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May 8, 1991

NUCLEAR ENGINEERING &amp; SERVICES DEPARTMENT

Docket Nos. 50-352  
50-353License Nos. NPF-39  
NPF-85

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

SUBJECT: Limerick Generating Station, Units 1 and 2  
Technical Specifications Change Request

Gentlemen:

Philadelphia Electric Company is submitting Technical Specifications Change Request (TSCR) No. 92-01-0, in accordance with 10 CFR 50.90, requesting an amendment to the Technical Specifications (TS) (Appendix A) of Operating License Nos. NPF-39 and NPF-85. Information supporting this Change Request is contained in Attachment 1 to this letter, and the proposed replacement pages are contained in Attachment 2.

This submittal requests changes to TS surveillance intervals to facilitate a change in the Limerick Generating Station (LGS), Units 1 and 2, refueling cycles from 18 months to 24 months. The 24 month refueling cycle will require a change from the current 18 month TS surveillance testing interval (i.e., a maximum of 22.5 months accounting for the allowable grace period) to a 24 month testing interval (i.e., a maximum of 30 months accounting for the allowable grace period). These TS changes were evaluated in accordance with the guidance provided in NRC Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991, and are being proposed accordingly.

As discussed in our letter dated February 11, 1992, this is the first of three Change Requests being submitted to the NRC to support the current change to 24 month refueling cycles at LGS, Units 1 and 2. This Change Request involves a proposed change to the TS surveillance intervals for seismic monitoring instrumentation and the main steam safety/relief valves. These proposed TS changes are the highest priority based on the impact on operations and outage scheduling.

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Therefore, we request that these changes be reviewed and approved by September 1992, and that the approved changes be effective within 30 days after issuance of the Amendments.

If you have any questions regarding this matter please contact us.

Very truly yours,



G. J. Beck, Manager  
Licensing Section

Attachments

cc: T. T. Martin, Administrator, Region I, USNRC  
T. J. Kenny, USNRC Senior Resident Inspector, LGS  
W. P. Dornsife, Director, PA Bureau of Radiological Protection

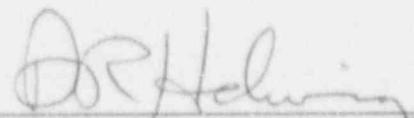
COMMONWEALTH OF PENNSYLVANIA :

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COUNTY OF CHESTER :

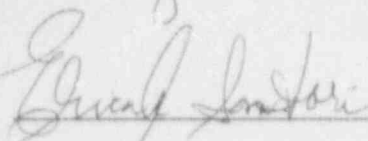
D. R. Helwig, being first duly sworn, deposes and says:

That he is Vice President of Philadelphia Electric Company; the Applicant herein; that he has read the foregoing Application for Amendment of Facility Operating License Nos. NPF-39 and NPF-85 (Technical Specifications Change Request No. 92-01-0) to facilitate a change in the Limerick Generating Station, Units 1 and 2 refueling cycles from 18 months to 24 months, and knows the contents thereof; and that the statements and matters set forth therein are true and correct to the best of his knowledge, information and belief.



Vice President

Subscribed and sworn to  
before me this 8<sup>th</sup> day  
of May 1991.



Notary Public

Notarial Seal  
Erica A. Santon, Notary Public  
Tredyffrin Twp., Chester County  
My Commission Expires July 10, 1995

ATTACHMENT 1

LIMERICK GENERATING STATION  
Units 1 and 2

Docket Nos. 50-352  
50-353

License Nos. NPF-39  
NPF-85

TECHNICAL SPECIFICATIONS CHANGE REQUEST

"Priority 1 Line Item Changes in Support  
of 24 Month Refueling Cycles"

Supporting Information for Changes - 11 pages

Philadelphia Electric Company (PECO), Licensee under Facility Operating Licenses NPF-39 and NPF-85 for Limerick Generating Station (LGS), Units 1 and 2, respectively, requests that the Technical Specifications (TS) contained in Appendix A of the Operating Licenses be amended as proposed herein. The proposed changes are indicated by a vertical bar in the margin of TS pages 3/4 3-72 and 3/4 4-7 for both LGS Unit 1 and Unit 2 TS, and are contained in Attachment 2.

We request that the changes proposed herein be effective within 30 days after issuance of the Amendments.

The proposed TS changes are requested to facilitate the current change in the LGS, Units 1 and 2 refueling cycles from 18 months to 24 months. The 24 month refueling cycle will require a change from the current 18 month TS surveillance testing interval (i.e., a maximum of 22.5 months accounting for the allowable grace period) to a 24 month testing interval (i.e., a maximum of 30 months accounting for the allowable grace period). As discussed in our letter dated February 11, 1992, this is the first of three Change Requests to support 24 month refueling cycles. This change request involves a proposed change to the TS surveillance intervals for seismic monitoring instrumentation and the main steam system safety/relief valves (SRVs). These proposed changes were evaluated in accordance with the guidance provided in NRC Generic Letter (GL) 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24-Month Fuel Cycle," dated April 2, 1991. We have determined that these proposed changes are the highest priority based on the impact on operations and outage scheduling. Therefore, we request that these proposed changes be reviewed and approved by September 30, 1992.

This Change Request provides a discussion and description, a safety assessment, and information supporting a finding of No Significant Hazards Consideration for each proposed TS change, and information supporting an Environmental Assessment.

#### Discussion and Description of the Proposed Changes

##### Change 1 - Seismic Monitoring Instrumentation

Seismic instrument XR-VA-151 is a peak acceleration recorder (i.e., Engdahl Enterprises model PAR400) designed to record the peak accelerations in three orthogonal directions that the instrument's mounting location experiences during a seismic event. This recorder is mounted onto the reactor-vessel-head flange using a steel plate and thermal insulating material; the instrument does not contact the flange. XR-VA-151 is a passive instrument which uses the mechanical energy imparted to it during a seismic event to record the data. The acceleration data is recorded on a replaceable medium within the instrument; the data is not transmitted to any other location. The data is retrieved after the seismic event and is used to verify design analyses in support of justifying plant integrity and operability.

TS surveillance requirement 4.3.7.2.1 requires that the seismic monitoring instruments be demonstrated operable by the performance of

the channel check, channel functional test, and channel calibration operations at the frequencies shown in TS Table 4.3.7.2-1. This TS Table specifies that only a channel calibration is required for seismic instrument XR-VA-151 at a frequency designated by the notation "R." TS Table 1.1 defines the "R" notation as a frequency of at least once per 18 months (i.e., 550 days). Therefore, the proposed TS change would annotate the frequency of channel calibration for seismic instrument XR-VA-151 on TS Table 4.3.7.2-1 to indicate that the calibration frequency for this instrument is once per 24 months.

Proposed changes, with respect to 24 month refueling cycles, to the calibration frequency for the remaining seismic monitoring instrumentation on TS Table 4.3.7.2-1 will be requested in one of the subsequent Change Request submittals identified in our February 11, 1992 letter because they have less impact on operations and the current outage schedule.

#### Change 2 - Main Steam System SRVs

The SRVs are Target Rock Corp. two-stage pilot operated dual function safety/relief valves. In the safety mode, the valve opens solely by mechanical means when pressure at the inlet of the valve reaches the set pressure of the valve. In the depressurization mode, the valve is remotely opened by a solenoid valve manifold/pneumatic operator assembly to provide controlled depressurization of the reactor coolant pressure boundary. There are a total of 14 SRVs that all function in the safety mode and have the capability to operate in the depressurization mode via manual actuation from the Main Control Room. Five (5) of the SRVs are allocated to the automatic depressurization system (ADS) which can automatically operate the valves in the depressurization mode to reduce reactor pressure and thus allow the low pressure Emergency Core Cooling Systems (ECCS) to cool the reactor. This Change Request only pertains to the self-actuating safety mode of the SRVs.

TS surveillance requirement 4.4.2.2 requires that: "At least 1/2 of the safety relief valves shall be removed, set pressure tested and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendations at least once per 18 months, and they shall be rotated so that all 14 safety relief valves are removed, set pressure tested, and reinstalled or replaced with spares that have been previously set pressure tested and stored in accordance with manufacturer's recommendations at least once per 40 months." This Change Request proposes to change the 18 months to 24 months for testing at least half of the SRVs, and change the 40 months (combination of an 18 month cycle and a 22 month cycle) to 54 months (combination of a 24 month cycle and a 30 month cycle) for testing all 14 SRVs.

Proposed changes, with respect to 24 month refueling cycles, to the other applicable surveillance testing intervals for the SRVs will be requested in one of the subsequent Change Request submittals identified in our February 11, 1992 letter because they have less impact on operations and the current outage schedule.



## Safety Assessment

### Change 1

Seismic instrument XR-VA-151 is one component of the plant's seismic instrumentation system that includes peak acceleration recorders, time-history accelerographs, response spectrum analyzer, seismic switch and seismic trigger. The seismic instrumentation mounted on Unit 1 and common structures and components satisfies the seismic instrumentation requirements for both Units 1 and 2. XR-VA-151 is not important to safety in that it is not needed for safe shutdown nor does the instrument interface with or control any structure, system, or component which is important to safety. XR-VA-151 does not control or initiate any protective or mitigating action. XR-VA-151 does not present the plant operators with any on-line information which is used by the operators for the initiation of any protective or mitigating actions.

The surveillance test for XR-VA-151 provides an as-found and as-left calibration record for this seismic instrument. The surveillance test history was reviewed for XR-VA-151 together with the history of corrective maintenance. This review indicates that three separate recorders were used as the instrument XR-VA-151 over the period from 1984 to 1991. The first and second recorders were replaced because of failures of mounting components. These two recorders performed as XR-VA-151 from 1984 to 1985 and from 1985 to 1989, respectively. The surveillance test records for the first two recorders do not provide enough information to evaluate instrument calibration change with time. The instrument mount was subsequently redesigned and the most recent surveillance test results provide evidence that the instrument mounting failures have been successfully resolved. The third recorder has been in service as XR-VA-151 since 1989. There are two surveillance tests for this recorder which span an 18-month service period. There is insufficient calibration history on a single recorder (serving as the XR-VA-151 instrument) to determine instrument drift. However, the most recent surveillance test results indicate that the instrument calibration stayed within acceptable limits over the last 18-month surveillance period.

The manufacturer recommends periodic replacement of some of the components (e.g., gasket, O-rings) of the peak acceleration recorder. This recommended replacement period exceeds 30 months. The peak acceleration recorder contains an indicating desiccant which, according to the manufacturer's recommendation and surveillance test directions, is replaced only when the desiccant indicates that it is moist (i.e., a color change from blue to pink). Since the XR-VA-151 recorder is a sealed device, the probability that the proposed extended surveillance period will fully expend the capacity of the desiccant and result in a failure of the recorder due to corrosion is very low. The manufacturer of XR-VA-151 has found a calibration interval of 30 months to be acceptable.

The proposed change in the surveillance frequency of XR-VA-151 does not introduce any new failure modes to the instrument, and there

is no indication that lengthening the calibration period will significantly increase the probability of occurrence of the existing failure modes of the instrument.

## Change 2

A review of accidents previously evaluated which result in self-actuated operation of the SRVs shows that the proposed change in frequency of the SRV TS surveillance requirement is not related to any of the accident initiators. No other change to the surveillance requirement, or to the design or function of any plant systems or equipment is being proposed.

An evaluation of LGS set pressure surveillance data since initial plant operation, as well as industry data on Target Rock two-stage SRVs (see Tables 1 and 2), does not indicate a trend toward negative drift, i.e., decreasing set pressure. Therefore, the proposed increase in the testing interval duration will not impact the probability of occurrence of an inadvertent SRV opening.

General Electric (GE) proprietary topical report NEDE-30476, "Setpoint Drift Investigation of Target Rock Two-Stage Safety/Relief Valve (Final Report)," as a result of an extensive SRV testing program funded by the Boiling Water Reactor (BWR) Owner's Group, identified that Target Rock two-stage SRVs experience an upward drift (i.e., increase) in set pressure due to corrosion induced bonding of the pilot disc and seat. The bonding process occurs due to a high oxygen environment corroding the Stellite pilot disc and seat surfaces combined with their close contact. The oxides from each surface grow together to form a bond. The force required to break this bond increases the effective initial set pressure since the pilot disc must lift to actuate the main disc. SRV set pressures which have drifted due to pilot disc/seat bonding return to near their nominal set point after the first actuation. Another cause of upward set pressure drift identified in NEDE-30476 is labyrinth seal induced friction due to insufficient clearances between the pilot rod and the pilot guide.

As discussed in Section 3.9.3.4 of Supplement 3 to NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," dated October 1984, the NRC recognized the generic upward set pressure drift problem exhibited by Target Rock two-stage SRVs as applicable to LGS, Units 1 and 2, but concluded that LGS can be operated with no adverse effect on the health and safety of the public until the NRC reaches a final generic solution for setpoint drift based on the reasons described below.

- 1) LGS has implemented the recommendations of all applicable supplements to GE Service Information Letter (SIL) No. 196, including Supplement 14, "Target Rock 2-Stage SRV Setpoint Drift." GE incorporated the NEDE-30476 report recommendations for improved SRV maintenance and refurbishment into Supplement 14 of GE SIL No. 196. The NRC concluded that implementation of these recommendations adequately address setpoint drift due to labyrinth seal



induced friction. Additionally, the NRC concluded, based on available two-stage SRV data, that setpoint drift resulting from pilot disc/seat bonding occurs less frequently than that caused by labyrinth seal induced friction. The proposed change in the frequency of SRV testing will not impact the implementation of these recommendations.

- 2) The 14 SRVs installed at LGS provide considerably more relieving capacity than is required by the applicable edition of the American Society of Mechanical Engineers (ASME) Code. Only 11 of the 14 SRVs are required to be operable in accordance with TS Section 3.4.2. The proposed change in the frequency of SRV testing will not impact the design of the SRVs.
- 3) The TS SRV set pressure testing at LGS exceeds the current ASME Code Section XI requirements, i.e., at least 50% of the SRVs are tested each refueling outage in accordance with TS versus 20% in accordance with ASME Code Section XI. ANSI/ASME OM-1-1981, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices," as invoked by ASME Code Section XI, requires all SRVs to be tested within a 60 month period with a minimum of 20% tested within any 24 months. The proposed change to TS Section 4.4.2.2 would require 50% of the SRVs to be tested in 24 months, and all SRVs to be tested within a maximum period of 54 months (i.e., 48 months with a six month grace period).

An historical search of LGS set pressure surveillance data since initial plant operation, as well as industry data on the Target Rock two-stage SRVs (see Tables 1 and 2), demonstrates that significant drift can occur within a month of service after refurbishment and can lead to the conclusion that setpoint drift magnitude approaches a plateau early in the operating cycle. The pilot disc/seat bonding mechanism described earlier also supports the plateau concept. As the oxide grows and covers the surfaces in contact, further oxidation would be impeded. Therefore, the bond strength, and consequently the set pressure drift magnitude, should approach a plateau. Based on the conclusion that a drift plateau is approached early in the operating cycle, the proposed extension of the surveillance interval to 24 months plus six months grace will not have a significant effect on an SRV's ability to perform its self-actuated safety function.

Certain High Pressure Coolant Injection (HPCI) system and Reactor Core Isolation Cooling (RCIC) system Motor Operated Valves (MOVs) must operate against a differential pressure that is determined based on the lowest SRV set pressure. The ability of these MOVs to perform their safety function will not be adversely affected as a result of any SRV upward set pressure drift effects associated with a 24 month refueling cycle. These MOVs are currently set to operate against a design differential pressure which is greater than the lowest SRV set pressure. This margin envelopes any expected SRV drift effects due to the proposed extended surveillance interval.

## Information Supporting a Finding of No Significant Hazards Consideration

We have concluded that the proposed changes to the LGS TS, to facilitate a change from 18 months to 24 month refueling cycles, do not constitute a Significant Hazards Consideration. In support of this determination, an evaluation of each of the three standards set forth in 10CFR50.92 is provided below.

1. The proposed TS changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

### Change 1

This proposed change involves a change in the channel calibration frequency for seismic instrument XR-VA-151 from 18 months to 24 months (i.e., a maximum of 30 months accounting for the allowable grace period). Seismic instrument XR-VA-151 is a passive device. This instrument does not interface with any other plant system or equipment, nor does this instrument provide on-line operational information to the plant operators. There is no accident previously evaluated which has as its initiator anything that is related to instrument XR-VA-151, its accuracy, or to the frequency of this instrument's surveillance testing. The proposed TS change to the surveillance testing interval for XR-VA-151 will not affect the ability of plant equipment important to safety to bring the plant to a safe shutdown condition, maintain the plant in a safe shutdown condition, or mitigate the consequences of any accident. As a result, the proposed change will not impact on-site or off-site doses resulting from accident-related radiological releases. Therefore, the proposed change in the surveillance frequency of XR-VA-151 will not increase the probability or consequences of an accident.

### Change 2

This proposed TS change involves a change in the frequency of surveillance testing of the main steam system SRVs from 18 months to 24 months (i.e., a maximum of 30 months accounting for the allowable grace period) for "50%" of the total of 14 SRVs, and from 40 months (i.e., accounting for two 18 month refueling cycles with one four month grace period) to 54 months (i.e., accounting for two 24 month refueling cycles with one six month grace period) for all 14 SRVs. There are no accidents that have as their initiators anything which would be related to the proposed change in frequency of the SRV surveillance testing. The proposed change will not change the design or function of any plant systems or equipment. An evaluation of LGS SRV set pressure surveillance data since initial plant operation, as well as industry data on Target Rock two-stage SRVs (see Tables 1 and

2), does not indicate a trend toward negative drift (i.e., decreasing set pressure). Therefore, the proposed change in frequency of surveillance testing of the SRVs will not impact the possibility of inadvertent opening of the SRVs.

As identified in GE report NEDE-30476, Target Rock two-stage SRVs experience an upward drift in set pressure due to corrosion induced bonding of the pilot disc and seat, and labyrinth seal induced friction due to insufficient clearances between the pilot rod and the pilot guide. An historical search of set pressure surveillance data (see Tables 1 and 2) can lead to the conclusion that set pressure drift magnitude approaches a plateau (i.e., a constant value) early in the operating cycle, and therefore, the proposed extension in the surveillance testing interval will not have a significant effect on an SRV's ability to perform its self-actuated safety function.

Additionally, as documented in Section 3.9.3.4 of Supplement 3 to NUREG-0991, "Safety Evaluation Report Related to the Operation of Limerick Generating Station, Units 1 and 2," dated October 1984, the NRC concluded that LGS can be operated with no adverse effect on the health and safety of the public given the upward set pressure drift of the SRVs based on the following three items: 1) LGS has implemented all applicable supplements of General Electric Service Information Letter (SIL) No. 196 which incorporates the improved SRV maintenance and refurbishment recommendations specified in GE report NEDE-30476; 2) as stated in section 5.2 of the Final Safety Analysis Report (FSAR), LGS has installed considerably more SRV relieving capacity than required by the applicable edition of the ASME Code; and 3) the TS required SRV set pressure testing frequency exceeds the current ASME Code Section XI requirements, i.e., at least 50% of the total of 14 SRVs are tested each refueling outage in accordance with TS versus 20% in accordance with ASME Code Section XI. None of these three bases will be affected by the proposed TS change. Therefore, there is no overall impact on the probability or the consequences of an accident previously evaluated.

2. The proposed TS changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

#### Change 1

The proposed change involves a change in the frequency of surveillance testing of XR-VA-151. This instrument does not interface with any equipment which is important to safety. The proposed TS change will not alter the design or function of this instrument, or any other plant equipment, nor will the proposed change introduce any new operating configurations or failure modes. The data recorded by this

instrument are not available to the plant operators during plant operation (i.e., during either normal or abnormal operation). Therefore, the proposed change will not create the possibility of an accident of a new or different type from any accident previously evaluated.

#### Change 2

The proposed change involves a change in the frequency of SRV testing. The proposed change will not alter the design or function of any plant systems or equipment. The proposed change will not introduce any new operating configurations, or any failure mechanism of a different type than already evaluated. Therefore, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. The proposed TS changes do not involve a significant reduction in a margin of safety.

#### Change 1

The proposed change involves a change in the frequency of surveillance testing of XR-VA-151. Since this instrument does not interface with any other plant system or equipment, the proposed change in the surveillance frequency of XR-CA-151 will not impact the safety margin of any system, structure, or component in the plant. Therefore, this proposed change will not reduce a margin of safety.

#### Change 2

The proposed change involves a change in the frequency of SRV testing. The NRC's original basis for acceptable operation of the plant with SRV set pressure drift as documented in Section 3.9.3.4 of Supplement 3 to NUREG-0991 is not altered by the proposed change to the TS surveillance frequency requirement for the SRVs. All applicable supplements to GE SIL No. 196 will continue to be implemented. The total SRV relieving capacity will not change. The TS required SRV set pressure testing frequency will continue to exceed the ASME Code Section XI/OM-1-1981 requirements, i.e., at least 50% of the total of 14 SRVs will be tested each refueling outage versus at least 20%. Therefore, the proposed change will not reduce a margin of safety.

#### Information Supporting an Environmental Assessment

An environmental assessment is not required for the changes proposed by this Change Request because the requested changes conform to the criteria for "actions eligible for categorical exclusion," as specified in 10CFR51.22(c)(9). The requested changes will have no impact on the environment. The requested changes do not involve a

significant hazards consideration as discussed in the preceding section. The requested changes do not involve a significant change in the types or significant increase in the amounts of any effluents that may be released offsite. In addition, the proposed changes do not involve a significant increase in individual or cumulative occupational radiation exposure.

#### Conclusion

The Plant Operations Review Committee and the Nuclear Review Board have reviewed these proposed changes to the TS and have concluded that they do not involve an unreviewed safety question, or a significant hazards consideration, and will not endanger the health and safety of the public.

TABLE 1

LGS TARGET ROCK TWO-STAGE SRV SET PRESSURE SURVEILLANCE DATAUnit 1 5/86 S/C Outage - 4 months of operation

average drift = 2.66%

high = 4.40%

low = 0.00%

10 of 14 >  $\pm 1\%$ 

5 of 14 &gt; 3%

0 of 14 &gt; 10%

1RO1 - 12 months of operation

average drift = 3.14% \*

high = &gt; 11% \*

low = -1.23%

10 of 14 >  $\pm 1\%$ 

6 of 14 &gt; 3%

2 of 14 &gt; 10%

\* Two valves failed to lift at approx. 1265 psig. Actual drift unknown.

1RO2 - 18 months of operation

average drift = 3.81%

high = 14.0%

low = -1.82%

13 of 14 >  $\pm 1\%$ 

7 of 14 &gt; 3%

1 of 14 &gt; 10%

1RO3 - 18 months of operation

average drift = 1.73%

high = 4.07%

low = -1.32%

11 of 14 >  $\pm 1\%$ 

2 of 14 &gt; 3%

0 of 14 &gt; 10%

2RO1 - 18 months of operation

average drift = 2.00%

high = 11.59%

low = -0.40%

9 of 14 >  $\pm 1\%$ 

3 of 14 &gt; 3%

1 of 14 &gt; 10%

ALL LGS DATA

average drift = 2.67%

high = 14.0%

low = -1.82%

drift >  $\pm 1\%$  = 76%

drift &gt; 3% = 33%

drift &gt; 10% = 6%



TABLE 2

INDUSTRY TARGET ROCK TWO-STAGE SRV SET PRESSURE SURVEILLANCE DATA

INDUSTRY (629 DATA POINTS)

average drift = 2.89%  
drift > 3% = 32%  
drift > 10% = 7%

HATCH UNIT 2 1991 DATA - 1 month of operation (11 valves total)

3 valves with drift from 5% to 7%  
9 valves with drift > 3%

MILLSTONE 1991 DATA - 22 months of operation (6 valves total)

1 valve with drift > 10%  
1 valve with -1.5% drift  
1 valve with 3.5% drift  
3 valves with severely steam cut pilot discs (drift data not meaningful)