HITACHI

GE Hitachi Nuclear Energy

Richard E. Kingston
Vice President, ESBWR Licensing

PO Box 780 M/C A-65
Wilmington, NC 28402-0780
USA

T 910 819 6192
F 910 362 6192
rick.kingston@ge.com

MFN 10-079

Docket No. 52-010

March 9, 2010

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Transmittal of ESBWR DCD Tier 1, Table 3.8-1 and Tier 2, Table 3.11-1 Markups Related to GEH Internal Corrective Action**

The purpose of this letter is to submit markups to ESBWR DCD, Tier 1 and Tier 2, which are the result of GEH internal review. These markups will be incorporated into DCD, Revision 7. The markup pages are contained in Enclosure 1. Changes associated with these corrective actions are enclosed within boxes on the markup pages. The changes are summarized below.

Affected Section	Description of Change
Tier 1, T3.8-1	Various corrections to attributes within the Electrical and Mechanical Equipment for Environmental Qualification table.
Tier 2, T3.11-1	Various corrections to attributes within the Electrical and Mechanical Equipment for Environmental Qualification table.

If you have any questions about the information provided, please contact me.

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

Enclosure:

1. MFN 10-079 Transmittal of ESBWR DCD Tier 1, Table 3.8-1 and Tier 2, Table 3.11-1 Markups Related to GEH Internal Corrective Action – DCD Markups

cc:

AE Cubbage	USNRC (with enclosures)
J G Head	GEH/Wilmington (with enclosures)
DH Hinds	GEH/Wilmington (with enclosures)
LF Dougherty	GEH/Wilmington (with enclosures)
eDRF Section	0000-0114-3167

Enclosure 1

MFN 10-079

Transmittal of ESBWR DCD Tier 1, Table 3.8-1 and Tier 2, Table 3.11-1 Markups Related to GEH Internal Corrective Action –

DCD Markups

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Nuclear Boiler System					
Depressurization Valves	8	CV	ESF	72 hr	MH
Safety Relief Valves	10	CV	ESF	72 hr	MH
Temperature element in DPV/SRV Discharge	18	CV	ESF	72 hr	EH
MSIV - Inboard	4	CV	PB	100 Days	MH
MSIV - Outboard	4	ST	PB	100 Days	MH
MSIV Drain Bypass Valve	2	ST	ESF	72 hr	MH
Steam Line Lowpoint Drain Bypass Valve	1	TB	ESF	72 hr	MH
Feedwater isolation valve	8	ST, CV	PB	100 Days	MH
RPV Level Transmitters	All	RB	ESF	100 Days	EH
RPV Temperature Elements	All	CV	ESF	100 Days	EH
RPV Pressure Transmitter	All	RB	ESF	100 Days	EH
Feed Piping Diff Pressure Transmitter	All	RB	ISOL	100 Days	EH
Steam Line Flow Transmitter	All	RB	ISOL	100 Days	EH
Electrical Modules and Cable	All	CV, RB, ST, TB	ESF	100 Days	EH
Isolation Condenser System					
Isolation Valves	16	CV	PB	100 Days	MH
Isolation Valves Operator	16	CV	ESF	100 Days	MH
Condensate Return Valves	4	CV	ESF	100 Days	MH
Condensate Return Valves Operator	4	CV	ESF	100 Days	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Condensate Return Bypass Valve	4	CV	ESF	100 Days	MH
Condensate Return Bypass Valve Operator	4	CV	ESF	100 Days	MH
Upper Header Vent Valve	8	CV	ESF	100 Days	MH
Upper Header Vent Valve Actuator	8	CV	ESF	100 Days	MH
Lower Header Vent Valve	16	CV	ESF	100 Days	MH
Lower Header Vent Valve Actuator	12~~6~~	CV	ESF	100 Days	MH
Pool Cross-Connect Valves	4	RB	ESF	100 Days	MH
Vent Line Temperature Element	8	CV	ESF	100 Days	EH
Condensate Drain Temperature Element	4	CV	ESF	100 Days	EH
Steam Piping Diff Pressure Transmitter	8	CV	ESF	100 Days	EH
Condensate Drain Diff Pressure Transmitter	8	CV	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB	ESF	100 Days	EH
Rod Control and Information System					
Electrical Modules and Cable	All	CB, RB	ESF	72 hr	EH
Control Rod Drive System					
HCU Scram Solenoid Pilot Valve	135	RB	ESF	72 hr	MH
FMCRD Passive Holding Brake	269	CV	ESF	72 hr	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
FMCRD Separation Switch	538	CV	ESF	72 hr	EH
Charging Water Header Pressure Transmitter	4	RB	ESF	72 hr	EH
Electrical Modules and Cable	All	CV, RB	ESF	72 hr	EH
High Pressure CRD Makeup Line Isolation Valves	2	RB	ESF	72 hr	MH
Backup Scram Valve Solenoids	2	RB	ESF	72 hr	EH
Leak Detection and Isolation System					
Pressure Transmitters	All	CV, RB, CB	ESF	100 Days	EH
Temperature Sensors	All	CV, RB, CB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
Feedwater Control System					
Electric Modules and Cable	All	CB, RB	ESF	72 hr	EH
Neutron Monitoring System					
Detector and Tube Assembly	All	CV	ESF	72 hr	MH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
Remote Shutdown System					
Electrical Panels, Modules and Cable	All	RB	ESF	100 Days	C

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Safety-Related Distributed Control and Information System (DCIS)					
Electrical Modules and Cable	All	RB, CB	ESF	100 Days	C
Reactor Protection System					
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
Diverse Protection System					
Electrical Modules and Cable	All	CB, RB, TB	ESF, ISOL	100 Days	EH
Safety System Logic and Control					
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
Standby Liquid Control System					
Isolation Check Valves	4	CV, ~~/~~RB	PB	100 days	MH
Squib Injection Valves	4	RB	ESF	72 hr	MH
Injection Shut-Off Valves Actuator	4	RB	ESF	100 Days	EH
Nitrogen Charging Globe Valve	2	RB	ESF	100 Days	MH
Nitrogen Charging Globe Valve Actuator	2	RB	ESF	100 Days	EH
Nitrogen Charging Check Valve	2	RB	ESF	72 hr	MH
Accumulator Depressurization Valves	4	RB	ESF	100 Days	MH
Accumulator Depressurization Valves Actuator	4	RB	ESF	100 Days	EH
Accumulator Relief Valve	2	RB	~~PB~~ESF	72 hr	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Injection Shut Off Valves	4	RB	ESF	100 Days	MH
Accumulator Level Instrumentation	8	RB	ESF	100 Days	EH
Accumulator Pressure Instrumentation	8	RB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB	ESF	100 Days	EH
Process Radiation Monitoring System					
Isolation Valves	4	CV, RB, CB	ESF	100 Days	MH
Radiation Monitors, Sensors, Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
Gravity-Driven Cooling System (GDCS)					
GDCS Pool Level Instrumentation	12	CV	ESF	100 Days	EH
GDCS Squib Valve to GDCS Pool	8	CV	ESF	72 hr	MH
GDCS Check Valve to GDCS Pool	8	CV	ESF	72 hr	MH
GDCS Squib Valve to Suppression Pool	4	CV	ESF	72 hr	MH
GDCS Check Valve to Suppression Pool	4	CV	ESF	72 hr	MH
GDCS Squib Valve to Lower Drywell (DW)	12	CV	ESF	72 hr	MH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Fuel and Auxiliary Pools Cooling System					
Containment Isolation Valve (CIV) - Drywell Spray - Outboard	1	RB	PB	100 Days	MH
CIV - Drywell Spray - Inboard	1	CV	PB	100 Days	MH
CIV – Suppression Pool Cooling (SPC) Suction - Outboard	4	RB	PB	100 Days	MH
CIV - SPC Return - Outboard	2	RB	PB	100 Days	MH
CIV - SPC Return - Inboard	2	CV	PB	100 Days	MH
CIV - GDCS Suction - Outboard	1	RB	PB	100 Days	MH
CIV - GDCS Suction - Inboard	1	CV	PB	100 Days	MH
CIV - GDCS Return - Outboard	1	RB	PB	100 Days	MH
CIV - GDCS Return - Inboard	1	CV	PB	100 Days	MH
LPCI Isolation	4	FB, RB	PB	100 Days	MH
IC/PCCS Pool Level Instrumentation	All	RB	ESF	100 Days	EH
Fuel Pool Level Instruments	2	FB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, FB, RB, CB	ESF	100 Days	EH
Reactor Water Cleanup/Shutdown Cooling System					
CIV - Mid Vessel - Inboard	2	CV	PB, ISOL	100 Days	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
CIV - Mid Vessel - Outboard	2	RB	PB, ISOL	100 Days	MH
CIV - Mid Vessel - Inboard Operator	2	CV	~~PB~~ISOL	72 hr	EH
CIV - Mid Vessel - Outboard Operator	2	RB	~~PB~~ISOL	72 hr	EH
CIV - Bottom Drain Inboard	2	CV	PB, ISOL	100 Days	MH
CIV - Bottom Drain Outboard	2	RB	PB, ISOL	100 Days	MH
CIV - Bottom Drain Inboard Operator	2	CV	~~PB~~ISOL	72 hr	EH
CIV - Bottom Drain Outboard Operator	2	RB	~~PB~~ISOL	72 hr	EH
CIV - Process Sampling Line -Inboard	2	CV	PB, PAMS	100 Days	MH
CIV - Process Sampling Line -Outboard	2	RB	PB, PAMS	100 Days	MH
CIV - Process Sampling Line -Inboard Operator	2	CV	~~PB/~~ISOL, PAMS	100 Days	EH
CIV - Process Sampling Line -Outboard Operator	2	RB	~~PB/~~ISOL, PAMS	100 Days	EH
Return Line Shutoff Valve	2	RB	ISOL	100 Days	MH
Check Valve to Feedwater	4	RB	ISOL	100 Days	MH
Mid-vessel Flow Instrumentation	All	CV	ISOL	100 Days	EH
Mid-vessel Temperature Instrumentation	All	CV	ISOL	100 Days	EH
Bottom Drain Flow Instrumentation	All	CV	ISOL	100 Days	EH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Bottom Drain Temperature Instrumentation	All	CV	ISOL	100 Days	EH
Return Line Flow Instrumentation	All	RB	ISOL	100 Days	EH
Return Line Temperature Instrumentation	All	RB	ISOL	100 Days	EH
Overboard Flow Instrumentation	All	RB	ISOL	100 Days	EH
Overboard Temperature Instrumentation	All	RB	ISOL	100 Days	EH
Electrical Modules and Cables	All	CV, RB	ESF	100 Days	EH
Main Control Room (MCR) Panels					
Panels, Modules and Cables	All	CB	ESF	100 Days	C
MCR Back Room Panels					
Panels, Modules and Cable	All	CB	ESF	100 Days	C
Local Panels and Racks					
Panels, Modules and Cable	All	ALL	ESF	100 Days	EH
Condensate and Feedwater System					
Feed Line Temperature Element	All	ST	ESF	100 Days	EH
Feed Piping Diff Pressure Transmitter	All	ST	ISOL	100 Days	EH
Electrical Modules and Cable	All	ST, CB	ESF	100 Days	EH
Makeup Water System					
Isolation Valves	All	CV, RB	ISOL	100 Days	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Chilled Water System					
Isolation Valves	~~8~~ All	CV, RB	ISOL	100 Days	MH
Service Air System					
Isolation Valves	~~4~~ All	CV, RB	ISOL	100 Days	MH
High Pressure Nitrogen Supply System					
Isolation Valves	4	CV, RB	ISOL	100 Days	MH
Electrical Power Distribution System (EPDS)					
Cable and Supports	All	CB, FB, RB	ESF	100 Days	EH
Uninterruptible AC Power Supply					
Electrical Modules and Cable	All	CV, CB, RB	ESF	100 Days	EH
Direct Current Power Supply					
Divisional 250 VDC Battery	8	RB	ESF	100 Days	E
Divisional 250 VDC Normal/Standby Battery Charger	12	RB	ESF	100 Days	E
Divisional 250 VDC Power Center	8	RB	ESF	100 Days	E
Divisional 250 VDC Transfer Switch Box	8	RB	ESF	100 Days	E
Isolation Power Center Normal Main Circuit Breaker	4	RB	ISOL	100 Days	E
Isolation Power Center Alternate Main Circuit Breaker	4	RB	ISOL	100 Days	E

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Isolation Power Center Supply Breaker to Division 250 VDC Normal Battery Charger	12	RB	ISOL	100 Days	E
Electrical Modules and Cable	All	CV, CB, RB, TB	ESF	100 Days	E
Raceway System					
Electrical Penetrations	All	CV	PB	100 Days	EH
Conduit, Cable Trays and Supports	All	CV, CB, RB, TB, FB	ESF	100 Days	EH
Containment System					
Vacuum Breakers	3	CV	ESF	100 Days	MH
Vacuum Breaker Isolation Valves	3	CV	ESF	72 hr	MH
Instrumentation and Cables	All	CV	ESF	100 Days	EH
Basemat Internal Melt Arrest Coolability (BiMAC) Temperature Element	ALL	CV	ESF	100 Days	EH
BiMAC Temperature Switch	ALL	CV	ESF	100 Days	EH
Passive Containment Cooling System					
Vent Fan ~~Ball~~ Check Valves	6	CV	ESF	100 Days	MH
Passive Containment Cooling System (PCCS) Vent Fan	6	CV	ESF	100 Days	EH
Containment Inerting System					
Isolation Valve	10	CV, RB	ISOL	100 Days	MH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
Passive Autocatalytic Recombiner System					
Passive Autocatalytic Recombiners	All	CV	ESF	100 Days	MH
Containment Monitoring System					
Containment Isolation Valves	All	CV, RB	ISOL	100 Days	MH
Electrical Modules and Cable	All	CB, CV, RB	ESF	100 Days	EH
Drywell Pressure Transmitters	All	RB	ESF	100 days	EH
Differential Pressure Transmitters	All	RB	ESF	100 days	EH
Suppression Pool Temperature Element	All	CV	ESF	100 days	EH
Lower DW Level Transmitter	All	RB	ESF, PAMS	100 days	EH
Suppression Pool Level Transmitters	All	RB	PAMS	100 days	EH
Suppression Pool Pressure Transmitters	All	RB	PAMS	100 days	EH
Hydrogen Analyzers	All	RB	ESF, PAMS	100 days	EH
Oxygen Analyzers	All	RB	ESF, PAMS	100 days	EH
Reactor Building HVAC					
Building Isolation Dampers	All	RB	ESF	100 Days	EH
Electrical Modules and Cable	All	RB	ESF	100 Days	EH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Control Building HVAC					
Control Room Habitability Area (CRHA) Supply Air Isolation Dampers	All	CB	ESF	100 Days	E
Emergency Filter Unit (EFU) Downstream Isolation Dampers	All	CB	ESF	100 Days	E
CRHA Restroom Exhaust Isolation Dampers	All	CB	ESF	100 Days	E
CRHA Smoke Purge Intake Isolation Dampers	All	CB	ESF	100 Days	E
CRHA Smoke Purge Exhaust Isolation Dampers	All	CB	ESF	100 Days	E
Emergency Filter Unit (EFU)	All	CB	ESF	100 Days	E
Electrical Modules and Cable	All	CB	ESF	100 Days	E
Fuel Building HVAC					
Fuel Building General Area HVAC Subsystem (FBGAVS) Building Supply Air Isolation Dampers	All	FB	ESF	100 Days	EH
FBGAVS Building Exhaust Air Isolation Dampers	All	FB	ESF	100 Days	EH
Fuel Building Fuel Pool Area HVAC Subsystem (FBFPVS) Building Supply Air Isolation Dampers	All	FB	ESF	100 Days	EH
FBFPVS Building Exhaust Air Isolation Dampers	All	FB	ESF	100 Days	EH

Table 3.8-1

Electrical and Mechanical Equipment for Environmental Qualification

Components (note 5)	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Electrical Modules and Cable	All	FB	ESF	100 Days	EH

Note 1: CV – Containment Vessel
ST – Steam Tunnel
RB – Reactor Building
FB – Fuel Building
CB – Control Building
TB – Turbine Building
OO – Outdoors Onsite
When multiple locations are listed, information in this table applies to equipment in all locations listed that also meets the other criteria shown.

Note 2: ESF – Engineered Safety Feature
PAMS – Post Accident Monitoring
ISOL – Containment Isolation
PB – Primary Pressure Boundary
When multiple functions are listed, information in this table applies to equipment associated with either function that also meets the other criteria shown.

Note 3: Required operation time refers to the period of time which the equipment must remain available or operational. Required operation times apply to equipment when all criteria shown in the first four columns of the table are met.

Note 4: E – Electrical Equipment Program
M – Mechanical Equipment Program
C – Computer Based I&C System Program
H – Harsh Environment (omission of H indicates Mild Environment)
Qualification program classifications apply to equipment when all criteria shown in the first four columns of the table are met.

Note 5: Valve operators/actuators are considered to be part of the valve assembly and are generally not listed separately in this table.

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
B21 Nuclear Boiler System					
Depressurization Valves	8	CV	ESF	72 hr	MH
Safety Relief Valves	10	CV	ESF	72 hr	MH
Temperature element in DPV/SRV Discharge	18	CV	ESF	72 hr	EH
MSIV - Inboard	4	CV	PB	100 Days	MH
MSIV - Outboard	4	ST	PB	100 Days	MH
MSIV Drain Bypass Valve	2	ST	ESF	72 hr	MH
Steam Line Lowpoint Drain Bypass Valve	1	TB	ESF	72 hr	MH
Feedwater isolation valve	8	ST, CV	PB	100 Days	MH
RPV Level Transmitters	All	RB	ESF	100 Days	EH
RPV Temperature Elements	All	CV	ESF	100 Days	EH
RPV Pressure Transmitter	All	RB	ESF	100 Days	EH
Feed Piping Diff Pressure Transmitter	All	RB	ISOL	100 Days	EH
Steam Line Flow Transmitter	All	RB	ISOL	100 Days	EH
Electrical Modules and Cable	All	CV, RB, ST, TB	ESF	100 Days	EH
B32 Isolation Condenser System					
Isolation Valves	16	CV	PB	100 Days	MH
Isolation Valves Operator	16	CV	ESF	100 Days	MH
Condensate Return Valves	4	CV	ESF	100 Days	MH
Condensate Return Valves Operator	4	CV	ESF	100 Days	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Condensate Return Bypass Valve	4	CV	ESF	100 Days	MH
Condensate Return Bypass Valve Operator	4	CV	ESF	100 Days	MH
Upper Header Vent Valve	8	CV	ESF	100 Days	MH
Upper Header Vent Valve Actuator	8	CV	ESF	100 Days	MH
Lower Header Vent Valve	12~~6~~	CV	ESF	100 Days	MH
Lower Header Vent Valve Actuator	16	CV	ESF	100 Days	MH
Pool Cross-Connect Valves	4	RB	ESF	100 Days	MH
Vent Line Temperature Element	8	CV	ESF	100 Days	EH
Condensate Drain Temperature Element	4	CV	ESF	100 Days	EH
Steam Piping Diff Pressure Transmitter	8	CV	ESF	100 Days	EH
Condensate Drain Diff Pressure Transmitter	8	CV	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB	ESF	100 Days	EH
C11 Rod Control and Information System					
Electrical Modules and Cable	All	CB, RB	ESF	72 hr	EH
C12 Control Rod Drive System					
HCU Scram Solenoid Pilot Valve	135	RB	ESF	72 hr	MH
FMCRD Passive Holding Brake	269	CV	ESF	72 hr	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
FMCRD Separation Switch	538	CV	ESF	72 hr	EH
Charging Water Header Pressure Transmitter	4	RB	ESF	72 hr	EH
Electrical Modules and Cable	All	CV, RB	ESF	72 hr	EH
High Pressure CRD Makeup Line Isolation Valves	2	RB	ESF	72 hr	MH
Backup Scram Valve Solenoids	2	RB	ESF	72 hr	EH
C21 Leak Detection and Isolation System					
Pressure Transmitters	All	CV, RB, CB	ESF	100 Days	EH
Temperature Sensors	All	CV, RB, CB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
C31 Feedwater Control System					
Electric Modules and Cable	All	CB, RB	ESF	72 hr	EH
C51 Neutron Monitoring System					
Detector and Tube Assembly	All	CV	ESF	72 hr	MH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
C61 Remote Shutdown System					
Electrical Panels, Modules and Cable	All	RB	ESF	100 Days	C

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
C63 Safety-Related Distributed Control and Information System (DCIS)					
Electrical Modules and Cable	All	RB, CB	ESF	100 Days	C
C71 Reactor Protection System					
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
C72 Diverse Protection System					
Electrical Modules and Cable	All	CB, RB, TB	ESF, ISOL	100 Days	EH
C74 Safety System Logic and Control					
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
C41 Standby Liquid Control System					
Isolation Check Valves	4	CV, RB	PB	100 days	MH
Squib Injection Valves	4	RB	ESF	72 hr	MH
Injection Shut-Off Valves Actuator	4	RB	ESF	100 Days	EH
Nitrogen Charging Globe Valve	2	RB	ESF	100 Days	MH
Nitrogen Charging Globe Valve Actuator	2	RB	ESF	100 Days	EH
Nitrogen Charging Check Valve	2	RB	ESF	72 hr	MH
Accumulator Depressurization Valves	4	RB	ESF	100 Days	MH
Accumulator Depressurization Valves Actuator	4	RB	ESF	100 Days	EH
Accumulator Relief Valve	2	RB	~~PB~~ESF	72 hr	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Injection Shut Off Valves	4	RB	ESF	100 Days	MH
Accumulator Level Instrumentation	8	RB	ESF	100 Days	EH
Accumulator Pressure Instrumentation	8	RB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, RB	ESF	100 Days	EH
D11 Process Radiation Monitoring System					
Isolation Valves	4	CV, RB, CB	ESF	100 Days	MH
Radiation Monitors, Sensors, Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH
E50 Gravity-Driven Cooling System (GDCS)					
GDCS Pool Level Instrumentation	12	CV	ESF	100 Days	EH
GDCS Squib Valve to GDCS Pool	8	CV	ESF	72 hr	MH
GDCS Check Valve to GDCS Pool	8	CV	ESF	72 hr	MH
GDCS Squib Valve to Suppression Pool	4	CV	ESF	72 hr	MH
GDCS Check Valve to Suppression Pool	4	CV	ESF	72 hr	MH
GDCS Squib Valve to Lower Drywell (DW)	12	CV	ESF	72 hr	MH
Electrical Modules and Cable	All	CV, RB, CB	ESF	100 Days	EH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
G21 Fuel and Auxiliary Pools Cooling System					
Containment Isolation Valve (CIV) - Drywell Spray - Outboard	1	RB	PB	100 Days	MH
CIV - Drywell Spray - Inboard	1	CV	PB	100 Days	MH
CIV – Suppression Pool Cooling (SPC) Suction - Outboard	4	RB	PB	100 Days	MH
CIV - SPC Return - Outboard	2	RB	PB	100 Days	MH
CIV - SPC Return - Inboard	2	CV	PB	100 Days	MH
CIV - GDCS Suction - Outboard	1	RB	PB	100 Days	MH
CIV - GDCS Suction - Inboard	1	CV	PB	100 Days	MH
CIV - GDCS Return - Outboard	1	RB	PB	100 Days	MH
CIV - GDCS Return - Inboard	1	CV	PB	100 Days	MH
LPCI Isolation	4	FB, RB	PB	100 Days	MH
IC/PCCS Pool Level Instrumentation	All	RB	ESF	100 Days	EH
Fuel Pool Level Instruments	2	FB	ESF	100 Days	EH
Electrical Modules and Cable	All	CV, FB, RB, CB	ESF	100 Days	EH
G31 Reactor Water Cleanup/Shutdown Cooling System					
CIV - Mid Vessel - Inboard	2	CV	PB, ISOL	100 Days	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)	
CIV - Mid Vessel - Outboard	2	RB	PB, ISOL	100 Days	MH	
CIV - Mid Vessel - Inboard Operator	2	CV	~~PB~~ISOL	72 hr	EH	
CIV - Mid Vessel - Outboard Operator	2	RB	~~PB~~ISOL	72 hr	EH	
CIV - Bottom Drain Inboard	2	CV	PB, ISOL	100 Days	MH	
CIV - Bottom Drain Outboard	2	RB	PB, ISOL	100 Days	MH	
CIV - Bottom Drain Inboard Operator	2	CV	~~PB~~ISOL	72 hr	EH	
CIV - Bottom Drain Outboard Operator	2	RB	~~PB~~ISOL	72 hr	EH	
CIV - Process Sampling Line -Inboard	2	CV	PB, PAMS	100 Days	MH	
CIV - Process Sampling Line -Outboard	2	RB	PB, PAMS	100 Days	MH	
CIV - Process Sampling Line -Inboard Operator	2	CV	~~PB~~ISOL, ~~/~~PAM	100 Days	EH	
CIV - Process Sampling Line -Outboard Operator	2	RB	~~PB~~ISOL, ~~/~~PAM	100 Days	EH	
Return Line Shutoff Valve	2	RB	ISOL	100 Days	MH	
Check Valve to Feedwater	4	RB	ISOL	100 Days	MH	
Mid-vessel Flow Instrumentation	All	CV	ISOL	100 Days	EH	
Mid-vessel Temperature Instrumentation	All	CV	ISOL	100 Days	EH	
Bottom Drain Flow Instrumentation	All	CV	ISOL	100 Days	EH	

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Bottom Drain Temperature Instrumentation	All	CV	ISOL	100 Days	EH
Return Line Flow Instrumentation	All	RB	ISOL	100 Days	EH
Return Line Temperature Instrumentation	All	RB	ISOL	100 Days	EH
Overboard Flow Instrumentation	All	RB	ISOL	100 Days	EH
Overboard Temperature Instrumentation	All	RB	ISOL	100 Days	EH
Electrical Modules and Cables	All	CV, RB	ESF	100 Days	EH
H11 Main Control Room (MCR) Panels					
Panels, Modules and Cables	All	CB	ESF	100 Days	C
H12 MCR Back Room Panels					
Panels, Modules and Cable	All	CB	ESF	100 Days	C
H21 Local Panels and Racks					
Panels, Modules and Cable	All	ALL	ESF	100 Days	EH
N21 Condensate and Feedwater System					
Feed Line Temperature Element	All	ST	ESF	100 Days	EH
Feed Piping Diff Pressure Transmitter	All	ST	ISOL	100 Days	EH
Electrical Modules and Cable	All	ST, CB	ESF	100 Days	EH
P10 Makeup Water System					
Isolation Valves	All	CV, RB	ISOL	100 Days	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
P25 Chilled Water System					
Isolation Valves	~~8~~ All	CV, RB	ISOL	100 Days	MH
P51 Service Air System					
Isolation Valves	~~4~~ All	CV, RB	ISOL	100 Days	MH
P54 High Pressure Nitrogen Supply System					
Isolation Valves	4	CV, RB	ISOL	100 Days	MH
R10 Electrical Power Distribution System (EPDS)					
Cable and Supports	All	CB, FB, RB	ESF	100 Days	EH
R13 Uninterruptible AC Power Supply					
Electrical Modules and Cable	All	CV, CB, RB	ESF	100 Days	EH
R16 Direct Current Power Supply					
Divisional 250 VDC Battery	8	RB	ESF	100 Days	E
Divisional 250 VDC Normal/Standby Battery Charger	12	RB	ESF	100 Days	E
Divisional 250 VDC Power Center	8	RB	ESF	100 Days	E
Divisional 250 VDC Transfer Switch Box	8	RB	ESF	100 Days	E
Isolation Power Center Normal Main Circuit Breaker	4	RB	ISOL	100 Days	E
Isolation Power Center Alternate Main Circuit Breaker	4	RB	ISOL	100 Days	E

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Isolation Power Center Supply Breaker to Division 250 VDC Normal Battery Charger	12	RB	ISOL	100 Days	E
Electrical Modules and Cable	All	CV, CB, RB, TB	ESF	100 Days	E
R31 Raceway System					
Electrical Penetrations	All	CV	PB	100 Days	EH
Conduit, Cable Trays and Supports	All	CV, CB, RB, TB, FB	ESF	100 Days	EH
T10 Containment System					
Vacuum Breakers	3	CV	ESF	100 Days	MH
Vacuum Breaker Isolation Valves	3	CV	ESF	72 hr	MH
Instrumentation and Cables	All	CV	ESF	100 Days	EH
Basemat Internal Melt Arrest Coolability (BiMAC) Temperature Element	ALL	CV	ESF	100 Days	EH
BiMAC Temperature Switch	ALL	CV	ESF	100 Days	EH
T15 Passive Containment Cooling System					
Vent Fan ~~Ball~~ Check Valves	6	CV	ESF	100 Days	MH
Passive Containment Cooling System (PCCS) Vent Fan	6	CV	ESF	100 Days	EH
T31 Containment Inerting System					
Isolation Valve	10	CV, RB	ISOL	100 Days	MH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Electrical Modules and Cable	All	CB, RB	ESF	100 Days	EH
T49 Passive Autocatalytic Recombiner System					
Passive Autocatalytic Recombiners	ALL	CV	ESF	100 Days	MH
T62 Containment Monitoring System					
Containment Isolation Valves	All	CV, RB	ISOL	100 Days	MH
Electrical Modules and Cable	All	CB, CV, RB	ESF	100 Days	EH
Drywell Pressure Transmitters	All	RB	ESF	100 days	EH
Differential Pressure Transmitters	All	RB	ESF	100 days	EH
Suppression Pool Temperature Element	All	CV	ESF	100 days	EH
Lower DW Level Transmitter	All	RB	ESF, PAMS	100 days	EH
Suppression Pool Level Transmitters	All	RB	PAMS	100 days	EH
Suppression Pool Pressure Transmitters	All	RB	PAMS	100 days	EH
Hydrogen Analyzers	All	RB	ESF, PAMS	100 days	EH
Oxygen Analyzers	All	RB	ESF, PAMS	100 days	EH
U40 Reactor Building HVAC					
Building Isolation Dampers	All	RB	ESF	100 Days	EH
Electrical Modules and Cable	All	RB	ESF	100 Days	EH

Table 3.11-1

Electrical and Mechanical Equipment for Environmental Qualification

Components	Quantity	Location (note 1)	Function (note 2)	Required Operation Time (note 3)	Qualification Program (note 4)
Electrical Modules and Cable	All	FB	ESF	100 Days	EH

Note 1: CV – Containment Vessel
ST – Steam Tunnel
RB – Reactor Building
FB – Fuel Building
CB – Control Building
TB – Turbine Building
OO – Outdoors Onsite
When multiple locations are listed, information in this table applies to equipment in all locations listed that also meets the other criteria shown.

Note 2: ESF – Engineered Safety Feature
PAMS – Post Accident Monitoring
ISOL – Containment Isolation
PB – Primary Pressure Boundary
When multiple functions are listed, information in this table applies to equipment associated with either function that also meets the other criteria shown.

Note 3: Required operation time refers to the period of time which the equipment must remain available or operational. Required operation times apply to equipment when all criteria shown in the first four columns of the table are met.

Note 4: E – Electrical Equipment Program
M – Mechanical Equipment Program
C – Computer Based I&C System Program
H – Harsh Environment (omission of H indicates Mild Environment)
Qualification program classifications apply to equipment when all criteria shown in the first four columns of the table are met.

Note 5: Valve operators/actuators are considered to be part of the valve assembly and are generally not listed separately in this table.