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APR 0 2 2001

U.S. Nuclear Regulatory Commission
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Washington, DC 20555

SUSQUEHANNA STEAM ELECTRIC STATION
SUPPLEMENTAL INFORMATION APPLICABLE TO PROPOSED AMENDMENT NO. 233 TO LICENSE NPF-14 AND PROPOSED AMENDMENT NO. 198 TO LICENSE NPF-22: RELAXATION OF EXCESS FLOW CHECK VALVE SURVEILLANCE TESTING REQUIREMENT
PLA-5295

Docket No. 50-387
and 50-388

Reference: 1) *PLA-5227, R.G. Byram to USNRC, Proposed Amendment No. 233 to License NPF-14: and Proposed Amendment No. 198 to License NPF-22: Relaxation of Surveillance Testing Requirements for Excess Flow Check Valves and Submittal of Pertinent IST Program Relief Requests dated 10/4/2000*

2) *PLA-5280, R. G. Byram to USNRC, Supplemental Information Applicable to Proposed Amendment No. 233 to License NPF-14 and Proposed Amendment No. 198 to License NPF-22: Relaxation of Excess Flow Check Valve Surveillance Testing Requirement dated 3/12/2001*

The purpose of this letter is to provide supplemental information regarding our proposed amendment request made in Reference (1) as supplemented by Reference (2). The need for this supplemental information was developed during a teleconference held with the NRC staff on March 28, 2001.

The supplemental information is provided in Attachment 1.

PPL Susquehanna, LLC requests approval of the proposed Amendment prior to April 9, 2001.

If you have any questions, please contact Mr. M. H. Crowthers at (610) 774-7766.

Sincerely,

R. G. Byram

Attachment

copy: NRC Region I
Mr. S. Hansell, NRC Sr. Resident Inspector
Mr. R. G. Schaaf, NRC Project Manager
Mr. D. J. Allard, PA DEP

A001

BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

PPL Susquehanna, LLC: Docket No. 50-387

SUPPLEMENTAL INFORMATION APPLICABLE TO PROPOSED AMENDMENT NO. 233 TO LICENSE NPF-14: RELAXATION OF EXCESS FLOW CHECK VALVE SURVEILLANCE TESTING REQUIREMENT SUSQUEHANNA STEAM ELECTRIC STATION UNIT NO. 1

Licensee, PPL Susquehanna, LLC, hereby files supplemental information in support of a revision to its Facility Operating License No. NPF-14 dated July 17, 1982.

This amendment involves a revision to the Susquehanna SES Unit 1 Technical Specifications.

PPL Susquehanna, LLC
By:

R. G. Byram
Sr. Vice President and Chief Nuclear Officer

Sworn to and subscribed before me
this 2nd day of April , 2001.

Notarial Seal
Nancy J. Lannen, Notary Public
Allentown, Lehigh County
My Commission Expires June 14, 2004

Notary Public

BEFORE THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

In the Matter of :

PPL Susquehanna, LLC : Docket No. 50-388

SUPPLEMENTAL INFORMATION APPLICABLE TO PROPOSED AMENDMENT NO. 198 TO LICENSE NPF-22: RELAXATION OF EXCESS FLOW CHECK VALVE SURVEILLANCE TESTING REQUIREMENT SUSQUEHANNA STEAM ELECTRIC STATION UNIT NO. 2

Licensee, PPL Susquehanna, LLC, hereby files supplemental information in support of a revision to its Facility Operating License No. NPF-22 dated March 23, 1984.

This amendment involves a revision to the Susquehanna SES Unit 2 Technical Specifications.

PPL Susquehanna, LLC
By:

R. G. Byram
Sr. Vice-President and Chief Nuclear Officer

Sworn to and subscribed before me
this 2nd day of April, 2001.

Notary Public

Notarial Seal
Nancy J. Lannen, Notary Public
Allentown, Lehigh County
My Commission Expires June 14, 2004

Attachment 1 to PLA-5295
Supplemental Information

Supplemental Information

Test Data

PPL provided Excess Flow Check Valve (EFCV) test data from the SSES Unit 2 4th Refueling Outage (Spring 1991) to the Unit 1 11th Refueling Outage (Spring 2000) in reference (2).

During the 1997-1998 time frame, PPL realized that the test failures that have occurred were likely due to an inability to establish adequate test conditions. Once realized, PPL adjusted test processes as necessary to achieve proper test conditions.

Since the 1997 Unit 2 outage when PPL recognized the test condition issue, only 1 test failure has occurred. The recent test history is as follows:

Fall	1996	Unit 1	RFO	Baseline
Spring	1997	Unit 2	RFO	Baseline
Spring	1998	Unit 1	RFO	0 Test Failures
Spring	1999	Unit 2	RFO	0 Test Failures
Spring	2000	Unit 1	RFO	1 Test Failure

This most recent performance encompasses:

Unit 1 3.5 years (100 valves) = 350 valve years
Unit 2 2 years (100 valves) = 200 valve years

Total = 550 valve years
= 4.8 E6 valve hours

Thus based on this test performance, it is concluded that the SSES failure rate data is deemed to demonstrate reliable EFCV performance. The performance history demonstrates that the risk of an EFCV failure to close is low. The most recent data (1996 going forward) reflects improved test performance accountable to the realization that past reported failures may not be valve related but test method related. Adjustment of test methods as deemed warranted to ensure adequate test pressures have resulted in the improved test results.

Corrective Actions

In reference (2), PPL detailed that in order to ensure that EFCV performance is adequately monitored and issues properly resolved, PPL is taking numerous actions. One of the key actions read as follows:

"Samples sizes are expanded if generic problems are identified in the cause determination."

To clarify how PPL will determine the need for expansion of sample sizes should a failure occur, PPL will test an additional 10% of the representative valves should a test failure occur contingent upon the following:

- Testing an additional 10 % sample based on a test failure will be accomplished if it can be determined that the test failure was a valve failure prior to refueling outage breaker closure.
- Testing of an additional 10% sample based on a test failure will be accomplished if the cause of the test failure is not determined prior to refueling outage breaker closure.

Testing of an additional 10% based on a test failure will not be accomplished if it can be determined prior to refueling outage breaker closure that the test failure was a test method problem and not a valve failure.

Test Pressure

PPL has established, in some procedures, a minimum test pressure. PPL performs some EFCV testing during the vessel hydrostatic test. The RPV hydrostatic pressure test (nominal 1035 psig) is done at normal operating pressure (TS 3.4.11 requires Rx Steam dome pressure be maintained less than or equal to 1050 psig). Thus when EFCV tests are performed during the RPV hydrostatic tests, the EFCV testing is performed when the RPV pressure is no greater than normal operating pressure.

Relief Requests:

The Reference (1) submittal contained two revised Refueling Outage Test Justifications (one each for Unit 1 and Unit 2).

These Refueling Outage Test Justifications will be deleted and the valves addressed therein have been included in revised Unit 1 and Unit 2 Relief Requests Number 23. These revised Relief Requests are included herein.

These revised relief requests incorporate the following changes:

- address the EFCVs previously listed in Refueling Test Justification Number 20
- address that some EFCVs can be tested during an outage (as had been addressed in the Refueling Test Justification)
- address the test frequency change to be consistent with the associated TS change and to provide a description of the SR 3.6.1.3.9 testing
- to clarify how PPL verifies the EFCV open position which is done at a greater than 2 year frequency

Test Method:

Reference (2) states that "Since 1997, 2 valve failures have been reported. One of these valves was replaced. No cause determination was performed. The other valve was retested after the tubing downstream of the valve was shortened to lower the flow resistance. As a result, alternate test methods were incorporated into procedures to help assure values of differential pressure were sufficient and achieved during the test. Typically, this involved reducing the length of tubing downstream of the valve to increase flow and differential pressure."

The alternate test method involving reducing the length of tubing downstream of the valve to increase flow and differential pressure was implemented in a specific procedure in which it was implemented and can be incorporated in others as appropriate.

RELIEF REQUEST NUMBER 23

System	P&ID	Valve	System	P&ID	Valve
RPV	M-141	XV-141F009	RPV (cont'd)	M-142	XV-142F051B
Main Steam	M-141	XV-141F070A			XV-142F051C
		XV-141F070B			XV-142F051D
		XV-141F070C			XV-142F053A
		XV-141F070D			XV-142F053B
		XV-141F071A			XV-142F053C
		XV-141F071B			XV-142F053D
		XV-141F071C			XV-142F055
		XV-141F071D			XV-142F057
		XV-141F072A			XV-142F059A
		XV-141F072B			XV-142F059B
		XV-141F072C			XV-142F059C
		XV-141F072D			XV-142F059D
		XV-141F073A			XV-142F059E
		XV-141F073B			XV-142F059F
		XV-141F073C			XV-142F059G
		XV-141F073D			XV-142F059H
RPV	M-142	XV-14201			XV-142F059L
		XV-14202			XV-142F059M
		XV-142F041			XV-142F059N
		XV-142F043A			XV-142F059P
		XV-142F043B			XV-142F059R
		XV-142F045A			XV-142F059S
		XV-142F045B			XV-142F059T
		XV-142F047A			XV-142F059U
		XV-142F047B			XV-142F061
		XV-142F051A			

RELIEF REQUEST NUMBER 23 (Cont'd)

System	P&ID	Valve	System	P&ID	Valve
RXR	M-143	XV-143F003A	RWCU	M-144	XV-14411A
		XV-143F003B			XV-14411B
		XV-143F004A			XV-14411C
		XV-143F004B			XV-14411D
		XV-143F009A			XV-144F046
		XV-143F009B	RCIC	M-149	XV-149F044A
		XV-143F009C			XV-149F044B
		XV-143F009D			XV-149F044C
		XV-143F010A			XV-149F044D
		XV-143F010B	HPCI	M-155	XV-155F024A
		XV-143F010C			XV-155F024B
		XV-143F010D			XV-155F024C
		XV-143F011A			XV-155F024D
		XV-143F011B	RHR	M-151	XV-15109A
		XV-143F011C			XV-15109B
		XV-143F011D			XV-15109C
		XV-143F012A			XV-15109D
		XV-143F012B	CORE SPRAY	M-152	XV-152F018A
		XV-143F012C			XV-152F018B
		XV-143F012D			
		XV-143F040A			
		XV-143F040B			
		XV-143F040C			
		XV-143F040D			
		XV-143F057A			
		XV-143F057B			

RELIEF REQUEST NUMBER 23 (Cont'd)

Category:	C
Class:	1
Function:	Containment Isolation
Impractical Test Requirement:	1. Exercise test valve one per 92 days. (OMa – 1988 Part 10 paragraph 4.3.2) 2. Valve Position Verification once every 2 years (OMa - 1988 Part 10 Paragraph 4.1)
Basis for Deferment:	Excess flow check valves are installed on instrument lines penetrating containment in accordance with Regulatory Guide 1.11. The lines are sized and/or orificed such that off-site doses will be substantially below 10CFR100 limits in the event of a rupture. Therefore, individual leak rate testing of these valves is not required for conformance with 10CFR50, Appendix J requirements. The excess flow check valve is a simple device; the major components are a poppet and spring. The spring holds the poppet open under static conditions. The valve will close upon sufficient differential pressure across the poppet. Functional testing of the valve is accomplished by venting the instrument side of the tube. The resultant increase in flow imposes a differential pressure across the poppet, which compresses the spring and decreases flow through the valve. Functional testing is required by Technical Specification SR 3.6.1.3.9. Systems design does not include test taps upstream of the Excess Flow Check Valves. For this reason, the EFCV's cannot be isolated and tested using a pressure source other than reactor pressure.

The testing described above requires the removal of the associated instrument or instruments from service. Since these instruments are in use during plant operation, removal of any of these instruments from service may cause a spurious signal which could result in a plant trip or an unnecessary challenge to safety systems. Additionally, process liquid will be contaminated to some degree, requiring special measures to collect flow from the vented instrument side and also will contribute to an increase in personnel radiation exposure.

Industry experience as documented in NEDO-32977-A indicates that EFCVs have a very low failure rate. At Susquehanna the SR failure rate has been approximately 1%. Only half of these SR failures have resulted in replacement of the EFCV. The Susquehanna test history shows no evidence of common mode failure. This Susquehanna test experience is consistent with the findings of the NEDO. The NEDO indicates similarly that many reported test failures at other plants were related to test methodologies and not actual EFCV failures. Thus, the EFCVs at Susquehanna, consistent with the industry, have exhibited a high degree of reliability, availability, and provide an acceptable level of quality and safety.

Therefore, PPL Susquehanna LLC requests relief pursuant to 10CFR50.55a(a)(3)(i) to test excess flow check valves at the frequency specified in the Susquehanna Technical Specifications Surveillance Requirements (SR) 3.6.1.3.9. As discussed in the Technical Specification Bases for this SR, this test provides assurance that each valve actuates to check flow on a simulated instrument line break.

Testing on a Cold Shutdown frequency is impractical considering the large number of valves to be tested and the condition that reactor pressure >500 psig is needed for testing. NUREG-1482 allows test deferrals to refueling outages if it is impractical to test quarterly or during cold shutdowns. In this instance, considering the large number of valves to be tested and the conditions required for testing (Reactor pressure), it is also a hardship to test all these valves during refueling outages. Recent improvements in Refueling Outage schedules (i.e. shorter outages) minimized the time that is planned for Refueling and testing activities during the outages. The appropriate time for performing these excess flow check valves tests during refueling outages is in conjunction with vessel hydrostatic testing. As a result of shorter outages, decay heat levels during hydrostatic tests are higher than in the past. If the hydrostatic test was extended to test all EFCV's, the vessel could require depressurization several times to avoid exceeding the maximum bulk coolant temperature limit. This is an evolution which challenges the reactor operators and thermally cycles the reactor vessel and should be avoided if possible. Also, based on past experience, excess flow check valve testing during hydrostatic testing becomes the outage critical path and could possibly extend the outage by 2 days if all EFCV's were to be tested during this time frame.

A proposed alternative to testing all EFCVs during the refueling outage would be to test certain excess flow check valves immediately preceding the refueling outage while the reactor is at power, while also instituting the appropriate administrative and scheduling controls. This provides the appropriate conditions for testing (Reactor pressure >500 psig), while also providing an acceptable level of quality and safety. Performance of the excess flow check valve testing prior to the outage will be scheduled such that, in the event of a failure, the resulting action statement and limiting condition of operation will encompass the planned shutdown for the refueling outage. Using this strategy, unplanned, unnecessary plant shutdowns as a result of excess flow check valve testing will be avoided.

In summary, considering the extremely low failure rate, personnel and plant safety concerns, the hardship of testing during refueling outages, EFCV testing during refueling outages for all EFCVs is impractical and results in a hardship without a compensating increase in the level of safety.

Alternate Testing:

Functional testing with verification that flow is checked will be performed per TS 3.6.1.3.9, either immediately preceding a planned Refueling Outage or during the Refueling Outage. For those valves tested prior to the Refueling Outage appropriate administrative and scheduling controls will be established.

SR 3.6.1.3.9 allows a "representative sample" of EFCVs to be tested every 24 months, such that each EFCV will be tested at least once every 10 years (nominal).

The EFCVs have position indication in the control room. Check valve remote position indication is excluded from Regulatory Guide 1.97 as a required parameter for evaluating containment isolation. The remote position indication will be verified in the closed direction at the same frequency as the exercise test, which will be performed at the frequency prescribed in Technical Specification Surveillance Requirement 3.6.1.3.9. After the close position test, the valves will be reset, and the remote open position indication will be verified. Although inadvertent actuation of an EFCV during operation is highly unlikely due to the spring-poppet design, Susquehanna verifies by surveillance procedure that the EFCVs indicate open in the control room at a frequency greater than once every 2 years.

RELIEF REQUEST NUMBER 23

System	P&ID	Valve	System	P&ID	Valve
RPV	M-2141	XV-241F009	RPV (continued)		XV-242F051B
Main Steam	M-2141	XV-241F070A			XV-242F051C
		XV-241F070B			XV-242F051D
		XV-241F070C			XV-242F053A
		XV-241F070D			XV-242F053B
		XV-241F071A			XV-242F053C
		XV-241F071B			XV-242F053D
		XV-241F071C			XV-242F055
		XV-241F071D			XV-242F057
		XV-241F072A			XV-242F059A
		XV-241F072B			XV-242F059B
		XV-241F072C			XV-242F059C
		XV-241F072D			XV-242F059D
		XV-241F073A			XV-242F059E
		XV-241F073B			XV-242F059F
		XV-241F073C			XV-242F059G
		XV-241F073D			XV-242F059H
RPV	M-2142	XV-24201			XV-242F059L
		XV-24202			XV-242F059M
		XV-242F041			XV-242F059N
		XV-242F043A			XV-242F059P
		XV-242F043B			XV-242F059R
		XV-242F045A			XV-242F059S
		XV-242F045B			XV-242F059T
		XV-242F047A			XV-242F059U
		XV-242F047B			XV-242F061
		XV-242F051A			

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RXR	M-2143	XV-243F003A	RWCU	M-2144	XV-24411A
		XV-243F003B			XV-24411B
		XV-243F004A			XV-24411C
		XV-243F004B			XV-24411D
		XV-243F009A			XV-244F046
		XV-243F009B	RCIC	M-2149	XV-249F044A
		XV-243F009C			XV-249F044B
		XV-243F009D			XV-249F044C
		XV-243F010A			XV-249F044D
		XV-243F010B	HPCI	M-2155	XV-255F024A
		XV-243F010C			XV-255F024B
		XV-243F010D			XV-255F024C
		XV-243F011A			XV-255F024D
		XV-243F011B	RHR	M-2151	XV-25109A
		XV-243F011C			XV-25109B
		XV-243F011D			XV-25109C
		XV-243F012A			XV-25109D
		XV-243F012B	CORE SPRAY	M-2152	XV-252F018A
		XV-243F012C			XV-252F018B
		XV-243F012D			
		XV-243F040A			
		XV-243F040B			
		XV-243F040C			
		XV-243F040D			
		XV-243F057A			
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The testing described above requires the removal of the associated instrument or instruments from service. Since these instruments are in use during plant operation, removal of any of these instruments from service may cause a spurious signal which could result in a plant trip or an unnecessary challenge to safety systems. Additionally, process liquid will be contaminated to some degree, requiring special measures to collect flow from the vented instrument side and also will contribute to an increase in personnel radiation exposure.

Industry experience as documented in NEDO032977-A indicates that EFCVs have a very low failure rate. At Susquehanna the SR failure rate has been approximately 1%. Only half of these SR failures have resulted in replacement of the EFCV. The Susquehanna test history shows no evidence of common mode failure. This Susquehanna test experience is consistent with the findings of the NEDO. The NEDO indicates similarly that many reported test failures at other plants were related to test methodologies and not actual EFCV failures. Thus, the EFCVs at Susquehanna, consistent with the industry, have exhibited a high degree of reliability, availability, and provide an acceptable level of quality and safety.

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RELIEF REQUEST NUMBER 23 (Cont'd.)

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A proposed alternative to testing all EFCVs during the refueling outage would be to test certain excess flow check valves immediately preceding the refueling outage while the reactor is at power, while also instituting the appropriate administrative and scheduling controls. This provides the appropriate conditions for testing (Reactor pressure >500 psig), while also providing an acceptable level of quality and safety. Performance of the excess flow check valve testing prior to the outage will be scheduled such that, in the event of a failure, the resulting action statement and limiting condition of operation will encompass the planned shutdown for the refueling outage. Using this strategy, unplanned, unnecessary plant shutdowns as a result of excess flow check valve testing will be avoided.

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Alternative Testing:

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