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SUBJECT: Forwards proposed Amends 90 & 44 to Licenses NPF-14 & NPF-22, respectively, allowing alternate method of post-accident drywell gaseous sampling & providing relief for restrictive action statement on drywell oxygen analyzer.

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Director of Nuclear Reactor Regulation
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Division of BWR Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
PROPOSED AMENDMENTS 90 TO NPF-14
AND 44 TO NPF-22 Docket Nos. 50-387
PLA-2786 FILES A17-2,R41-2 50-388

Dear Ms. Adensam:

The purpose of this letter is to propose changes to the Susquehanna SES Unit 1 and Unit 2 Technical Specifications. The proposed changes would allow an alternate method of post-accident drywell gaseous sampling as well as providing relief for an unnecessarily restrictive action statement on the drywell oxygen analyzer.

Attached to this letter are the proposed changes (which are described below) in marked-up as well as retyped form.

DESCRIPTION OF PROPOSED CHANGES

A. Addition of Preplanned Alternate Method

Footnote "##" has been added to Table 3.3.7.5-1 in the Required Number of Channels and Minimum Channels Operable columns for instruments 8a and b (in both Units 1 and 2):

> "## The preplanned alternate method of monitoring this parameter, once implemented, is considered a valid "channel" to meet this requirement."

The footnote will allow a one-for-one substitution of the alternate method for any one inoperable analyzer channel in order to meet the operability requirements of the limiting condition for operation (LCO).

Footnote "#" has been added to Table 4.3.7.5-1 on the "Drywell Oxygen/Hydrogen Analyzer" instrument (in both Units 1 and 2):

> "# If the preplanned alternate method is being utilized, an appropriate CHANNEL CHECK and an appropriate CHANNEL CALIBRATION shall be performed at the listed frequencies."

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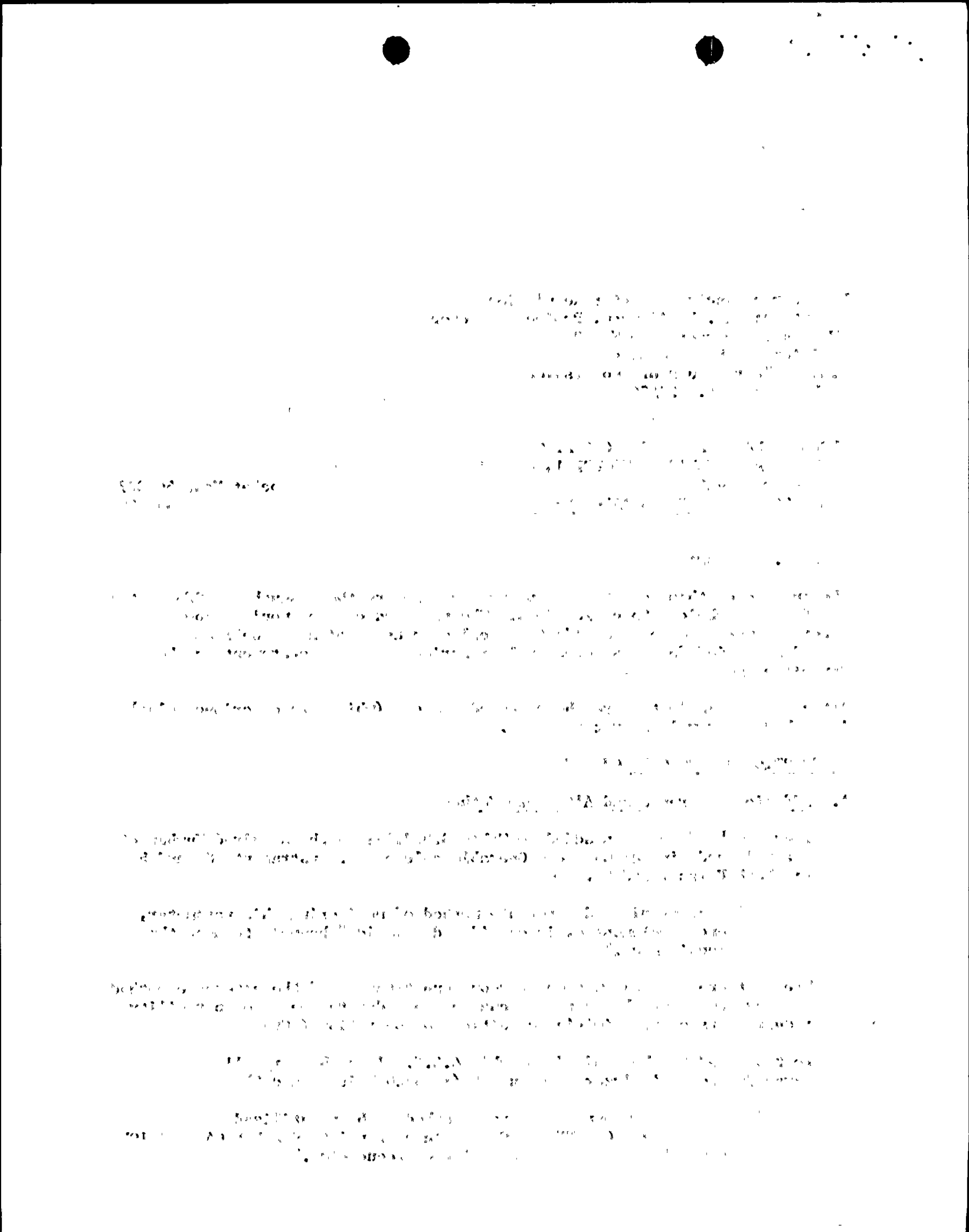

This footnote will ensure the same frequency of surveillance is performed on the alternate instrumentation when it is being utilized to meet the LCO. Footnote "*", which provides the hydrogen analyzer sample gas requirements for the quarterly calibration, was clarified to indicate that it does not apply to the alternate method.

B. Revised Action Statement for Oxygen Analyzer

On Table 3.3.7.5-1 (for both Units 1 and 2) Action 80 for the oxygen analyzer is proposed to be changed to Action 82, which is the same requirement currently applied to the hydrogen analyzer.

This change increases the allowed outage time for one channel of the oxygen analyzer from 7 days to 30 days and for two channels from 48 hours to 7 days.

NO SIGNIFICANT HAZARDS CONSIDERATIONS

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

A. The intent of Technical Specification Table 3.3.7.5-1, instruments 8a and b, is to ensure the ability to monitor hydrogen and oxygen levels in containment post-accident (they are not depended upon during normal operation), considering a single failure. The monitors do not perform an automatic safety function; rather they provide the operator with information so that the hydrogen recombiners can be started in order to keep the containment atmosphere below combustible levels, as discussed in FSAR Subsection 6.2.5 (attached). As such, these monitors serve to confirm the steps taken in emergency procedure EO-200-103 (PC/P-4, p.17 of 33, attached; this is typical for both units) which require the recombiners to be started if hydrogen exceeds predetermined limits or if 24 hours has elapsed since containment pressure has exceeded a predetermined limit.

The Post Accident Sampling System (PASS), which was added to the plant to allow grab samples of various fluids post-accident, was evaluated to determine if it could perform this monitoring function. The key elements in the acceptability of this noncontinuous monitoring methodology are ensuring that post-accident combustible gas buildup is a relatively slow process and that mitigating action (i.e. startup of hydrogen recombiners) is not an immediate concern. The evaluation assumed that the only source of oxygen generation (post-accident) is from the radiolysis of water and steam. The in-leakage of air from outside the "isolated" containment is considered negligible, because a positive pressure MSIV leakage control system is not used. A recirculating compressed gas system performs the same function. Also, oxygen saturated in the suppression pool and reactor water/steam should be insignificant.

As shown in Figures 1 and 2 (attached), the NRC designates a 4% hydrogen concentration, by volume, to be the minimum amount needed for flammability with any combination of air, steam, oxygen or nitrogen mixture. Also, for inerted containments, a minimum 5% oxygen concentration (by volume) is necessary for flammability. These proportions are substantiated by NUREG CR-1561, "The Behavior of Hydrogen During Accidents in Light Water Reactors."

Because there are many reactions (post-accident) that may generate hydrogen, the method for mitigation of combustion chosen for Susquehanna was the monitoring and control of hydrogen when concentrations are low and the recombination of all oxygen with hydrogen when hydrogen concentrations are high. This is accomplished by the hydrogen analyzers and hydrogen recombiners. The only reaction that generates oxygen is radiolysis; ionizing radiation decomposes water (H_2O) into hydrogen (H_2) and oxygen (O_2) at a rate of twice-as-much hydrogen as oxygen. Super-imposed on FSAR Figure 6.2-48 (attached) is the amount of oxygen produced in time after a LOCA. This is considered conservative because some of the oxygen will be used for metal corrosion and metal-oxide formation. Therefore, based on the previously stated arguments and by extrapolation, the super-imposed oxygen buildup shown in FSAR Figure 6.2-50 (attached) reveals that the 5% oxygen limit will not be reached prior to 1.6 days after the DBA given a 4% initial concentration (Tech Spec normal O_2 limit). When Emergency Procedure EO-200-103 (Step PCP-4, which requires the operation of a hydrogen recombiner for hydrogen amounts greater than 3% or within 24 hrs. of a "Hi Containment Pressure Signal") is implemented, oxygen will never reach a 5% volume and hydrogen will still remain the key variable.

Based on the above, it is apparent that although the use of PASS is slow when compared to continuous sampling, it is completely acceptable when compared to the initial 1.2 day period for starting the hydrogen recombiners and the oxygen buildup rates. Therefore grab samples from the PASS can be considered equivalent to the hydrogen or oxygen analyzers from a safety perspective provided procedures are put in place that provide for:

(a) During normal operation, with one hydrogen or oxygen analyzer inoperable the alternative PASS methodology is demonstrated operable at least as often as the inoperable analyzer channel would be if it were in service, i.e., channel check monthly and channel calibration quarterly. The proposed Technical Specificaton changes will ensure that these tests are required.

(b) During emergency operations, should a single failure occur in the hydrogen/oxygen analyzer system, the alternate PASS methodology is used within 1.2 days of the initiation of the event and every 12 hours thereafter unless the hydrogen recombiners have been operating for the complete 12 hour period.

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Upon approval of this request, appropriate procedure revisions will be enacted to ensure this requirement is met.

Based on the above, the use of PASS is an acceptable alternative in that it does not invalidate any previous analysis.

B. The extension of the allowed outage time is supported by FSAR Subsection 6.2.5 and NUREG 0737 (both attached) which both implicitly support the idea that hydrogen monitoring is at least as important as oxygen monitoring. As stated in the above evaluation of PASS as an acceptable monitoring system, the monitors serve as a backup to emergency procedure EO-200-103, which is independent of oxygen measurement.

Therefore the allowance for use of a diverse method of oxygen determination as an alternative to shutting down at the end of the LCO period and the extension of that allowed outage time equivalent to that allowed for hydrogen is warranted and no change to any safety analysis is required.

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

A. As stated in the response to I above, the monitors, either the currently required analyzers or PASS, will function to provide information to the operator post-accident in order to implement an associated emergency procedure. Since it performs a post-accident monitoring function, it can only affect the results of the transient it is there to help mitigate. It cannot create a new or different kind of accident. With respect to the containment pressure transient it protects against, it was shown to be adequate in I above.

B. The extension of an allowed outage time has no relationship to new or different accidents. The time simply reflects an acceptable time to operate the unit with the subject instrumentation in a less reliable (non single failure proof) state.

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

A. The use of PASS was evaluated against the function it was proposed to perform in I above. Although it is noncontinuous in its monitoring method, it was shown that this would have no adverse impact on the ability to provide the information necessary to mitigate buildup of combustible gases in containment. Therefore, no significant reduction in safety margin has occurred.

B. The allowed outage time extension was made via an equivalence argument with respect to the hydrogen and oxygen monitoring functions. Since the hydrogen buildup was shown to be ahead of the

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oxygen levels, the associated procedure to mitigate the effects is keyed off of the hydrogen level. Therefore, the allowed outage time for the oxygen instrumentation should not be more restrictive than those of the hydrogen monitors. The allowed outage time for the hydrogen monitors was established by the NRC in Generic Letter No. 83-36, "NUREG-0737 Technical Specifications"; therefore, no new evaluation of an appropriate allowed outage time is necessary.

Based on the above, no significant reduction in a margin of safety was proposed.

IMPLEMENTATION

The proposed changes will avoid unnecessary shutdowns of the Susquehanna units due to the inoperability of the subject post-accident monitoring instrumentation. PP&L therefore requests that the staff review of this request be completed by May 1, 1987.

Any information necessary to support the NRC review in a timely fashion will be made available. Please direct such requests to Mr. R. Sgarro at (215) 770-7855. Pursuant to 10CFR170, the appropriate fee has been enclosed.

Very truly yours,

H. W. Keiser
Vice President-Nuclear Operations

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