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SUSQUEHANNA STEAM ELECTRIC STATION
AMENDMENT REQUEST NO. 305 TO UNIT 1 LICENSE NPF-14
AND AMENDMENT REQUEST NO. 276 TO UNIT 2 LICENSE
NPF-22: ONE-TIME EXTENSION OF TECHNICAL SPECIFICATION 3.8.1
RESPONSE TO TECHNICAL SPECIFICATION BRANCH
REQUEST FOR ADDITIONAL INFORMATION (RAI) **Docket Nos. 50-387**
PLA-6530 **and 50-388**

Reference: 1) PLA-6480, Mr. W. H. Spence (PPL) to Document Control Desk (USNRC), "Susquehanna Steam Electric Station Amendment Request No. 305 to Unit 1 License NPF-14 and Amendment Request No. 276 to Unit 2 License NPF-22: One Time Extension of Technical Specification 3.8.1 Allowable Completion Time for Offsite AC Circuits," dated March 24, 2009.

2) PLA-6509, Mr. W. H. Spence (PPL) to Document Control Desk (USNRC), "Susquehanna Steam Electric Station Amendment Request Amendment Request No. 305 to Unit 1 License NPF-14 and Amendment Request No. 276 to Unit 2 License NPF-22: One-Time Extension of Technical Specification 3.8.1 Supplemental Electrical Information," dated May 12, 2009.

3) Emails from Mr. B. Vaidya (USNRC) to D. L. Filchner, et al. (PPL), "Susquehanna Units 1 and 2, ME0969 & ME0970, ITSB RAIs-Amd for T-20 Replacement, One-time Ext of AOT in Ts 3.8.1," dated June 2, 2009 and June 17, 2009.

In accordance with the provisions of 10 CFR 50.90, PPL Susquehanna, LLC (PPL) submitted a request for amendment to the Technical Specifications (TS) for Susquehanna Units 1 and 2 (SSES) in Reference 1.

On June 2, 2009 and June 17, 2009, the emails in Reference 3 contained requests from the NRC Technical Specification Branch (TSB) for additional information to be provided to complete the review of Reference 1. A teleconference between PPL and NRC staff on June 17 provided additional clarification to each of the RAI questions documented in the emails.

The attachment provides PPL's response to each of the RAI questions discussed during the teleconference.

A001
NRR

These supplemental responses do not revise any existing regulatory commitments or change the no significant hazards consideration included in Reference 1.

Any questions regarding the basis or discussion associated with this response should be directed to Mr. D. L. Filchner - Nuclear Regulatory Affairs, at (610) 774-7819.

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

Executed on: 6-29-09

Richard D Fangdin for W. H. Spence

W. H. Spence

Attachment: Responses to Technical Specification Branch RAIs

Copy: NRC Region I
Mr. R. Janati, DEP/BRP
Mr. F. W. Jaxheimer, NRC Sr. Resident Inspector
Mr. B. K. Vaidya, NRC Project Manager

Attachment to PLA-6530

Responses to Technical Specification Branch RAIs

NRC TSB QUESTION 1:

Justify that the third request to extend TS 3.8.1 Required Action A.3, for ST replacement at power since 2002, represents a plant corrective maintenance practice that is done in a manner that does not compromise safety.

PPL RESPONSE:

The ST No. 20 startup transformer replacement is being undertaken to assure that the offsite electric power system remains capable of providing a reliable electric power to the connected safety-related equipment. This transformer replacement is a maintenance activity, consistent with the Regulatory Guide 1.160 broad definition of maintenance, which corrects a degraded condition currently existing on the ST No. 20 startup transformer. By replacing the transformer, the probability of losing power from the connected offsite circuit due to a ST No. 20 failure is reduced, thereby improving the reliability of the electric power supply to the connected safety-related equipment.

The unavailability of one startup transformer is already considered in the plant design and is allowed by the current Technical Specifications. The increased outage time for a startup transformer has no effect on the capability of the other startup transformer to supply the required safety-related loads of both units if it becomes necessary to safely shut down both units simultaneously. The Susquehanna Steam Electric Station (SSES) design basis is the ability to mitigate a LOCA in one unit, while safely shutting down the other unit.

SSES is designed and operated consistent with the defense-in-depth philosophy. The units have diverse power sources available (e.g., Emergency Diesel Generators to cope with a loss of the preferred AC source – which is offsite power supplied through the startup transformers). During the ST No. 20 replacement, AC power will be supplied to the Engineered Safety Features (ESF) buses on both SSES Units 1 and 2 from ST No. 10. The ST No. 20 replacement will have no effect on ST No. 10 operation. The replacement of ST No. 20 will further ensure continued long-term reliability. Therefore, it is acceptable under certain controlled conditions, to extend the Completion Time and replace the ST No. 20 to maintain the reliability of the offsite emergency power systems.

The defense-in-depth philosophy in reactor design and operation results in multiple means to accomplish safety functions and prevent release of radioactive material. The impact of the proposed Technical Specification changes were evaluated and determined to be consistent with the defense-in-depth philosophy.

The ST No. 20 transformer replacement will be performed in accordance with existing plant maintenance procedures, and managed in accordance with the plant technical specifications, the SSES work management procedures, and 10 CFR 50.65 Maintenance Rule requirements. Utilizing these requirements and procedures provides assurance that

all aspects of nuclear safety that could be affected by the transformer replacement are managed to minimize any nuclear safety risks.

As described in Reference 1, the second offsite circuit, which includes the ST No. 10 startup transformer, is fully capable of supplying all the design basis accident loads on both Susquehanna Units 1 and 2. The second offsite circuit, in addition to the four emergency diesel generators, will be maintained operable in accordance with the technical specifications and capable of performing their required safety functions. This will ensure that nuclear safety is maintained during the LCO 3.8.1 Required Action A.3 extended Completion Time for one inoperable offsite circuit. A subsequent failure of the second offsite circuit or a diesel generator during the extended Completion Time would result in entry into another LCO 3.8.1 Condition that would lead to a plant shutdown if the equipment restoration does not occur within the associated Completion Time.

When the problem with the ST No. 20 H1 bushing was discovered in October 2008, the preferred option for correcting the condition was to replace the transformer. The transformer replacement was considered for inclusion in the Unit 2 outage in April/May of 2009. Replacement during the outage was not chosen because, based on test results, the bushing degradation did not appear that it would cause imminent transformer failure, and therefore did not justify revising the existing outage plans and resource requirements to accommodate a transformer changeout.

However it was also determined that the condition of the bushing and projected further degradation was not acceptable for long term operation because it would likely result in transformer failure at a later time. Therefore, transformer replacement in September 2009 was determined to be the best option from various planning aspects, which included:

- completion of PJM interconnection studies which assure electric power system stability during the 10 day work period and the corresponding impacts on safety to other nuclear units connected to the grid,
- more favorable weather conditions in September (at this time of year humidity is typically lower, reducing the potential to affect transformer internals when opened to the atmosphere),
- continued exposure to the potential failure of the transformer if the replacement were to be scheduled for the Unit 1 refueling outage in 2010 (potential impact on the operation of plant safety-related equipment during less desirable conditions), and
- resource availability to perform the work.

The requested LCO 3.8.1 Action A.3 Completion Time extension to 10 days is necessary to perform all the work and testing associated with replacement of ST No. 20. The following specific work activities are scheduled to start on September 14, 2009 and scheduled to end on September 21, 2009. The additional time requested provides a

reasonable contingency for adverse weather conditions or unanticipated installation problems. The major activities that will be performed during the scheduled work window after entry into LCO 3.8.1 Condition A for one inoperable offsite circuit include:

September 14

- Erecting scaffold to access and determinate the low side connections to the existing transformer.
- Access and determinate the high side connections to the existing transformer.
- Determinate and remove control wiring from the existing transformer.
- Drain all the oil from the existing transformer.
- Install a nitrogen blanket on the transformer.
- Remove a fan bank from the existing transformer to allow movement eastward.
- Remove fire protection piping, control wiring and conduits.

September 15

- Determinate lightning arrestors.
- Move existing transformer off the pad.
- Move the new transformer on to the pad.

September 16

- Establish vacuum on the new transformer for oil fill.
- Install new fire protection stanchions and piping.
- Install conduits and pull control panel wiring.

September 17

- Fill the new transformer with oil and stabilize.

September 18

- Doble Test the new transformer.
- Fabricate and install high side cables.
- Terminate low side cables.
- Terminate control panel cables and wiring.
- Remove scaffolding for low side cable terminations.

September 19

- Perform control wiring circuit checks (cold).
- Install new fire protection conduits.
- Pull new cables for fire protection heat detectors and install new detectors.
- Perform control wiring circuit checks (hot).
- Calibrate plant computer point for the new transformer.

September 20

- Perform fire protection circuit heat detector checks.
- Perform fire protection spray test.
- Energize new transformer unloaded.
- Verify proper phase rotation.
- Load new transformer with bus 20 and buses 11A and 11B.

September 21

- Declare new transformer operable.

NRC TSB QUESTION 2:

Show that in making the third request for extending the completion time of LCO 3.8.1 Required Action A.3, to replace damaged/degraded station transformers considered the previous two requests thereby ensuring that intentional entry into ACTIONS was not made for operational convenience in accordance with LCO 3.0.2.

PPL RESPONSE:

The work activites and compensatory measures associated with this proposed change are consistent with the NRC approved submittals that PPL requested in 2002 and 2003 for LCO 3.8.1 Action A.3 Completion Time extensions. However, the reasons for each of the prior requests and this request are distinct. The 2002 extension request was in conjunction with enforcement discretion due to the actual failure of ST No. 20. The 2003 extension request was the result of a proactive decision to replace startup transformer ST No. 10 based on a root cause determination from the 2002 ST No. 20 failure. As a result, ST No. 10 reliability was assured by these actions taken to avoid the failure experienced on ST No. 20 in 2002. As stated in Reference 2, this Completion Time extension request is necessary to correct the degraded condition of the ST No. 20, before it fails, in a planned and controlled manner without any significant decrease in nuclear safety.

This transformer replacement is corrective maintenance that is being undertaken to maintain the reliability of an offsite power source. As stated in response to question 1 above, the option for transformer replacement in September was not based on operational convenience, it was determined to be the most appropriate time based on actual test results for the bushing condition, typical weather conditions, grid stability, and the planning and resource efforts that would be required to accomplish the changeout. Startup transformers are designed for the life of the units and normal maintenance can be and is performed within the existing 72 hour Completion Time. Replacement of a startup transformer is not a normally planned maintenance activity, however, there are occasions when it needs to be done when a decrease in reliability is recognized.

The term "operational convenience" first appears in the model Technical Specifications in Generic Letter 87-09, "Sections 3.0 and 4.0 of the Standard Technical Specifications (STS) on the Applicability of Limiting Conditions for Operation and Surveillance Requirements." The Model BWR Technical Specifications 3.0 Bases (Generic Letter 87-09, Enclosure 5) only mentioned "operational convenience" in LCO 3.0.3 Bases. However, the PWR 3.0 Bases, Generic Letter 87-09 Enclosure 3, included the "operational convenience" limitation in the LCO 3.0.1 Bases. In both cases, the term "operational convenience" was equated with "routine voluntary removal of a system(s) or component(s) from service in lieu of other alternatives that would not result in redundant systems or components being inoperable." Also, in both the PWR LCO 3.0.1 Bases and the PWR and BWR LCO 3.0.3 Bases, the discussion of "operational convenience" was in the context of Actions requiring a shutdown.

Since the proposed amendment affects only one offsite circuit, "operational convenience" does not apply because redundant systems or components are not rendered inoperable. This proposed Completion Time extension to 10 days is not "routine" and no "redundant systems or components" are being removed from service.

The NRC Inspection Manual, Part 9900 - Technical Guidance document entitled "Voluntary Entry into Limiting Conditions for Operation Action Statements to Perform Preventative Maintenance," states: "Performing on-line PM (e.g., emergency diesel generator overhaul at power) requires intentionally entering the technical specifications (TS) limiting conditions for operation (LCO) for the affected system. If a licensee does this, it must complete the PM and restore operability within the time specified in the appropriate action statement of the LCO (i.e., the allowed outage time (AOT).

Intentional entry into an action statement of an LCO is not a violation of the TS (except in certain cases, such as intentionally creating a loss of function situation or entering LCO 3.0.3 simply for operational convenience). For example, TS allow licensees to perform surveillance testing during power operation, even though such testing requires entry into LCO action statements. TS permit entry into LCO action statements to

perform surveillance testing for a number of reasons. One reason is that the time needed to perform most surveillances is usually only a small fraction of the AOT associated with the action statement. Another reason is that the benefit to safety (increased level of assurance of reliability and verification of OPERABILITY) derived from meeting surveillance requirements is considered to more than compensate for the risk to safety from operating the facility in an LCO action statement for a small fraction of the AOT."

PPL's request for this one time TS 3.8.1 Action A.3 Completion Time extension to 10 days is consistent with the Part 9900 discussion of on-line preventative maintenance.

NRC TSB QUESTION 3:

Explain why a third extension for replacing station transformers is not symptomatic of a design inadequacy with PPL Susquehanna in meeting the 72 hours Completion Time as required by LCO 3.8.1.

PPL RESPONSE:

This Completion Time extension request does not constitute a design inadequacy for the offsite electrical power system. The offsite power system for SSES Units 1 and 2 meets the requirements of the General Design Criteria 5, 17, and 18 as determined by NRC review and documented in NUREG 0776 (Safety Evaluation Report for SSES Units 1 and 2). As stated above, startup transformers are designed for the life of the units and normal maintenance can be and is performed within the existing 72 hour Completion Time. Replacement of a startup transformer is not a normally planned maintenance activity, however, there are occasions when it needs to be done when a decrease in reliability is recognized

In April 2009, NRC Region I performed a Problem Identification and Resolution (PI&R) inspection of the current ST No. 20 transformer degraded bushing condition. This inspection concluded that while PPL could have improved upon its establishment of baseline performance characteristics, there were no findings of significance and that PPL has appropriately incorporated lessons learned from the 2002 transformer failure.

The first 10 day Completion Time extension request, in 2002, was the result of an online failure of ST No. 20. The second 10 day Completion Time extension request, in 2003, was a proactive decision to replace ST No. 10 based on the root cause analysis of the 2002 failure. The concern was that the same design deficiency may have existed in the ST No. 10 transformer, which caused ST No. 20 to fail. This third 10 day Completion Time request is the result of another appropriate decision to address the existing degraded condition of the ST No. 20 H1 bushing before it becomes a critical issue. In addition, PPL has utilized vendor and industry operating experience to properly incorporate

lessons learned which should result in reducing the need for future transformer related problems that require a changeout.

PPL has initiated an evaluation of the options available to avoid a future request to extend the Completion Time for LCO 3.8.1 Action A.3. Options currently being considered include a permanent change to the Completion Time or a design change / modification to the SSES offsite electrical power system to accommodate a startup transformer changeout without requiring entry into the LCO 3.8.1 Condition A.