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ATTENTION: "REPLACE" directions do not affect the Table of Contents, Therefore no TOC will be issued with the updated material.

TSB2 - TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

REMOVE MANUAL TABLE OF CONTENTS    DATE: 12/17/2008

ADD        MANUAL TABLE OF CONTENTS    DATE: 01/19/2009

CATEGORY: DOCUMENTS    TYPE: TSB2

A001  
HR

ID: TEXT 3.1.3  
ADD: REV: 2

REMOVE: REV:1

CATEGORY: DOCUMENTS TYPE: TSB2  
ID: TEXT 3.3.1.2  
REMOVE: REV:1

ADD: REV: 2

CATEGORY: DOCUMENTS TYPE: TSB2  
ID: TEXT 3.8.4  
REMOVE: REV:2

ADD: REV: 3

CATEGORY: DOCUMENTS TYPE: TSB2  
ID: TEXT LOES  
REMOVE: REV:91

ADD: REV: 92

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# SSES MANUAL

Manual Name: TSB2

Manual Title: TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

## Table Of Contents

Issue Date: 01/19/2009

<u>Procedure Name</u>	<u>Rev</u>	<u>Issue Date</u>	<u>Change ID</u>	<u>Change Number</u>
TEXT LOES <b>Title:</b> LIST OF EFFECTIVE SECTIONS	92	01/19/2009		
TEXT TOC <b>Title:</b> TABLE OF CONTENTS	13	04/23/2008		
TEXT 2.1.1 <b>Title:</b> SAFETY LIMITS (SLS) REACTOR CORE SLS	3	10/04/2007		
TEXT 2.1.2 <b>Title:</b> SAFETY LIMITS (SLS) REACTOR COOLANT SYSTEM (RCS) PRESSURE SL	1	10/04/2007		
TEXT 3.0 <b>Title:</b> LIMITING CONDITION FOR OPERATION (LCO) APPLICABILITY	2	10/12/2006		
TEXT 3.1.1 <b>Title:</b> REACTIVITY CONTROL SYSTEMS SHUTDOWN MARGIN (SDM)	1	03/24/2005		
TEXT 3.1.2 <b>Title:</b> REACTIVITY CONTROL SYSTEMS REACTIVITY ANOMALIES	0	11/18/2002		
TEXT 3.1.3 <b>Title:</b> REACTIVITY CONTROL SYSTEMS CONTROL ROD OPERABILITY	2	01/19/2009		
TEXT 3.1.4 <b>Title:</b> REACTIVITY CONTROL SYSTEMS CONTROL ROD SCRAM TIMES	3	09/29/2006		
TEXT 3.1.5 <b>Title:</b> REACTIVITY CONTROL SYSTEMS CONTROL ROD SCRAM ACCUMULATORS	1	07/06/2005		
TEXT 3.1.6 <b>Title:</b> REACTIVITY CONTROL SYSTEMS ROD PATTERN CONTROL	2	03/24/2005		

## SSES MANUAL

Manual Name: TSB2

Manual Title: TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.1.7 3 10/04/2007  
**Title:** REACTIVITY CONTROL SYSTEMS STANDBY LIQUID CONTROL (SLC) SYSTEM

TEXT 3.1.8 2 10/04/2007  
**Title:** REACTIVITY CONTROL SYSTEMS SCRAM DISCHARGE VOLUME (SDV) VENT AND DRAIN VALVES

TEXT 3.2.1 3 04/09/2007  
**Title:** POWER DISTRIBUTION LIMITS AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

TEXT 3.2.2 2 04/03/2007  
**Title:** POWER DISTRIBUTION LIMITS MINIMUM CRITICAL POWER RATIO (MCPR)

TEXT 3.2.3 1 10/04/2007  
**Title:** POWER DISTRIBUTION LIMITS LINEAR HEAT GENERATION RATE LHGR

TEXT 3.3.1.1 3 04/09/2007  
**Title:** INSTRUMENTATION REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

TEXT 3.3.1.2 2 01/19/2009  
**Title:** INSTRUMENTATION SOURCE RANGE MONITOR (SRM) INSTRUMENTATION

TEXT 3.3.2.1 2 04/09/2007  
**Title:** INSTRUMENTATION CONTROL ROD BLOCK INSTRUMENTATION

TEXT 3.3.2.2 0 11/18/2002  
**Title:** INSTRUMENTATION FEEDWATER - MAIN TURBINE HIGH WATER LEVEL TRIP INSTRUMENTATION

TEXT 3.3.3.1 7 10/27/2008  
**Title:** INSTRUMENTATION POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

TEXT 3.3.3.2 1 04/18/2005  
**Title:** INSTRUMENTATION REMOTE SHUTDOWN SYSTEM

TEXT 3.3.4.1 0 11/18/2002  
**Title:** INSTRUMENTATION END OF CYCLE RECIRCULATION PUMP TRIP (EOC-RPT) INSTRUMENTATION

## SSES MANUAL

**Manual Name:** TSB2

**Manual Title:** TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.3.4.2                   0       11/18/2002  
**Title:** INSTRUMENTATION ANTICIPATED TRANSIENT WITHOUT SCRAM RECIRCULATION PUMP TRIP  
(ATWS-RPT) INSTRUMENTATION

TEXT 3.3.5.1                   3       07/06/2005  
**Title:** INSTRUMENTATION EMERGENCY CORE COOLING SYSTEM (ECCS) INSTRUMENTATION

TEXT 3.3.5.2                   0       11/18/2002  
**Title:** INSTRUMENTATION REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM INSTRUMENTATION

TEXT 3.3.6.1                   3       10/04/2007  
**Title:** INSTRUMENTATION PRIMARY CONTAINMENT ISOLATION INSTRUMENTATION

TEXT 3.3.6.2                   3       10/27/2008  
**Title:** INSTRUMENTATION SECONDARY CONTAINMENT ISOLATION INSTRUMENTATION

TEXT 3.3.7.1                   2       10/27/2008  
**Title:** INSTRUMENTATION CONTROL ROOM EMERGENCY OUTSIDE AIR SUPPLY (CREOAS) SYSTEM  
INSTRUMENTATION

TEXT 3.3.8.1                   3       12/17/2007  
**Title:** INSTRUMENTATION LOSS OF POWER (LOP) INSTRUMENTATION

TEXT 3.3.8.2                   0       11/18/2002  
**Title:** INSTRUMENTATION REACTOR PROTECTION SYSTEM (RPS) ELECTRIC POWER MONITORING

TEXT 3.4.1                     3       04/09/2007  
**Title:** REACTOR COOLANT SYSTEM (RCS) RECIRCULATION LOOPS OPERATING

TEXT 3.4.2                     0       11/18/2002  
**Title:** REACTOR COOLANT SYSTEM (RCS) JET PUMPS

TEXT 3.4.3                     1       01/16/2006  
**Title:** REACTOR COOLANT SYSTEM (RCS) SAFETY/RELIEF VALVES (S/RVS)

TEXT 3.4.4                     0       11/18/2002  
**Title:** REACTOR COOLANT SYSTEM (RCS) RCS OPERATIONAL LEAKAGE

## SSES MANUAL

Manual Name: TSB2

Manual Title: TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.4.5	2	04/19/2007	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RCS PRESSURE ISOLATION VALVE (PIV) LEAKAGE
TEXT 3.4.6	1	04/18/2005	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RCS LEAKAGE DETECTION INSTRUMENTATION
TEXT 3.4.7	2	10/04/2007	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RCS SPECIFIC ACTIVITY
TEXT 3.4.8	1	04/18/2005	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RESIDUAL HEAT REMOVAL (RHR) SHUTDOWN COOLING SYSTEM - HOT SHUTDOWN
TEXT 3.4.9	0	11/18/2002	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RESIDUAL HEAT REMOVAL (RHR) SHUTDOWN COOLING SYSTEM - COLD SHUTDOWN
TEXT 3.4.10	2	05/10/2006	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) RCS PRESSURE AND TEMPERATURE (P/T) LIMITS
TEXT 3.4.11	0	11/18/2002	<b>Title:</b> REACTOR COOLANT SYSTEM (RCS) REACTOR STEAM DOME PRESSURE
TEXT 3.5.1	3	01/16/2006	<b>Title:</b> EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM ECCS - OPERATING
TEXT 3.5.2	0	11/18/2002	<b>Title:</b> EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM ECCS - SHUTDOWN
TEXT 3.5.3	1	04/18/2005	<b>Title:</b> EMERGENCY CORE COOLING SYSTEMS (ECCS) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEM RCIC SYSTEM
TEXT 3.6.1.1	2	10/04/2007	<b>Title:</b> CONTAINMENT SYSTEMS PRIMARY CONTAINMENT
TEXT 3.6.1.2	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS PRIMARY CONTAINMENT AIR LOCK

## SSES MANUAL

**Manual Name:** TSB2

**Manual Title:** TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.6.1.3	8	01/23/2008	<b>Title:</b> CONTAINMENT SYSTEMS PRIMARY CONTAINMENT ISOLATION VALVES (PCIVS)
TEXT 3.6.1.4	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS CONTAINMENT PRESSURE
TEXT 3.6.1.5	1	10/05/2005	<b>Title:</b> CONTAINMENT SYSTEMS DRYWELL AIR TEMPERATURE
TEXT 3.6.1.6	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS SUPPRESSION CHAMBER-TO-DRYWELL VACUUM BREAKERS
TEXT 3.6.2.1	2	12/17/2007	<b>Title:</b> CONTAINMENT SYSTEMS SUPPRESSION POOL AVERAGE TEMPERATURE
TEXT 3.6.2.2	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS SUPPRESSION POOL WATER LEVEL
TEXT 3.6.2.3	1	01/16/2006	<b>Title:</b> CONTAINMENT SYSTEMS RESIDUAL HEAT REMOVAL (RHR) SUPPRESSION POOL COOLING
TEXT 3.6.2.4	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS RESIDUAL HEAT REMOVAL (RHR) SUPPRESSION POOL SPRAY
TEXT 3.6.3.1	2	06/13/2006	<b>Title:</b> CONTAINMENT SYSTEMS PRIMARY CONTAINMENT HYDROGEN RECOMBINERS
TEXT 3.6.3.2	1	04/18/2005	<b>Title:</b> CONTAINMENT SYSTEMS DRYWELL AIR FLOW SYSTEM
TEXT 3.6.3.3	0	11/18/2002	<b>Title:</b> CONTAINMENT SYSTEMS PRIMARY CONTAINMENT OXYGEN CONCENTRATION
TEXT 3.6.4.1	7	10/04/2007	<b>Title:</b> CONTAINMENT SYSTEMS SECONDARY CONTAINMENT

## SSES MANUAL

**Manual Name:** TSB2

**Manual Title:** TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.6.4.2	2	01/03/2005	<b>Title:</b> CONTAINMENT SYSTEMS SECONDARY CONTAINMENT ISOLATION VALVES (SCIVS)
TEXT 3.6.4.3	4	09/21/2006	<b>Title:</b> CONTAINMENT SYSTEMS STANDBY GAS TREATMENT (SGT) SYSTEM
TEXT 3.7.1	2	05/02/2008	<b>Title:</b> PLANT SYSTEMS RESIDUAL HEAT REMOVAL SERVICE WATER (RHRSW) SYSTEM AND THE ULTIMATE HEAT SINK (UHS)
TEXT 3.7.2	2	05/02/2008	<b>Title:</b> PLANT SYSTEMS EMERGENCY SERVICE WATER (ESW) SYSTEM
TEXT 3.7.3	0	11/18/2002	<b>Title:</b> PLANT SYSTEMS CONTROL ROOM EMERGENCY OUTSIDE AIR SUPPLY (CREOAS) SYSTEM
TEXT 3.7.4	0	11/18/2002	<b>Title:</b> PLANT SYSTEMS CONTROL ROOM FLOOR COOLING SYSTEM
TEXT 3.7.5	1	10/04/2007	<b>Title:</b> PLANT SYSTEMS MAIN CONDENSER OFFGAS
TEXT 3.7.6	1	01/17/2005	<b>Title:</b> PLANT SYSTEMS MAIN TURBINE BYPASS SYSTEM
TEXT 3.7.7	1	10/04/2007	<b>Title:</b> PLANT SYSTEMS SPENT FUEL STORAGE POOL WATER LEVEL
TEXT 3.8.1	7	04/23/2008	<b>Title:</b> ELECTRICAL POWER SYSTEMS AC SOURCES - OPERATING
TEXT 3.8.2	0	11/18/2002	<b>Title:</b> ELECTRICAL POWER SYSTEMS AC SOURCES - SHUTDOWN
TEXT 3.8.3	1	04/23/2008	<b>Title:</b> ELECTRICAL POWER SYSTEMS DIESEL FUEL OIL LUBE OIL AND STARTING AIR



# SSES MANUAL

Manual Name: TSB2

Manual Title: TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.8.4 3 01/19/2009  
**Title:** ELECTRICAL POWER SYSTEMS DC SOURCES - OPERATING

TEXT 3.8.5 1 12/14/2006  
**Title:** ELECTRICAL POWER SYSTEMS DC SOURCES - SHUTDOWN

TEXT 3.8.6 1 12/14/2006  
**Title:** ELECTRICAL POWER SYSTEMS BATTERY CELL PARAMETERS

TEXT 3.8.7 3 03/31/2006  
**Title:** ELECTRICAL POWER SYSTEMS DISTRIBUTION SYSTEMS - OPERATING

TEXT 3.8.8 0 11/18/2002  
**Title:** ELECTRICAL POWER SYSTEMS DISTRIBUTION SYSTEMS - SHUTDOWN

TEXT 3.9.1 0 11/18/2002  
**Title:** REFUELING OPERATIONS REFUELING EQUIPMENT INTERLOCKS

TEXT 3.9.2 0 11/18/2002  
**Title:** REFUELING OPERATIONS REFUEL POSITION ONE-ROD-OUT INTERLOCK

TEXT 3.9.3 0 11/18/2002  
**Title:** REFUELING OPERATIONS CONTROL ROD POSITION

TEXT 3.9.4 0 11/18/2002  
**Title:** REFUELING OPERATIONS CONTROL ROD POSITION INDICATION

TEXT 3.9.5 0 11/18/2002  
**Title:** REFUELING OPERATIONS CONTROL ROD OPERABILITY - REFUELING

TEXT 3.9.6 1 10/04/2007  
**Title:** REFUELING OPERATIONS REACTOR PRESSURE VESSEL (RPV) WATER LEVEL

TEXT 3.9.7 0 11/18/2002  
**Title:** REFUELING OPERATIONS RESIDUAL HEAT REMOVAL (RHR) - HIGH WATER LEVEL

# SSES MANUAL

**Manual Name:** TSB2

**Manual Title:** TECHNICAL SPECIFICATIONS BASES UNIT 2 MANUAL

TEXT 3.9.8 0 11/18/2002

**Title:** REFUELING OPERATIONS RESIDUAL HEAT REMOVAL (RHR) - LOW WATER LEVEL

TEXT 3.10.1 1 01/23/2008

**Title:** SPECIAL OPERATIONS INSERVICE LEAK AND HYDROSTATIC TESTING OPERATION

TEXT 3.10.2 0 11/18/2002

**Title:** SPECIAL OPERATIONS REACTOR MODE SWITCH INTERLOCK TESTING

TEXT 3.10.3 0 11/18/2002

**Title:** SPECIAL OPERATIONS SINGLE CONTROL ROD WITHDRAWAL - HOT SHUTDOWN

TEXT 3.10.4 0 11/18/2002

**Title:** SPECIAL OPERATIONS SINGLE CONTROL ROD WITHDRAWAL - COLD SHUTDOWN

TEXT 3.10.5 0 11/18/2002

**Title:** SPECIAL OPERATIONS SINGLE CONTROL ROD DRIVE (CRD) REMOVAL - REFUELING

TEXT 3.10.6 0 11/18/2002

**Title:** SPECIAL OPERATIONS MULTIPLE CONTROL ROD WITHDRAWAL - REFUELING

TEXT 3.10.7 1 03/24/2005

**Title:** SPECIAL OPERATIONS CONTROL ROD TESTING - OPERATING

TEXT 3.10.8 2 04/09/2007

**Title:** SPECIAL OPERATIONS SHUTDOWN MARGIN (SDM) TEST - REFUELING

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
TOC	Table of Contents	13
B 2.0	SAFETY LIMITS BASES	
	Page TS / B 2.0-1	1
	Page TS / B 2.0-2	3
	Page TS / B 2.0-3	4
	Page TS / B 2.0-4	6
	Page TS / B 2.0-5	1
	Pages TS / B 2.0-6 through TS / B 2.0-8	1
B 3.0	LCO AND SR APPLICABILITY BASES	
	Page TS / B 3.0-1	1
	Pages TS / B 3.0-2 through TS / B 3.0-4	0
	Pages TS / B 3.0-5 through TS / B 3.0-7	1
	Pages TS / B 3.0-8 through TS / B 3.0-9	2
	Page TS / B 3.0-10	1
	Page TS / B 3.0-11	2
	Page TS / B 3.0-11a	0
	Page TS / B 3.0-12	1
	Pages TS / B 3.0-13 through TS / B 3.0-15	2
	Pages TS / B 3.0-16 and TS / B 3.0-17	0
B 3.1	REACTIVITY CONTROL BASES	
	Pages B 3.1-1 through B 3.1-4	0
	Page TS / B 3.1-5	1
	Pages TS / B 3.1-6 and TS / B 3.1-7	2
	Pages B 3.1-8 through B 3.1-13	0
	Page TS / B 3.1-14	1
	Page TS / B 3.1-15	0
	Page TS / B 3.1-16	1
	Pages TS / B 3.1-17 through TS / B 3.1-19	0
	Pages TS / B 3.1-20 and TS / B 3.1-21	1
	Page TS / B 3.1-22	0
	Page TS / B 3.1-23	1
	Page TS / B 3.1-24	0
	Page TS / B 3.1-25	1
	Page TS / B 3.1-26	0
	Page TS / B 3.1-27	1
	Page TS / B 3.1-28	2
	Page TS / 3.1-29	1
	Pages B 3.1-30 through B 3.1-33	0
	Pages TS / B 3.1-34 through TS / B 3.1-36	1
	Pages TS / B 3.1-37 and TS / B 3.1-38	2
	Pages TS / B 3.1-39 and TS / B 3.1-40	2
	Page TS / B 3.1-40a	0
	Page TS / B 3.1-41	1

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Page TS / B 3.1-42	2
	Pages TS / B 3.1-43	1
	Page TS / B 3.1-44	0
	Page TS / B 3.1-45	3
	Page TS / B 3.1-46	0
	Page TS / B 3.1-47	1
	Pages TS / B 3.1-48 and TS / B 3.1-49	1
	Page B 3.1-50	0
	Page TS / B 3.1-51	2
B 3.2	POWER DISTRIBUTION LIMITS BASES	
	Page TS / B 3.2-1	2
	Page TS / B 3.2-2	1
	Page TS / B 3.2-3	3
	Page TS / B 3.2-4	1
	Pages TS / B 3.2-5 and TS / B 3.2-6	3
	Page TS / B 3.2-7	2
	Pages TS / B 3.2-8 and TS / B 3.2-9	4
	Page TS / B 3.2-10	2
	Pages TS / B 3.2-11 through TS / B 3.2-13	1
B 3.3	INSTRUMENTATION	
	Pages TS / B 3.3-1 through TS / B 3.3-4	1
	Page TS / B 3.3-5	2
	Page TS / B 3.3-6	1
	Pages TS / B 3.3-7 through TS / B 3.3-12	3
	Page TS / B 3.3-13	2
	Page TS / B 3.3-14	3
	Pages TS / B 3.3-15 and TS / B 3.3-16	2
	Pages TS / B 3.3-17 and TS / B 3.3-18	3
	Pages TS / B 3.3-19 through TS / B 3.3-27	2
	Pages TS / B 3.3-28 through TS / B 3.3-30	3
	Page TS / B 3.3-31	2
	Page TS / B 3.3-32	4
	Page TS / B 3.3-33	3
	Page TS / B 3.3-34	2
	Pages TS / B 3.3-34a though TS / B 3.3-34i	0
	Pages TS / B 3.3-35 and TS / B 3.3-36	2
	Pages TS / B.3.3-37 and TS / B 3.3-38	1
	Page TS / B 3.3-39	2
	Pages TS / B 3.3-40 through TS / B 3.3-43	2
	Pages TS / B 3.3-44 through TS / B 3.3-54	3
	Pages TS / B 3.3-54a through TS / B 3.3-54e	0
	Pages B 3.3-55 through B 3.3-63	0
	Pages TS / B 3.3-64 and TS / B 3.3-65	2
	Page TS / B 3.3-66	4

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Page TS / B 3.3-67	3
	Page TS / B 3.3-68	4
	Page TS / B 3.3-69	5
	Page TS / B 3.3-70	4
	Page TS / B 3.3-71	3
	Pages TS / B 3.3-72 and TS / B 3.3-73	2
	Page TS / B 3.3-74	3
	Page TS / B 3.3-75	2
	Pages TS / B 3.3-75a and TS / B 3.3-75 b	6
	Page TS / B 3.3-75c	5
	Pages B 3.3-76 and TS / B 3.3-77	0
	Page TS / B 3.3-78	1
	Pages B 3.3-79 through B 3.3-91	0
	Pages TS / B 3.3-92 through TS / B 3.3-103	1
	Page TS / B 3.3-104	2
	Pages TS / B 3.3-105 and TS / B 3.3-106	1
	Page TS / B 3.3-107	2
	Page TS / B 3.3-108	1
	Page TS / B 3.3-109	2
	Pages TS / B 3.3-110 through TS / B 3.3-112	1
	Page TS / B 3.3-113	2
	Page TS / B 3.3-114	1
	Page TS / B 3.3-115 through TS / B 3.3-118	2
	Pages TS / B 3.3-119 through TS / B 3.3-120	1
	Pages TS / B 3.3-121 and TS / B 3.3-122	2
	Page TS / B 3.3-123	1
	Page TS / B 3.3-124	2
	Page TS / B 3.3-124a	0
	Page TS / B 3.3-125	1
	Page TS / B 3.3-126	2
	Page TS / B 3.3-127	3
	Page TS / B 3.3-128	2
	Pages TS / B 3.3-129 through TS / B 3.3-131	1
	Page TS / B 3.3-132	2
	Pages TS / B 3.3-133 and TS / B 3.3-134	1
	Pages B 3.3-135 through B 3.3-137	0
	Page TS / B 3.3-138	1
	Pages B 3.3-139 through B 3.3-149	0
	Pages TS / B 3.3-150 and TS / B 3.3-151	1
	Page TS / B 3.3-152	2
	Page TS / B 3.3-153	1
	Page TS / B 3.3-154	2
	Page TS / B 3.3-155	1
	Pages TS / B 3.3-156 through TS / B 3.3-158	2
	Pages TS / B 3.3-159 through TS / B 3.3-161	1
	Page TS / B 3.3-162	1

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Page TS / B 3.3-163	2
	Page TS / B 3.3-164	1
	Pages TS / B 3.3-165 and TS / B 3.3-166	2
	Pages TS / B 3.3-167 and TS / B 3.3-168	1
	Pages TS / B 3.3-169 and TS / B 3.3-170	2
	Pages TS / B 3.3-171 through TS / B 3.3-177	1
	Page TS / B 3.3-178	2
	Page TS / B 3.3-179	3
	Page TS / B 3.3-179a	2
	Page TS / B 3.3-180	1
	Page TS / B 3.3-181	3
	Page TS / B 3.3-182	1
	Page TS / B 3.3-183	2
	Page TS / B 3.3-184	1
	Page TS / B 3.3-185	3
	Page TS / B 3.3-186	1
	Pages TS / B 3.3-187 and TS / B 3.3-188	2
	Pages TS / B 3.3-189 through TS / B 3.3-191	1
	Page TS / B 3.3-192	0
	Page TS / B 3.3-193	1
	Pages TS / B 3.3-194 and TS / B 3.3-195	0
	Page TS / B 3.3-196	2
	Pages TS / B 3.3-197 through TS / B 3.3-205	0
	Page TS / B 3.3-206	1
	Pages B 3.3-207 through B 3.3-209	0
	Page TS / B 3.3-210	1
	Page TS / B 3.3-211	2
	Pages TS / B 3.3-212 and TS / B 3.3-213	1
	Pages B 3.3-214 through B 3.3-220	0
<b>B 3.4</b>	<b>REACTOR COOLANT SYSTEM BASES</b>	
	Pages TS / B 3.4-1 and TS / B 3.4-2	1
	Pages TS / B 3.4-3 and TS / B 3.4-4	4
	Pages TS / B 3.4-5 and TS / B 3.4-9	3
	Pages B 3.4-10 through B 3.4-14	0
	Page TS / B 3.4-15	1
	Pages TS / B 3.4-16 through TS / B 3.4-18	2
	Pages B 3.4-19 through B 3.4-27	0
	Pages TS / B 3.4-28 and TS / B 3.4-29	1
	Pages B 3.4-30 through B 3.3-31	0
	Page TS / B 3.4-32	1
	Page B 3.4-33 and B 3.4-34	0
	Pages TS / B 3.4-35 and TS / B 3.4-36	1
	Page TS / B 3.4-37	2
	Page B 3.4-38	1
	Pages B 3.4-39 and B 3.4-40	0

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Page TS / B 3.4-41	1
	Pages B 3.4-42 through B 3.4-48	0
	Page TS / B 3.4-49	3
	Pages TS / B 3.4-50 through TS / B 3.4-52	2
	Page TS / B 3.4-53	1
	Pages TS / B 3.4-54 and TS / B 3.4-55	2
	Page TS / B 3.4-56	1
	Page TS / B 3.4-57	2
	Pages TS / B 3.4-58 through TS / B 3.4-60	1
B 3.5	<b>ECCS AND RCIC BASES</b>	
	Pages TS / B 3.5-1 and TS / B 3.5-2	1
	Pages TS / B 3.5-3 through TS / B 3.5-6	2
	Pages TS / B 3.5-7 through TS / B 3.5-10	1
	Pages TS / B 3.5-11 and TS / B 3.5-12	2
	Pages TS / B 3.5-13 and TS / B 3.5-14	1
	Pages TS / B 3.5-15 and TS / B.3.5-16	2
	Page TS / B 3.5-17	3
	Page TS / B 3.5-18	1
	Pages B 3.5-19 through B 3.5-24	0
	Pages TS / B 3.5-25 through TS / B 3.5-27	1
	Pages B 3.5-28 through B 3.5-31	0
B 3.6	<b>CONTAINMENT SYSTEMS BASES</b>	
	Page TS / B 3.6-1	2
	Page TS / B 3.6-1a	3
	Page TS / B 3.6-2 and TS / B 3.6-3	3
	Page TS / B 3.6-4	4
	Page TS / B 3.6-5	3
	Page TS / B 3.6-6	4
	Pages TS / B 3.6-6a and TS / B 3.6-6b	2
	Page TS / B 3.6-6c	0
	Pages B 3.6-7 through B 3.6-14	0
	Page TS / B 3.6-15	3
	Page TS / B 3.6-15a	0
	Page TS / B 3.6-15b	2
	Pages TS / B 3.6-16 and TS / B 3.6-17	2
	Page TS / B 3.6-17a	0
	Pages TS / B 3.6-18 and TS / B 3.6-19	1
	Page TS / B 3.6-20	2
	Page TS / B 3.6-21	3
	Pages TS / B 3.6-21a and TS / B 3.6-21b	0
	Pages TS / B 3.6-22 and TS / B 3.6-23	2
	Pages TS / B 3.6-24 and TS / B 3.6-25	1
	Page TS / B 3.6-26	3
	Page TS / B 3.6-27	3

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Page TS / B 3.6-28	6
	Page TS / B 3.6-29	3
	Page TS / B 3.6-29a	0
	Page TS / B 3.6-30	2
	Page TS / B 3.6-31	3
	Page TS / B 3.6-32	1
	Page TS / B 3.6-33	2
	Page TS / B 3.6-34	1
	Page TS / B 3.6-35	3
	Pages TS / B 3.6-36 and TS / B 3.6-37	2
	Page TS / B 3.6-38	3
	Page TS / B 3.6-39	7
	Pages B 3.6-40 through B 3.6-42	0
	Pages TS / B 3.6-43 and TS / B 3.6-44	1
	Page TS / B 3.6-45	2
	Pages TS / B 3.6-46 through TS / B 3.6-50	1
	Page TS / B 3.6-51	2
	Pages B 3.6-52 through B 3.6-55	0
	Pages TS / B 3.6-56 and TS / B 3.6-57	2
	Pages B 3.6-58 through B 3.6-62	0
	Pages TS / B 3.6-63 and TS / B 3.6-64	1
	Pages B 3.6-65 through B 3.6-68	0
	Pages B 3.6-69 through B 3.6-71	1
	Page TS / B 3.6-72	2
	Pages TS / B 3.6-73 and TS / B 3.6-74	1
	Pages B 3.6-75 and B 3.6-76	0
	Page TS / B 3.6-77	1
	Pages B 3.6-78 through B 3.6-82	0
	Page TS / B 3.6-83	3
	Page TS / B 3.6-84	2
	Page TS / B 3.6-85	4
	Page TS / B 3.6-86 through TS / B 3.6-87a	2
	Page TS / B 3.6-88	4
	Page TS / B 3.6-89	2
	Page TS / B 3.6-90	3
	Pages TS / B 3.6-91 through TS / B 3.6-95	1
	Page TS / B 3.6-96	2
	Pages TS / B 3.6-97 and TS / B 3.6-98	1
	Page TS / B 3.6-99	2
	Page TS / B 3.6-99a	0
	Pages TS / B 3.6-100 and TS / B 3.6-101	1
	Pages TS / B 3.6-102 and TS / B 3.6-103	2
	Page TS / B 3.6-104	3
	Page TS / B 3.6-105	2
	Page TS / B 3.6-106	3



SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
B 3.7	PLANT SYSTEMS BASES	
	Page TS / B 3.7-1	3
	Page TS / B 3.7-2	4
	Pages TS / B 3.7-3 through TS / B 3.7-5	3
	Page TS / B 3.7-5a	0
	Page TS / B 3.7-6 and TS / B 3.7-6a	2
	Pages TS / B 3.7-6b and TS / B 3.7-6c	1
	Page TS / B 3.7-7	3
	Page TS / B 3.7-8	2
	Pages B 3.7-9 through B 3.7-11	0
	Pages TS / B 3.7-12 and TS / B 3.7-13	1
	Pages TS / B 3.7-14 through TS / B 3.7-18	2
	Page TS / B 3.7-18a	0
	Pages TS / B 3.7-19 through TS / B 3.7-24	1
	Pages TS / B 3.7-25 and TS / B 3.7-26	0
	Pages TS / B 3.7-27 through TS / B 3.7-29	2
	Pages TS / B 3.7-30 and TS / B 3.7-31	1
	Page TS / B 3.7-32	0
	Page TS / B 3.7-33	1
B 3.8	ELECTRICAL POWER SYSTEMS BASES	
	Pages B 3.8-1 through B 3.8-3	0
	Page TS / B 3.8-4	1
	Pages TS / B 3.8-4a and TS / B 3.8-4b	0
	Pages TS / B 3.8-5 and TS / B 3.8-6	3
	Page TS / B 3.8-6a	1
	Pages B 3.8-7 and B 3.8-8	0
	Page TS / B 3.8-9	2
	Pages TS / B 3.8-10 and TS / B 3.8-11	1
	Pages B 3.8-12 through B 3.8-18	0
	Page TS / B 3.8-19	1
	Pages B 3.8-20 through B 3.8-22	0
	Page TS / B 3.8-23	1
	Page B 3.8-24	0
	Pages TS / B 3.8-25 and TS / B 3.8-26	1
	Pages B 3.8-27 through B 3.8-35	0
	Page TS / B 3.8-36	1
	Page TS / B 3.8-37	0
	Page TS / B 3.8-38	1
	Pages TS / B 3.8-39 through TS / B 3.8-46	0
	Page TS / B 3.8-47	1
	Pages TS / B 3.8-48 through TS / B 3.8-50	0
	Page TS / B 3.8-51	1
	Pages TS / B 3.8-52 through TS / B 3.8-55	0

SUSQUEHANNA STEAM ELECTRIC STATION  
**LIST OF EFFECTIVE SECTIONS (TECHNICAL SPECIFICATIONS BASES)**

<u>Section</u>	<u>Title</u>	<u>Revision</u>
	Pages TS / B 3.8-56 through TS / B 3.8-59	2
	Pages TS / B 3.8-60 through TS / B 3.8-64	3
	Page TS / B 3.8-65	4
	Page TS / B 3.8-66	5
	Pages TS / B 3.8-67 and TS / B 3.8-68	4
	Page TS / B 3.8-69	5
	Pages TS / B 3.8-70 through TS / B 3.8-83	1
	Pages TS / B 3.8-83A through TS / B 3.8-83D	0
	Pages B 3.8-84 through B 3.8-85	0
	Page TS / B 3.8-86	1
	Page TS / B 3.8-87	2
	Pages TS / B 3.8-88 through TS / B 3.8-93	1
	Pages B 3.8-94 through B 3.8-99	0
B 3.9	REFUELING OPERATIONS BASES	
	Pages TS / B 3.9-1 and TS / B 3.9-2	1
	Page TS / B 3.9-2a	1
	Pages TS / B 3.9-3 and TS / B 3.9-4	1
	Pages B 3.9-5 through B 3.9-18	0
	Pages TS / B 3.9-19 through TS / B 3.9-21	1
	Pages B 3.9-22 through B 3.9-30	0
B 3.10	SPECIAL OPERATIONS BASES	
	Page TS / B 3.10-1	2
	Pages TS / B 3.10-2 through TS / B 3.10-5	1
	Pages B 3.10-6 through B 3.10-32	0
	Page TS / B 3.10-33	2
	Page B 3.10-34	0
	Page B 3.10-35	1
	Pages B 3.10-36 and B 3.10-37	0
	Page B 3.10-38	1
	Page TS / B 3.10-39	2

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B 3.1 REACTIVITY CONTROL SYSTEMS

B 3.1.3 Control Rod OPERABILITY

BASES

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**BACKGROUND** Control rods are components of the control rod drive (CRD) System, which is the primary reactivity control system for the reactor. In conjunction with the Reactor Protection System, the CRD System provides the means for the reliable control of reactivity changes to ensure under conditions of normal operation, including anticipated operational occurrences, that specified acceptable fuel design limits are not exceeded. In addition, the control rods provide the capability to hold the reactor core subcritical under all conditions and to limit the potential amount and rate of reactivity increase caused by a malfunction in the CRD System. The CRD System is designed to satisfy the requirements of GDC 26, GDC 27, GDC 28, and GDC 29 (Ref. 1).

The CRD System consists of 185 locking piston control rod drive mechanisms (CRDMs) and a hydraulic control unit for each drive mechanism. The locking piston type CRDM is a double acting hydraulic piston, which uses condensate water as the operating fluid. Accumulators provide additional energy for scram. An index tube and piston, coupled to the control rod, are locked at fixed increments by a collet mechanism. The collet fingers engage notches in the index tube to prevent unintentional withdrawal of the control rod, but without restricting insertion.

This Specification, along with LCO 3.1.4, "Control Rod Scram Times," and LCO 3.1.5, "Control Rod Scram Accumulators," ensure that the performance of the control rods in the event of a Design Basis Accident (DBA) or transient meets the assumptions used in the safety analyses of References 2, 3, and 4.

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**APPLICABLE SAFETY ANALYSES** The analytical methods and assumptions used in the evaluations involving control rods are presented in References 2, 3, and 4. The control rods provide the primary means for rapid reactivity control (reactor scram), for maintaining the reactor subcritical and for limiting the potential effects of reactivity insertion events caused by malfunctions in the CRD System.

(continued)

BASES

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APPLICABLE  
SAFETY  
ANALYSES  
(continued)

The capability to insert the control rods provides assurance that the assumptions for scram reactivity in the DBA and transient analyses are not violated. Since the SDM ensures the reactor will be subcritical with the highest worth control rod withdrawn (assumed single failure), the additional failure of a second control rod to insert, if required, could invalidate the demonstrated SDM and potentially limit the ability of the CRD System to hold the reactor subcritical. If the control rod is stuck at an inserted position and becomes decoupled from the CRD, a control rod drop accident (CRDA) can possibly occur. Therefore, the requirement that all control rods be OPERABLE ensures the CRD System can perform its intended function.

The control rods also protect the fuel from damage which could result in release of radioactivity. The limits protected are the MCPR Safety Limit (SL) (see Bases for SL 2.1.1, "Reactor Core SLs," and LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)"), the 1% cladding plastic strain fuel design limit (see Bases for LCO 3.2.3, "LINEAR HEAT GENERATION RATE (LHGR)," and LCO 3.2.4, "Average Power Range Monitor (APRM) Gain and Setpoints"), and the fuel damage limit (see Bases for LCO 3.1.6, "Rod Pattern Control") during reactivity insertion events.

The negative reactivity insertion (scram) provided by the CRD System provides the analytical basis for determination of plant thermal limits and provides protection against fuel damage limits during a CRDA. The Bases for LCO 3.1.4, LCO 3.1.5, and LCO 3.1.6 discuss in more detail how the SLs are protected by the CRD System.

Control rod OPERABILITY satisfies Criterion 3 of the NRC Policy Statement (Ref. 5).

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LCO

The OPERABILITY of an individual control rod is based on a combination of factors, primarily, the scram insertion times, the control rod coupling integrity, and the ability to determine the control rod position. Accumulator OPERABILITY is addressed by LCO 3.1.5. The associated scram accumulator status for a control rod only affects the scram insertion times; therefore, an inoperable accumulator does not immediately require declaring a control rod inoperable. Although not all control rods are required to be OPERABLE to

(continued)

BASES

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LCO  
(continued) satisfy the intended reactivity control requirements, strict control over the number and distribution of inoperable control rods is required to satisfy the assumptions of the DBA and transient analyses.

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APPLICABILITY In MODES 1 and 2, the control rods are assumed to function during a DBA or transient and are therefore required to be OPERABLE in these MODES. In MODES 3 and 4, control rods are not able to be withdrawn (except as permitted by LCO 3.10.3 and LCO 3.10.4) since the reactor mode switch is in shutdown and a control rod block is applied. This provides adequate requirements for control rod OPERABILITY during these conditions. Control rod requirements in MODE 5 are located in LCO 3.9.5, "Control Rod OPERABILITY—Refueling."

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ACTIONS The ACTIONS Table is modified by a Note indicating that a separate Condition entry is allowed for each control rod. This is acceptable, since the Required Actions for each Condition provide appropriate compensatory actions for each inoperable control rod. Complying with the Required Actions may allow for continued operation, and subsequent inoperable control rods are governed by subsequent Condition entry and application of associated Required Actions.

A.1, A.2, A.3 and A.4

A control rod is considered stuck if it will not insert by either CRD drive water or scram pressure. With a fully inserted control rod stuck, no actions are required as long as the control rod remains fully inserted. The Required Actions are modified by a Note, which allows the rod worth minimizer (RWM) to be bypassed if required to allow continued operation. LCO 3.3.2.1, "Control Rod Block Instrumentation," provides additional requirements when the RWM is bypassed to ensure compliance with the CRDA analysis. With one withdrawn control rod stuck, the local scram reactivity rate assumptions may not be met if the stuck control rod separation criteria are not met. This separation criteria stipulates that a stuck control rod is equivalent to a "slow" control rod for purposes of separation requirements between "slow" control rods.

(continued)

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BASES

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ACTIONS

A.1, A.2, A.3 and A.4 (continued)

Therefore, a verification that the separation criteria are met must be performed immediately. The separation criteria are not met if a) the stuck control rod occupies a position adjacent to two "slow" control rods, b) the stuck control rod occupies a position adjacent to one "slow" control rod and the one "slow" control rod is also adjacent to another "slow" control rod, or, c) if the stuck control rod occupies a location adjacent to one "slow" control rod when there is another pair of "slow" control rods adjacent to one another. Adjacent control rods include control rods that are either face or diagonally adjacent. The description of "slow" control rods is provided in LCO 3.1.4, "Control Rod Scram Times." In addition, the associated control rod drive must be disarmed in 2 hours. The allowed Completion Time of 2 hours is acceptable, considering the reactor can still be shut down, assuming no additional control rods fail to insert, and provides a reasonable time to perform the Required Action in an orderly manner. Isolating the control rod from scram prevents damage to the CRDM. The control rod can be isolated from scram and normal insert and withdraw pressure, yet still maintain cooling water to the CRD.

Monitoring of the insertion capability of each withdrawn control rod must also be performed within 24 hours from discovery of Condition A concurrent with THERMAL POWER greater than the low power setpoint (LPSP) of the RWM. SR 3.1.3.3 performs periodic tests of the control rod insertion capability of withdrawn control rods. Testing each withdrawn control rod ensures that a generic problem does not exist. This Completion Time also allows for an exception to the normal "time zero" for beginning the allowed outage time "clock." The Required Action A.3 Completion Time only begins upon discovery of Condition A concurrent with THERMAL POWER greater than the actual LPSP of the RWM, since the notch insertions may not be compatible with the requirements of rod pattern control (LCO 3.1.6) and the RWM (LCO 3.3.2.1). The allowed Completion Time provides a reasonable time to test the control rods, considering the potential for a need to reduce power to perform the tests. To allow continued operation with a withdrawn control rod stuck, an evaluation of adequate SDM is also required within 72 hours. Should a DBA or transient require a shutdown, to preserve the single failure criterion, an additional control rod would have to be assumed to fail to insert when

(continued)

BASES

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ACTIONS

A.1, A.2, A.3 and A.4 (continued)

required. Therefore, the original SDM demonstration may not be valid. The SDM must therefore be evaluated (by measurement or analysis) with the stuck control rod at its stuck position and the highest worth OPERABLE control rod assumed to be fully withdrawn.

The allowed Completion Time of 72 hours to verify SDM is adequate, considering that with a single control rod stuck in a withdrawn position, the remaining OPERABLE control rods are capable of providing the required scram and shutdown reactivity. Failure to reach MODE 4 is only likely if an additional control rod adjacent to the stuck control rod also fails to insert during a required scram. Even with the postulated additional single failure of an adjacent control rod to insert, sufficient reactivity control remains to reach and maintain MODE 3 conditions.

B.1

With two or more withdrawn control rods stuck, the plant must be brought to MODE 3 within 12 hours. The occurrence of more than one control rod stuck at a withdrawn position increases the probability that the reactor cannot be shut down if required. Insertion of all insertable control rods eliminates the possibility of an additional failure of a control rod to insert. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

C.1 and C.2

With one or more control rods inoperable for reasons other than being stuck in the withdrawn position, operation may continue, provided the control rods are fully inserted

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(continued)

BASES

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ACTIONS

C.1 and C.2 (continued)

within 3 hours and disarmed (electrically or hydraulically) within 4 hours. Inserting a control rod ensures the shutdown and scram capabilities are not adversely affected. The control rod is disarmed to prevent inadvertent withdrawal during subsequent operations. The control rods can be hydraulically disarmed by closing the drive water and exhaust water isolation valves. The control rods can be electrically disarmed by disconnecting power from all four directional control valve solenoids. Required Action C.1 is modified by a Note, which allows the RWM to be bypassed if required to allow insertion of the inoperable control rods and continued operation. LCO 3.3.2.1 provides additional requirements when the RWM is bypassed to ensure compliance with the CRDA analysis.

The allowed Completion Times are reasonable, considering the small number of allowed inoperable control rods, and provide time to insert and disarm the control rods in an orderly manner and without challenging plant systems.

D.1 and D.2

Out of sequence control rods may increase the potential reactivity worth of a dropped control rod during a CRDA. At  $\leq 10\%$  RTP, the generic banked position withdrawal sequence (BPWS) analysis requires inserted control rods not in compliance with BPWS to be separated by at least two OPERABLE control rods in all directions, including the diagonal. Therefore, if two or more inoperable control rods are not in compliance with BPWS and not separated by at least two OPERABLE control rods, action must be taken to restore compliance with BPWS or restore the control rods to OPERABLE status. Condition D is modified by a Note indicating that the Condition is not applicable when  $> 10\%$  RTP, since the BPWS is not required to be followed under these conditions, as described in the Bases for LCO 3.1.6. The allowed Completion Time of 4 hours is acceptable, considering the low probability of a CRDA occurring.

(continued)



BASES

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ACTIONS  
(continued)

E.1

In addition to the separation requirements for inoperable control rods, a BPWS assumption requires that no more than three inoperable control rods are allowed in any one BPWS group.

Therefore, with one or more BPWS groups having four or more inoperable control rods, control rods must be restored to OPERABLE status so that no BPWS group has four or more inoperable control rods. Required Action E.1 is modified by a Note indicating that the Condition is not applicable when THERMAL POWER is > 10% RTP since the BPWS is not required to be followed under these conditions, as described in the Bases for LCO 3.1.6. The allowed Completion Time of 4 hours is acceptable, considering the low probability of a CRDA occurring.

F.1

If any Required Action and associated Completion Time of Condition A, C, D, or E are not met, or there are nine or more inoperable control rods, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours.

This ensures all insertable control rods are inserted and places the reactor in a condition that does not require the active function (i.e., scram) of the control rods. The number of control rods permitted to be inoperable when operating above 10% RTP (e.g., no CRDA considerations) could be more than the value specified, but the occurrence of a large number of inoperable control rods could be indicative of a generic problem, and investigation and resolution of the potential problem should be undertaken. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power in an orderly manner and without challenging plant systems.

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SURVEILLANCE  
REQUIREMENTS

SR 3.1.3.1

The position of each control rod must be determined to ensure adequate information on control rod position is available to the operator for determining CRD OPERABILITY and controlling rod patterns. Control rod position may be

(continued)

BASES

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SURVEILLANCE REQUIREMENTS SR 3.1.3.1 (continued)

determined by the use of OPERABLE position indicators, by moving control rods to a position with an OPERABLE indicator, or by the use of other appropriate methods. The 24 hour Frequency of this SR is based on operating experience related to expected changes in control rod position and the availability of control rod position indications in the control room.

SR 3.1.3.2

NOT USED

SR 3.1.3.3

Control rod insertion capability is demonstrated by inserting each partially or fully withdrawn control rod at least one notch and observing that the control rod moves. The control rod may then be returned to its original position. This ensures the control rod is not stuck and is free to insert on a scram signal. These Surveillances are not required when THERMAL POWER is less than or equal to the actual LPSP of the RWM, since the notch insertions may not be compatible with the requirements of the Banked Position Withdrawal Sequence (BPWS) (LCO 3.1.6) and the RWM (LCO 3.3.2.1). The 31 day Frequency takes into account operating experience related to changes in CRD performance. At any time, if a control rod is immovable, a determination of that control rod's ability to trip (OPERABILITY) must be made and appropriate action taken.

SR 3.1.3.4

Verifying that the scram time for each control rod to notch position 05 is  $\leq 7$  seconds provides reasonable assurance that the control rod will insert when required during a DBA or transient, thereby completing its shutdown function. This SR is performed in conjunction with the control rod scram time testing of SR 3.1.4.1, SR 3.1.4.2, SR 3.1.4.3, and SR 3.1.4.4. The LOGIC SYSTEM FUNCTIONAL TEST in

(continued)

BASES

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SURVEILLANCE REQUIREMENTS SR 3.1.3.4 (continued)

LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," and the functional testing of SDV vent and drain valves in LCO 3.1.8, "Scram Discharge Volume (SDV) Vent and Drain Valves," overlap this Surveillance to provide complete testing of the assumed safety function. The associated Frequencies are acceptable, considering the more frequent testing performed to demonstrate other aspects of control rod OPERABILITY and operating experience, which shows scram times do not significantly change over an operating cycle.

SR 3.1.3.5

Coupling verification is performed to ensure the control rod is connected to the CRDM and will perform its intended function when necessary. The Surveillance requires verifying a control rod does not go to the withdrawn overtravel position. The overtravel position feature provides a positive check on the coupling integrity since only an uncoupled CRD can reach the overtravel position. The verification is required to be performed any time a control rod is withdrawn to the "full out" position (notch position 48) or prior to declaring the control rod OPERABLE after work on the control rod or CRD System that could affect coupling. This includes control rods inserted one notch and then returned to the "full out" position during the performance of SR 3.1.3.3. This Frequency is acceptable, considering the low probability that a control rod will become uncoupled when it is not being moved and operating experience related to uncoupling events.

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- REFERENCES
1. 10 CFR 50, Appendix A GDC 26, GDC 27, GDC 28, and GDC 29.
  2. FSAR, Section 4.3.2
  3. FSAR, Section 4.6
  4. FSAR, Section 15.
  5. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
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## B 3.3 INSTRUMENTATION

### B 3.3.1.2 Source Range Monitor (SRM) Instrumentation

#### BASES

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##### BACKGROUND

The SRMs provide the operator with information relative to the neutron flux level at startup and low flux levels in the core. As such, the SRM indication is used by the operator to monitor the approach to criticality and determine when criticality is achieved. The SRMs are not fully withdrawn from the core until the SRM to intermediate range monitor (IRM) overlap is demonstrated (as required by SR 3.3.1.1.6), when the SRMs are normally fully withdrawn from the core.

The SRM subsystem of the Neutron Monitoring System (NMS) consists of four channels. Each of the SRM channels can be bypassed, but only one at any given time, by the operation of a bypass switch. Each channel includes one detector that can be physically positioned in the core. Each detector assembly consists of a miniature fission chamber with associated cabling, signal conditioning equipment, and electronics associated with the various SRM functions. The signal conditioning equipment converts the current pulses from the fission chamber to analog DC currents that correspond to the count rate. Each channel also includes indication, alarm, and control rod blocks. However, this LCO specifies OPERABILITY requirements only for the monitoring and indication functions of the SRMs.

During refueling, shutdown, and low power operations, the primary indication of neutron flux levels is provided by the SRMs or special movable detectors connected to the normal SRM circuits. The SRMs provide monitoring of reactivity changes during fuel or control rod movement and give the control room operator early indication of unexpected subcritical multiplication that could be indicative of an approach to criticality.

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##### APPLICABLE SAFETY ANALYSES

Prevention and mitigation of prompt reactivity excursions during refueling and low power operation is provided by LCO 3.9.1, "Refueling Equipment Interlocks"; LCO 3.1.1, "SHUTDOWN MARGIN (SDM)"; LCO 3.3.1.1, "Reactor Protection System (RPS) Instrumentation"; IRM Neutron Flux—High and Average Power Range Monitor (APRM) Neutron Flux—High

(continued)

BASES

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APPLICABLE  
SAFETY ANALYSES  
(continued)

(Setdown) Functions; and LCO 3.3.2.1, "Control Rod Block Instrumentation."

The SRMs have no safety function and are not assumed to function during any FSAR design basis accident or transient analysis. However, the SRMs provide the only on-scale monitoring of neutron flux levels during startup and refueling. Therefore, they are being retained in Technical Specifications.

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LCO

During startup in MODE 2, three of the four SRM channels are required to be OPERABLE to monitor the reactor flux level prior to and during control rod withdrawal, subcritical multiplication and reactor criticality, and neutron flux level and reactor period until the flux level is sufficient to maintain the IRMs on Range 3 or above. All but one of the channels are required in order to provide a representation of the overall core response during those periods when reactivity changes are occurring throughout the core.

In MODES 3 and 4, with the reactor shut down, two SRM channels provide redundant monitoring of flux levels in the core.

In MODE 5, during a spiral offload or reload, an SRM outside the fueled region will no longer be required to be OPERABLE, since it is not capable of monitoring neutron flux in the fueled region of the core. Fueled region is a continuous area with fuel. Thus, CORE ALTERATIONS are allowed in a quadrant with no OPERABLE SRM in an adjacent quadrant provided the Table 3.3.1.2-1, footnote (b), requirement that the bundles being spiral reloaded or spiral offloaded are all in a single fueled region containing at least one OPERABLE SRM is met. Spiral reloading and offloading encompass reloading or offloading a cell on the edge of a continuous fueled region (the cell can be reloaded or offloaded in any sequence).

In nonspiral routine operations, two SRMs are required to be OPERABLE to provide redundant monitoring of reactivity changes occurring in the reactor core. Because of the local nature of reactivity changes during refueling, adequate coverage is provided by requiring one SRM to be OPERABLE in

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BASES

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LCO  
(continued)

the quadrant of the reactor core where CORE ALTERATIONS are being performed, and the other SRM to be OPERABLE in an adjacent quadrant containing fuel. These requirements ensure that the reactivity of the core will be continuously monitored during CORE ALTERATIONS.

Special movable detectors, according to footnote (c) of Table 3.3.1.2-1, may be used during CORE ALTERATIONS in place of the normal SRM nuclear detectors. These special detectors must be connected to the normal SRM circuits in the NMS, such that the applicable neutron flux indication can be generated. These special detectors provide more flexibility in monitoring reactivity changes during fuel loading, since they can be positioned anywhere within the core during refueling. They must still meet the location requirements of SR 3.3.1.2.2 and all other required SRs for SRMs.

For an SRM channel to be considered OPERABLE, it must be providing neutron flux monitoring indication.

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APPLICABILITY

The SRMs are required to be OPERABLE in MODES 2, 3, 4, and 5 prior to the IRMs being on scale on Range 3 to provide for neutron monitoring. In MODE 1, the APRMs provide adequate monitoring of reactivity changes in the core; therefore, the SRMs are not required. In MODE 2, with IRMs on Range 3 or above, the IRMs provide adequate monitoring and the SRMs are not required.

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ACTIONS

A.1 and B.1

In MODE 2, with the IRMs on Range 2 or below, SRMs provide the means of monitoring core reactivity and criticality. With any number of the required SRMs inoperable, the ability to monitor neutron flux is degraded. Therefore, a limited time is allowed to restore the inoperable channels to OPERABLE status.

Provided at least one SRM remains OPERABLE, Required Action A.1 allows 4 hours to restore the required SRMs to OPERABLE status. This time is reasonable because there is adequate capability remaining to monitor the core, there is

(continued)

BASES

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ACTIONS

A.1 and B.1 (continued)

limited risk of an event during this time, and there is sufficient time to take corrective actions to restore the required SRMs to OPERABLE status or to establish alternate IRM monitoring capability. During this time, control rod withdrawal and power increase is not precluded by this Required Action. Having the ability to monitor the core with at least one SRM, proceeding to IRM Range 3 or greater (with overlap required by SR 3.3.1.1.6), and thereby exiting the Applicability of this LCO, is acceptable for ensuring adequate core monitoring and allowing continued operation.

With three required SRMs inoperable, Required Action B.1 allows no positive changes in reactivity (control rod withdrawal must be immediately suspended) due to inability to monitor the changes. Required Action A.1 still applies and allows 4 hours to restore monitoring capability prior to requiring control rod insertion. This allowance is based on the limited risk of an event during this time, provided that no control rod withdrawals are allowed, and the desire to concentrate efforts on repair, rather than to immediately shut down, with no SRMs OPERABLE.

C.1

In MODE 2, if the required number of SRMs is not restored to OPERABLE status within the allowed Completion Time, the reactor shall be placed in MODE 3. With all control rods fully inserted, the core is in its least reactive state with the most margin to criticality. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging plant systems.

D.1 and D.2

With one or more required SRMs inoperable in MODE 3 or 4, the neutron flux monitoring capability is degraded or nonexistent. The requirement to fully insert all insertable control rods ensures that the reactor will be at its minimum reactivity level while no neutron monitoring capability is available. Placing the reactor mode switch in the shutdown position prevents subsequent control rod withdrawal by

(continued)

BASES

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ACTIONS

D.1 and D.2 (continued)

maintaining a control rod block. The allowed Completion Time of 1 hour is sufficient to accomplish the Required Action, and takes into account the low probability of an event requiring the SRM occurring during this interval.

E.1 and E.2

With one or more required SRM inoperable in MODE 5, the ability to detect local reactivity changes in the core during refueling is degraded. CORE ALTERATIONS must be immediately suspended and action must be immediately initiated to fully insert all insertable control rods in core cells containing one or more fuel assemblies. Suspending CORE ALTERATIONS prevents the two most probable causes of reactivity changes, fuel loading and control rod withdrawal, from occurring. Inserting all insertable control rods ensures that the reactor will be at its minimum reactivity given that fuel is present in the core. Suspension of CORE ALTERATIONS shall not preclude completion of the movement of a component to a safe, conservative position.

Action (once required to be initiated) to insert control rods must continue until all insertable rods in core cells containing one or more fuel assemblies are inserted.

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SURVEILLANCE  
REQUIREMENTS

The SRs for each SRM Applicable MODE or other specified conditions are found in the SRs column of Table 3.3.1.2-1.

SR 3.3.1.2.1 and SR 3.3.1.2.3

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on another channel. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the instrument channels could be an indication of excessive instrument drift in one of the channels or something even more serious. A CHANNEL CHECK will detect gross channel failure; thus, it

(continued)



BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.2.1 and SR 3.3.1.2.3 (continued)

is key to verifying the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria which are determined by the plant staff based on an investigation of a combination of the channel instrument uncertainties may be used to support this parameter comparison and include indication and readability. If a channel is outside the criteria, it may be an indication that the instrument has drifted outside its limit, and does not necessarily indicate the channel is Inoperable.

The Frequency of once every 12 hours for SR 3.3.1.2.1 is based on operating experience that demonstrates channel failure is rare. While in MODES 3 and 4, reactivity changes are not expected; therefore, the 12 hour Frequency is relaxed to 24 hours for SR 3.3.1.2.3. The CHANNEL CHECK supplements less formal checks of channels during normal operational use of the displays associated with the channels required by the LCO.

SR 3.3.1.2.2

To provide adequate coverage of potential reactivity changes in the core, a maximum of two SRMs are required to be OPERABLE. One SRM is required to be OPERABLE in the quadrant where CORE ALTERATIONS are being performed, and the other OPERABLE SRM must be in an adjacent quadrant containing fuel. However, in accordance with Table 3.3.1.2-1, only one SRM is required during a spiral reload until the fueled region is large enough to encompass a second installed SRM. Note 1 states that the SR is required to be met only during CORE ALTERATIONS. It is not required to be met at other times in MODE 5 since core reactivity changes are not occurring. This Surveillance consists of a review of plant logs to ensure that SRMs required to be OPERABLE for given CORE ALTERATIONS are, in fact, OPERABLE. In the event that only one SRM is required to be OPERABLE, per Table 3.3.1.2-1, footnote (b), only the a. portion of this SR is required. Note 2 clarifies that more than one of the three requirements can be met by the same OPERABLE SRM. The 12 hour Frequency is based upon operating experience and supplements operational controls over refueling activities

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.2.2 (continued)

that include steps to ensure that the SRMs required by the LCO are in the proper quadrant.

SR 3.3.1.2.4

This Surveillance consists of a verification of the SRM instrument readout to ensure that the SRM reading is greater than a specified minimum count rate, which ensures that the detectors are indicating count rates indicative of neutron flux levels within the core. The signal-to-noise ratio shown in Figure 3.3.1.2-1 is the SRM count rate at which there is a 95% probability that the SRM signal indicates the presence of neutrons and only a 5% probability that the SRM signal is a result of noise (Ref. 1). With few fuel assemblies loaded, the SRMs will not have a high enough count rate to satisfy the SR. Therefore, allowances are made for loading sufficient "source" material, in the form of irradiated fuel assemblies, to establish the minimum count rate.

To accomplish this, the SR is modified by a Note that states that the count rate is not required to be met on an SRM that has less than or equal to four fuel assemblies adjacent to the SRM and no other fuel assemblies are in the associated core quadrant. With four or less fuel assemblies loaded around each SRM and no other fuel assemblies in the associated core quadrant, even with a control rod withdrawn, the configuration will not be critical. The signal to noise ratio is only required to be determined every 7 or 31 days per the requirements of SR 3.3.1.2.5 or 3.3.1.2.6.

The Frequency is based upon channel redundancy and other information available in the control room, and ensures that the required channels are frequently monitored while core reactivity changes are occurring. When no reactivity changes are in progress, the Frequency is relaxed from 12 hours to 24 hours.

SR 3.3.1.2.5 and SR 3.3.1.2.6

Performance of a CHANNEL FUNCTIONAL TEST demonstrates the associated channel will function properly. SR 3.3.1.2.5 is

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.3.1.2.5 and SR 3.3.1.2.6 (continued)

required in MODE 5, and the 7 day Frequency ensures that the channels are OPERABLE while core reactivity changes could be in progress. This Frequency is reasonable, based on operating experience and on other Surveillances (such as a CHANNEL CHECK), that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

SR 3.3.1.2.6 is required in MODE 2 with IRMs on Range 2 or below, and in MODES 3 and 4. Since core reactivity changes do not normally take place, the Frequency has been extended from 7 days to 31 days.

The 31 day Frequency is based on operating experience and on other Surveillances (such as CHANNEL CHECK) that ensure proper functioning between CHANNEL FUNCTIONAL TESTS.

Verification of the signal to noise ratio also ensures that the detectors are inserted to an acceptable operating level. In a fully withdrawn condition, the detectors are sufficiently removed from the fueled region of the core to essentially eliminate neutrons from reaching the detector. Any count rate obtained while the detectors are fully withdrawn is assumed to be "noise" only.

The Note to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability (THERMAL POWER decreased to IRM Range 2 or below). The SR must be performed within 12 hours after IRMs are on Range 2 or below. The allowance to enter the Applicability with the 31 day Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

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BASES

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SURVEILLANCE  
REQUIREMENTS  
(continued)

SR 3.3.1.2.7

Performance of a CHANNEL CALIBRATION at a Frequency of 24 months verifies the performance of the SRM detectors and associated circuitry. The Frequency considers the plant conditions required to perform the test, the ease of performing the test, and the likelihood of a change in the system or component status. The neutron detectors are excluded from the CHANNEL CALIBRATION because they cannot readily be adjusted. The detectors are fission chambers that are designed to have a relatively constant sensitivity over the range and with an accuracy specified for a fixed useful life.

Note 2 to the Surveillance allows the Surveillance to be delayed until entry into the specified condition of the Applicability. The SR must be performed in MODE 2 within 12 hours of entering MODE 2 with IRMs on Range 2 or below. The allowance to enter the Applicability with the 24 month Frequency not met is reasonable, based on the limited time of 12 hours allowed after entering the Applicability and the inability to perform the Surveillance while at higher power levels. Although the Surveillance could be performed while on IRM Range 3, the plant would not be expected to maintain steady state operation at this power level. In this event, the 12 hour Frequency is reasonable, based on the SRMs being otherwise verified to be OPERABLE (i.e., satisfactorily performing the CHANNEL CHECK) and the time required to perform the Surveillances.

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REFERENCES

1. General Electric Service Information Letter (SIL) 478 "SRM Minimum Count Rate" dated December 16, 1988.
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## B 3.8 ELECTRICAL POWER SYSTEMS

### B 3.8.4 DC Sources-Operating

#### BASES

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##### BACKGROUND

The DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment. As required by 10 CFR 50, Appendix A, GDC 17 (Ref. 1), the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 (Ref. 2) and IEEE-308 (Ref. 3).

The Unit 2 DC power sources provide both motive and control power to selected safety related equipment, as well as circuit breaker control power for the nonsafety related 13.8 kV, 4.16 kV, and 480 V and lower AC distribution systems. Each DC subsystem is energized by one 125/250 V battery and at least 1 Class 1E battery charger. The 250 V DC batteries for division I are supported by two full capacity chargers; the 250 V DC batteries for division II are supported by a full capacity charger; and, the 125 V DC batteries are each supported by a single full capacity charger. Each battery is exclusively associated with a single 125/250 VDC bus and cannot be interconnected with any other 125/250 VDC subsystem. The chargers are supplied from the same AC load groups for which the associated DC subsystem supplies the control power. Transfer switches provide the capability to power Unit 1 and common DC loads from Unit 2 DC sources.

Diesel Generator (DG) E DC power sources provide control and instrumentation power for DG E.

During normal operation, the DC loads are powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC loads are automatically powered from the station batteries.

The DC power distribution system is described in more detail in Bases for LCO 3.8.7, "Distribution System—Operating," and LCO 3.8.8, "Distribution System—Shutdown."

(continued)

BASES

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BACKGROUND  
(continued)

Each battery has adequate storage capacity to meet the battery duty load profiles in the FSAR, Chapter 8 Tables (Ref. 12). The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors.

Each subsystem, including the battery bank, chargers and DC switchgear, is located in an area separated physically and electrically from the other subsystems to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. There is no sharing between redundant Class 1E subsystems such as batteries, or battery chargers.

The batteries for the electrical power subsystems are sized to produce required capacity at 80% of design rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit is 105/210 V at the battery terminals.

The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. This specific gravity corresponds to an open circuit voltage of approximately 124 V for a 60 cell battery (i.e., cell voltage of 2.06 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage  $\geq 2.06$  Vpc, the battery cell will maintain its capacity for 30 days without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage of 2.20 to 2.25 Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of 2.2 Vpc corresponds to a total float voltage output of 132 V for a 60 cell battery as discussed in the FSAR, Chapter 8 (Ref. 12).

Each battery charger of DC electrical power subsystem has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger has sufficient capacity to restore the battery from the design minimum charge to its fully charged state within design basis requirements while supplying normal steady state loads (Ref. 12).

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(continued)

BASES

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BACKGROUND  
(continued)

The battery charger is normally in the float-charge mode. Float-charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the battery. This assures the internal losses of a battery are overcome and the battery is maintained in a fully charged state.

When desired, the charger can be placed in the equalize mode. The equalize mode is at a higher voltage than the float mode and charging current is correspondingly higher. The battery charger is operated in the equalize mode after a battery discharge or for routine maintenance. Following a battery discharge, the battery recharge characteristic accepts current at the current limit of the battery charger (if the discharge was significant, e.g. following a battery service test) until the battery terminal voltage approaches the charger voltage setpoint. Charging current then reduces exponentially during the remainder of the recharge cycle. Lead-calcium batteries have recharge efficiencies of greater than 95%, so once at least 105% of the ampere-hours discharged have been returned, the battery capacity would be restored to the same condition as it was prior to the discharge. This can be monitored by direct observation of the exponentially decaying charging current or by evaluating the amp-hours discharged from the battery and amp-hours returned to the battery.

APPLICABLE  
SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter 6 (Ref. 4) and Chapter 15 (Ref. 5), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation. The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining DC sources OPERABLE during accident conditions in the event of:

- a. An assumed loss of all offsite AC power or all onsite AC power; and
- b. A worst case single failure.

The DC sources satisfy Criterion 3 of the NRC Policy Statement (Ref. 6).

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BASES (continued)

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LCO

The DC electrical power subsystems are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 12).

The DC electrical power subsystems include:

- a. each Unit 2 and Unit 1 DC electrical power subsystem identified in Table 3.8.4-1 including a 125 volt or 250 volt DC battery bank in parallel with a battery charger and the corresponding control equipment and interconnecting cabling supplying power to the associated bus; and,
- b. the Diesel Generator E DC electrical power subsystem identified in Table 3.8.4-1 including a 125 volt DC battery bank in parallel with a battery charger and the corresponding control equipment and interconnecting cabling supplying power to the associated bus.

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APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, and 3 to ensure safe unit operation and to ensure that:

- a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and
- b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 4 and 5 are addressed in the Bases for LCO 3.8.5, "DC Sources—Shutdown."

(continued)



BASES (continued)

ACTIONS

A.1, A.2, A.3

Condition A represents one subsystem with one (or two) battery chargers inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period.

Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action A.2) from any discharge that might have occurred due to the charger inoperability.

A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a premature shutdown.

If established battery terminal voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

If the charger is operating in the current limit mode after 2 hours, that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition, in this case, is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery.

(continued)

BASES (continued)

ACTIONS  
(continued)

A.1, A.2, A.3 (continued)

The charge time can be extensive, and there is not adequate assurance that it can be recharged to comply with the 12 hour Completion Time of Required Action A.2.

Required Action A.2 requires that the battery float current be verified as less than or equal to 2 amps. Float current less than 2 amps indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The 2 amp value is based on documentation from the battery manufacturer that charging current less than 2 amps indicates a battery with a full state of charge (Reference 13). If monitoring the battery float current during the initial 12 hour period does not verify that the current is less than or equal to 2 amps at the expiration of the initial 12 hour period, the battery must be declared inoperable. During subsequent 12 hour periods, if the battery float current is greater than 2 amps, there may be additional battery problems and the battery must be declared inoperable.

Required Action A.3 limits the restoration time for the inoperable battery charger to 72 hours. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger with sufficient capacity such that it is fully capable of restoring the battery voltage to the minimum acceptable limits, carrying respective DC bus loads, and maintaining the battery in a fully charged condition). The 72 hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status and is consistent with the 72 hour Completion Time for the SSES emergency diesel generators.

Condition A is modified by a Note that states that Condition A is not applicable to the DG E DC electrical power subsystem. Condition E or F is applicable to an inoperable DG E DC electrical power subsystem.

B.1

Condition B represents one subsystem with one battery bank inoperable. With one battery bank inoperable, the DC bus is being supplied by the OPERABLE battery charger. Any event that results in a loss of the AC bus supporting the battery charger will also result in loss of DC to that subsystem. Recovery of the AC bus, especially if it is due to a loss of

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BASES (continued)

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ACTIONS  
(continued)

B.1 (continued)

offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed, and diesel generator output circuit breakers, etc.) may rely upon the battery. In addition, the energization transients of any DC loads that are beyond the capability of the battery charger and normally require the assistance of the battery will not be able to be brought online. The 2 hour limit allows sufficient time to effect restoration of an inoperable battery bank given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than 2.07 V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times.

Condition B is modified by a Note that states that Condition B is not applicable to the DG E DC electrical power subsystem. Condition E or F is applicable to an inoperable DG E DC electrical power subsystem.

C.1

Condition C represents one subsystem with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC Distribution System division.

If one of the required DC electrical power subsystems is inoperable, as a result of equipment other than the battery or battery charger being inoperable, the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

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BASES (continued)

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ACTIONS  
(continued)

C.1 (continued)

Condition C is modified by a Note that states that Condition C is not applicable to the DG E DC electrical power subsystem. Condition E or F is applicable to an inoperable DG E DC electrical power subsystem.

D.1 and D.2

If two Unit 2 DC electrical power subsystems are inoperable or if an inoperable Unit 2 DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 4 is consistent with the time required in Regulatory Guide 1.93 (Ref. 7).

(continued)

BASES

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ACTIONS  
(continued)

E.1

If Diesel Generator E is not aligned to the class 1E distribution system, the only supported safety function is for the ESW system. Therefore, under this condition, if Diesel Generator E DC power subsystem is not OPERABLE actions are taken to either restore the battery to OPERABLE status or shutdown Diesel Generator E and close the associated ESW valves in order to ensure the OPERABILITY of the ESW system. The 2 hour limit is consistent with the allowed time for other inoperable DC sources and provides sufficient time to evaluate the condition of the battery and take the corrective actions.

F.1

If the Diesel Generator is aligned to the class 1E distribution system, the loss of Diesel Generator E DC power subsystem will result in the loss of a on-site Class 1E power source. Therefore, under this condition, if Diesel Generator E DC power subsystem is not OPERABLE actions are taken to either restore the battery to OPERABLE status or declare Diesel Generator E inoperable and take Actions of LCO 3.8.1. The 2 hour limit is consistent with the allowed time for other DC sources and provides sufficient time to evaluate the condition of the battery and take the necessary corrective actions.

G.1 and G.2

With one or more DC Unit 1 DC power subsystems inoperable, the remaining DC electrical power distribution subsystems are capable of supporting the minimum safety functions necessary to shut down the reactor and maintain it in a safe shutdown condition, assuming no single failure. However, overall reliability is reduced because a single failure in the remaining DC electrical power distribution subsystems could result in the minimum required ESF functions not being supported. The Completion Time of 2 hours is consistent with the Completion Times associated with a loss of one or more DC distribution subsystems and will allow sufficient time to restore power.

(continued)

BASES

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ACTIONS

G.1 and G.2 (continued)

Completion of Required Action G.1 causes Unit 1 loads to be powered from a Unit 2 DC electrical power subsystem. Although the corresponding Unit 2 DC electrical power subsystems are evaluated for this condition, the CONDITION violates a design commitment to maintain DC power separation between units. To minimize the time this condition exists, Required Action G.2 directs power to be restored to the corresponding Unit 1 DC electrical power subsystem, which restores power to the common loads, or requires that the Unit 1 and common loads be declared inoperable. The Completion Time of 72 hours provides sufficient time to restore power and acknowledges the fact that the condition, although not consistent with all design requirements, maintains all required safety systems available.

H.1

If Unit 1 and common loads required to support Unit 2 cannot be transferred to corresponding Unit 2 DC electrical power subsystem when Unit 1 DC sources are inoperable; or, cannot be transferred back to a Unit 1 DC source when the Unit 1 DC source becomes OPERABLE, the associated loads may be incapable of performing their intended function and must be declared inoperable immediately.

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(continued)

BASES (continued)

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer. This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). The minimum established float voltage for OPERABILITY per SR 3.8.4.1 is 129 VDC for 125 VDC and 258 VDC for 250 VDC batteries. This voltage should be adjusted downward by 2.20 VDC for any cells jumpered out of the battery bank. This SR must be performed every 7 days consistent with manufacturer recommendations and IEEE-450 (Ref. 8).

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

This SR requires that each battery charger be capable of supplying DC current to its associated battery bank at the minimum established float voltage for greater than or equal to 4 hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The time period is sufficient for the charger temperature to have stabilized and to have been maintained for at least 2 hours.

(continued)

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.2 (continued)

The Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The test can be conducted using actual or simulated loads. The discharge rate and test length corresponds to the design duty cycle requirements as specified in Reference 12.

The Frequency of 24 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations or at some other outage, with intervals between tests not to exceed 24 months.

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test SR 3.8.6.6 in lieu of a service test SR 3.8.4.3.

The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the Electrical Distribution System, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance. Examples of unplanned events may include:

1. Unexpected operational events which cause the equipment to perform the function specified by this Surveillance, for which adequate documentation is available; and
2. Post maintenance testing that requires performance of this Surveillance in order to restore the component to OPERABLE, provided the maintenance was required, or performed in conjunction with maintenance required to maintain OPERABILITY or reliability.

(continued)



BASES (continued)

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SURVEILLANCE  
REQUIREMENTS

SR 3.8.4.3 (continued)

Since the Diesel Generator E DC electrical power subsystem does not support loads other than the Diesel Generator E required loads, the mode restriction note need not be applied to the Diesel Generator E subsystem unless it is aligned to the class 1E distribution subsystem. The note does have applicability to the Diesel Generator E subsystem when the Diesel Generator E is substituted for one of the other Diesel Generators. When the Diesel Generator E is aligned to the class 1E distribution subsystem, the Diesel Generator E subsystem is required to support operability of the Diesel Generator E. Thus when in this configuration, the note does need to be applicable since performing the Surveillance would remove a required DC electrical power subsystem from service.

SR 3.8.4.4

This Surveillance is provided to direct that Surveillances for the Unit 1 DC sources required to support Unit 2 are governed by the Unit 2 Technical Specifications. When Unit 1 DC Sources are required to be Operable to support Unit 2, the Unit 1 Surveillances must be met. Performance of a Unit 1 Surveillance at the specified Frequency will satisfy Unit 2 requirements.

When Unit 1 is in MODE 4 or 5 or moving irradiated fuel assemblies in the secondary containment, a Note to SR 3.8.5.1 specifies that some SRs are required to be met but do not have to be performed. The Note to Unit 2 SR 3.8.5.1 states that the Note to Unit 1 SR 3.8.2.1 is applicable if Unit 1 is in MODE 4 or 5. This ensures that Unit 2 Technical Specifications do not require a Unit 1 SR to be performed, when the Unit 1 Technical Specifications does not require performance of a Unit 1 SR.

(continued)

BASES (continued)

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- REFERENCES
1. 10 CFR 50, Appendix A, GDC 17.
  2. Regulatory Guide 1.6.
  3. IEEE Standard 308.
  4. FSAR, Chapter 6.
  5. FSAR, Chapter 15.
  6. Final Policy Statement on Technical Specifications Improvements, July 22, 1993 (58 FR 39132).
  7. Regulatory Guide 1.93.
  8. IEEE Standard 450.
  9. Regulatory Guide 1.32, February 1977.
  10. Regulatory Guide 1.129, April 1977, February 1978.
  11. IEEE Standard 485.
  12. FSAR Chapter 8, Section 8.3.2.1.1.6.
  13. Letter from C&D Technologies, Inc. – Power Solutions, "Float Current Used as an Indicator of Battery Charge State", to L. R. Casella, dated August 9, 2006.
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