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January 31, 1991

GRAHAM M. LEITCH
VICE PRESIDENT
LIMERICK GENERATING STATION

Docket Nos. 50-352
50-353
License Nos. NPF-39
NPF-85

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Limerick Generating Station, Units 1 and 2
Supplement to our Response dated August 10, 1990, to
NRC Inspection Report Nos. 50-352/90-80 and 50-353/90-80

Dear Sirs:

Attached is a supplement to Philadelphia Electric Company's response dated August 10, 1990, to NRC Inspection Report Nos. 50-352/90-80 and 50-353/90-80 for Limerick Generating Station (LGS), Units 1 and 2. The cover letter that transmitted the Inspection Report requested we provide our short and long term actions relative to the unresolved items identified in the Executive Summary. The resolutions of the short term items were documented in our letter, "Response to NRC Unresolved Items Identified in Inspection Report Nos. 50-352/90-80 and 50-353/90-80," dated August 10, 1990, and the letter stated that resolution of the long term items would be provided in a supplement. The Attachment to this letter is a revision of our August 10, 1990 submittal and serves as our supplemental response to the unresolved items as well as the other concerns identified throughout the report. This supplemental response provides resolution of both the short term and long term actions.

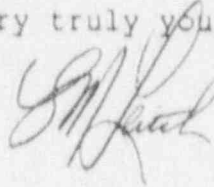
Additionally, on September 28, 1990, the NRC responded to our initial response for the unresolved items and requested that we provide the status of our plans to review the Peach Bottom Atomic Power Station TRIP procedures as a result of the inspection findings at LGS. The letter also requested that we provide the status of our plans to incorporate the inspection findings into the Nuclear Group Administrative procedures. The status of these two items is also provided in the Attachment.

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If you have any questions, or require additional information
please do not hesitate to contact us.

Very truly yours,

A handwritten signature in cursive script, appearing to read "T. J. Kenny".

DCS/rgs

Attachment

cc: T. T. Martin, Administrator, Region I USNRC
T. J. Kenny, USNRC Senior Resident Inspector, LGS

Limerick Generating Station, Units 1 and 2
Supplemental Response to NRC Unresolved Items Identified in
Inspection Report Nos. 50-352/90-80 and 50-353/90-80

The cover letter that transmitted NRC Inspection Report Nos. 50-352/90-80 and 50-353/90-80 requested that we provide our short and long term actions relative to the unresolved items identified in the Executive Summary. The two unresolved items are 352 and 353/90-80-01 and 352 and 353/90-80-02. Below is our response to each of these unresolved items. Additionally, we have provided our response to the other concerns identified throughout the report. Each item is addressed below in the order that they appeared in the Details section of the report.

The Short Term actions (designated ST) make certain enhancements in the Plant Specific Technical Guideline (PSTG) and Transient Response Implementation Plan (TRIP) procedures. The PSTGs and affected TRIP procedures were all revised, reviewed by the Plant Operations Review Committee (PORC) and approved by the Operations and Technical Staffs by July 15, 1990. Implementation and the necessary training of these changes was completed by September 15, 1990. Long Term items were reviewed and appropriate actions were determined by December 31, 1990. The results of this review and the resultant actions are detailed in this revision to the response and are indicated by revision bars in the right-hand margin.

Additionally, on September 28, 1990, the NRC responded to our initial response for the unresolved items and requested that we provide the status of our plans to review the Peach Bottom Atomic Power Station TRIP procedures as a result of the inspection findings at LGS. The letter also requested that we provide the status of our plans to incorporate the inspection findings into the Nuclear Group Administrative procedures. The status of these two items is also provided at the end of this Attachment.

Independent Technical Adequacy Review of the TRIP Procedures,
Unresolved Item 90-80-01, Section 4.0

Item 1

The inspection team identified that when transitioning to the contingency portion of the PSTG, the PSTG refers to specific procedure numbers, such as the T-100 series, rather than the individual PSTG contingencies.

Response

The PSTG has been revised to reference contingency numbers rather than TRIP procedure numbers (ST).

Item 2

The inspectors identified a TRIP procedure deviation from the PSTG on entering T-100 (SCRAM procedure) instead of entry into the Reactor Pressure Vessel (RPV) Control procedure, T-101. This constitutes extra steps which may not be required and has the potential to cause operator error.

Response

The appropriate Emergency Operating Procedures (EOPs) will be revised to direct entry into T-101 whenever a SCRAM is necessary during performance of the EOPs. T-100 will be revised to be no longer included in the EOPs. These revisions will be incorporated into a Human Factors revision, expected to be completed by December 31, 1991.

Item 3

A deviation between the PSTG and the TRIP procedures was identified. The PSTG direction given, when emergency RPV depressurization is required, is to enter T-101 at Step RC-1 and execute it concurrently. The TRIP procedures only direct entry into T-112, Emergency Blowdown. Procedure T-112 has direction to SCRAM the reactor if it has not already been scrammed, therefore, entry into T-101 is redundant. The inspection team concluded that since T-101 gives the operator guidance to control level and power that T-112 does not, T-101 should be entered when emergency blowdown is required.

Response

Item 3 is related to Item 2, revision of T-100. Item 3 resolution will be addressed accordingly based on resolution of Item 2.

Item 4

There were several examples of incorrect information in the PSTG that reflect on system capability. The PSTG refers to the steam condensing mode of the Residual Heat Removal (RHR) system, the High Pressure Coolant Injection (HPCI) system use for boron injection, the Low Pressure Coolant Injection (LPCI) system loops C and D heat exchanger capability, and RPV flooding sources, none of which exist in the plant.

Response

The PSTG has been revised to reference only Limerick Generating Station (LGS) systems and not generic systems (ST).

Item 5

There are several actions contained in the TRIP procedures which are not directed by the PSTGs. In T-101 (RPV control), when an SRV is

cycling, adequate core cooling is not considered when establishing suppression pool cooling. T-112 contains direction to avoid emergency depressurization of the reactor vessel below 100 psig unless motor driven pumps are available. Technical Specifications actions are included in the SP/T portion of T-102.

Response

Direction for suppression pool cooling operation will be deleted from T-101 (RPV Control) since high suppression pool temperature is an entry condition into T-102 (Primary Containment Control). T-112 (Emergency Blowdown) has been revised to remove this direction. T-102 will be revised to remove Technical Specifications recheck steps. T-101 and T-102 will be revised as part of the Human Factors revisions, expected to be completed by December 31, 1991.

Item 6

A number of transition points were found to be in error in several TRIP procedures.

Response

All TRIP procedure flowcharts have been reviewed and revised where necessary to ensure the proper step numbers at the entry/exit arrows are correct providing proper transition directions (ST).

Item 7

Terminology used in certain flowcharts is ambiguous. Such terms as "stabilize," "consider," and "shutdown" require concise definitions that are clearly understood by the operators.

Response

NOTE: Administrative procedure A-94, "TRIP Writer's Guide," is superceded by Nuclear Group Administrative Procedure (NGAP) NA-11T001, "TRIP Procedures Program for Limerick and Peach Bottom," Nuclear Guideline (NG) NG-001, "Peach Bottom and Limerick TRIP Procedures Writer's Guide," and NG-002, "Verification and Validation (V&V) Program for Peach Bottom and Limerick TRIP Procedures." The necessity for keeping procedure A-94 is being evaluated.

Guideline NG-001, provides definitions for "stabilize," "consider," and "shutdown." Additionally, the definition of "shutdown" has been expanded to include quantitative measures to determine if the reactor is shutdown, and is documented in the revised TRIP Bases. These TRIP Bases are utilized in the Licensed Operator Regualification Training program to ensure that the operators understand the definitions.

This expanded definition of "shutdown" will be included in the next revision of guideline NG-001, expected to be completed by December 31, 1991.

Item 8

The RPV Control procedure, T-101, step RC/P-14, directed an operator to hold at this step until "power is below 4%." The PSTG requires that the operator determine if the reactor is "shutdown" at this point.

Response

T-101 step RC/P-14 has been revised to verify the reactor is "shutdown" rather than "power...below 4%" (ST).

Item 9

The Primary Containment Control procedure, T-102, steps SP/L-22 and SP/T-14, permit depressurization only if boren injection is not required. The PSTG requires depressurization regardless of whether boron injection is required.

Response

The wording "UNLESS BORON IS REQUIRED" has been removed from T-102 (ST).

Item 10

The Primary Containment Control procedure, T-102, step SP/L-8 has a note which states that at 17.8 feet suppression pool level, the Suppression Pool Temperature Monitoring System (SPOTMOS) temperature indication becomes invalid. The note does not direct the operator to use an alternate indication, in this case RHR pump suction temperature indication with an RHR pump in service.

Response

Note #2 of T-102 has been revised to add use of the RHR suction temperature indicator with the RHR pump running (ST).

Item 11

The Emergency Blowdown procedure, T-112, steps EB-1, EB-2 and EB-3, require the operator to SCRAM the reactor and enter the SCRAM procedure, T-100. This action is considered by the inspection team to be a redundant step since all T-112 entry conditions but one, T-102 DW/T, already direct the reactor to be scrammed prior to entering T-112.

Response

There are three entry conditions into T-112 (Emergency Blowdown) from T-102 (Primary Containment Control) that do not direct the reactor to be scrammed prior to entering T-112: T-102, SP/L (if suppression pool level is too low); T-102, DW/T; and T-102, PC/H. The deletion of the direction to SCRAM in T-112 will be addressed during the Human Factors revisions, expected to be completed by December 31, 1991.

Item 12

T-112 step EB-19 directed security HPCI on high suppression pool level. This is considered to be redundant due to this guidance appearing in T-102.

Response

Step EB-19 of T-112 has been deleted (ST).

Item 13

The north and south stack process radiation monitor HI-HI alarm setpoints, used as entry conditions into the Radioactivity Release Control procedure, T-104, are conservative with respect to the BWR Owners Group Emergency Operating Procedure (EOP) Guideline entry condition requirement of "release rate above the offsite release rate which requires an Alert." The T-104 entry conditions are satisfactory with respect to monitored releases, but do not directly address the unmonitored release path scenario.

Response

T-104 has been revised to show an entry from EP-101 (ST). EP-101 has been revised to give direction to enter T-104 on appropriate radiological conditions (ST). The PSTG has been revised to incorporate the above changes (ST).

Control Room and Plant Walkdowns, Sections 5.0 and 10.0

Item 1

Based on walkdowns performed during the EOP Inspection, the glare from the plexiglass covering the flowcharts in the Main Control Room (MCR) is excessive. The glare makes it difficult to use the procedures.

Response

TRIP procedure flowcharts in the Main Control Room (MCR) have been laminated with a dull finish laminate to reduce the glare caused by the plexiglass.

Item 2

Non-licensed operators (NLOs) occasionally had difficulty in locating infrequently operated valves during the walkdown of the T-200 series procedures.

Response

Plant area maps were added to the T-200 Series procedures to assist operators in locating equipment in the plant.

Simulator, Section 6.0

Item 1

One of the comments noted during the plant walkdown was that the curves in the Safety Parameter Display System (SPDS) in the plant do not agree with the curves in the TRIP procedures. The SPDS was not used by operators in the simulator because it is not yet functional in the simulator.

Response

The SPDS curves are being revised to agree with those in the TRIP procedures. These changes are nearly complete with final testing expected to be completed by March 31, 1991. SPDS is scheduled to be incorporated into the Licensed Operator Requalification Training program during the first training quarter of 1991.

Item 2

The current location of the SPDS monitors is not conducive for use by the shift supervisor while using the TRIP procedures. The SPDS monitors are located on the shift supervisors desk and the reactor operators computer desk. The TRIP procedures are used by the shift supervisor on the back of the reactor operators computer desk. Neither monitor is visible to the shift supervisor.

Response

A detailed study is being performed to determine the best technical and economical solution for providing a SPDS monitor that is visible by the shift supervisor while using the TRIP procedures. This study is expected to be completed by December 31, 1992.

Human Factors Review of the EOPs, Unresolved Item 90-80-02,
Section 7.0

Item 1

Two principal human factors concerns about the TRIP flowcharts were identified: size and complexity. T-101 (RPV Control) and T-102 (Primary Containment Contr. are inconvenient to use because of their dimensions. The size of the flowcharts is related to the wording of the step instructions which are frequently long and complex.

Response

A Human Factors review was performed in December 1990. This review included those specific items referenced in Attachment C of the NRC Inspection Report and other related comments throughout the report. Appropriate changes will be incorporated into the Human Factors revisions expected to be completed by December 31, 1991.

Item 2

Procedure A-94, "TRIP Writer's Guide," revision 5, provides minimum guidance for the preparation of TRIP satellite procedures (T-200 Series).

Response

Guideline NG-001, "Peach Bottom and Limerick TRIP procedure Writer's Guide (PSWG)," provides specific guidance on the preparation of TRIP satellite procedures (T-200 Series).

Item 3

It is possible to laydown T-101 and T-102 side by side in the simulator which is not possible in the control room, given the flowchart laydown space in the control room.

Response

An evaluation is being performed to determine if any adjustments of the TRIP procedure flowchart laydown area in the simulator is necessary. This evaluation is expected to be completed by May 31, 1991.

Walkdown Comments, Attachment B

Item 1

Many of the T-200 series procedures contain sets of steps which install jumpers or lift leads. However, the purpose for performing each step is not always obvious.

Response

Descriptive text for each major set of jumper/lifted lead steps will be added to the T-200 Series procedures as part of their periodic reviews. These revisions are expected to be completed by June 30, 1992.

Item 2

Inspectors noted that some of the area maps and signs formerly located at the tops of stairwells and entrances to areas have fallen down, or are missing. This makes it more difficult for operators to locate infrequently operated components which are required to be operated in the T-200 series procedures.

Response

Plant area maps were added to the T-200 Series procedures to assist operators in locating equipment in the plant.

Item 3

Step RC/P-8 of T-101 has the operator open the Main Steam Isolation Valves (MSIVs) to provide a heat sink, using procedure T-221 if necessary. T-101 did not "Restore Instrument Air" after a LOCA signal per procedure SE-10, nor did T-221 restore instrument air to the outboard MSIVs. Without instrument air, the outboard MSIVs could not be opened.

Response

We added the proper steps to T-221 prior to the inspection team departing the site (ST). We determined that a revision of T-101 is not required for this concern.

Item 4

The T-102 related curves in the SPDS did not match the current revision of the BWR Owners Group EOPs. SPDS does caution the operators that the curves currently in SPDS are not valid for use with the TRIP procedures.

Response

The SPDS curves are being revised to agree with those in the current revision of the BWR Owners Group EOPs and the LGS TRIP procedures. These changes are nearly complete with final testing expected to be completed by March 31, 1991.

Item 5

Curve PC/P-3 (Primary Containment Pressure Limit) of T-102 asks for Drywell Pressure on recorder PR57-*01 to calculate containment level. The recorder is labeled "Pri Cont Atm" versus "Drywell Pressure".

Response

The TRIP flowchart was corrected to agree with the recorder (ST).

Item 6

In step RF-19 of T-116, "RPV Flooding," the operator is directed to check for a 69 psid pressure difference between the Reactor Pressure Vessel (RPV) and the Suppression Pool (SP). The RPV pressure instrument has 20 psig scale increments and the SP instrument has 5 psig scale increments. A 69 psid would be difficult to read.

Response

The 69 psid has been changed to 70 psid (ST).

Item 7

The borax and boric acid stored in the locker near the SLC tank would be of little use for filling the Control Rod Drive (CRD) pump suction strainer body, as it would need to be transported down three floors and from the reactor enclosure building to the turbine building. The locker contains no thermometer as specified in the procedure.

Response

A thermometer was added to the cabinet prior to the inspection team leaving the site. The T-211 procedure, "CRD System Boric Acid-Sodium Pentaborate Injection," has since been cancelled as recommended by the inspection team since this procedure is difficult to implement and more desirable methods are available (ST).

Item 8

The handswitch for SV-57-201 also controls SV-52-239, but is not labeled as such on the control board. (The inspection report referenced the second valve as SV-57-239).

Response

PECo Nonconformance Report NCR L90-259 was generated to relabel the handswitch. The response to this NCR was completed on January 30, 1991, and the corrective action is expected to be completed by June 30, 1991. In addition, review of remaining control room handswitches was completed and discrepancies were identified and are expected to be addressed by March 31, 1991, with corrective actions expected to be completed by August 31, 1991.

Human Factors Examples, Attachment C

Item 1

Administrative Procedure A-94, "TRIP Writer's Guide," provides no guidance for the writing of logic statements and minimizing their complexity.

Response

Guidance for writing logic statements for both T-100 and T-200 Series procedures is included in guideline NG-001, "Peach Bottom and Limerick TRIP Procedures Writer's Guide (PSWG)." Guideline NG-001 also provides guidance for minimizing the complexity of procedural steps.

Guideline NG-002, "Verification and Validation Program for Peach Bottom and Limerick TRIP Procedures," has checklists to verify correct use of logic statements.

Item 2

A-94 does not define a very effective way of using color in the flowcharts.

Response

Guideline NG-001 specifies use of color in TRIP procedures and the applicable checklist from guideline NG-002 verifies the appropriate use.

Item 3

A-94 does not fully state the conventions for presenting referencing instructions (i.e., instructions to execute another procedure

concurrently) and branching instructions (i.e., instructions to leave the present procedure or branch and go to another procedure). In the flowcharts, references to T-200 procedures are put in command boxes. References to T-100 procedures are put in special symbols unless the reference is conditional, in which case it appears in the recheck step command symbol. These practices were found to be used consistently, but they are not mentioned in A-94. References to non-TRIP procedures are not treated as consistently. Sometimes they are in the command box and sometimes in the reference symbol. Examples of this inconsistency are given in the findings related to the TRIP procedures.

Response

Guideline NG-001 provides direction for formatting referencing and branching instructions and the applicable Plant Specific Writer's Guide (PSWG) verification checklists from guideline NG-002 verify the appropriate use.

Item 4

A-94 specifies that flow lines are to be darker than the flowchart symbols. The difference in line intensity is substantial. The guidance is inconsistent with the recommended practice (as indicated in NUREG/CR-5228).

Response

NUREG/CR-5228 was reviewed and guideline NG-001 was issued containing appropriate guidance for line weight 1 (thin) for all flowchart symbols and line weight 6 (thick) for flow lines. However, line weights may vary as required to improve clarity.

Item 5

A-94 does not provide guidance on the method of verification, i.e., it does not say what will be done to verify a procedure or procedure revision. A-94 also provides no guidance on how problems identified during this verification will be resolved.

Response

The V&V guideline, NG-002, divides verification into two categories; technical verification and PSWG verification. There are technical verification checklists for the T-100 and T-200 series procedures which check the technical accuracy of the procedure. The checklists from guideline NG-002 ensure that the guidance from the PSWG is incorporated into the procedures. All checklists have a "Discrepancies Identified" section, and a "Discrepancy Resolution" section. The V&V guideline requires that the TRIP Procedure Program Manager develops resolutions to any discrepancies, and present them to the identifier. The identifier must approve of the resolutions, or

the discrepancy must be presented to the responsible senior staff member.

Items 6 and 7

A-94 does not provide guidelines for determining when verification is required and when validation is required. These decisions are left to the discretion of the procedure writer who makes recommendations to the Plant Operations Review Committee (PORC). Additionally, A-94 does not make it completely clear that verification and validation apply to satellite procedures (T-200 series) as well as to the flowcharts. Of particular concern is the need to make sure that satellite procedures are walked down in sufficient detail to make sure that they are accurate, feasible, and appropriate for the emergency situation; that the in-plant components involved can be readily located; and that the tools, materials, and equipment needed to perform the tasks are available.

Response

NGAP NA-11T001 specifies that V&V shall be performed on all new TRIP procedures, as well as significant revisions to all T-100 and T-200 series procedures. The V&V guideline, NG-002, specifies that V&V is not required for minor revisions as determined by the responsible senior staff member. Minor revisions are defined in guideline NG-002.

Status of the Review of the PBAPS TRIP Procedures Regarding the LGS Inspection Findings

Since the inspection in May 1990, the PBAPS TRIP Upgrade Program included consideration of concerns expressed by the NRC staff in the inspection report. A review of the generic and applicable specific findings of the inspection report was made and the PBAPS TRIP procedures were revised by November 19, 1990, to address the concerns in technical content, support, implementation, and development process. One minor revision to the TRIP procedure bases and an Operator Aid are left to be completed and are expected to be completed by April 30, 1991 to alert operators to the effective level range of the SPOTMOS instruments.

Status of the Incorporation of the LGS Inspection Findings into the Nuclear Group Administrative Procedures

Nuclear Group Administrative Procedure (NGAP) NA-11T001, "TRIP Procedures Program for Limerick and Peach Bottom, "Nuclear Guideline NG-001, "Peach Bottom and Limerick TRIP Procedures Writer's Guide," and NG-002, "Verification and Validation (V&V) Program for Peach Bottom and Limerick TRIP Procedures," were approved by PBAPS and LGS by November 9, 1990, which incorporate the inspection findings.