Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
LI-10-100		Tank Secondary Level				
LT-10-92		Tank Primary Level Transmitter				
M-1, 2, 3, 4, 5, 6		BV ATR FW loop				
633 pump 1 batteries		Start batteries for FW pump 633-1 diesel driver				
688-M-1 Batteries		Diesel firewater pump start batteries	X			Batteries lack spacers and have little lateral resistance.
688-M-2 Batteries		Diesel firewater pump start batteries	X			Batteries lack spacers and have little lateral resistance.
ND-10-645		FT-10-90 High Side Isolation		X	FT-10-90	
ND-10-646		FT-10-90 Low Side Isolation		X	FT-10-90	
ND-10-647		FT-10-90 Equalization		X	FT-10-90	
ND-10-652		PI-10-106 Isolation		X	688-M-6	
ND-10-812		PI-10-122 Vent Valve				
ND-10-894		High Side Calibration Isolation on FT-10-90		X	FT-10-90	
ND-10-895		Low Side Calibration Isolation of FT-10-90		X	FT-10-90	
PCV-10-911		688-M-1 Cooling Water Pressure Control Valve		X	688-M-1	
PCV-10-912		688-M-2 Cooling Water Pressure Control Valve		X	688-M-2	
PCV-10-913		688-M-1 Cooling Water Bypass Pressure Control Valve		X	688-M-1	
PCV-10-914		688-M-2 Cooling Water Bypass Pressure Control Valve		X	688-M-2	
PI-10-106		Surge Suppressor Pressure		X	688-M-6	
PI-10-122		FW Pressure Indicator				
PI-10-123		FW to BH EFIS pressure indicator				
PI-10-141		688-M-1 Cooling Water Pressure		X	688-M-1	
PI-10-142		688-M-2 Cooling Water Pressure		X	688-M-2	
PI-10-143		Firewater Pressure Indicator				
PI-10-144		Firewater Pressure Indicator				
PI-10-93		688-M-1 Pump Suction Pressure		X	688-M-1	
PI-10-94		M-2 Pump Suction Pressure		X	688-M-2	

Equipment ID	Individual Component ID	Description	PC-4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
PI-10-95		688-M-1 Pump Discharge Pressure		X	688-M-1	
PI-10-96		M-2 Pump Discharge Pressure		X	688-M-2	
PS-1-110 (Firewater)		Upper Firewater System Inlet Pressure Switch				
PT-10-143		Firewater Pressure Transmitter		X	688-E-5	
PT-10-144		Firewater Pressure Transmitter		X	688-E-6	
PT-10-6 (Firewater)		Lower Firewater System Inlet Pressure Transmitter				
R1		Block valve, tank 718 outlet to F.W. header				
R-128		BV on discharge of Deep Well Pump #4				
R-129		BV on common discharge of Deep Well Pump #1 & #3				
R-14-CK		Check valve on suction breaker of Deep Well Pump #3				
R-19-CK		Check valve on suction breaker of Deep Well Pump #4				
R-6		BV (BV) on discharge of Deep Well Pump #1				
R-7-CK		Check valve on discharge of Deep Well Pump #1				
SG-10-637		688-M-1 Cooling Water Sightglass				
SG-10-638		688-M-2 Cooling Water Sightglass				
SG-12-55		688-M-7 Fuel Tank Level		X	688-M-7	
SG-12-56		688-M-8 Fuel Tank Level		X	688-M-8	
ST-10-907		688-M-1 Cooling Water Strainer		X	688-M-1	
ST-10-908		688-M-2 Cooling Water Strainer		X	688-M-2	
ST-10-909		688-M-1 Cooling Water Strainer		X	688-M-1	
ST-10-910		688-M-2 Cooling Water Strainer		X	688-M-2	
SV-10-896		688-M-2 FW Pump Test Solenoid Valve		X	688-E-6	
SV-10-897		688-M-1 FW Pump Test Solenoid Valve		X	688-E-5	

Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
SV-10-915		688-M-1 Cooling Water Solenoid Valve		X	688-M-1	
SV-10-916		688-M-2 Cooling Water Solenoid Valve		X	688-M-2	
TM-10-107		688-M-1 Tachometer				
TM-10-108		688-M-2 Tachometer				
Unnumbered	Unnumbered 12	Piping, raw water overhead storage tank				
Unnumbered	Unnumbered 56	Piping from F.W. system to LCV-1-615 &-616				
Unnumbered	Unnumbered 57	Piping, F.W. in TRA-633				
650-E-1		M-3 Controller				
650-E-2		M-4 Controller				
650-LP-3		Lighting Panel				
650-M-1		Deep Well Pump #3 and Motor				
650-M-3		Oil Cooling Pump	X			Inadequate anchorage.
650-M-4		Oil Recirculation Pump	X	X	650-M-3	Reference Parent Component
650-M-5		Oil Cooling Heat Exchanger	X	X	650-M-3	Reference Parent Component
650-M-6		Surge Tank	X	X	650-M-3	Reference Parent Component
650-M-8		shaft oiler		X	650-M-1	
672-E-3		Lighting Panel LP-17				
672-E-4		M-2 Controller				
672-E-5		M-3 Controller				
672-M-1		Deep Well Pump #4 and Motor				
672-M-2		Oil Cooling Pump	X			Adjacent unanchored cabinet.
672-M-3		Oil Recirculation Pump	X	X	672-M-2	Reference Parent Component
672-M-6		Oil Cooling Heat Exchanger	X	X	672-M-2	Reference Parent Component
672-M-7		Surge Tank	X	X	672-M-2	Reference Parent Component
672-MS-4		Deep Well Pump #4 Breaker	X			Inadequate anchorage.
672-T-2		Lighting Panel LP-17 transformer				
BFP-10-838		Double Check Backflow Preventer	X	X	672-M-2	Reference Parent Component
BFP-10-842		Double Check Backflow Preventer	X	X	650-M-3	Reference Parent Component
BL-10-694		Oil Cooling Pump Suction Valve	X	X	650-M-3	Reference Parent Component

Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
BL-10-695		Oil Cooling Pump Discharge Valve	X	X	650-M-3	Reference Parent Component
BL-10-696		Oil Recirculation Pump Suction Valve	X	X	650-M-3	Reference Parent Component
BL-10-697		Oil Recirculation Heat Exchanger Outlet Valve	X	X	650-M-3	Reference Parent Component
BL-10-699		Oil Recirculation Pump Suction Line Vent Valve	X	X	650-M-3	Reference Parent Component
BL-10-704		Oil Cooling Pump Suction Valve	X	X	672-M-2	Reference Parent Component
BL-10-705		Oil Cooling Pump Discharge Valve	X	X	672-M-2	Reference Parent Component
BL-10-706		Oil Recirculation Pump Suction Valve	X	X	672-M-2	Reference Parent Component
BL-10-707		Oil Recirculation Pump Discharge Valve	X	X	672-M-2	Reference Parent Component
BL-10-708		Oil Recirculation Pump Suction Line Vent Valve	X	X	672-M-2	Reference Parent Component
BL-10-715		Oil Recirc/Cooling Crosstie Valve	X	X	650-M-3	Reference Parent Component
BL-10-716		Oil Recirc/Cooling Crosstie Valve	X	X	672-M-2	Reference Parent Component
BL-10-836		Oil Recirc/Cooling Crosstie Valve	X	X	672-M-2	Reference Parent Component
BL-10-837		Oil Recirc/Cooling Crosstie Valve	X	X	672-M-2	Reference Parent Component
BL-10-840		Oil Recirc/Cooling Crosstie Valve	X	X	650-M-3	Reference Parent Component
BL-10-841		Oil Recirc/Cooling Crosstie Valve	X	X	650-M-3	Reference Parent Component
Breaker 1		M-3 Controller breaker		X	650-LP-3	
Breaker 2?				X	672-E-3	
Breaker 3		M-2 Controller breaker		X	672-E-3	
Breaker 4		M-4 Controller breaker		X	650-LP-3	
Breaker 7?				X	672-E-3	
Breaker 8		M-3 Controller breaker		X	672-E-3	
FCV-10-158		shaft oiler solenoid valve		X	650-M-1	
FI-10-77		Oil Recirc Flow Indicator	X	X	650-M-3	Reference Parent Component
FI-10-80		Oil Recirc Flow Indicator	X	X	672-M-2	Reference Parent Component
ND-10-698		Heat Exchanger Vent Valve	X	X	650-M-3	Reference Parent Component
R-11		Deep Well Pump #3 Discharge Valve				
R-12-CK		Deep Well Pump #3 Discharge Check Valve				

Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
R-13		Deep Well Pump #3 Siphon Isolation Valve				
R-16		Deep Well Pump #4 Discharge Valve				
R-17-CK		Deep Well Pump #4 Discharge Check Valve				
R-18		Deep Well Pump #4 Siphon Isolation Check Valve				
SF-10-701		Surge Tank Block Valve	X	X	650-M-3	Reference Parent Component
SF-10-711		Surge Tank Block Valve	X	X	672-M-2	Reference Parent Component
ST-10-1040		Oil Recirc/Cooling Crosstie Strainer	X	X	650-M-3	Reference Parent Component
ST-10-1041		Oil Recirc/Cooling Crosstie Strainer	X	X	672-M-2	Reference Parent Component
TS-53005			X	X	672-M-2	Reference Parent Component
Fuel Storage and Handling						
BL-10-164, 165, 166, 167, 168	BL-10-164	Emergency Firewater Canal Fill	X			Capacity does not bound demand.
	BL-10-165					
	BL-10-166					
	BL-10-167		X			Capacity does not bound demand.
	BL-10-168		X			Capacity does not bound demand.
GB-CC-19-9		Recycle Isolation Valve				
GT-CC-19-1		Recycle Isolation Valve	X			Capacity does not bound demand.
GT-CC-19-10		Recycle Isolation Valve	X			Capacity does not bound demand.
GT-S-6-290,		Isolation Valves, ATR Canal Level Control	X			Capacity does not bound demand.
LS-19-1		Level Switch, ATR Canal Level Control	X			GERS caveats cannot be met. GERS needed due to high demand.
LT-10-133		Level Transmitter, ATR Canal Emergency Firewater Makeup				
ND-6-837, 838 and 839		Isolation Valves, ATR Canal Level Control	X			Capacity does not bound demand.

Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
None	None 1	Bubbler Tube, ATR Canal Level Control	X			No applicable experience data equipment class.
None	None 13	Rotameter, ATR Canal Level Control	X			Capacity does not bound demand.
None	None 17	Pillows, Canal Impact Absorbing	X			No applicable experience data equipment class.
None	None 18	Bellows Between Canal and Reactor Vessel	X			No applicable experience data equipment class.
None	None 19	Nitrogen Backup for Emergency Firewater Canal Fill				
None	None 2	Viewing Window	X			No applicable experience data equipment class.
PRV-6-840		Pressure Regulator Valve, ATR Canal Level Control				
Storage Locations 1,2		Transfer Station	X			No applicable experience data equipment class.
Unnumbered	Unnumbered 21	Canal drain valves (Irradiated Fuel Storage Area)				
Unnumbered	Unnumbered 24	Drain valve cover plates (Irradiated Fuel Storage Area)	X			No applicable experience data equipment class.
Unnumbered	Unnumbered 29	Canal low-level alarm system	X			GERS caveats cannot be met. GERS needed due to high demand.
Unnumbered	Unnumbered 40	Canal Level Indication				
Unnumbered	Unnumbered 46	Steel liners, canals (working and storage - not ATRC)	X			No applicable experience data equipment class.
Unnumbered	Unnumbered 55	Canal bulkheads, Standard and Short	X			No applicable experience data equipment class.
Primary Coolant System (PCS)						
1-48		Piping, chemical clean connection to emer pumps suction				
1-49		Piping, chemical clean connection to emer pumps discharge				
670-E-28-CR2		Relay, Primary emergency coolant pump hardwired autostart logic	X	X	670-E-28	Capacity does not bound demand.

Equipment ID	Individual Component ID	Description	PC4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for Outlier
670-E-28-PS1		Power Supply, Primary emergency coolant pump hardwired autostart logic		X	670-E-28	
BF-A-1-14		Control valve, main, primary coolant flow				
CK-A-1-17, -20		Check valves, emergency coolant pump discharge lines				
CK-A-1-2, -5, -8, -11		Check valves, primary coolant pump discharge lines				
CK-B-1-15		Check valve, PCP suction header to emerg. coolant pumps				
CK-B-1-89		Check valve, pressurizing pumps to PCS return header				
CK-B-1-90		Check valve, primary by-pass demineralizer to PCS				
FE-36		Flow orifice at inlet to GT-E-1-85				
FE-37		Flow orifice to bypass demin				
FIS-1-23 and FIS-1-24		Flow indicator switch, Primary emergency coolant pump hardwired autostart logic				
GB-L-1-47		Bypass valve				
GT-A-1-1, -4, -7, -10		Block valves, primary coolant pump suction lines				
GT-A-1-3, -6, -9, -12		Block valves, primary coolant pump discharge lines				
GT-B-1-16, -19		Block valves, emergency coolant pump suction lines				
GT-B-1-18, -21		Block valves, emergency coolant pump outlet lines				
GT-D-1-31		Block valve, pressurizing pumps to PCS return header				
GT-D-1-32		Block valve, pressurizing pumps discharge to bypass demin				
GT-D-1-33		Block valve, PCS to pressurizing pump suction				
GT-D-1-35		Block valve, primary coolant to 10-in drain line				
GT-D-1-37		Block valve, bypass demin return line to PCS drain line				

Equipment ID	Individual Component ID	Description	PC 4 Criteria Not Satisfied	Subcomponent	Parent Component	Basis for outlier
GT-D-1-38		Block valve, bypass demin return line to PCS				
GT-D-1-39		Block valve, upper reactor vessel drain line				
GT-D-1-70		Block valve, lower reactor vessel drain line				
GT-I-1-82, -83		Block valves, primary coolant inlet lines to RX vessel				
GT-P-1-45		Block valve, LDW to degassing tank				
670-M-10		Primary emergency cooling pump				
670-M-11		Primary emergency cooling pump				
Pri Pumps RLY-A, 670-E15-2K-CR1	670-E-15-2K-CR1	Relays, Primary emergency coolant pump hardwired autostart logic		X	670-E-15	
	Pri Pumps RLY-A (670-E-1)		X	X	670-E-1	Reference Parent Component
	Pri Pumps RLY-A (670-E-2)		X	X	670-E-2	Reference Parent Component
T1 thru 12		Rx vessel instrument thimbles				
Cable and Conduit Raceways						
2B-C-1 Cable Trays		Five tier support, with bracing.				
2B-C-2 Cable Trays		Three tier support with additional conduit and duct on vertical strut. Embedded channel is also loaded by rod hung pipe support.				
2B-C-3 Cable Trays		Six tier support without bracing. Sagging of trays noted.	X			Inadequate support anchorage.
2B-C-4 Cable Trays		Five tier support that is partially loaded by long vertical run of trays, spans first basement and second basement.				
Emergency Pump Motor Conduit		Conduit to AC emergency pump motor	X			Conduit passes through seismically inadequate block wall.

APPENDIX B

ATR EQUIPMENT DATABASE (1 CD)

APPENDIX C

LISTING OF CALCULATIONS

Calculations prepared in support of this report are organized into two sets. Table C-1 lists calculations that do not evaluate equipment anchorage. These calculations are assigned a calculation number that follows a 0602301.01-S-0XX designation. Table C-2 lists calculations that evaluate equipment anchorage. These calculations are assigned a calculation number that follows a 0602301.01-S-1XX designation.

Table C-1. Listing of Calculations that Do Not Evaluate Equipment Anchorage.

Calculation No.	Calculation Title
0602301-01-S-001	Comparison of Seismic Demand to Seismic Experience Capacity
0602301-01-S-002	Seismic Evaluation of the Seismic Category I Underground Firewater System
0602301-01-S-003	Seismic Evaluation of Deep Well Pump Nos. 3 and 4
0602301-01-S-004	Support Evaluation for Panel 670-E-67
0602301-01-S-005	Seismic Evaluation of the TRA-770 Ventilation Stack
0602301-01-S-006	Limited Analytical Review of Cable Tray Supports
0602301-01-S-007	Seismic Evaluation of the Concrete Block and Shielding Walls in TRA-670
0602301-01-S-008	Seismic Evaluation of Seismic Category I Relays
0602301-01-S-009	Anchorage Evaluation for Group O-3

Table C-2. Listing of Calculations Evaluate Equipment Anchorage.

Calculation No.	Calculation Title	Equipment
0602301-01-S-101	Anchorage Evaluation for Group F-4	670-E-58, -59
0602301-01-S-102	Anchorage Evaluation for Group F-3	E11A, B,
0602301-01-S-103	Anchorage Evaluation for Groups W-4 and W-5	E11C, D, Spare
0602301-01-S-104	Anchorage Evaluation for Group W-1	I52A, B, C; NLPA 31 A, B, C; RAm-511A, B, C; E310A, B, C; E311A, D
0602301-01-S-105	Anchorage Evaluation for Group F-10	E13A, B, C, D
0602301-01-S-106	Anchorage Evaluation for Group F-15	670-E-104, 670-E-116
0602301-01-S-107	Anchorage Evaluation for Group F-6	670-E-26,
0602301-01-S-108	Anchorage Evaluation for Group F-1	670-E-459
0602301-01-S-109	Anchorage Evaluation for Group F-19	670-E-15
0602301-01-S-110	Anchorage Evaluation for Group F-2	VVS Instrument Racks – First Basement and First Floor
0602301-01-S-111	Anchorage Evaluation for Group F-7	670-E-23, 670-E-28
0602301-01-S-112	Anchorage Evaluation for Group F-5	PT-10-6 (EFIS), LT-10-133, LT-514B, dPT-1-21, -22, -23, -24, LT-514C, LT-514A
0602301-01-S-113	Anchorage Evaluation for Group F-12	P11
0602301-01-S-114	Anchorage Evaluation for Group F-23	670-E-4, 670-E-5, 670-E-6, 670-E-7, 670-E-8, 670-E-9, ATS 670-E-228
0602301-01-S-115	Anchorage Evaluation for Group F-20	670-M-10, 670-M-11
0602301-01-S-116	Anchorage Evaluation for Group F-9	674-M-10
0602301-01-S-117	Anchorage Evaluation for Group F-14	674-M-8
0602301-01-S-118	Anchorage Evaluation for Group F-16	Reactor Console
0602301-01-S-119	Anchorage Evaluation for Group F-26	I51A, I51B, I51C
0602301-01-S-120	Anchorage Evaluation for Group F-27	M-42, M-43
0602301-01-S-121	Anchorage Evaluation for Group F-22	670-E-117
0602301-01-S-122	Anchorage Evaluation for Group F-24	670-M-42, -43

APPENDIX D

CALCULATION NO. 0602301.01-S-001, *COMPARISON OF SEISMIC DEMAND TO SEISMIC EXPERIENCE CAPACITY*

APPENDIX E

CALCULATION NO. 0602301.01-S-002, *SEISMIC EVALUATION OF THE SEISMIC CATEGORY I UNDERGROUND FIREWATER SYSTEM*

APPENDIX F

CALCULATION NO. 0602301.01-S-003, *SEISMIC EVALUATION OF DEEP WELL PUMP NOS. 3 AND 4*

APPENDIX G

CALCULATION NO. 0602301.01-S-004, *SUPPORT EVALUATION FOR PANEL 670-E-67*

APPENDIX H

CALCULATION NO. 0602301.01-S-005, *SEISMIC EVALUATION OF THE TRA-770 VENTILATION STACK*

APPENDIX I

CALCULATION NO. 0602301.01-S-006, *LIMITED ANALYTICAL REVIEW OF CABLE TRAY SUPPORTS*

APPENDIX J

CALCULATION NO. 0602301.01-S-007, *SEISMIC EVALUATION OF THE CONCRETE BLOCK AND SHIELDING WALLS IN TRA-670*

APPENDIX K

CALCULATION NO. 0602301.01-S-008, *SEISMIC EVALUATION OF SEISMIC CATEGORY I RELAYS*