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 FACIL: 50-387 SUSQUEHANNA STEAM ELECTRIC STATION UNIT 1, PENNSYLV
 50-388 SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2, PENNSYLV
 AUTH. NAME: CURTIS, N.W. AUTHOR AFFILIATION: PENNSYLVANIA POWER & LIGHT CO.
 RECIP. NAME: GRIER, B.H. RECIPIENT AFFILIATION: REGION 1, PHILADELPHIA, OFFICE OF THE DIRECTOR

DOCKET #
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SUBJECT: FORWARDS ADDL INFO TO 780228 LTR RE POTENTIAL DEFICIENCY IN COAX CABLE. BETHEL & RAYCHEM INVESTIGATIONS CONCLUDE NO VIOLATIONS OF QA PROCEDURES OCCURRED.

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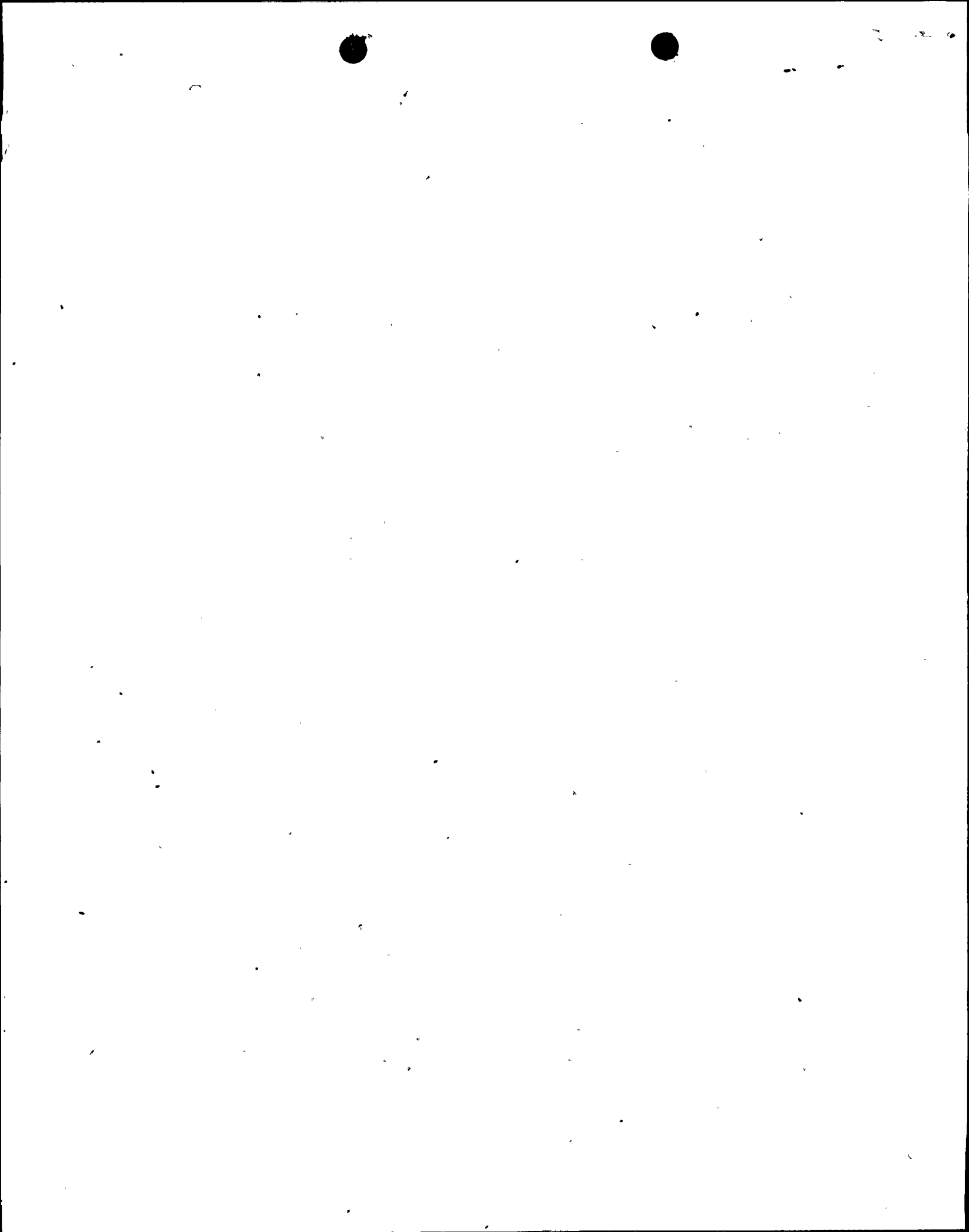
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	08	MPA	1	1	09	DEPY DIR DPM	1	1
	10	QAB	1	1	11	STANDRDS DEV	1	1
	12	JORDAN, E/IE	1	1	13	FIELD COOR/IE	1	1
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NORMAN W. CURTIS
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821-5381

April 19, 1979

Mr. Boyce H. Grier
Director, Region I
U. S. Nuclear Regulatory Commission
612 Park Avenue
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SUSQUEHANNA STEAM ELECTRIC STATION
EVALUATION OF A POTENTIAL DEFICIENCY
IN COAX CABLE (8856-E-131-BC)
DOCKET NOS: 50-387 & 50-388
LICENSE NOS: CPPR-101 & CPPR-102
ERS 100450/100508 FILE 840-4
PLA-347

Dear Mr. Grier:

This supplements our letter, PLA-328 dated February 28, 1978, in which we informed you of a potentially reportable deviation, as provided for under 10CFR 50.55(e). The condition related to defects found in coaxial cable manufactured by Raychem Corporation under purchase specification 8856-E-131-BC. This supplement is submitted to advise you and formally document the fact that, based upon subsequent evaluation by Bechtel and Raychem, PP&L has concluded that the condition is not reportable under 10CFR 50.55(e).

The defect originally detected consisted of bubbles in the clear colorless polyolefin (second insulation), through which the white polyarylene polymer (first insulation) was observed to be missing when the outer jacket was removed.

Bechtel and Raychem examined all cables, designated as Q09, which had been shipped to the Susquehanna site in order to identify and segregate all reels which could possibly contain such defects. During this examination, several lumps were found at various locations on the cable. These lumps appeared similar to the bubble type/missing insulation defect described above, but through subsequent inspection, the lumps proved to be the result of either braided splices in shielding or a slight thickening of the dielectric due to surges during the extrusion process. Neither condition affects cable performance and is considered an acceptable part of the manufacturing process; however, Bechtel subsequently submitted for retesting by Raychem a four foot length of cable containing the thickened dielectric. The results of this retesting confirmed the acceptability of the cable performance.

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Bechtel and Raychem examinations confirmed that the defects were confined to one production lot of cable at SSES, particularly cable reels 1-Q09-3, -4, -8 and 2-Q09-3. The remaining 8, 775 feet of this lot were located in inventory at the Raychem facility.

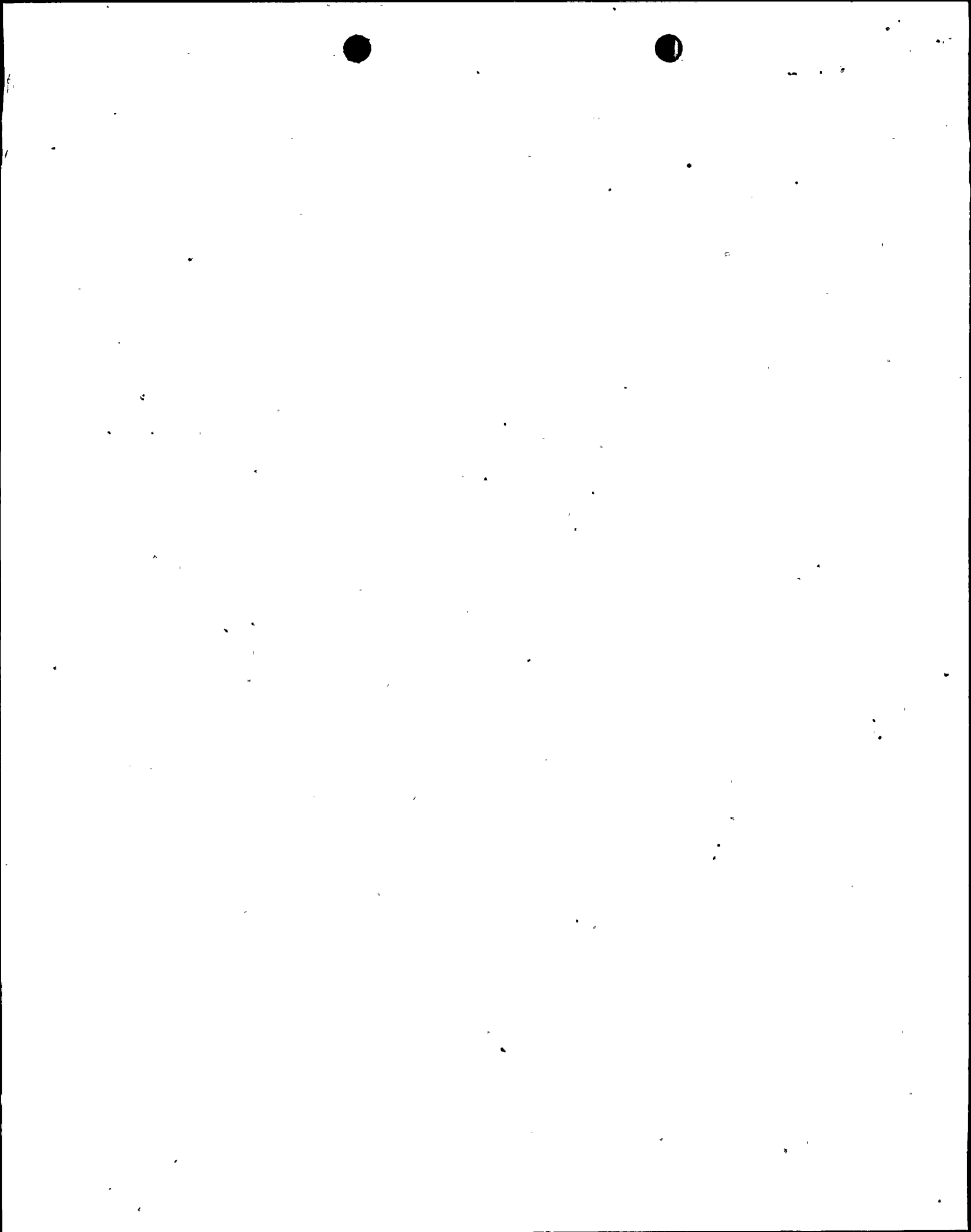
Raychem identified the source of the bubble type/missing insulation defect as conductor splices made during manufacturing. Such splices, which are normally removed as part of the manufacturing process, were not removed prior to shipment of the reels in question. As the cable is manufactured, the conductor splice is made by removing about 2 inches of the first insulation from the conductor; then the conductor ends are joined together by silver soldering. The next processing step is the application of the second insulation, the polyolefin dielectric. This clear, colorless dielectric is applied by an extrusion process. After the conductor splice has passed the extruder head, annular voids form between the polyolefin and the bare conductor. These voids are easily visible through the polyolefin and result in a cable cross sectional area which is approximately 90% larger than the adjacent standard cable.

In analyzing the safety implication due to the presence of a conductor splice, Bechtel determined that short circuiting between the conductor and shield could result if the following conditions existed:

- (a) High temperature as experienced in the containment during a LOCA
- (b) Absence of the first insulation.
- (c) A bend in the cable at the location where the first insulation is missing.

Considering the conditions described above, the end use of this cable was investigated and the following conclusions reached:

- The Q09 cable is used only outside of the containment and will not be subjected to the LOCA temperatures. Therefore, even if the spliced area had been installed, the absence of the first layer of high temperature insulation in the spliced area could not degrade the electrical circuits.
- Only two safety related circuits, the Average Power Range Monitor (APRM) and the Local Power Range Monitor (LPRM), use the Q09 cable. Both of these circuits are designed so that a failure of the Q09 cable would not present a safety hazard. The Q09 cable runs from termination cabinets to the outboard containment side of electrical penetrations.



A 100 foot sample containing conductor splices was retested by Raychem and exhibited electrical characteristics which are within the requirements of specification 8856-E-131. However, in the interest of conservatism, the spliced areas will be removed and will not be allowed for use at the Susquehanna site and the disposition of Bechtel NCR-3447 so stipulates.

In addition to the investigation conducted by Raychem, Bechtel requested that the use of similar Raychem coax cable types supplied to the site as part of Westinghouse specification E-135 for electrical penetrations and General Electric specification J-1 for the PGCC Advanced Control Room System be investigated for the presence of any similar conductor splice condition.

GE concluded its investigation and has determined that the condition identified by Bechtel was not evident in cables used in the fabrication of J-1 PGCC components at their San Jose facility. Bechtel field forces have committed to examine, on a sampling basis, cable in J-1 PGCC/ACR system components presently on site in order to provide an independent verification of the GE response.

Bechtel field forces have also examined eight (8) Westinghouse penetrations furnished under specification 8856-E-135 and have found no defects in similar coax cable. Westinghouse has not yet advised Bechtel of the results of its investigation.

Should the results of the Westinghouse investigation and/or subsequent Bechtel field inspection of the GE PGCC/ACR system prove otherwise, the Commission will be advised promptly; however, we reaffirm that the condition is presently deemed not reportable under 50.55(e) based on the following reasons:

- (a) There are no violations of QA procedures. The manufacturing step omitted was not included as a Raychem inspection checkpoint. Raychem stated that if uninterrupted lengths of cable do not meet the Bechtel minimum length requirement, the length will be replaced. Should it be necessary to manufacture additional small quantities of cable, Raychem has committed to the insertion of a quality control inspection point to insure that conductor splices are detected and removed at manufacture.
- (b) The cable passed all of the required electrical tests. Samples with splices included were retested and met the specifications.
- (c) The problem is limited to one production run of cable and all of this cable is accounted for.
- (d) None of the Q09 cable is used inside the containment.
- (e) Only two safety related circuits use Q09 cable, and a cable failure in these circuits would not present a safety hazard.

April 19, 1979

The results of the Bechtel and Raychem investigation, MCAR-1-30 and NCR-3447 are available for review by your inspection personnel at the Susquehanna site.

Very truly yours,



N. W. Curtis
Vice President-Engineering & Construction

ARS/JRB:mcb

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