MANUAL HARD COPY DISTRIBUTION
DOCUMENT TRANSMITTAL 2008-17298

USER INFORMATION:

GERLACH*ROSE M EMPL#:028401 CA#: 0363

Address: NUCSA2

Phone#: 254-3194

TRANSMITTAL INFORMATION:

TO: GERLACH*ROSE M 04/18/2008

LOCATION: USNRC

FROM: NUCLEAR RECORDS DOCUMENT CONTROL CENTER (NUCSA-2)

THE FOLLOWING CHANGES HAVE OCCURRED TO THE HARDCOPY OR ELECTRONIC MANUAL ASSIGNED TO YOU. HARDCOPY USERS MUST ENSURE THE DOCUMENTS PROVIDED MATCH THE INFORMATION ON THIS TRANSMITTAL. WHEN REPLACING THIS MATERIAL IN YOUR HARDCOPY MANUAL, ENSURE THE UPDATE DOCUMENT ID IS THE SAME DOCUMENT ID YOU'RE REMOVING FROM YOUR MANUAL. TOOLS FROM THE HUMAN PERFORMANCE TOOL BAG SHOULD BE UTILIZED TO ELIMINATE THE CHANCE OF ERRORS.

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

TRM1 - TECHNICAL REQUIREMENTS MANUAL UNIT 1

REMOVE MANUAL TABLE OF CONTENTS DATE: 04/13/2008

ADD MANUAL TABLE OF CONTENTS DATE: 04/17/2008

CATEGORY: DOCUMENTS TYPE: TRM1

A001

NRR

ID: TEXT 2.2
REMOVE: REV:5

ADD: REV: 6

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.1.3
REMOVE: REV:3

ADD: REV: 4

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.10.4
ADD: REV: 2

REMOVE: REV:1

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.12.2
ADD: REV: 4

REMOVE: REV:3

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.2.1
ADD: REV: 9

REMOVE: REV:8

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.3.9
REMOVE: REV:2

ADD: REV: 3

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT 3.4.4
REMOVE: REV:1

ADD: REV: 2

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT B3.10.4
REMOVE: REV:0

ADD: REV: 1

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT B3.3.9
REMOVE: REV:2

ADD: REV: 3

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT B3.6.3
ADD: REV: 2

REMOVE: REV:1

CATEGORY: DOCUMENTS TYPE: TRM1
ID: TEXT LOES
REMOVE: REV:44

ADD: REV: 45

CATEGORY: DOCUMENTS TYPE: TRM1

ID: TEXT TOC
ADD: REV: 15

REMOVE: REV:14

ANY DISCREPANCIES WITH THE MATERIAL PROVIDED, CONTACT DCS @ X3107 OR X3136 FOR ASSISTANCE. UPDATES FOR HARDCOPY MANUALS WILL BE DISTRIBUTED WITHIN 3 DAYS IN ACCORDANCE WITH DEPARTMENT PROCEDURES. PLEASE MAKE ALL CHANGES AND ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX UPON COMPLETION OF UPDATES. FOR ELECTRONIC MANUAL USERS, ELECTRONICALLY REVIEW THE APPROPRIATE DOCUMENTS AND ACKNOWLEDGE COMPLETE IN YOUR NIMS INBOX.

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

Table Of Contents

Issue Date: 04/17/2008

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.3.1 0 11/18/2002
Title: INSTRUMENTATION RADIATION MONITORING INSTRUMENTATION

TEXT 3.3.2 2 11/09/2007
Title: INSTRUMENTATION SEISMIC MONITORING INSTRUMENTATION

TEXT 3.3.3 2 11/09/2007
Title: INSTRUMENTATION METEOROLOGICAL MONITORING INSTRUMENTATION

TEXT 3.3.4 4 11/09/2007
Title: INSTRUMENTATION TRM POST-ACCIDENT MONITORING INSTRUMENTATION

TEXT 3.3.5 0 11/18/2002
Title: INSTRUMENTATION THIS PAGE INTENTIONALLY LEFT BLANK

TEXT 3.3.6 2 10/19/2005
Title: INSTRUMENTATION TRM ISOLATION ACTUATION INSTRUMENTATION

TEXT 3.3.7 1 11/09/2007
Title: INSTRUMENTATION MAIN TURBINE OVERSPEED PROTECTION SYSTEM

TEXT 3.3.8 1 10/22/2003
Title: INSTRUMENTATION TRM RPS INSTRUMENTATION

TEXT 3.3.9 3 04/17/2008
Title: OPRM INSTRUMENTATION CONFIGURATION

TEXT 3.3.10 1 12/14/2004
Title: INSTRUMENTATION REACTOR RECIRCULATION PUMP MG SET STOPS

TEXT 3.3.11 1 10/22/2003
Title: INSTRUMENTATION MVP ISOLATION INSTRUMENTATION

TEXT 3.4.1 1 04/26/2006
Title: REACTOR COOLANT SYSTEM REACTOR COOLANT SYSTEM CHEMISTRY

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.4.2 0 11/18/2002
Title: REACTOR COOLANT SYSTEM STRUCTURAL INTEGRITY

TEXT 3.4.3 1 11/09/2007
Title: REACTOR COOLANT SYSTEM HIGH/LOW PRESSURE INTERFACE LEAKAGE MONITORS

TEXT 3.4.4 2 04/17/2008
Title: REACTOR COOLANT SYSTEM REACTOR RECIRCULATION FLOW AND ROD LINE LIMIT

TEXT 3.4.5 1 04/26/2006
Title: REACTOR COOLANT SYSTEM REACTOR VESSEL MATERIALS

TEXT 3.5.1 1 02/04/2005
Title: EMERGENCY CORE COOLING AND RCIC ADS MANUAL INHIBIT

TEXT 3.5.2 1 11/09/2007
Title: EMERGENCY CORE COOLING AND RCIC ECCS AND RCIC SYSTEM MONITORING INSTRUMENTATION

TEXT 3.5.3 0 11/18/2002
Title: EMERGENCY CORE COOLING AND RCIC LONG TERM NITROGEN SUPPLY TO ADS

TEXT 3.6.1 0 11/18/2002
Title: CONTAINMENT VENTING OR PURGING

TEXT 3.6.2 0 11/18/2002
Title: CONTAINMENT SUPPRESSION CHAMBER-TO-DRYWELL VACUUM BREAKER POSITION INDICATION

TEXT 3.6.3 0 11/18/2002
Title: CONTAINMENT SUPPRESSION POOL ALARM INSTRUMENTATION

TEXT 3.6.4 0 11/18/2002
Title: CONTAINMENT PRIMARY CONTAINMENT CLOSED SYSTEM BOUNDARIES

TEXT 3.7.1 0 11/18/2002
Title: PLANT SYSTEMS EMERGENCY SERVICE WATER SYSTEM (ESW) SHUTDOWN

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.7.2 0 11/18/2002
Title: PLANT SYSTEMS ULTIMATE HEAT SINK (UHS) AND GROUND WATER LEVEL

TEXT 3.7.3.1 1 04/26/2006
Title: PLANT SYSTEMS FIRE SUPPRESSION WATER SUPPLY SYSTEM

TEXT 3.7.3.2 2 04/26/2006
Title: PLANT SYSTEMS SPRAY AND SPRINKLER SYSTEMS

TEXT 3.7.3.3 2 08/18/2005
Title: PLANT SYSTEMS CO2 SYSTEMS

TEXT 3.7.3.4 1 04/26/2006
Title: PLANT SYSTEMS HALON SYSTEMS

TEXT 3.7.3.5 1 04/26/2006
Title: PLANT SYSTEMS FIRE HOSE STATIONS

TEXT 3.7.3.6 1 04/26/2006
Title: PLANT SYSTEMS YARD FIRE HYDRANTS AND HYDRANT HOSE HOUSES

TEXT 3.7.3.7 1 04/26/2006
Title: PLANT SYSTEMS FIRE RATED ASSEMBLIES

TEXT 3.7.3.8 6 11/09/2007
Title: PLANT SYSTEMS FIRE DETECTION INSTRUMENTATION
LDCN 3503

TEXT 3.7.4 1 04/26/2006
Title: PLANT SYSTEMS SOLID RADWASTE SYSTEM

TEXT 3.7.5.1 0 11/18/2002
Title: PLANT SYSTEMS MAIN CONDENSER OFFGAS HYDROGEN MONITOR

TEXT 3.7.5.2 0 11/18/2002
Title: PLANT SYSTEMS MAIN CONDENSER OFFGAS EXPLOSIVE GAS MIXTURE

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.7.5.3 1 04/26/2006
Title: PLANT SYSTEMS LIQUID HOLDUP TANKS

TEXT 3.7.6 1 03/01/2005
Title: PLANT SYSTEMS ESSW PUMPHOUSE VENTILATION

TEXT 3.7.7 1 01/31/2008
Title: PLANT SYSTEMS MAIN CONDENSER OFFGAS PRETREATMENT LOGARITHMIC RADIATION MONITORING

TEXT 3.7.8 4 06/21/2007
Title: PLANT SYSTEMS SNUBBERS

TEXT 3.7.9 1 08/28/2006
Title: PLANT SYSTEMS CONTROL STRUCTURE HVAC

TEXT 3.7.10 1 12/14/2004
Title: PLANT SYSTEMS SPENT FUEL STORAGE POOLS (SFSPS)

TEXT 3.8.1 1 02/04/2005
Title: ELECTRICAL POWER PRIMARY CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

TEXT 3.8.2.1 2 11/09/2007
Title: ELECTRICAL POWER MOTOR OPERATED VALVES (MOV) THERMAL OVERLOAD PROTECTION - CONTINUOUS

TEXT 3.8.2.2 2 12/14/2004
Title: ELECTRICAL POWER MOTOR OPERATED VALVES (MOV) THERMAL OVERLOAD PROTECTION - AUTOMATIC

TEXT 3.8.3 0 11/18/2002
Title: ELECTRICAL POWER DIESEL GENERATOR (DG) MAINTENANCE ACTIVITIES

TEXT 3.8.4 0 11/18/2002
Title: ELECTRICAL POWER 24 VDC ELECTRICAL POWER SUBSYSTEM

TEXT 3.8.5 0 11/18/2002
Title: ELECTRICAL POWER DEGRADED VOLTAGE PROTECTION

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.8.6 0 11/18/2002
Title: ELECTRICAL POWER EMERGENCY SWITCHGEAR ROOM COOLING

TEXT 3.8.7 0 12/14/2006
Title: BATTERY MAINTENANCE AND MONITORING PROGRAM

TEXT 3.9.1 0 11/18/2002
Title: REFUELING OPERATIONS DECAY TIME

TEXT 3.9.2 0 11/18/2002
Title: REFUELING OPERATIONS COMMUNICATIONS

TEXT 3.9.3 0 11/18/2002
Title: REFUELING OPERATIONS REFUELING PLATFORM

TEXT 3.10.1 1 04/26/2006
Title: MISCELLANEOUS SEAL SOURCE CONTAMINATION

TEXT 3.10.2 2 08/08/2006
Title: MISCELLANEOUS SHUTDOWN MARGIN TEST RPS INSTRUMENTATION

TEXT 3.10.3 1 04/26/2006
Title: MISCELLANEOUS INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

TEXT 3.10.4 2 04/17/2008
Title: MISCELLANEOUS LEADING EDGE FLOW METER (LEFM)

TEXT 3.11.1.1 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS LIQUID EFFLUENTS CONCENTRATION

TEXT 3.11.1.2 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS LIQUID EFFLUENTS DOSE

TEXT 3.11.1.3 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS LIQUID WASTE TREATMENT SYSTEM

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.11.1.4 1 12/14/2004
Title: RADIOACTIVE EFFLUENTS LIQUID RADWASTE EFFLUENT MONITORING INSTRUMENTATION

TEXT 3.11.1.5 2 05/02/2007
Title: RADIOACTIVE EFFLUENTS RADIOACTIVE LIQUID PROCESS MONITORING INSTRUMENTATION

TEXT 3.11.2.1 3 04/26/2006
Title: RADIOACTIVE EFFLUENTS DOSE RATE

TEXT 3.11.2.2 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS DOSE - NOBLE GASES

TEXT 3.11.2.3 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS DOSE - IODINE, TRITIUM, AND RADIONUCLIDES IN PARTICULATE FORM

TEXT 3.11.2.4 0 11/18/2002
Title: RADIOACTIVE EFFLUENTS GASEOUS RADWASTE TREATMENT SYSTEM

TEXT 3.11.2.5 3 11/14/2006
Title: RADIOACTIVE EFFLUENTS VENTILATION EXHAUST TREATMENT SYSTEM

TEXT 3.11.2.6 3 05/02/2007
Title: RADIOACTIVE EFFLUENTS RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

TEXT 3.11.3 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS TOTAL DOSE

TEXT 3.11.4.1 4 08/08/2006
Title: RADIOACTIVE EFFLUENTS MONITORING PROGRAM

TEXT 3.11.4.2 2 04/26/2006
Title: RADIOACTIVE EFFLUENTS LAND USE CENSUS

TEXT 3.11.4.3 1 04/26/2006
Title: RADIOACTIVE EFFLUENTS INTERLABORATORY COMPARISON PROGRAM

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 3.12.1 0 11/19/2002
Title: LOADS CONTROL PROGRAM CRANE TRAVEL-SPENT FUEL POOL STORAGE POOL

TEXT 3.12.2 4 04/17/2008
Title: LOADS CONTROL PROGRAM HEAVY LOADS REQUIREMENTS

TEXT 3.12.3 0 11/19/2002
Title: LOADS CONTROL PROGRAM LIGHT LOADS REQUIREMENT

TEXT B3.0 3 05/02/2007
Title: APPLICABILITY BASES TECHNICAL REQUIREMENT FOR OPERATION (TRO) APPLICABILITY

TEXT B3.1.1 1 11/09/2007
Title: REACTIVITY CONTROL SYSTEMS BASES ANTICIPATED TRANSIENT WITHOUT SCRAM ALTERNATE ROD INJECTION (ATWS-ARI) INSTRUMENTATION

TEXT B3.1.2 0 11/19/2002
Title: REACTIVITY CONTROL SYSTEMS BASES CONTROL ROD DRIVE (CRD) HOUSING SUPPORT

TEXT B3.1.3 3 03/31/2006
Title: REACTIVITY CONTROL SYSTEMS BASES CONTROL ROD BLOCK INSTRUMENTATION

TEXT B3.1.4 0 11/19/2002
Title: REACTIVITY CONTROL SYSTEMS BASES CONTROL ROD SCRAM ACCUMULATORS INSTRUMENTATION AND CHECK VALVE

TEXT B3.2.1 0 11/19/2002
Title: CORE OPERATING LIMITS BASES CORE OPERATING LIMITS REPORT (COLR)

TEXT B3.3.1 0 11/19/2002
Title: INSTRUMENTATION BASES RADIATION MONITORING INSTRUMENTATION

TEXT B3.3.2 1 11/09/2007
Title: INSTRUMENTATION BASES SEISMIC MONITORING INSTRUMENTATION

TEXT B3.3.3 2 11/09/2007
Title: INSTRUMENTATION BASES METEOROLOGICAL MONITORING INSTRUMENTATION

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.3.4 3 11/09/2007
Title: INSTRUMENTATION BASES TRM POST ACCIDENT MONITORING (PAM) INSTRUMENTATION

TEXT B3.3.5 2 11/09/2007
Title: INSTRUMENTATION BASES THIS PAGE INTENTIONALLY LEFT BLANK

TEXT B3.3.6 3 10/19/2005
Title: INSTRUMENTATION BASES TRM ISOLATION ACTUATION INSTRUMENTATION

TEXT B3.3.7 1 11/09/2007
Title: INSTRUMENTATION BASES MAIN TURBINE OVERSPEED PROTECTION SYSTEM

TEXT B3.3.8 1 10/22/2003
Title: INSTRUMENTATION BASES TRM REACTOR PROTECTION SYSTEM (RPS) INSTRUMENTATION

TEXT B3.3.9 3 04/17/2008
Title: OPRM INSTRUMENTATION

TEXT B3.3.10 0 11/19/2002
Title: INSTRUMENTATION BASES REACTOR RECIRCULATION PUMP MG SET STOPS

TEXT B3.3.11 1 10/22/2003
Title: INSTRUMENTATION BASES MVP ISOLATION INSTRUMENTATION

TEXT B3.4.1 0 11/19/2002
Title: REACTOR COOLANT SYSTEM BASES REACTOR COOLANT SYSTEM CHEMISTRY

TEXT B3.4.2 0 11/19/2002
Title: REACTOR COOLANT SYSTEM BASES STRUCTURAL INTEGRITY

TEXT B3.4.3 1 11/09/2007
Title: REACTOR COOLANT SYSTEM BASES HIGH/LOW PRESSURE INTERFACE LEAKAGE MONITOR

TEXT B3.4.4 0 11/19/2002
Title: REACTOR COOLANT SYSTEM BASES REACTOR RECIRCULATION FLOW AND ROD LINE LIMIT

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.4.5 0 11/19/2002
Title: REACTOR COOLANT SYSTEM BASES REACTOR VESSEL MATERIALS

TEXT B3.5.1 0 11/19/2002
Title: ECCS AND RCIC BASES ADS MANUAL INHIBIT

TEXT B3.5.2 1 11/09/2007
Title: ECCS AND RCIC BASES ECCS AND RCIC SYSTEM MONITORING INSTRUMENTATION

TEXT B3.5.3 1 11/09/2007
Title: ECCS AND RCIC BASES LONG TERM NITROGEN SUPPLY TO ADS

TEXT B3.6.1 0 11/19/2002
Title: CONTAINMENT BASES VENTING OR PURGING

TEXT B3.6.2 0 11/19/2002
Title: CONTAINMENT BASES SUPPRESSION CHAMBER-TO-DRYWELL VACUUM BREAKER POSITION INDICATION

TEXT B3.6.3 2 04/17/2008
Title: CONTAINMENT BASES SUPPRESSION POOL ALARM INSTRUMENTATION
LDCN 3933

TEXT B3.6.4 1 12/14/2004
Title: CONTAINMENT BASES PRIMARY CONTAINMENT CLOSED SYSTEM BOUNDARIES

TEXT B3.7.1 0 11/19/2002
Title: PLANT SYSTEMS BASES EMERGENCY SERVICE WATER SYSTEM (SHUTDOWN)

TEXT B3.7.2 0 11/19/2002
Title: PLANT SYSTEMS BASES ULTIMATE HEAT SINK (UHS) GROUND WATER LEVEL

TEXT B3.7.3.1 2 01/07/2008
Title: PLANT SYSTEMS BASES FIRE SUPPRESSION WATER SUPPLY SYSTEM

TEXT B3.7.3.2 2 04/26/2006
Title: PLANT SYSTEMS BASES SPRAY AND SPRINKLER SYSTEMS

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.7.3.3 0 11/19/2002
Title: PLANT SYSTEMS BASES CO2 SYSTEMS

TEXT B3.7.3.4 1 04/26/2006
Title: PLANT SYSTEMS BASES HALON SYSTEMS

TEXT B3.7.3.5 1 04/26/2006
Title: PLANT SYSTEMS BASES FIRE HOSE STATIONS

TEXT B3.7.3.6 1 04/26/2006
Title: PLANT SYSTEMS BASES YARD FIRE HYDRANTS AND HYDRANT HOSE HOUSES

TEXT B3.7.3.7 0 11/19/2002
Title: PLANT SYSTEMS BASES FIRE RATED ASSEMBLIES

TEXT B3.7.3.8 1 01/12/2004
Title: PLANT SYSTEMS BASES FIRE DETECTION INSTRUMENTATION

TEXT B3.7.4 0 11/19/2002
Title: PLANT SYSTEMS BASES SOLID RADWASTE SYSTEM

TEXT B3.7.5.1 0 11/19/2002
Title: PLANT SYSTEMS BASES MAIN CONDENSER OFFGAS HYDROGEN MONITOR

TEXT B3.7.5.2 0 11/19/2002
Title: PLANT SYSTEMS BASES MAIN CONDENSER OFFGAS EXPLOSIVE GAS MIXTURE

TEXT B3.7.5.3 0 11/19/2002
Title: PLANT SYSTEMS BASES LIQUID HOLDUP TANKS

TEXT B3.7.6 1 03/01/2005
Title: PLANT SYSTEMS BASES ESSW PUMPHOUSE VENTILATION

TEXT B3.7.7 2 01/31/2008
Title: PLANT SYSTEMS BASES MAIN CONDENSER OFFGAS PRETREATMENT LOGARITHMIC RADIATION MONITORING INSTRUMENTATION

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.7.8 3 06/21/2007
Title: PLANT SYSTEMS BASES SNUBBERS

TEXT B3.7.9 1 12/14/2004
Title: PLANT SYSTEMS BASES CONTROL STRUCTURE HVAC

TEXT B3.7.10 1 12/14/2004
Title: PLANT SYSTEMS BASES SPENT FUEL STORAGE POOLS

TEXT B3.8.1 1 02/04/2005
Title: ELECTRICAL POWER BASES PRIMARY CONTAINMENT PENETRATION CONDUCTOR OVERCURRENT PROTECTIVE DEVICES

TEXT B3.8.2.1 0 11/19/2002
Title: ELECTRICAL POWER BASES MOTOR OPERATED VALVES (MOV) THERMAL OVERLOAD PROTECTION - CONTINUOUS

TEXT B3.8.2.2 1 09/17/2004
Title: ELECTRICAL POWER BASES MOTOR OPERATED VALVES (MOV) THERMAL OVERLOAD PROTECTION - AUTOMATIC

TEXT B3.8.3 0 11/19/2002
Title: ELECTRICAL POWER BASES DIESEL GENERATOR (DG) MAINTENANCE ACTIVITIES

TEXT B3.8.4 0 11/19/2002
Title: ELECTRICAL POWER BASES 24 VDC ELECTRICAL POWER SUBSYSTEM

TEXT B3.8.5 0 11/19/2002
Title: ELECTRICAL POWER BASES DEGRADED VOLTAGE PROTECTION

TEXT B3.8.6 1 02/04/2005
Title: ELECTRICAL POWER BASES EMERGENCY SWITCHGEAR ROOM COOLING

TEXT B3.8.7 0 12/14/2006
Title: BATTERY MAINTENANCE AND MONITORING PROGRAM

TEXT B3.9.1 0 11/19/2002
Title: REFUELING OPERATIONS BASES DECAY TIME

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.9.2 0 11/19/2002
Title: REFUELING OPERATIONS BASES COMMUNICATIONS

TEXT B3.9.3 0 11/19/2002
Title: REFUELING OPERATIONS BASES REFUELING PLATFORM

TEXT B3.10.1 0 11/19/2002
Title: MISCELLANEOUS BASES SEALED SOURCE CONTAMINATION

TEXT B3.10.2 1 03/31/2006
Title: MISCELLANEOUS BASES SHUTDOWN MARGIN TEST RPS INSTRUMENTATION

TEXT B3.10.3 0 11/19/2002
Title: MISCELLANEOUS BASES INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)

TEXT B3.10.4 1 04/17/2008
Title: MISCELLANEOUS BASES LEADING EDGE FLOW METER (LEFM)

TEXT B3.11.1.1 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES LIQUID EFFLUENTS CONCENTRATION

TEXT B3.11.1.2 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES LIQUID EFFLUENTS DOSE

TEXT B3.11.1.3 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES LIQUID WASTE TREATMENT SYSTEM

TEXT B3.11.1.4 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES LIQUID RADWASTE EFFLUENT MONITORING INSTRUMENTATION

TEXT B3.11.1.5 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES RADIOACTIVE LIQUID PROCESS MONITORING INSTRUMENTATION

TEXT B3.11.2.1 1 12/14/2004
Title: RADIOACTIVE EFFLUENTS BASES DOSE RATE

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT B3.11.2.2 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES DOSE - NOBLE GASES

TEXT B3.11.2.3 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES DOSE - IODINE, TRITIUM, AND RADIONUCLIDES IN PARTICULATES FORM

TEXT B3.11.2.4 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES GASEOUS RADWASTE TREATMENT SYSTEM

TEXT B3.11.2.5 4 11/14/2006
Title: RADIOACTIVE EFFLUENTS BASES VENTILATION EXHAUST TREATMENT SYSTEM

TEXT B3.11.2.6 1 01/27/2004
Title: RADIOACTIVE EFFLUENTS BASES RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

TEXT B3.11.3 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES TOTAL DOSE

TEXT B3.11.4.1 2 01/06/2006
Title: RADIOACTIVE EFFLUENTS BASES MONITORING PROGRAM

TEXT B3.11.4.2 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES LAND USE CENSUS

TEXT B3.11.4.3 0 11/19/2002
Title: RADIOACTIVE EFFLUENTS BASES INTERLABORATORY COMPARISON PROGRAM

TEXT B3.12.1 1 10/04/2007
Title: LOADS CONTROL PROGRAM BASES CRANE TRAVEL-SPENT FUEL STORAGE POOL

TEXT B3.12.2 0 11/19/2002
Title: LOADS CONTROL PROGRAM BASES HEAVY LOADS REQUIREMENTS

TEXT B3.12.3 0 11/19/2002
Title: LOADS CONTROL PROGRAM BASES LIGHT LOADS REQUIREMENTS

Manual Name: TRM1

Manual Title: TECHNICAL REQUIREMENTS MANUAL UNIT 1

TEXT 4.1 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS ORGANIZATION

TEXT 4.2 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS REPORTABLE EVENT ACTION

TEXT 4.3 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS SAFETY LIMIT VIOLATION

TEXT 4.4 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS PROCEDURES & PROGRAMS

TEXT 4.5 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS REPORTING REQUIREMENTS

TEXT 4.6 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS RADIATION PROTECTION PROGRAM

TEXT 4.7 0 08/31/1998
Title: ADMINISTRATIVE CONTROLS TRAINING

TRM1 text TOC
4/8/05

TRM1 text LOES
04/08/2008

2.0 PLANT PROGRAMS AND SETPOINTS

2.2 Instrument Trip Setpoint Table

The Instrument Trip Setpoint Limits in Table 2.2-1 are the Trip Setpoint value limits that were contained in the Instrumentation Setpoint tables for protection systems and other functions important to safety that were included in the scope of the original Standard Technical Specifications. Actual instrument setpoints are established utilizing the Allowable Values specified in the Technical Specifications and Technical Requirements. Allowable Values are established in the Reference LCOs and TROs identified in this Table. TRO references are enclosed in square brackets.

Instrumentation process setpoints for the listed subsystems and trip functions are set consistent with the Trip Setpoint Limit Column of Table 2.2-1. Actual setpoints are established in accordance with engineering procedures.

Alarm setpoints and other non-protection system trip settings as may be found in the Technical Specifications or in the Technical Requirements are not included in this table.

Reference NDAP-QA-1104 Setpoint Change Control

TABLE 2.2-1 (Page 1 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.1	Reactor Protection		
2.2.1.1	3.3.1.1	Intermediate Range Monitor, Neutron Flux - High	≤ 120/125 divisions of full scale
2.2.1.2	3.3.1.1	Average Power Range Monitor, Neutron Flux - High (Setdown)	≤ 18% of RATED THERMAL POWER
2.2.1.3	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power – High, Two Loop Operation	0.55 W + 58.7%
2.2.1.4	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power – High, Single Loop Operation	0.55 (W- ΔW) + 58.7%[b]
2.2.1.5	3.3.1.1	Average Power Range Monitor, Simulated Thermal Power – High, Clamp	≤ 113.5% of RATED THERMAL POWER
2.2.1.6	3.3.1.1	Average Power Range Monitor, Neutron Flux - High	≤ 118% of RATED THERMAL POWER
2.2.1.7	3.3.1.1	Reactor Vessel Steam Dome Pressure - High	≤ 1087 psig
2.2.1.8	3.3.1.1	Reactor Vessel Water Level - Low, Level 3	≥ 13.0 inches [a]
2.2.1.9	3.3.1.1	Main Steam Isolation Valve - Closure	≤ 10% closed
2.2.1.10		This Section Not Used	
2.2.1.11	3.3.1.1	Drywell Pressure - High	≤ 1.72 psig
2.2.1.12	3.3.1.1	Scram Discharge Volume Water Level - High - Level Transmitter	≤ 65 gallons
2.2.1.13	3.3.1.1	Scram Discharge Volume Water Level - High - Float Switch	≤ 61 gallons
2.2.1.14	3.3.1.1	Turbine Stop Valve - Closure	≤ 5.5% closed
2.2.1.15	3.3.1.1	Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≥ 500 psig

(continued)

[a] See Figure 2.2-1
[b] For Single loop operation, the value of ΔW = 8.7

TABLE 2.2-1 (Page 2 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.1.16	OPRM Instrumentation		
2.2.1.16.1	3.3.1.1	Sp PBA Amplitude Trip	See COLR – TRO 3.2
2.2.1.16.2	3.3.1.1	Np PBA Successive Confirmation Count Trip	See COLR – TRO 3.2
2.2.1.16.3	[3.3.9]	TOL (ε) Period Tolerance	0.10 sec
2.2.1.16.4	[3.3.9]	fc Conditioning Filter Cutoff Frequency	1.50 Hz
2.2.1.16.5	[3.3.9]	Tmin Oscillation Period Lower Time Limit	1.00 sec
2.2.1.16.6	[3.3.9]	Tmax Oscillation Period Upper Time Limit	3.50 sec
2.2.1.16.7	[3.3.9]	LPRMmin Minimum LRPMs/Cell Required for Cell Operability	2
2.2.1.16.8	[3.3.9]	S1 Peak Threshold Setpoint/ABA & GRBA	1.20
2.2.1.16.9	[3.3.9]	S2 Valley Threshold Setpoint/ABA & GRBA	0.85
2.2.1.16.10	[3.3.9]	Smax Amplitude Trip Setpoint/ABA	1.50
2.2.1.16.11	[3.3.9]	DR3 Growth Rate Factor Setpoint/GRBA	1.60
2.2.2	Isolation Actuation Instrumentation		
2.2.2.1	Primary Containment Isolation		
2.2.2.1.1	3.3.6.1	Reactor Vessel Water Level Low, Level 3	≥ 13.0 inches[(a)]
2.2.2.1.2	3.3.6.1	Reactor Vessel Water Level Low Low, Level 2	≥ -38.0 inches[(a)]
2.2.2.1.3	3.3.6.1	Reactor Vessel Water Level Low Low Low, Level 1	≥ -129 inches[(a)]
2.2.2.1.4	3.3.6.1	Drywell Pressure - High	≤ 1.72 psig
2.2.2.1.5	3.3.6.1/[3.3.6]	SGTS Exhaust Radiation - High	≤ 23.0 mR/hr
2.2.2.1.6	[3.3.6]	Main Steam Line Radiation – High High	≤ 15 x full power background without hydrogen injection

(continued)

[(a)] See Figure 2.2-1

TABLE 2.2-1 (Page 3 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.2.2	Secondary Containment Isolation		
2.2.2.2.1	3.3.6.2	Reactor Vessel Water Level - Low Low, Level 2	≥ -38.0 inches[(a)]
2.2.2.2.2	3.3.6.2	Drywell Pressure - High	≤ 1.72 psig
2.2.2.2.3	3.3.6.2	Refuel Floor High Exhaust Duct Radiation - High	≤ 18 mR/hr
2.2.2.2.4	3.3.6.2	Railroad Access Shaft Exhaust Duct Radiation - High	≤ 5 mR/hr
2.2.2.2.5	3.3.6.2	Refuel Floor Wall Exhaust Duct Radiation - High	≤ 21 mR/hr
2.2.2.3	Main Steam Line Isolation		
2.2.2.3.1	3.3.6.1	Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches[(a)]
2.2.2.3.2	3.3.6.1	Main Steam Line Pressure - Low	≥ 861 psig
2.2.2.3.3	3.3.6.1	Main Steam Line Flow - High	≤ 173 psid
2.2.2.3.4	3.3.6.1	Condenser Vacuum - Low	≥ 9.0 inches Hg vacuum
2.2.2.3.5	3.3.6.1	Reactor Building Main Steam Line Tunnel Temperature - High	≤ 177°F
2.2.2.3.6		This Section Not Used	
2.2.2.3.7	[3.3.6]	Reactor Building Main Steam Line Tunnel Δ Temperature - High	≤ 99°F
2.2.2.3.8	[3.3.6]	Turbine Building Main Steam Tunnel Temperature - High	≤ 197°F
2.2.2.4	Reactor Water Cleanup System Isolation		
2.2.2.4.1	3.3.6.1	Reactor Vessel Water Level - Low Low, Level 2	≥ -38 inches[(a)]
2.2.2.4.2	3.3.6.1	RWCU Δ Flow - High	≤ 59 gpm
2.2.2.4.3	3.3.6.1	RWCU Flow - High	≤ 462 gpm
2.2.2.4.4	3.3.6.1	RWCU Penetration Area Temperature - High	≤ 131°F
2.2.2.4.5	[3.3.6]	RWCU Penetration Room Area Δ Temperature - High	≤ 69°F
2.2.2.4.6	3.3.6.1	RWCU Pump Area Temperature - High	≤ 147°F
2.2.2.4.7	[3.3.6]	RWCU Pump Room Area Δ Temperature - High	≤ 69°F
2.2.2.4.8	3.3.6.1	RWCU Heat Exchanger Area Temperature - High	≤ 147°F
2.2.2.4.9	[3.3.6]	RWCU Heat Exchanger Room Area Δ Temperature – High	≤ 69°F

(continued)

[(a)] See Figure 2.2-1

TABLE 2.2-1 (Page 4 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.2.5	Reactor Core Isolation Cooling System Isolation		
2.2.2.5.1	3.3.6.1	RCIC Steam Line Δ Pressure - High	≤ 188 inches H_2O
2.2.2.5.2	3.3.6.1	RCIC Steam Supply Line Pressure - Low	≥ 60 psig
2.2.2.5.3	3.3.6.1	RCIC Turbine Exhaust Diaphragm Pressure - High	≤ 10.0 psig
2.2.2.5.4	3.3.6.1	RCIC Equipment Room Temperature - High	≤ 167°F
2.2.2.5.5	3.3.6.1	RCIC Pipe Routing Area Temperature - High	≤ 167°F
2.2.2.5.6	3.3.6.1	RCIC Emergency Area Cooler Temperature - High	≤ 167°F
2.2.2.5.7	3.3.6.1	Drywell Pressure - High	≤ 1.72 psig
2.2.2.5.8	[3.3.6]	RCIC Equipment Room Δ Temperature - High	≤ 89°F
2.2.2.5.9	[3.3.6]	RCIC Pipe Routing Area Δ Temperature - High	≤ 89°F
2.2.2.6	High Pressure Coolant Injection System Isolation		
2.2.2.6.1	3.3.6.1	HPCI Steam Line Δ Pressure - High	≤ 370 inches H_2O
2.2.2.6.2	3.3.6.1	HPCI Steam Supply Line Pressure - Low	≥ 104 psig
2.2.2.6.3	3.3.6.1	HPCI Turbine Exhaust Diaphragm Pressure - High	≤ 10 psig
2.2.2.6.4	3.3.6.1	HPCI Equipment Room Temperature - High	≤ 167°F
2.2.2.6.5	3.3.6.1	HPCI Emergency Area Cooler Temperature - High	≤ 167°F
2.2.2.6.6	3.3.6.1	HPCI Pipe Routing Area Temperature - High	≤ 167°F
2.2.2.6.7	3.3.6.1	Drywell Pressure - High	≤ 1.72 psig
2.2.2.6.8	[3.3.6]	HPCI Equipment Room Δ Temperature - High	≤ 89°F
2.2.2.6.9	[3.3.6]	HPCI Pipe Routing Area Δ Temperature - High	≤ 89°F
2.2.2.7	Shutdown Cooling/System Isolation		
2.2.2.7.1	3.3.6.1	Reactor Vessel Water Level - Low, Level 3	≥ 13.0 inches[(a)]
2.2.2.7.2	3.3.6.1	Reactor Vessel Steam Dome Pressure - High	≤ 98 psig
2.2.2.7.3	[3.3.6]	RHR Flow - High	≤ 25,000 gpm
2.2.3	ECCS Actuation		
2.2.3.1	Core Spray System		
2.2.3.1.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches[(a)]
2.2.3.1.2	3.3.5.1	Drywell Pressure - High	≤ 1.72 psig
2.2.3.1.3	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low injection permissive	≥ 413, ≤ 427 psig

(continued)

[(a)] See Figure 2.2-1

TABLE 2.2-1 (Page 5 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.3.2	LPCI Mode of RHR System		
2.2.3.2.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches[(a)]
2.2.3.2.2	3.3.5.1	Drywell Pressure - High	≤ 1.72 psig
2.2.3.2.3	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low, injection permissive	≥ 413, ≤ 427 psig
2.2.3.2.4	3.3.5.1	Reactor Vessel Steam Dome Pressure - Low, Recirculation Discharge Valve permissive	≥ 236 psig, decreasing
2.2.3.3	HPCI System		
2.2.3.3.1	3.3.5.1	Reactor Vessel Water Level - Low Low, Level 2	≥ -38 inches[(a)]
2.2.3.3.2	3.3.5.1	Drywell Pressure - High	≤ 1.72 psig
2.2.3.3.3	3.3.5.1	Condensate Storage Tank Level - Low	≥ 36.0 inches above tank bottom
2.2.3.3.4	3.3.5.1	Reactor Vessel Water Level - High, Level 8	≤ 54 inches
2.2.3.4	Automatic Depressurization System (ADS)		
2.2.3.4.1	3.3.5.1	Reactor Vessel Water Level - Low Low Low, Level 1	≥ -129 inches
2.2.3.4.2	3.3.5.1	Drywell Pressure - High	≤ 1.72 psig
2.2.3.4.3	3.3.5.1	ADS Timer	≤ 102 seconds
2.2.3.4.4	3.3.5.1	Core Spray Pump Discharge Pressure - High	≥ 135, ≤ 155 psig
2.2.3.4.5	3.3.5.1	Low Pressure Coolant Injection Pump Discharge Pressure - High	≥ 121, ≤ 129 psig
2.2.3.4.6	3.3.5.1	Reactor Vessel Water Level - Low, Level 3 Confirmatory	≥ 13 inches
2.2.3.4.7	3.3.5.1	ADS Drywell Pressure Bypass Timer	≤ 420 seconds
2.2.3.5	Loss of Power - ECCS Actuation		
2.2.3.5.1	4.16kv ESS Bus Undervoltage (Loss of Voltage < 20%)		
2.2.3.5.1.1	3.3.8.1	Bus Undervoltage	≥ 823.2, ≤ 856.8 Volts
2.2.3.5.1.2	3.3.8.1	Time delay	≥ 0.4, ≤ 0.6 seconds

(continued)

[(a)] See Figure 2.2-1

TABLE 2.2-1 (Page 6 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.3.5.2	4.16kV ESS Bus Undervoltage (Degraded Voltage < 65%)		
2.2.3.5.2.1	3.3.8.1	Bus Undervoltage	≥ 2641.1, ≤ 2748.9 Volts
2.2.3.5.2.2	3.3.8.1	Time delay	≥ 2.7, ≤ 3.3 seconds
2.2.3.5.3	4.16kV ESS Bus Undervoltage (Degraded Voltage, < 93%)		
2.2.3.5.3.1	3.3.8.1	Bus Undervoltage	≥ 3829.3, ≤ 3906.7 Volts
2.2.3.5.3.2	3.3.8.1	Time Delay (Non-LOCA)	≥ 4 minute, 30 seconds ≤ 5 minute, 30 seconds
2.2.3.5.3.4	3.3.8.1	Time Delay (LOCA)	≥ 9, ≤ 11 seconds
2.2.3.5.4	480V ESS Bus 0B565 Undervoltage (Degraded Voltage, < 65%)		
2.2.3.5.4.1	[3.8.5]	480V Basis	≥ 308.9, ≤ 315.1 Volts
2.2.3.5.4.2	[3.8.5]	Time Delay	≥ 4.5, ≤ 5.5 seconds
2.2.3.5.5	480V ESS Bus 0B565 Undervoltage (Degraded Voltage, < 92%)		
2.2.3.5.5.1	[3.8.5]	480V Basis	≥ 437.6, ≤ 446.4 Volts
2.2.3.5.5.2	[3.8.5]	Time Delay	≥ 9, ≤ 11 seconds
2.2.4	ATWS Alternate Rod Injection and Recirculation Pump Trip		
2.2.4.1	3.3.4.2/[3.1.1]	Reactor Vessel, Water Level - Low Low, Level 2	≥ -38 inches[(a)]
2.2.4.1	3.3.4.2/[3.1.1]	Reactor Vessel Steam Dome Pressure – High	≤ 1135 psig
2.2.5	End of Cycle Recirculation Pump Trip		
2.2.5.1	3.3.4.1	Turbine Stop Valve-Closure	≤ 5.5% closed
2.2.5.2	3.3.4.1	Turbine Control Valve - Fast Closure	≥ 500 psig
2.2.6	Reactor Core Isolation Cooling System Actuation		
2.2.6.1	3.3.5.2	Reactor Vessel Water Level - Low Low, Level 2	≥ -38 inches[(a)]
2.2.6.2	3.3.5.2	Reactor Vessel Water Level - High, Level 8	≤ 54 inches[(a)]
2.2.6.3	3.3.5.2	Condensate Storage Tank Level – Low	≥ 36.0 inches above tank bottom

(continued)

[(a)] See Figure 2.2-1

TABLE 2.2-1 (Page 7 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.7	Control Rod Block		
2.2.7.1	Rod Block Monitor		
2.2.7.1.1	3.3.2	Low Power Range - Upscale	See COLR TRO 3.2
	3.3.2	Intermediate Power Range - Upscale	See COLR TRO 3.2
	3.3.2	High Power Range - Upscale	See COLR TRO 3.2
2.2.7.1.2	3.3.2	Low Power Range Setpoint	See COLR TRO 3.2
	3.3.2	Intermediate Power Range Setpoint	See COLR TRO 3.2
	3.3.2	High Power Range Setpoint	See COLR TRO 3.2
2.2.7.2	APRM		
2.2.7.2.1	[3.1.3]	Simulated Thermal Power-High - Two Loop Operation	0.55W + 54.2%
2.2.7.2.2	[3.1.3]	Simulated Thermal Power-High - Single Loop Operation	0.55 (W-ΔW) + 54.2% [c]
2.2.7.2.3	[3.1.3]	Simulated Thermal Power-High - Clamp	≤ 108% of RATED THERMAL POWER
2.2.7.2.4	[3.1.3]	Downscale	≥ 5% of RATED THERMAL POWER
2.2.7.2.5	[3.1.3]	Neutron Flux - High (Setdown)	≤ 12% of RATED THERMAL POWER
2.2.7.3	Source Range Monitors		
2.2.7.3.1	[3.1.3]	Upscale	≤ 2E5 cps
2.2.7.3.2	[3.1.3]	Downscale	≥ 3.0 cps[b]
2.2.7.4	Intermediate Range Monitors		
2.2.7.4.1	[3.1.3]	Upscale	≤ 108/125 divisions of full scale
2.2.7.4.2	[3.1.3]	Downscale	≥ 5/125 divisions of full scale
2.2.7.5	Scram Discharge Volume		
2.2.7.5.1	[3.1.3]	Water Level – High	≤ 35.9 gallons
2.2.7.6	Reactor Coolant System Recirculation Flow		
2.2.7.6.1	[3.1.3]	Upscale	114%

(continued)

[b] With a signal-to-noise ratio ≥ 2, or within the limits of Figure 2.2-2.

[c] For single loop operation, the value of ΔW = 8.7

TABLE 2.2-1 (Page 8 of 8)
INSTRUMENTATION SETPOINTS

	SYSTEM/REFERENCE LCO [TRO]	TRIP FUNCTION	TRIP SETPOINT
2.2.8	CREOASS		
2.2.8.1	3.3.7.1	Main Control Room Outside Air Intake Radiation Monitor	≤ 5 mR/hr
2.2.8.1.1	3.3.7.1	Reactor Vessel Water Level - Low Low, Level 2	≥ -38.0 inches[(a)]
2.2.8.1.2	3.3.7.1	Drywell Pressure – High	≤ 1.72 psig
2.2.8.1.3	3.3.7.1	Refuel Floor High Exhaust Duct Radiation - High	≤ 18 mR/hr
2.2.8.1.4	3.3.7.1	Railroad Access Shaft Exhaust Duct Radiation – High	≤ 5 mR/hr
2.2.8.1.5	3.3.7.1	Refuel Floor Wall Exhaust Duct Radiation - High	≤ 21 mR/hr
2.2.9	Feedwater/Main Turbine Trip System Actuation		
2.2.9.1	3.3.2.2	Reactor Vessel Level – High	≤ 54.0 inches[(a)]
2.2.10	MVP Isolation		
2.2.10.1	[3.3.11]	Main Steam Line Radiation – High High	≤ 15 x full power background without hydrogen injection

[(a)] See Figure 2.2-1

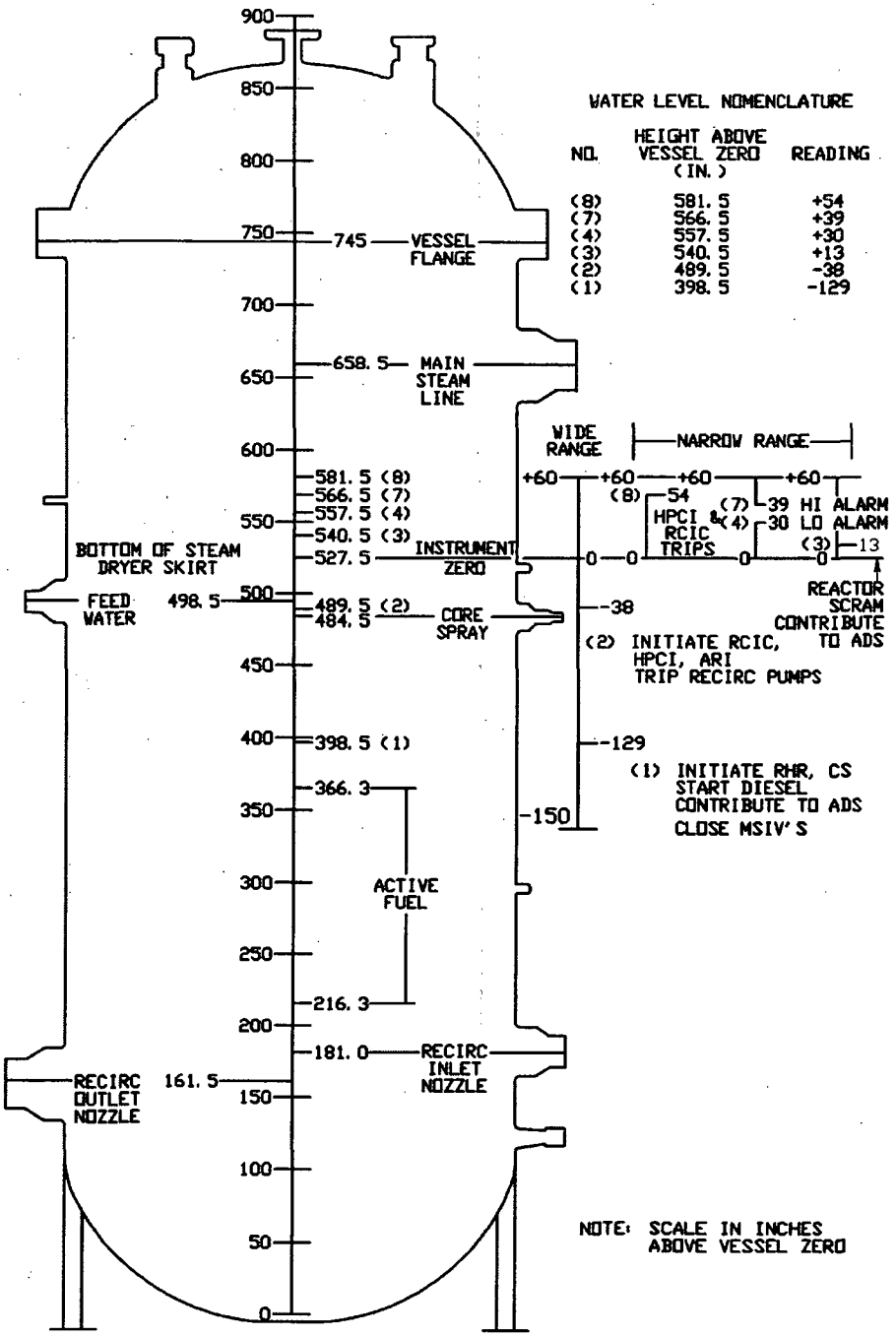


FIGURE 2.2-1
REACTOR VESSEL WATER LEVEL

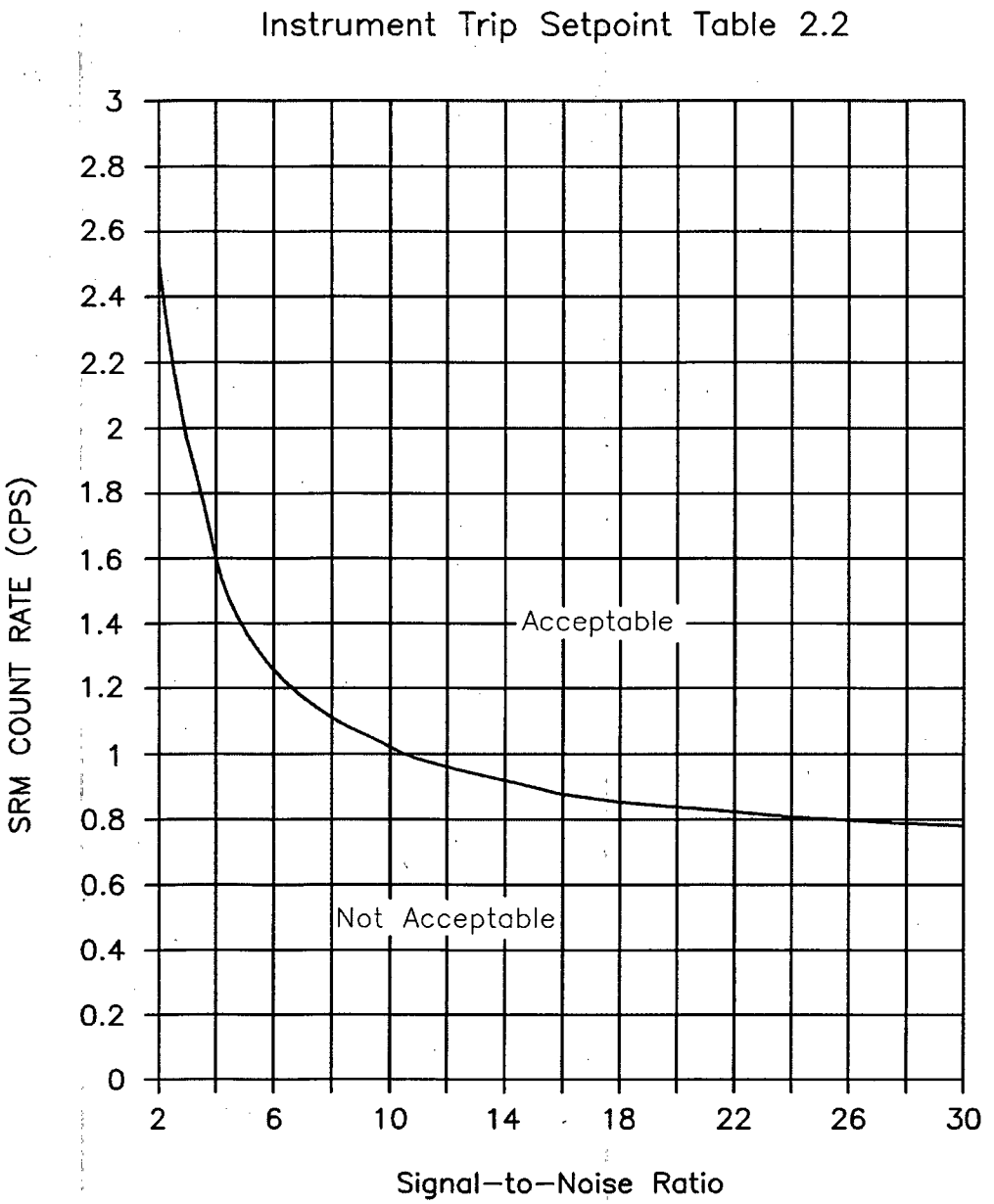


Figure 2.2–2
Minimum SRM Trip Setpoint Versus Signal–to–Noise Ratio

3.1 Reactivity Control Systems

3.1.3 Control Rod Block Instrumentation

The control rod block instrumentation for each function in Table 3.1.3-1 shall be OPERABLE.

APPLICABILITY: According to Table 3.1.3-1

ACTIONS

---------- NOTE ----------
Separate condition entry is allowed for each channel

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more required channels inoperable.	A.1 Enter the Condition referenced in Table 3.1.3-1for the channel.	Immediately
B. As required by Required Action A.1 and referenced in Table 3.1.3-1.	B.1 Place at least one inoperable channel in the tripped condition. AND B.2 Place the inoperable channel in the tripped condition.	1 hour from discovery of loss of trip capability 7 days
C. As required by Required Action A.1 and referenced in Table 3.1.3-1.	C.1 Place the inoperable channel in the tripped condition.	12 hours
D. Required Actions and Completion Time of Conditions B or C not met.	D.1 Suspend Control Rod withdrawal.	Immediately

TECHNICAL REQUIREMENT SURVEILLANCE

---------- NOTES ----------

1. Refer to Table 3.1.3-1 to determine which TRSs apply for each Control Rod Block Function.

2. Neutron detectors may be excluded from CHANNEL CALIBRATION.

3. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided at least one other OPERABLE channel in the same trip system is monitoring that parameter.

	SURVEILLANCE	FREQUENCY
TRS 3.1.3.1	Perform CHANNEL CHECK	12 hours
TRS 3.1.3.2	---------- NOTE ---------- For Function 1.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST	184 days
TRS 3.1.3.3	Perform CHANNEL FUNCTIONAL TEST	7 days
TRS 3.1.3.4	Perform CHANNEL FUNCTIONAL TEST	92 days
TRS 3.1.3.5	Perform CHANNEL CALIBRATION	184 days
TRS 3.1.3.6	---------- NOTE ---------- Neutron detectors are excluded. ---------- Perform CHANNEL CALIBRATION	24 months
TRS 3.1.3.7	Perform LOGIC SYSTEM FUNCTIONAL TEST	24 months

TABLE 3.1.3-1 (Page 1 of 2)
CONTROL ROD BLOCK INSTRUMENTATION

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. APRM					
a. Neutron Flux - High (Setdown)	2, 5[a]	3	B	TRS 3.1.3.2 TRS 3.1.3.6	≤ 14% RTP
b. Simulated Thermal Power – High	1	3	B	TRS 3.1.3.2 TRS 3.1.3.6	0.55W + 56.2%[b]
c. Downscale	1	3	B	TRS 3.1.3.2 TRS 3.1.3.6	≥ 3% RTP
d. Inop	1, 2	3	B	TRS 3.1.3.2	NA
	5[a]	3	B	TRS 3.1.3.2	NA
2. Source Range Monitors					
a. Detector not full in	2[c]	3	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
	5[j]	2	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
b. Upscale	2[d]	3	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≤ 3.3E5 cps
	5[j]	2	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≤ 3.3E5 cps
c. Inop	2[d]	3	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
	5[j]	2	B	TRS 3.1.3.3 TRS 3.1.3.7	NA

(continued)

(a) When performing Shutdown Margin Demonstration per Technical Specification 3.10.8.
(b) For single loop operation, the value of ΔW = 8.7
(c) When not automatically bypassed with SRM counts ≥ 100 cps or the IRM channels on range 3 or higher.
(d) When not automatically bypassed with IRM channels on range 8 or higher.
(j) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

TABLE 3.1.3-1 (Page 2 of 2)
CONTROL ROD BLOCK INSTRUMENTATION

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
d. Downscale	2[e]	3	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≥ 1.8 cps[f]
	5[i] [j]	2	B	TRS 3.1.3.3 TRS 3.1.3.6 TRS 3.1.3.7	≥ 1.8 cps[f]
3. Intermediate Range Monitors					
a. Detector not full in	2, 5[j]	6	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
b. Neutron Flux - High	2, 5[j]	6	B	TRS 3.1.3.1 TRS 3.1.3.3 TRS 3.1.3.5 TRS 3.1.3.7	≤ 110/125 divisions of full scale
c. Inop	2, 5[j]	6	B	TRS 3.1.3.3 TRS 3.1.3.7	NA
d. Downscale	2[g] 5[j]	6	B	TRS 3.1.3.1 TRS 3.1.3.3 TRS 3.1.3.5 TRS 3.1.3.7	3/125 divisions of full scale
4. Scram Discharge Volume Water Level - High	1, 2, 5[h]	2	C	TRS 3.1.3.4 TRS 3.1.3.6	≤ 36.5 gallons
5. Reactor Coolant System Recirculation Flow					
a. Upscale	1	3	C	TRS 3.1.3.2 TRS 3.1.3.6	≤ 117/125 divisions of full scale

(e) When not automatically bypassed with IRMs on range 3 or higher.
(f) With a signal-to-noise ratio ≥ 2, or within the limits of TS Figure 3.3.1.2-1.
(g) When not automatically bypassed with IRM channels on range 1.
(h) When more than one control rod is withdrawn. Not applicable to control rods removed per Technical Specification 3.10.5 or 3.10.6.
(i) Not required when eight or fewer fuel assemblies (adjacent to the SRMs) are in the core.
(j) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

3.2 Core Operating Limits Report (COLR)

3.2.1 Core Operating Limits Report (COLR)

TRO 3.2.1 The Core Operating Limits specified in the attached COLR shall be met.

APPLICABILITY: Specified in the referenced Technical Specifications.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Core Operating Limits not met.	A.1 Perform action(s) described in referenced Technical Specification.	Specified in referenced Technical Specifications.

TECHNICAL REQUIREMENT SURVEILLANCE

SURVEILLANCE	FREQUENCY
----------NOTE---------- No associated Surveillances. Surveillances are implemented in the applicable Technical Specifications. ----------	N/A

Susquehanna SES
Unit 1 Cycle 16

CORE OPERATING LIMITS REPORT

Nuclear Fuels Engineering

March 2008

CORE OPERATING LIMITS REPORT
REVISION DESCRIPTION INDEX

Rev. No.	Affected Sections	Description/Purpose of Revision
0	ALL	Issuance of this COLR is in support of Unit 1 Cycle 16 operation.

SUSQUEHANNA STEAM ELECTRIC STATION
Unit 1 Cycle 16
CORE OPERATING LIMITS REPORT

Table of Contents

1.0 INTRODUCTION

This CORE OPERATING LIMITS REPORT for Susquehanna Unit 1 Cycle 16 is prepared in accordance with the requirements of Susquehanna Unit 1, Technical Specification 5.6.5. As required by Technical Specifications 5.6.5, core shutdown margin, the core operating limits, RBM setpoints, and OPRM setpoints presented herein were developed using NRC-approved methods and are established such that all applicable limits of the plant safety analysis are met.

2.0 DEFINITIONS

Terms used in this COLR but not defined in Section 1.0 of the Technical Specifications or Section 1.1 of the Technical Requirements Manual are provided below.

2.1 The AVERAGE PLANAR EXPOSURE at a specified height shall be equal to the total energy produced per unit length at the specified height divided by the total initial weight of uranium per unit length at that height.

2.2 The PELLET EXPOSURE shall be equal to the total energy produced per unit length of fuel rod at the specified height divided by the total initial weight of uranium per unit length of that rod at that height.

2.3 FDLRX is the ratio of the maximum LHGR calculated by the core monitoring system for each fuel bundle divided by the LHGR limit for the applicable fuel bundle type.

2.4 $LHGRFAC_f$ is a multiplier applied to the LHGR limit when operating at less than 108 Mlbm/hr core flow. The $LHGRFAC_f$ multiplier protects against both fuel centerline melting and cladding strain during anticipated system transients initiated from core flows less than 108 Mlbm/hr.

2.5 $LHGRFAC_p$ is a multiplier applied to the LHGR limit when operating at less than 100% rated power. The $LHGRFAC_p$ multiplier protects against both fuel centerline melting and cladding strain during anticipated system transients initiated from partial power conditions.

2.6 MFLCPR is the ratio of the applicable MCPR operating limit for the applicable fuel bundle type divided by the MCPR calculated by the core monitoring system for each fuel bundle.

2.7 MAPRAT is the ratio of the maximum APLHGR calculated by the core monitoring system for each fuel bundle divided by the APLGHR limit for the applicable fuel bundle type.

2.8 OPRM is the Oscillation Power Range Monitor. The Oscillation Power Range Monitor (OPRM) will reliably detect and suppress anticipated stability related power oscillations while providing a high degree of confidence that the MCPR safety limit is not violated.

2.9 N_P is the OPRM setpoint for the number of consecutive confirmations of oscillation half-cycles that will be considered evidence of a stability related power oscillation.

2.10 S_P is the OPRM trip setpoint for the peak to average OPRM signal.

2.11 F_P is the core flow, in Mlbm / hr, below which the OPRM RPS trip is activated.

3.0 SHUTDOWN MARGIN

3.1 Technical Specification Reference

Technical Specification 3.1.1

3.2 Description

The SHUTDOWN MARGIN shall be equal to or greater than:

a) 0.38% Δk/k with the highest worth rod analytically determined

OR

b) 0.28% Δk/k with the highest worth rod determined by test

Since core reactivity will vary during the cycle as a function of fuel depletion and poison burnup, Beginning of Cycle (BOC) SHUTDOWN MARGIN (SDM) tests must also account for changes in core reactivity during the cycle. Therefore, the SDM measured at BOC must be equal to or greater than the applicable requirement from either 3.2.a or 3.2.b plus an adder, "R". The adder, "R", is the difference between the calculated value of maximum core reactivity (that is, minimum SDM) during the operating cycle and the calculated BOC core reactivity. If the value of "R" is zero (that is, BOC is the most reactive point in the cycle) no correction to the BOC measured value is required.

The SHUTDOWN MARGIN limits provided in 3.2a and 3.2b are applicable in MODES 1, 2, 3, 4, and 5. This includes core shuffling.

4.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

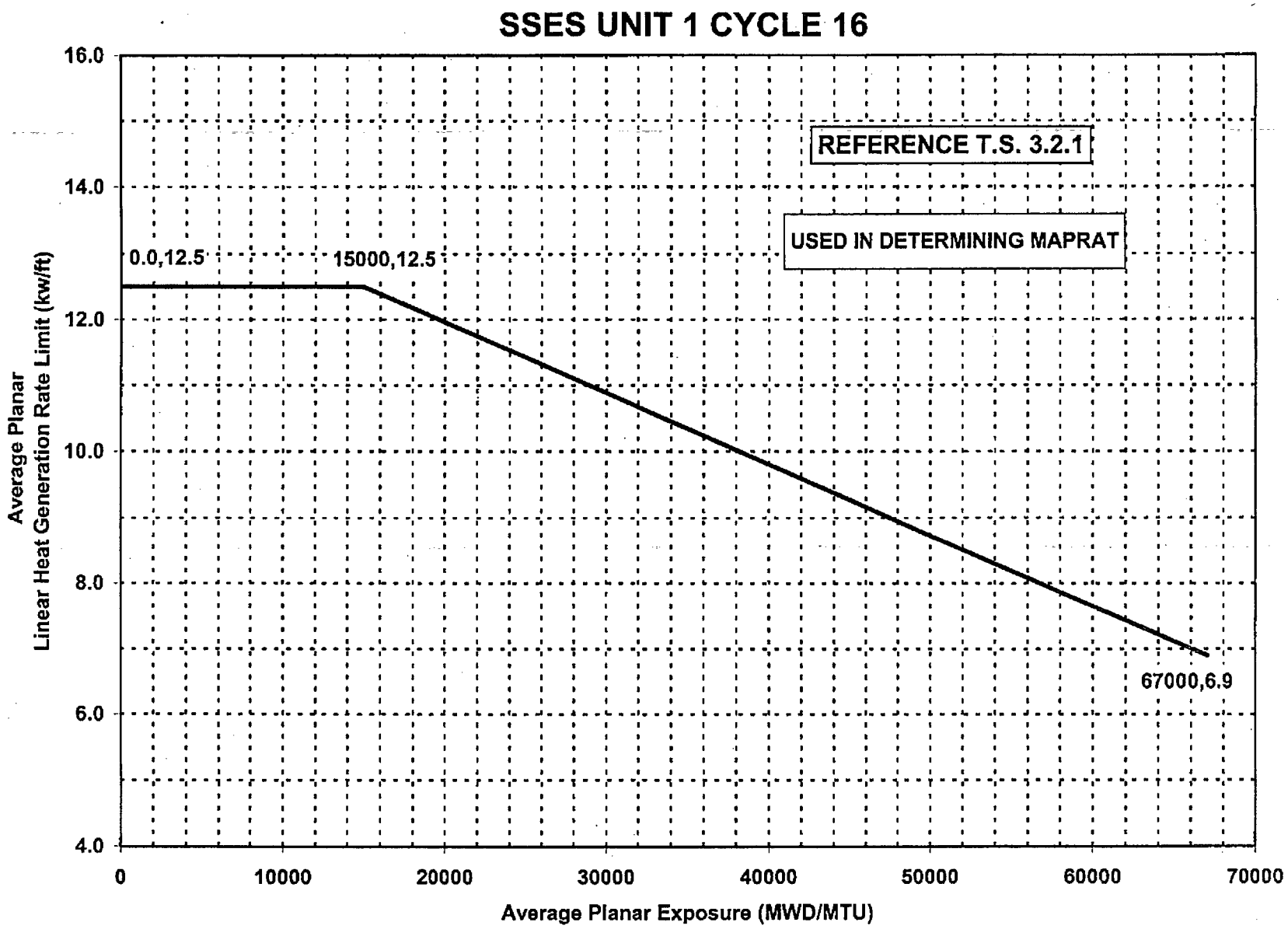
4.1 Technical Specification Reference

Technical Specification 3.2.1

4.2 Description

The APLHGRs for ATRIUM™-10 fuel shall not exceed the limit shown in Figure 4.2-1.

The APLHGR limits in Figure 4.2-1 are valid for Main Turbine Bypass Operable and Inoperable, EOC-RPT Operable and Inoperable, and Backup Pressure Regulator Operable and Inoperable in Two Loop operation. The APLHGR limits for Single Loop operation are provided in Section 8.0.



AVERAGE PLANAR LINEAR HEAT GENERATION RATE LIMIT VERSUS
AVERAGE PLANAR EXPOSURE TWO LOOP OPERATION
ATRIUM™-10 FUEL
FIGURE 4.2-1

5.0 MINIMUM CRITICAL POWER RATIO (MCPR)

5.1 Technical Specification Reference

Technical Specification 3.2.2, 3.3.4.1, 3.7.6, and 3.7.8

5.2 Description

The MCPR limit is specified as a function of core power, core flow, average scram insertion time per Section 5.3 and plant equipment operability status. The MCPR limits for all fuel types (ATRIUM™-10) shall be the greater of the Flow-Dependent or the Power-Dependent MCPR, depending on the applicable equipment operability status.

a) Main Turbine Bypass / EOC-RPT / Backup Pressure Regulator Operable

Figure 5.2-1: Flow-Dependent MCPR value determined from BOC to EOC

Figure 5.2-2: Power-Dependent MCPR value determined from BOC to EOC

b) Main Turbine Bypass Inoperable

Figure 5.2-3: Flow-Dependent MCPR value determined from BOC to EOC

Figure 5.2-4: Power-Dependent MCPR value determined from BOC to EOC

c) EOC-RPT Inoperable

Figure 5.2-5: Flow-Dependent MCPR value determined from BOC to EOC

Figure 5.2-6: Power-Dependent MCPR value determined from BOC to EOC

d) Backup Pressure Regulator Inoperable

Figure 5.2-7: Flow-Dependent MCPR value determined from BOC to EOC

Figure 5.2-8: Power Dependent MCPR value determined from BOC to EOC

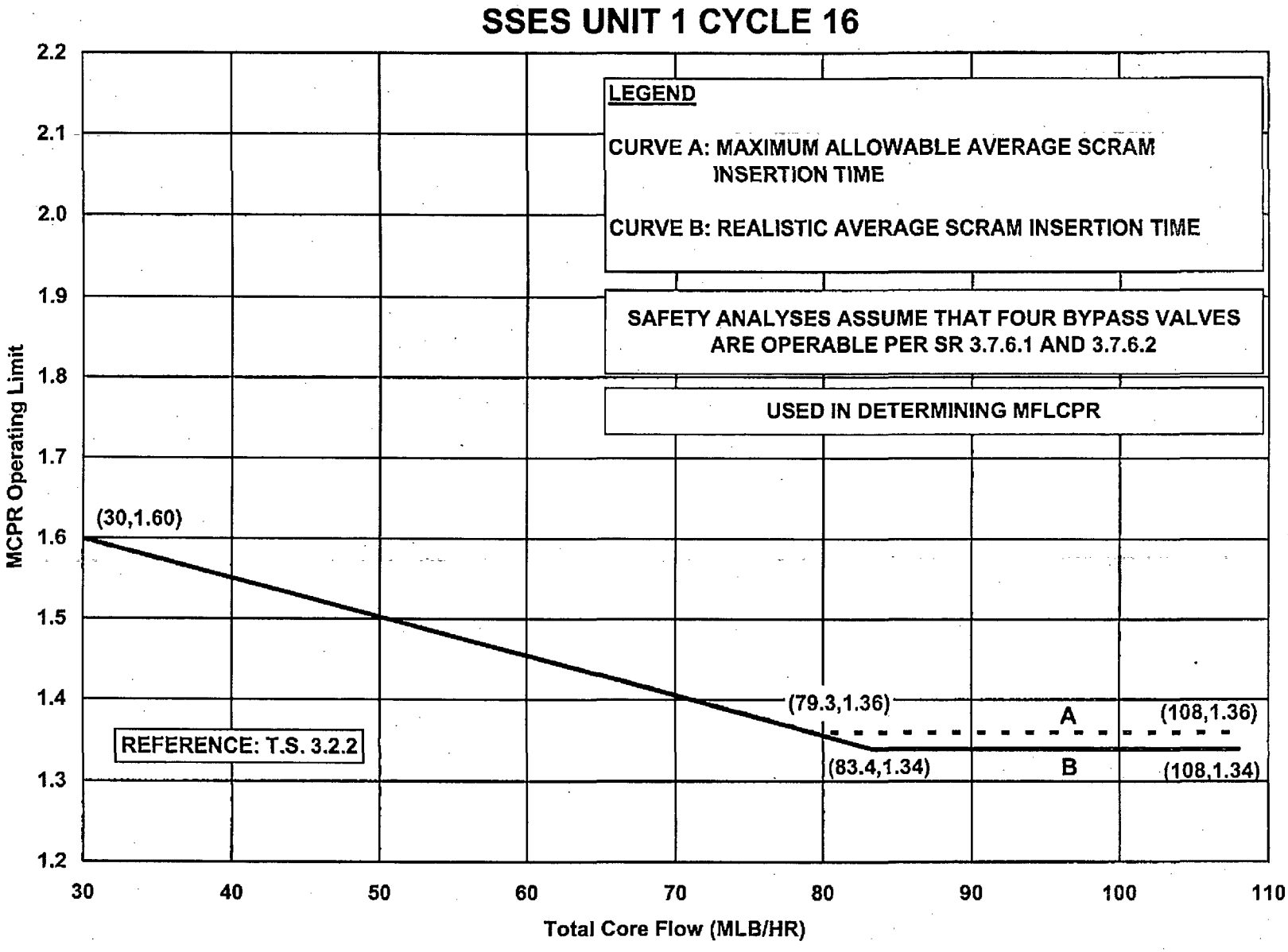
The MCPR limits in Figures 5.2-1 through 5.2-8 are valid for Two Loop operation.

The MCPR limits for Single Loop operation are provided in Section 8.0.

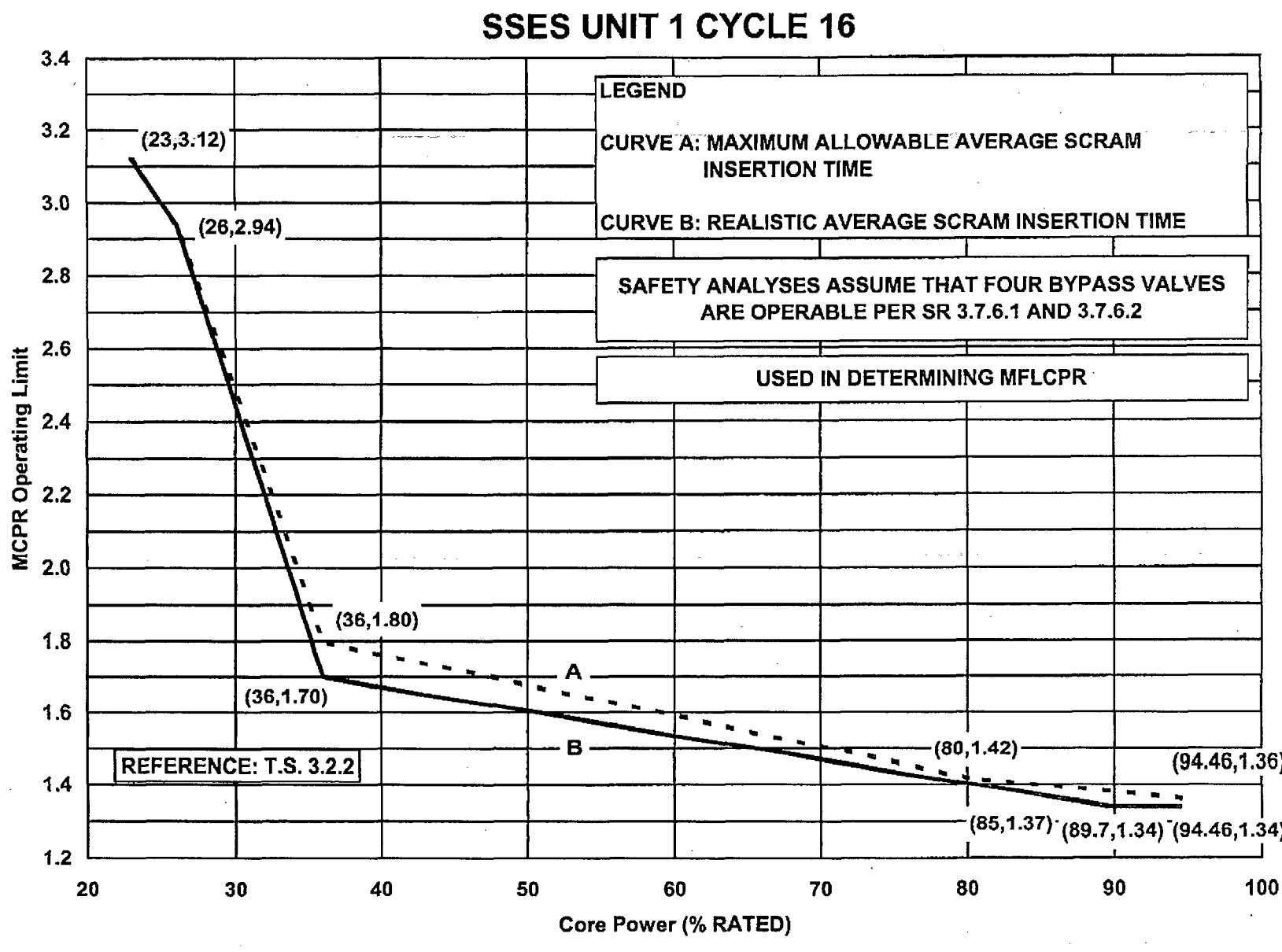
5.3 Average Scram Time Fraction

If the average measured scram times are greater than the Realistic Scram times listed in Table 5.3-1 then the MCPR operating limits corresponding to the Maximum Allowable Average Scram Insertion Time must be implemented. Determining MCPR operating limits based on interpolation between scram insertion times is not permitted. The evaluation of scram insertion time data, as it relates to the attached table should be performed per Reactor Engineering procedures.

Main Turbine Bypass / EOC-RPT / Backup Pressure Regulator Operable



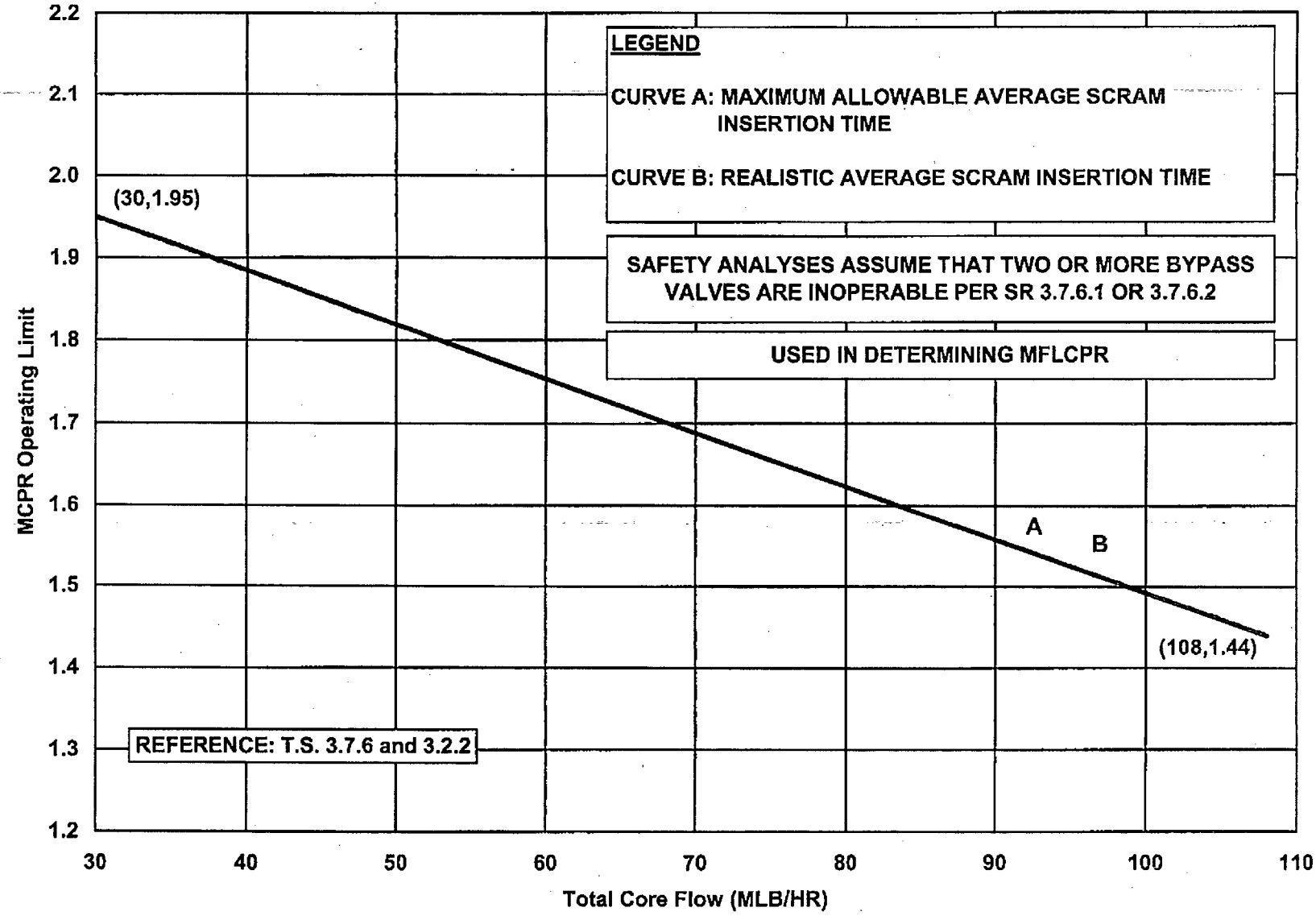
MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
MAIN TURBINE BYPASS / EOC-RPT / BACKUP PRESSURE REGULATOR OPERABLE
TWO LOOP OPERATION (BOC TO EOC)
FIGURE 5.2-1



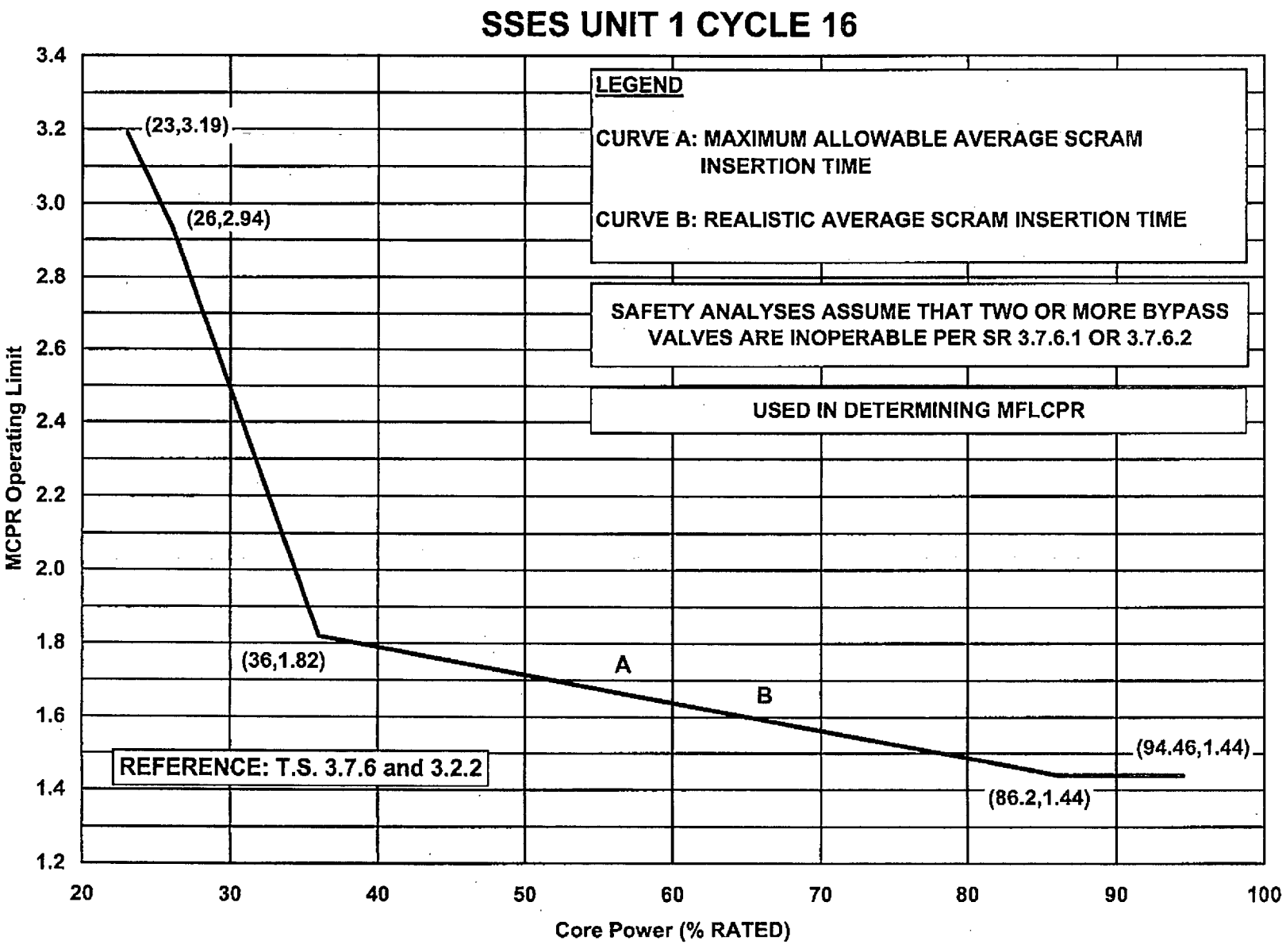
MCPR OPERATING LIMIT VERSUS CORE POWER
MAIN TURBINE BYPASS / EOC-RPT / BACKUP PRESSURE REGULATOR OPERABLE
TWO LOOP OPERATION (BOC TO EOC)
FIGURE 5.2-2

Main Turbine Bypass Inoperable

SSES UNIT 1 CYCLE 16



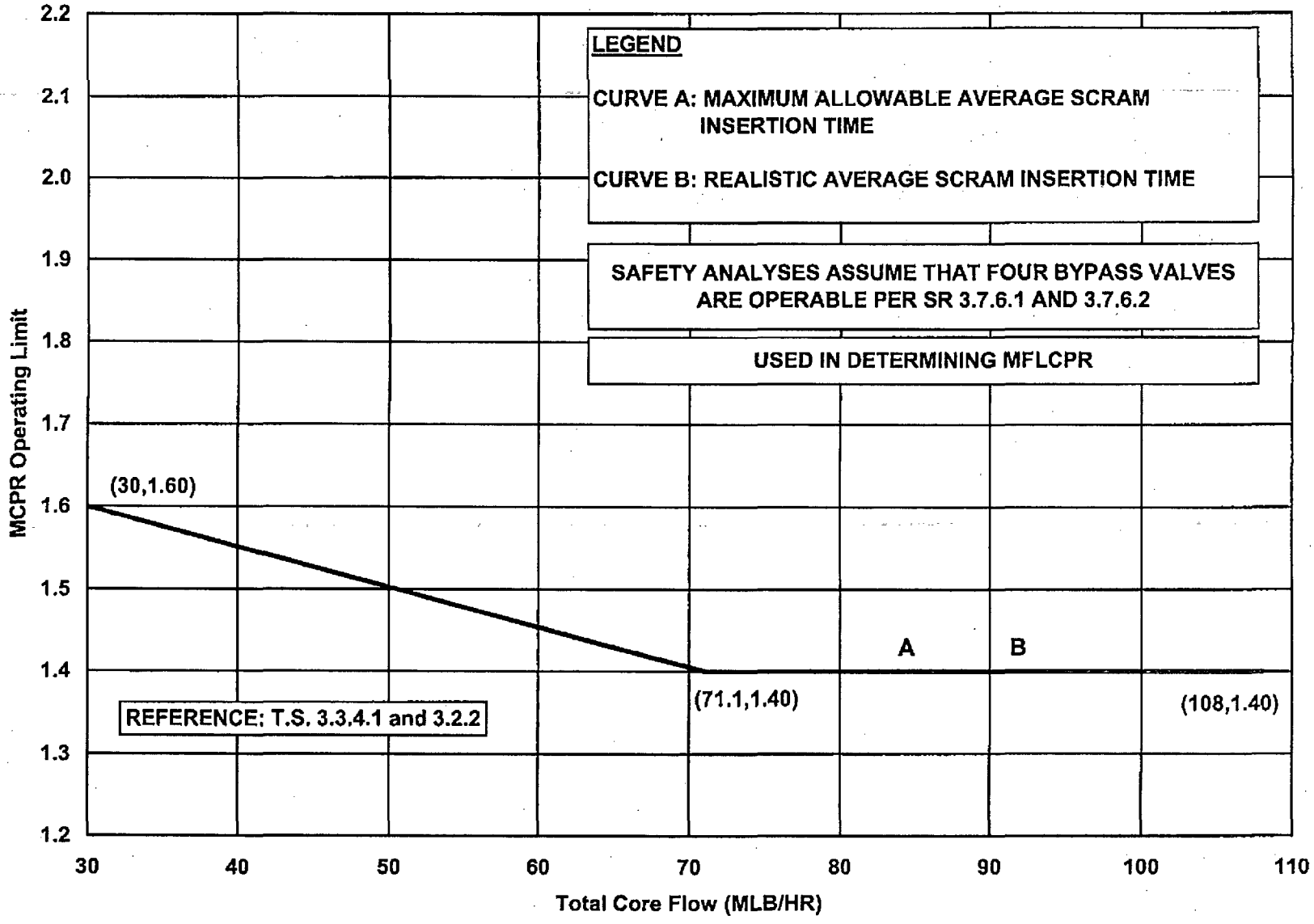
MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
MAIN TURBINE BYPASS INOPERABLE
TWO LOOP OPERATION (BOC TO EOC)
FIGURE 5.2-3



MCPR OPERATING LIMIT VERSUS CORE POWER
MAIN TURBINE BYPASS INOPERABLE
TWO LOOP OPERATION (BOC to EOC)
FIGURE 5.2-4

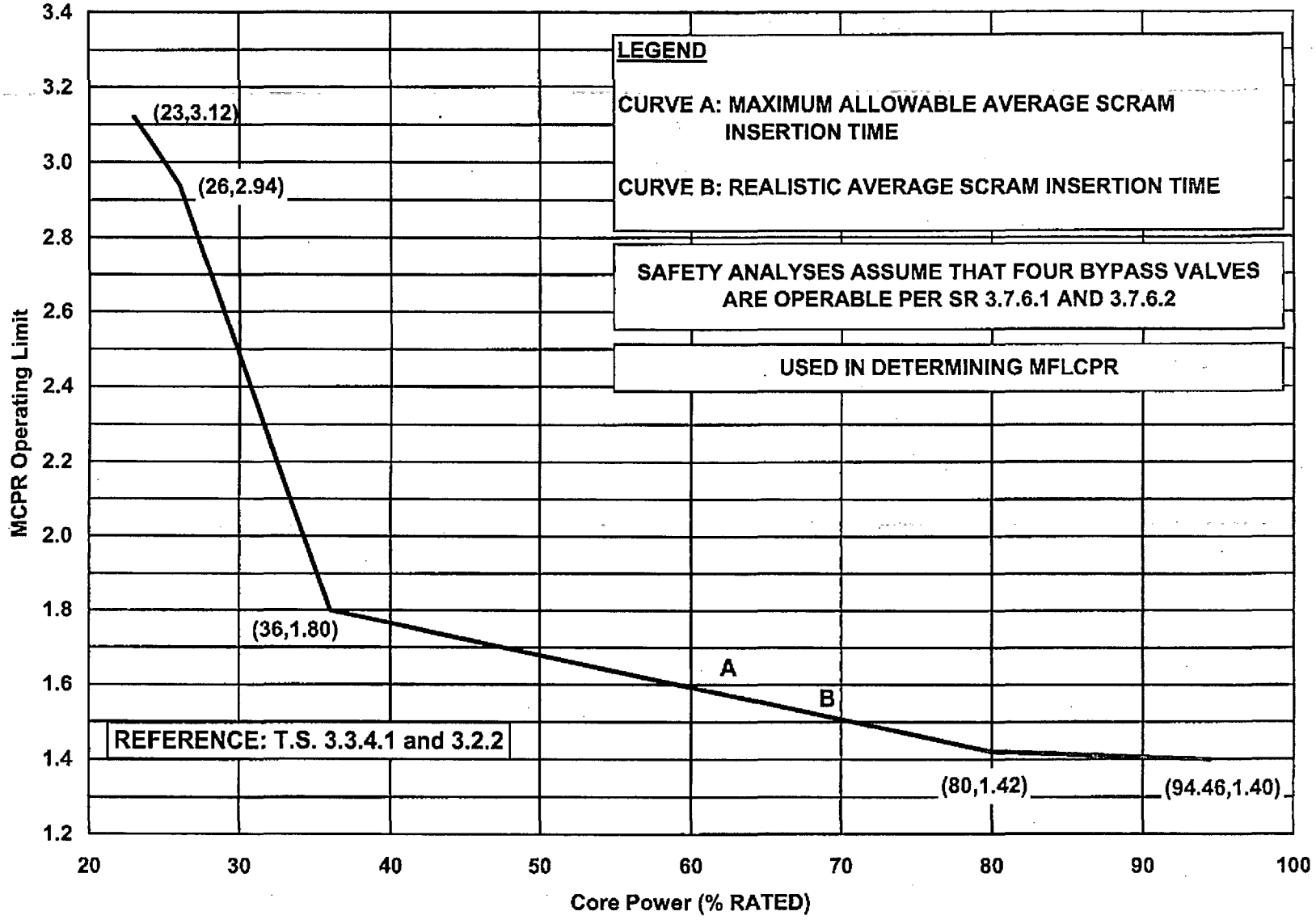
EOC-RPT
Inoperable

SSES UNIT 1 CYCLE 16



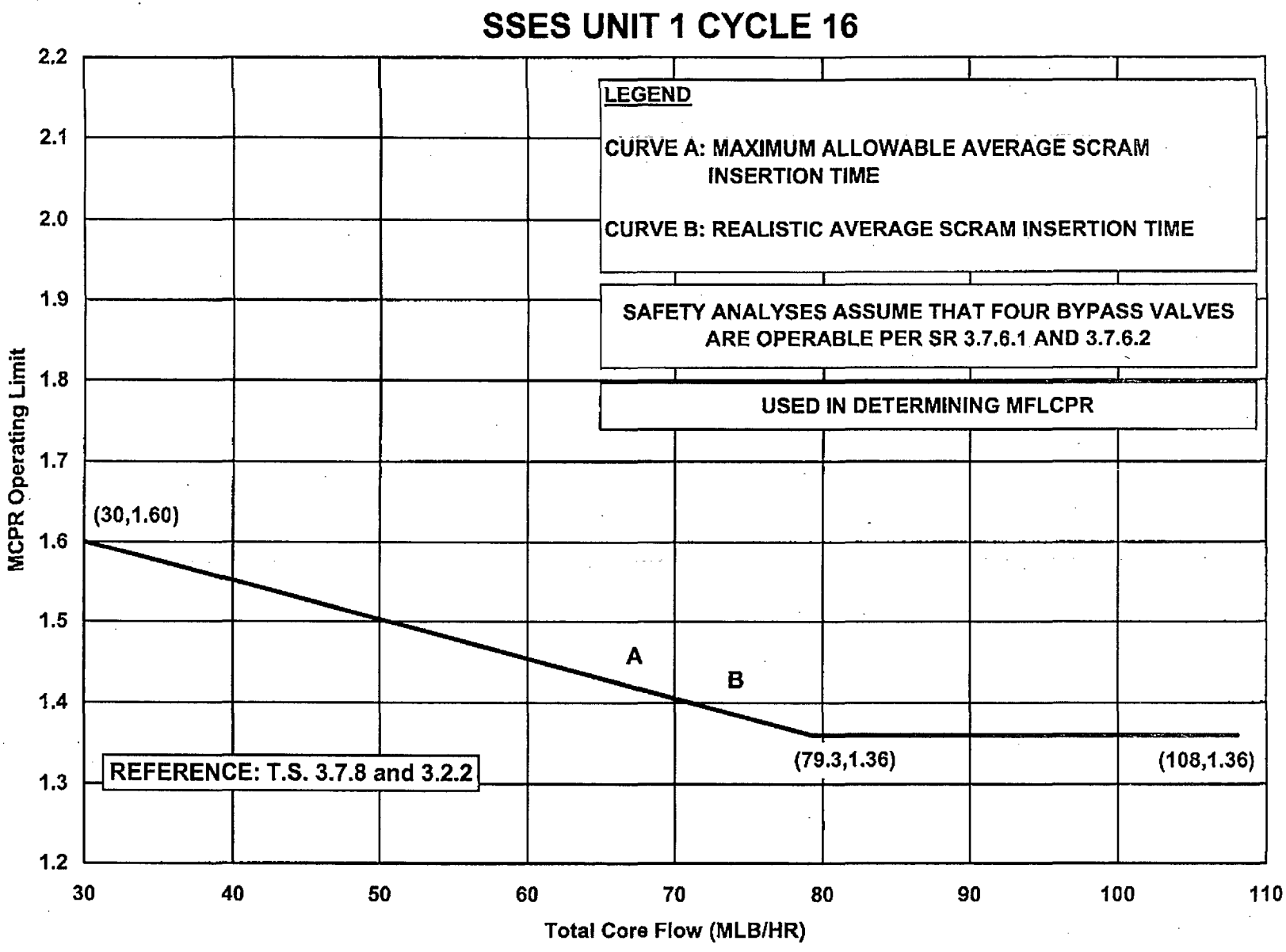
MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
EOC-RPT INOPERABLE
TWO LOOP OPERATION (BOC TO EOC)
FIGURE 5.2-5

SSES UNIT 1 CYCLE 16



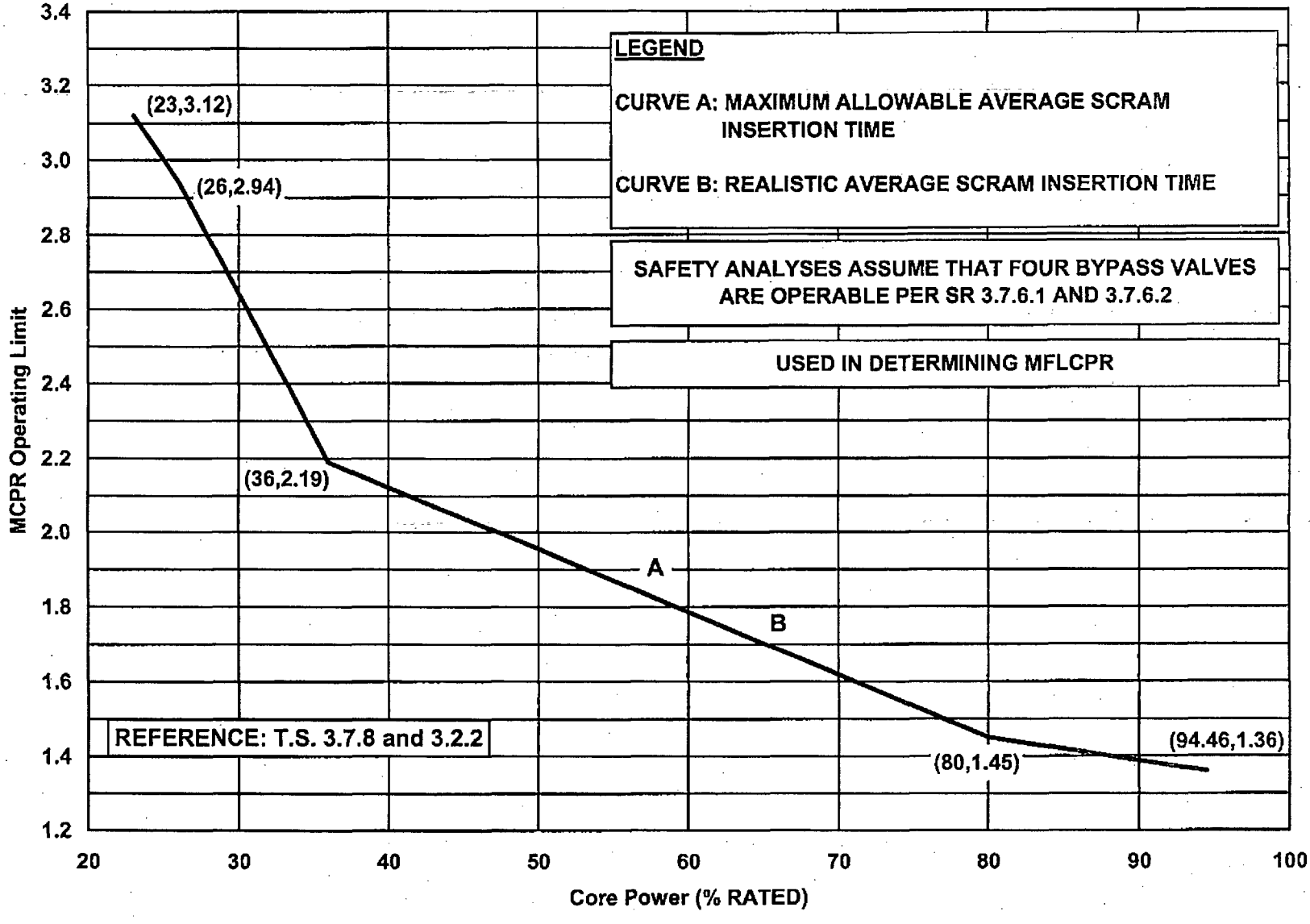
MCPR OPERATING LIMIT VERSUS CORE POWER
EOC-RPT INOPERABLE
TWO LOOP OPERATION (BOC to EOC)
FIGURE 5.2-6

Backup Pressure Regulator Inoperable



MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
BACKUP PRESSURE REGULATOR INOPERABLE
TWO LOOP OPERATION (BOC TO EOC)
FIGURE 5.2-7

SSES UNIT 1 CYCLE 16



MCPR OPERATING LIMIT VERSUS CORE POWER
BACKUP PRESSURE REGULATOR INOPERABLE
TWO LOOP OPERATION (BOC to EOC)
FIGURE 5.2-8

Table 5.3-1

Average Scram Time Fraction Table For Use With Scram Time Dependent MCPR Operating Limits

Control Rod Position	Average Scram Time to Position (seconds)		
45	0.470		0.520
39	0.630		0.860
25	1.500		1.910
5	2.700		3.440
Average Scram Insertion Time	Realistic		Maximum Allowable

6.0 LINEAR HEAT GENERATION RATE (LHGR)

6.1 Technical Specification Reference

Technical Specification 3.2.3 and 3.7.6

6.2 Description

The maximum LHGR for ATRIUM™-10 fuel shall not exceed the LHGR limit determined from Figure 6.2-1. The LHGR limit in Figure 6.2-1 is valid for Main Turbine Bypass Operable and Inoperable, EOC-RPT Operable and Inoperable, and Backup Pressure Regulator Operable and Inoperable.

To protect against both fuel centerline melting and cladding strain during anticipated system transients initiated from reduced power and flow conditions, power and flow dependent LHGR limit multipliers are provided. The following figures are applicable to EOC-RPT Operable and Inoperable and Backup Pressure Regulator Operable and Inoperable:

a) Main Turbine Bypass Operable

Figure 6.2-2: Flow-Dependent LHGR Limit Multiplier

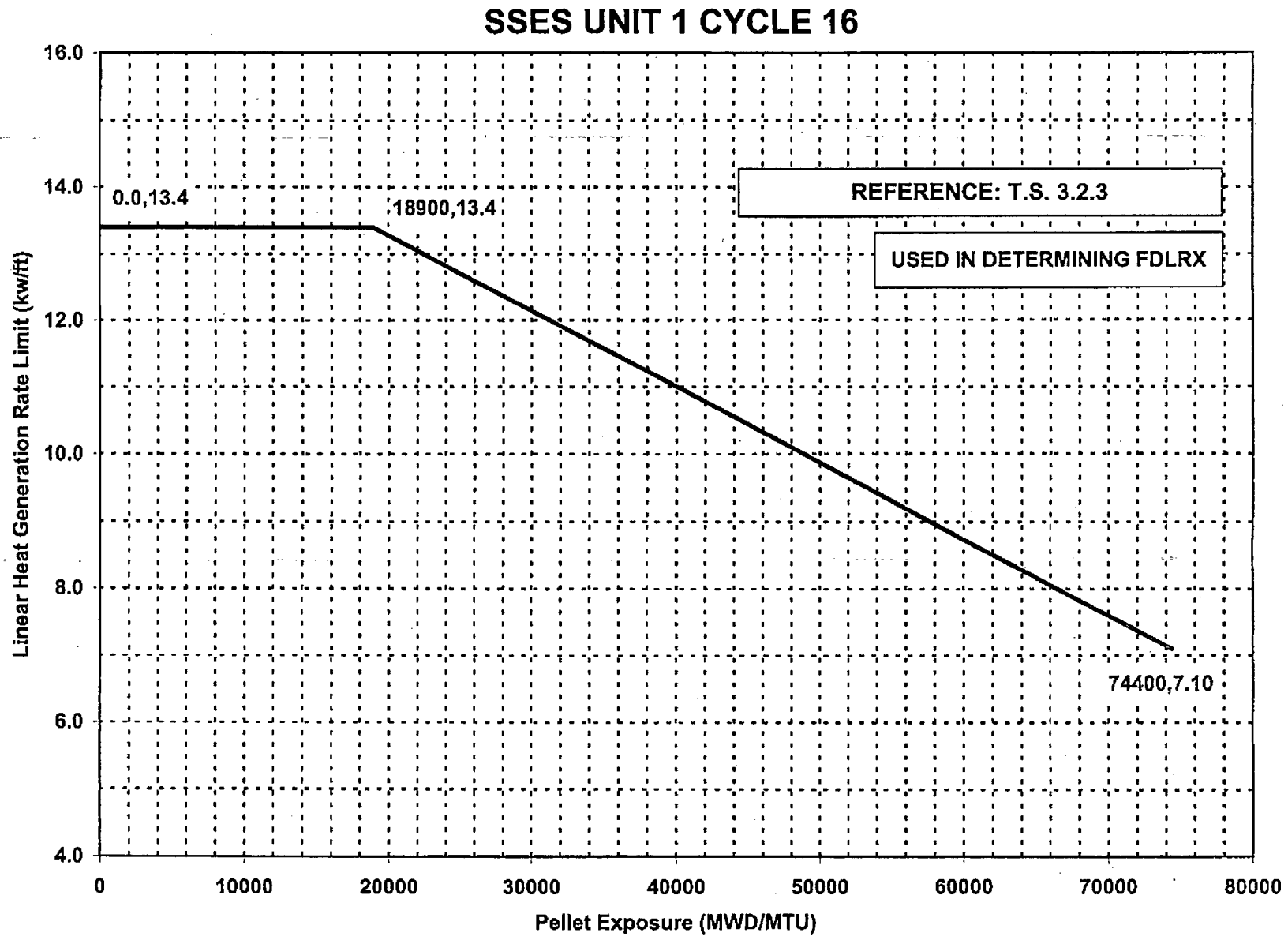
Figure 6.2-3: Power-Dependent LHGR Limit Multiplier

b) Main Turbine Bypass Inoperable

Figure 6.2-4: Flow-Dependent LHGR Limit Multiplier

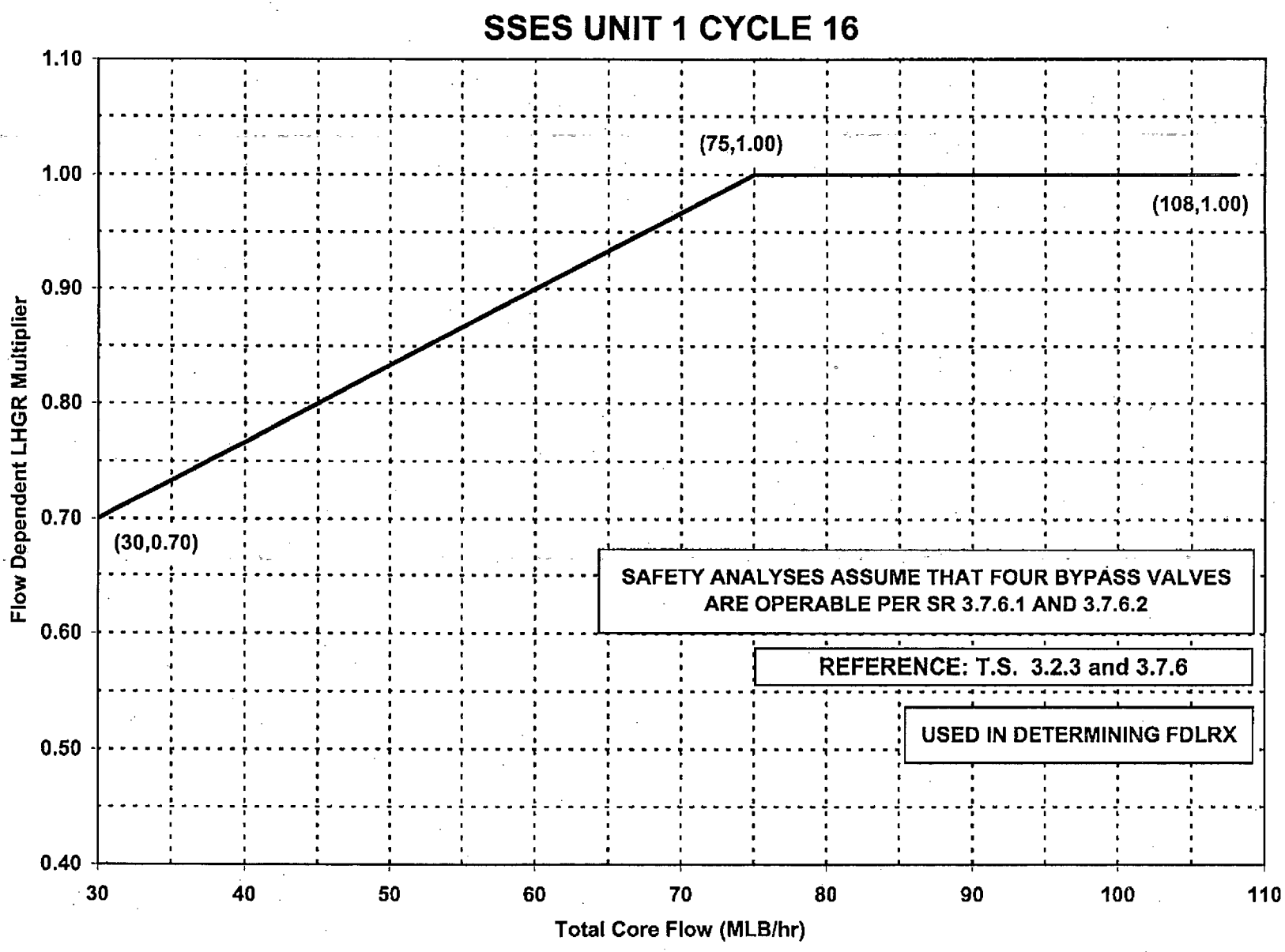
Figure 6.2-5: Power-Dependent LHGR Limit Multiplier

The LGHR limit and LHGR limit multipliers in Figures 6.2-1 through 6.2-5 are valid for both Two Loop and Single Loop operation.

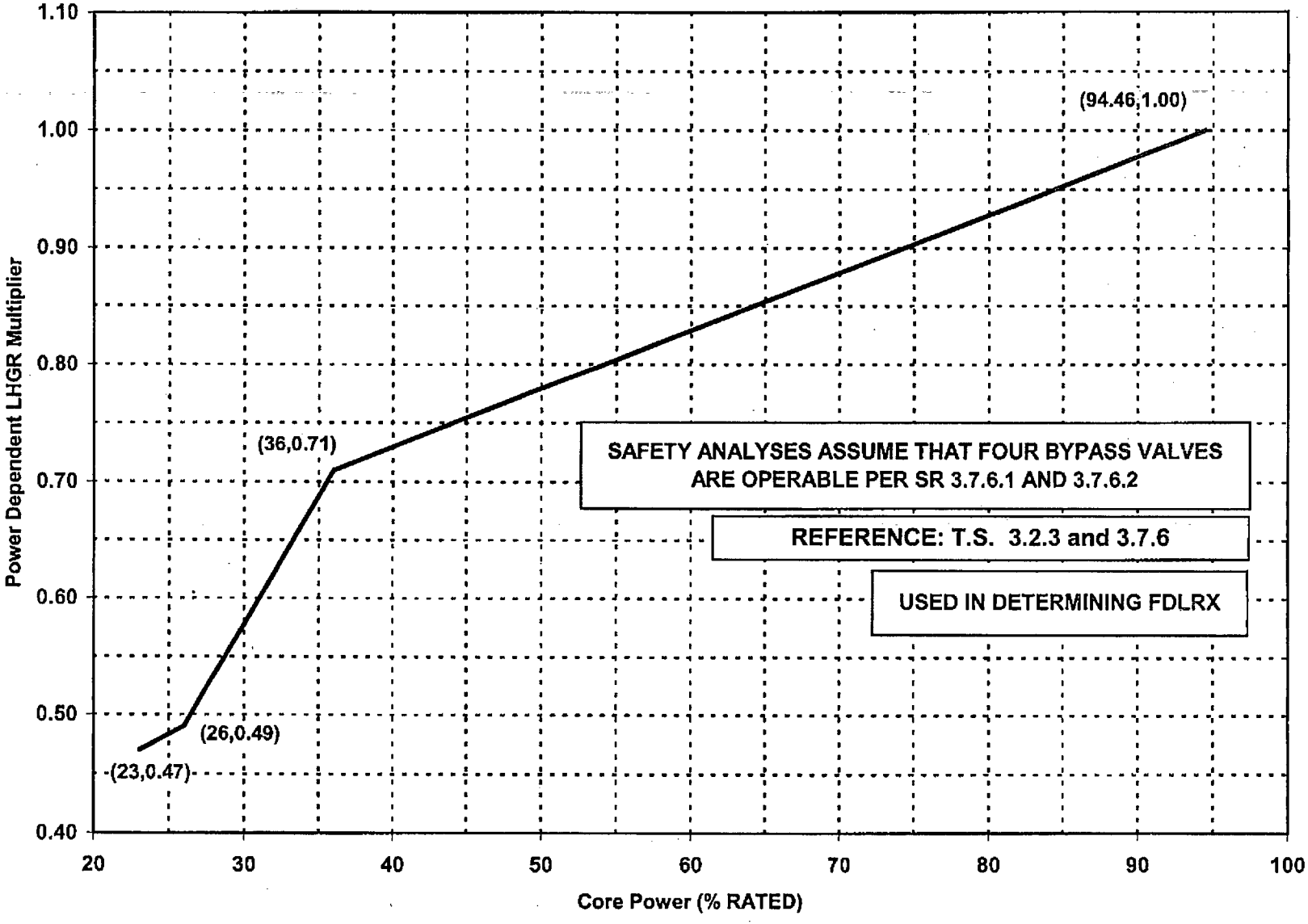


LINEAR HEAT GENERATION RATE LIMIT VERSUS PELLET EXPOSURE
ATRIUM™-10 FUEL
FIGURE 6.2-1

Main Turbine Bypass Operable

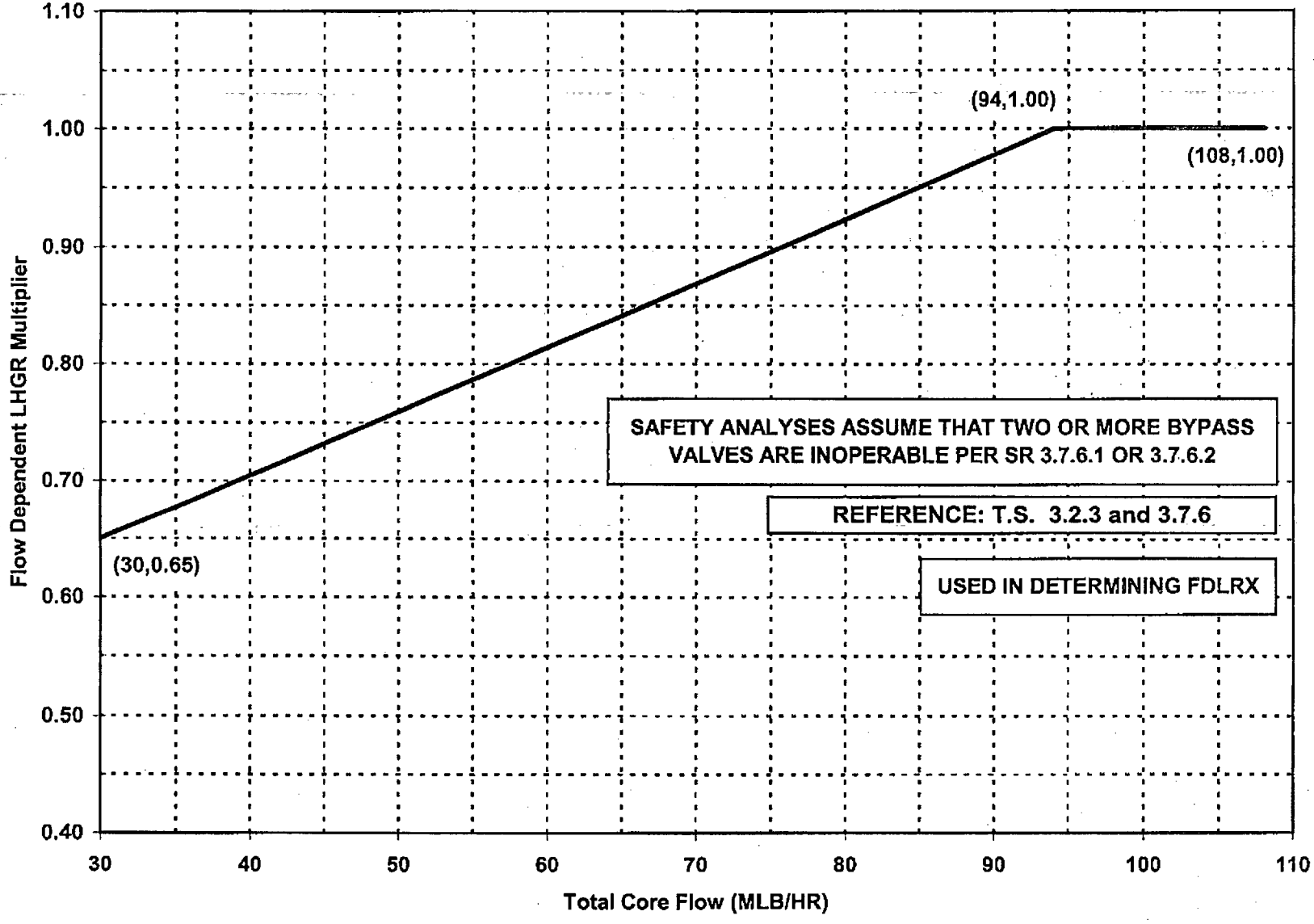


FLOW DEPENDENT LHGR LIMIT MULTIPLIER
MAIN TURBINE BYPASS OPERABLE
ATRIUM™-10 FUEL
FIGURE 6.2-2

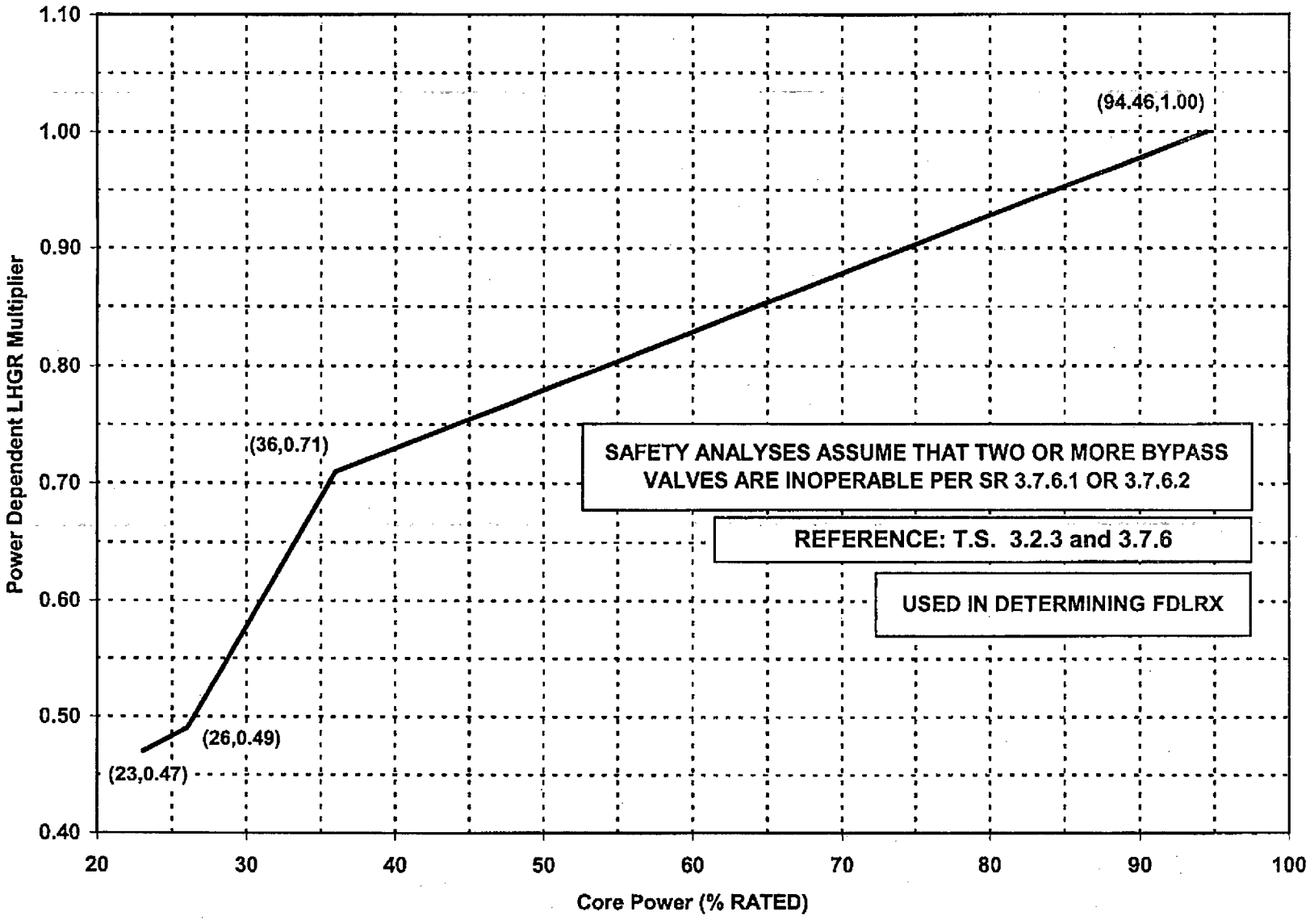


POWER DEPENDENT LHGR LIMIT MULTIPLIER
MAIN TURBINE BYPASS OPERABLE
ATRIUM™-10 FUEL
FIGURE 6.2-3

Main Turbine Bypass Inoperable



FLOW DEPENDENT LHGR LIMIT MULTIPLIER
MAIN TURBINE BYPASS INOPERABLE
ATRIUM™-10 FUEL
FIGURE 6.2-4



POWER DEPENDENT LHGR LIMIT MULTIPLIER
MAIN TURBINE BYPASS INOPERABLE
ATRIUM™-10 FUEL
FIGURE 6.2-5

7.0 ROD BLOCK MONITOR (RBM) SETPOINTS AND OPERABILITY REQUIREMENTS

7.1 Technical Specification Reference

Technical Specification 3.3.2.1

7.2 Description

The RBM Allowable Value and Trip Setpoints for;

a) Low Power Range Setpoint,
b) Intermediate Power Range Setpoint,
c) High Power Range Setpoint,
e) Low Power Range - Upscale,
f) Intermediate Power Range - Upscale, and
g) High Power Range - Upscale

shall be established as specified in Table 7.2-1. The RBM setpoints are valid for Two Loop and Single Loop Operation, Main Turbine Bypass Operable and Inoperable, EOC-RPT Operable and Inoperable, and Backup Pressure Regulator Operable and Inoperable.

The RBM system design objective is to block erroneous control rod withdrawal initiated by the operator before fuel design limits are violated. If the full withdrawal of any control rod would not violate a fuel design limit, then the RBM system is not required to be operable. Table 7.2-2 provides RBM system operability requirements to ensure that fuel design limits are not violated.

Table 7.2-1
RBM Setpoints

Function	Allowable Value[1]	Nominal Trip Setpoint
Low Power Range Setpoint	28.0	24.9
Intermediate Power Range Setpoint	63.0	61.0
High Power Range Setpoint	83.0	81.0
Low Power Range - Upscale	123.4	123.0
Intermediate Power Range - Upscale	113.6	113.2
High Power Range - Upscale	110.6	110.2

(1) Power setpoint function (Low, Intermediate, and High Power Range Setpoints) determined in percent of rated thermal power. Upscale trip setpoint function (Low, Intermediate, and High Power Range - Upscale) determined in percent of reference level.

Table 7.2-2
RBM System Operability Requirements

Thermal Power (% of Rated)	MCPR [2,3]
≥ 28 and < 90	< 1.76
≥ 90 and < 95	< 1.47

(2) Applicable to Main Turbine Bypass Operable and Inoperable, EOC-RPT Operable and Inoperable, and Backup Pressure Regulator Operable and Inoperable.

(3) Applicable to both Two Loop and Single Loop Operation.

8.0 RECIRCULATION LOOPS - SINGLE LOOP OPERATION

8.1 Technical Specification Reference

Technical Specification 3.2.1, 3.2.2, 3.2.3, 3.3.4.1, 3.4.1, 3.7.6, and 3.7.8

8.2 Description

APLHGR

The APLHGR limit for ATRIUM™-10 fuel shall be equal to the APLHGR Limit from Figure 8.2-1.

The APLHGR limits in Figure 8.2-1 are valid for Main Turbine Bypass Operable and Inoperable, EOC-RPT Operable and Inoperable, and Backup Pressure Regulator Operable and Inoperable in Single Loop operation.

Minimum Critical Power Ratio Limit

The MCPR limit is specified as a function of core power, core flow, and plant equipment operability status. The MCPR limits for all fuel types (ATRIUM™-10) shall be the greater of the Flow-Dependent or the Power-Dependent MCPR, depending on the applicable equipment operability status.

a) Main Turbine Bypass / EOC-RPT / Backup Pressure Regulator Operable

Figure 8.2-2: Flow-Dependent MCPR value determined from BOC to EOC

Figure 8.2-3: Power-Dependent MCPR value determined from BOC to EOC

b) Main Turbine Bypass Inoperable

Figure 8.2-4: Flow-Dependent MCPR value determined from BOC to EOC

Figure 8.2-5: Power-Dependent MCPR value determined from BOC to EOC

c) EOC-RPT Inoperable

Figure 8.2-6: Flow-Dependent MCPR value determined from BOC to EOC

Figure 8.2-7: Power-Dependent MCPR value determined from BOC to EOC

d) Backup Pressure Regulator Inoperable

Figure 8.2-8: Flow-Dependent MCPR value determined from BOC to EOC

Figure 8.2-9: Power-Dependent MCPR value determined from BOC to EOC

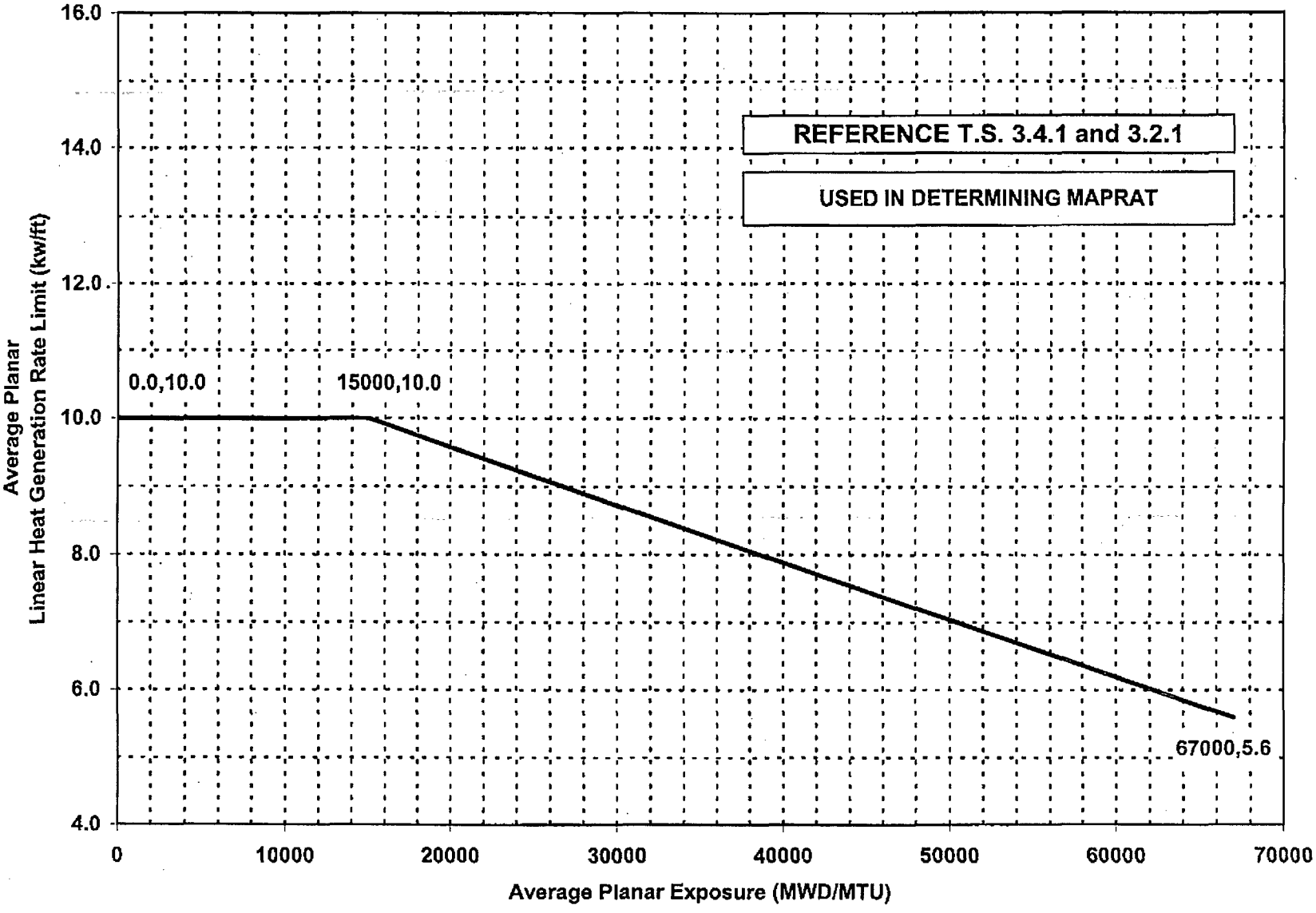
The MCPR limits in Figures 8.2-2 through 8.2-9 are valid only for Single Loop operation.

Linear Heat Generation Rate Limit

The LHGR limits for Single Loop Operation are defined in Section 6.0.

RBM Setpoints and Operability Requirements

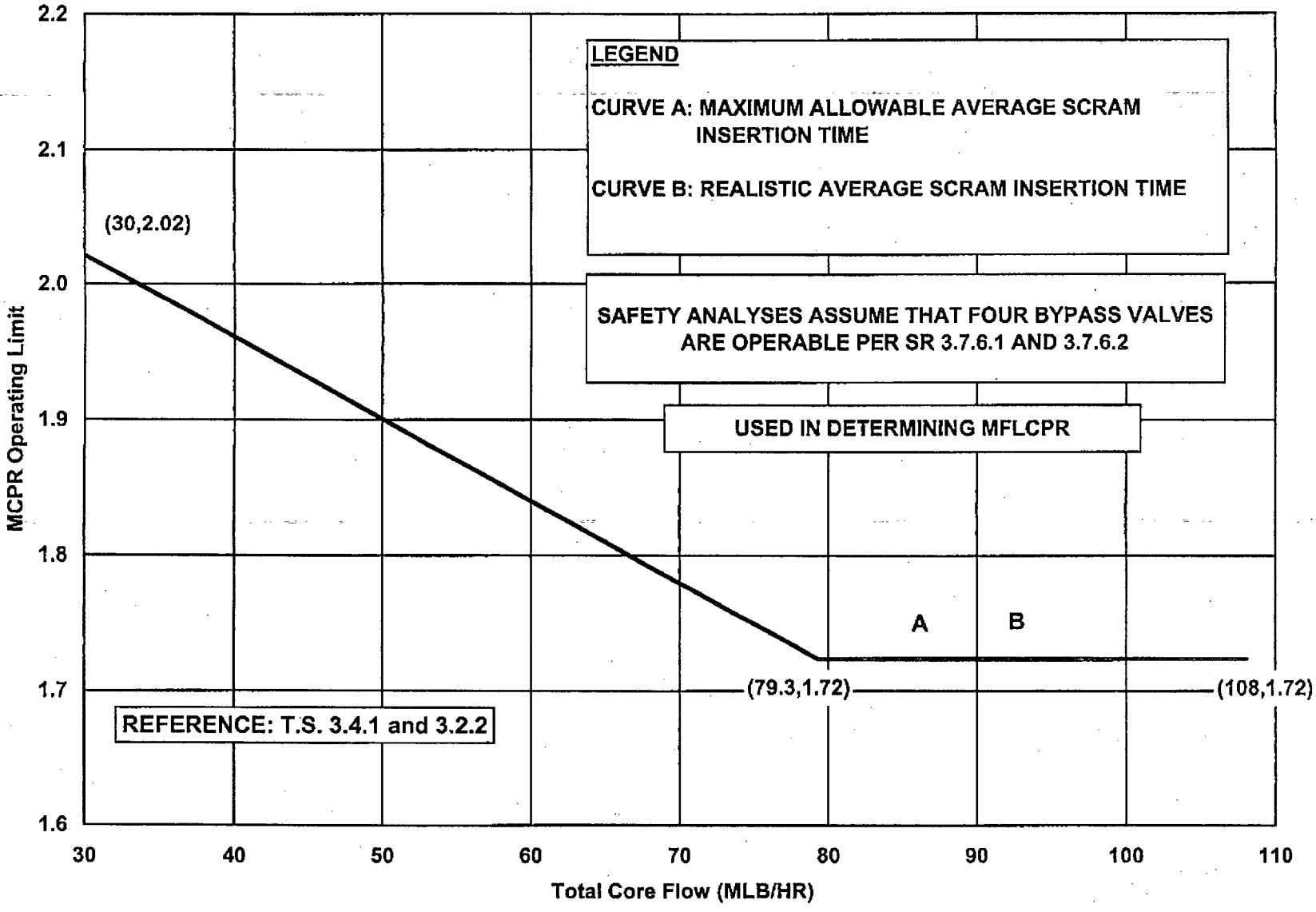
The RBM setpoints and operability requirements for Single Loop Operation are defined in Section 7.0.



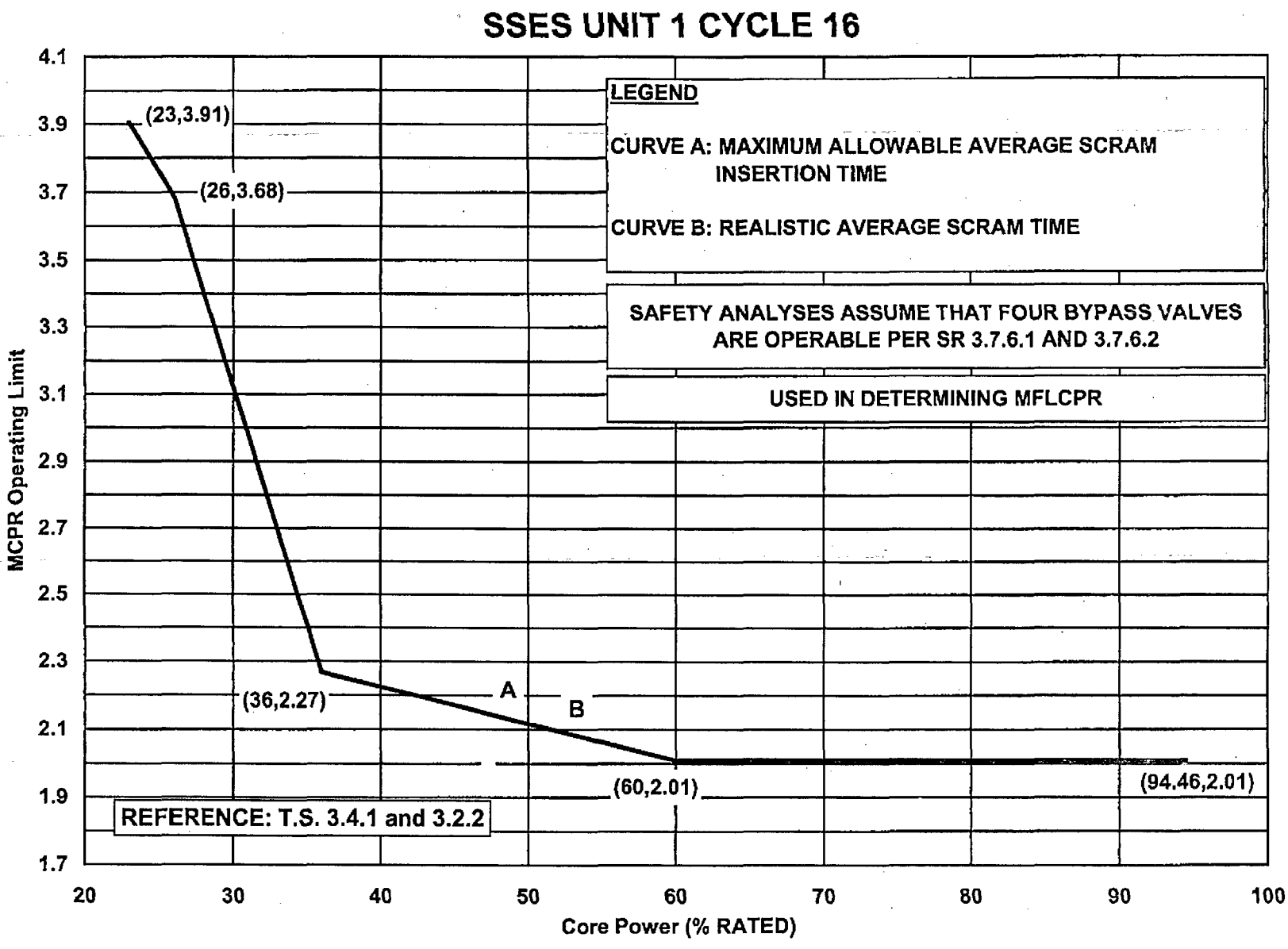
AVERAGE PLANAR LINEAR HEAT GENERATION RATE LIMIT VERSUS
AVERAGE PLANAR EXPOSURE SINGLE LOOP OPERATION
ATRIUM™-10 FUEL
FIGURE 8.2-1

Main Turbine Bypass / EOC-RPT / Backup Pressure Regulator Operable

SSES UNIT 1 CYCLE 16



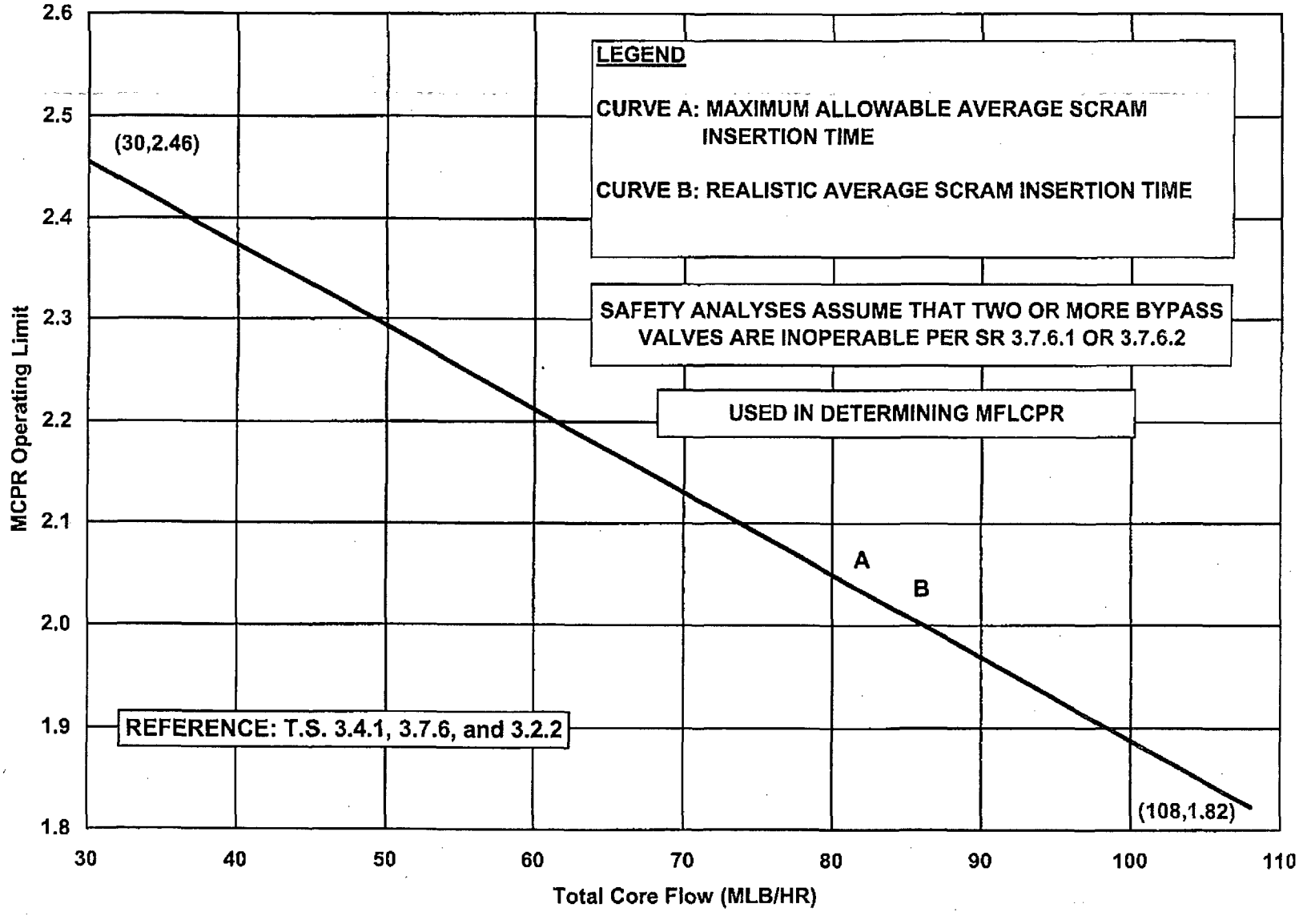
MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
MAIN TURBINE BYPASS / EOC-RPT / BACKUP PRESSURE REGULATOR OPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-2



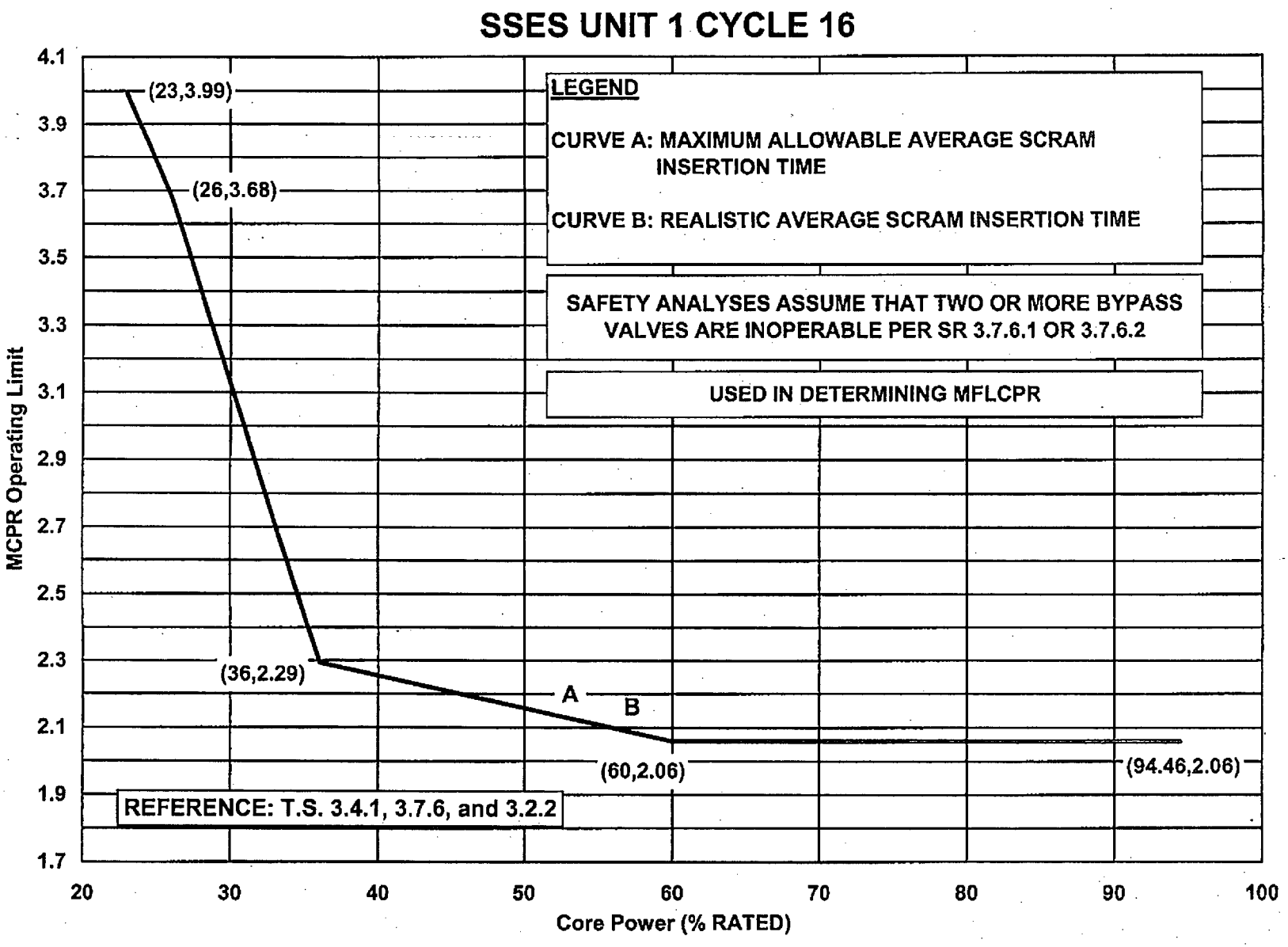
MCPR OPERATING LIMIT VERSUS CORE POWER
MAIN TURBINE BYPASS / EOC-RPT / BACKUP PRESSURE REGULATOR OPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-3

Main Turbine Bypass Inoperable

SSES UNIT 1 CYCLE 16

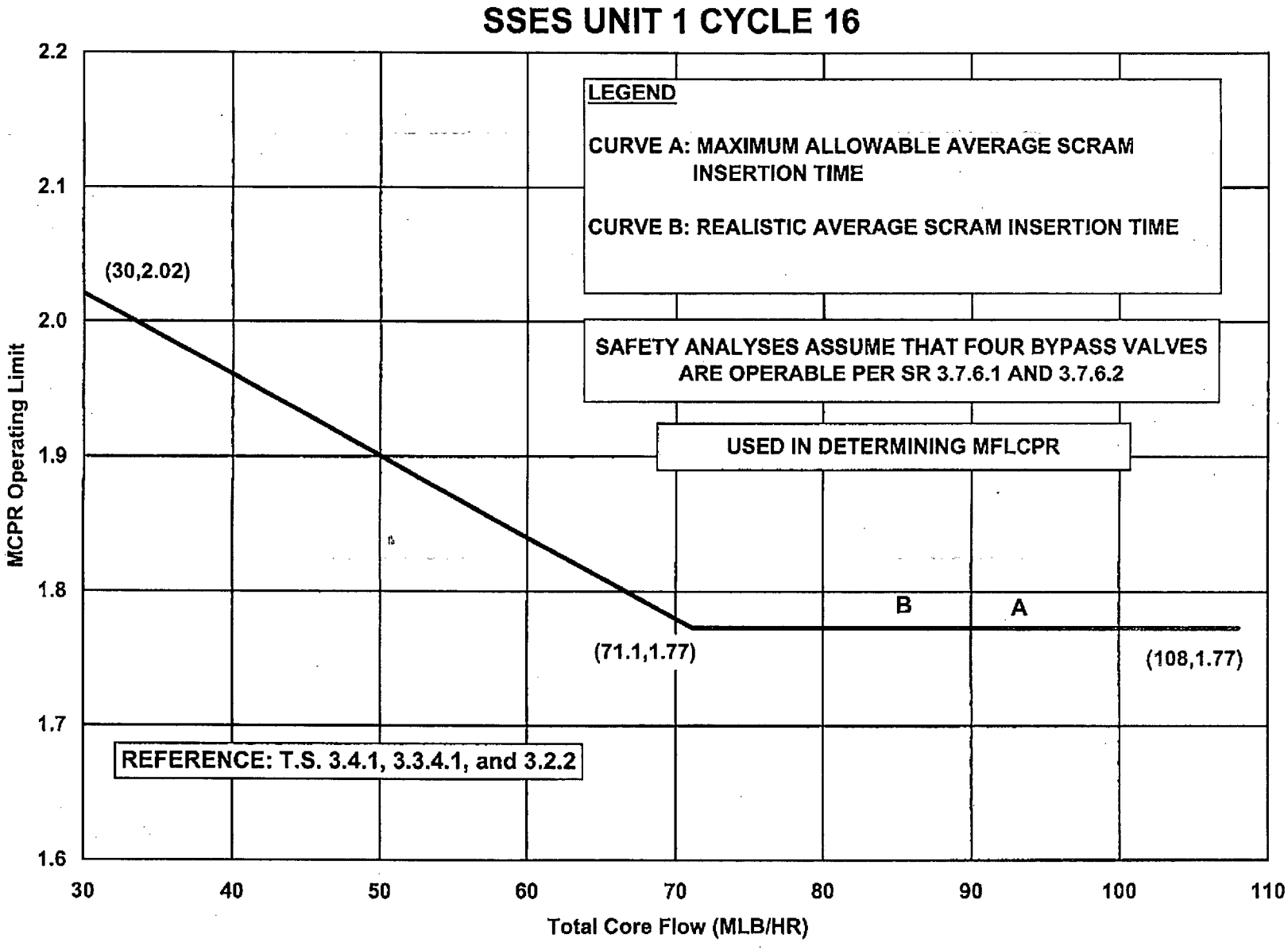


MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
MAIN TURBINE BYPASS INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-4

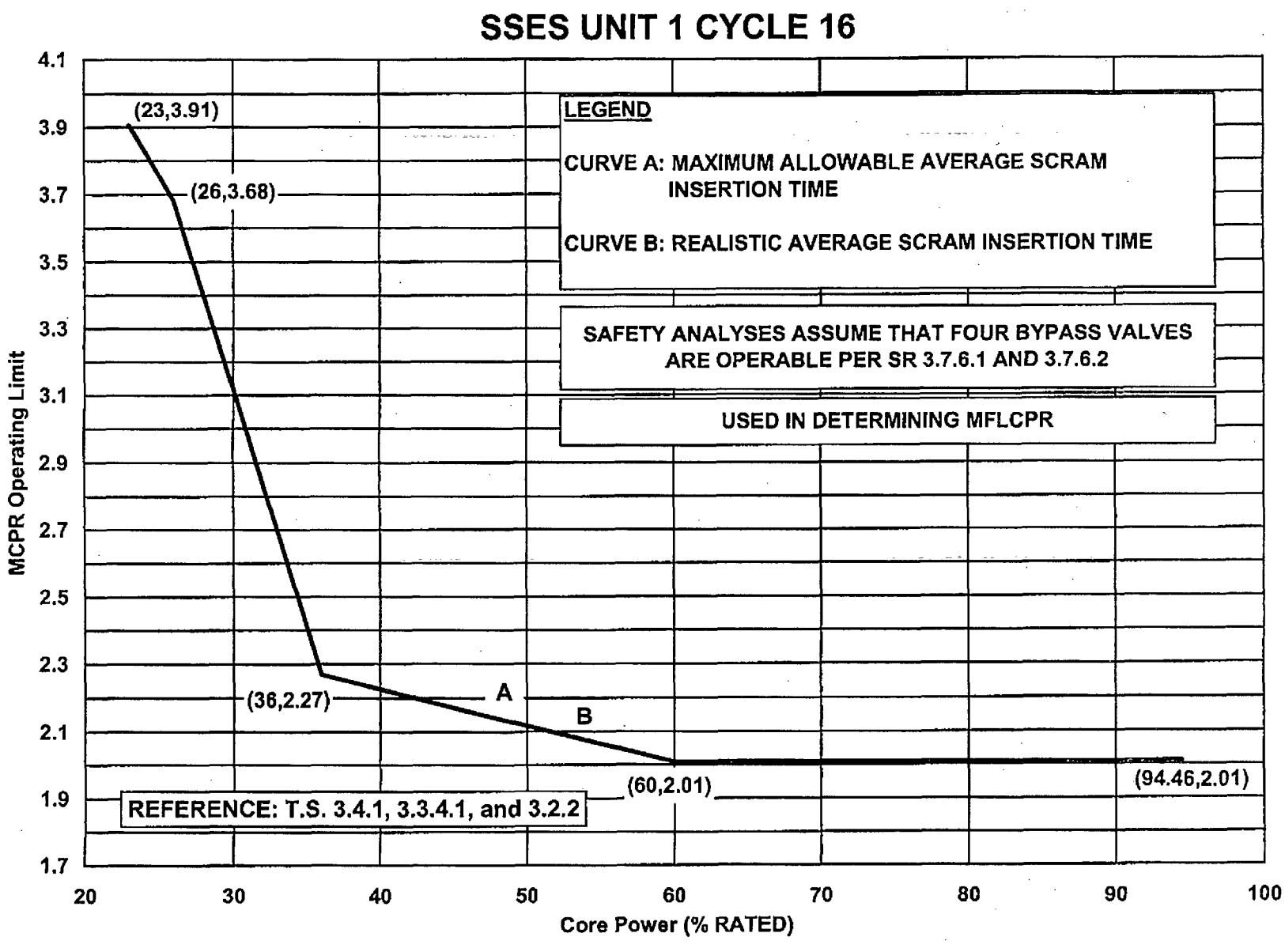


MCPR OPERATING LIMIT VERSUS CORE POWER
MAIN TURBINE BYPASS INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-5

EOC-RPT Inoperable

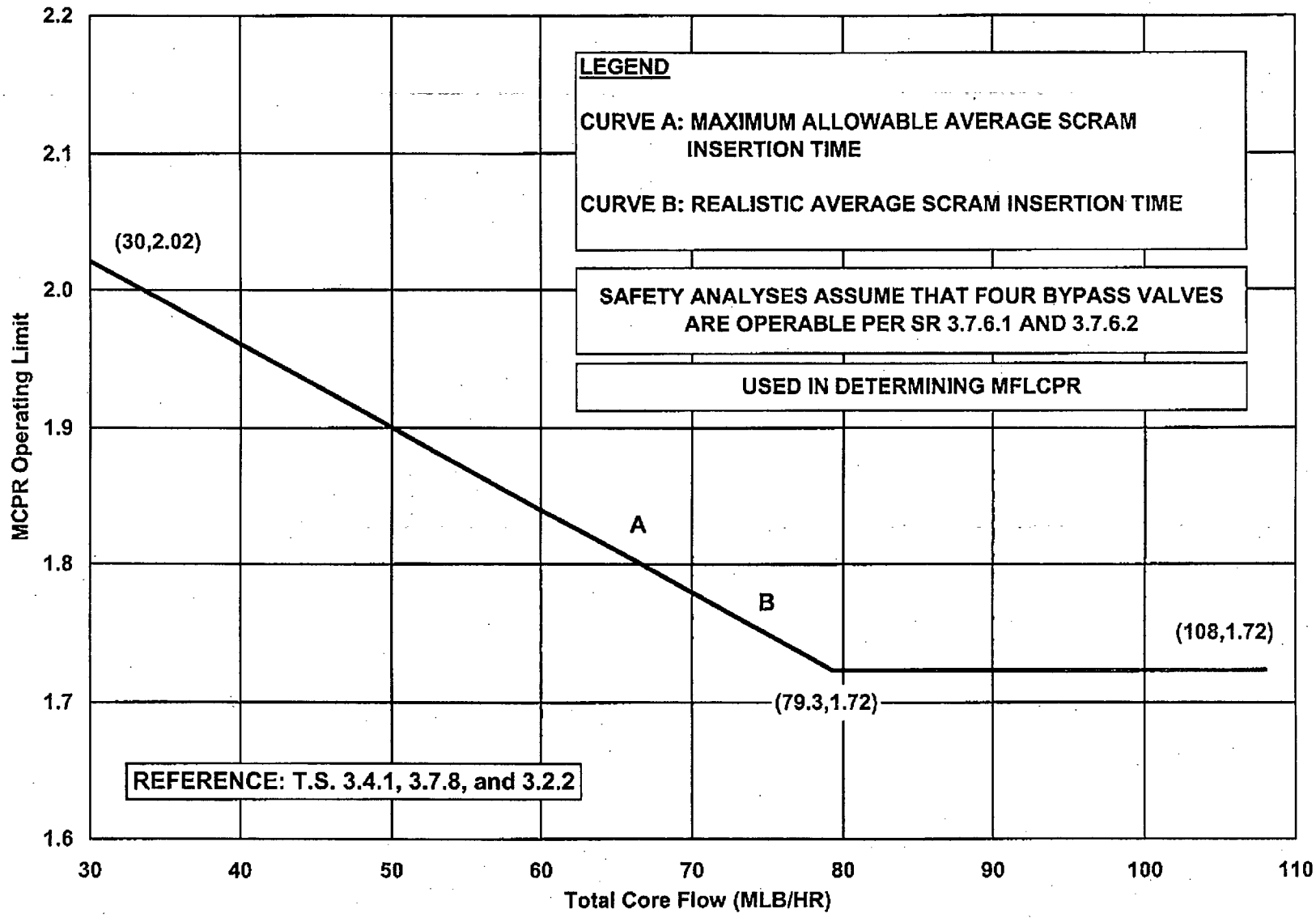


MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
EOC-RPT INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-6

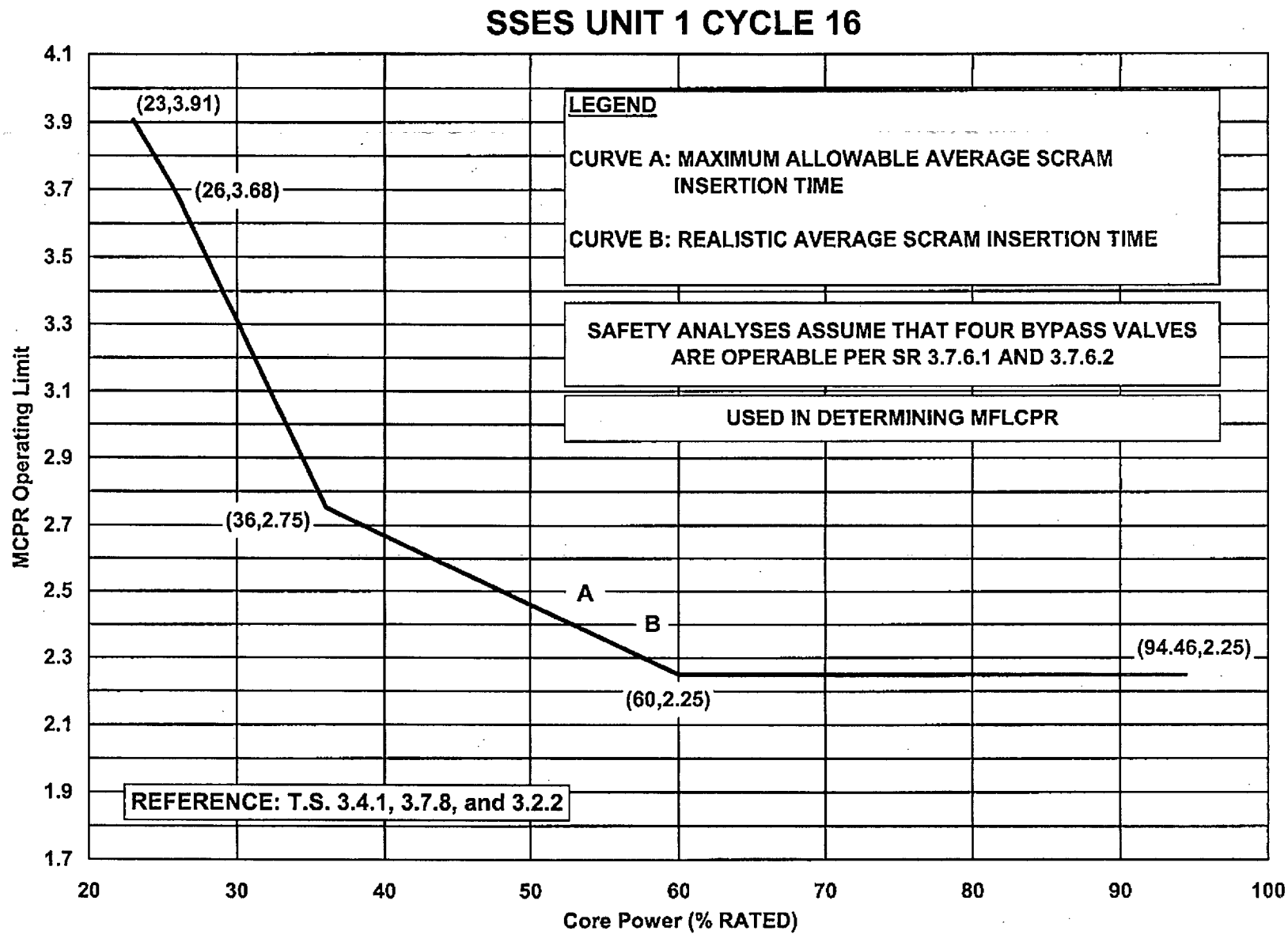


MCPR OPERATING LIMIT VERSUS CORE POWER
EOC-RPT INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-7

Backup Pressure Regulator Inoperable



MCPR OPERATING LIMIT VERSUS TOTAL CORE FLOW
BACKUP PRESSURE REGULATOR INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-8



MCPR OPERATING LIMIT VERSUS CORE POWER
BACKUP PRESSURE REGULATOR INOPERABLE
SINGLE LOOP OPERATION (BOC to EOC)
FIGURE 8.2-9

9.0 POWER / FLOW MAP

9.1 Technical Specification Reference

Technical Specification 3.3.1.1

9.2 Description

Monitor reactor conditions to maintain THERMAL POWER / core flow outside of Stability Regions I and II of the Power / Flow map, Figure 9.1.

If the OPRM Instrumentation is OPERABLE per TS 3.3.1.1, Region I of the Power / Flow map is considered an immediate exit region.

If the OPRM Instrumentation is inoperable per TS 3.3.1.1, Region I of the Power / Flow map is considered an immediate scram region.

Region II of the Power / Flow map is considered an immediate exit region regardless of the operability of the OPRM Instrumentation.

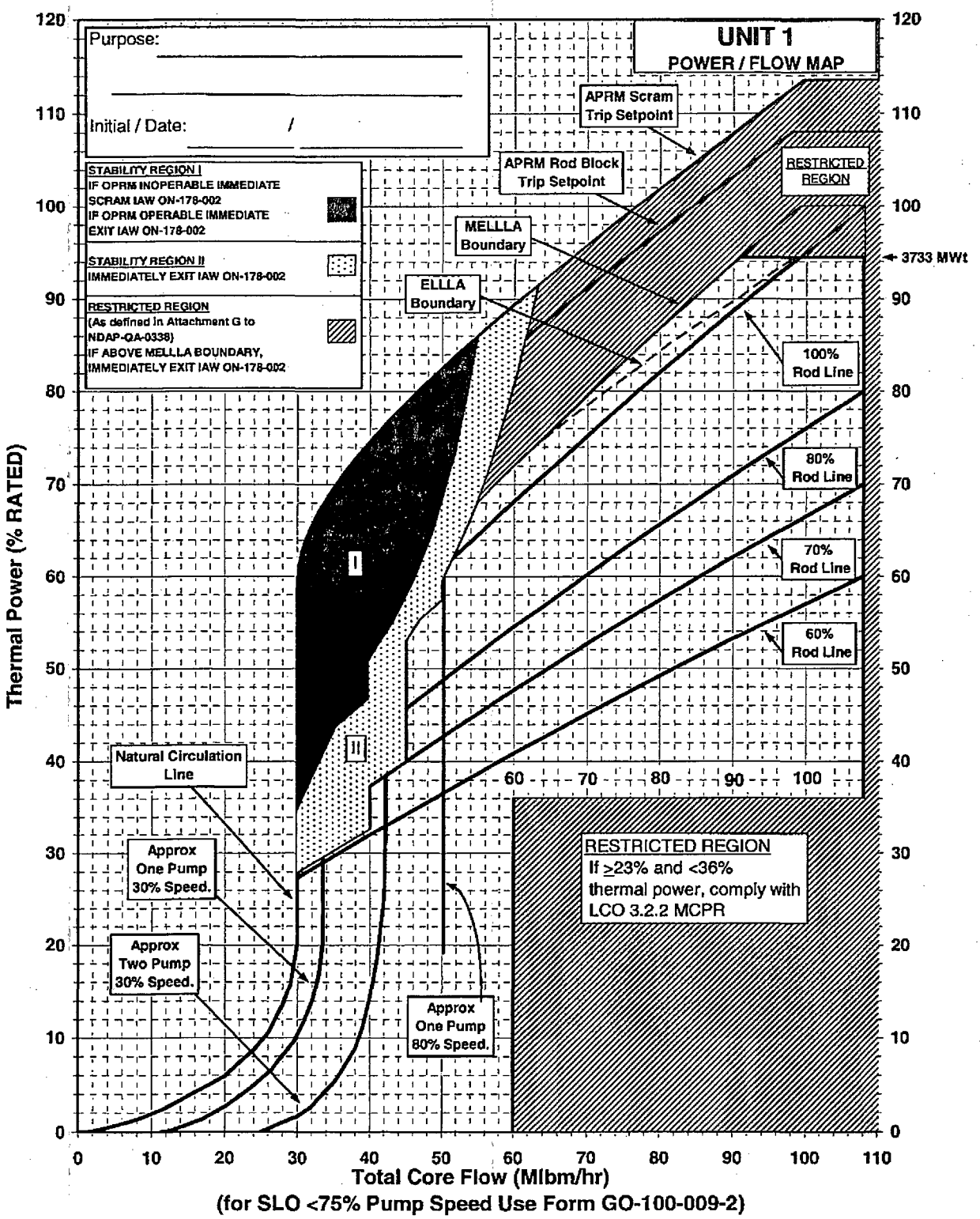


Figure 9.1
SSES Unit 1 Cycle 16 Power / Flow Map

10.0 OPRM SETPOINTS

10.1 Technical Specification Reference

Technical Specification 3.3.1.1

10.2 Description

Setpoints for the OPRM Instrumentation are established that will reliably detect and suppress anticipated stability related power oscillations while providing a high degree of confidence that the MCPR Safety limit is not violated. The setpoints are described in Section 2.0 and are listed below:

S_P = 1.11

N_P = 15

F_P = 60 Mlbm / hr

11.0 REFERENCES

11.1 The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

1. XN-NF-81-58(P)(A), Revision 2 and Supplements 1 and 2, "RODEX2 Fuel Rod Thermal-Mechanical Response Evaluation Model," Exxon Nuclear Company, March 1984.

2. EMF-2361(P)(A), Revision 0, "EXEM BWR-2000 ECCS Evaluation Model," Framatome ANP, May 2001.

3. EMF-2292(P)(A), Revision 0, "ATRIUM™-10: Appendix K Spray Heat Transfer Coefficients," Siemens Power Corporation, September 2000.

4. XN-NF-84-105(P)(A), Volume 1 and Volume 1 Supplements 1 and 2, "XCOBRA-T: A Computer Code for BWR Transient Thermal-Hydraulic Core Analysis," Exxon Nuclear Company, February 1987.

5. XN-NF-80-19(P)(A), Volume 1 and Supplements 1 and 2, "Exxon Nuclear Methodology for Boiling Water Reactors: Neutronic Methods for Design and Analysis," Exxon Nuclear Company, March 1983.

6. XN-NF-80-19(P)(A), Volumes 2, 2A, 2B, and 2C "Exxon Nuclear Methodology for Boiling Water Reactors: EXEM BWR ECCS Evaluation Model," Exxon Nuclear Company, September 1982.

7. XN-NF-80-19(P)(A), Volume 3 Revision 2 "Exxon Nuclear Methodology for Boiling Water Reactors Thermex: Thermal Limits Methodology Summary Description," Exxon Nuclear Company, January 1987.

8. XN-NF-80-19(P)(A), Volume 4, Revision 1, "Exxon Nuclear Methodology for Boiling Water Reactors: Application of the ENC Methodology to BWR Reloads," Exxon Nuclear Company, June 1986.

9. XN-NF-85-67(P)(A), Revision 1, "Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel," Exxon Nuclear Company, Inc., September 1986.

10. ANF-524(P)(A), Revision 2 and Supplements 1 and 2, "Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors," November 1990.

11. NE-092-001A, Revision 1, "Licensing Topical Report for Power Uprate With Increased Core Flow," Pennsylvania Power & Light Company, December 1992 and NRC SER (November 30, 1993).

12. ANF-89-98(P)(A) Revision 1 and Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," Advanced Nuclear Fuels Corporation, May 1995.

13. EMF-2209(P)(A), Revision 2, "SPCB Critical Power Correlation," Framatome ANP, September 2003.

14. EMF-85-74(P)(A), Revision 0, Supplement 1(P)(A) and Supplement 2(P)(A), "RODEX2A (BWR) Fuel Rod Thermal-Mechanical Evaluation Model," Siemens Power Corporation, February 1998.

15. EMF-2158(P)(A), Revision 0, "Siemens Power Corporation Methodology for Boiling Water Reactors: Evaluation and Validation of CASMO-4/Microburn-B2," Siemens Power Corporation, October 1999.

16. EMF-CC-074(P)(A), Volume 4, Revision 0, "BWR Stability Analysis - Assessment of STAIF with Input from MICROBURN-B2," Siemens Power Corporation, August 2000.

17. NEDO-32465-A, "BWROG Reactor Core Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications," August 1996.

18. ANF-913(P)(A), Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, "COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses," Advanced Nuclear Fuels Corporation, August 1990.

19. ANF-1358(P)(A), Revision 3, "The Loss of Feedwater Heating Transient in Boiling Water Reactors," Framatome ANP, September 2005.

3.3 Instrumentation

3.3.9 OPRM Instrumentation Configuration

TRO 3.3.9 Oscillation Power Range Monitor (OPRM) supporting setpoints and settings shall be within the specified limits.

APPLICABILITY: Thermal POWER ≥23% RTP

ACTIONS

---NOTE---

1. Separate Condition entry is allowed for each channel

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. OPRM Setpoints and Settings not in accordance with Table 3.3.9-1	A.1 Enter the condition referenced in Table 3.3.9-1 for the parameter	Immediately
B. As required by Required Action A.1 and referenced in Table 3.3.9.1	B.1 Declare affected OPRM channel inoperable.	Immediately
C. As required by Required Action A.1 and referenced in Table 3.3.9-1	C.1 Restore the OPRM Setpoints and Settings to within the specified limits. OR C.2 Declare affected OPRM channel inoperable	120 days Immediately
D. Alternate method to detect and suppress thermal hydraulic instability oscillations required by LCO 3.3.1.1 Required Action I.1.	D.1 Initiate monitoring to detect entry into Conditions E,F, and/or G.	Immediately

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
E. ----------NOTE---------- Only applicable as required by Required Action D.1 ---------- Total core flow as a function of THERMAL POWER within Region I of the Power Flow map as specified in the COLR. OR Total core flow as a function of THERMAL POWER within Region II of the Power Flow map as specified in the COLR and less than 50% of required LPRM upscale alarms OPERABLE	E.1 Place reactor mode switch in the shutdown position.	Immediately
F. ---------NOTE---------- Only applicable as required by Required Action D.1 and when in Region II of the Power Flow map as specified in the COLR. ---------- Two or more APRM readings oscillating with one or more oscillating ≥10% of RTP peak-to-peak OR	F.1 Place the reactor mode switch in the shutdown position.	Immediately

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. (continued) Two or more LPRM upscale alarms activating and deactivating with a period ≥1 second and ≤5 seconds. OR Sustained LPRM oscillations >10 W/cm^2 peak-to-peak with a period ≥1 second and ≤5 seconds.		
G. ---------NOTE---------- Only applicable as required by Required Action D.1. ---------- Total core flow as a function of THERMAL POWER is within Region II of the Power Flow map as specified in the COLR.	G.1 Initiate action to restore total core flow as a function of THERMAL POWER outside of Region II.	Immediately
H. Less than 50% of the required LPRM Upscale Alarms are OPERABLE	H.1 Post sign on the reactor control panel that less than 50% of the LPRM Upscale Alarms are OPERABLE.	1 hour

TECHNICAL REQUIREMENT SURVEILLANCE

	SURVEILLANCE	FREQUENCY
TRS 3.3.9.1	----------NOTE---------- Only required to be met when an alternate method to detect and suppress thermal hydraulic instability oscillations is required by LCO 3.3.1.1 Required Action I.1. ---------- Verify total core flow as a function of THERMAL POWER is outside of Region I and II of the Power Flow map as specified in the COLR.	24 hours
TRS 3.3.9.2	Perform CHANNEL CALIBRATION on the LPRM Upscale alarm	24 months
TRS 3.3.9.3	Verify OPRM parameter setpoints and settings are within limits	24 months

Table 3.3.9-1
OPRM SETPOINTS AND SETTINGS

	OPRM PARAMETER	DESCRIPTION	CONDITIONS REFERENCED FROM REQUIRED ACTION A.1	VALUE
1.	TOL (ε)	Period Tolerance	B	≥0.10 and ≤0.30 sec
2.	fc	Conditioning Filter Cutoff Frequency	B	1.5 Hz
3.	Tmin	Oscillation Period Lower Time Limit	B	≥1.0 and ≤1.2 sec
4.	Tmax	Oscillation Period Upper Time Limit	B	3.5 sec
5.	LPRMmin	Minimum LRPMs/Cell Required for Cell Operability	B	≥2
6.	S1	Peak Threshold Setpoint/ABA & GRBA	C	≥1.10 and ≤1.20
7.	S2	Valley Threshold Setpoint/ABA & GRBA	C	≥0.85 and ≤0.95
8.	Smax	Amplitude Trip Setpoint/ABA	C	≥1.30 and ≤1.50
9.	DR3	Growth Rate Factor Setpoint/GRBA	C	≥1.30 and ≤1.60

3.4 Reactor Coolant System (RCS)

3.4.4 Reactor Recirculation Flow and Rod Line Limit

TRO 3.4.4 Operating loop flow rate shall be ≤ 50% of rated loop flow rate and the reactor shall be operating at a THERMAL POWER/core flow condition below the 70% rod line shown in the Power Flow map specified in the COLR.

APPLICABILITY: MODES 1, 2, 3, and 4 during recirculation pump start.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A Requirements of the TRO not met	A.1 Restore parameter(s) to within limits	Prior to recirculation pump start

TECHNICAL REQUIREMENT SURVEILLANCE

SURVEILLANCE		FREQUENCY
TRS 3.4.4.1	Verify the operating loop flow rate is ≤ 50% of rated loop flow rate and that the reactor is operating at a THERMAL POWER/core flow condition below the 70% rod line shown in the power flow map specified in the COLR.	Once within 15 minutes prior to each recirculation pump start

3.10.4 Section not used

THIS PAGE INTENTIONALLY LEFT BLANK

3.12 Loads Control Program

3.12.2 Heavy Loads Requirements

TRO 3.12.2 The Technical Specification Limiting Conditions of Operation and Technical Requirements for Operation listed in Table 3.12.2-1 shall be met.

APPLICABILITY: During movement of heavy loads in the proximity of irradiated fuel.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The Conditions of TRO 3.12.2 are not met.	A.1 Suspend movement of heavy loads in the proximity of irradiated fuel.	Immediately

TECHNICAL REQUIREMENT SURVEILLANCE

SURVEILLANCE		FREQUENCY
TRS 3.12.2.1	Administratively verify that all requirements of TRO are met.	Within 12 hours prior to commencing movement of heavy loads AND Every 12 hours thereafter

TABLE 3.12.2-1
TRO 3.12.2 REQUIREMENTS

a.	LCO 3.3.6.2[(a)]
b.	LCO 3.3.7.1[(b)]
c.	LCO 3.6.4.1[(c)]
d.	LCO 3.6.4.2[(c)]
e.	LCO 3.6.4.3[(d)]
f.	LCO 3.7.3[(d)]
g.	LCO 3.7.7[(e)]
h.	LCO 3.8.2[(i)]
i.	LCO 3.8.5
j.	LCO 3.8.8[(i)]
k.	LCO 3.9.6[(g)]
l.	TRO 3.3.4[(f)]
m.	TRO 3.7.1[(h)]
n.	TRO 3.9.1[(g)]

(a) One trip system with all associated channels OPERABLE (Functions 3, 4, 5, 6 and 8). Note that the available trip system must support the Table 3.12.2-1e required SGT subsystem.

(b) One trip system with all associated channels OPERABLE (Functions 3, 4, 5, 6, 8 and 9). Note that the available trip system must support the Table 3.12.2-1f required CREOAS subsystem.

(c) Zone III only.

(d) Minimum of one subsystem OPERABLE.

(e) Only required for movement of heavy load in the proximity of irradiated fuel in the spent fuel storage pool.

(f) Minimum of one Table 3.3.4-1 Function 4 channel OPERABLE.

(g) Only required for movement of heavy load in the proximity of irradiated fuel in the Reactor Pressure Vessel with the Steam Separator removed.

(h) Two ESW pumps capable of supplying cooling to the required diesel generators.

(i) Necessary AC Sources and Distribution Systems OPERABLE to support equipment required to be OPERABLE by TRM Table 3.12.2-1.

B 3.3.9 OPRM Instrumentation

BASES

TRO

The OPRM system configuration governs its operation in accordance with the licensing analysis. Several configuration parameters are intrinsic to the trip function safety setpoint bases or provide settings for defense-in-depth algorithm features that are not assumed in the basis for the protection system safety analysis (Reference 2, Reference 3).

Each of the setting values may be used as the process setpoint or device setting without further adjustment for uncertainties.

Setpoints and Settings Bases

TOL(ε) Period Tolerance

The specified range of values for the period tolerance has been demonstrated to provide continuous confirmations upon transition from stable reactor operation to a growing reactor instability. A range of values is provided to allow system tuning to avoid spurious alarms on period confirmations. Limiting the setpoint adjustment range provides assurance that the Period Based Detection Algorithm will provide sufficient confirmations for a growing instability.

f_c Conditioning Filter Cutoff Frequency

The specified value for the Conditioning Filter Cutoff Frequency has been demonstrated to provide continuous confirmations upon transition from stable reactor operation to a growing reactor instability. Setting minimizes impact on signal amplitude and provides assurance that the Period Based Detection Algorithm will provide sufficient confirmations for a growing instability.

Tmin Oscillation Period Lower Time Limit

Tmax Oscillation Period Upper Time Limit

The Oscillation Period Time Limit parameters establish the range of detectable oscillation periods of OPRM cell signals for signal oscillations associated with reactor core thermal-hydraulic instability.

(continued)

B 3.3.9 OPRM Instrumentation

BASES

TRO (continued)

LPRMmin

This value determines the availability and resulting sensitivity of cells in the reactor core in the event of LPRM channel failures. The minimum LPRM per cell parameter is an assumption of the OPRM trip setpoint (Sp) basis calculation.

Amplitude and Growth Rate Based Algorithm Parameters

S1	Peak Threshold Setpoint / ABA + GRBA
S2	Valley Threshold Setpoint / ABA + GRBA
Smax	Amplitude Trip Setpoint / ABA
DR3	Growth Rate Factor Setpoint / GRBA

These parameters calibrate the Amplitude and Growth Rate Based Algorithm, described in References 2 and 3, which provides an OPRM trip output to the Reactor Protection System. The OPRM design and licensing basis takes no credit for the Amplitude and Growth Rate Based Algorithm. The algorithm is provided as a defense-in-depth feature in the event of unanticipated power oscillations. These Amplitude and Growth Rate Based Algorithm Parameters are considered sufficient to provide backup protection and to avoid spurious trips by maximizing margin to expected operating conditions and transients.

ACTIONS

The required actions assure that the system settings that support the Period Based Algorithm setpoint analysis, and those parameters that define the Amplitude and Growth Rate Based Algorithm are returned in a timely manner to the values assumed in the analysis (Reference 2, Reference 3) or that the affected channel is declared inoperable and the applicable Required Action of LCO 3.3.1.1 is then entered, or an alternate method to detect and suppress thermal hydraulic instability oscillations is employed.

(continued)

B 3.3.9 OPRM Instrumentation

BASES

ACTIONS (continued)

Note 1 has been provided to modify the ACTIONS related to affected OPRM channels. Technical Specification Section 1.3, Completion Times, specifies that once a Condition has been entered, subsequent divisions, subsystems, components, or variables expressed in the Condition discovered to be inoperable or not within limits will not result in separate entry into the Condition. Technical Specification Section 1.3 also specifies that Required Actions of the Condition continue to apply for each additional failure, with Completion Times based on initial entry into the Condition. However, the Required Actions for affected OPRM channels provide appropriate compensatory measures. As such, a Note has been provided that allows separate Condition entry for each affected OPRM channel.

B.1

Several parameter settings are essential for the proper operation of the OPRM period-based trip algorithm. The permissible values of Period Confirmation Tolerance, Averaging Filter time constant, Conditioning Filter Cutoff Frequency, and minimum operable LPRM per cell parameters are limited by the setpoint basis calculations and system transient response analysis. The Minimum and Maximum Oscillation Period settings limit the algorithm window to the cell signal resonances that can be associated with unstable thermal-hydraulic conditions.

Because the ability of the OPRM channel to perform its safety function is affected by these parameter settings, the affected OPRM channel must be considered inoperable when these conditions are not met.

Operability is evaluated for each inoperable channel and Required Actions taken in accordance with LCO 3.3.1.1.

C.1

The design objective for the Amplitude and Growth Rate Based Algorithms is to provide automatic action to limit the size of these unanticipated oscillations, thereby preventing fuel cladding damage. Several parameter settings define the function of the Amplitude and Growth Rate Based Algorithm. The OPRM design and licensing basis takes no credit for the Amplitude and Growth Rate Based Algorithm, which is provided as a defense-in-depth feature in the event of unanticipated oscillations.

(continued)

ACTIONS C.1 (continued)

Because the ability of the OPRM Channel to perform its safety function is not affected by these parameter settings, the affected OPRM Channel need not be immediately considered inoperable when these conditions are not met. These parameters are to be maintained for conformance with the licensing requirement of a defense-in-depth feature in addition to the licensed OPRM trip function. This is corrected by returning the parameters to conformance within 120 days of identification.

Since the Amplitude and Growth Rate Based parameters affect only the defense-in-depth response within each channel, failure to maintain the proper parameters in the channel affects only the operability of that channel.

D.1

This Action is to be taken if the Period Based Detection Algorithm trip function is not available in accordance with LCO 3.3.1.1, and initiation of an alternate method to Detect and Suppress thermal hydraulic instability oscillations is required by the referenced LCO Required Actions. The applicable Conditions are entered as required.

E.1

As directed from Required Action D.1, this Action provides preemptive protection through Power/Flow Map operating restrictions

When operating in Region I of the Power / Flow map specified in the COLR, or when operating in Region II of the Power / Flow map specified in the COLR with less than 50% of the required LPRM upscale alarms OPERABLE, the potential for thermal-hydraulic oscillations is greatly increased and sufficient margin may not be available for operator response to suppress potential thermal-hydraulic oscillations. Therefore, the reactor mode switch must be immediately placed in the shutdown position. Action is taken immediately to place the plant in a condition where any potential for thermal-hydraulic instabilities will be terminated.

Identification of which LPRMs are Upscale can be determined by a number of methods in the control room. The most commonly used method is visual and audible observance of the LPRM Upscale Annunciator and Alarm followed with identification of the individual LPRMs feeding the annunciation/alarm. Identification of individual LPRM Upscale is possible by observance of the various Operator display assemblies and control panel monitors.

(continued)

ACTIONS (continued)

F.1

As directed from Required Action D.1, this Action provides guidance for Operator action in response to thermal-hydraulic instability oscillations.

When operating in Region II of the Power/Flow map specified in the COLR immediate response is necessary when there are indications that thermal hydraulic oscillations are occurring as defined in the CONDITION.

LPRM upscale alarms are required to detect reactor core thermal-hydraulic instability events. The criteria for determining which LPRM upscale alarms are required is based on assignment of these alarms to designated core zones. These core zones consist of the level A, B, and C alarms in 4 or 5 adjacent LPRM strings. The number and location of LPRM strings in each zone assure that with 50% or more of the associated LPRM upscale alarms OPERABLE sufficient monitoring capability is available to detect core wide and regional oscillations. Operating plant instability data is used to determine the specific LPRM strings assigned to each zone.

Identification of which LPRMs are Upscale can be determined by a number of methods in the control room. The most commonly used method is visual and audible observance of the LPRM Upscale Annunciator and Alarm followed with identification of the individual LPRMs feeding the annunciation/alarm. Identification of individual LPRM Upscale is possible by observance of the various Operator display assemblies and control panel monitors.

G.1

As directed from Required Action D.1, this Action provides guidance for Operator action in response to operation in conditions that may lead to thermal-hydraulic instability oscillations.

When operating in Region II of the Power/Flow map specified in the COLR, the potential for thermal-hydraulic oscillations is increased and sufficient margin may not be available for operator response to suppress potential thermal-hydraulic oscillations. Therefore, action must be initiated immediately to restore operation outside of Regions II of the Power/Flow map specified in the COLR. This can be accomplished by either decreasing THERMAL POWER with control rod insertion or increasing core flow by increasing recirculation pump speed. The starting of a recirculation pump will not be used as a means to exit the excluded Regions because the starting of a recirculation pump with the plant operating above the 70% rod line is prohibited due to potential instability problems.

(continued)

B 3.3.9 OPRM Instrumentation

BASES

ACTIONS (continued)

H.1

The LPRMs provide a capability to monitor power in selected locations of the reactor core. The LPRM Upscale Alarm Instrumentation provides information concerning local power oscillations. Condition F requires a reactor scram when operating in Region II of the Power/Flow map specified in the COLR with indications that thermal hydraulic oscillations are occurring. The number and location of LPRM strings in each zone assures that with 50% or more of the associated LPRM upscale alarms OPERABLE any power oscillations which could occur would be detected and proper actions can be taken.

Identification of which LPRMs are Upscale can be determined by a number of methods in the control room. The most commonly used method is visual and audible observance of the LPRM Upscale Annunciator and Alarm followed with identification of the individual LPRMs feeding the annunciation/alarm. Identification of individual LPRM Upscale is possible by observance of the various Operator display assemblies and control panel monitors.

A sign is posted in the Control Room to ensure that plant operators are aware of the system condition if a plant transient results in the plant entering into the instability region.

TRS

TRS 3.3.9.1

Required only when the OPRM trip function is not available, this TRS ensures the combination of core flow and THERMAL POWER are within required limits to prevent uncontrolled thermal hydraulic oscillations by ensuring the recirculation loops are within the limits established by the Power / Flow map specified in the COLR. At low recirculation flows and high reactor power, the reactor exhibits increased susceptibility to thermal-hydraulic instability. The Power / Flow map specified in the COLR is based on guidance provided in References 7, 8, and 9 which also provided the guidance on how to respond to operation in these conditions. The 24 hour Frequency is based on operating experience and the operator's inherent knowledge of the current reactor status, including significant changes in THERMAL POWER and core flow to ensure the requirements are constantly met.

TRS 3.3.9.2

This TRS is to be performed at the specified Frequency to ensure that the LPRM Upscale Alarm Instrumentation are maintained OPERABLE.

(continued)

B 3.3.9 OPRM Instrumentation

BASES

TRS (continued)

TRS 3.3.9.3

The parameter setpoint verification surveillance compares the desired settings and setpoints to the values contained in the processor memory. This surveillance is required to assure that the settings are maintained in accordance with the setpoint analysis. The frequency is based on the OPRM CALIBRATION frequency per SR 3.3.1.1.18.

REFERENCES

1. NEDO-31960-A, BWROG Long Term Solution Licensing Methodology
2. NEDO-31960-A, Supp. 1, BWROG Long Term Solution Licensing Methodology
3. NEDO-32465-A, BWROG Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology and Reload Applications
4. Deleted
5. Generic Letter 94-02, Long-Term Solutions and Upgrade Of Interim Operating Recommendations for Thermal-Hydraulic Instabilities in Boiling Water Reactors
6. LCO 3.3.1.1, Reactor Protection System (RPS) Instrumentation
7. GE Service Information Letter No. 380, "BWR Core Thermal Hydraulic Stability," Revision 1, February 10, 1984
8. Letter, L. A. England to M. J. Virgilio, "BWR Owner's Group Guidelines for Stability Interim Corrective Action," June 6, 1994
9. EMF-CC-074(P)(A), Volume 4, Revision 0, "BWR Stability Analysis: Assessment of STAIF with Input from MICROBURN-B2," November 1999
10. NEDC-32410P-A, "Nuclear Measurement Analysis and Control Power Range Neutron Monitor (NUMAC PRNM) Retrofit Plus Option III Stability Trip Function"

B 3.6.3 Suppression Pool Alarm Instrumentation

BASES

TRO

The function of the Suppression Pool Instrumentation is to provide continuous monitoring of the suppression pool temperature and level. This monitoring function supplements the Operator observations and periodic Technical Specification Surveillance Requirements which require observation of the monitored parameters.

The suppression pool alarm instrumentation is designed to warn the control room operator that a limit has been reached and some compensatory action may be required. The setpoints are chosen to be consistent with the limits defined in the Technical Specifications.

Each channel of suppression pool narrow range level instrumentation consists of a transmitter, indicator and alarm circuit. This TRO only requires the alarm function to be maintained. The indicator is not required to support this function but can be used to support the performance of TRS 3.6.3.1, "Channel Check," and can be used to perform Surveillance Requirement (SR) 3.6.2.2.1.

Each channel of suppression pool temperature consists of 8 temperature detectors , as described in the Basis for SR 3.6.2.1.1, associated indicators and alarm circuits. The four alarm functions, as specified in Table 3.6.3-1, are displayed by monitors located both on the electronic unit (TX-15751 for Div. I, TX-15752 for Div II) and on the main control board (TIAH-15751 for Div. I, TIAH-15752 for Div. II). The alarm displays on both the electronic unit and main control board must be surveilled. Annunciators, tripped by the plant computer at a calculated bulk pool temperature of 88°F and by the electronic unit at or below the 105°F, 110°F and 120°F limits, enhance the operator's monitoring capability but are not required to be surveilled. This TRO only requires the alarm function to be maintained. The indicators are not required to support this function but can be used to support the performance of TRS 3.6.3.1, "Channel Check" and can be used to perform SR 3.6.2.1.1.

ACTIONS

The Actions are defined to ensure proper corrective measures are taken in response to the inoperable components.

(continued)

B 3.6.3 Suppression Pool Alarm Instrumentation

BASES (continued)

TRS

The TRSs are defined to be performed at the specified Frequency to ensure that the Suppression Pool Alarm Instrumentation Function is maintained OPERABLE.

TRS 3.6.3.1

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 against a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between 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 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.

TRS 3.6.3.2

A CHANNEL FUNCTIONAL TEST is performed on each required channel to ensure that the entire channel will perform the intended function.

The Frequency of 92 days is based on the reliability analysis of Reference 1.

REFERENCES

(1) EWR 365129, Evaluation of extending SPOTMOS alarm functional test from 31 days to 92 days.

B 3.10.4 Section not used

BASES

THIS PAGE INTENTIONALLY LEFT BLANK

B 3.10.4 Section not used

BASES

THIS PAGE INTENTIONALLY LEFT BLANK