



**Commonwealth Edison**  
 72 West Adams Street, Chicago, Illinois  
 Address Reply to: Post Office Box 767  
 Chicago, Illinois 60690 - 0767

April 4, 1989

U.S. Nuclear Regulatory Commission  
 Attn: Document Control Desk  
 Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3  
 Quad Cities Station Units 1 and 2  
 Zion Station Units 1 and 2  
 LaSalle County Station Units 1 and 2  
 Byron Station Units 1 and 2  
 Braidwood Station Units 1 and 2  
 Status of NRC Bulletin 88-10  
 NRC Docket Nos. 50-237/249, 50-254/265, 50-295/304,  
50-373/374, 50-454/455, and 50-456/457

Reference: (a) NRC Bulletin No. 88-10, dated November 22, 1988.

Dear Sir:

Reference (a), addressed to all holders of operating licenses or construction permits for nuclear power reactors, requested that addressees take actions to provide reasonable assurance that molded-case circuit breakers purchased for use in safety-related applications without verifiable traceability to the circuit breaker manufacturer perform their safety function.

This letter provides Commonwealth Edison's initial response to Reference (a). The attached response provides the current status of actions taken to date, and those actions planned, to meet the requirements of Reference (a).

Please address any questions that you or your staff may have concerning this response to this office.

Respectfully,

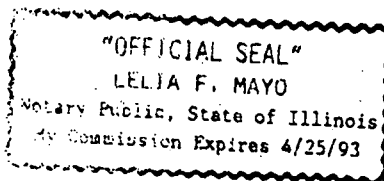
*Milton H. Richter*

M. H. Richter  
 Nuclear Licensing Administrator

rf/5611k-6  
 cc: A. B. Davis  
 Resident Inspectors - D/QC/LSC/Z/BY/BW

Subscribed and Sworn to  
 before me this 4th day  
 of April, 1989

*Lelia F. Mayo*  
 Notary Public



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**Commonwealth Edison Company Response  
NRC Bulletin 88-10  
Nonconforming Molded-Case Circuit Breakers**

NRC Bulletin 88-10 (Bulletin) requested that licensees take actions to provide reasonable assurance that molded-case circuit breakers (MCCBs) purchased for use in safety-related applications without verifiable traceability to the circuit breaker manufacturer (CBM) perform their safety functions. This response provides the current status of actions taken to date, and a description of the actions planned, in order to comply with the requirements of the Bulletin at each Commonwealth Edison (Edison) nuclear power station.

Since Reporting Requirement 1.c requested confirmation on Actions 1 through 7, this response was formatted to follow the Actions requested. Some of the Actions have been combined for presentation purposes. The responses apply to all Edison nuclear stations unless noted otherwise.

**Actions 1 and 2**

1. All addressees are requested to perform the following review by March 1, 1989:
  - a. Identify all molded-case CBs purchased prior to August 1, 1988, that are being maintained as stored spares for safety-related (Class 1E) applications or commercial grade CBs that are being maintained as stored spares for future use in safety-related applications; this includes CBs purchased from a CBM or from any other source. If the number of these stored spare CBs is less than 50 at a nuclear plant site, then randomly select CBs purchased between August 1, 1983 and August 1, 1988 that have been installed in safety-related applications as replacements or modifications to form a minimum sample of 50 CBs per nuclear plant site.
  - b. Verify the traceability of these CBs.
  - c. Identify the number, manufacturer, model number, and to the extent possible the procurement chain for all those CBs identified in (1a) that cannot be traced to the CBM. For installed CBs, also identify each system in which they are/were installed.
2. All holders of operating licenses who identify installed CBs per item 1 that cannot be traced to a CBM are requested to prepare, within 30 days of the completion

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of each item, an analysis justifying continued operation until items 1 through 5 of the actions requested in this Bulletin have been completed.

### Response

Edison has performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The total quantity of breakers found in stock is presented below.

| <u>BRAIDWOOD</u>    | <u>BYRON</u> | <u>DRESDEN</u> | <u>LASALLE</u> | <u>QUAD CITIES</u> | <u>ZION</u> |
|---------------------|--------------|----------------|----------------|--------------------|-------------|
| 783                 | 281          | 76             | 149            | 238                | 124         |
| <u>TOTAL: 1,651</u> |              |                |                |                    |             |

Requests for traceability information were sent to all non-CBM suppliers of these breakers. Procuring traceability information from suppliers was found to be very time consuming due to the number of breakers involved. Table 1 presents the results of Edison's search thus far for documented traceability to the CBM. Additional information on the breaker inventory and traceability verification are presented on Tables 2 and 3. For further details on a station specific basis, see Attachments A through F of this response. These Attachments summarize pertinent breaker information (i.e., manufacturer, model number, procurement chain) to satisfy reporting requirement 1.b.

Edison's Quality Assurance (QA) Department is presently performing audits of the MCCB suppliers. The results of these audits will substantiate the traceability status for breakers listed as "No\*" and "Yes\*" on Tables 1 and 3. The Edison QA audits being performed will review the supplier's procurement processes and verify the validity of non-CBM supplied traceability documentation. For each supplier, the audits cover every applicable purchase order. Priority is being given to complete audits of Edison's primary MCCB suppliers, Westinghouse Electric Supply Company and General Electric Supply Company, by May 1, 1989. Audits of other suppliers will be reviewed on a case-by-case basis to determine if special audits are justifiable or whether new replacement breakers should be procured. In either case, it is expected that disposition of all breakers covered by this Bulletin will be completed by June 1, 1989, and a final report on the results of Action 1 will be provided within 30 days of completion.

At this time, each station has controls in place to prevent installation of those breakers in stock, in safety-related applications, which have not been verified by Edison QA audits to be traceable to the CBM. The response to Action 7 contains further discussion on this item.

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No analyses were required for justifying continued operation since all of the breakers identified for Action 1 at each station were stored spares.

### Action 3

All addressees who identify 80 percent or more CBs traceable to the CBM per item 1 are requested to test the CBs that are not traceable to the CBM in accordance with the test program described in Attachment 1 of the Bulletin. Any installed CBs that fail any of these tests should be replaced with CBs that meet the criteria of item 7 of the actions requested or CBs that pass all the tests in accordance with the testing program described in Attachment 1 of the Bulletin. If more than 10 percent of the CBs tested fail any of the tests described in Attachment 1 of the Bulletin, continue with item 4; otherwise, proceed to item 6 of the actions requested.

Holders of operating licenses are requested to complete this testing program before startup from the first refueling outage beginning after March 1, 1989. Holders of construction permits are requested to complete this testing program before fuel load.

### Response

It is Edison's understanding, through Nuclear Management and Resources Council (NUMARC) correspondence, that the NRC will not require testing of stored non-traceable MCCBs provided that those breakers are considered "failed" within the context of the Bulletin. Edison does not believe sufficient benefits exist to warrant testing all of the stored non-traceable MCCBs. Therefore, Edison does not plan on testing the stored non-traceable MCCBs at any station unless situations develop during the performance of the Bulletin (i.e., Action 5 of the Bulletin) which would require that a tested, non-traceable breaker be installed in a safety-related application. This action would only be taken to prevent an operational impact on a unit (i.e., a unit shutdown, extension of a unit outage, etc.).

Edison will retain for one year the non-traceable breakers removed from stock for possible future evaluation or to aid in NRC or NUMARC investigations of suppliers. It should be noted that these breakers may be used in safety-related applications as described in the previous paragraph, or possibly downgraded for use in non-safety related applications following appropriate pre-installation inspection/testing.

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**Actions 4 and 2**

4. All addressees who identify less than 80 percent of the CBs traceable to the CBM per item 1 or who identify a failure rate of more than 10 percent for the CBs tested per item 3 are requested to perform the following actions:
  - a. Identify all molded-case CBs that have been purchased between August 1, 1983 and August 1, 1988, and installed in safety-related applications as replacements or installed during modifications.
  - b. Verify the traceability of these CBs.
  - c. Identify the number, manufacturer, model number, system in which they are/were installed, and to the extent possible, the procurement chain for all those CBs identified in (4a) that cannot be traced to the CBM.
2. All holders of operating licenses who identify installed CBs per item 4 that cannot be traced to a CBM are requested to prepare, within 30 days of the completion of each item, an analysis justifying continued operation until items 1 through 5 of the actions requested in this Bulletin have been completed.

**Response**

A review of the breaker inventory and traceability data (on Table 1) reveals that MCCBs in stock at Dresden, Quad Cities, and Zion Stations will not meet the 80 percent traceability criteria. This was mainly caused by the lack of available supplier documentation due to the age of the purchase. Therefore, these stations have begun efforts to identify the MCCBs installed in safety-related applications between August 1, 1983 and August 1, 1988, and determine traceability to the CBM. It is expected that this action will be completed by June 1, 1989. As requested by reporting requirement 1.b of the Bulletin, a report will be submitted 30 days following the completion of Action 4 for each applicable station.

The analysis for justifying continued operation for installed breakers which are determined to be non-traceable has been performed on a generic basis by Edison. The evaluation is presented on Attachment G of this response. Edison believes this evaluation, which applies to all stations, fulfills the requirement for any installed breaker determined to be non-traceable. Therefore, Edison believes Action 2 of the Bulletin has been completed.

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It is Edison's understanding, through NUMARC correspondence, that the NRC will consider on a case-by-case basis relieving stations, with a very small number of non-traceable MCCBs in stock, of Actions 4 and 5 (testing/replacement program for non-traceable breakers which are installed). Based on the anticipated high traceability percentages (See Table 1) for Byron, Braidwood and LaSalle Stations, and the relative age of the stations (i.e., early in plant life), Edison believes that Byron, Braidwood and LaSalle Stations warrant consideration for relief from Actions 4 and 5. Edison will provide a separate submittal requesting the NRC consideration and concurrence on this matter when the Edison Quality Assurance Department audits are completed (see response to Bulletin Actions 1 and 2).

#### Action 5

All addressees who identify installed CBs that cannot be traced to the CBM per item 4 are requested to replace these CBs with components that meet criteria of item 7 of the actions requested or to test them in accordance with the program described in Attachment 1 of the Bulletin; CBs that fail any of these tests should be replaced with CBs that meet the criteria of item 7 of the actions requested or CBs that pass all tests in accordance with the test program described in Attachment 1 of the Bulletin.

Holders of operating licences are requested to replace or to test at least one-half, or all if the total number is less than 75, of these installed CBs before startup from the first refueling outage beginning after March 1, 1989. The remaining CBs should be replaced or tested before startup from the second refueling outage beginning after March 1, 1989.

#### Response

For the stations who will be performing Actions 4 and 5, Edison intends to meet the requirements (test/replace) and schedule outlined in Action 5 provided appropriate traceable breakers can be procured to support outage schedules (see Table 4 for refueling outage schedules). A survey is being conducted of traceable breakers (throughout the Edison nuclear system) which could serve as replacements for potentially non-traceable breakers presently installed. Edison will be in a better position to evaluate the concern of breaker availability following the performance of Action 4. It should be noted that the three stations (Dresden, Quad Cities, Zion) who will be definitely performing Action 5, presently have a very depleted inventory of traceable breakers, therefore, actions have begun to procure traceable breakers to replace those breakers which have been determined

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to be non-traceable.

Edison will notify the NRC in a timely manner if problems meeting the requirements and schedule of Action 5 are anticipated or encountered. If the requirements for Action 5 cannot be accomplished by the completion of the first refueling outage, the requirements will be performed by the completion of the second refueling outage for the unit.

Prior to issuance of the Bulletin during Edison's review of NRC Information Notice 88-46 (and associated supplements), it was determined that Dresden Unit 2 had a MCCB from one of the "suspect" suppliers installed in a safety-related application. This breaker was subsequently tested, in accordance with the Bulletin, during the recent Unit 2 refuel outage. Further details on this situation, and subsequent breaker testing, can be found in Attachment C.

#### Action 6

*Information generated while performing the actions requested in items 1, 2, 3, 4, and 5 should be documented and maintained for a period of 5 years after completion of all requested actions.*

#### Response

Edison will maintain the records generated during the performance of the Bulletin for the period requested.

#### Action 7

*With the exception of the actions taken in response to items 3 and 5 of the actions requested, molded-case CBMs installed in safety-related applications after August 1, 1988 should be:*

- a. *Manufactured by and procured from a CBM under a 10 CFR 50, Appendix B, program; or*
- b. *Procured from a CBM or others with verifiable traceability to the CBM, in compliance with applicable industry standards, and upgraded to safety-related by the licensee or others using an acceptable dedication program.*

#### Response

As previously mentioned, at this time only MCCBs that meet the criteria of Action 7 are being maintained as stored spares for future use in safety-related applications at all stations. It should be noted that due to a misinterpretation

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of the Bulletin definition of "verifiable traceability", which was later clarified through NUMARC correspondence, Byron Station removed the initially applied controls on those spare breakers for which traceability documentation was received from the supplier (Yes\* breakers on Table 1). The controls were recently re-established and will remain in affect until the applicable Edison QA audits are completed. This action had no impact since none of the breakers were installed while controls were removed.

Procurement requirements for breakers to be used in safety-related applications are being revised so that future purchases will have verifiable traceability. This will basically be accomplished by requiring direct shipment from the CBM. Edison's corporate and station personnel are also reviewing commercial grade dedication practices/procedures to enhance the present dedication process and develop standardization among the Edison nuclear stations. This effort, which began prior to the issuance of the Bulletin, is ongoing at this time. In addition to these efforts involving safety-related applications, Edison is participating in the NUMARC Industry Initiative to ensure reliable performance of MCCBs used in non-safety related applications.

For those non-traceable breakers installed after August 1, 1988, efforts will be made to meet the requirements in Action 5 (test/replace) by the completion of the first refueling outage, subject to the availability of traceable replacing breakers. If the first refueling outage cannot be achieved, the requirements in Action 5 will be performed by the completion of the second refueling outage for the unit.

In regards to Action 7, Edison is very concerned about preventing the use of breakers determined traceable by supplier documentation prior to QA audit verification (Yes\* breakers on Table 1). Edison believes the immediate application of Action 7 has the potential for operational impact which is not necessary to accomplish the intent of the Bulletin. To avoid an operational impact on a unit, Edison believes use of a breaker based on supplier traceability documentation should be allowed prior to the completion of QA audit verification provided that a licensee 1) is making a conscientious effort to perform the required actions of the Bulletin, and 2) has a tracking system to identify breaker location following installation. If the QA verification should not substantiate the supplier's procurement process or documentation for the installed breaker, requirements and schedules similar to those in Action 5 should apply. Edison has made every effort to adhere to the requirements of Action 7 since issuance of the Bulletin, however an instance occurred at Braidwood Station which illustrates this concern. Further details on this situation can be found in Attachment A.



TABLE 1

## SUMMARY OF TRACEABILITY RESULTS IN TERMS OF PERCENTAGES

| TRACED TO | STATION |           |       |         |         |             | Total  |        |
|-----------|---------|-----------|-------|---------|---------|-------------|--------|--------|
|           | CBM     | BRAIDWOOD | BYRON | DRESDEN | LASALLE | QUAD CITIES |        | ZION   |
| NO        |         |           |       | 13.2%   |         | 28.2%       | 1.6%   | 4.8%   |
| NO*       | 3.7%    | 0.7%      |       | 60.5%   | 11.4%   | 53.8%       | 94.4%  | 20.5%  |
| YES       | 24.8%   | 42.0%     |       | 15.8%   | 81.2%   | 12.6%       | 4.0%   | 29.1%  |
| YES*      | 71.5%   | 57.3%     |       | 10.5%   | 7.4%    | 5.5%        |        | 45.6%  |
| Total:    | 100.0%  | 100.0%    |       | 100.0%  | 100.0%  | 100.0%      | 100.0% | 100.0% |

## SUMMARY OF TRACEABILITY RESULTS IN TERMS OF QUANTITIES

| TRACED TO | STATION |           |       |         |         |             | Total |       |
|-----------|---------|-----------|-------|---------|---------|-------------|-------|-------|
|           | CBM     | BRAIDWOOD | BYRON | DRESDEN | LASALLE | QUAD CITIES |       | ZION  |
| NO        |         |           |       | 10      |         | 67          | 2     | 79    |
| NO*       | 29      | 2         |       | 46      | 17      | 128         | 117   | 339   |
| YES       | 194     | 118       |       | 12      | 121     | 30          | 5     | 480   |
| YES*      | 560     | 161       |       | 8       | 11      | 13          |       | 753   |
| Total:    | 783     | 281       |       | 76      | 149     | 238         | 124   | 1,651 |

**No** - Not traceable to the CBM, due to "suspect" supplier or unknown source; must be replaced or tested.

**No\*** - Presently not traceable, mainly due to age of purchase or lack of supplier documentation. Edison's Quality Assurance Department will review supplier's procurement process to determine if any breakers can be declared traceable. Non-traceable breakers will be replaced or tested.

**Yes** - Traceable to CBM, based on direct procurement or shipment from the CBM; no further actions required.

**Yes\*** - Traceable per supplier documentation which shows traceability to the CBM. Verification by Edison's Quality Assurance Department is being performed.

TABLE 2  
CROSS REFERENCE OF MCCB SUPPLIERS

| SUPPLIER                         | STATION   |       |         |         |             |      | Total |
|----------------------------------|-----------|-------|---------|---------|-------------|------|-------|
|                                  | BRAIDWOOD | BYRON | DRESDEN | LASALLE | QUAD CITIES | ZION |       |
| COMBUSTION ENGINEERING           | 1         | 2     |         |         |             |      | 3     |
| COMSIP - DELPHI SYSTEMS DIV.     |           |       | 2       |         |             |      | 2     |
| CRESCENT ELECTRIC SUPPLY CO.     |           |       | 3       | 8       | 10          |      | 21    |
| CUTLER HAMMER                    |           |       |         |         | 5           |      | 5     |
| ENGLEWOOD ELECTRIC SUPPLY CO     |           |       |         | 6       |             |      | 6     |
| FARWELL & HENDRICKS              |           |       | 6       |         |             |      | 6     |
| GAMMA-METRICS                    | 2         | 1     |         |         |             |      | 3     |
| GENERAL ELECTRIC CO.             |           | 6     | 8       | 3       | 11          | 5    | 33    |
| GENERAL ELECTRIC SUPPLY CO.      | 2         |       | 41      | 14      | 78          | 93   | 228   |
| GRAYBAR                          |           |       |         |         | 18          |      | 18    |
| KLOCKNER - MOELLER               |           |       |         | 97      | 3           |      | 100   |
| NEWARK ELECTRONICS               | 4         | 3     |         |         |             |      | 7     |
| NUTHERM INTERNATIONAL INC.       |           |       | 4       |         | 43          |      | 47    |
| POWER CONVERSION PRODUCTS        | 2         | 2     |         |         | 2           |      | 6     |
| SUPPLIER UNKNOWN                 |           |       |         |         | 8           | 2    | 10    |
| WESTINGHOUSE CORP.               | 193       | 110   |         |         |             |      | 303   |
| WESTINGHOUSE ELECTRIC SUPPLY CO. | 579       | 157   | 12      | 21      | 60          | 24   | 853   |
| Total:                           | 783       | 281   | 76      | 149     | 238         | 124  | 1,651 |

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**TABLE 3**  
**CROSS REFERENCE OF TRACEABILITY RESULTS TO MCCB SUPPLIER**

| <u>SUPPLIER</u>                  | <u>TRACED TO CBM</u> |            |            |             | <u>Total</u> |
|----------------------------------|----------------------|------------|------------|-------------|--------------|
|                                  | <u>NO</u>            | <u>NO*</u> | <u>YES</u> | <u>YES*</u> |              |
| COMBUSTION ENGINEERING           |                      | 2          |            | 1           | 3            |
| COMSIP - DELPHI SYSTEMS DIV.     |                      |            |            | 2           | 2            |
| CRESCENT ELECTRIC SUPPLY CO.     |                      | 10         |            | 11          | 21           |
| CUTLER HAMMER                    |                      | 5          |            |             | 5            |
| ENGLEWOOD ELECTRIC SUPPLY CO     |                      |            |            | 6           | 6            |
| FARWELL & HENDRICKS              |                      |            |            | 6           | 6            |
| GAMMA-METRICS                    |                      |            |            | 3           | 3            |
| GENERAL ELECTRIC CO.             |                      |            | 33         |             | 33           |
| GENERAL ELECTRIC SUPPLY CO.      |                      | 222        | 6          |             | 228          |
| GRAYBAR                          |                      | 2          | 16         |             | 18           |
| KLOCKNER - MOELLER               |                      |            | 100        |             | 100          |
| NEWARK ELECTRONICS               |                      |            |            | 7           | 7            |
| NUTHERM INTERNATIONAL INC.       | 47                   |            |            |             | 47           |
| POWER CONVERSION PRODUCTS        |                      | 2          | 2          | 2           | 6            |
| SUPPLIER UNKNOWN                 | 10                   |            |            |             | 10           |
| WESTINGHOUSE CORP.               |                      |            | 303        |             | 303          |
| WESTINGHOUSE ELECTRIC SUPPLY CO. | 22                   | 96         | 20         | 715         | 853          |
| <u>Total:</u>                    | <u>79</u>            | <u>339</u> | <u>480</u> | <u>753</u>  | <u>1,651</u> |

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Table 4

SUMMARY OF PLANNED REFUELING OUTAGES  
FOR COMMONWEALTH EDISON STATIONS

| Station     | Unit | Present Planned Schedule for the<br>First and Second Refuel Outages<br>Starting After March 1, 1989 |                 |
|-------------|------|---|-----------------|
|             |      |   |                 |
| Braidwood   | 1    | September, 1989   | January, 1991   |
| Braidwood   | 2    | March, 1990   | September, 1991 |
| Byron       | 1    | January, 1990   | September, 1991 |
| Byron       | 2    | *September, 1990  | *February, 1992 |
| Dresden     | 2    | September, 1990   | March, 1992     |
| Dresden     | 3    | November, 1989  | March, 1991     |
| LaSalle     | 1    | September, 1989   | March, 1991     |
| LaSalle     | 2    | March, 1990   | January, 1992   |
| Quad Cities | 1    | September, 1989   | October, 1990   |
| Quad Cities | 2    | February, 1990  | September, 1991 |
| Zion        | 1    | September, 1989   | February, 1991  |
| Zion        | 2    | March, 1990   | September, 1991 |

\* Proposed - Pending Approval

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**ATTACHMENT A**  
**BRAIDWOOD STATION**

As required by Action 1.a of the Bulletin, Braidwood performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 783 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in Braidwood Table A. Of the seven hundred eighty three (783) MCCBs, two (2) were manufactured by General Electric Company, seven (7) were manufactured by Heineman Electric Company, two (2) were manufactured by Square D, and seven hundred seventy two (772) were manufactured by Westinghouse Electric Corporation.

The two (2) General Electric MCCBs were purchased from General Electric Supply Company. Of the seven (7) Heineman Electric MCCBs one (1) was purchased from Combustion Engineering, two (2) from Gamma-Metrics, and four (4) from Newark Electronics. The two (2) Square D MCCBs were purchased from Power Conversion Products. The Westinghouse MCCBs were supplied from two sources. One hundred ninety three (193) directly from Westinghouse Electric Corporation, and five hundred seventy nine (579) from Westinghouse Electric Supply Company.

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**Combustion Engineering (CE)** - One (1) Heineman breaker was procured from Combustion Engineering, the original equipment supplier/designer of the Reactor Vessel Level Indicating System (RVLIS) for which the replacement breaker was bought. The breaker was bought to the original design specification. Combustion Engineering is an Appendix B, 10 CFR Part 21 supplier. CE has stated that the circuit breaker was purchased through an authorized distributor of Heineman breakers and has supplied the station with a copy of the purchase order to Heineman. Edison QA verification of this information is required.

**Gamma-Metrics** - The two (2) Heineman MCCBs procured from Gamma-Metrics have been certified to the CBM under letter,

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dated February 8, 1989, by their QA Manager. Gamma-Metrics is the original equipment supplier/designer of the equipment for which the replacement breakers were bought. Edison QA verification of this information is required.

**General Electric Supply Company (GESCO)** - The two (2) General Electric MCCBs were procured from GESCO. GESCO would not supply any specific traceability documentation. However, according to an internal review, GESCO has advised all nuclear power facilities of MCCBs procured from non-manufacturer suppliers since 1986. GESCO's notification to CECo of such procurements did not list these breakers. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

**Newark Electronics** - Four (4) Heineman breakers were procured from Newark Electronics, an authorized distributor of Heineman breakers. Newark Electronics has supplied sample purchase order information showing direct purchase from Heineman. Edison QA verification of this information is required.

**Power Conversion Products (PCP)** - The two (2) Square D breakers procured from PCP have been traced to Interstate Electric who purchased them from Square D Corporation. This information was supplied verbally by the PCP QA Manager. PCP is trying to locate the invoice for this material. Edison QA verification of this information is required.

**Westinghouse Electric Corporation** - One hundred ninety three (193) Westinghouse MCCBs were procured directly from Westinghouse Electric Corporation with certification from the Nuclear Projects Supplier QA Manager. These breakers are therefore considered traceable to the CBM.

**Westinghouse Electric Supply Company (WESCO)** - Of the five hundred seventy nine (579) Westinghouse breakers procured through WESCO, five hundred fifty three (553) have been traced to Westinghouse Electric Corporation based on documentation searches performed by WESCO. The Station has received copies of these WESCO purchase orders to Westinghouse Electric Corporation for each Edison purchase order. Edison QA verification of this information is required.

Twenty five (25) breakers were procured from Westinghouse Electric Corporation according to WESCO records, however copies of invoices were not readily retrievable. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

The remaining one (1) Westinghouse breaker was received.

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with shipping papers from Westinghouse Corporation facilities. This breaker is therefore considered traceable to the CBM.

#### **Installation of Breaker Based on Supplier Documentation**

Since the issuance of the Bulletin, an instance occurred at Braidwood Station (Unit 2) where it became necessary to install a MCCB in a safety-related application prior to Edison QA audit verification. Traceability verification was verbally received from the supplier prior to installation and documentation was subsequently received. This breaker will be verified during the Edison QA audits. If traceability cannot be verified the breaker will be replaced/tested within the time frame specified in the response to Action 7.

- TABLE A - Braidwood Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM                          | SUPPLIER  | MANUFACTURER                    | PART NUMBER                   | S.I.#                          | STOCK QTY   | STATION DOC.  | 88-10 COMMENTS   |
|--|---|---------------------------------|-------------------------------|--------------------------------|---|---|--|
| NO*                                    | GENERAL<br>ELECTRIC SUPPLY<br>CO.   | GENERAL<br>ELECTRIC             | THED124020                    |                                | 1   | C OF C FROM GESCO                                       | CECO QA REVIEW REQUIRED  |
|  |   | GENERAL<br>ELECTRIC<br>SQUARE D | THED124020WL                  |                                | 1   | C OF C FROM GESCO                                       | CECO QA REVIEW REQUIRED  |
|  | POWER<br>CONVERSION<br>PRODUCTS<br>WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | WESTINGHOUSE                    | 1383150209 TYPE 772D76<br>CB1 |                                | 2   | C OF C FROM PCP   | PCP TO INTERSTATE P.O.; INTERSTATE TO SQ.D<br>(LOOKING FOR INVOICE)                    |
|  |   | WESTINGHOUSE                    | 5679D12G22                    | 762D37                         | 2   | C OF C FROM WESCO                                       | WESCO TO WESTINGHOUSE P.O. D55105-552729 -<br>NEED COPY                                |
|  |   | WESTINGHOUSE<br>WESTINGHOUSE    | EHB1030<br>HFB3020            | 771F77                         | 12<br>1   | C OF C FROM WESCO<br>C OF C FROM WESCO                  | DOCUMENTATION NOT AVAILABLE<br>WESCO TO WESTINGHOUSE P.O. D55105-552277 -<br>NEED COPY |
|  | WESTINGHOUSE  | QBHW1020                        | 767B25                        | 10                             | C OF C FROM WESCO                                     | SHIPPED FROM WESCO STOCK 5/18/88                        |  |
|  |   |                                 | Total:                        | 29                             |   |   |  |
| YES                                    | WESTINGHOUSE<br>CORP.   | WESTINGHOUSE                    | 5679D12G22                    | 762D37                         | 2   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | EHB1030                       |                                | 8   | C OF C FROM WESCO                                       | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB                           |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB                           |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB                           |                                | 6   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB                           |                                | 7   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3015                       |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3020                       | 775E60                         | 4   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3022ML                     |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3022ML                     | 775F60                         | 12  | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3025                       |                                | 2   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3030                       | 775G60                         | 4   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3040                       | 775H60                         | 13  | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3045L                      |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3045ML                     | 775B61                         | 44  | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3070                       |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3100                       | 775C61                         | 4   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3110ML                     |                                | 1   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3110ML                     | 775B62                         | 70  | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|  |   | WESTINGHOUSE                    | HFB3150                       | 775D62                         | 6   | C OF C FROM WESTINGHOUSE CORP.                          | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
| WESTINGHOUSE                           | HFB3190ML   | 775G62                          | 4                             | C OF C FROM WESTINGHOUSE CORP. | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM           |   |  |
| WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | WESTINGHOUSE  | QCHW1015                        |                               | 1                              | C OF C FROM WESCO & PACKING<br>LIST FROM WESTINGHOUSE | PACKING LIST FROM WESTINGHOUSE & WESCO<br>DOCUMENTATION |  |
|  |   |                                 | Total:                        | 194                            |   |   |  |
| YES*                                   | COMBUSTION<br>ENGINEERING<br>GAMMA-METRICS                                | HEINEMAN<br>ELECTRIC            | AM2-A3A-1-3                   | 771D30                         | 1   | C OF C FROM C.E.  | CE PROCURED FROM ELECT-MECH. TO HEINEMAN<br>DIRECTLY                                   |
|  |   | HEINEMAN<br>ELECTRIC            | 000222-001                    | 774D29                         | 2   | C OF C FROM GAMMA METRICS                               | CERT. FROM GAMMA-METRICS   |



- TABLE A - Braidwood Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                         | MANUFACTURER      | PART NUMBER  | S.I.#  | STOCK QTY | STATION DOC.       | 88-10 COMMENTS                |
|---------------|----------------------------------|-------------------|--------------|--------|-----------|--------------------|-------------------------------|
| YES*          | NEWARK ELECTRONICS               | HEINEMAN ELECTRIC | AM2-A3A-10-2 | 771F28 | 2         | C OF C FROM NEWARK | NEED TO VERIFY VENDOR INFO    |
|               |                                  | HEINEMAN ELECTRIC | AM2-A3A-15-2 | 771G28 | 2         | C OF C FROM NEWARK | NEED TO VERIFY VENDOR INFO    |
|               | WESTINGHOUSE ELECTRIC SUPPLY CO. | WESTINGHOUSE      | HFB3015      | 767B24 | 60        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3020      | 767C24 | 30        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3022ML    | 767B26 | 70        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3025      | 772C25 | 15        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3030      | 767D24 | 18        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3040      | 767E24 | 70        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3045ML    | 767C26 | 30        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3050      | 773E97 | 10        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3070      | 767F24 | 60        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3100      | 767G24 | 30        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3110ML    | 767D26 | 69        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3125      | 767H24 | 29        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3150      | 773A78 | 15        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3190ML    | 767E26 | 45        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW1030     |        | 2         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |

Total: 560

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Total: 783  
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**ATTACHMENT B**  
**BYRON STATION**

As required by Action 1.a of the Bulletin, Byron performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 281 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in Byron Table B. Of the two hundred eighty one (281) MCCBs, six (6) were manufactured by General Electric Company, six (6) were manufactured by Heineman Electric Company, and two hundred sixty nine (269) were manufactured by Westinghouse Electric Corporation.

The six (6) General Electric MCCBs were purchased directly from General Electric Company. Of the six (6) Heineman Electric MCCBs two (2) were purchased from Combustion Engineering, one (1) from Gamma-Metrics, and three (3) from Newark Electronics. The Westinghouse MCCBs were supplied from three sources. Two (2) MCCBs were purchased from Power Conversion Products, one hundred fifty seven (157) from Westinghouse Electric Supply Company (WESCO), and one hundred ten (110) from Westinghouse Electric Corporation.

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**Combustion Engineering (CE)** - Two (2) Heineman breakers were procured from Combustion Engineering, the original equipment supplier/designer of the Reactor Vessel Level Indicating System (RVLIS) for which the replacement breakers were bought. The breakers were bought to the original design specification. Combustion Engineering is an Appendix B, 10 CFR Part 21 supplier. CE has stated that the circuit breakers were purchased through an authorized distributor of Heineman breakers and has supplied copies of the purchase orders for the breakers CE passed through to Edison. Edison QA will review the procurement practices of CE and appropriate distributor facilities to determine if these breakers can be declared traceable.

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**Gamma-Metrics** - The one (1) Heineman MCCB procured from Gamma-Metrics has been certified to the CBM under letter, dated February 8, 1989, by their QA Manager. Gamma-Metrics is the original equipment supplier/designer of the equipment for which the replacement breaker was bought. Edison QA verification of this information is required.

**General Electric Company** - All six (6) General Electric MCCBs were procured directly from General Electric Company with certification from Nuclear Product and Engineering Services. These breakers are therefore considered traceable to the CBM.

**Newark Electronics** - Three (3) Heineman breakers were procured from Newark Electronics, an authorized distributor of Heineman breakers. Newark Electronics has supplied sample purchase order information showing direct purchase from Heineman. Edison QA verification of this information is required.

**Power Conversion Products (PCP)** - The two (2) Westinghouse breakers procured from PCP have been traced to WESCO who purchased them from Westinghouse Electric Corporation. This documentation was supplied by PCP under letter dated February 27, 1989 from their QA manager. It included certification from Westinghouse Electric Corporation dated November 9, 1982. These breakers are therefore considered traceable to the CBM.

**Westinghouse Electric Corporation** - One hundred ten (110) Westinghouse MCCBs were procured directly from Westinghouse Electric Corporation with certification from the Nuclear Projects Supplier QA Manager. These breakers are therefore considered traceable to the CBM.

**Westinghouse Electric Supply Company (WESCO)** - The one hundred fifty seven (157) Westinghouse breakers procured through WESCO have been traced to Westinghouse Electric Corporation based on documentation searches performed by WESCO. The Station has received copies of WESCO's purchase orders to Westinghouse Electric Corporation for each Edison purchase order. Edison QA verification of this information is required.

- TABLE B - Byron Station Molded Case Circuit Breakers.  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER   | MANUFACTURER         | PART NUMBER  | S.I.#  | STOCK QTY | STATION DOC.   | 88-10 COMMENTS   |
|---------------|--|----------------------|--------------|--------|-----------|--|--|
| NO*           | COMBUSTION<br>ENGINEERING                                | HEINEMAN<br>ELECTRIC | AM2-A3A-1-3  | 771D30 | 1         | C OF C FROM COMB. ENG. - TO<br>THEIR QA PGM                  | CE PROCURED FROM ELEC-MECH TO GREENE-SHAW TO<br>HEINEMAN             |
|               |  | HEINEMAN<br>ELECTRIC | AM2-A3A-1-3  | 771D30 | 1         | C OF EQUIP BASED ON SOURCE<br>VERIFICATION BY COMB. ENG      | CE PROCURED FROM ELECT-MECH TO GREENE-SHAW<br>TO HEINEMAN            |
|               |  |                      |              | Total: | 2         |  |  |
| YES           | GENERAL<br>ELECTRIC CO.                                  | GENERAL<br>ELECTRIC  | THED124020   | 772H70 | 2         | C OF C FROM G.E.   | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM<br>WITH APPENX. B QA PGM |
|               |  | GENERAL<br>ELECTRIC  | THED124030   | 772G70 | 2         | C OF C FROM G.E.   | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM<br>WITH APPENX. B QA PGM |
|               |  | GENERAL<br>ELECTRIC  | THED124040   | 772A71 | 2         | C OF C G.E.  | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM<br>WITH APPENX. B QA PGM |
|               | POWER<br>CONVERSION<br>PRODUCTS<br>WESTINGHOUSE<br>CORP. | WESTINGHOUSE         | HFB3150      | 773A78 | 2         | C OF C FROM PCP  | CERT FROM WESTINGHOUSE CORP.   |
|               |  | WESTINGHOUSE         | EB2100       | 779A41 | 1         | C OF C FROM WEST NSID  | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | EB3030       | 762H72 | 1         | C OF C FROM WESCO, CECO P.O.<br>TO WESTINGHOUSE G.O. IN19980 | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | EB3030       | 762H72 | 1         | C OF C FROM WESTHSE CORP. CCD<br>DIV.                        | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | EB3090       | 762C73 | 1         | C OF C FROM WESTHSE CORP. CCD<br>DIV.                        | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | EB3090       | 762C73 | 2         | C OF C FROM WESCO, CECO P.O.<br>TO WESTINGHOUSE G.O. IN19980 | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | EB3100       | 762F71 | 2         | C OF C FROM WESCO, CECO P.O.<br>TO WESTINGHOUSE G.O. IN19980 | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM.                         |
|               |  | WESTINGHOUSE         | EB3100       | 783B07 | 1         | C OF C FROM WEST   | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB, MARK 75 | 772H33 | 1         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3015      | 767B24 | 8         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3020      | 772H32 | 2         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3025      | 772C25 | 7         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3030      | 767D24 | 10        | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3040      | 767E24 | 3         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3045ML    | 767C26 | 1         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3045ML    | 772F33 | 3         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3070      | 772E33 | 1         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | HFB3100      | 772G32 | 2         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | QBHW1015     | 773A02 | 9         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | QBHW1015     | 773A02 | 27        | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | QBHW1020     | 767B25 | 9         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | QBHW3020     | 772B71 | 1         | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  | WESTINGHOUSE         | OCHW1015     | 773H01 | 17        | C OF C FROM WESTINGHOUSE CORP.                               | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM                          |
|               |  |                      |              |        |           | Total:   | 118  |
| YES*          | GAMMA-METRICS  | HEINEMAN<br>ELECTRIC | 000222-001   | 774D29 | 1         | C OF C FROM G-M, TO QA PGM                                   | CERT. FROM GAMMA-METRICS TO PROCUREMENT FROM<br>CBM                  |
|               | NEWARK   | HEINEMAN             | AM2-A3A-10-2 | 771F28 | 1         | C OF C FROM NEWARK   | NEED TO VERIFY VENDOR INFO   |

- TABLE B - Byron Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                         | MANUFACTURER      | PART NUMBER  | S.I.#  | STOCK QTY | STATION DOC.       | 88-10 COMMENTS                |
|---------------|----------------------------------|-------------------|--------------|--------|-----------|--------------------|-------------------------------|
| YES*          | ELECTRONICS                      | ELECTRIC HEINEMAN | AM2-A3A-15-2 | 771G28 | 2         | C OF C FROM NEWARK | NEED TO VERIFY VENDOR INFO    |
|               | WESTINGHOUSE ELECTRIC SUPPLY CO. | WESTINGHOUSE      | EB1015       | 771A77 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | EB1020       | 771B77 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | EH81030      | 771F77 | 1         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | EH81030      | 771F77 | 3         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | EH81100      | 771B58 | 3         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3015      | 767B24 | 2         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3020      | 767C24 | 3         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3022ML    | 767B26 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3030      | 767D24 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3040      | 767E24 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3045ML    | 767C26 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3070      | 767F24 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3100      | 767G24 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3110ML    | 767D26 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3125      | 767H24 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3150      | 767A25 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3190ML    | 767E26 | 2         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | HFB3190ML    | 767E26 | 4         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW1020     | 767B25 | 30        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW1030     | 767C25 | 25        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW2020     | 767D25 | 20        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW2030     | 767E25 | 1         | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |
|               |                                  | WESTINGHOUSE      | QBHW2030     | 767E25 | 19        | C OF C FROM WESCO  | NEED TO CONFIRM DOCUMENTATION |

Total: 161

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Total: 281  
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**ATTACHMENT C**  
**DRESDEN STATION**

As required by Action 1.a of the Bulletin, Dresden performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 76 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in Dresden Table C. Of the seventy six (76) MCCBs, two (2) were manufactured by Siemens ITE, sixty two (62) were manufactured by General Electric Company and twelve (12) were manufactured by Westinghouse Electric Corporation.

The two (2) Siemens ITE MCCBs were purchased from Comsip-Delphi Systems. Of the sixty two (62) General Electric MCCBs forty one (41) were purchased from General Electric Supply Company (GESCO), three (3) were purchased from Crescent Electric Company, six (6) were purchased from Farwell & Hendricks, four (4) were purchased from Nutherm and eight (8) were purchased directly from General Electric Company. The twelve (12) Westinghouse MCCBs were purchased from Westinghouse Electric Supply Company (WESCO).

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**Comsip-Delphi Systems** - The two (2) Siemens ITE breakers were procured from Comsip-Delphi Systems. Correspondence received from Comsip-Delphi indicates these breakers were procured from Associated Wholesale Electric Company who certifies the breakers were purchased directly from Siemens ITE. Edison QA verification of this information is required.

**Crescent Electric Supply Company** - Three (3) General Electric breakers were procured from Crescent Electric Supply company. Due to the age of the purchase, Crescent could not supply any traceability information. Edison QA will review the procurement process of Crescent facilities to determine if these breakers can be declared traceable.

**Farwell & Hendricks, Inc. (F&H)** - Six (6) General Electric breakers were procured from Farwell & Hendricks, Inc. under an Edison approved 10 CFR 50 Appendix B, Quality Assurance

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program. Certification from F&H to performance capabilities has been received. Acceptance based on F&H's dedication program should be sufficient to meet bulletin requirements. Edison QA verification of this information is required.

**General Electric Company (G.E.)** - Eight (8) G.E. MCCBs were procured with certification directly from General Electric Company. These breakers are therefore considered traceable to the CBM.

**General Electric Supply Company (GESCO)** - Of the forty one (41) General Electric MCCBs procured from GESCO four (4) were received with shipping papers from the Plainville General Electric Company facilities. These breakers are therefore consider traceable to the CBM. For the remainder, GESCO would not supply any specific traceability documentation. However, according to an internal review, GESCO has advised all nuclear power facilities of MCCBs procured from non-manufacturer suppliers since 1986. GESCO's notification to Edison of such procurements did not list these breakers. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

**Nutherm International Inc.** - Four (4) General Electric breakers were procured from Nutherm International Inc. These MCCBs were originally purchased by Quad Cities Station and transferred to Dresden. These breakers are known to have been refurbished and procured from a non-CBM source. These breakers are not traceable. (See Quad Cities Attachment E for further details)

**Westinghouse Electric Supply Company (WESCO)** - Of the twelve (12) Westinghouse breakers procured through WESCO, six (6) MCCBs could not be traced due to the age of the purchases. Edison QA will review the procurement process of local WESCO facilities to determine if these breakers can be declared traceable. The remaining six (6) are known to have been procured from a non-CBM source and are not traceable.

#### **Breaker Testing at Dresden**

As indicated in the text of this report, during Edison's review of NRC Information Notice 88-46 (and associated supplements), it was determined that Dresden Unit 2 had a MCCB from one of the "suspect" suppliers (HLC Electric Supply Company, Inc.) installed in a safety-related application. The breaker was a Westinghouse Model FA2050, which is a 50 amp, 600 volt breaker. The breaker was installed in the 250 volt DC system for the motor operated High Pressure Coolant Injection (HPCI) steam isolation valve. Also received on this purchase order were three (3) additional breakers of the same model number. Two (2) of these breakers were in stock

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as safety-related spares, and the third breaker had been previously discarded. The two spare breakers were removed from stock, and a justification for continued operation was performed (approved September 30, 1988) allowing operation of Unit 2 with the circuit breaker installed.

During the recent refueling outage for Unit 2, the installed breaker was tested in accordance with the prescribed Bulletin tests and failed. Subsequent testing of the two spares resulted in one failing and one passing the Bulletin test requirements. The breaker which was successfully tested was then installed for the HPCI steam isolation valve. The testing of these breakers is documented under Work Request D79617 at Dresden Station.

A summary of the results of the breaker testing is presented below.

- Total number of MCCBs in the sample: three (3).
- Number of MCCBs untraceable to the manufacturer: three (3).
- Number of MCCBs tested: three (3).
- Number of MCCBs that failed Bulletin tests: two (2).
- Source of MCCBs that failed (i.e., primary and secondary distributor from which licensee purchased MCCBs): WESCO from HLC.



- TABLE C - Dresden Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                           | MANUFACTURER                           | PART NUMBER  | S.I.#   | STOCK QTY         | STATION DOC.                                | 88-10 COMMENTS                              |
|---------------|------------------------------------|--|--------------|---------|-------------------|---|---|
| NO            | NUTHERM<br>INTERNATIONAL<br>INC.   | GENERAL<br>ELECTRIC                    | TEF136M1025  | 772D38  | 4                 | C OF C FROM NUTHERM                         | KNOWN NON-CBM SUPPLIED                      |
|               |                                    | WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | EH2040       | 506E47  | 2                 | C OF C FROM WESCO                           | KNOWN NON-CBM SUPPLIED                      |
|               |                                    | WESTINGHOUSE                           | FA2050       | 507C78  | 2                 | C OF C FROM WESCO                           | KNOWN NON-CBM SUPPLIED                      |
|               |                                    | WESTINGHOUSE                           | FA2100       | 507C79  | 2                 | C OF C FROM WESCO                           | KNOWN NON-CBM SUPPLIED                      |
|               |                                    |  |              | Total:  | 10                |   |   |
| NO*           | CRESCENT<br>ELECTRIC SUPPLY<br>CO. | GENERAL<br>ELECTRIC                    | TED136070    | 315A02  | 3                 | C OF C FROM CRESCENT                        | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |                                    | GENERAL<br>ELECTRIC SUPPLY<br>CO.      | TEB122020WL  | 503G52  | 1                 |   | CECO QA REVIEW REQUIRED                     |
|               | GENERAL<br>ELECTRIC<br>CO.         | GENERAL<br>ELECTRIC                    | TEB122020WL  | 503G52  | 6                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TEC36003     | 503D22  | 4                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TEC36007     | 503D20  | 3                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TEC36015     | 503D21  | 4                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TEC36030     | 503D30  | 2                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TED136050    | 168A52  | 3                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TED136070WL  | 770D04  | 1                 | C OF C FROM GESCO                           | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TFJ236200WL  | 268A05  | 1                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TFJ236225WL  | 268A04  | 1                 |   | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TFJ236225WL  | 268A04  | 2                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | THED136070WL | 767F95  | 1                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | THED136M030  | 507H39  | 2                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | THQ11130     | 765D55  | 4                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | GENERAL<br>ELECTRIC                    | TJJ426200WL  | 762D55  | 2                 | C OF C FROM GESCO, ELMHURST                 | CECO QA REVIEW REQUIRED                     |
|               |                                    | WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | WESTINGHOUSE | EHB2040 | 268A06            | 1   | C OF C FROM WESCO                           |
| WESTINGHOUSE  | FA2015                             |  | 506A10       | 1       | C OF C FROM WESCO | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |   |
|               | WESTINGHOUSE                       | FA2020                                 | 501G34       | 1       | C OF C FROM WESCO | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |   |

- TABLE C - Dresden Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER   | MANUFACTURER     | PART NUMBER  | S.I.#           | STOCK QTY | STATION DOC.   | 88-10 COMMENTS  |
|---------------|--|------------------|--------------|-----------------|-----------|--|---|
| NO*           | WESTINGHOUSE                                     | WESTINGHOUSE     | FA2030       | 268A15          | 3         | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  |                  |              | Total:          | 46        |  |   |
| YES           | GENERAL ELECTRIC CO.                             | GENERAL ELECTRIC | TF136020     | 268A03          | 5         | PACKING LIST FROM G.E., PLAINVILLE                                 | PROCUREMENT FROM CORP. DIV. OF CBM, & G.E. PACKING SLIP           |
|               |  | GENERAL ELECTRIC | TFJ236175WLN | 762D23          | 2         | PRODUCT QUALITY CERTIFICATION                                      | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM WITH APPENX. B QA PGM |
|               |  | GENERAL ELECTRIC | TFJ236225    | 500B61          | 1         | PRODUCT QUALITY CERTIFICATION & PACKING LIST FROM G.E., PLAINVILLE | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM & PACKING LIST        |
|               | GENERAL ELECTRIC SUPPLY CO.                      | GENERAL ELECTRIC | TED136050WL  | 786E27          | 2         | C OF C FROM GESCO & PACKING SLIP FROM G.E., PLAINVILLE             | PACKING SLIP FROM G.E.  |
|               |  | GENERAL ELECTRIC | TFJ236200WL  | 762D55          | 2         | C OF C FROM GESCO & PACKING SLIP FROM G.E. PLAINVILLE              | PACKING SLIP FROM G.E.  |
|               |  |                  |              | Total:          | 12        |  |   |
| YES*          | COMSIP - DELPHI SYSTEMS DIV. FARWELL & HENDRICKS | ITE GOULD        | P1515        | 767A57          | 2         | C OF C FROM COMSIP   | CERT. FROM ASSOCIATED WHOLESALE                                   |
|               |  | GENERAL ELECTRIC | TED136070WL  | 770D04          | 6         | CERTS. FROM F&H  | PER SUPPLIER'S QA APPROVED DEDICATION PROGRAM                     |
|               |  |                  |              | Total:          | 8         |  |   |
|               |  |                  |              | -----<br>Total: | 76        |  |   |

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ATTACHMENT D  
LASALLE STATION

As required by Action 1.a of the Bulletin, LaSalle performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 149 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in LaSalle Table D. Of the one hundred forty nine (149) MCCBs, six (6) were manufactured by Siemans ITE, twenty one (21) were manufactured by General Electric Company, two (2) were manufactured by Square D, twenty three (23) were manufactured by Westinghouse Electric Corporation and ninety seven (97) were manufactured by Klockner-Moeller.

The six (6) Siemans ITE MCCBs were purchased from Englewood Electric Supply Company. Of the twenty one (21) General Electric MCCBs, fourteen (14) were purchased from General Electric Supply Company (GESCO), four (4) were purchased from Crescent Electric Company, and three (3) were purchased directly from General Electric Company. Of the twenty three (23) Westinghouse MCCBs, twenty one (21) were purchased from Westinghouse Electric Supply Company (WESCO) and two (2) were purchased from Crescent Electric Company. The two (2) Square D MCCBs were purchased from Crescent Electric Company. The ninety seven (97) Klockner-Moeller MCCBs were purchased directly from Klockner-Moeller.

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**Crescent Electric Supply Company** - One (1) Westinghouse and four (4) General Electric breakers were procured from Crescent Electric Supply Company. Due to the age of the purchases, Crescent could not supply any traceability information. Edison QA will review the procurement process of Crescent facilities to determine if these breakers can be declared traceable.

One (1) Westinghouse breaker was procured by Crescent from Kinney & Kinney, an electrical distributor. Kinney & Kinney supplied a copy of their order to Westinghouse Electric

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Corporation for this breaker. Two (2) Square D breakers were procured by Crescent from Square D. Copies of these purchase orders have been received by the station. Edison QA will verify this information.

**Englewood Electric Supply Company** - The six (6) Siemens ITE breakers were procured from Englewood Electric Supply Company. Documentation received from Englewood indicates these breakers were procured directly from Siemens ITE. The station has received copies of Englewood's purchase orders to Siemens ITE. Edison QA verification of this information is required.

**General Electric Company (G.E.)** - Three (3) General Electric MCCBs were procured with certification directly from General Electric Company. These breakers are therefore considered traceable to the CBM.

**General Electric Supply Company (GESCO)** - Of the fourteen (14) General Electric MCCBs procured from GESCO two (2) were received with shipping papers from the General Electric Company facilities in Plainville. These breakers are therefore considered traceable to the CBM. For the remainder, GESCO would not supply any specific traceability documentation. However, according to an internal review, GESCO has advised all nuclear power facilities of MCCBs procured from non-manufacturer suppliers since 1986. GESCO's notification to Edison of such procurements did not list these breakers. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

**Klockner-Moeller** - Ninety seven (97) breakers were procured with certification directly from Klockner-Moeller. These breakers are therefore considered traceable to the CBM.

**Westinghouse Electric Supply Company (WESCO)** - Of the twenty one (21) Westinghouse breakers procured through WESCO, nineteen (19) MCCBs were received with shipping papers from Westinghouse Electric Corporation facilities. These breakers are therefore considered traceable to the CBM. The remaining two (2) MCCBs have been traced to Westinghouse Electric Corporation based on documentation searches performed by WESCO. The Station has received a copy of WESCO's purchase order to Westinghouse Electric Corporation. Edison QA verification of this information is required.

- TABLE D - LaSalle Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM  | SUPPLIER                           | MANUFACTURER        | PART NUMBER             | S.I.#               | STOCK QTY    | STATION DOC. | 88-10 COMMENTS                              |   |   |
|--|------------------------------------|---------------------|-------------------------|---------------------|--------------|--------------|---|---|---|
| NO*  | CRESCENT<br>ELECTRIC SUPPLY<br>CO. | GENERAL<br>ELECTRIC | TEB122030WL             | 503G89              | 4            |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |   |   |
|  |                                    | WESTINGHOUSE        | HLB-2400F               | 506G35              | 1            |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |   |   |
|  | GENERAL<br>ELECTRIC SUPPLY<br>CO.  | GENERAL<br>ELECTRIC | TEB122060WL             | 504D84              | 2            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36015                | 503D21              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36015                | 503D21              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36100                | 503D18              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36150                | 503D19              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36150                | 503D19              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TEC36150                | 503D19              | 2            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TFJ224175WL             | 766C41              | 1            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | GENERAL<br>ELECTRIC | TFJ224175WL             | 766C41              | 2            |              | CECO QA REVIEW REQUIRED                     |   |   |
|  |                                    | Total:              |                         |                     |              |              | 17  |   |   |
|  |                                    | YES                 | GENERAL<br>ELECTRIC CO. | GENERAL<br>ELECTRIC | 117C1797P102 | 503H07       | 2   |   | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM |
|  |                                    |                     |                         | GENERAL<br>ELECTRIC | 117C1797P116 | 503H08       | 1   |   | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM |
| GENERAL<br>ELECTRIC SUPPLY<br>CO.<br>KLOCKNER -<br>MOELLER | GENERAL<br>ELECTRIC                |                     | TFJ224175WL             | 766C41              | 2            |              | SHIPPING PAPERS FROM G.E.<br>PLAINVILLE     | BASED ON PACKING LIST FROM G.E. CO.       |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160-ZM6C-         | 296A43              | 2.6/5        | 20           | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6-4         | 296A56              | 0-500        | 1            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6-4         | 296A56              | 0-500        | 2            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6C-         | 296A44              | 4/8-C        | 1            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6C-         | 296A44              | 4/8-C        | 1            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6C-         | 296A44              | 4/8-C        | 3            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-160/ZM6C-         | 296A44              | 4/8-C        | 9            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-<br>MOELLER               |                     | NZMH6-63/ZM6-15         | 296A50              | -120         | 1            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |
|  | KLOCKNER-                          |                     | NZMH6-63/ZM6-15         | 296A50              |              | 1            | DIRECT ORDER TO CBM                         | BASED ON PROCUREMENT FROM CBM WITH QA PGM |   |

- TABLE D - LaSalle Station Molded Case Circuit Breakers  
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| TRACED TO CBM | SUPPLIER                         | MANUFACTURER     | PART NUMBER     | S.I.#  | STOCK QTY | STATION DOC.  | 88-10 COMMENTS   |
|---------------|----------------------------------|------------------|-----------------|--------|-----------|---|--|
| YES           | KLOCKNER                         | MOELLER          | -120            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-15 | 296A50 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -120            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-2. | 296A45 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 1-12            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-2. | 296A45 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 1-12            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-3. | 296A46 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 7-20            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-3. | 296A46 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 7-20            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-3. | 296A46 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 7-20            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-33 | 296A51 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -200            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-33 | 296A51 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -200            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-33 | 296A51 | 3         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -200            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-40 | 296A55 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -320            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-50 | 296A52 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -320            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-50 | 296A52 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -320            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-6. | 296A47 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 6-32            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-6. | 296A47 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 6-32            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-60 | 296A54 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -800            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-60 | 296A54 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -800            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-63 | 296A57 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -500            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-63 | 296A58 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -800            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-63 | 296A58 | 2         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -800            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63/ZM6-63 | 296A58 | 22        | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | -800            |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63ZM6-12- | 296A49 | 1         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 80-08           |        |           |   |  |
|               |                                  | KLOCKNER-MOELLER | NZMH6-63ZM6-12- | 296A49 | 3         | DIRECT ORDER TO CBM                                 | BASED ON PROCUREMENT FROM CBM WITH QA PGM                          |
|               |                                  | KLOCKNER-MOELLER | 80-08           |        |           |   |  |
|               | WESTINGHOUSE ELECTRIC SUPPLY CO. | WESTINGHOUSE     | 81E4930         | 760D87 | 3         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | WESCO TO WESTINGHOUSE P.O. 5105-374562 - NEED COPY, DIRECT SHIPMNT |
|               |                                  | WESTINGHOUSE     | HFB2040         | 503C85 | 2         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.                               |

- TABLE D - LaSalle Station Molded Case Circuit Breakers  
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| TRACED TO CBM | SUPPLIER                               | MANUFACTURER | PART NUMBER | S.I.#  | STOCK QTY | STATION DOC.  | 88-10 COMMENTS                                  |
|---------------|--|--------------|-------------|--------|-----------|---|---|
| YES           | WESTINGHOUSE                           | WESTINGHOUSE | HFB2040L    | 503C78 | 2         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  | WESTINGHOUSE | HFB2100L    | 503C76 | 2         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  | WESTINGHOUSE | JB2100      | 503C84 | 3         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  | WESTINGHOUSE | JB2125L     | 503C75 | 2         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  | WESTINGHOUSE | JB2150L     | 503C74 | 3         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  | WESTINGHOUSE | JB2250L     | 503C72 | 2         | SHIPPING PAPERS FROM WESTINGHOUSE CORP., DUNCAN, SC | PACKING SLIP FROM WESTINGHOUSE CORP.            |
|               |  |              |             | Total: | 121       |   |   |
| YES*          | CRESCENT<br>ELECTRIC SUPPLY<br>CO.     | SQUARE D     | Q0B230H     | 766A77 | 2         |   | COPY OF SQUARE D P.O.                           |
|               |  | WESTINGHOUSE | HLB-2400F   | 506G35 | 1         |   | COPY OF P.O. TO KINNEY & KINNEY TO WESTINGHOUSE |
|               | ENGLEWOOD<br>ELECTRIC SUPPLY<br>CO     | ITE          | EF3-B015    | 768D79 | 5         |   | COPY OF P.O. TO ITE PER VENDOR                  |
|               | WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | ITE          | FJ63B150    | 769A94 | 1         |   | COPY OF P.O. TO ITE PER VENDOR                  |
|               |  | WESTINGHOUSE | HFB2100     | 503C77 | 2         |   | NEED TO CONFIRM WESCO INFORMATION               |
|               |  |              |             | Total: | 11        |   |   |
|               |  |              |             | Total: | 149       |   |   |

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ATTACHMENT E  
QUAD CITIES STATION

As required by Action 1.a of the Bulletin, Quad Cities performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 238 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in Quad Cities Table E. Of the two hundred thirty eight (238) MCCBs, one hundred sixty five (165) were manufactured by General Electric Company, two (2) were manufactured by Square D, sixty eight (68) were manufactured by Westinghouse Electric Corporation and three (3) were manufactured by Klockner-Moeller.

Of the one hundred sixty five (165) General Electric MCCBs, seventy eight (78) were purchased from General Electric Supply Company (GESCO), ten (10) were purchased from Crescent Electric Company, eighteen (18) were purchased from Graybar, forty three (43) were purchased from Nutherm International, eleven (11) were purchased directly from General Electric Company and five (5) where the source of supply is unknown. Of the sixty eight (68) Westinghouse MCCBs, sixty (60) were purchased from Westinghouse Electric Supply Company (WESCO), five (5) were purchased from Cutler Hammer and three (3) where the source of supply is unknown. The two (2) Square D MCCBs were purchased from Power Conversion Products. The three (3) Klockner-Moeller MCCBs were purchased directly from Klockner-Moeller.

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**Crescent Electric Supply Company** - Of the ten (10) General Electric breakers procured through Crescent, eight (8) breakers have been traced to General Electric Company based on documentation searches performed by Crescent. The Station has received copies of Crescent's purchase orders to General Electric Company. Edison QA verification of this information is required.

The remaining two (2) breakers could not be traced by Crescent. Edison QA will review the procurement process of



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local Crescent facilities to determine if these breakers can be declared traceable.

**Cutler Hammer** - These five (5) Westinghouse breakers could not be traced due to the age of the purchases. Edison QA will review the procurement process of Cutler Hammer facilities to determine if these breakers can be declared traceable.

**General Electric Company (G.E.)** - Eleven (11) General Electric MCCBs were procured with certification directly from General Electric Company. These breakers are therefore considered traceable to the CBM.

**General Electric Supply Company (GESCO)** - For the seventy eight (78) General Electric MCCBs procured from GESCO, GESCO would not supply any specific traceability documentation. However, according to an internal review, GESCO has advised all nuclear power facilities of MCCBs procured from non-manufacturer suppliers since 1986. GESCO's notification to Edison of such procurements did not list these breakers. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

**Graybar** - Of the eighteen (18) General Electric MCCBs procured from Graybar, sixteen (16) were received with shipping papers from General Electric Company facilities. These breakers are therefore considered traceable to the CBM.

The two (2) remaining General Electric MCCBs procured from Graybar could not be traced due to the age of the purchases. Edison QA will review the procurement process of local Graybar facilities to determine if these breakers can be declared traceable.

**Klockner-Moeller** - These three (3) breakers were procured with certification directly from Klockner-Moeller. These breakers are therefore considered traceable to the CBM.

**Nutherm International Inc.** - Forty three (43) General Electric breakers were procured from Nutherm International Inc. Nutherm procured these breakers from Flannigan Electric in Jackson, MS. Flannigan bought the breakers from two sources, General Magnetics in City of Commerce, CA. and Voyten Electric in Franklin, PA. These breakers are known to have been used and refurbished and are therefore not traceable to the CBM.

**Power Conversion Products (PCP)** - The two (2) Square D breakers procured from PCP have been traced to Interstate Electric who purchased them from Square D Corporation. The Station has received copies of the PCP to Interstate and Interstate to Square D purchase orders. Edison QA

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verification of this information is required.

**Supplier Unknown** - The procurement source of five (5) General Electric and three (3) Westinghouse MCCBs cannot be established. These breakers are not traceable.

**Westinghouse Electric Supply Company (WESCO)** - Of the sixty (60) Westinghouse breakers procured through WESCO, three (3) breakers have been traced to Westinghouse Electric Corporation based on documentation searches performed by WESCO. The Station has received a copy of WESCO's purchase order to Westinghouse Electric Corporation. Edison QA verification of this information is required.

Sixteen (16) breakers were procured by WESCO from a "suspect" supplier. These breakers are not considered traceable.

The remaining forty one (41) breakers WESCO could not be traced due to the age of the purchases. Edison QA will review the procurement process of local WESCO facilities to determine if these breakers can be declared traceable.

- TABLE E - Quad Cities Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                                       | MANUFACTURER     | PART NUMBER | S.I.#  | STOCK QTY                          | STATION DOC.  | 88-10 COMMENTS                              |
|---------------|--|------------------|-------------|--------|------------------------------------|---|---|
| NO            | NUTHERM INTERNATIONAL INC.<br>SUPPLIER UNKNOWN | GENERAL ELECTRIC | TEF136M1025 | 772D38 | 43                                 | C OF C FROM NUTHERM, PROCURED THROUGH FLANNIGAN ELEC, JACKSON, MS | KNOWN NON-CBM SUPPLIED                      |
|               |  | GENERAL ELECTRIC | TEC36003    | 503D22 | 2                                  | NOT FOUND   |   |
|               | WESTINGHOUSE ELECTRIC SUPPLY CO.               | GENERAL ELECTRIC | TEF136040   | 764B73 | 2                                  | NONE FOUND  | NO INFORMATION AT STATION                   |
|               |  | GENERAL ELECTRIC | TFJ236175   | 764A56 | 1                                  | NONE FOUND  | NO INFORMATION AT STATION                   |
|               |  | WESTINGHOUSE     | 45E-6341    | 771G03 | 1                                  | NONE FOUND  | NO INFORMATION AT STATION                   |
|               |  | WESTINGHOUSE     | EH2100      | 506E50 | 1                                  | NONE FOUND  | NO INFORMATION AT STATION                   |
|               |  | WESTINGHOUSE     | WH-45E-6341 | 764A73 | 1                                  | NONE FOUND  | NO INFORMATION AT STATION                   |
|               |  | WESTINGHOUSE     | EH2020      | 505F58 | 3                                  | IDENTIFIED BY WESCO FOR IE NOTICE 88-46                           | KNOWN NON-CBM SUPPLIED                      |
|               |  | WESTINGHOUSE     | EH2050      | 506E48 | 2                                  | C OF C FROM WESCO   | KNOWN NON-CBM SUPPLIED                      |
|               |  | WESTINGHOUSE     | EH2050      | 506E48 | 2                                  | IDENTIFIED BY WESCO FOR IE NOTICE 88-46                           | KNOWN NON-CBM SUPPLIED                      |
|               |  | WESTINGHOUSE     | EH2070      | 506E49 | 4                                  | C OF C FROM WESCO   | KNOWN NON-CBM SUPPLIED                      |
|               |  | WESTINGHOUSE     | FA2100      | 507C79 | 3                                  | C OF C FROM WESCO   | KNOWN NON-CBM SUPPLIED                      |
|               | WESTINGHOUSE                                   | FA3035M          | 507C81      | 2      | C OF C FROM WESCO, DAVENPORT, IOWA | KNOWN NON-CBM SUPPLIED  |   |
|               | Total:   |                  |             |        |                                    | 67  |   |
| NO*           | CRESCENT ELECTRIC SUPPLY CO.                   | GENERAL ELECTRIC | TED134060   | 500G54 | 2                                  | C OF C FROM CRESCENT  | HAVE NOT LOCATED TRACEABILITY DOCUMENTATION |
|               | CUTLER HAMMER                                  | WESTINGHOUSE     | LA2400F     | 502B46 | 1                                  | C OF C FROM CUTTLER HAMMER  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |  | WESTINGHOUSE     | LA2400F     | 502B46 | 2                                  | C OF C FROM CUTTLER HAMMER  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               | GENERAL ELECTRIC SUPPLY CO.                    | WESTINGHOUSE     | LA2600F     | 761A01 | 2                                  | C OF C FROM CUTTLER HAMMER  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |  | GENERAL ELECTRIC | TEB111100   | 508C96 | 1                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEB111100   | 508C96 | 1                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEB122020   | 503G52 | 2                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEC36003    | 503D22 | 10                                 | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEC36007    | 502G40 | 2                                  | C OF C FROM GESCO, JOLIET   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEC36015    | 503D21 | 1                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEC36015    | 503D21 | 1                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               |  | GENERAL ELECTRIC | TEC36015    | 503D21 | 4                                  | C OF C FROM GESCO   | CECO QA REVIEW REQUIRED                     |
|               | GENERAL ELECTRIC                               | TEC36100         | 501E66      | 2      | C OF C FROM GESCO                  | CECO QA REVIEW REQUIRED   |   |

- TABLE E - Quad Cities Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER | MANUFACTURER     | PART NUMBER | S.I.#  | STOCK QTY | STATION DOC.                             | 88-10 COMMENTS          |
|---------------|----------|------------------|-------------|--------|-----------|--|-------------------------|
| NO*           | GENERAL  | GENERAL ELECTRIC | TED134100   | 765838 | 4         | NONE FOUND                               | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136015   | 168A48 | 2         | C OF C FROM GESCO, JOLIET                | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136020   | 770E03 | 1         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136025   | 502C57 | 1         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136030   | 770F03 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136035   | 770G03 | 1         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136040   | 770H03 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136045   | 770A04 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136050   | 168A52 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136060   | 770B04 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136060   | 770B04 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136070   | 770D04 | 1         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136070   | 770D04 | 3         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TED136150   |        | 4         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFJ226225   | 500G55 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFJ236175   | 764A56 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFJ236T125  | 500F22 | 1         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK226T150  | 315A03 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236F000  | 500G56 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236F000  | 504D76 | 3         | C OF C FROM GESCO, SHIPPED FROM ELMHURST | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236T150  | 504B89 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236T175  | 500G58 | 4         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236T225  | 500G59 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | TFK236T225  | 500G59 | 2         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |
|               |          | GENERAL ELECTRIC | THQL1115    | 503D31 | 3         | C OF C FROM GESCO                        | CECO QA REVIEW REQUIRED |

- TABLE E - Quad Cities Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                               | MANUFACTURER     | PART NUMBER          | S.I.#             | STOCK QTY                                   | STATION DOC.   | 88-10 COMMENTS  |
|---------------|--|------------------|----------------------|-------------------|---|--|---|
| NO*           | GRAYBAR                                | GENERAL ELECTRIC | TEC36100             | 501E66            | 1   | C OF C FROM GRAYBAR  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | GENERAL ELECTRIC | TFK236T150           | 504889            | 1   | C OF C FROM GRAYBAR  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               | WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | WESTINGHOUSE     | EH2030               | 506E46            | 3   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EH2040               | 506E47            | 2   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EH2100               | 506E50            | 3   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2020              | 504F67            | 2   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2030              | 504F68            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2040              | 504D23            | 5   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2050              | 504F71            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2070              | 504F70            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | EHB2100              | 504F69            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | FA2015               | 506A10            | 4   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | FA2040               | 507C77            | 3   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | FA2050               | 507C78            | 6   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | FA2100               | 507C79            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | FA3190M              | 507C82            | 1   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
|               |  | WESTINGHOUSE     | HKA2225T (TRIP UNIT) |                   | 3   | C OF C FROM WESCO  | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD                       |
| WESTINGHOUSE  | LA2225                                 | 507C80           | 4                    | C OF C FROM WESCO | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |  |   |
|               |  |                  | Total:               |                   | 128   |  |   |
| YES           | GENERAL ELECTRIC CO.                   | GENERAL ELECTRIC | TFJ224175            | 766G55            | 1   | PRODUCT QUALITY CERT & CERT OF QUALIFICATION FROM G.E., NEBO     | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM WITH APPENX. B QA PGM |
|               |  | GENERAL ELECTRIC | TFJ224175            | 766G55            | 2   | PRODUCT QUALITY CERT G.E., NEBO                                  | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM WITH APPENX. B QA PGM |
|               |  | GENERAL ELECTRIC | THJK436150WL         | 768B18            | 2   | PQC FROM G.E. NUCLEAR ENERGY BUSINESS OPERATIONS                 | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM WITH APPENX. B QA PGM |
|               |  | GENERAL ELECTRIC | VARIOUS              |                   | 6   | PQC FROM G.E. - SAN JOSE   | BASED ON PROCUREMENT FROM CBM WITH QA PGM                         |
|               | GRAYBAR                                | GENERAL ELECTRIC | TEC36030             | 503D30            | 16  | CECO C OF C FROM GRAYBAR, WITH A PACKING SLIP FROM G.E., CHICAGO | PACKING SLIP FROM G.E.  |
|               | KLOCKNER - MOELLER                     | KLOCKNER-MOELLER | NZMH6-63-500         | 296A57            | 1   | C OF C FROM KLOCKNER-MOELLER                                     | BASED ON PROCUREMENT FROM CBM WITH QA PGM                         |
|               |  | KLOCKNER-MOELLER | NZMH6-63-500         | 296A57            | 2   | C OF C FROM KLOCKNER-MOELLER                                     | BASED ON PROCUREMENT FROM CBM WITH QA PGM                         |
|               |  |                  | Total:               |                   | 30  |  |   |
| YES*          | CRESCENT ELECTRIC SUPPLY CO.           | GENERAL ELECTRIC | TED136025            | 502C57            | 5   | C OF C FROM CRESCENT (DAVENPORT, IOWA)                           | COPY OF G.E. P.O. FROM CRESCENT                                   |
|               |  | GENERAL ELECTRIC | THOL1115             | 503D31            | 3   | C OF C FROM CRESCENT   | COPY OF G.E. P.O. FROM CRESCENT                                   |
|               | POWER                                  | SQUARE D         | KAL362001021         | 766D74            | 1   | CECO C OF C FROM PCP, APPROVED CERT & PACKING LISTS FROM PCP     |   |

- TABLE E - Quad Cities Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                         | MANUFACTURER | PART NUMBER  | S.I.#  | STOCK QTY | STATION DOC.   | 88-10 COMMENTS                |
|---------------|----------------------------------|--------------|--------------|--------|-----------|--|-------------------------------|
| YES*          | CONVERSION PRODUCTS              | SQUARE D     | LAL26400SER3 | 766E74 | 1         | CECO C OF C FROM PCP, APPROVED CERT & PACKING LISTS FROM PCP | QA PGM                        |
|               | WESTINGHOUSE ELECTRIC SUPPLY CO. | WESTINGHOUSE | LA2300F      |        | 3         | CECO C OF C FROM WESCO                                       | NEED TO CONFIRM DOCUMENTATION |
|               |                                  |              |              |        | Total:    |  | 13                            |
|               |                                  |              |              |        | Total:    |  | 238                           |

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**ATTACHMENT F**  
**ZION STATION**

As required by Action 1.a of the Bulletin, Zion performed a walkdown/inventory search of all safety-related and commercial grade MCCBs which are stored in stock as replacement spare breakers for use in safety-related applications. The station inventory contained 124 MCCBs which are within the scope of this bulletin. This inventory includes all replacement safety related circuit breakers which had been maintained in Edison stock or by on-site contractors. A list of these MCCBs containing manufacturer, part number, stores item number (S.I.), quantity, and traceability information is compiled in Zion Table F. Of the one hundred twenty four (124) MCCBs, five (5) were manufactured by Bryant, one hundred (100) were manufactured by General Electric Company and nineteen (19) were manufactured by Westinghouse Electric Corporation.

The five (5) Bryant MCCBs and the nineteen (19) Westinghouse MCCBs were purchased from Westinghouse Electric Supply Company. Of the one hundred (100) General Electric MCCBs, ninety three (93) were purchased from General Electric Supply Company, five (5) were purchased directly from General Electric Company, and two (2) have unknown procurement.

Station and Corporate personnel have researched the procurement documentation (i.e., Purchase Orders and Receiving Reports) and Supplier furnished documentation in order to establish traceability back to the CBM. A brief description of the procurement documentation from each supplier follows:

**General Electric Company (G.E.)** - Five (5) General Electric MCCBs were procured directly from General Electric Company. These breakers are therefore considered traceable to the CBM.

**General Electric Supply Company (GESCO)** - Ninety three (93) General Electric MCCBs were procured from General Electric Supply Company. GESCO would not supply any specific traceability documentation. However, according to an internal review, GESCO has advised all nuclear power facilities of MCCBs procured from non-manufacturer suppliers since 1986. GESCO's notification to Edison of such procurements did not list these breakers. Edison QA will review the procurement practices of local GESCO facilities to determine if these breakers can be declared traceable.

**Supplier Unknown** - The procurement source of two (2) G.E. MCCBs cannot be established. These breakers are not traceable.

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Westinghouse Electric Supply Company (WESCO) - Of the nineteen (19) Westinghouse breakers procured through WESCO, ten (10) MCCBs could not be traced due to the age of the purchases. The remaining nine Westinghouse breakers (9) were shipped from WESCO stock or from a known Westinghouse Corporation invoice according to WESCO records, but documented traceability was not available. The five (5) Bryant MCCBs procured through WESCO could not be traced due to the age of the purchases. Edison QA will review the procurement process of local WESCO facilities to determine if any of these breakers can be declared traceable.



- TABLE F - Zion Station Molded Case Circuit Breakers  
Review of Inventory for Traceability - NRC Bulletin 88-10

| TRACED TO CBM | SUPPLIER                          | MANUFACTURER | PART NUMBER | S.I.#  | STOCK QTY               | STATION DOC. | 88-10 COMMENTS           |
|---------------|-----------------------------------|--------------|-------------|--------|-------------------------|--------------|--------------------------|
| NO            | SUPPLIER<br>UNKNOWN               | GENERAL      | TED136020WL | 770E03 | 1                       |              | SOURCE OF SUPPLY UNKNOWN |
|               |                                   | ELECTRIC     | TED136050WL | 168A52 | 1                       |              | SOURCE OF SUPPLY UNKNOWN |
|               |                                   | ELECTRIC     |             |        |                         |              |                          |
|               |                                   |              | Total:      |        | 2                       |              |                          |
| NO*           | GENERAL<br>ELECTRIC SUPPLY<br>CO. | GENERAL      | TEC36007    | 168A45 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TEC36007    | 168A45 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TEC36015    | 503D21 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TEC36015    | 503D21 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TEC36015    | 503D21 | 3                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TEC36030    | 268A10 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TEC36030    | 268A10 | 3                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED134100WL | 168A55 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED134100WL | 168A55 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED134100WL | 168A55 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED136020WL | 770E03 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED136020WL | 770E03 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED136020WL | 770E03 | 3                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED136025WL | 168A48 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED136025WL | 168A48 | 1                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED136025WL | 168A48 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED136025WL | 502C57 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED136030   | 504B50 | 2                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | GENERAL      | TED136030   | 504B50 | 4                       |              | CECO QA REVIEW REQUIRED  |
|               |                                   | ELECTRIC     | TED136040WL | 770H03 | 1                       |              | CECO QA REVIEW REQUIRED  |
| GENERAL       | TED136040WL                       | 770H03       | 3           |        | CECO QA REVIEW REQUIRED |              |                          |
| ELECTRIC      |                                   |              |             |        |                         |              |                          |

- TABLE F - Zion Station Molded Case Circuit Breakers  
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| TRACED TO CBM | SUPPLIER                               | MANUFACTURER | PART NUMBER  | S.I.#  | STOCK QTY | STATION DOC. | 88-10 COMMENTS                              |
|---------------|--|--------------|--------------|--------|-----------|--------------|---|
| NO*           | GENERAL                                | GENERAL      | TED13605WL   | 168A52 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13605WL   | 168A52 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13605WL   | 168A52 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13605WL   | 168A52 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13606WL   | 770B04 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13606WL   | 770B04 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13606WL   | 770B04 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13607WL   | 770D04 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TED13607WL   | 770D04 | 3         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TFJ236150WL  | 168A56 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TFJ236150WL  | 168A56 | 3         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THED124070WL | 268A13 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THED124070WL | 268A13 | 3         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THED126040WL | 268A08 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THED126040WL | 268A08 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THED136100WL | 268A00 | 3         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THQB1115     | 505F55 | 5         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THQB1120     | 505F56 | 7         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | THQB1130     | 505F57 | 10        |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     |              |        |           |              |   |
|               |  | GENERAL      | TYPE EC,     | 168A47 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     | DA-7700      |        |           |              |   |
|               |  | GENERAL      | TYPE EC,     | 168A47 | 1         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     | DA-7700      |        |           |              |   |
|               |  | GENERAL      | TYPE EC,     | 168A47 | 2         |              | CECO QA REVIEW REQUIRED                     |
|               |  | ELECTRIC     | DA-7700      |        |           |              |   |
|               | WESTINGHOUSE<br>ELECTRIC SUPPLY<br>CO. | BRYANT       | BR130        | 765F38 | 5         |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |  | WESTINGHOUSE | DA2300       | 507H18 | 1         |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |  | WESTINGHOUSE | EB2100N      | 763G37 | 3         |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |
|               |  | WESTINGHOUSE | HOP-1020     | 268A11 | 1         |              | DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD |

- TABLE F - Zion Station Molded Case Circuit Breakers  
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| TRACED TO CBM | SUPPLIER                | MANUFACTURER | PART NUMBER | S.I.#  | STOCK QTY | STATION DOC. | 88-10 COMMENTS   |
|---------------|-------------------------|--------------|-------------|--------|-----------|--------------|--|
| NO*           | WESTINGHOUSE            | WESTINGHOUSE | HQP-1020    | 268A11 | 2         |              | SHIPPED FROM WESCO STOCK 12/6/88<br>SHIPPED FROM WESCO STOCK<br>DOCUMENTATION NOT AVAILABLE - ORDER TOO OLD<br>WESCO TO WESTINGHOUSE P.O. 5105-380200 - NEED<br>COPY |
|               |                         | WESTINGHOUSE | HQP-1020    | 268A11 | 5         |              |  |
|               |                         | WESTINGHOUSE | HQP-1030    | 268A12 | 5         |              |  |
|               |                         | WESTINGHOUSE | HQP2015H    | 760B53 | 2         |              |  |
|               |                         |              | Total:      |        | 117       |              |  |
| YES           | GENERAL<br>ELECTRIC CO. | GENERAL      | THQB1130    | 268A14 | 5         |              | BASED ON PROCUREMENT FROM CORP. DIV. OF CBM  |
|               |                         | ELECTRIC     |             |        |           |              |  |
|               |                         |              | Total:      |        | 5         |              |  |
|               |                         |              | Total:      |        | 124       |              |  |

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**ATTACHMENT G**  
**EVALUATION OF OPERATION WITH INSTALLED NON-TRACEABLE MCCBS**

Commonwealth Edison has prepared this evaluation of operation with installed non-traceable molded case circuit breakers (MCCBs) as a result of concerns raised by NRC Bulletin 88-10. This evaluation provides factors which support operability, and includes: Component Failure Analysis, System Design Analysis, and Low Risk Assessments.

Edison will aggressively test or replace all installed MCCBs of concern by the Bulletin. This action will alleviate any question of the ability of the circuit breakers to properly perform their design function and will fulfill the Bulletin documentation requirements. The ability to complete testing/replacement of all Bulletin breakers will depend on replacement breaker availability and the ability to remove breakers from service without affecting the safe and reliable operation of the plant. In all cases, non-traceable breakers will be either replaced or demonstrated adequate by test prior to start-up from the second refueling outage.

Priority of breaker replacement or testing will be established based on risk (e.g., questionable breakers installed in redundant divisions will be the highest priority).

**Component Failure Analysis**

- Insulation Breakdown Failure

Effect: Loss of supply bus.

Failure Probability: Extremely low [constant voltage supply on breaker during normal operation demonstrates insulation integrity].

- Inadvertent or Premature Breaker Opening

Effect: Loss of breaker service.

Failure Probability: Low [normal system operation and surveillance testing provides assurance of the breakers' capability to supply load].

- Failure to Clear Fault or Overload Condition

Effect: Loss of supply bus.

Failure Probability: Low [circuit failure concurrent with a system demand is low. Extremely low with Class 1E circuit design. Additional protective devices (e.g., overload relay, redundant breaker) may clear fault and limit loss of power to breaker service].

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### System Design Analysis

- Fully redundant design in safety-related systems. Failure of a single breaker will not defeat redundant system. A circuit failure (thus a challenge to the MCCB) is considered the designed for "single failure" and therefore the redundant division will successfully perform the required safety function.
- Design diversity in many safety-related systems protects against common mode failures [e.g., Dresden Primary Containment Isolation (PCI) valves on HPCI steam supply has an inboard AC powered valve and an outboard DC valve with diverse MCCB types and manufacturers].
- Class 1E circuit design, installation and maintenance assures proper circuit performance.

### Low Risk Assessments

- Only a subset of all breakers without verifiable traceability have been refurbished.
- Some refurbished MCCBs will perform the intended safety functions.
- Low probability of accident or system demand.
- Low probability of circuit failure thus a demand or challenge to the MCCB.
- Normal system operation and surveillance testing provides added assurance that MCCB supports load.
- Low probability of MCCB failure between testing or surveillance.
- Low probability of coincident failure of refurbished MCCBs.