
L0033		261/81-002R1 AN:169531
L0034		261/81-002 AN:163487
L0035		259/80-016 AN:155201
L0037		348/78-086 AN:142743
L0038		255/77-045 AN:130027
L0039		387/LETTER TO NRC, 09/05/78 AN:141461
L0040		277/80-008 AN:158286
L0041		366/80-002 AN:154946
L0042		289/80-001 AN:154696
L0043		213/80-003 AN:154452

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0044		312/79-013 AN:153446
L0045		321/79-081 AN:151755
L0046		293/79-031 AN:151460
L0047		344/79-008 AN:150027
L0048		331/79-002 AN:149241
L0049		280/79-008 AN:148803
L0050		282/79-009 AN:148759
L0051		263/79-003 AN:148741
L0052		327/80-086 AN:159778
L0053		334/80-060 AN:159355
L0054		280/80-036 AN:159198
L0055		348/80-037 AN:159125
L0056		338/80-042 AN:158731
L0057		295/80-023 AN:158254
L0058		219/82-010 AN:173458
L0059		249/81-039 AN:171843
L0060		237/81-079 AN:172255
L0061		344/81-016 AN:168563
L0062		281/81-036 AN:167214
L0063		244/81-019 AN:171940
L0064		280/81-009 AN:166673
L0065		320/79-012 AN:153164
L0070		280/80-059 AN:160908
L0071		334/80-073 AN:160469

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0072		327/LETTER TO NRC, 07/20/79 AN:154079
L0073		369/LETTER TO NRC, 08/24/79 AN:154076
L0074		390/LETTER TO NRC, 09/21/79 AN:154075
L0075		339/LETTER TO NRC, 07/02/79 AN:153796
L0076		272/79-050 AN:152739
L0077		348/79-023 AN:152168
L0078		295/79-050 AN:150895
L0079		280/79-022 AN:150767
L0080		344/79-011 AN:150700
L0081		305/79-018 AN:150476
L0082		261/79-019 AN:150475
L0083		334/79-015 AN:150424
L0084		286/79-006 AN:150419
L0085		247/79-018 AN:150408
L0086		280/79-026-R1 AN:153317
L0087		280/79-026 AN:151743
L0088		338/79-120 AN:152332
L0089		338/[illegible]ER TO NRC, 11/05/79 AN:155848
L0090		272/7[illegible]8 AN:151735
L0092		325/79-[illegible]:151936
L0093		213/78-[illegible]6-R1 AN:142813
L0094		368/LETTER TO NRC, 04/18/78 AN:140152
L0095		346/78-057 AN:139607
L0096		213/78-006 AN:138369

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0097		321/78-019 AN:138358 (ALSO APPLIES TO DOCKET 366)
L0098		335/LETTER TO NRC, 04/17/78 AN:137352
L0099		389/LETTER TO NRC, 04/17/78 AN:137353
L0100		368/78 LETTER TO NRC, 04/18/78 AN:137048
L0101		302/77-052 SUPPLEMENT AN:131208
L0102		302/77-052 AN:125539
L0103		313/77-019 AN:129789
L0104		346/LETTER TO NRC, 01/21/77 AN:122427
L0105		346/LETTER TO NRC, 03/23/77 AN:123027
L0106		219/76-029 AN:121031
L0107		438/LETTER TO NRC, 11/01/76 AN:119823
L0108		296/LETTER TO NRC, 03/04/76 AN:112145
L0109		324/75-088 AN:106597
L0110		387/LETTER TO NRC, 04/04/75 AN:102145
L0112		327/80-195 AN:163375
L0113		289/81-009 AN:169269
L0114		346/80-053 AN:159115
L0115		346/80-053R1 AN:163512
L0116		338/80-096 AN:161704
L0117		361/82-002 AN:173265
L0119		338/81-042 AN:166508
L0120		348/81-037 AN:166497
L0121		334/81-045 AN:166347
L0122		259/LETTER TO NRC, 06/09/75 AN:111468

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0123		259/80-016R1 AN:168942
L0124		304/75-038 AN:119480
L0125		219/79-014 AN:149450
L0126		213/78-018 AN:140161
L0128		416/82-014 AN:175135
L0129		339/81-055 AN:169226
L0130		312/78-001 AN:138830
L0131		324/77-024 AN:124913
L0132		368/78-005 AN:141490
L0133		254/82-012 AN:175258 (ALSO APPLIES TO DOCKET 265)
L0135		334/82-002 AN:153725
L0139		317/LETTER TO NRC, 05/23/75 AN:103125
L0144		329/LETTER TO NRC, 08/07/79 AN:153800
L0145		219/83-011 AN:182394
L0146		219/83-010 AN:182443
L0147		219/83-014 AN:183022
L0148		267/83-018 AN:188376
L0150		272/81-054 AN:166595
L0151		346/80-029 AN:158860
L0152		249/80-31 AN:158229
L0153		368/78-004 AN:141487
L0155		206/80-033 AN:160315
L0156		362/82-006R1 AN:184741

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0157		266/79-004 AN:148775 (ALSO APPLIES TO DOCKET NO. 301)
L0158		361/LETTER TO NRC, 01/16/78 AN:134494 (ALSO APPLIES TO DOCKET NO. 362)
L0159		338/79-083 AN:150373
L0160		250/79-021 AN:150371
L0161		251/79-010 AN:150367
L0162		280/80-070 AN:161615
L0163		362/82-006 AN:181580
L0164		327/83-162 AN:188148
L0165		261/77-009 AN:126011
L0166		280/81-020R1 AN:188527
L0167		293/81-054R3 AN:171899
L0168		280/81-020 AN:168508
L0169		266/81-009 AN:167694
L0170		336/83-030 AN:188149
L0171		364/80-003 AN:162466
L0172		348/80-076 AN:162463
L0173		320/LETTER TO NRC, 8/28/75 AN:106365
L0174		206/81-001 AN:163843
L0175		321/80-016 AN:154884
L0176		219/80-044 AN:160902
L0177		206/LETTER TO AEC, 03/21/68 AN:47801
L0178		335/LETTER TO NRC, 11/25/75 AN:108823
L0179		254/76-036 AN:120762

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L0180		259/79-017 AN:151439
L1001		287/LETTER TO NRC, 04/23/81 AN:171562
L1004		302/80-010 AN:160846
L1005		327/80-077 AN:159793
L1006		368/80-018 AN:158279
L1008		334/79-015R1 AN:150885
L1009		272/78-072 AN:141236
L1010		324/76-077 AN:113275
L1014		346/81-045 AN:168592
L1015		220/81-001 AN:164440
L1017		321/80-082 AN:159189
L1018		312/80-014 AN:155505
L1020		325/79-097 AN:153363
L1022		336/81-006 AN:164147
L1023		281/83-055 AN:188195
L1024		344/81-008 AN:166413
L1026		317/81-079 AN:171387
L1027		318/81-047 AN:171109
L1028		245/81-002 AN:165884
L1029		369/82-015 REV 1 AN:183454
L1031		316/82-025 AN:184831
L1032		416/83-115 AN:185787
L1033		293/81-054 AN:169588
L1034		321/81-120 AN:171090

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L1035		317/80-041 AN:159453
L1037		272/81-110 AN:171528
L1038		348/80-069 AN:161784
L1039		327/80-180 AN:161749
L1040		305/75-020 AN:108078
L1041		318/78-035 AN:141523
L1042		280/77-021 AN:130889
L1043		254/LETTER TO AEC, 06/17/72 AN:075977
L1044		364/80-001 AN:161769
L1045		304/81-033 AN:171733
L2001		255/LETTER TO AEC, 03/02/72 AN:069527
L2002		255/LETTER TO AEC, 09/16/71 AN:065969
L2004		155/79-22-R1 AN:153973
L2005		155/79-22 AN:151825
L2007		155/77-44 AN:130833
L2009		245/79-026 AN:151912
L2011		244/LETTER TO AEC, 10/23/73 AN:087031
L2012		244/LETTER TO AEC, 10/31/71 AN:085370
L2013		244/LETTER TO AEC, 10/31/73 AN:085369
L2014		244/LETTER TO AEC, 04/29/71 AN:066927
L2017		219/LETTER TO AEC, 09/18/73 AN:083833
L2020		335/82-050 AN:179450
L2021		251/82-013 AN:177393
L2023		206/81-018 AN:168122

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REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
L2024		301/LETTER TO AEC, 12/19/74 AN:099037
L2025		277/79-016 AN:149260
L2026		334/80-067 AN:160142
L2027		245/LETTER TO AEC, 05/12/71 AN:063125
L2030		250/LETTER TO AEC, 11/17/72 AN:076406
L2032		272/LETTER TO AEC, 02/06/75 AN:093620
L2034		324/75-148 AN:109263
L2036		368/83-035 AN:185904
L2037		281/83-040 AN:186451
L2038		318/83-060 AN:187090
L2053		318/82-034 AN:175551
L2054		317/80-027 AN:158650
L5003		261/81-005 AN:164149
L5004		304/76-017 AN:117080
L5005		280/80-026 AN:156952
L5006		304/80-026 AN:161826
M0004	NS18(4):549-551	HUMAN ERROR CAUSES DG FIRE AT ZION 2, 09/18/76
M0005	NUREG/CR-1901	REVIEW AND EVALUATION OF SYSTEM INTERACTIONS METHODS
M0006	NS21(5):655-656	LOSS OF DECAY-HEAT-REMOVAL CAPABILITY AT DAVIS-BESSE 1, 04/19/80
M1001	NUREG-0090 V2,#1	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JANUARY-MARCH, 1979
M1003	NUREG-0090 V2,#2	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, APRIL-JUNE, 1979

APPENDIX D - EVENT REFERENCES

REFERENCE NO.	REPORT NO.	REFERENCE DESCRIPTION
M1004	NUREG-0090 V5,#3	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JULY-SEPTEMBER, 1982
M1005	NS19(6):765-767	COMMON-CAUSE INCIDENT INVOLVING NON-NUCLEAR INSTRUMENTATION AT RANCHO SECO, 03/20/77
M1007	NUREG-75/090	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JANUARY-JUNE, 1975
M1008	NUREG-0090-3	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JANUARY-MARCH, 1976
M1009	NUREG-0090 V6,#1	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JANUARY-MARCH, 1983
M1010	NUREG-0090-5	REPORT TO CONGRESS ON ABNORMAL OCCURRENCES, JULY-SEPTEMBER, 1976
M2001	NUREG/CR-2497	PRECURSORS TO POTENTIAL SEVERE CORE DAMAGE ACCIDENTS: 1969-79. A STATUS REPORT

NRC FORM 335 (2 84) NRCM 1102, 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

SEE INSTRUCTIONS ON THE REVERSE

1 REPORT NUMBER (Assigned by TIDC, add Vol. No., if any)
NUREG/CR-3922
ORNL/NOAC-224
Vol. 2

2 TITLE AND SUBTITLE
Survey and Evaluation of System Interaction Events and Sources
Appendices C and D

3 LEAVE BLANK

4 DATE REPORT COMPLETED
MONTH: December
YEAR: 1984

5 AUTHOR(S)
G.A. Murphy/NOAC
M.L. Casada, M.P. Johnson, M.D. Muhlheim, J.J. Rooney, J.H. Turner/JFBA

6 DATE REPORT ISSUED
MONTH: January
YEAR: 1985

7 PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Nuclear Oper. Analysis Center
Oak Ridge National Laboratory
P. O. Box Y
Oak Ridge, TN 37831

Subcontractor:
JBF Associates, Inc.
1000 Technology Park Ctr
Knoxville, TN 37932

8 PROJECT/TASK/WORK UNIT NUMBER

9 FIN OR GRANT NUMBER
B0789

10 SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)
Division of Safety Technology
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

11a TYPE OF REPORT
Technical

b PERIOD COVERED (Inclusive dates)

12 SUPPLEMENTARY NOTES

13 ABSTRACT (200 words or less)

This report describes the first phase of an NRC-sponsored project that identified and evaluated system interaction (SI) events that have occurred at commercial nuclear power plants in the United States. The project included: an assessment of nuclear power plant operating experience data sources; the development of search methods and event selection criteria for identifying SI events; review of possible SI events; and final evaluation and categorization of events. The report outlines each of these steps and presents the results of the project. The results include 235 events identified as adverse system interactions and 23 categories into which those events were assigned. The categories represent groups of similar events and include areas such as: adverse interactions between normal or offsite power and emergency power systems; degradation of safety systems by vapor or gas intrusion; degradation of safety-related equipment by fire protection systems; and flooding of safety-related equipment through plant drain systems. After evaluating each category (and the events contained in them), the project made two major recommendations: the safety significance of each category with emphasis on the potential for continued problems in these areas should be examined; and current system interaction analyses methods should be studied to determine their effectiveness for identifying system interaction events. (Phase II of this project, "Evaluation of System Interaction Methods," will assess the effectiveness of current methods using the events identified in this report).

14 DOCUMENT ANALYSIS - a KEYWORDS/DESCRIPTORS
Systems Analysis

IDENTIFIERS/OPEN ENDED TERMS
Adverse Systems Interaction
Unresolved Safety Issue A-17

15 AVAILABILITY STATEMENT
Unlimited

16 SECURITY CLASSIFICATION
(This page) Unclassified
(This report) Unclassified

17 NUMBER OF PAGES

18 PRICE

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555