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SUBJECT: Concurs w/intent of Reg. Guide 1.97, Revision 2. Design & procurement of mats for changes will begin immediately. Study underway to determine performance of thermocouples at various locations.

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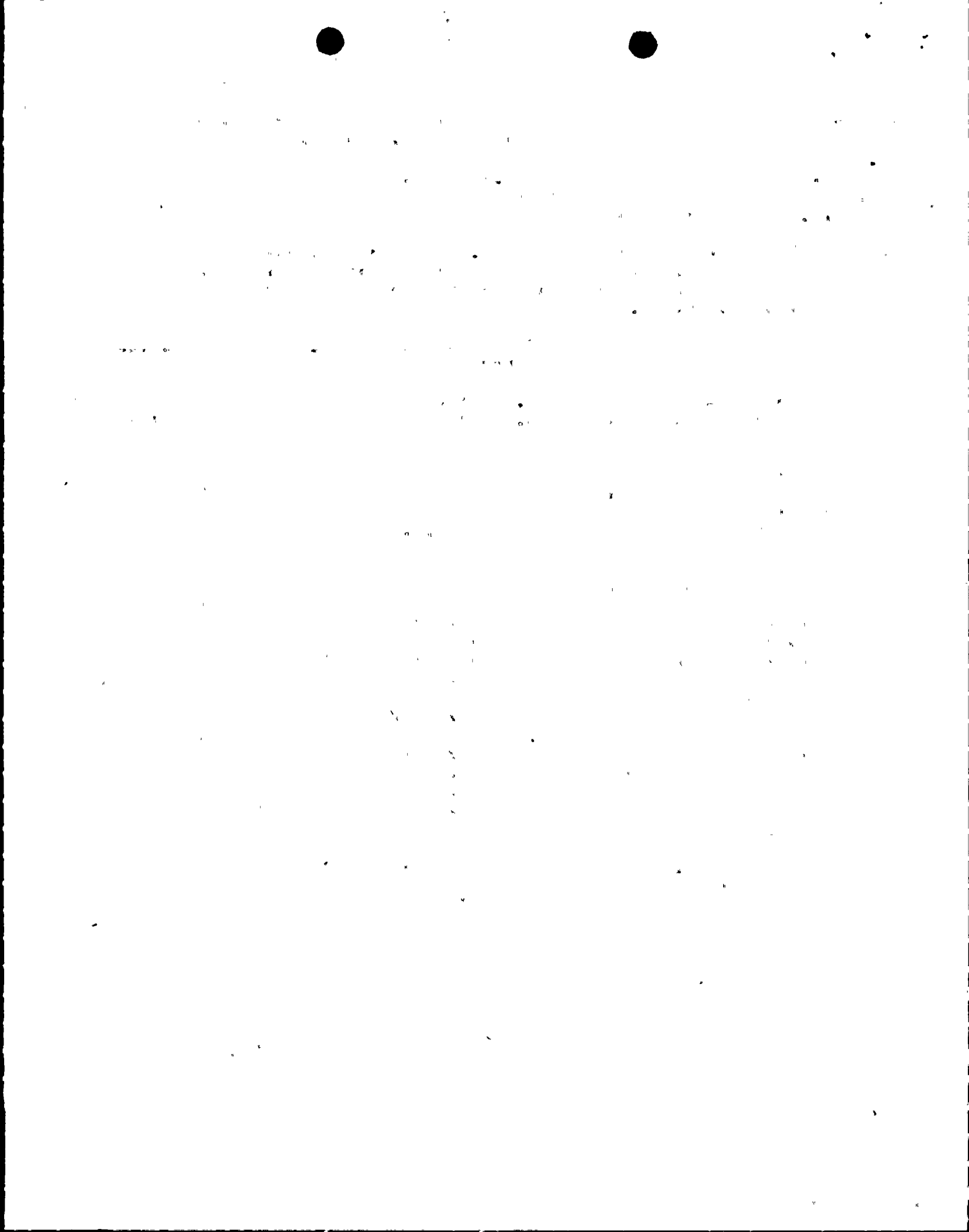
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Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



Docket Nos. 50-387
50-388

SUSQUEHANNA STEAM ELECTRIC STATION
SER ISSUE NO. 39 (R.G. - 1.97)
ER 100450 FILE 841-2
PLA-965

Dear Mr. Schwencer:

The purpose of this letter is to transmit the PP&L position on Regulatory Guide 1.97, Revision 2.

PP&L concurs with the intent of Regulatory Guide 1.97, Revision 2. This intent is to insure that a necessary and sufficient set of instruments exist to insure the assessment of plant and environmental conditions during and following an accident as required by 10 CFR Part 50, Appendix A, General Design Criteria 13, 19 and 64. Regulatory Guide 1.97 shall be adhered to in order to demonstrate compliance with GDC 13, 19, and 64 except where technical justification exists to deviate from the letter of the guide while maintaining adherence to its intent. A list of these exceptions and their justifications are contained in enclosure (1) to this letter.

Section 1.1 and Table 1 of Regulatory Guide 1.97 require a plant specific analysis to determine those variables (TYPE A) to be monitored that provide the primary information required to permit the control room operators to take the specified manually controlled actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions for design basis accident events. The Susquehanna S.E.S. TYPE A variables are contained in enclosure (2) to this letter. This list was derived from a review of the design basis accidents contained in Chapter 15 of the Susquehanna S.E.S. FSAR and the Susquehanna S.E.S. emergency procedures. Enclosure (2) represents the Susquehanna S.E.S. TYPE A variable list at this point in time. It is expected that variables will be added and deleted to the TYPE A variable list as system designs and emergency procedures change.

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Where equipment is required to be qualified by Section 1.3 and Table 1 of Regulatory Guide 1.97, it will be qualified in accordance with applicable portions of the Susquehanna S.E.S. equipment qualification program for Class 1E equipment. Environmental parameters, seismic parameters and duration of operation will be in accordance with this program.

Where systems must be modified to comply with the intent of Regulatory Guide 1.97, Revision 2, the design and procurement of materials for these changes will begin immediately. These changes will be implemented as soon as possible but no later than the first refueling outage for Unit 1 and fuel load for Unit 2 providing properly qualified equipment is available. If properly qualified equipment is not available the changes will be implemented at the first scheduled outage after equipment becomes available.

Table 1 of Regulatory Guide 1.97 requires the monitoring of the status of standby power and other energy sources important to safety. PP&L has interpreted this requirement to mean monitoring of the ESF buses and the pneumatic supplies to the safety relief valves. Voltages and currents of the ESF buses will be monitored in the control room at the 4KV level. Safety relief valve pneumatic supply pressure will also be monitored in the control room. Distribution buses and motor control centers which are fed from the ESF buses and DC buses are monitored in the control room by use of breaker position and undervoltage annunciators. Operator response to loss of these lower level buses will be directed by operating procedures. This capability was reviewed and will be documented to the NRC in PP&L's response to IE Bulletin 79-27. Power supply monitoring instrumentation will be qualified to the same level as the equipment it is monitoring.

Supplement No. 2 to the Susquehanna S.E.A. Safety Evaluation Report required PP&L to perform a study to determine the appropriate location and number of thermocouples to provide improved detection of inadequate core cooling. PP&L and the BWR Owners Group are presently performing a study to determine the performance of thermocouples at various locations.

If you have any questions, please contact us.

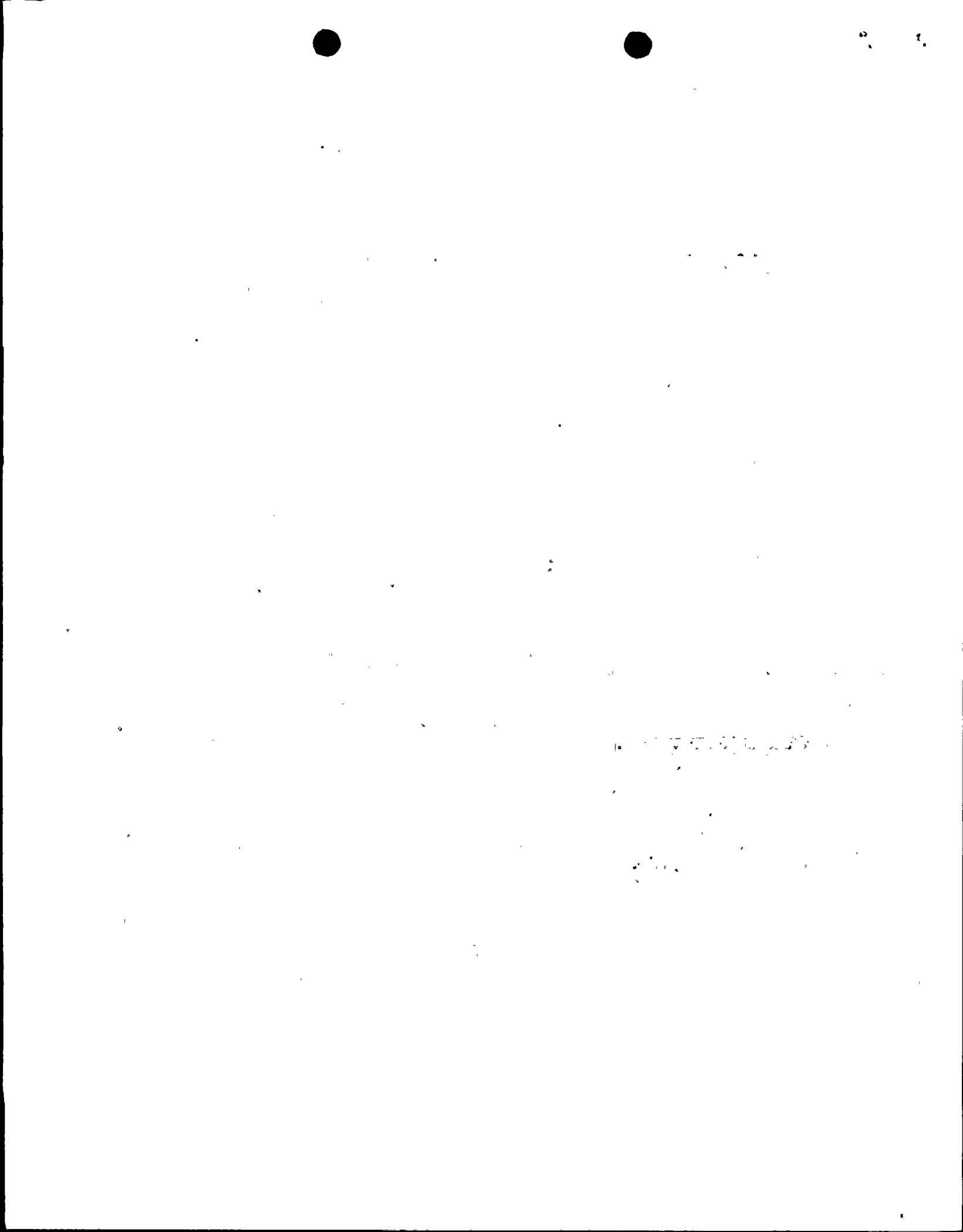
Very truly yours,



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

JAB/kes

Attachment
cc.: R. Perch-USNRC



EXCEPTIONS TO R.G. 1.97 DESIGN CRITERIA

Reactor Water Level:

Table 1 of R.G. 1.97 requires a range extending from the bottom of the core to the center line of the main steam line. To comply with this requirement, PP&L will use two fuel zone instruments, two wide range instruments and the upset range instrument. The upset range instrument provides only a single channel of indication and will not provide complete compliance with Section 1.3.1.b of R.G. 1.97.

The upset range instrument reference leg utilizes the top head vent as a penetration. In order to comply with Section 1.3.1.b of R.G. 1.97, an additional head penetration would be needed to provide a penetration for a redundant reference column for a second upset range instrument. It should be noted that the required range of indication is approximately 440 inches. The upset range instrument is required to monitor only the upper 70 inches of this range. All automatic and manual operator actions occur while the reactor water level is within the range monitored by the redundant wide range instruments.

It is PP&L's determination that the proposed water level instrumentation meets the intent of R.G. 1.97. Furthermore, the difficulty of the addition of a level instrument to provide redundant monitoring of the upper 70 inches of the required range is not warranted by the marginal improvement in plant safety that might be achieved.

Drywell Sump Level:

The drywell sumps at the Susquehanna SES are shallow (6 inches deep) sumps with a capacity of 316 gallons. The level in the sumps is monitored by a system which is designed to identify small leakages as specified in Regulatory Guide 1.45. The drain lines from these sumps will isolate automatically or manually upon a significant reactor coolant pressure boundary leak. It is expected that the sump would fill in a matter of minutes or less during a pressure boundary breach. The overflow from the sumps would then drain into the suppression pool via the drywell downcomers. From the time the sumps start to overflow the level instruments provide no useful information.

Based on the above discussion, it is PP&L's determination that this variable provides no relevant information during and following an accident. This variable will not be included in the Susquehanna SES list of post-accident monitoring variables.

Primary Containment Isolation Valve Position:

The requirements of Table 1 and Section 1.3.1.b state that each primary containment isolation valve should have single failure proof indication of position in the control room. As installed, each isolation valve (excluding check valves) has a position indicator in the control room. When both isolation valves are taken as a pair, single failure proof indication of the containment isolation function is provided for each containment penetration. It is PP&L's determination that this arrangement satisfactorily meets the intent of R.G. 1.9.7.

The valve position indication circuits are safety grade circuits with the exception of the indicating lights. The light bulbs currently used are long life industrial quality incandescent light bulbs which have demonstrated a high degree of reliability at the Susquehanna SES and other power stations. PP&L considers these light bulbs to be acceptable for this service. At present qualified incandescent light bulbs are not available. If qualified replacement bulbs become available in the future, the existing bulbs will be replaced.

Primary Coolant Radiation Level:

The purpose of this variable is to provide a means of detecting a breach of fuel cladding. The present instrumentation installed at Susquehanna provides many diverse methods for accomplishing this function. Indications of fuel cladding failure are provided by the following instruments:

1. Off-Gas Pretreatment Radiation Monitor
2. Main Steam Line Radiation Monitors
3. Containment Area Radiation Monitors
4. Containment H₂ Monitors
5. The Post-Accident Sample Station (Manual Sample Analysis)
6. The Post-Accident Sample Station Sample Line Radiation Monitor.

It is PP&L's determination that the safety grade and non-safety grade systems listed above satisfy the intent of R.G. 1.97.

Radiation Exposure Rate:

PP&L takes exception to the range specified in Table 1 of R.G. 1.97. PP&L has done a detailed post-accident radiation study and has determined maximum radiation fields for the entire plant. Where existing area radiation monitors will peg off scale during a postulated accident, the range will be increased to insure the instrument remains on scale. Where existing instruments remain on scale during accidents, no changes in range will be made. This philosophy will ensure that exposure rates throughout the plant can be assessed for all possible conditions.

Effluent Radioactivity Noble Gas:

PP&L takes exception to the requirement of Table 1 and Section 1.3.2.a of R.G. 1.97 that requires these instruments to be qualified

in accordance with R.G. 1.89. PP&L has replaced the original GE supplied effluent monitoring system with a state-of-the-art Eberline digital effluent monitoring system. This system was designed to meet all the requirements of NUREG-0737. The NRC in the Susquehanna SES Safety Evaluation Report found this system to be acceptable for safe operation of the plant. It is PP&L's determination that the existing system adequately meets the intent of R.G. 1.97.

Emergency Damper Position:

Table 1 and Section 1.3.2 of R.G. 1.97 require the emergency damper position indication system to be qualified in accordance with R.G. 1.97. The Susquehanna SES emergency damper position indication consists of qualified safety grade equipment with the exception of the incandescent light bulbs for the position indicators. The light bulbs currently used are long life industrial quality incandescent light bulbs which have demonstrated a high degree of reliability at the Susquehanna SES and other power stations. PP&L considers these light bulbs to be acceptable for this service. At present qualified incandescent light bulbs are not available. If qualified replacement bulbs become available in the future, the existing bulbs will be replaced.

SLCS Flow:

Table 1 of R.G. 1.97 requires the measurement of SLCS flow. The Susquehanna SES SLCS design does not directly measure flow. Indication of flow from the positive displacement SLCS pump is provided by indication of pump discharge pressure and injection line valve position sensors. It is PP&L's determination that the existing instrumentation adequately meets the intent of R.G. 1.97.

Should major system re-design be required for ATWS considerations, this recommendation will be considered in the redesign.

Vent Flow Rates (Effluent Vents):

PP&L takes exception to the requirements of Table 1 and Section 1.3.2.a of R.G. 1.97 that requires these instruments to be qualified in accordance with R.G. 1.89. PP&L has installed a flow measuring system which provides control signals to the effluent sampling system and accurate indication of flow. The effluent sampling system was designed to meet the requirements of NUREG-0737, Item II.F.1. The NRC in the Susquehanna SES Safety Evaluation Report found this system to be acceptable for safe operation of the plant. It is PP&L's determination that the existing system adequately meets the intent of R.G. 1.97.

Neutron Flux:

Table 1 of R.G. 1.97 requires the range of this post-accident neutron flux monitors to cover the range of $10^{-6}\%$ to 100% power. PP&L has determined that the lower two decades are not required for reactivity control in a BWR and that a range of $10^{-4}\%$ to 100% power is sufficient. The R.G. 1.97 specification of $10^{-6}\%$ to 100% power is appropriate for normal start-up needs where control rod withdrawal is the normal procedure. For BWR accident scenarios an increase of

reactivity (no control rods being removed) could only be caused by "hideout" or other unforeseen inadvertent removal of boron that was added via the SLC system, or other effects such as change in temperature and fission product poisoning. These reactivity additions would likely have a slow rate of change. A power reading in the range of $10^{-2}\%$ would give the operator time to identify the problem and to investigate corrective action. PP&L believes the range of $10^{-4}\%$ to 100% will satisfactorily meet the intent of R.G. 1.97 with a large conservative margin.

JAB/kes

Enclosure (2) to PLA- 965

SUSQUEHANNA S.E.S. TYPE A VARIABLE LIST

<u>Variable</u>	<u>Table 1* Classification</u>
Neutron Flux	B
Containment Hydrogen	B
Containment Oxygen	B
Reactor Pressure	B
Reactor Water Level	B
Suppression Pool Temperature	B, D
Drywell Temperature	D
Drywell Pressure	B, D

*Table 1 of Regulatory Guide 1.97, Revision 2

JAB/kes