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CURTIS,N.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Responds to 831230 requests for response to items identified in EG&G technical evaluation rept on conformance to Reg Guide 1.97 & comments on any assumptions that surpass util 811113 submittal.

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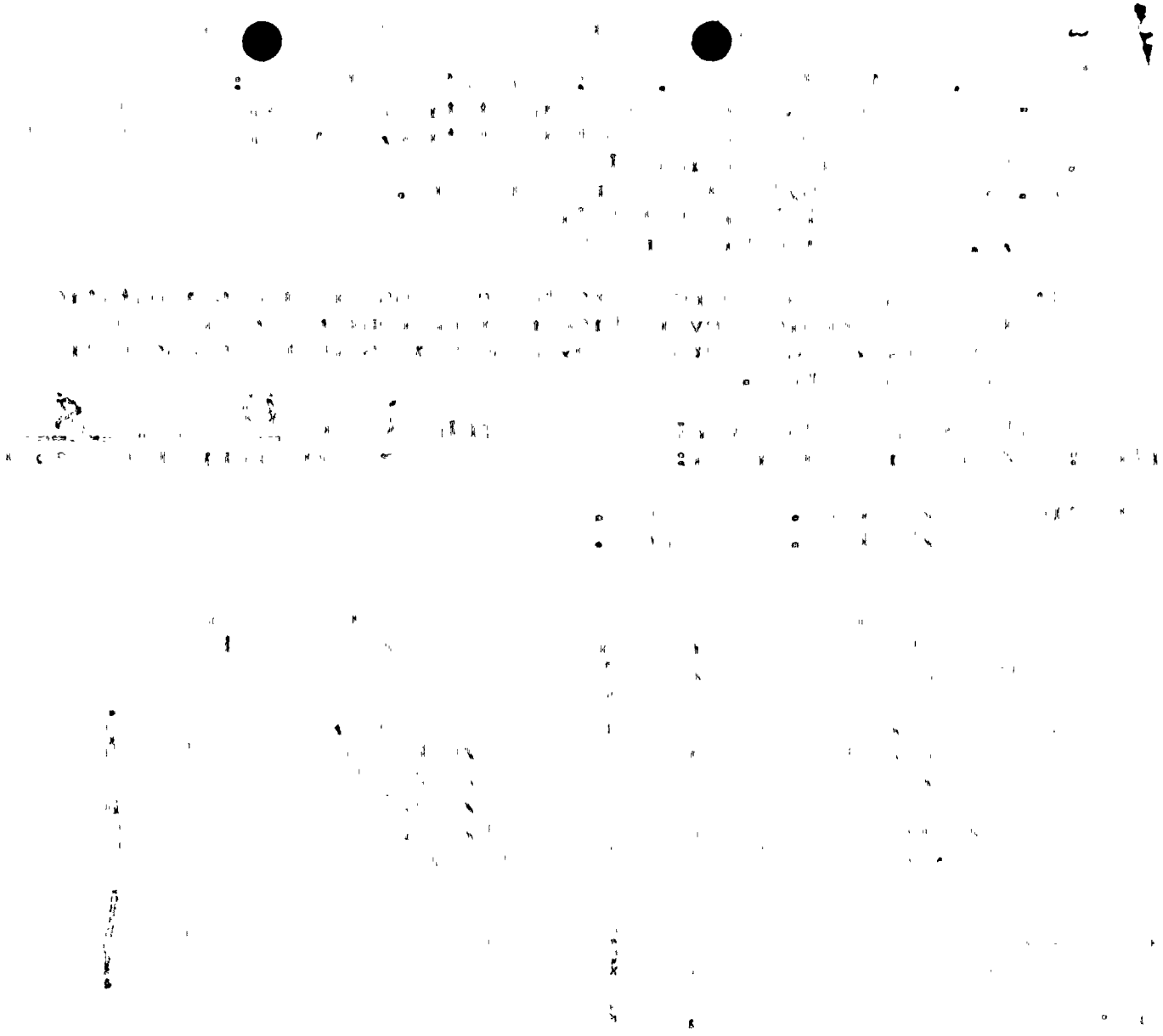

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MAR 13 1984

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
CONFORMANCE TO REGULATORY GUIDE 1.97
ER 100450/100508 FILES 841-2,843
PLA-2099

Docket Nos. 50-387
50-388

Dear Mr. Schwencer:

This letter is provided in response to your letter of December 30, 1983 which provided the EG&G Idaho, Inc. Technical Evaluation Report (TER) on Conformance to Regulatory Guide 1.97 for Susquehanna Steam Electric Station, Unit Nos. 1 and 2. Your letter requests we provide responses to the items identified in the enclosed TER and also that we review the TER and comment on any assumptions that may go beyond our PLA-965, dated November 13, 1981 submittal. Our response to your request is provided below. The format of our response is to address individually each subsection of Section 3. of the TER.

3.1 Adherence to Regulatory Guide 1.97

NRC Evaluation

The licensee stated that the regulatory guide shall be adhered to except where technical justification exists to deviate from the letter of the guide while maintaining adherence to its intent. Therefore, it is concluded that the licensee has provided an explicit commitment on conformance to the guidance of Regulatory Guide 1.97, except for those exceptions that were justified as noted in Subsection 3.3. The information provided by the licensee (reference 5) pre-dated Generic Letter No. 82-33 and did not include the information identified as items 1 through 8 (e.g., Instrument Range, etc.) in section 2 of this report. This information should be provided to document the licensee's commitment on conformance to Generic Letter No. 82-33.

PP&L Response

The information requested will be submitted as part of our report on Regulatory Guide 1.97, scheduled for submittal to the staff in May, 1984.

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3.2 Type A Variables

NRC Evaluation

In that Regulatory Guide 1.97 does not specifically identify Type A variables, i.e., those variables that provide information required for operator controlled safety actions, the licensee classified the following instrumentation channels as Type A variables.

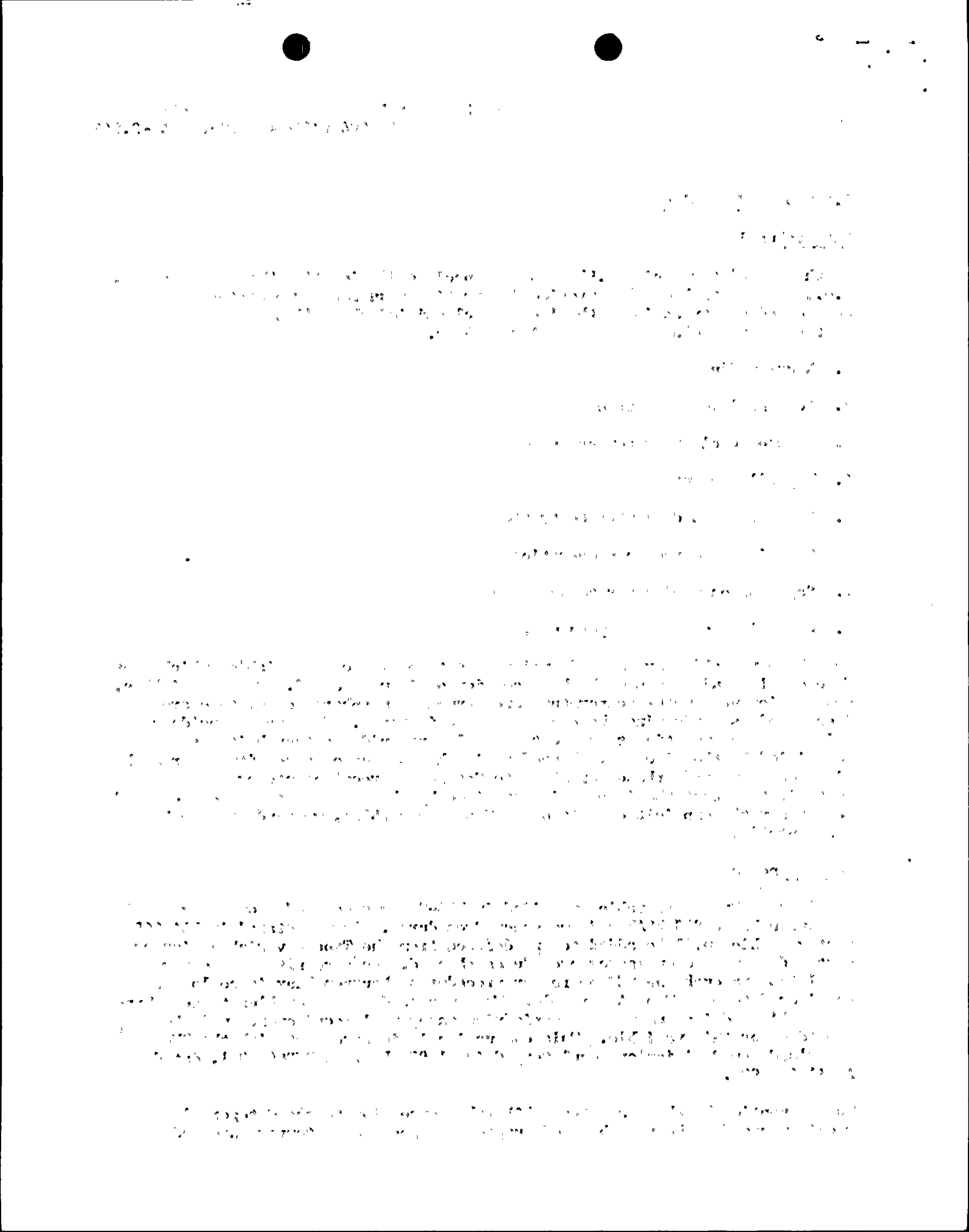
1. Neutron flux
2. Coolant level in reactor
3. Reactor coolant system pressure
4. Drywell pressure
5. Containment hydrogen concentration
6. Containment oxygen concentration
7. Suppression pool water temperature
8. Drywell atmosphere temperature.

The above variables are also identified as type B, C or D variables which meet Category 1 requirements with the exception of items 7 and 8. These variables, suppression pool water temperature and drywell atmosphere temperature are identified as satisfying the category 2 requirements. The staff considers this to be an exception taken to the regulatory guide, although it was not so identified by the licensee. Therefore in the absence of a commitment from the licensee to upgrade these variables to Category 1 requirements or justification that the information provided by these variables is not required to satisfy the explicit definition of Type A variables, we find this to be unacceptable.

PP&L Response

The list of Type A variables provided in PLA-965 was derived from a review of the Susquehanna SES FSAR and Emergency Procedures. It was stated in PLA-965 that variables will be added to and deleted from the Type A variable list as system designs and emergency procedures changed. As a result of a review of the latest Susquehanna SES emergency procedures, Neutron Flux is no longer considered to be a Type A variable. We now consider Neutron Flux to be a Type B variable and instrumentation satisfying Category 1 requirements will be provided for this variable. This evaluation is in agreement with the BWR Owner's Group Position on Regulatory Guide 1.97, Rev. 2, BWROG-8311, dated April 6, 1983.

The assumption by the staff that PP&L takes exception to the Category 1 requirements for the variables of suppression pool water temperature and



drywell atmosphere temperature is incorrect. The instruments currently installed on Units 1 and 2 used to measure these variables satisfy Category 1 requirements.

3.3.1 Neutron Flux

NRC Evaluation

This instrumentation complies with Category 1 requirements. The instrument range is not as recommended by Regulatory Guide 1.97 (10^{-6} to 100% of full power). The installed instrumentation covers a range of from 10^{-4} to 100% of full power.

The licensee notes that accident scenarios resulting in an increase in reactivity could only be caused by inadvertent removal of boron that was added by the standby liquid control system or by other effects such as a change in temperature of fission product poisoning. The licensee states that these reactivity additions would likely have a slow rate of change, and concludes that power readings in the range of 10^{-2}% of full power (two decades above the minimum range provided) would give the operator sufficient time to identify the problem and investigate corrective action.

We find that the justification provided by the licensee for a deviation in the range recommendations for neutron flux unacceptable. There was no quantitative analysis provided for the increase in reactivity event (no control rods being removed). It is the staff's position that the licensee must provide the recommended range identified in the Regulatory Guide or provide a quantitative analysis for the increase in reactivity events which address the following questions:

1. How fast is the deboration event and why?

2. When is adequate warning available to the operator via his instrumentation?

3. How much time is there between the warning and criticality?

PP&L Response

A neutron flux monitoring system which complies with Category 1 requirements is being installed on both Units 1 and 2. Based upon initial calculations for neutron flux leakage it is believed a low end range of 10^{-5}% is achievable. Depending on the amount of conservatism used in neutron leakage calculations, a low end range of 10^{-6}% may be achieved. The actual low end range will not be known until the Unit 2 power test program allows calibration of the neutron flux measuring system. If the actual range should be less than the range required by Regulatory Guide 1.97, Rev. 2, PP&L will provide a quantitative analysis justifying the actual range.

3.3.2 Coolant Level in the Reactor

NRC Evaluation

Regulatory Guide 1.97, Revision 2, requires redundant instruments with a range extending from the bottom of the core support plate to the centerline of the main steam line. To comply with this requirement, the licensee will use two fuel zone channels, two wide range channels and an upset range channel.

There is overlap between the channel ranges. The upset range instrument reference leg uses the top head vent as a penetration. In order to comply with the single failure requirement of Regulatory Guide 1.97, an additional head penetration would be needed for a redundant reference column for a second upset range channel.

The required range of indication for reactor coolant level is 440 inches. Only the upper 70 inches are not monitored by redundant instruments. The licensee notes that no manual or automatic functions are initiated in the upper 70 inches since these functions occur in the range monitored by redundant wide range channels. The licensee concludes that the proposed reactor coolant level instrumentation meets the intent of the Regulatory Guide, and that only a marginal improvement in plant safety would be achieved by installing a redundant channel. We concur that an additional upset range channel may result in only a marginal safety improvement and therefore find this justification acceptable.

PP&L Response

As a result of discussions with your staff regarding inadequate core cooling, we have implemented several instrumentation changes to enhance the operator's ability to determine reactor water level. The details of these modifications will be provided as part of our report on Regulatory Guide 1.97 scheduled for submittal in May, 1984.

3.3.3 Drywell and Drywell Drains Sump Level

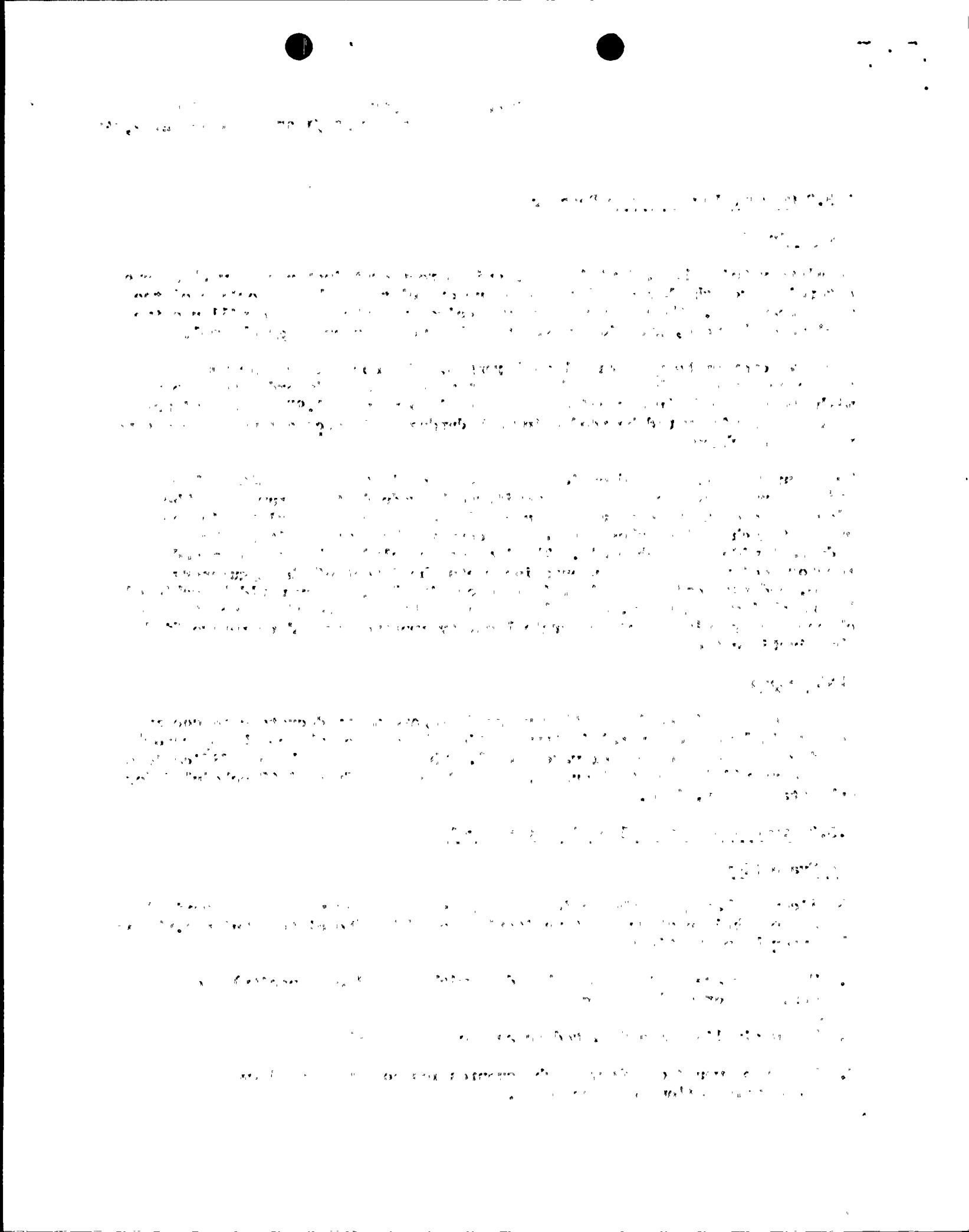
NRC Evaluation

The licensee has given the following reasons for not providing this variable as part of their post accident monitoring variables (Regulatory Guide 1.97) at the Susquehanna Station:

1. The sumps are shallow (6 inches deep with 316 gallon capacity) and designed for small leakage

2. The drain lines are isolated on an accident signal

3. The sumps would overflow to the suppression pool via the drywell downcomers following an accident.



4. The level in the sumps is measured by existing instrumentation to identify small leakages in accordance with Regulatory Guide 1.45.

Sump level detection is a method of determining leakage from the reactor coolant system that is specified in Regulatory Guide 1.45. Once the sump is full, no useful post-accident information would be available for instruments qualified to either Regulatory Guide 1.45 or 1.97. The sump drains are isolated on an accident signal, and the operator is able to tell that the sump is full by using the existing instrumentation.

Based on the above, the lack of instrumentation recommended by Regulatory Guide 1.97 is acceptable.

PP&L Response

No comment.

3.3.4 Primary Containment Isolation Valve Positions

NRC Evaluation

The instrumentation for valve position indication does not use seismically qualified indicator lamps. The licensee indicates that seismically qualified indicator lamps are not available.

The staff requires a commitment from the licensee to a) take action in pursuit of seismically qualified lamps and, b) replace the unqualified lamps in a reasonable period of time.

PP&L Response

PP&L will attempt to either procure and install seismically qualified lamps compatible with existing lamp holders or seismically qualify the existing indicator lamps. If this effort is unsuccessful, PP&L intends to describe our effort to comply with this requirement and provide justification for the acceptability of the presently installed lamps. A schedule for the accomplishment of this task will be provided as part of our report on Regulatory Guide 1.97 scheduled for submittal in May, 1984.

3.3.5 Radiation Level in Circulating Primary Coolant

NRC Evaluation

A direct measurement of this variable is not provided. The licensee indicates that radiation level measurements to indicate fuel cladding failure are provided by the following instruments:

1. Off-gas pretreatment radiation monitor

2. Main steam line radiation monitor

3. Containment area radiation monitor

4. Containment hydrogen monitor

5. Post-accident sample station (manual sample analysis)

6. Post-accident sample station sample line radiation monitor.

This instrumentation is recommended by the Regulatory Guide to indicate damage to fuel cladding regardless of whether there has been a breach of the reactor coolant system pressure boundary.

Not all of these monitors are available (due to containment isolation) in a post-accident situation. Those that are have not been shown by the licensee to have a continuous direct relationship to the radiation level in the circulating primary coolant. We cannot conclude that the present instrumentation is suitable for this variable.

Instrumentation that is suitable for this variable has been under research and development. We find that the diverse indication presently provided for this variable is acceptable on an interim basis, on the conditions that the licensee (a) commit to assess the availability of systems for this variable and to evaluate the systems within a reasonable time frame, and (b) commit to installation of a satisfactory system within a reasonable time frame.

PP&L Response

It is PP&L's position that instrumentation utilized to measure radiation levels in circulating primary coolant should be designated Category 3 rather than Category 1 and that the existing instrumentation at Susquehanna SES is adequate. The existing Susquehanna SES emergency procedures do not specify any planned operator action to be taken which would require monitoring of this variable and, therefore, it is considered to be a backup variable in a post accident situation which does not warrant continuous monitoring. The existing instrumentation provides a diverse and reliable indication of fuel cladding integrity.

A detail discussion of this position is provided in the "BWR Owner's Group Position on Regulatory Guide 1.97, Rev. 2", BWROG-8311, dated April 6, 1983. PP&L concurs with the BWR Owner's Group Position on this variable.

3.3.6 Radiation Exposure Rate

NRC Evaluation

The licensee has instrumentation for this variable with individual instrument ranges that vary from the recommended range. The licensee has performed a post-accident radiation study that determined the maximum radiation field for each location. Where existing radiation monitors will drive offscale during a postulated accident, the licensee has committed to increase the range to ensure that the instrument will remain on scale. The licensee has not identified what range changes are required or provided a schedule for implementation consistent with the information requirements identified in the

generic letter. We find that the licensee commitment to implement those changes required to provide an adequate instrument range is acceptable, however, the licensee should provide the ranges and locations with a schedule for implementation consistent with the Section 6.2 requirements of Generic Letter 82-33.

PP&L Response

The location and range of the post accident range ARMs will be provided to the staff as part of our report on Regulatory Guide 1.97, scheduled for submittal in May, 1984.

3.3.7 Noble Gas and Vent Flow Rates

NRC Evaluation

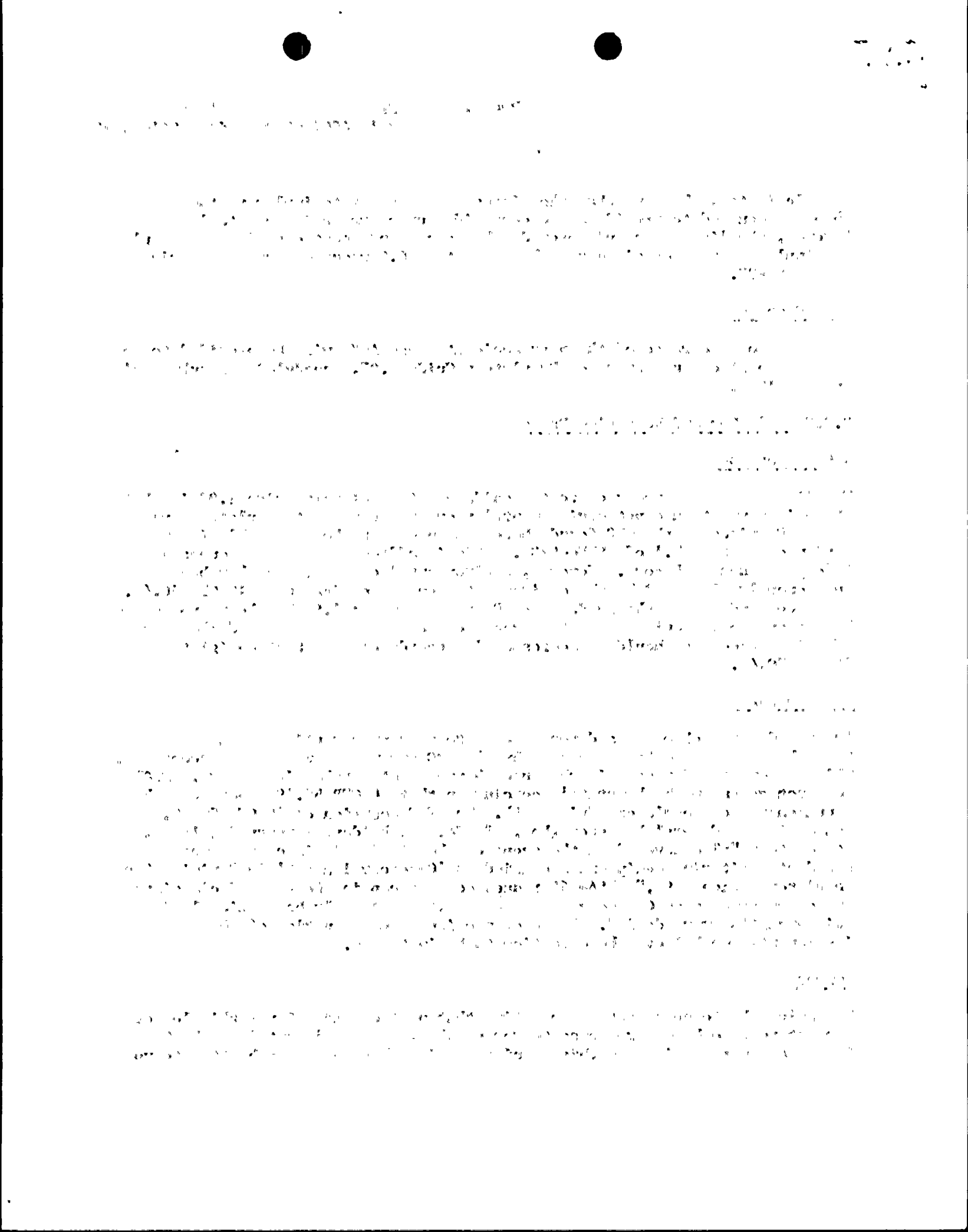
The licensee takes exception to the guidance of Regulatory Guide 1.97 in that these instruments are not environmentally qualified to meet Regulatory Guide 1.89. Previously, the NRC found these instruments to be acceptable in the review of Item II.F.1 of NUREG-0737. This is addressed in the Susquehanna Safety Evaluation Report. However, environmental qualification has been subsequently clarified by the environmental qualification rule, 10 CFR 50.49. It is concluded that the guidance of Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with Section (g) to 10 CFR 50.49.

PP&L Response

As stated, the noble gas and vent flow rate instruments utilized at Susquehanna SES have been reviewed by the NRC and were found to be acceptable. This review was addressed in the Susquehanna Safety Evaluation Report. PP&L does not concur with the staff's conclusion that 10 CFR 50.49 supersedes the requirements of Regulatory Guide 1.97. The NRC position on 10 CFR 50.49, as posted in the Federal Register (Vol. 48, No. 15, Friday, January 21, 1983), states that "also covered in the scope of the final rule is certain post accident monitoring equipment specified as 'Category 1 and 2' in Revision 2 of Regulatory Guide 1.97." PLA-965 requested an exception be granted classifying these instruments as Category 3. 10 CFR 50.49 would only be applicable if this exception were denied. Based on previous NRC evaluation of these instruments, we believe the exception to be justified.

Summary

We would like to point out at this time that neither PLA-965 nor this letter are intended to be our response to Paragraph 6.2 to Supplement 1 to NUREG 0737. A report satisfying this requirement is scheduled for submittal to you



in May, 1984. Several of the areas for which you have expressed concern will be addressed in our report. However, should you have additional questions, please contact us.

Very truly yours,

N. W. Curtis
Vice President-Engineering & Construction-Nuclear

cc: R. L. Perch - USNRC