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SENIOR VICE PRESIDENT
NUCLEAR

February 13, 1986
BECO Ltr. #86- 012

Thomas T. Martin, Director
Division of Radiation Safety
and Safeguards
U.S. Nuclear Regulatory Commission
631 Park Avenue
King of Prussia, PA 19406

License No. DPR-35
Docket No. 50-293

Subject: Response to "Areas Requiring Improvement"
as Contained in NRC Inspection Report 85-27

Dear Mr. Martin:

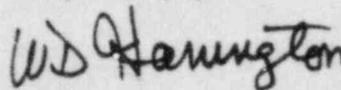
This letter is in response to the subject "Areas Requiring Improvement" contained in NRC Inspection Report 85-27, conducted by Mr. R. Nimitz of your office on September 16-20, 1985 at Pilgrim Nuclear Power Station.

The subject issues and Boston Edison's responses are enclosed as an attachment to this letter.

Please note that this response is being submitted in accordance with our telecon to the NRC on 1/9/86, during which we were approved for a response due date extension to 2/13/86.

If you should have any further questions regarding this matter, please do not hesitate to contact me.

Very truly yours,



W. D. Harrington

Attachment

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ISSUE

Demonstrate the adequacy of system purge times. Data were not presented to demonstrate the adequacy of the purge times specified in procedures. Adequate purge time is needed to ensure representative sampling. (50-392/85-27-01)

RESPONSE

The Nuclear Engineering Department is currently evaluating adequacy of the PASS system purge times. Their evaluation is expected to be completed by 3/1/86.

ISSUE

Demonstrate the adequacy of the sample dilution method and related equipment. Data were not available to demonstrate the adequacy of the sample dilution method and related equipment. Sampling dilution is a key element in the quantification of sample results. (50-293/85-85-27-02)

RESPONSE

The Chemistry Group is currently evaluating the adequacy of the sample dilution method and related equipment in view of General Electric's recommendation. We estimate completion of this review by 8/31/86.

ISSUE

Determine the volume of the coolant collection ball valve. During the preoperational testing, the ball valve, which collects a measured volume of coolant, was determined to be 0.14 ml, instead of the value of 0.10 ml. The value of 0.10 ml. was presented in procedures. The valve, which was actually tested during preops, has since been replaced, but the new valve's volume has not been determined. (50-293/85-27-03)

RESPONSE

The volume of the valve will be determined through the Chemistry Group's evaluation mentioned in our response to Issue #85-27-02. The appropriate procedure will be revised by the Chemistry Group to reflect the new volume. These actions are expected to be completed by 8/31/86.

ISSUE

Repair and/or replace the flow control check valve. After the primary system tests had been successfully conducted, the flow control valve stuck open in a fixed position (0.6 GPM). The design flow rate of 1 GPM could not be attained. (50-293/85-27-04)

RESPONSE

A Maintenance Request has been generated in order to facilitate repairs to the flow control valve. These repairs are expected to be completed (by the Maintenance Group) by 3/1/86.

ISSUE

Demonstrate the adequacy of system purge times. Data were not presented to demonstrate the adequacy of the purge times specified in procedures. Adequate system purge time is needed to ensure representative sampling. (50-293/85-27-05)

RESPONSE

See response to Issue #85-27-01.

ISSUE

The capability to obtain a representative sample of containment atmosphere should be demonstrated. (50-293/85-27-06):

1. There has been no line loss or plate-out study conducted.
2. The sampling assembly is not heat traced. This could lead to excessive condensation collecting on the iodine cartridges. This problem would be particularly troublesome with high humidity in containment.

RESPONSE

The Nuclear Engineering Department is evaluating the subject issues and we anticipate completion of this review by 3/1/86.

ISSUE

Correct the air sampler rotometer reading for differences in air density created by pump suction. The sampling procedure (5.7.11) uses the rotometer reading in the calculation of the radioiodine concentration. (50-293/85-27-07)

RESPONSE

The Nuclear Engineering Department is evaluating the air sampler rotometer readings for differences in air density created by air suction. We anticipate completion of this review by 3/1/86.

ISSUE

The detection limit and sensitivity of the chloride analysis method should be clearly defined. Procedures should be revised to include provisions for the retention of an undiluted sample for up to 30 days for more detailed chloride analysis. (50-293/85-27-08)

RESPONSE

The Chemistry Group is currently assessing the system's capabilities in regard to chloride analysis. Their subsequent conclusions (scheduled to be finished 6/30/86) and corrective actions may include a new time and motion study and procedural changes.

ISSUE

Obtain and maintain supplies necessary to conduct boron analysis with carminic acid method. (50-293/85-27-09)

RESPONSE

The above-mentioned supplies have been obtained and a new calibration curve has been drafted to be used in this analysis. The current procedure will be revised to reflect this new curve by 5/30/86.

ISSUE

Clarify commitments and capabilities relative to pH analyses. (50-293/85-27-10)

RESPONSE

Boston Edison is not committed to performing pH measurements on post-accident samples.

ISSUE

Review and evaluate the need to perform isotopic analyses of dissolved gasses. If a need is identified, provision should be made to conduct isotopic analyses on dissolved gasses. (50-293/85-27-11)

RESPONSE

The Chemistry Group has assessed the need to perform isotopic analysis of dissolved gasses and has concluded that they are not necessary for the initial core damage assessment process. Therefore, Procedure 5.7.5 will be revised (by the Chemistry Group) by 12/31/86.

ISSUE

The following matters requiring licensee attention were identified:
(50/293/85-27-12)

- a) The use of dissolved gas or hydrogen analysis data in the assessment of core damage should be clearly specified. Also, it should be demonstrated that the committed range and accuracy can be achieved. Procedures should be established and implemented where needed.
- b) The amount of gas transported to the laboratory for analysis should be minimized.
- c) Personnel should be instructed either to follow procedures or the procedures should be revised to reflect actual practices. Incorrect gas volumes were injected into the gas chromatograph.

RESPONSE

- a) See response to Issue #85-27-11.
- b) & c) The appropriate procedures are currently being revised by the Chemistry Group to address incorrect gas volumes, minimization of gas volumes, and range and accuracy issues. These procedure changes are expected to be completed by 12/31/86.

ISSUE

Establish a routine maintenance program for the PASS. Not all components of the PASS have been included in a regular surveillance/calibration program. Also, there does not appear to be a formal administrative procedure for assuring that non-safety related equipment, such as the PASS, is incorporated in the routine maintenance (50-293/85-27-13)

RESPONSE

A procedure which will implement a once-per-cycle calibration of PASS instrumentation will be written and implemented (by the Maintenance Group) by 9/1/86.

ISSUE

Establish a spare parts program for the PASS.

A PASS spare parts program is under development. The licensee is coordinating this program development with the BWR Owner's Group. (50-293/85-27-14).

RESPONSE

Efforts are ongoing in BECo to develop a PASS spare parts program. The Nuclear Engineering Department has been requested to assist in this development.

ISSUE

Establish PASS sample shipping procedures.

The procedures for the handling, loading and off-site shipment of samples are in a draft form and arrangements are being made through the PIMS to supply the needed shipping cask. (50-293/85-27-15)

RESPONSE

Procedures are currently being drafted by the Radiological Section. It is estimated that the procedures will be incorporated by 8/31/86.

ISSUE

Arrangements for backup off-site analysis are incomplete. A verbal agreement exists with Millstone to provide backup support. This agreement is being formalized by the licensee's legal staff. (50-293/85-27-16)

RESPONSE

The Radiological Section is currently providing answers to several technical questions posed by Millstone. Subsequent to resolution of the technical issues BECo's legal department will be requested to review the legalities of the contract prior to BECo's signing the document.

ISSUE

Establish provisions for detection of leakage across chiller. Provisions have not been made for the detection of leakage of reactor coolant into the chiller cooling water. The pressure differential between the sampling and the cooling lines could result in the buildup of significant activity in the chiller in the event of such a leak. (50-293/85-27-17)

RESPONSE

The Nuclear Engineering Department has been requested to analyze the above issue and supply recommendations to the Radiological Section. NED's analysis is expected to be completed by 4/30/86.

ISSUE

Provide provisions to preclude PASS from exceeding its design temperature specification.

The chiller will automatically shutdown on low or high pressure signals. However, mechanisms have not been provided for the interruption of the flow of the uncooled water into the PASS or of operator actions procedures to prevent the PASS from exceeding its temperature design specifications. (50-193/85-27-18)

RESPONSE

An Engineering Support Request has been initiated to request the Nuclear Engineering Department's evaluation of the system's design capabilities in this area. The evaluation is expected to be completed by 4/30/86.

ISSUE

Improve the safety of the access to the PASS.

Under accident conditions personnel may be required to climb a 20' ladder to the location of the PASS controls while wearing protective clothing and SCBA gear. The ladder does not have a cage to prevent a person from falling backward. (50-293/85-27-19)

RESPONSE

A safety cage on the subject ladder was installed on 1/31/86.

ISSUE

Establish Alarm Set Points for the PASS Area Radiation Monitor.

Consider using an alarm set point based on maximum dose rates that could be encountered such that 10 CFR 50 GDC 19 dose limits will not be exceeded. (50-293/85-27-20)

RESPONSE

The Radiological Section is currently considering revising Procedure 5.7.2.16 to require the issuance of self-alarming dosimetry. By 6/1/86, the procedure will be revised and the associated equipment will have been obtained.

ISSUE

Evaluate the need to install charcoal filters in the exhaust hood of the chemistry laboratory.

A charcoal filter has not been provided for the laboratory ventilation exhaust system. During an accident radioiodine releases may result from the operation of the gas chromatograph, plasma spectrometer and laboratory hood.
(50-293/85-27-21)

RESPONSE

The Nuclear Engineering Department has evaluated the sample hood system in the chemistry laboratory to assess the adequacy of filtration. The Radiological Section is reviewing NED's evaluation and will take appropriate actions.

ISSUE

Calibrate the PASS radiation detector in accordance with manufacturer's specifications.

The three radiation detectors associated with the PASS are not calibrated in accordance with manufacturer's specifications and recommendations. For example, the manufacturer requires the one electronic channel to be set at 2200 volts and the other two channels at 2500 volts. Based on the calibration procedure, all electronic channels were set at 2500 volts. Also, there was no in-situ check of the instruments response following reinstallation.
(50-293/85-27-22)

RESPONSE

Procedure 6.5-305 has been revised to coincide with the manufacturer's recommendations regarding voltage settings.

In-situ checks are next to impossible to conduct due to the amount of lead bricks surrounding the sampling station. Additionally, our current methods of calibration give us an adequate level of assurance that the units are operable and calibrated properly.

ISSUE

Reevaluate the adequacy of the "time and motion" study performed for collection of PASS samples. Ensure the requirements of 10 CFR 50 GDC 19 can be met.

The "Time and Motion Study" was conducted using generic methods before the actual procedures were developed. It is not clear that the samples can be collected and analyzed within GDC limits using the existing procedures.
(50-293/85-27-23).

RESPONSE

The adequacy of the existing time and motion studies will be reevaluated and, if necessary, another time and motion study will be conducted by the Radiological Section by 12/31/86.

ISSUE

Clarify use of pressure in procedures.

Procedure 5.7.4.1.9 does not include provisions for the specification of the pressure in units of inches of Hg. Procedures use units of psig. Subatmospheric readouts in "inches of Hg" are the most appropriate readouts. (50-293/85-27-24)

RESPONSE

The appropriate procedural changes are currently being prepared by the Chemistry Group and are expected to be completed by 6/30/86.

ISSUE

Establish reliable backup power for the chiller.

A reliable source of backup power has not been provided for the chiller used for cooling the incoming reactor coolant in the event of a loss of off-site power. While a backup method of cooling has been devised, it has not been tested for proper hose fitting. Also, the heat removal capability of this method has not been established. (50-293/85-27-25)

RESPONSE

The Nuclear Engineering Department has been asked to evaluate this issue. Their recommendations are expected by 4/30/86.

ISSUE

Identify and provide "carrying devices".

Procedure 5.7.3.1.2 states that a "carrying device" would be used to transport the syringe containing radioactive gasses. It is not clear what type of "carrying device" is to be used (50-293/85-17-26)

RESPONSE

A procedural change will be initiated by the Chemistry Group to identify the "carrying device." The procedural change is expected to be completed by 6/30/86.

ISSUE

Clearly specify the range of all High Range Noble Gas Monitors. The reasons for the inconsistencies between the range of capability of the high-range monitors as can be derived from the reports by ENTECH and from information supplied by the licensee to NRC should be investigated. Also range overlap should be clearly specified. (50-293/85-27-27)

RESPONSE

The above issues are being evaluated by the Radiological Section. Their evaluation is expected to be completed by 7/31/86.

ISSUE

The ability of the low range monitors to function for sustained periods of time at concentrations close to and beyond their upper range for and to recover therefrom during a post-accident sequence should be established. If this cannot be satisfactorily accomplished, provisions for turning off the power to them and/or bypassing them during these periods of time should be considered. (50-293/85-27-28)

RESPONSE

The Nuclear Engineering Department has been requested to assess the above issue and provide recommendations regarding the recovery ability of the low-range monitors. Their assessment is expected to be completed by 4/30/86.

ISSUE

The possible effect of radioiodines deposited within ducts on the response of the high range monitors should be considered. If it is appreciable, considerations should be given to relocating the detectors to a shield cave within which they view a suitable volume of an off-line aliquot of the stack/vent flow. (50-293/85-27-29)

RESPONSE

The above possibility is currently being considered by the Radiological Section. Their evaluation will be completed by 12/31/86.

ISSUE

Establish provisions in procedures for the sampling of the main stack and the reactor building vent (similar to those now contained in these for sampling in the turbine building) for the measurement of samples of radiation levels up to and including design basis, so as to accomplish continuous sampling throughout a post-accident sequence. (50-293/85-27-30)

RESPONSE

Health Physics and Chemistry personnel will perform a new time and motion study to formulate a basis for revising the M.S. and R.B.V. sampling procedures. Following an evaluation of the study by the Radiological Section (expected to be completed by 7/31/86). Chemistry will then revise the affected procedures, as appropriate. The revisions are expected to be incorporated by 12/31/86.

ISSUE

Perform a time and motion study to ascertain that the system design will make it possible to remove and transport design basis samples within GDC-19 criteria. All appropriate source terms should be used for this study. (50-293/85-27-31)

RESPONSE

See response to Issue #85-27-30.

ISSUE

Provide the necessary nomograms and calculator/computer procedures, whereby measurement of the collected radioiodine activities can readily be translated into release concentrations and rates. (50-293/85-27-32)

RESPONSE

We believe that this capability currently exists through the following procedures:

- 5.7.3.4 ("Sampling, Transport, and Analysis of Effluent Iodines and Particulates from the Reactor Building Vent Under Emergency Procedures")
- 5.7.3.3 ("Sampling Transport and Analysis of Effluent Iodines and Particulates from the Main Stack Under Emergency Conditions")
- 5.7.2.18 ("Off-Site Dose Projections and Protective Action Guides for the General Public")

However, an evaluation will be performed by the Radiological Section and, if appropriate, additional nomograms or other aids will be added to existing procedures. This evaluation is expected to be completed by 12/31/86.

ISSUE

Develop correction factors for the non-isokinetic sampling rates for the range of stack flow rates of the unit vent especially for those anticipated under accident conditions. (50-293/85-27-33)

RESPONSE

The Nuclear Engineering Department is currently studying this issue. By 3/31/86, they will submit their findings to the Radiological Section who will, in turn, determine the acceptability of applying correction factors in accordance with ANSI Guidelines.

The Chemistry Group will subsequently revise the appropriate procedures. The procedural revisions are expected to be completed by 12/31/86.

ISSUE

Evaluate the capabilities of the sampling system to collect representative samples under accident condition. (50-293/85-27-34)

RESPONSE

The Nuclear Engineering Department is currently evaluating BECo's capabilities to collect non-isokinetic samples under accident conditions, and, as mentioned in the response to Issue 85-27-33, their findings will be forwarded to the Radiological Section by 3/31/86 for further dispositioning.

ISSUE

In order to reduce the anticipated dose rate of the collected sample, and/or to facilitate its analysis, the licensee should review and/or resolve (as appropriate) the following matters: (50-293/85-27-35)

- a. Provide shielding for the effluent sample holders
- b. The provision of labels and a flow diagram for the valves and indicators on the sample racks.
- c. The heat tracing of the sampling line for reactor building vent, in view of the possibility that it may contain steam leakage or moisture therefrom under accident conditions.
- d. The provision of features which will enable the purging of in-place sample canister and nearby sample lines with a clean air supply, prior to their removal for transport and analysis.
- e. The addition to manual dose assessment procedures of nomograms which would make it possible to estimate field iodine dose rates on the basis of measured radioiodine activity (or release rates derived therefrom).

RESPONSE

- a. Shielding for effluent sample holders will be addressed on completion of time-motion studies (for details see BECo's response to Issue 85-27-31).
- b. The Chemistry Group will place the appropriate labels and diagrams on the Main Stack and Reactor building vent panels. Actions are expected to be completed by 6/30/86.
- c. The Nuclear Engineering Department is evaluating the need to heat trace the sampling line for the Reactor Building vent. Their analysis is expected to be completed by 5/1/86.
- d. The Nuclear Engineering Department is evaluating the need to install an air or nitrogen system to purge in-place canisters at the Main Stack and Reactor Building Vent areas. Their evaluation will be completed by 5/1/86.
- e. The Chemistry Group will revise procedures where actual readings in "MR" or "R" will be recorded on a data sheet and the information relayed back to the TSC for estimation of field iodine dose rates. The subject procedures will be revised by 12/31/86, in conjunction with other actions described in the response to Issue #85-27-30.

ISSUE

Fully establish and implement the operator Training Modules for operation/use of the PAM Panel (Module CT-SH/IG-S-120). (50-293/85-27-36).

RESPONSE

A new reference text has been developed and is being used as a reference for the operator training module. The above training will be included in the 1986 Operator requalification training.

ISSUE

Train and qualify appropriate personnel on Procedure 5.7.5, "Estimating Core Damage". Personnel have not been trained in the new procedure. (50-293/85-27-37)

RESPONSE

S.T.A. personnel are considered the primary audience for training on Procedure 5.7.5. All S.T.A. personnel were sent a copy of the subject procedure to review in September, 1985. An S.T.A. Initial Training Program is currently being designed by the Training Group and will be conducted by 5/31/86.

ISSUE

Include North/East Torus Monitor Response Curve in Procedure 5.7.5. The procedure contains only the Drywell monitor response curve. However, the Drywell response curve is being incorrectly used with the Torus monitors (50-293/85-27-38).

RESPONSE

The above issue(s) will be evaluated and, if necessary, corrected by the Radiological Section by 8/31/86.

ISSUE

Review dose/damage response curves for the Drywell Monitors. At less than 100% core damage, no other radiation sources (e.g. primary lines in area of detectors) are used as contributors to the detector readings. A review should be performed to ensure that sources in the area of the detectors (other than the gaseous activity in primary containment) do not adversely effect the core damage estimates. (50-293/85-27-39)

RESPONSE

The above issue will be evaluated by the Radiological Section and, if necessary, corrective actions will be implemented.

ISSUE

The licensee should obtain additional SAM-2s. Currently all SAM-2s (4) have been assigned to specific locations. The licensee does not have any spare units. Spare units should be obtained in the event an assigned SAM-2 becomes defective or needs calibration. (50-293/85-27-40)

RESPONSE

Two (2) additional SAM-2's have been received and will be used as spare units.

ISSUE

Certain aspects of the procedures for calibration and use of the SAM-2 are written in such a manner that literal reading of the procedures would cause errors in quantification of airborne iodine: (50-293/85-27-41)

- the method for determination and use of iodine measurement efficiency is not clear/consistent between SAM-2 calibration/use procedures,
- CPM is not defined (i.e. net or gross).

RESPONSE

New equipment which will modify the counting procedure has arrived as of 1/2/86. Procedure 6.5-287, ("Calibration of Airline SAM-2") has been revised to reflect the new counting methods and to address the two above items.

ISSUE

Some of the procedures for use of the SAM-2 do not include the correction factors for determination of total iodine dose. The procedures only include correction factors for dose due to I-131. (50-293/85-27-42)

RESPONSE

All environmental monitoring teams' I-131 readings are corrected for total iodine dose by the Emergency Dose Assessment Engineers via Procedure 5.7.2.18 ("Off-Site Dose Projections and Protective Action Guides for the General Public"). Additionally, Procedure 5.7.2.19 ("In-Plant I-131 Air Sampling and Analysis") is currently being revised to add this capability. We estimate the Radiological Section will have the procedure in place by 3/31/86.

ISSUE

No verification of acceptability of air flow calibration devices used to calibrate iodine air samplers has been performed. (50-293/85-27-43)

RESPONSE

The Radiological Section currently has the iodine air samplers calibrated by a vendor who uses an NBS traceable calibrator. The Station procedure will be revised by 3/31/86 to require recording of the calibrator serial number on the calibration form.

ISSUE

Procedures for use of the SAM-2s for analysis of iodine activity collected on sample media allow the analyses to be made in up to a radiation field of 4 mR/hr. The licensee should perform and document an evaluation that demonstrates that a SAM-2 can detect 1×10^{-7} uCi/ml in a 4 mR/hr field. (50-293/85-27-44)

RESPONSE

The above evaluation is currently being conducted by the Radiological Section and will be completed by 8/31/86.

ISSUE

The model of the installed solenoid valves differed from the test model. The licensee tried to qualify the installed model by similarity. However, evaluation of similarities and differences between the installed model and the test model (e.g. organic materials used and their thermal aging effect, coil temperature rating, physical size and construction etc.) were not performed. (50-293/85-27-45)

RESPONSE

The Nuclear Engineering Department has completed a similarity analysis (on 11/1/85) and has filed that information in the E.Q. reference files.

ISSUE

The valve manufacturer recommended the O-rings be replaced once every five years. This was not addressed in the EQ file. Justification should be provided if this recommendation is not to be implemented. (50-293/85-27-46)

RESPONSE

The Nuclear Engineering Department has added justification documentation to the E.Q. files to address the above issue.

ISSUE

Information Notice 84-68 identified field cable degradation when connected to high power solenoid valves. The cable degradation was caused by substantial temperature increase in the solenoid housing. The effect of this should be addressed in the EQ file. (50-293/85-27-47)

RESPONSE

As a result of NED's review of Info Notice 84-68, the above mentioned effects have been added to the E.Q. files as of 12/1/85.

ISSUE

Review and evaluate the need to incorporate the periodic calibration of PASS instrumentation into the routine maintenance/calibration program. Critical instruments should be included in such a program. (50-293/85-27-48)

RESPONSE

See response to Issue #85-27-13.

ISSUE

The radiation exposure qualification data was not contained in the EQ files.. This data should be made available for NRC review (50-293/85-27-49).

RESPONSE

Revision 1 and 2 to the EQES have been added (by the Nuclear Engineering Department) to the reference files pertaining to the Raychem Shrink Tubing material used in the PASS system. The tubing is the only radiation sensitive material used in the construction of the radiation detectors. The data in the files is now considered complete and will be made available to the inspector upon request.

ISSUE

The coaxial cables for the radiation detectors at the Drywell were found laying on the floor and were subject to being stepped on. The licensee's May 18, 1982 letter indicated the cables were in conduit. There appears to be a Deviation from the information provided to the NRC. (50-293/85-27-50)

RESPONSE

The above issue was separately responded to via Boston Edison Letter #85-222, dated 12/13/85.

ISSUE

Page 18 of the Test Report 1035-1 described the yearly, 5-year and 10-year maintenance requirements for the H₂O₂ analyzer.

The yearly maintenance requirement states "carefully inspect for degradation, replace as necessary". This description appears to provide less than acceptable guidance relative to performing an inspection of this safety related system. The qualification maintenance for this system was not available for review. The licensee should clearly identify the inspection acceptance criteria. (50-293/85-27-51)

RESPONSE

The Maintenance Section has requested the Nuclear Engineering Department to evaluate the above issue and provide recommendations. NED's evaluation is expected to be completed by 4/30/86.