MC-1

SHOREHAM NUCLEAR POWER STATION

PLANT SPECIFIC TECHNICAL GUIDELINES

PSTG #1

INTRODUCTION AND OPERATOR PRECAUTION

REVISION NO: 1

PREPARED BY: _____ DATE: 6/30/88

REVIEWED BY: Clyde T. Newsom DATE: 6/30/88

OPERATING ENGINEER APPROVAL: _____ DATE: 7/1/88

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

INTRODUCTION

The Shoreham PSTG's have been developed utilizing Revision 4 of the BWR Owners Group's Emergency Procedure Guidelines. The PSTG's are written to show in sufficient detail, the flow of information from its analytic base to its use as a technical guideline.

The format of the PSTG's shows each BWROG EPG step, the corresponding PSTG step (including Shoreham specific systems, components, data, etc.), and a justification for any differences between the two. References are provided and are drawn from the following source documents:

- Shoreham Technical Specifications
- Shoreham Safety Analysis Report
- As-built plant drawings
- Nuclear Engineering Department Calculations (using the above source documents)
- Currently Approved Shoreham Station Procedures
- Shoreham Probalistic Risk Assessment

The PSTGs will form the technical bridge between the Shoreham specific design and the Owners Group's EPG's, and provide the necessary audit trail to meet the requirements of NUREG-0899. Together with the Writer's Guide, the PSTGs will be utilized to develop symptom oriented, Human Factored, Emergency Operating Procedures for the Shoreham Nuclear Power Station.

The following symptomatic Plant Specific Technical Guidelines have been developed from the BWROG EPGs:

- RPV Control Guideline
- Primary Containment Control Guideline
- Secondary Containment Control Guideline
- Radioactivity Release Control Guideline

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

The RPV Control Guideline maintains adequate core cooling, shuts down the reactor, and cools down the RPV to cold shutdown conditions. This guideline is entered whenever low RPV water level, high RPV pressure, or high drywell pressure occurs, or whenever a condition which requires reactor scram exists and reactor power is above the APRM downscale trip or cannot be determined.

The Primary Containment Control Guideline maintains primary containment integrity and protects equipment in the primary containment with respect to the consequences of all mechanistic events. This guideline is entered whenever suppression pool temperature, drywell temperature, drywell pressure, suppression pool water level, or primary containment hydrogen concentration is above its high operating limit or suppression pool water level is below its low operating limit. Suppression pool, and drywell, temperatures are determined by plant-specific procedures for determining bulk suppression pool water temperature, drywell atmosphere average temperature, respectively.

The Secondary Containment Control Guideline protects equipment in the secondary containment, limits radioactivity release to the secondary containment, and either maintains secondary containment integrity or limits radioactivity release from the secondary containment. This guideline is entered whenever a secondary containment temperature, radiation level, or water level is above its maximum normal operating value or secondary containment differential pressure reaches zero.

The Radioactivity Release Control Guideline limits radioactivity release into areas outside the primary and secondary containments. This guideline is entered whenever offsite radioactivity release rate is above that which requires an Alert.

Table 1 is a list of the abbreviations used in the guidelines.

At various points throughout these guidelines, operator precautions are noted by the symbol:

[#]

The number within the box refers to a numbered "Caution" contained in the Operator Precautions section. These "Cautions" are brief and succinct red flags for the operator.

At various points within these PSTGs, limits are specified beyond which certain actions are required. While conservative, these limits are derived from engineering analyses utilizing best-estimate (as opposed to licensing) models. Consequently, these limits are generally not as conservative as the limits specified in a plant's Technical Specifications. This is not to imply that operation beyond the Technical Specifications is recommended in any emergency. Rather, such operation is required and is now permitted under certain degraded conditions in order to safely mitigate the consequences of those degraded conditions. The limits specified in the PSTGs establish the boundaries within which continued safe operation of the plant can be assured.

At other points within these PSTG's, defeating safety system interlocks and initiation logic is specified. This is also required in order to safely mitigate the consequences of degraded conditions, and it is generally specified only when conditions exist for which the interlock or logic was not designed. Bypassing other interlocks may also be required due to instrument failure, etc., but these interlocks cannot be identified in advance and are therefore not specified in the PSTGs.

The entry conditions for these PSTGs are symptomatic of both emergencies and events which may degrade into emergencies. The guidelines specify actions appropriate for both. Therefore, entry into procedures developed from these guidelines is not conclusive that an emergency has occurred.

Each procedure developed from these PSTGs is entered whenever any of its entry conditions occurs, irrespective of whether that procedure has already been entered or is presently being executed. The procedure is exited and the operator returns to non-emergency procedures when either of the exit conditions specified in the procedure is satisfied or it is determined that an emergency no longer exists. For example, the procedure developed from the RPV Control Guideline specifies cooldown to cold shutdown conditions by various methods and exit after the shutdown cooling interlocks have cleared, but entry into this procedure does not require any cooldown if it can be determined that an emergency no longer exists prior to establishing the conditions required to commence the cooldown as specified in the procedure. After a procedure developed from these guidelines has been entered, subsequent clearing of all entry conditions for that procedure is not, by itself, conclusive that an emergency no longer exists.

TABLE I

PSTG ABBREVIATIONS

ADS	-	Automatic Depressurization System
APRM	-	Average Power Range Monitor
ARI	-	Alternate Rod Insertion
CRD	-	Control Rod Drive
CS	-	Core Spray
ECCS	-	Emergency Core Cooling System
HPCI	-	High Pressure Coolant Injection
HVAC	-	Heating, Ventilating and Air Conditioning
LCO	-	Limiting Condition for Operation
LPCI	-	Low Pressure Coolant Injection
MSIV	-	Main Steamline Isolation Valves
NPSH	-	Net Positive Suction Head
RBSVS	-	Reactor Building Standby Ventilation System
RBNVS	-	Reactor Building Normal Ventilation System
RCIC	-	Reactor Core Isolation Cooling
RHR	-	Residual Heat Removal
RPS	-	Reactor Protection System
RPV	-	Reactor Pressure Vessel
RSCS	-	Rod Sequence Control System
RWCU	-	Reactor Water Cleanup
RWM	-	Rod Worth Minimizer
SLC	-	Standby Liquid Control
SRV	-	Safety Relief Valve

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #1

An RPV water level instrument may be used to determine RPV water level only when al[illegible] conditions are satisfied for that instrument:

1. The temperatures near all the instrument runs are below the RPV Saturation Temperature.

2. For each of the instruments in the following table, the instrument reads above the Minimum Indicated Level or the temperatures near all the instrument reference leg vertical runs are below the Maximum Run Temperature.

Instrument	Range (in.)	Maximum Run Temperature (°F) DW Runs	RB Runs	Minimum Indicated Level (in.)
[Fuel Zone	-317 to -17	376	NA	-305]

3. For each of the following instruments, the instrument reads above the Minimum Indicated Level associated with the highest temperature near an instrument reference leg vertical run:

a. Narrow Range (0 to 60 in.)

Highest Drywell Run Temperature (°F) Between Low	High	Minimum Indicated Level (in.)
-	286	0
286	350	5
350	450	14
450	550	26

Operator Precautions

EPG Step:
(Con't)

CAUTION #1

b. Wide Range (-150 to +60 in.)

Highest Drywell Run Temperature (°F) Between Low	High	Minimum Indicated Level (in.)
-	128	-150
128	250	-140
250	350	-131
350	450	-120
450	550	-107

c. Shutdown Range (-17 to +383 in.)

Highest Drywell Run Temperature (°F) Between Low	High	Minimum Indicated Level (in.)
-	150	10
150	250	23
250	350	41
350	450	65
450	550	98

SNPS PSTG Step:

CAUTION #1

An RPV water level instrument may be used to determine RPV water level only when all the following conditions are satisfied for that instrument:

1. The temperatures near all the instrument runs are below the RPV Saturation Temperature. (RPV Saturation Curve - Figure A)

2. For each of the instruments in the following table, the instrument reads above the Minimum Indicated Level or the temperatures near all the instrument reference leg vertical runs are below the Maximum Run Temperature.

SNPS PSTG Step:
(Con't)

CAUTION #1

Instrument	Range (in.)	Maximum Run Temperature (°F) DW Runs	Maximum Run Temperature (°F) RB Runs	Minimum Indicated Level (in.)
Fuel Zone A & B	-310 to -110	NA	328	-302.7
Wide Range A & B	-150 to 60	NA	132	-121.0
Narrow Range A & B	0 to 60	NA	207	7.2

3. For each of the following instruments, the instrument reads above the Minimum Indicated Level associated with the highest temperature near an instrument reference leg vertical run:

   a. Shutdown Range (0 to 400 in.)

Highest Drywell Run Temperature (°F) Between Low	High	Minimum Indicated Level (in.)
-	100	9.5
100	150	20.8
150	200	36.1
200	250	54.3
250	300	75.5
300	350	99.6
350	450	158.2
450	550	248.7

   b. Upset Range (0 to 180 in.)

Highest Drywell Run Temperature (°F) Between Low	High	Minimum Indicated Level (in.)
-	150	0
150	200	19.8
200	250	43.3
250	300	70.8
300	350	102.0
350	400	137.4
400	550	Useless

Justification for Differences/References

RPV Saturation Temperature: Derived from ASME steam tables, Properties of Saturated Steam and Saturated Water.

Water Level Instrument Data: NED Appendix C Calculation No. C-NAD-274.

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #2

[Heated Reference leg instruments] may not be used to determine RPV water level during rapid RPV depressurization below 500 psig.

SNPS PSTG Step:

None

Justification For Differences/References:

The Shoreham Nuclear Power Station does not utilize heated reference leg instrumentation. (FSAR Section 5).

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #3

Operating HPCI or RCIC turbines below [2200 rpm (minimum turbine speed limit per turbine vendor manual)] may result in unstable system operation and equipment damage.

SNPS PSTG Step:

CAUTION #2

Operating HPCI or RCIC turbines below 2200 rpm may result in unstable system operation and equipment damage.

Justification For Differences/References:

Minimum turbine speed per turbine vendor manual - Station Procedures 23.202.01 and 23.119.01

Terry Turbine Manuals: 1E41-1, 1E51-1

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #4

Elevated suppression chamber pressure may trip the RCIC turbine on high exhaust pressure.

SNPS PSTG Step:

CAUTION #3

Elevated suppression chamber pressure may trip the RCIC Turbine on high exhaust pressure.

Justification For Differences/References:

N/A

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #5

If HPCS is taking suction from the suppression pool and suppression pool temperature exceeds the HPCS Pump NPSH Limit, the pump may be damaged and become inoperable.

SNPS PSTG Step:

None

Justification For Differences/References:

The Shoreham Nuclear Power Station is a BWR 4 and does not have a HPCS. (FSAR Section 6.3)

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #6

Cooldown rates above [100°F/hr (RPV cooldown rate LCO)] may be required to accomplish this step.

SNPS PSTG Step:

CAUTION #4

Cooldown rates above 100°F/hr may be required to accomplish this step.

Justification For Differences/References:

RPV cooldown rate LCO - Shoreham Technical Specification section 3.4.6.

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

CAUTION #7

A rapid increase in injection into the RPV may induce a large power excursion and result in substantial core damage.

SNPS PSTG Step:

CAUTION #5

A rapid increase in injection into the RPV may induce a large power excursion and result in substantial core damage.

Justification For Differences/References:

N/A

SHOREHAM NUCLEAR POWER STATION

Plant Specific Technical Guidelines

Operator Precautions

EPG Step:

None

SNPS PSTG Step

CAUTION #6

If a [equipment name] is started with its associated Emergency Diesel Generator Load greater than [KW value] KW, then 3300 KW may be exceeded. |<1

Equipment Name	KW Value
CRD Pump	3050 KW
RHR Pump	2250 KW
Hydrogen Recombiner	3150 KW
Drywell Cooling System	3200 KW
RWCU Pump	3250 KW
RBCLCW Pump	3200 KW

|<1

Justification for Differences/References

This SNPS specific caution has been added as a result of the derating of the TDI Emergency Diesel Generators to 3300 KW. Its purpose is to alert operators that by starting a piece of equipment not normally required during design basis events may cause diesel loading to exceed 3300 KW.

The caution will be inserted before each step in which operation of equipment may be called for during a design basis accident. The equipment must be powered by emergency buses and not be already included on the Bus Program Logic. Examples of equipment which falls into this category are CRD pumps, RWCU pumps, Hydrogen Recombiners and Drywell Coolers. Additional equipment may be preceded by a caution at the discretion of the Operating Engineer.

Equipment vs KW Value: SNPS SAR Section 8.3 (Table 8.3.1-1)
SP 29.015.01, Loss of Offsite Power |<1