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September 8, 2009

PG&E Letter DCL-09-065

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Docket No. 50-275, OL-DPR-80
Docket No. 50-323, OL-DPR-82
Diablo Canyon Units 1 and 2
Response to NRC Request for Additional Information Regarding Emergency License Amendment Request 09-04, "Revision to Technical Specification 3.7.1, 'Main Steam Safety Valves (MSSVs) for Unit 2 Cycle 15'"

Reference: 1. PG&E Letter DCL-09-062, "Emergency License Amendment Request 09-04 Revision to Technical Specification 3.7.1, 'Main Steam Safety Valves (MSSVs) for Unit 2 Cycle 15,'" dated September 3, 2009.

Dear Commissioners and Staff:

PG&E Letter DCL-09-062, dated September 3, 2009, submitted Emergency License Amendment Request (LAR) 09-04, "Revision to Technical Specification 3.7.1, 'Main Steam Safety Valves (MSSVs) for Unit 2 Cycle 15'" (Reference 1). LAR 09-04 proposes a one-time change to Technical Specification (TS) 3.7.1, "Main Steam Safety Valves (MSSVs)," Table 3.7.1-1, "Maximum Allowable Power Range Neutron Flux High Setpoint With Inoperable MSSVs," to allow an increase in the Power Range Neutron Flux High setpoint from 87 percent rated thermal power (RTP) to 106 percent RTP for Unit 2 Cycle 15 with only Unit 2 main steam relief valve (RV) RV-224 inoperable.

On September 8, 2009, the NRC staff requested additional information required to complete the review of Reference 1. PG&E's responses to the staff's questions are provided in the Enclosure. Attachment 1 to the Enclosure provides marked-up TS pages, Attachment 2 provides retyped TS pages, and Attachment 3 provides marked-up TS Bases pages for information only. These three Attachments supersede the Reference 1 Attachments 1, 2, and 3 in their entirety.

This information includes additional information to support the technical evaluation contained in Reference 1, and provides a revised no significant hazards consideration determination that supersedes that provided in the Enclosure of Reference 1.

A001
NRR

PG&E understands that the NRC is reviewing LAR 09-04 as an exigent LAR rather than an emergency LAR. Furthermore, PG&E may require additional time to implement the changes associated with the response to request for additional information question 3. Therefore, PG&E now requests approval of LAR 09-04 no later than September 15, 2009. Also, PG&E requests the license amendment be made effective upon NRC issuance, to be implemented within 30 days from the date of issuance.

This communication contains a new commitment to be implemented following NRC approval of the LAR. The commitment is contained in Attachment 4.

If you have any questions, or require additional information, please contact Larry Parker at (805) 545-3386.

I state under penalty of perjury that the foregoing is true and correct.

Executed on September 8, 2009.

Sincerely,

James R. Becker
Site Vice President

kjse/4328/N5026586
Enclosure
cc: Gary W. Butner, Acting Branch Chief, California Department of Public Health
Elmo E. Collins, NRC Region IV
Michael S. Peck, NRC, Senior Resident Inspector
Diablo Distribution
cc/enc: Alan B. Wang, Project Manager, Office of Nuclear Reactor Regulation

PG&E Response to NRC Request for Additional Information Regarding Emergency License Amendment Request 09-04, "Revision to Technical Specification 3.7.1, 'Main Steam Safety Valves (MSSVs) for Unit 2 Cycle 15'"

NRC Question 1:

By letter dated September 3, 2009, Pacific Gas and Electric Company (PG&E, the licensee), submitted an one-time emergency license amendment request (LAR) to the Diablo Canyon Power Plant (DCPP), Unit 2 to revise Technical Specification (TS) 3.7.1, "Main Steam Safety Valves (MSSVs)," Table 3.7.1-1, "Maximum Allowable Power Range Neutron Flux High Setpoint With Inoperable MSSVs." DCPP, Unit 2 currently has a MSSV inoperable (MS-2-RV-224), and per TS 3.7.1, Required Action A.1 is operating at approximately 80 percent rated thermal power (RTP). The proposed change will allow an increase in the Power Range Neutron Flux High setpoint from 87 percent RTP to 106 percent RTP in Table 3.7.1-1 with only MS-2-RV-224 inoperable for the remainder of Cycle 15, which is scheduled to end in October 2009.

The US Nuclear Regulatory Commission (NRC) staff has determined that the following additional information is needed to complete its review of the subject license amendment request for DCPP.

In the NRC staff's judgment, the integral power achieved during the pre-trip power ascension could be a fairly significant factor affecting the secondary pressure rise. Therefore, the assertion that initiating the transient at 102-percent power is a conservative treatment of power uncertainty may not be correct.

Discuss why initiating the loss of load/turbine trip (LOL/TT) transient in an overpower condition is conservative relative to secondary pressurization when the transient is assumed to be terminated by an overpower trip. Address (1) whether initiating the transient from a 98-percent power condition would result in a greater secondary pressurization, and (2) why the modeling technique employed is sufficiently conservative to account for this potentially greater pressurization.

PG&E Response:

In PG&E Letter DCL-09-062, "Emergency License Amendment Request (LAR) 09-04, Revision to Technical Specification 3.7.1, 'Main Steam Safety Valves (MSSVs) for Unit 2 Cycle 15,'" dated September 3, 2009, the three separate RETRAN cases analyzed at full power conditions conservatively bound the maximum potential challenge to the main steam safety valve (MSSV) relief capacity for any credible event that could occur during the remainder of DCPP Unit 2 Cycle 15 operation.

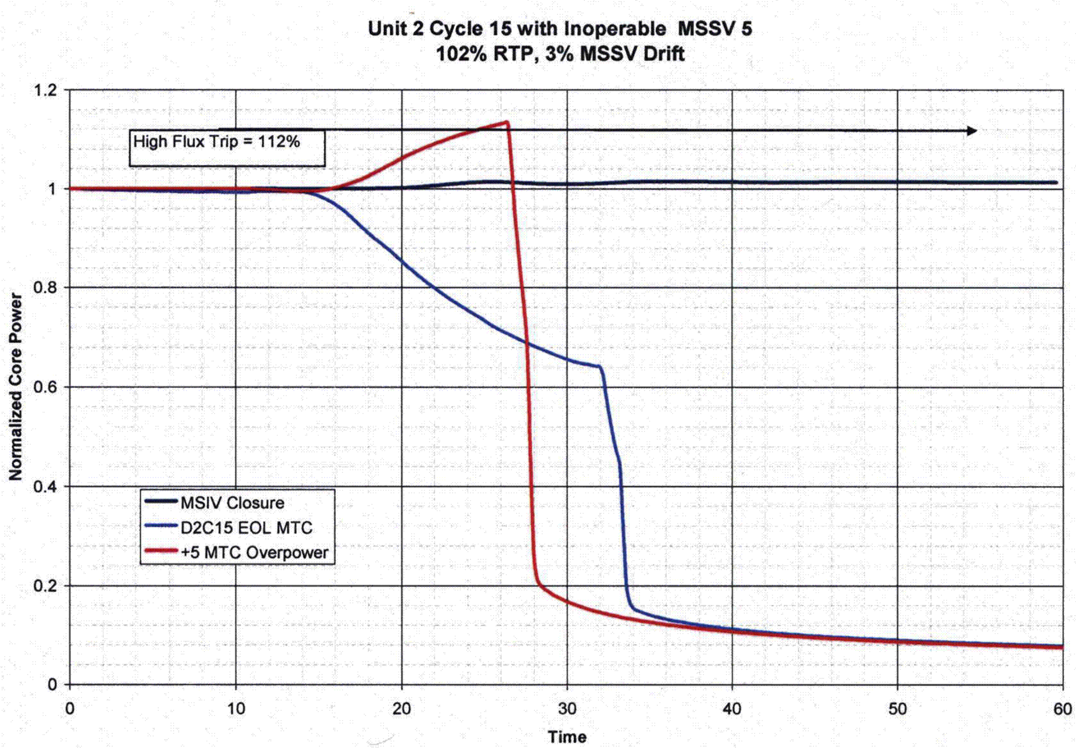
RETRAN Case 1 assumed a noncredible +5 percent milli-rho per degree Fahrenheit (pcm/°F) Moderator Temperature Coefficient (MTC) to bound any potential power increase transient that could occur since a LOL event and subsequent reactor coolant system (RCS) heatup can not result in a power increase with the current Unit 2 Cycle 15 core conditions (see the RETRAN Case 2 discussion on MTC below). Any power increase transient that could occur such as an excessive load increase is not limiting for secondary pressurization since it would not result in a turbine trip and stop secondary heat removal until a reactor trip is generated. Any power increase transient that could occur at a lower power level would continue to have secondary heat removal until it eventually reached the same Power Range Neutron Flux High setpoint as analyzed in RETRAN Case 1, unless another reactor trip such as the Overtemperature Delta Temperature trip occurred earlier. Analyzing the overpower transient from 102 percent rated thermal power (RTP) combined with an assumed instantaneous loss of secondary heat removal capability and a nuclear power increase up to the 112 percent high flux trip setpoint conservatively maximizes the core decay heat and energy transferred into the RCS at the time the high flux trip occurs. Therefore, RETRAN Case 1 conservatively determines the reduction in the high flux trip setpoint that must be implemented to ensure the core power and integral energy transferred into the RCS at the time of reactor trip do not exceed the MSSV relief capacity for any credible overpower transient that could occur during the remainder of Unit 2 Cycle 15.

RETRAN Case 2 is analyzed at 102 percent RTP with a negative MTC that bounds the Unit 2 Cycle 15 conditions to demonstrate that any LOL event can not transfer enough energy into the RCS to exceed the operable MSSV relief capacity. The full-power Unit 2 Cycle 15 RCS boron concentration is currently less than 300 parts per million (ppm), and at any power level and associated RCS T_{avg}, the MTC will be very negative. Figure 1 shows the power level versus time for the RETRAN cases analyzed. With the negative MTC, the core power is significantly reduced due to the negative reactivity feedback as the RCS heats up following the LOL and associated loss of secondary heat removal. The MSSVs open before the reactor trip occurs and the net sudden increase in secondary heat removal combined with the rapid reduction in core power level result in a reactor trip on low pressurizer pressure. With a negative end of life (EOL) MTC, any LOL transient that is initiated from less than full power will still result in a rapid power reduction and will depressurize faster to the reactor trip setpoint when the MSSVs open. Therefore, it is not credible that a LOL event, which initiates at a power level lower than 102 percent RTP when combined with the Unit 2 Cycle 15 EOL MTC analyzed, could transfer more integral energy into the RCS prior to the reactor trip. The RETRAN Case 2 analyzed at 102 percent RTP and with the near EOL MTC is bounding for any LOL event that could occur at a reduced power level for the remainder of Unit 2 Cycle 15 operation.

RETRAN Case 3 analyzed an instantaneous closure of the main steam isolation valve (MSIV) and secondary steam flow on the affected steam generator (SG) at 102 percent RTP. This represents the maximum relief capacity challenge to the affected SG MSSVs that could occur for any steam flow transient that does not result in a reactor trip. RETRAN Case 3 did not credit any control system or protection system interaction such that a reactor trip was precluded and the affected SG MSSVs were challenged to maintain steady state full power steam flow conditions without exceeding the secondary pressure limit. Any MSIV closure event that occurs at a lower power level would result in a reduced heat transfer challenge to the affected SG MSSVs and would be less limiting for evaluating the peak secondary pressurization.

RETRAN Cases 1, 2, and 3 were all evaluated using the same RETRAN thermal hydraulic model that is currently used for the LOL peak pressure analysis in Final Safety Analysis Report Section 15.2.7. As such, using this RETRAN model for the thermal hydraulic evaluation of the initial power conditions and instantaneous secondary heat removal is appropriately conservative for bounding the remainder of Unit 2 Cycle 15 for any secondary pressure increase transient that could occur.

Figure 1



NRC Question 2:

What is the MTC at end of cycle conditions? Is there any sort of Tcold reduction? What's the actual condition relative to the analysis?

PG&E Response:

The DCPP Unit 2 Cycle 15 EOL MTC surveillance test was recently completed on August 10, 2009. It verified that the measured MTC at full power is less negative than the limit established in the Unit 2 Cycle 15 Core Operating Limits Report (COLR). The surveillance calculated a full power MTC value of -26.87 pcm/°F compared to the COLR surveillance limit of -39.0 pcm/°F. RETRAN Case 2 evaluated the LOL event with a MTC range of -10 pcm/°F to -18.0 pcm/°F over the RCS average temperature (Tavg) range associated with power operation. This MTC range is less negative and is conservatively bounding for the Unit 2 Cycle 15 measured range of MTC, which is estimated to be -19 pcm/°F to -27 pcm/°F. The Unit 2 Cycle 15 MTC range continues to become more negative as the boron concentration reduces with core burnup. Therefore, the RETRAN Case 2 evaluation conservatively under predicts the actual power reduction that would occur for a LOL heatup event and is conservatively bounding for the remainder of Unit 2 Cycle 15 operation.

Unit 2 Cycle 15 does not implement any RCS Tavg or Tcold reduction during normal full power operation. If Unit 2 Cycle 15 accrues enough core burnup to experience a loss of full power capability, an EOL temperature and power coast down and associated RCS Tavg reduction could be implemented within the constraints established for the Cycle 15 core design. Since the Unit 2 Cycle 15 MTC would be more negative at these EOL core conditions, the reduced power and RCS Tavg associated with a power coast down would remain conservatively bounded by the RCS Tavg and negative MTC conditions assumed in the RETRAN evaluation.

NRC Question 3:

The Maximum Allowable Value in TS Table 3.7.1-1 is being changed from 87 percent to 106 percent and as addressed in NRC's letter dated January 8, 2008, (ADAMS accession No. ML073240006) and PG&E's license amendment request dated January 11, 2007, the footnotes to comply with Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006, need to be added.

PG&E Response:

To comply with RIS 2006-17, an additional footnote was added to the proposed TS Table 3.7.1-1 change. Attachment 1 to this Enclosure provides the revised marked-up TS pages, Attachment 2 provides the revised retyped TS pages, and Attachment 3 provides the revised marked-up TS Bases pages for information only. These three Attachments supersede the PG&E Letter DCL-09-062 Attachments 1, 2, and 3 in their entirety.

The proposed footnote is similar to that proposed for the engineered safety feature actuation system SG Water Level-High High Feedwater Isolation Nominal Trip Setpoint in PG&E Letter DCL-07-075, "Supplement to License Amendment Request 07-01, 'Revision to Technical Specifications to Support Steam Generator Replacement, and Response to Request For Additional Information,'" dated August 9, 2007, and approved by the NRC in Amendment No. 198 to Facility Operating License No. DPR-80 and Amendment No. 199 to Facility Operating License No. DPR-82 for the DCPP, Unit Nos. 1 and 2, respectively, dated January 8, 2008. The only difference in the proposed footnote from PG&E Letter DCL-07-075 is that the sentence "Footnote (a) does not apply to this function," is not included because this sentence is only applicable to TS Table 3.3.2-1, which includes footnote (a). The additional footnote ensures the guidance provided in RIS 2006-17 is met during Unit 2 Cycle 15 while the proposed TS is applicable and that the methodologies used to determine the as-found and the as-left tolerances are specified in a procedure controlled under 10 CFR 50.59.

The six percent total tolerance used to determine the Maximum Allowable Power Range Neutron Flux High Setpoint of 106 percent RTP is applicable for the guidance provided in RIS 2006-17. PG&E will calculate the required as-found and as-left tolerances in accordance with the guidance of RIS 2006-17 prior to the adjustment of the DCPP Unit 2 Maximum Allowable Power Range Neutron Flux High Setpoint from 87 percent to 106 percent during DCPP Unit 2 Cycle 15.

As a result of the additional TS change to comply with RIS 2006-17, a revised no significant hazards consideration is contained below. This supersedes the no significant hazards consideration previously provided in the Enclosure of PG&E Letter DCL-09-062.

<u>No Significant Hazards Consideration</u>

PG&E has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. *Does the change involve a significant increase in the probability or consequences of an accident previously evaluated?*

This License Amendment Request (LAR) proposes a one-time change to Technical Specification (TS) 3.7.1, "Main Steam Safety Valves (MSSVs)," Table 3.7.1-1, "Maximum Allowable Power Range Neutron Flux High Setpoint With Inoperable MSSVs" to allow an increase in the Power Range Neutron Flux High setpoint from 87 percent rated thermal power (RTP) to 106 percent RTP for Unit 2 Cycle 15 with only Unit 2 main steam relief valve 224 (MS-2-RV-224) inoperable. In addition, the LAR proposed change revises and clarifies the surveillance requirements for the Power Range Neutron Flux High Setpoint during Unit 2 Cycle 15.

The increase in the Power Range Neutron Flux High setpoint TS value does not initiate an accident. Technician adjustments to lower the Power Range Neutron Flux High setpoint could cause a reactor trip, however, this action is already a TS requirement. Thus, increasing the TS setpoint value from the current value will not change the requirement for a technician to adjust the setpoints downward when MSSVs become inoperable, and therefore, will not increase the probability of a reactor trip.

The revision and clarification of the surveillance requirements for the Power Range Neutron Flux High setpoint ensure that this function will actuate as assumed in the safety analyses.

With the increase in the Power Range Neutron Flux High setpoint with only MS-2-RV-224 inoperable during Unit 2 Cycle 15 the remaining MSSVs will continue to prevent overpressure of the main steam leads and Steam Generators (SGs), and remove adequate heat from the reactor coolant system (RCS).

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. *Does the change create the possibility of a new or different kind of accident from any accident previously evaluated?*

The increase in the Power Range Neutron Flux High setpoint TS value with only MS-2-RV-224 inoperable during Unit 2 Cycle 15 does not initiate an accident and does not change the method by which any safety-related system performs the function.

The revision and clarification of the surveillance requirements for the Power Range Neutron Flux High setpoint will provide assurance that the plant will operate within the limits assumed in the safety analyses.

The proposed change does not result in plant operation outside the limits previously considered, nor allow the progression of transients or accidents in a manner different than previously considered.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. *Does the change involve a significant reduction in a margin of safety?*

The RCS pressure boundary is applicable to the proposed change. With the proposed change all relevant event acceptance criteria were found to be satisfied. Therefore, the proposed change does not involve a reduction in a margin of safety.

With the proposed change, the MSSVs will still prevent SG pressure from exceeding 110 percent of SG design pressure in accordance with the ASME code. The conclusions for the Final Safety Analysis Report accident analyses are unaffected by the change, remain valid, and provide margin.

The instrument surveillance requirement changes for the Power Range Neutron Flux High setpoint ensure that the instrumentation will actuate as assumed in the safety analysis.

Therefore, the proposed change does not involve a significant reduction in a margin of safety.

Based on the above safety evaluation, PG&E concludes that the change proposed by this LAR satisfies the no significant hazards consideration standards of 10 CFR 50.92(c), and accordingly a no significant hazards finding is justified.

Proposed Technical Specification Changes (marked-up)

Table 3.7.1-1 (page 1 of 1)
Maximum Allowable Power Range Neutron Flux High Setpoint With Inoperable MSSVs

MINIMUM NUMBER OF MSSVs PER STEAM GENERATOR REQUIRED OPERABLE	MAXIMUM ALLOWABLE POWER RANGE NEUTRON FLUX HIGH SETPOINT %RTP
4	87* **
3	47*
2	29*

* Unless the reactor trip system breakers are in the open position.

** For Unit 2 Cycle 15 with only MS-2-RV-224 inoperable, a Maximum Allowable Power Range Neutron Flux High Setpoint of 106% RTP may be used. If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The methodologies used to determine the as-found and the as-left tolerances are specified in the Equipment Control Guidelines.

Proposed Technical Specification Changes (retyped)

Remove Page	Insert Page
3.7-2	3.7-2

Table 3.7.1-1 (page 1 of 1)
Maximum Allowable Power Range Neutron Flux High Setpoint With Inoperable MSSVs

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** For Unit 2 Cycle 15 with only MS-2-RV-224 inoperable, a Maximum Allowable Power Range Neutron Flux High Setpoint of 106% RTP may be used. If the as-found channel setpoint is outside its predefined as-found tolerance, then the channel shall be evaluated to verify that it is functioning as required before returning the channel to service. The instrument channel setpoint shall be reset to a value that is within the as-left tolerance around the Nominal Trip Setpoint (NTSP) at the completion of the surveillance; otherwise, the channel shall be declared inoperable. Setpoints more conservative than the NTSP are acceptable provided that the as-found and as-left tolerances apply to the actual setpoint implemented in the Surveillance procedures to confirm channel performance. The methodologies used to determine the as-found and the as-left tolerances are specified in the Equipment Control Guidelines.

Changes to Technical Specification Bases Pages
(For information only)

B 3.7 PLANT SYSTEMS

B 3.7.1 Main Steam Safety Valves (MSSVs)

BASES

BACKGROUND	The primary purpose of the MSSVs is to provide overpressure protection for the secondary system. The MSSVs also provide protection against overpressurizing the reactor coolant pressure boundary (RCPB) by providing a heat sink for the removal of energy from the Reactor Coolant System (RCS) if the preferred heat sink, provided by the Condenser and Circulating Water System, is not available. Five MSSVs are located on each main steam header, outside containment, upstream of the main steam isolation valves, as described in the FSAR, Section 10.3.1 (Ref. 1). The MSSVs must have sufficient capacity to limit the secondary system pressure to ≤ 110% of the steam generator design pressure. The MSSV design includes staggered setpoints, according to Table 3.7.1-2 in the accompanying LCO, so that only the needed valves will actuate. Staggered setpoints reduce the potential for valve chattering that is due to steam pressure insufficient to fully open all valves during an overpressure event.
APPLICABLE SAFETY ANALYSES	The design basis for the MSSVs comes from Reference 2 and its purpose is to limit the secondary system pressure to ≤ 110% of design pressure for any anticipated operational occurrence (AOO) or accident considered in the Design Basis Accident (DBA) and transient analysis. The events that challenge the relieving capacity of the MSSVs, and thus RCS pressure, are those characterized as decreased heat removal events, which are presented in the FSAR, Section 15.2 and 15.3 (Ref. 3). Of these, the full power turbine trip without steam dump is the limiting AOO with respect to secondary system pressure. This event also terminates normal feedwater flow to the steam generators. The safety analysis demonstrates that the transient response for turbine trip occurring from full power without a direct reactor trip presents no hazard to the integrity of the RCS or the Main Steam System.

(continued)

BASES

APPLICABLE SAFETY ANALYSES (continued)	One turbine trip analysis is performed assuming primary system pressure control via operation of the pressurizer relief valves and sprays. The analysis demonstrates that the DNB design basis is met. Another analysis is performed assuming no primary system pressure control, but crediting reactor trip on high pressurizer pressure and operation of the pressurizer safety valves. This analysis demonstrates that the maximum RCS pressure does not exceed 110% of the design pressure. All cases analyzed demonstrate that the MSSVs maintain Main Steam System integrity by limiting the maximum steam pressure to less than 110% of the steam generator design pressure. The MSSVs are assumed to have two active and one passive failure modes. The active failure modes are spurious opening, and failure to reclose once opened. The passive failure mode is failure to open upon demand. The MSSVs satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).
LCO	The accident analysis requires that five MSSVs per steam generator be OPERABLE to provide overpressure protection for design basis transients occurring at 102% RTP. The LCO requires that five MSSVs per steam generator be OPERABLE in compliance with Reference 2. The OPERABILITY of the MSSVs is defined as the ability to open upon demand within the setpoint tolerances, to relieve steam generator overpressure, and reseat when pressure has been reduced. The OPERABILITY of the MSSVs is verified by periodic surveillance testing in accordance with the Inservice Testing Program. This LCO provides assurance that the MSSVs will perform their designed safety functions to mitigate the consequences of accidents that could result in a challenge to the RCPB, or Main Steam System integrity.
APPLICABILITY	In MODES 1, 2, and 3, five MSSVs per steam generator are required to be OPERABLE to limit secondary pressure. In MODES 4 and 5, there are no credible transients requiring the MSSVs. The steam generators are not normally used for heat removal in MODES 5 and 6, and thus cannot be overpressurized; there is no requirement for the MSSVs to be OPERABLE in these MODES.

(continued)

BASES (continued)

ACTIONS

The ACTIONS table is modified by a Note indicating that separate Condition entry is allowed for each MSSV.

A.1

With one or more MSSVs inoperable, action must be taken so that the available MSSV relieving capacity meets Reference 2 requirements.

Continued operation with less than all five MSSVs OPERABLE for each steam generator is permissible, if THERMAL POWER is limited to the relief capacity of the remaining MSSVs. This is accomplished by restricting THERMAL POWER and the Power Range Neutron Flux trip setpoint so that the energy transfer to the most limiting steam generator is not greater than the available relief capacity in that steam generator.

The Reactor Trip Setpoint reductions applied in TS Table 3.7.1-1 are derived on the following bases:

One MSSV Inoperable

The limiting FSAR Condition II accident for overpressure concerns is a loss of external load/turbine trip. The event is analyzed with the RETRAN-02 computer program to demonstrate the adequacy of the MSSVs to maintain the main steam system lower than 1210 psia, or 110% of the 1085 psig SG design pressure.

In a PG&E calculation, the transient is reanalyzed to determine the effect of only four MSSVs per SG being available. The analysis assumes a 3% tolerance for all the available MSSVs. The MSSV on each SG with the lowest nominal setpoint was assumed unavailable, and the Unit 2 model is used because of its higher **design RCS average temperature**~~thermal rating~~. The results of the calculation show that the peak pressures in the SGs are lower than 1210 psia, or 110% of the 1085 psig SG design pressure (Ref. 8).

Thus, with one MSSV inoperable per SG, the remaining MSSVs are capable of providing sufficient pressure relief capacity for the plant to operate at 100% RATED THERMAL POWER (RTP). However, the value applied to the high neutron flux trip setpoints must be lowered an additional 6% RTP to account for instrument and channel uncertainties (Ref. 7). This adjustment results in a setpoint of 94% RTP; however, the setpoint will remain at 87% RTP for additional conservatism.

This paragraph applies during Unit 2 Cycle 15 with only MS-2-RV-224 inoperable. For Unit 2 Cycle 15 with only MS-2-RV-224 inoperable, the required high neutron flux trip setpoint is 106% RTP to ensure the remaining MSSVs are capable of providing sufficient pressure relief capacity for plant operation at 100% RTP (Ref. 10). The high neutron flux trip setpoint is calculated using the methodology in WCAP-11082 (Ref. 7). For Unit 2 Cycle 15 additional footnotes provide requirements when the as-found channel setpoint is outside its predefined as-found tolerance, for

reset of the instrument channel setpoint, and for when setpoints more conservative than the Nominal Trip Setpoint are used. The additional footnotes ensure the guidance provided in Regulatory Issue Summary 2006-17 (Ref. 11) are met and that the methodologies used to determine the as-found and the as-left tolerances are specified in a procedure controlled under 10 CFR 50.59.

(continued)

BASES

ACTIONS

A.1 (continued)

More than One MSSV Inoperable

For more than one MSSV on each loop inoperable, the following Westinghouse algorithm contained in NSAL 94-001 (Ref. 4) is used:

$$\text{Hi } \phi = (100/Q)\frac{(w_g h_{fg} N)}{K}$$

where:

Hi ϕ	=	Safety Analysis PR high neutron flux setpoint, percent
Q	=	Nominal NSSS power rating of the plant (including reactor coolant pump heat), MWt
K	=	Conversion factor, 947.82 (Btu/sec)/MWt
w_s	=	Minimum total steam flow rate capability of the operable MSSVs on any one SG at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, in lb/sec. For example, if the maximum number of inoperable MSSVs per SG is three, then w_s should be a summation of the capacity of the operable MSSVs at the highest operable MSSV operating pressure, excluding the three highest capacity MSSVs.
h_{fg}	=	heat of vaporization for steam at the highest MSSV opening pressure including tolerance and accumulation, as appropriate, Btu/lbm
N	=	Number of loops in plant

For the case of two and three inoperable MSSVs per SG, the setpoints derived are 53% and 35% RTP, respectively. However, the values applied to the high neutron flux trip setpoints must be lowered an additional 6% RTP to account for instrument and channel uncertainties (Ref. 7), which results in setpoints of 47% and 29% RTP, respectively (Ref. 9).

When a MSSV(s) is inoperable, the power must be reduced in 4 hours to a value less than or equal to the value specified in table 3.7.1-1, corresponding to the number of OPERABLE MSSVs.

The Power Range Neutron Flux-high trip setpoint must also be reduced in 4 hours, to less than or equal to the value specified in Table 3.7.1-1, corresponding to the number of OPERABLE MSSVs.

(continued)

BASES

ACTIONS

A.1 (continued)

The allowed Completion Time is reasonable base on operating experience to complete the Required Actions in an orderly manner without challenging unit systems.

B.1 and B.2

If THERMAL POWER and Power Range Neutron Flux Trip are not reduced as required by Table 3.7.1-1 within the associated Completion Time, or if one or more steam generators have less than two MSSVs OPERABLE, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 6 hours, and in MODE 4 within 12 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1

This SR verifies the OPERABILITY of the MSSVs by the verification of each MSSV lift setpoint in accordance with the Inservice Testing Program. The ASME Code, Section XI (Ref. 5), requires that safety and relief valve tests be performed in accordance with ASME OM Code Appendix I (Ref. 6). According to Reference 6, the following tests are required:

a. Visual examination;
b. Seat tightness determination;
c. Setpoint pressure determination (lift setting);
d. Compliance with owner's seat tightness criteria; and
e. Verification of the balancing device integrity on balanced valves.

The ASME OM Code requires that all valves be tested every 5 years, and a minimum of 20% of the valves be tested every 24 months. The ASME Code specifies the activities and frequencies necessary to satisfy the requirements. Table 3.7.1-2 allows a ± 3% setpoint (as-found lift point) tolerance on the valves for OPERABILITY (with the exception of the lowest set MSSV setpoint, which is (+3%/-2%); however, the valves are reset to ± 1% during the Surveillance to allow for drift. The lift settings, according to Table 3.7.1-2 in the accompanying LCO, correspond to ambient conditions of the valve at nominal operating temperature and pressure.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.1.1 (continued)

This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. The MSSVs may be either bench tested or tested in situ at hot conditions using an assist device to simulate lift pressure. If the MSSVs are not tested at hot conditions, the lift setting pressure shall be corrected to ambient conditions of the valve at operating temperature and pressure.

REFERENCES

1. FSAR, Section 10.3.1.
2. ASME Boiler and Pressure Vessel Code, Section III, 1968.
3. FSAR, Section 15.2 and 15.3.
4. **Westinghouse Nuclear Safety Advisory Letter NSAL-94-001, "Operation at Reduced Power Levels with Inoperable MSSVs," January 20, 1994 (included in** NRC Information Notice IN-94-60, "Potential Overpressurization of the Main Steam System," August 22, 1994).
5. ASME, Boiler and Pressure Vessel Code, Section XI.
6. ASME Code for Operation and Maintenance of Nuclear Power Plants, 2001 Edition including 2002 and 2003 Addenda.
7. Westinghouse Report WCAP-11082, Revision 6~~5~~, "Westinghouse Setpoint Methodology for Protection Systems Diablo Canyon Units 1 and 2, 24 Month Fuel Cycle Program."
8. PG&E Design Calculation N-114, "Over-Pressure Study for One MSSV Per Loop Unavailable", dated 3/10/94.
9. PG&E Design Calculation N-115, "Reduced Power Levels for A Number of MSSVs Inoperable", dated 3/14/94.
10. **PG&E Design Calculation STA-279, Revision 0, "RETRAN Loss of Load With an Inoperable MSSV".**
11. **NRC Regulatory Issue Summary (RIS) 2006-17, "NRC Staff Position on the Requirements of 10 CFR 50.36, 'Technical Specifications,' Regarding Limiting Safety System Settings During Periodic Testing and Calibration of Instrument Channels," dated August 24, 2006.**

Commitment

Commitment

PG&E will calculate the required as-found and as-left tolerances in accordance with the guidance of RIS 2006-17 prior to the adjustment of the DCPP Unit 2 Maximum Allowable Power Range Neutron Flux High Setpoint from 87 percent to 106 percent during DCPP Unit 2 Cycle 15.