Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
		Reactivity Control		
C71	1a	RPS SCRAM Circuits: Refer to the BWROG "White Paper" on IN 2007-07. The "White Paper" explains that a single hot, should it occur in the right location in the right circuit, could prevent 1/4 of the rods from inserting. Similarly, two (2) hot shorts in the right location in the right circuit could prevent a full scram. Note: Single hot short can not also fail backup scram system	May be addressed by actions already included in the plant EOPs. This is an issue inside and outside of the Control Room. Reactivity Control is addressed by having as link between the Fire Safe Shutdown Procedures and the Procedure to either vent the scram air header or depower RPS (or reactor trip bus) to accomplish the SCRAM should manual scram from the Control Room not be effective.	All
C71	1b	Multiple pilot valve fail to de-energize SV 1-17 & SV 1-18	Scram pilot solenoids failure to de-energize so scram valve pilot air header stays pressurized (might be redundant with 1a, check white paper)	All
		Reactor Coolant Makeup Control		

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
B21	2a	(Main Steam) Head vent valves (2) Spuriously Open.	Valve Numbers MS-V-1, MS-V-2 or similar. Scenario may be screened, depending on line size and criteria for required versus available RCS Injection rate. Refer to PRA criteria about how big of a steam line break is of concern, and use that to determine if the Scenario is of interest.	All
B21	2b	(Main Steam) MSIV's hot short results in MSIVs failing to close or re-opening.	Valve numbers MS-V-22A-D, MS-V-28A-D or similar. The postulated scenario involves failure of redundant, normally open, Main Steam Isolation Valves (MSIV) in one of the four Main Steam Lines (MSL) to close on demand. Each MSIV has an AC and a DC solenoid valve (Note: Some BWRs use all DC solenoids). Both valves de-energize to close the MSIV. May need to look at MSIV reopening, if closed on a fire.	BWR2/3/4/5/6
B21	2c	(Main Steam), Main Steam Line Drain Shutoffs spuriously open.	Valve numbers MS-V-16, MS-V-19 (F016 and F019) or similar. May be an additional downstream manual valve MS-V-21 (F021) with an orificed bypass. Valve Motor may be removed or have power disconnected. May be able to analyze flow rate as an acceptable inventory loss.	BWR2/4/5/6
B31	2d	Failure to trip the Recirc pump on loss of cooling. Recirc pump seal failure LOCA	Reactor seal leakage. Spurious closure of IV-70-92, loss of RBCLC pumps and loss of service water, results in loss of RBCLC and consequential seal LOCA.	Applicable to one BWR2
C11	2e	RPV coolant drain through the SDV vent and drain	This scenario is a MSO initiated drain of reactor coolant from the SCRAM Discharge Volume to the Reactor Building sump. The scenario is triggered by MSO opening of the solenoid valves which supply control air to the air operated isolation valves.	All

Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
E12	2f	Inventory control Hi/Lo pressure interface valve spurious operation - (Residual Heat Removal) SDC Suction Isolation Valves	RHR-V-8, RHR-V-9 (F008, F009) or similar. Removal of DC Control Power Fuses may resolve (may not resolve 3-phase proper rotation hot shorts). This is the traditional Hi/Lo pressure interface.	BWR3/4/5/6
E12	2g	Inventory control valve spurious operation - (Residual Heat Removal) Discharge to Recirc Loop Isolation Valves	Possible path includes the Warm-up line. Valves RHR-V-53A & B, RHR-V-50A & B (F015A&B, F017A&B) or similar. Testable check valve will go closed on DP. Need to consider whether RHR crosstie is open. T-H analysis of piping pressure/temperature may resolve. Power may be removed on Bypass.	BWR4/5/6
E12	2h	Inventory control valve spurious operation - (Residual Heat Removal) RHR Head Spray Valves	MOV -F022, MOV-F023 or similar. May be cut and Capped for some plants, or have a check valve to prevent back flow.	BWR3/4
E12	2i	Spurious Operations that creates RHR Pump Flow Diversion from RHR/LPCI.	RHR flow can be diverted to the containment through the Containment Spray isolation valves (E11-F016A, B and E11-F021A, B or similar), Consider the possibility of failing either the primary containment boundary (drywell/torus junction) or internal structural elements of the pressure suppression design as a result of spraying the drywell under conditions where drywell sprays are not allowed by EOPs. Spraying into a hot dry environment in the drywell could result in a pressure reduction beyond what can be addressed by the containment vacuum breakers.	BWR4
E12	2j	Spurious Operations that creates RHR Pump Flow Diversion from RHR/LPCI, including diversion to the Torus or Suppression Pool.	RHR flow can be diverted to the containment through the RHR Torus or Suppression Pool return line isolation valves (E11-F024A, B and E11-F028A, B).	

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E12	2k	Spurious Operations that creates RHR Pump Flow Diversion from RHR/LPCI, including diversion to the Torus or Suppression Pool Spray Header.	RHR flow can be diverted to the containment through the Torus or Suppression Pool Spray Header isolation valve (E11-F027A, B and F028 or similar) or RHR Warm-up Line (E11-F026B). F026 typically has power removed, and 53 is in line, typically normally closed.	
E12	2l	Spurious RHR min flow failure to open with failure to establish a discharge path.	RHR min flow failure to open (with spurious pump start at high pressure or RPV injection line valves spuriously fail close). may lead to pump overheating/failure likely III.G.3 scenario.	All
E12	2m	Spurious operation (open) of valve RHR A DISCH TO RADWASTE INBOARD ISOLATION and RHR radwaste isolation valve	Valves F049, F040 (Radwaste letdown) or similar. F010 (Crosstie) spurious operation or if F010 is open may divert flow from opposite train. F010 may have power removed.	BWR4/6
E12	2n	Spurious opening of two series RHR unit cross tie valves	BFN Only	BWR4
E12	2o	Spurious opening of two series RHR loop cross tie valves	F010 (Crosstie)valve or similar. Breaker power may be removed.	BWR4
E12	2p	Spurious opening of F073 and F074 RHR service water to RHR injection flood up	ESW emergency containment (core) flooder valves.	
E21	2q	Spurious Operation of normally closed Core Spray Discharge Check bypass valve (equalizing valve) or testable check valves, and core spray discharge valve F005.	Bypass Valve is normally down powered, DC MOV. 2 DC hot shorts can open the valve, resulting in an alignment of High Pressure RCS pressure to the Low Pressure Core Spray Piping. Testable Check valve should go closed upon DP across valve.	BWR5

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E21	2r	Spurious Operations that Create Core Spray Pump Flow Diversion for injection to the RPV	CS flow can be diverted to the Torus or Suppression Pool through the CS test line MOVs (E21-F015A, B or similar). Test Line is typically a 10" line with Orifice. This is a single spurious operation, so should already be addressed in SSA (unless the line includes 2 series valves). Should review for MSOs not addressed in SSA, such as combinations of CS test Line MOV opening and CS Discharge Valve Opening (Scenario 2O).	BWR2/4
E21	2s	Address Core Spray flow diversion to the equipment drains IV-40-30, 31, 32, 33 and to the containment spray raw water system.	The reference to IV-40-30, -31, -32 and -33(high point vents, low point drains to Reactor Building Equipment Drain Tank{RBEDT]) MOV's should be pulled out as a separate specific item.	Applicable to one BWR2
E21	2t	Path from Core Spray injection discharge valve to reactor building equipment drain tank vent isolation valves, scenario is plant specific	Spurious actuation of vents (IV-40-30, 32) and CS Injection (10 or 11) or loop 2 (IV-40-31, 33 and 09 or 08) requires 3-phase proper polarity hot shorts on IV-40-30 and 31 because power is removed.	Applicable to one BWR2
E22	2u	Spurious HPCS/HPCI operation (Note: for plants where HPCI is a subset of Feedwater, scenario may involve continued operation of HPCI)	Vessel Overfill into steam lines. Could Impair RCIC operation (if credited) due to vessel overfill and water in the steam line. Can occur as a result of: a) Spurious valve Operation: Turbine Stop Valve and HPCI Discharge Shutoff Valve Spurious Operation (HPCI-F067, F006 or similar), b) Damage to Cabling for transmitters (two required to start HPCI), c) Damage to High Level Trip Circuitry, or d) HPCI pump controls hot short (for either motor or TD HPCI).	

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E41	2v	HPCI inject to Core Spray (F037 & F048 valves opening) over pressurizing CS.	Potential Hi/Lo pressure interface scenario.	BWR4
E41	2w	HPCI drain to the sump failing open on loss of air pressure.	AOV F004/F005 (F028, F029, and bypass is F055.) or similar. Open drain flow path may not be sufficient to fail HPCI function.	BWR4
E41/E22	2x	Spurious operation (open) of both of HPCI/HPCS CST Test Return/Bypass valves.	MSOs to the HPCI/HPCS discharge test line valves can divert flow to the Condensate Storage Tank. If suction is from the Suppression Pool, the Suppression Pool inventory is diverted to the CST. Valves E41-F011, E41-F008 [E22*MOVF010 and E22*MOVF011] (MO2316, CV2315), E41-F042, E41-F041(MO2321, MO2322), or similar."	BWR4/6
E51	2y	RCIC Test flow to CST Stop and throttle valves flow diversion	Valve numbers F022 and F011 or similar. The throttle valve and isolation valve in the return line to the Condensate Storage Tank are normally closed and at least one of the valves must remain closed to prevent flow diversion from the RCIC pump to support the reactor inventory control function, especially during suppression pool cooling.	BWR6
E51	2z	RCIC Drain Pot Drains failing open on loss of air pressure	AOV F025/F026 (RCIC) on the drain to the sump failing open on loss of air pressure. Does not appear to be a concern. 1inch steam line leak, assuming the drain POT fails open. Trap would limit the flow. Diversion would also require F0054 bypass to open. Diversion may be too small to be a concern.	BWR4

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BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E51	2aa	RCIC Pump Diversion through Mini Flow Line to the Suppression Pool or test return Line.	The RCIC pump discharge can be diverted through the test return line to the CST through a MOV isolation valve and the common HPCI AOV throttle valve. RCIC min flow line MOV E51-F019 is another path and a path from the pump suction to the suppression pool through MOVs E51-F029 and E51-F031.	BWR4
E51	2ab	Spurious operation (open) of both of RCIC TEST RETURN TO CONDENSATE STORAGE TANK valves with suction on the Suppression Pool may route the RCIC inventory to the CST.	Valves 1E51*MOVF022 and 1E51*MOVF059 and a Spurious startup signal or valves RCIC PUMP DISCHARGE TEST LINE ISOLATION E51-F022, RCIC PUMP TORUS SUCTION INBOARD ISOLATION E51-F03, RCIC PUMP TORUS SUCTION OUTBOARD ISOLATION E51-F029, and HPCI/RCIC TEST RETURN REDUNDANT SHUTOFF VALVE E41-F011 or similar.	BWR4/6
E51	2ac	RCIC Suction Valves	(F010, F031 or similar) CST and Suppression Pool Suction Valves - There is a potential to isolate the injection paths from the CST and Suppression pool to the RCIC pump.	BWR4
G31	2ad	RPV bottom drain isolations to reactor building equipment drain tank spuriously opening	Spurious operation of valves BV-37-08 and BV-37-09 (Dwg. C-18009). Thermal overload removed to prevent spurious operation. as Hi/Lo pressure interface. This is a 3-phase hot short of proper polarity (May be only a two phase hot short because there are only two phases with thermal overload heaters. The third phase remains connected to the circuit).	Applicable to one BWR2
G33	2ae	Spurious operation (open) of BOTH REACTOR WATER CLEAN-UP ISOLATION Valves may route RPV inventory into the RWCU system.	1G33*MOVF001, 1G33*MOVF004 or similar. Closed loop system, but may be a concern due to high temperature in the piping for plants with low pressure RWCU piping (e.g., older BWRs).	All

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BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
G33	2af	Spurious operation of RX Water Clean Up valves(RWCU drain to condenser and/or radwaste collection tanks.)	Valves RWCU-FCV-33, and RWCU-V-34 or RWCU-V-35, or similar. Would require additional MOVs open to RWC; MOV 1 or 4 (or similar).	BWR2/3/4/5
G38	2ag	Suppression Pool Drain down: One example: Suppression Pool Water Management system suction flow is diverted or that the return flow is diverted for some there may also have the safeguards keep fill pumps with lines to the ECCS injection lines.	May be unique flow paths for each BWR, involving any drain down path from the suppression pool. One example: If the one of two Torus Water Management System pumps are either running or spuriously starts, and one of two normally closed suction isolation MOVs open, and the normally closed condenser isolation valve opens, then Suppression Pool water is pumped to the condenser. Torus Cleanup may be locked closed for many plants. Drain to the Condenser typically a 3" line. Another example – Containment Spray at a plant that has a connection to RADWASTE that would divert torus water if failed open.	BWR4-6
N21	2ah	Spurious Operations that Create Standby Feedwater System(SBFW) (AC Driven FW Pump) Flow Diversion from RPV	Applicable to BWRs with SBFW system or other motor driven FW pump.	BWR4
N21	2ai	Spurious operation of a feedwater or booster pump and a level control valve may cause uncontrolled feedwater injection into the RPV. This could also include continued operation of the Feedwater Pump (driven off the main turbine shaft). Fire damage to the feedwater pump clutch and/or associated controls could prevent tripping the pump, resulting in a serious overfeed situation.	Valves 1FWS-P1A(B, C), 1FWS-MOV26A(B, C), 1C33-LVF001A(B, C, D) 1C33-LVF002 or similar. Booster Pump operation would require decreased vessel pressure. Feedwater pumps may not be a concern if steam driven, and not driven of the main turbine shaft..	BWR2/3/6

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BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
P11	2aj	Loss of CST Inventory to Hot Well	Several paths exist that can cause a gravity drain of the CST to the Hotwell. The condition can happen due to spurious operation of MOVs alone, and if the normal hotwell pump or emergency hotwell pumps spuriously start, the condition is worsened. Standpipes for drain paths may limit the minimum level in the CST. Should review Fire SSA assumptions for minimum level and effect of drain down.	BWR2/4
P11	2ak	CST supply to Condensate Return Tank (CRT) supply shutoff MOV spurious operation	This MSO involves spurious operation of MOVs in the piping connecting the CST and CRT. If either of two valves spuriously open, a gravity transfer can occur which can lower the water level significantly in the CST. See discussion above on Standpipes. Scenario not applicable to plants without a CRT or equivalent.	BWR4
P11	2al	CST discharge to Radwaste system shutoff MOV spurious operation	Spurious operation of two MOVs in the Condensate system can set up a gravity drain path from the CST to the radwaste system. The water loss may need to be evaluated to support the time line to reach such a step in a manual action feasibility study. See discussion above on Standpipes.	BWR4
Reactor Coolant System Pressure Control				
B21	3a	Potential opening of all SRVs	Multiple spurious can open a portion or all of the SRVs from conductor to conductor (cable) failures or pressure switch instrumentation racks containing all switches for the SRVs. GE Calc. available on SRV openings.	BWR2/4/5/6

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
B21	3b	Multiple ERV (SRV) opening	Safety Relief Valve-Two or More Spuriously Open "this failure requires two or more sustained fire induced failures in cables or within a control room panel to open more than one SRV."	BWR2/4/5
B21	3c	Spurious ADS: Safety Relief Valve-Failure of ADS Initiation Logic, opening SRVs simultaneously due to energization of relays	This postulated scenario features a failure that will open multiple SRVs simultaneously and requires energization of relays K6Aand K7A or K6B and K7B in a two out or two taken twice logic scheme (ref. APED-B21-018<2>). As such this failure requires two sustained fire induced failures within the control room panel with no damage to the individual SRV control circuits to initiate ADS. It should be noted that the individual SRV control circuits are powered from and contain control logic within the panel. May not be applicable to plants that have installed confirmatory logic in ADS to prevent ADS for control room fires.	BWR2/4
Decay Heat Removal				
E12	4a	Loss of RHR suppression pool cooling due to suction valve interlock interactions	Fire causes the loss of both loops of RHR suppression pool cooling (flow control valve for RHR A unavailable due to fire damage to cables; hot short causes shutdown cooling suction MOV RHR-V-6B to fail open, which fails RHR B suppression pool cooling due to interlocks).	BWR3/4/5/6
E12	4b	Failure due to diversion of suppression pool decay heat removal through 16B & 17B.	Loss of both loops of RHR suppression pool cooling. Loss of suppression pool leads to Containment Failure the containment failure location fails HPCS.	BWR3/4/5/6

Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
E14	4c	Dedicated Shut Down Cooling System - "Spurious opening of SDC heat exchanger bypass valves(FCV-38-128, 131, and 134)"	Spurious opening of normally closed heat exchanger bypass air operated valves FCV-38- 128, 131, and 134. These valves fail open on loss of instrument air and control power.SDC is a manually operated system and is used several hours after the event. If needed, these valves can be operated manually. May be a cold shutdown issue, if cooling is not needed for Hot standby.	Applicable to one BWR2
E15	4d	Dedicated Shut Down Cooling System - "Spurious closure of Pump suction valves from torus (IV-80-01, 02, 21 and 22)"	IV-80-01, 02, 21 and 22. Spurious closure {DWG 18012, sh. 2}	BWR2
E15	4e	Dedicated Shut Down Cooling System - "Spurious closure of Pump discharge to drywell valves (IV-80-15, 16, 35 and 36)"	IV-80-15, 16, 35 and 36. Spurious closure {DWG 18012, sh. 1} Note: All four IV-80-15, 16, 35 and 36 valves go open and they can not be re-positioned on loss of instrument air.	BWR2
E15	4f	Dedicated Containment Spray System - "Spurious closure of the normally open Containment spray raw water discharge valves (MOVs BV-93-25, 26, 27 and 28.)"	Spurious closure of the normally open MOVs BV-93-25, 26, 27 and 28. {DWG 18012, sh. 1}	Applicable to one BWR2
E15	4g	Dedicated Containment Spray System - Spurious opening of normally closed Containment spray raw water to containment spray supply valves (MOVs FCV-93-72 and 73)	Spurious opening of normally closed MOVs FCV-93-72 and 73. {DWG 18012, sh. 1}FCV-93-72 and 73 are interlocked with BV-93-28 and 26 respectively (per system description SDBD 203). If raw water intertie occurs when conditions are wrong, spraying the drywell with cold raw water could cause a failure of the pressure suppression function of containment.	Applicable to one BWR2

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BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E15	4h	Dedicated Containment Spray System - Spurious opening of normally closed Containment spray raw water to core spray supply valves (MOVs FCV-93-71 and 74)	Spurious opening of normally closed MOVs FCV-93-71 and 74. FCV-93-71 and 74 are interlocked with BV-93-25 and 27 respectively (per system description SDBD 203).	Applicable to one BWR2
E15	4i	Dedicated Containment Spray System - Spurious opening of normally closed Containment spray venting valves(MOVs IV-80-114 and 115)	Spurious opening of normally closed MOVs IV-80-114 and 115 causing flow diversion in containment spray. {DWG 18012, sh. 2}	BWR2
E21	4j	Dedicated Core Spray System - "Spurious closure of normally open torus suction valves (MOVs IV-81-01, 02, 21 and 22)"	Spurious closure of normally open MOVs IV-81-01, 02, 21 and 22. {DWG 18007, sh. 1}	BWR2
E21	4k	Dedicated Core Spray System - Spurious closure of normally open RPV injection valve (MOVs IV-40-02 and 12)	Spurious closure of normally open MOVs IV-40-02 and 12. {DWG 18007, sh. 1}	BWR2
E52	4l	Isolation Condenser - "Spurious closure of Steam line isolation valves (IV-39-07, 08, 09 or 10) results in failure of decay heat removal. Failure to isolate for pipe breaks. "	Spurious closure of IV-39-07, 08, 09 or 10 results in failure of decay heat removal. Failure to isolate for pipe breaks. Based on the RIS evaluation, it was shown that credible circuit failure modes may exist to spuriously close the DC motor operated valves IV-39-07 and IV-39-08. This spurious closure is based on conductor to conductor hot short failures of two cables.	BWR2/3
E52	4m	Isolation Condenser - Condensate return isolation valve failure to move/remain in correct position	AOVs IV-39-05, 06 fail to open resulting in failure of EC system. Failure to stay closed for pipe breaks. Dwg. 18017-1	BWR2/3

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
E52	4n	Isolation Condenser - Failure of Vent to main steam line valve (IV-05-02 and 03) to close or hot short(s) that keeps both valves open results in loss of inventory.	Failure of IV-05-02 and 03 to close or hot short(s) that keeps both valves open results in loss of inventory. These valves receive a signal to close on vessel Lo-Lo level. IV-05-01, 04, 11, 12 do not receive a signal to close on EC actuation. {DWG 18017, sh. 1}	BWR2/3
E52	4o	Isolation Condenser - "Failure of Vent to main steam line valves (IV-05-01, 11, 12, 04) to close results in loss of inventory."	Failure of IV-05-01, 11, 12, 04 to close results in loss of inventory. These valves do not receive a signal to close on EC actuation. {DWG 18017, sh. 1}	BWR2/3
E52	4p	Isolation Condenser - Spurious opening of normally-closed Vent to torus valves (BV-05-05 and 07) results in loss of inventory.	Spurious opening of normally-closed BV-05-05 and 07 results in loss of inventory. {DWG 18017, sh. 1}	BWR2/3
E52	4q	Isolation Condenser - Spurious closure of Cross-connect valve(BV-60-13) on makeup line results in loss of cross-connect capability of makeup source.	Spurious closure of BV-60-13 results in loss of cross-connect capability of makeup source. {DWG 18017, sh. 1}	BWR2/3
T23	4r	Containment Over Pressure (COP), NPSH loss due to spurious initiation of containment sprays.	A General Review of NPSH and Containment Over Pressure should be performed to look for other pathways such as containment inerting system or other containment isolations, other than the 3 listed here. COP is only an issue for plants that credit COP for NPSH concerns. Sprays initiated with hot, dry drywell could result in a rapid depressurization of the drywell, that is so rapid the vacuum breakers can not mitigate, resulting in collapse of the torus ring header and possible loss of pressure suppression design function.	Mark I (BWR2/3/4)

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BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
T23	4s	Containment Over Pressure (COP), NPSH loss, Spurious opening of Containment Vent.	Spurious opening of Containment Vent, resulting in Containment depressurization, following a loss of Suppression pool cooling. Containment vent through pathways not including the rupture disc. COP is only an issue for plants that credit COP for NPSH concerns.	Mark I (BWR2/3/4)
T23	4t	Containment Over Pressure (COP), NPSH loss, Spurious opening of the drywell floor drain sump valves.	Spurious opening of the drywell floor drain sump, since it isn't directly connected to the airspace. COP is only an issue for plants that credit COP for NPSH concerns.	Mark I (BWR2/3/4)
T23	4u	Spurious opening of torus vent and purge valves.	Spurious opening of torus vent and purge valves IV-201-07, 08, 16, and 17 or BV-201-21 and 22 will lead to loss of containment isolation.	BWR2
T23	4w	Mark I containment with Torus Ring Header: too much flow through the ring header due to spurious operation of multiple pumps (more than allowed by design) from the ring header.	NPSH Issue for the operating/credited pump. May be caused by a false LOCA signal.	
Support Systems				
E12	5a	Additional components load onto credited diesel generator	Scenario causes diesel generator overloading and inoperability. Note: Scenario very site specific. Interlocks may prevent this from occurring. In addition, overloading may also occur if proper load sequencing is bypassed via hot shorts, causing simultaneous loading of multiple components onto the EDG.	All
G38	5b	Spurious operation (open) of both SUPPRESSION POOL CLEAN-UP ISOLATION Valves.	Drain down of suppression pool below minimal level. 1RHS*AOV62, 1RHS*AOV63 or similar	BWR6

Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
P41	5c	Emergency Service Water pump operation at shutoff head	Prior to isolation of the circuits and component control at the remote shutdown panel, the Auto start or spurious Control Room fire induced start of the Emergency Service Water (ESW) Pump followed by a spurious closure of the ESW Pump Discharge Valve. The ESW Pump would be operating with no flow until isolation and control from remote station is achieved. III.G.3 only because for non-III.G.3 areas not employing isolation transfer switches such fire damage would also disable the ability of the pump to operate.	BWR4/6
	5d	Spurious RHR Service Water pump operation at shutoff head	Prior to isolation of the circuits and component control at the remote shutdown panel, the Control Room fire causes a start of the Residual Heat Removal Service Water (RHRSW) Pump followed by a spurious closure of the RHRSW Pump Discharge Valve. The RHRSW Pump would be operating with no flow until isolation and control from remote station is achieved. III.G.3 only because for non-III.G.3 areas not employing isolation transfer switches such fire damage would also disable the ability of the pump to operate.	BWR4/6

Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
P41	5e	Spurious operation (open) of both RHR SERVICE WATER ISOLATION (Crosstie) valves in a loop may result in diversion of service water flow from the RHR heat exchangers.	1E12*MOVF094 AND 1E12*MOVF096 or similar. Diversion of Service Water could also cause failure of the credited Service Water Pump due to runout.	BWR6
R43	5f	Non-synchronous paralleling of EDG with on-site and off-site sources through spurious breaker operations	Scenario causes damage to diesel generator by closing into a live bus out-of-phase. Note: Scenarios are very site specific. Interlocks may prevent this from occurring.	All
R43	5g	Non-Synchronous Paralleling - inadvertent cross tie breaker operation between opposite divisions (e.g., 4160V, 480V) of Div 1(2) EDGs through Spurious Operation of 480 V Breakers or the Divisional Cross-Tie through 4160 V Maintenance Tie Breakers	Scenario causes damage to diesel generator by closing into a live bus out-of-phase. Note: Scenario very site specific. Interlocks may prevent this from occurring.	All
R43	5h	Non-Synchronous Paralleling - inadvertent cross tying the off site power sources through the on-site busses & breakers.	Spurious breaker closings between separate divisions of off-site power.	All

Table G-1 BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
R43	5i	Spurious Diesel generator operation without cooling water	The fire causes the startup of the Emergency Diesel Generator, Spurious closure of the ESW Pump Discharge Valve or trip of the ESW Pump would stop the cooling water supply to the Emergency Diesel Generator. Running the Emergency Diesel Generator with a loss of cooling water could trip the diesel on high temperature. If the fire has resulted in the actuation of a LOOP or LOCA bypass of the high temperature trip, the diesel could continue to run until damage from over-temperature conditions stop it.	All
R43	5j	Service Water System - Spurious operation (open) of both cross-connection valves would cause an uncontrolled loss of service water to the opposite division.	1SWP*MOV505A, 1SWP*MOV505B or similar, for RHR Service Water, F119A/B or similar would have to open.	All

Table G-1

BWR Generic MSO List

MPL	#	Scenario Description	Notes	Plant type (note: may be applicable to other plant types)
R24N/A	5k	Spurious motor-operated valve operation, AND Wire-to-wire short(s) bypass torque and limit switches	General scenario is that fire damage to motor-operated valve circuitry causes spurious operation. If the same fire causes wire-to-wire short(s) such that the valve torque and limit switches are bypassed, then the valve motor may stall at the end of the valve cycle. This can cause excess current in the valve motor windings as well as valve mechanical damage. This mechanical damage may be sufficient to prevent manual operation of the valve. Scenario only applies to motor-operated valves. Note this generic issue may have already been addressed during disposition of NRC Information Notice 92-18. This disposition should be reviewed in the context of multiple spurious operations and multiple hot shorts.	All
T41	5l	Loss of HVAC: Spurious isolation of HVAC to credited loads	Perform review to identify spurious failures that could cause isolation of Heating Ventilation and Air Conditioning (HVAC) to credited loads. Credited loads may include pump rooms, switchgear rooms, and rooms containing solid state control systems. Examples of spurious failures include spurious damper isolation and spurious isolation of cooling flow to chillers. Also look at Fire-induced damage causes loss of both cooling fans and cooling pumps on startup transformer when offsite power is credited.	All
W25/W24	5m	Cooling pond (UHS) inventory loss - Cooling pond to tower cross tie. HV12-111, HV12-113 fail open, Can pump spray pond to the cooling tower (non-UHS).	Drain down of dedicated ultimate heat sink (cooling pond) to non- safety systems	All

Table G-1				
BWR Generic MSO List				
MPL	#	**Scenario Description**	**Notes**	**Plant type (note: may be applicable to other plant types)**
Process Monitoring				
	6a	No generic Scenarios identified		