REACTOR COOLANT SYSTEM

HIGH POINT VENTS

LIMITING CONDITION FOR OPERATION

3.4.11 The Reactor Coolant System will have two high point vents installed on it, one in each loop. One of these vents shall be OPERABLE. For the vent to be OPERABLE, both valves in the vent will have to be OPERABLE. Each vent will have the following valves installed on it:

a.	Reactor Coolant System Loop 1	RC4608A, RC4608B
b.	Reactor Coolant System Loop 2	RC4610A, RC4610B

APPLICABILITY: MODES 1, 2 and 3

ACTION

a. With both of the high point vents not OPERABLE, restore one vent to OPERABLE status within 30 days, or be in HOT SHUTDOWN within the next 12 hours.

b. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.4.11 No additional Surveillance Requirements other than those required by Specification 4.0.5, except that the Surveillance will be performed once per 18 months during the COLD SHUTDOWN or REFUELING MODE.

TABLE 3.3-10 (Continued)

POST-ACCIDENT MONITORING INSTRUMENTATION

INSTRUMENT	MINIMUM CHANNELS OPERABLE
15. Low Pressure Injection (DHR) Flow	1/Channel
16. HPI System Pump and Valve Status	1/System
17. LPI System Pump and Valve Status	1/System
18. Containment Spray Pump and Valve Status	1/System
19. Core Flood Valve Status	1/System
20. BWST Valve Status	1/System
21. Containment Emergency Sump Valve Status	1/Valve
22. Containment Air Recirculation Fan Status	1/Fan
23. Containment Air Cooling Fan Status	1/Fan
24. EVS Fan and Damper Status	1/System
25. Auxiliary Feedwater Flow Rate	1/Steam Generator
26. RC System Subcooling Margin Monitor	1
27. PORV Position Indicator	1
28. PORV Block Valve Position Indicator	1
29. Safety Valve Position Indicator	1/Valve
30. BWST Level	3
31. CONTAINMENT NORMAL SUMP LEVEL	1
32. CONTAINMENT WIDE RANGE LEVEL	1
33. CONTAINMENT WIDE RANGE PRESSURE	1

TABLE 4.3-10 (Continued)

POST-ACCIDENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

INSTRUMENT	CHANNEL CHECK	CHANNEL CALIBRATION
15. Low Pressure Injection (DHR) Flow	M	R
16. HPI System Pump and Valve Status	M	NA
17. LPI System Pump and Valve Status	M	NA
18. Containment Spray Pump and Valve Status	M	NA
19. Core Flood Valve Status	M	NA
20. BWST Valve Status	M	NA
21. Containment Emergency Sump Valve Status	M	NA
22. Containment Air Recirculation Fan Status	M	NA
23. Containment Air Cooling Fan Status	M	NA
24. EVS Fan and Damper Status	M	NA
25. Auxiliary Feedwater Flow Rate	M	R
26. RC System Subcooling Margin Monitor	M	R
27. PORV Position Indicator	M	R
28. PORV Block Valve Position Indicator	M	R
29. Pressurizer Safety Valve Position Indicator	M	R
30. BWST Level	S	R
31. CONTAINMENT NORMAL SUMP LEVEL	M	R
32. CONTAINMENT WIDE RANGE LEVEL	M	R
33. CONTAINMENT WIDE RANGE PRESSURE	M	R

DAVIS BESSE, UNIT 1

3/4 3-50

Amendment No. 35, 37

3/4.4.11 HIGH POINT VENTS

The operability of the high point vents ensures availability of a path to vent noncondensible gases from the reactor coolant system which may inhibit natural circulation.

Docket No. 50-346
License No. NPF-3
Serial No. 803
May 5, 1982

Attachment 2

I. Changes to Davis-Besse Nuclear Power Station Unit 1, Appendix A, Technical Specifications and Table 3-7-1 and Bases.

A. Time Required to Implement

This change is to be effective upon NRC approval.

B. Reason for Change (Facility Change Request 79-177, Rev. A)

To allow credit for excess flow relieving capacity and permit higher power operation in the event of inoperable safety valves.

C. Safety Evaluation

(See attached)

SAFETY EVALUATION

The safety function of the main steam safety valves is to provide over-pressure protection for the steam generator secondary side. There are 18 safety valves (9 per steam generator) which were designed in accordance with ASME Section III, Article 9, 1968 Edition. The specified valve lift settings and relief capacities are in accordance with the 1968 Edition but, as these values are more conservative, they meet the requirements of the ASME code for Class II components, 1971 Edition, (as referenced in Technical Specifications B 3/4 7.1.1) specifically:

Relieving Capacity of Pressure-Relief Devices (NC-7411)

The total rated relieving capacity of the pressure relief devices intended for overpressure protection of a nuclear power system whose components are within the scope of subsection NC shall be sufficient to prevent a rise in pressure of more than ten percent above system design pressure (at design temperature) within the protected boundary of the system under any pressure transients anticipated to arise.

Set Pressure Limitations (NC-7511)

The set pressure of at least one of the pressure-relief devices connected to the system shall not be greater than the maximum allowable working pressure of the system (at design temperature) which it protects. Additional pressure-relief devices, other than safety-relief and liquid-relief valves, may have higher set pressures but in no case shall the set pressures be such that the total accumulated pressure exceeds 110 percent of the system design pressure.

The proposed change to the Davis-Besse Technical Specifications specifically addresses the equation for deriving the reduced high flux trip setpoint as a function of inoperable main steam line code safety valves (Section B 3/4.7.1.1). The safety function of this Technical Specification is to assure that adequate secondary side steam relieving capacity is maintained in the event of inoperability of one or more main steam safety valves. This is accomplished by reducing The Reactor Protection System high flux trip setpoint which is calculated using the equation referred above.

In the present form, the equation uses the total relieving capacity as the installed capacity. When examined closely, this disallows credit for the excess installed capacity of the safety valves at Davis-Besse. This excess is calculated to be the installed minus the required capacity, 120% - 112% = 8%.

The proposed change to the equation is to use the required relieving capacity as the base line value. This means that reductions from the required relieving capacity would necessitate a corresponding reduction in

power. This would allow credit for excess flow relieving capacity and permit higher power operation in the event of inoperable safety valves. The proposed equation is:

$$SP = \frac{(X) - (Y)(V)}{Z} \times 104.9$$

where:

SP = Reduced trip setpoint in percent of RATED THERMAL POWER*. (not to exceed 104.9)

V = Maximum number of inoperable safety valves per steam generator.

104.9 = High flux trip setpoint specified in Table 2.2.1.

X = Total relieving capacity of all safety valves (installed) per steam generator in pounds per hour, 7,087,500 lbs/hour.

Y = Maximum relieving capacity of any one safety valve in pounds per hour, 845,759 lbs/hour.

Z = Required relieving capacity per steam generator in pounds per hour, 6,585,600 lbs/hour.

This modified equation is a more accurate representation of flow relieving capacity installed at Davis-Besse. The change would allow greater permissible power generation in the event of inoperable code safety valves without degradation of any safety factors or violation of the requirements of Section III of the ASME Boiler and Pressure Vessel Code, 1971 edition (as outlined above). Further, this proposed change would have no detrimental effect on the station's ability to prevent or mitigate the consequence(s) of an accident and the safety function of the Technical Specification remains unaltered.

Pursuant to the above, it is concluded that the technical specification change does not constitute an unreviewed safety question.

*Rated thermal power shall be a total reactor core heat transfer rate to the reactor coolant of 2772 MW_t.

DESIGN DATA AND CALCULATIONS

The following design data has been established on a per steam generator basis:

Secondary Side

Design Pressure, psig	1050
Design Temperature, °F	600
Steam Flow (outlet), lbs/hr	5.99×10^6

The total rated relieving capacity for the 18 installed safety relieve valves has been established as:

14 (6" x 10") valves at 845,759 lbs/hr = 11,840,626

4 (6" x 8") valves at 583,574 lbs/hr = 2,334,296

14,174,922 lbs/hr

This is equivalent to 120% of the total secondary steam flow at 100% rated thermal power.

The maximum design reactor power operation has been established at 112%.*

*The maximum reactor power operation is 112% - 7.1 = 104.9% where 7.1% is the nuclear instrumentation (NI) error. 104.9% is the reactor protection system maximum high flux trip setpoint in Technical Specifications Table 2.2.1.

Therefore, the total required relieving capacity is calculated to be:

$112\% \left[2(5.88 \times 10^6 \text{ lbs/hr})\right] = 13{,}171{,}200 \text{ lbs/hr}$

jh b/4

BASES

3/4.7.1 TURBINE CYCLE

3/4.7.1.1 SAFETY VALVES

The OPERABILITY of the main steam line code safety valves ensures that the secondary system pressure will be limited to within 110% its design pressure of 1050 psig during the most severe anticipated system operational transient. The maximum relieving capacity is associated with a turbine trip from 100% RATED THERMAL POWER coincident with an assumed loss of condenser heat sink (i.e., no steam bypass to the condenser).

The specified valve lift settings and relieving capacities are in accordance with the requirements of Section III of the ASME Boiler and Pressure Vessel Code, 1971 Edition. The total relieving capacity for all valves on all of the steam is 14,175,000 lbs/hr which is 120 percent of the total secondary steam flow of 11,760,000 lbs/hr at 100% RATED THERMAL POWER. A minimum of 2 OPERABLE safety valves per steam generator ensures that sufficient relieving capacity is available for the allowable THERMAL POWER restriction in Table 3.7-1.

STARTUP and/or POWER OPERATION is allowable with safety valves inoperable within the limitations of the ACTION requirements on the basis of the reduction in secondary system steam flow and THERMAL POWER required by the reduced reactor trip settings of the High Flux channels. The reactor trip setpoint reductions are derived on the following bases:

$$SP = \frac{(X) - (Y)(V)}{\cancel{X}\ \ Z} \times \cancel{105.5}\ 104.9$$

where:

SP = reduced Trip Setpoint in percent of RATED THERMAL POWER (NOT TO EXCEED 104.9)

V = maximum number of inoperable safety valves per steam generator

104.9 ~~105.5~~ = High Flux Trip Setpoint specified in Table 2.2.1

X = Total relieving capacity of all safety valves per steam generator in lbs/hour, 7,087,500 lbs/hour

Y = Maximum relieving capacity of any one safety valve in lbs/hour, 845,759 lbs/hour

Z = Required relieving capacity per steam generator in pounds per hour, 6,595,600 lbs/hour.

TABLE 3.7-1

MAXIMUM ALLOWABLE HIGH FLUX TRIP SETPOINT WITH INOPERABLE STEAM LINE SAFETY VALVES

Maximum Number of Inoperable Safety Valves on Any Steam Generator	Maximum Allowable High Flux Trip Setpoint (Percent of RATED THERMAL POWER)
1	~~92.91~~ 99.42
2	~~80.32~~ 85.95
3	~~67.73~~ 72.48
4	~~55.14~~ 59.01
5	~~42.55~~ 45.54
6	~~29.96~~ 32.06
7	~~17.36~~ 18.59