SAFETY LIMIT	LIMITING SAFETY SYSTEM SETTING
B. Core Thermal Power Limit (Reactor Pressure $\leq$ 800 psia)	B. APRM Rod Block Trip Setting SRB $\leq$ (0.66 W + 42% - 0.66 ΔW) $\frac{(FRP)}{MFLPD}$ where: FRP = fraction of rated thermal power (3293 MWt). MFLPD = maximum fraction of limiting power density where the limiting Power density is 13.4 KW/ft for all 8 x 8 fuel. The ratio of FRP to MFLPD shall be set equal to 1.0 unless the actual operating value is less than the design value of 1.0, in which case the actual operating value will be used.
C. Whenever the reactor is in the shutdown condition with irradiated fuel in the reactor vessel, the water level shall not be less than minus 160 inches indicated level (378 inches above vessel zero).	C. Scram and isolation--> reactor low water level 538 in. above vessel zero (0" on level instruments)

SAFETY LIMIT	LIMITING SAFETY SYSTEM SETTING	
	2.1 (Cont'd)	
	D. Scram-- turbine stop valve closure	≤10 percent
	E. Scram-- turbine control fast closure on loss of control oil pressure.	500<P<850 psig.
	F. Scram--low condenser vacuum	> 23 inches Hg vacuum
	G. Scram--main steam line isolation	≤10% valve closure
	H. Main steam isolation valve closure--nuclear system low pressure	≥850 psig
	I. Core Spray & LPCI actuation--reactor low-low-low water level	> minus 160 in. Indicated level (≥ 378 inches above vessel zero)
	J. HPCI & RCIC actuation--reactor low-low water level	> minus 48 in. Indicated level (≥ 490 inches above vessel zero)
	K. Main steam isolation valve closure--reactor low-low-low water level	> minus 160 in. Indicated level (≥ 378 inches above vessel zero)

1.1.C BASES (Cont'd.)

However, for this specification a Safety Limit violation will be assumed when a scram is only accomplished by means of a backup feature of the plant design. The concept of not approaching a Safety Limit, provided scram signals are operable, is supported by the extensive plant safety analysis.

The computer provided with Peach Bottom Unit 2 has a sequence annuciation program which will indicate the sequence in which events such as scram, APRM trip initiation, pressure scram initiation, etc. occur. This program also indicates when the scram setpoint is cleared. This will provide information on how long a scram condition exists and thus provide some measure of the energy added during a transient. Thus, computer information normally will be available for anlayzing scrams; however, if the computer information should not be available for any scram analysis, Specification 1.1.C will be relied upon to determine if a Safety Limit has been violated.

D. Reactor Water Level (Shutdown Condition)

During periods when the reactor is shutdown, consideration must also be given to water level requirements due to the effect of decay heat. If reactor water level should drop below the top of the active fuel during this time, the ability to cool the core is reduced. This reduction in core cooling capability could lead to elevated cladding temperatures and clad perforation. The core can be cooled sufficiently should the water level be reduced to two-thirds the core height. Establishment of the safety limit at minus 160 inches indicated level (378 inches above vessel zero) provides adequate margin to assure sufficient cooling during shutdown conditions. This level will be continuously monitored.

E. References

1. General Electric BWR Thermal Analysis Basis (GETAB): Data, Correlation and Design Application, January 1977 (NEDO-10958-A).

2. Process Computer Performance Evaluation Accuracy, General Electric Company BWR Systems Department, June 1974 (NEDO-20340).

3. "General Electric Boiling Water Reactor Generic Reload Fuel Application", NEDE-24011-P-A.

2.1 BASES (Cont'd.)

C. Reactor Water Low Level Scram and Isolation (Except Main Steamlines)

The setpoint for the low level scram is above the bottom of the separator skirt. This level has been used in transient analyses dealing with coolant inventory decrease. The results reported in FSAR subsection 14.5 show that scram and isolation of all process lines (except main steam) at this level adequately protects the fuel and the pressure barrier, because MCPR is greater than the fuel cladding integrity safety limit in all cases, and system pressure does not reach the safety valve settings. The scram setting is approximately 23 inches below the normal operating range and is thus adequate to avoid spurious scrams.

D. Turbine Stop Valve Closure Scram

The turbine stop valve closure scram trip anticipates the pressure, neutron flux and heat flux increase that could result from rapid closure of the turbine stop valves. With a scram trip setting of less than or equal to 10 percent of valve closure from full open, the resultant increase in surface heat flux is limited such that MCPR remains above the fuel cladding integrity safety limit even during the worst case transient that assumes the turbine bypass is closed. This scram is bypassed when turbine steam flow is below 30% of rated, as measured by turbine first stage pressure.

E. Turbine Control Valve Scram

The turbine control valve fast closure scram anticipates the pressure, neutron flux and heat flux increase that could result from fast closure of the turbine control valves due to a load rejection exceeding the capacity of the bypass valves or a failure in the hydraulic control system which results in a loss of oil pressure. This scram is initiated from pressure switches in the hydraulic control system which sense loss of oil pressure due to the opening of the fast acting solenoid valves or a failure in the hydraulic control system piping. Two turbine first stage presure switches for each trip system initiate automatic bypass of the turbine control valve fast closure scram when the first stage pressure is below that required to produce 30% of rated power. Control valve closure time is approximately twice as long as that for stop valve closure.

TABLE 3.2.A

INSTRUMENTATION THAT INITIATES PRIMARY CONTAINMENT ISOLATION

Minimum No. of Operable Instrument Channels per Trip System (1)	Instrument	Trip Level Setting	Number of Instrument Channels Provided By Design	Action (2)
2 (6)	Reactor Low Water Level	≥ 0" Indicated Level (3)	4 Inst. Channels	A
1	Reactor High Pressure (Shutdown Cooling Isolation)	≤ 75 psig	2 Inst. Channels	D
2	Reactor Low-Low-Low Water Level	at or above -160" indicated level (4)	4 Inst. Channels	A
2 (6)	High Drywell Pressure	≤ 2 psig	4 Inst. Channels	A
2	High Radiation Main Steam Line Tunnel	≤ 3 X Normal Rated (8) Full Power Background	4 Inst. Channels	B
2	Low Pressure Main Steam Line	≥ 850 psig (7)	4 Inst. Channels	B
2 (5)	High Flow Main Steam Line	≤ 140% of Rated Steam Flow	4 Inst. Channels	B
2	Main Steam Line Tunnel Exhaust Duct High Temperature	≤ 200 deg. F (9)	4 Inst. Channels	B

NOTES FOR TABLE 3.2.A

1. Whenever Primary Containment integrity is required by Section 3.7, there shall be two operable or tripped trip systems for each function.

2. If the first column cannot be met for one of the trip systems, that trip system shall be tripped or the appropriate action listed below shall be taken:

   A. Initiate an orderly shutdown and have the reactor in Cold Shutdown Condition in 24 hours.

   B. Initiate an orderly load reduction and have Main Steam Lines isolated within eight hours.

   C. Isolate Reactor Water Cleanup System.

   D. Isolate Shutdown Cooling.

3. Instrument setpoint corresponds to 538 inches above vessel zero.

4. Instrument setpoint corresponds to 378 inches above vessel zero.

5. Two required for each steam line.

6. These signals also start SBGTS and initiate secondary containment isolation.

7. Only required in Run Mode (interlocked with Mod Switch).

8. At a radiation level of 1.5 times the normal rated power background, an alarm will be tripped in the control room to alert the control room operators to an increase in the main steam line tunnel radiation level.

9. In the event of a loss of ventilation in the main steam line tunnel area, the main steam line tunnel exhaust duct high temperature setpoint may be raised up to 250 degrees F for a period not to exceed 30 minutes to permit restoration of the ventilation flow. During the 30 minute period, an operator shall observe control room indications of the duct temperature so in the event of rapid increases (indicative of a steam line break) the operator shall promptly close the main steam line isolation valves.

Notes for Table 3.2.B

1. Whenever any CSCS subsystem is required by Section 3.5 to be operable, there shall be two operable trip systems. If the first column cannot be met for one of the trip systems, that trip system shall be placed in the tripped condition or the reactor shall be placed in the Cold Shutdown Condition within 24 hours.

2. Close isolation valves in RCIC subsystem.

3. Close isolation valves in HPCI subsystem.

4. Instrument set point corresponds to 378 inches above vessel zero.

5. HPCI has only one trip system for these sensors.

TABLE 3.2.G

INSTRUMENTATION THAT INITIATES RECIRCULATION PUMP TRIP

Minimum No. of Operable Instrument Channels Per Trip System (1)	Instrument	Trip Level Setting	Number of Instrument Channels Provided by Design	Action
1	Reactor High Pressure	$\leq$ 1120 psig	4	(2)
1	Reactor Low-Low Water Level	> -48 in. indicated level	4	(2)

Notes for Table 3.2.G

1. Whenever the reactor is in the RUN Mode, there shall be one operable trip system for each parameter for each operating recirculation pump. If this cannot be met, the indicated action shall be taken.

2. Reduce power and place the mode selector-switch in a mode other than the RUN Mode.

TABLE 4.2.A

MINIMUM TEST AND CALIBRATION FREQUENCY FOR PCIS

	Instrument Channel (5)	Instrument Functional Test	Calibration Frequency	Instrument Check
1)	Reactor High Pressure (Shutdown Cooling Permissive)	(1)	Once/3 months	None
2)	Reactor Low-Low-Low Water Level (7)	(1) (3)	Once/operating cycle	Once/day
3)	Main Steam High Temp.	(1) (3)	Once/operating cycle	Once/day
4)	Main Steam High Flow (7)	(1) (3)	Once/operating cycle	Once/day
5)	Main Steam Low Pressure	(1)	Once/3 months	None
6)	Reactor Water Cleanup High Flow	(1)	Once/3 months	Once/day
7)	Reactor Water Cleanup High Temp.	(1)	Once/3 months	None

	Logic System Functional Test (4) (6)	Frequency
1)	Main Steam Line Isolation Vvs. Main Steam Line Drain Vvs. Reactor Water Sample Vvs.	Once/6 months
2)	RHR - Isolation Vv. Control Shutdown Cooling Vvs. Head Spray	Once/6 months
3)	Reactor Water Cleanup Isolation	Once/6 months
4)	Drywell Isolation Vvs. TIP Withdrawal Atmospheric Control Vvs. Sump Drain Valves	Once/6 months
5)	Standby Gas Treatment System Reactor Building Isolation	Once/6 months

3.2 BASES

In addition to reactor protection instrumentation which initiates a reactor scram, protective instrumentation has been provided which initiates action to mitigate the consequences of accidents which are beyond the operator's ability to control, or terminates operator errors before they result in serious consequences. This set of specifications provides the limiting conditions of operation for the primary system isolation function, initiation of the core cooling systems, control rod block and standby gas treatment systems. The objectives of the Specifications are (i) to assure the effectiveness of the protective instrumentation when required even during periods when portions of such systems are out-of-service for maintenance, and (ii) to prescribe the trip settings required to assure adequate performance. When necessary, one channel may be made inoperable for brief intervals to conduct required functional tests and calibrations.

Some of the settings on the instrumentation that initiate or control core and containment cooling have tolerances explicitly stated where the high and low values are both critical and may have a substantial effect on safety. The set points of other instrumentation, where only the high or low end of the setting has a direct bearing on safety, are chosen at a level away from the normal operating range to prevent inadvertent actuation of the safety system involved and exposure to abnormal situations.

Actuation of primary containment valves is initiated by protective instrumentation shown in Table 3.2.A which senses the conditions for which isolation is required. Such instrumentation must be available whenever primary containment integrity is required.

The instrumentation which initiates primary system isolation is connected in a dual bus arrangement.

The low water level instrumentation set to trip at zero inches indicated level (538 inches above vessel zero) closes all isolation valves except those in Groups 1, 4 and 5. Details of valve grouping and required closing times are given in Specification 3.7. For valves which isolate at this level, this trip setting is adequate to prevent core uncovery in the case of a break in the largest line assuming a 60 second valve closing time. Required closing times are less than this.

The low-low reactor water level instrumentation is set to trip when reactor water level is minus 48 inches indicated level (490 inches above vessel zero). This trip initiates the HPCI and RCIC and trips the recirculation pumps. The low-low-low reactor water level instrumentation is set to trip when the reactor water level is minus 160 inches indicated level (378 inches above vessel zero). This trip closes Main Steam Line Isolation Valves, Main Steam Drain Valves and Recirc Samples Valves (Group 1), activates the remainder of the CSCS subsystem, and starts

PBAPS

NOTES FOR TABLE NO. 3.7.1

Key: O = Open
C = Closed
SC = Stays Closed
GC = Goes Closed

Note: Isolation groupings are as follows:

GROUP 1: The valves in Group 1 are actuated by any one of the following conditions:

1. Reactor vessel low-low-low water level.
2. Main steam line high radiation.
3. Main steam line high flow.
4. Main steam line space high temperature.
5. Main steam line low pressure (RUN mode only).

GROUP 2A: The valves in Group 2A are actuated by any one of the following conditions:

1. Reactor vessel low water level.
2. Reactor water cleanup system heat exchanger discharge high temperature.
3. Reactor water cleanup system suction line break.
4. Standby liquid control system actuation.

GROUP 2B: The valves in Group 2B are actuated by any one of the following conditions:

1. Reactor vessel low water level.
2. High drywell pressure.
3. Reactor high pressure of shutdown mode.

GROUP 2C: The valves in Group 2C are actuated by any one of the following conditions:

1. Reactor low water level.
2. High reactor vessel pressure, (600 PSIG)
3. High drywell pressure.

GROUP 2D: The valves in Group 2D are actuated by the following conditions:

1. High drywell pressure.
2. Reactor low water level.

GROUP 3: The valves in Group 3 are actuated by any one of the following conditions:

3.7.D & 4.7.D BASES

Primary Containment Isolation Valves

Double isolation valves are provided on lines penetrating the primary containment and open to the free space of the containment. Closure of one of the valves in each line would be sufficient to maintain the integrity of the pressure suppression system. Automatic initiation is required to minimize the potential leakage paths from the containment in the event of a loss-of-coolant accident.

Group 1: Actuation for valves associated with the isolation of the main steam system. The main steam lines are isolated by reactor vessel low-low-low water level in order to allow for removal of decay heat subsequent to a scram, yet isolate in time for proper operation of the core standby cooling systems. The valves in group 1 are also closed when process instrumentation detects excessive main steam line flow, high radiation, low pressure, or main steam space high temperature.

Group 2: Actuation for valves associated with the isolation of the reactor auxiliary systems. Some of the reactor auxiliary systems such as the RWCU and RHR shutdown cooling systems connect into the reactor coolant boundary while others such as the drywell equipment and floor drain discharge valves do not penetrate the reactor coolant boundary. Group 2 actuation is subdivided as follows:

Group 2A - process lines are normally in use and it is therefore not desirable to cause spurious isolation due to high drywell pressure resulting from non-safety related causes. To protect the reactor from a possible pipe break in the system, isolation is provided by high temperature at the cleanup system heat exchanger/outlet or high flow through the inlet to the cleanup system. Also, since the vessel could potentially be drained through the cleanup system, a low level isolation is provided. An alarm of high temperature in the cleanup system area will provide an indication of suction line break resulting in manual isolation of the system. During actuation of the standby liquid control system, the cleanup system is isolated.

Group 2B - isolation valves are not normally in use and are closed by reactor vessel low water level, high drywell pressure or high reactor pressure of the shutdown mode.

Group 2C - isolation valves can only be opened when the reactor is at low pressure and the core standby cooling systems are not required. Also, since the reactor vessel could potentially be drained through these process lines, these valves are closed by low water level.

6.5.2.8 Continued

e. The Facility Emergency Plan and implementing procedures at least once per year.

f. The Facility Security Plan and implementing procedures at least once per two years.

g. Any other area of facility operation considered appropriate by the OSR Committee or the Vice President, Electric Production.

Authority

6.5.2.9 The OSR Committee shall report to and advise the Vice President, Electric Production, on those area of responsibility specified to Section 6.5.2.7 and 6.5.2.8.

Records

6.5.2.10 Records of OSR Committee activities shall be prepared, approved and distributed as indicated below:

a. Minutes of each OSR Committee meeting shall be prepared, approved and forwarded to the Vice President, Electric Production, within 14 days following each meeting.

b. Reports of reviews encompassed by Section 6.5.2.7.e, f, g and h above, shall be prepared, approved and forwarded to the Vice President, Electric Production, within 14 days following completion of the review.

c. Audit reports encompassed by Section 6.5.2.8 above shall be forwarded to the Vice President, Electric Production, and to the management positions responsible for the areas audited within 30 days after completion on the audit.