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# Closeout of IE Bulletin 80-15: Possible Loss of Emergency Notification System (ENS) with Loss of Offsite Power

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## ABSTRACT

Documentation is provided in this report for the closeout of IE Bulletin 80-15 for nuclear power reactors. This bulletin pertained to a possible loss of the Emergency Notification System (ENS) upon loss of offsite power. Closeout is based on the implementation and verification of six (6) required actions by licensees of nuclear power reactors in operation or near to receiving an operating license when the bulletin was issued on June 18, 1980. Evaluation of utility responses and NRC/Region inspection reports indicates that the bulletin is closed for all of the 69 nuclear power reactors to which it was issued for action and which were not shut down indefinitely or permanently at the time of issuance of this report. Background information is supplied in the Introduction and Appendix A. Nuclear fuel facilities as well as nuclear power facilities were identified in the enclosures to the bulletin. However, per an NRC memorandum, the closeout of the bulletin for nuclear fuel facilities is not within the scope of this report.

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CLOSEOUT OF IE BULLETIN 80-15:  
POSSIBLE LOSS OF EMERGENCY NOTIFICATION  
SYSTEM (ENS) WITH LOSS OF OFFSITE POWER

INTRODUCTION

This report provides documentation for the closeout of IE Bulletin 80-15 for nuclear power reactors in accordance with the Statement of Work in Task Order 37 under NRC Contract 05-85-157-02. Documentation is based on records obtained from the NRC Document Control System.

Fuel facilities receiving the bulletin for action are not included in this review. Responsibility for tracking bulletin status for these facilities rests with NRC's Office of Nuclear Materials Safety and Safeguards (NMSS).

The Bulletin was issued on June 18, 1980, to all licensees of nuclear power and nuclear fuel facilities in operation or near to receiving an operating license. The concern was based on losses of the Emergency Notification System (ENS) at Davis-Besse 1 and Indian Point 2. Davis-Besse 1 used on-site power and Indian Point 2 used power supplied by the local telephone company.

Information Notice 85-77 was issued on September 20, 1985, to alert licensees to the possibility that modifications (such as changing to fiber optics or interrupting offsite power for maintenance activities without adequate review) may increase the vulnerability of the ENS.

Copies of IE Bulletin 80-15, IE Circular 80-09, IE Information Notice 84-42, and IE Information Notice 85-77 are included in Appendix A of this report for presentation of background information. Utility responses and NRC/Region inspection reports are documented in Table B.1 as the basis for bulletin closeout. Utility manhours expended on the bulletin are listed in Appendix C. Abbreviations used in this report and associated documents are listed in Appendix D.

## SUMMARY

1. The bulletin is closed for the following 33 facilities per Criterion 1 (see page B-7):

|                    |                    |                  |
|--------------------|--------------------|------------------|
| Beaver Valley 1    | Nine Mile Point 1  | San Onofre 1     |
| Big Rock Point 1   | North Anna 1,2     | Sequoyah 1       |
| Browns Ferry 1,2,3 | Palisades          | St. Lucie 1      |
| Calvert Cliffs 1,2 | Peach Bottom 2,3   | Surry 1,2        |
| Davis-Besse 1      | Pilgrim 1          | Trojan           |
| Dresden 2,3        | Prairie Island 1,2 | Vermont Yankee 1 |
| Indian Point 2     | Robinson 2         | Zion 1,2         |
| Maine Yankee       | Salem 1,2          |                  |

2. The bulletin is closed for the following 35 facilities per Criterion 2 (see page B-7):

|                   |                |                  |
|-------------------|----------------|------------------|
| Arkansas 1,2      | FitzPatrick    | Monticello       |
| Brunswick 1,2     | Fort Calhoun 1 | Oconee 1,2,3     |
| Cook 1,2          | Ginna          | Oyster Creek 1   |
| Cooper Station    | Haddam Neck    | Point Beach 1,2  |
| Crystal River 3   | Hatch 1,2      | Quad Cities 1,2  |
| Diablo Canyon 1,2 | Indian Point 3 | Rancho Seco 1    |
| Duane Arnold      | Kewaunee       | Turkey Point 3,4 |
| Farley 1          | Millstone 1,2  | Yankee-Rowe 1    |

3. The bulletin is closed for the following three facilities per notes 3 and 6 (see page B-7):

|           |          |       |
|-----------|----------|-------|
| McGuire 1 | Summer 1 | TMI 1 |
|-----------|----------|-------|

4. The bulletin is closed for all 69 facilities. Note: McGuire 1 and Summer 1 are not included in the list of 69 OLS and NTOLs affected by this bulletin. See Note 3 on page B-7.
5. For the revised tables of facilities using telephone company or on-site power, see tables B.2 and B.3 on pages B-8 and B-9.
6. Because they are shut down indefinitely or permanently (SDI), the following six (6) facilities are excluded from Table B.1:

|                |                |           |
|----------------|----------------|-----------|
| Dresden 1      | Humboldt Bay 3 | La Crosse |
| Fort St. Vrain | Indian Point 1 | TMI 2     |

7. Occurrences at Davis-Besse 1 and Indian Point 2 led to issuance of Bulletin 80-15. Occurrences at Palisades and Quad Cities 1,2 led to issuance of Information Notice 85-77. All five of these facilities have closed bulletin status.

## CONCLUSIONS

The concerns of the bulletin have been met.

## ADDITIONAL AREAS OF CONCERN

Additional areas of concern beyond the scope of the bulletin are presented in Information Notices (INs) 84-42, and 85-77 (see pages A-7 through A-12).

APPENDIX A  
Background Information and Required Actions

Note: For actions required of the utilities,  
see pages A-1 and A-2.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

SSINS No.: 6820  
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IE Bulletin No. 80-15  
Date: June 18, 1980  
Page 1 of 2

POSSIBLE LOSS OF EMERGENCY NOTIFICATION SYSTEM (ENS) WITH LOSS OF OFFSITE POWER

In the past year, there have been two occurrences where a loss of off-site power has resulted in a loss of communications between a power reactor facility and the NRC Operations Center via the Emergency Notification System (ENS). The most recent occurrence was at Indian Point Unit 2 on June 3, 1980. The earlier event occurred at the Davis Besse facility on October 15, 1979 and resulted in the issuance of IE Circular 80-09.

The installation of the ENS requires a station package which operates on 110 VAC. In some cases, the station package is located at the local telephone company which supplies the required power for normal operation and emergency power for operation during abnormal occurrences, but in many cases, the package is located at the site and is served by on-site power. In some cases where the station package is served by on-site power, the station package has not been backed up by emergency power.

NRC data indicates that the station packages for each facility are powered in the manner described in the two enclosures.

Actions to be taken by all licensees:

1. Within 10 days of the date of this Bulletin, verify by direct inspection, in conjunction with the appropriate telephone company representative, that the ENS at your facility is powered in the manner described in the two enclosures.
2. Those facilities which have station packages requiring on-site power, but which are not connected to a safeguards instrumentation bus which is backed up by batteries and an inverter or equally reliable power supply, shall make necessary modifications and provide such a connection.
3. All facilities are to develop and conduct a test, within 60 days of the issuance of this Bulletin, to verify that all extensions of the ENS located at your facility(ies) would remain fully operable from the facility(ies) to the NRC Operations Center in the event of a loss of offsite power to your facility(ies). This is not intended to mean that an actual loss of offsite power be executed.

4. If it is determined that a station package requiring on-site power is not connected to a safeguards instrumentation bus backed up by automatic transfer to batteries and an inverter or an equally reliable power supply, notify the NRC Operations Center via the ENS within 24 hours after such determination.
5. Prepare and issue an administrative procedure or directive which requires notification to the NRC Operations Center by commercial telephone or relayed message within one hour of the time that one or more extensions of the ENS located at your facility(ies) is subsequently found to be inoperable for any reason.
6. Provide a written report, within 75 days of the issuance of this Bulletin, describing the result of the reviews required by items 1 and 2 above, the results of the testing required by item 3 and the procedures required by item 5.

This information is requested under the provisions of 10 CFR 50.54(f). Accordingly, you are requested to provide within the time periods specified in item 6 above, written statements of the above information, signed under oath or affirmation.

Reports shall be submitted to the Director of the appropriate NRC Regional Office and a copy forwarded to the Director, NRC Office of Inspection and Enforcement, Washington, D.C. 20555.

Approved by GAO, B180225 (R0072): clearance expires 7-31-80. Approval was given under a blanket clearance specifically for identified generic problems.

Enclosures:

1. Facilities With "Hotline" Powered  
By Local Telephone Company
2. Facilities With "Hotline" Using  
On-Site Power

Facilities With "Hotline" Powered By Local Telephone Company

Region I

B&W Leechburg/Apollo  
Beaver Valley 1  
Calvert Cliffs 1 & 2  
Fitzpatrick  
Ginna  
Indian Point 2  
Indian Poin 3  
Millstone 1 & 2  
NFS-West Valley  
Nine Mile Point 1  
Three Mile Island 1 & 2  
TI-Attleboro  
Westinghouse Cheswick

Region II

Hatch 1 & 2  
NFS-Erwin

Region III

Cook 1 & 2  
Dresden 1, 2 & 3  
Duane Arnold  
Kerr McGee Cresent  
La Crosse  
Monticello  
Palisades  
Point Beach 1 & 2  
Quad Cities 1 & 2

Region V

Exxon Richland  
General Atomics LaJolla  
Rockwell Canoga Park  
San Onofre  
Trojan

Enclosure 1

Facilities With "Hotline" Using On-Site Power

Region I

Haddam Neck  
Maine Yankee  
Oyster Creek  
Peach Bottom 2 & 3  
Pilgrim 1  
Salem 1 & 2  
UNC-Montville  
UNC-Wood River Junction  
Vermont Yankee  
Yankee Rowe

Region II

B&W LRC-Lynchburg  
B&W Navy-Lynchburg  
Browns Ferry 1, 2 & 3  
Brunswick 1 & 2  
Crystal River  
Farley 1  
North Anna 1 & 2  
Oconee 1, 2 & 3  
Robinson 2  
Sequoah 1  
St. Lucie 1  
Surry 1 & 2  
Turkey Point 3 & 4

Region III

Big Rock Point  
Davis-Besse  
Kewaunee  
Prairie Island 1 & 2  
Zion 1 & 2

Region IV

Arkansas Nuclear One, 1 & 2  
Cooper  
Fort Calhoun  
Fort St. Vrain

Region V

Diablo Canyon  
Rancho Seco

Enclosure 2

April 28, 1980

IE Circular No. 80-09

## PROBLEMS WITH PLANT INTERNAL COMMUNICATIONS SYSTEMS

## Description of Circumstances at the Kewaunee Power Plant:

On January 17, 1980, the Kewaunee Nuclear Power Plant lost offsite power to its 4160V non-safeguards buses. Since the system used for internal communications, paging and evacuation alarm purposes (Gai-tronics) was powered from a non-safeguards bus, plant communications were degraded during the outage. This degraded condition persisted until power was restored to the affected bus thru an emergency safeguards bus. While in the degraded mode, the licensee used two-way portable radios for internal communications. The radios performed satisfactorily, per se; however, when transmitting in the vicinity of certain electronic equipment, they induced false signals into the electronic equipment.

## Description of Circumstances at the Davis-Besse Power Station:

On October 15, 1979, the Davis-Besse Power Station lost all offsite power. During the period when offsite power was not available, the licensee noted that the internal three digit telephones (GTE) would not function. In addition, the NRC "Red Phone" was subsequently reported to have been out of service. Other licensee phone systems (Gai-tronics and the outside four digit Ohio Bell phones) did work.

Following this event, the licensee provided emergency power to its phones and the NRC took action through AT&T to provide emergency power to all Red Phones. (Note: Although the communications system at Davis-Besse was not designed to meet the single failure criterion, its FSAR states that the main internal communications system is supplied by two redundant power feeders from the uninterruptable instrumentation distribution panels.)

## RECOMMENDED ACTION FOR LICENSEES AND HOLDERS OF CONSTRUCTION PERMITS

All licensees of nuclear power reactors and holders of construction permits should be aware of the potential problems described above. Because of the generic implications of the above problems, it is recommended that the following actions be considered:

1. Determine the source of power for plant internal communications systems;
2. Upgrade the internal communications systems to assure operability during the loss of offsite power or other foreseeable events;

3. Determine whether any plant electronic equipment may be adversely affected by portable radio transmissions. This determination should include, but not be limited to, the computer system, electro-hydraulic system, and nuclear instrumentation system; and
4. Instruct employees on the use of radios in areas susceptible to electromagnetic interference.

No written response to this Circular is required; however, if additional information regarding these matters is required, contact the Director of the appropriate NRC Regional Office.

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, DC 20555

June 5, 1984

IE INFORMATION NOTICE NO. 84-42: EQUIPMENT AVAILABILITY FOR CONDITIONS  
DURING OUTAGES NOT COVERED BY TECHNICAL  
SPECIFICATIONS

Addressees:

All holders of a nuclear power plant operating license (OL) or construction permit (CP).

Purpose:

This information notice is provided to alert licensees to the importance of controlling equipment availability for conditions during outages not covered by Technical Specifications. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements and, therefore, no specific action or written response is required.

Description of Circumstances:

On January 8, 1984, the Palisades Nuclear Plant experienced a complete loss of offsite and onsite ac power. The event was precipitated by the need to isolate a faulty switchyard breaker. To isolate the breaker, it was necessary to interrupt the offsite power supply to the plant. At the time of the event, Palisades was in a refueling outage with all fuel removed from the reactor and the no. 2 diesel generator (DG) inoperable. The service water pump powered from the no. 1 (operable) DG also was inoperable as a result of maintenance.

When the shift supervisor interrupted the offsite power supply to the plant, the operators did not realize cooling water to the operable DG was not available. The control room alarm indication, which should have warned the operators, was apparently masked by the large number of simultaneous alarms received when the offsite power was interrupted. Approximately 50 minutes later the DG overheated and was manually tripped. Once the DG was tripped, all station power was lost, with the exception of the station batteries and their associated dc and preferred ac buses. The loss of ac power caused a loss of plant communications, fire protection, security, and habitability systems as well as the fuel pool cooling system. (Compensatory measures were promptly taken upon loss of the normal security systems.) The loss of communications is considered the most serious consequence of this event. This loss of communications will be further addressed in a separate information

notice (IN). The restoration of ac power was delayed as a result of an inoperable main transformer (out for maintenance) and a malfunction of one of the startup supply breakers.

While operating procedures required two operable diesel generators before removing offsite power, operating procedures did not specifically delineate equipment availability requirements for this defueled condition. The shift supervisor violated the procedure and proceeded with the evolution after evaluating fuel cooling. The fuel pool was known to heat up very slowly and to require days without active cooling before the high temperature alarm would be reached. The shift supervisor, however, failed to fully recognize the importance of the other support systems (e.g., communication, fire protection) to the overall safety of the plant. The procedural requirements were reviewed as part of the evaluation of fuel cooling and it was determined their intent was to minimize risk to fuel integrity when the fuel was in the reactor vessel.

Following the loss of onsite and offsite ac power, the Emergency Procedures were not implemented in a timely manner because the importance of the various support systems had not been recognized.

The licensee initiated many corrective actions as a result of this event (see Palisades Licensee Event Report (LER) 84-001). Some of the more important corrective actions by the licensee include:

1. A review of the management control of equipment for plant conditions not covered by the requirements of the Technical Specifications. The review will specifically address electrical system requirements during cold shutdown to ensure sufficient equipment remains available to maintain the plant in a safe condition and to meet the commitments of the Site Emergency, Security, and Fire Protection Plans.
2. Establishing minimum equipment availability for specific conditions not covered by the Technical Specifications.
3. Provide classroom training for all operators on the use and intent of the Site Emergency Plan.
4. Integrate the use of the Site Emergency Plan into simulator training.
5. Discuss the need for strict adherence to operating procedures with all operations personnel.

NRC has previously identified concerns with operability of required equipment in IE IN 83-56, "Operability of Required Auxiliary Equipment," and IN 80-20, "Loss of Decay Heat Removal Capability at Davis-Besse Unit 1 While in a Refueling Mode." If you have any questions regarding this matter, please

IN 84-42  
June 5, 1984  
Page 3 of 3

contact the Regional Administrator of the appropriate NRC Regional Office or this office.



Edward L. Jordan, Director  
Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement

Technical Contact: H. Bailey, IE  
(301) 492-7078

Attachment:  
List of Recently Issued IE Information Notices

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF INSPECTION AND ENFORCEMENT  
WASHINGTON, D.C. 20555

September 20, 1985

IE INFORMATION NOTICE NO. 85-77: POSSIBLE LOSS OF EMERGENCY NOTIFICATION  
SYSTEM DUE TO LOSS OF AC POWER

Addressees:

All holders of a nuclear power plant operating license (OL) or a construction permit (CP).

Purpose:

This information notice is provided to alert licensees to the possibility that modifications to plant telephone systems may result in a change in the vulnerability of the Emergency Notification System (ENS) and other plant telephones to losses of ac power. It is expected that recipients will review the information for applicability to their facilities and consider actions, if appropriate, to preclude similar problems occurring at their facilities. However, suggestions contained in this information notice do not constitute NRC requirements; therefore, no specific action or written response is required.

Description of Circumstances:

On January 8, 1984, the Palisades Nuclear Plant interrupted its offsite power supply for maintenance activities. Subsequently all ac power from the emergency diesel generators was lost. (This event is described in detail in Information Notice No. 84-42.) As a result of the ac power problems, all onsite telephones were rendered inoperable for approximately 3 hours, except for two offsite-powered pay telephones. Loss of the ENS and normal communications significantly hampered the notification process.

On May 7, 1985, Quad Cities Unit 1 was operating at 90% power. The Unit 2 auxiliary transformer was inadvertently shorted while the unit was shut down with its associated emergency diesel generator out for maintenance. This caused the loss of offsite ac power to Unit 2 and a voltage transient in Unit 1 that subsequently caused that unit to scram about 15 minutes later. Unit 1 retained offsite ac power. One division of Unit 2 was promptly powered by autostart of the swing emergency diesel generator, and the other division was powered within about 20 minutes by crosstie to a 4KV bus of Unit 1. When the licensee attempted to notify the NRC Emergency Operations Center over the ENS, the circuit repeatedly disconnected. The Quad Cities plant also was unable to receive incoming calls from the NRC over commercial telephone lines.

These incidents indicate that the provisions of IE Bulletin 80-15 were not maintained at the affected facilities at the times of the events. The bulletin required verification that all ENS station packages that use onsite ac power were connected to a safeguards instrumentation bus backed up by automatic transfer to batteries and an inverter or an equally reliable power source. At the time the bulletin was issued, both plants had ENS packages that were powered by the local telephone company, making them independent of ac power sources at the plant sites.

Discussion:

The installation of the ENS requires a station package that operates on 110 Vac. In some cases, the station package is located at the local telephone company which supplies the required power for normal operation and emergency power for operation during abnormal situations. However, in many cases, the ENS package is located at the site and is served by ac power provided by the plant.

Earlier incidents involving loss of offsite power led to losses of emergency notification capabilities at the Davis-Besse facility on October 15, 1979, and at the Indian Point Unit 2 on June 3, 1980. These incidents prompted the issuance of IE Circular 80-09 and IE Bulletin 80-15. The bulletin contained a list of those stations with ENS packages powered by the telephone company and a list of those stations with ENS packages powered at the plant site. At that time, both the Palisades plant and the Quad Cities plant had ENS packages with power supplies provided by the telephone company.

Subsequent changes to provide additional circuits in the telephone system at the Palisades plant resulted in the ENS and commercial telephone system packages being powered at the plant site. Power was supplied from a bus supported by an emergency diesel generator. However, the modification was not controlled within the licensee's formal modification process and was thus completed without formal review. The modified ENS power supply was not backed by batteries and an inverter, as previously provided by Bulletin 80-15, and was not independent of the station's commercial telephone service as reflected in the licensee's Emergency Plan.

During the incident at Palisades on January 8, 1984, the unit was intentionally powered from a single emergency diesel generator on the 1C 2400-V bus to allow isolation of a faulty switchyard breaker. The unit was defueled, and the other diesel was inoperable due to maintenance. When the running diesel subsequently overheated and tripped, the station was without ac power with the exception of preferred ac. Although some other buses were repowered by offsite ac within an hour, difficulties in closing the breakers to the 1C and 1E 2400-V buses resulted in the extended loss of all telephones except for two pay telephones powered by the telephone company. The 1E bus was repowered after about 3 hours by successfully closing the breaker to the offsite source. This provided partial restoration of the telephone service. However, the ENS telephones on the 1C bus were not restored for 6 hours, when they were finally jumpered to an energized source.

At the Quad Cities plant, the local telephone company abandoned the copper wire cables that were in use in 1980 and installed a fiber optics communications system in its place. Because the fiber optics cable does not provide for electrical power transmission, the fiber optics package at the plant had to be provided with an onsite power source. Similarly, the site package for the ENS had to be shifted to onsite power. The licensee powered the fiber optics package from an instrument bus in Unit 2 and the ENS from an instrument bus in Unit 1. These buses are supported by emergency diesel generators, but the power supplies to the communications packages are not backed up by batteries and an inverter in accordance with Bulletin 80-15.

During the event on May 7, 1985, when the Unit 2 instrument bus powering the fiber optics package lost power, both the ENS and normal PBX telephones became inoperable. The Unit 1 bus supporting the ENS package remained powered by an offsite ac source through the switchyard, but could not communicate through the unpowered fiber optics system. Once power was restored to the Unit 2 bus through a crosstie, the ENS circuit repeatedly disconnected as the licensee attempted to make emergency notifications.

These events illustrate the need for careful review of changes to plant telephone equipment to ensure that the reliability of the ENS is not compromised. In those cases where offsite communications power that is supplied by the telephone company is replaced by an onsite power source, it is important to consider the reliability of the power sources for all segments of the ENS transmission path. Those plants that already supply the ENS from an onsite safeguards instrumentation bus should be aware that the introduction of a fiber optics connection by the local telephone company still may compromise the ENS if the plant-end fiber optics package is not similarly powered.

No specific action or written response is required by this information notice. If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC regional office or this office.

  
Edward L. Jordan, Director  
Division of Emergency Preparedness  
and Engineering Response  
Office of Inspection and Enforcement

Technical Contacts: S. Long, IE  
(301) 492-7159

R. Priebe, IE  
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Attachment: List of Recently Issued IE Information Notices

APPENDIX B

Documentation of Bulletin Closeout  
For Nuclear Power Facilities

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES

| Facility         | Utility | Docket | Facility Status<br>06-18-80 | NRC Region | Utility Response | Inspection Report and Date       | Closeout Status and criterion (2)           |
|------------------|---------|--------|-----------------------------|------------|------------------|----------------------------------|---|
| (1)              | (1)     | (1)    | (1)                         | (1)        | (1)              | (1)                              | (1)   |
| Arkansas 1       | AP&L    | 50-313 | OL                          | IV         | B&W              | 09-03-80<br>10-22-80             | 80-17(10-31-80) Closed 2                    |
| Arkansas 2       | AP&L    | 50-368 | OL                          | IV         | C-E              | 09-03-80<br>10-22-80             | 80-17(10-31-80) Closed 2                    |
| Beaver Valley 1  | DLC     | 50-334 | OL                          | I          | W                | 09-11-80                         | 81-28(01-07-82)<br>82-13(07-20-82) Closed 1 |
| Big Rock Point 1 | CPC     | 50-155 | OL                          | III        | GE               | 09-02-80                         | 80-10(09-25-80) Closed 1                    |
| Browns Ferry 1   | TVA     | 50-259 | OL                          | II         | GE               | 08-29-80<br>03-03-81<br>06-10-81 | 81-18(08-10-81) Closed 1                    |
| Browns Ferry 2   | TVA     | 50-260 | OL                          | II         | GE               | 08-29-80<br>03-03-81<br>06-10-81 | 81-18(08-10-81) Closed 1                    |
| Browns Ferry 3   | TVA     | 50-296 | OL                          | II         | GE               | 08-29-80<br>03-03-81<br>06-10-81 | 81-18(08-10-81) Closed 1                    |
| Brunswick 1      | CP&L    | 50-325 | OL                          | II         | GE               | 08-27-80<br>11-06-80<br>08-24-81 | 80-35(09-24-80) Closed 2                    |
| Brunswick 2      | CP&L    | 50-324 | OL                          | II         | GE               | 08-27-80<br>11-06-80<br>08-24-81 | 80-32(09-24-80) Closed 2                    |
| Calvert Cliffs 1 | BG&E    | 50-317 | OL                          | I          | C-E              | 08-21-80<br>10-31-80             | 81-02(03-10-81) Closed 1                    |
| Calvert Cliffs 2 | BG&E    | 50-318 | OL                          | I          | C-E              | 08-21-80<br>10-31-80             | 81-02(03-10-81) Closed 1                    |

Notes indicated by numbers in parentheses are located on page B-7.

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES (contd)

| Facility        | Utility | Docket | Facility Status<br>06-18-80 | NRC Region | NSSS | Utility Response Date | Inspection Report and Date | Closeout Status and Criterion (2) |
|-----------------|---------|--------|-----------------------------|------------|------|-----------------------|----------------------------|-----------------------------------|
|                 |         | (1)    |                             |            |      |                       |                            |                                   |
| Cook 1          | IMECO   | 50-315 | OL                          | III        | W    | 09-04-80              | 80-13(10-22-80)            | Closed 2                          |
| Cook 2          | IMECO   | 50-316 | OL                          | III        | W    | 09-04-80              | 80-11(10-22-80)            | Closed 2                          |
| Cooper Station  | NPPD    | 50-298 | OL                          | IV         | GE   | 06-27-80<br>08-06-80  | 80-12(08-29-80)            | Closed 2                          |
| Crystal River 3 | FPC     | 50-302 | OL                          | II         | B&W  | 07-30-80              | 80-33(11-24-80)            | Closed 2                          |
| Davis-Besse 1   | TECO    | 50-346 | OL                          | III        | B&W  | 08-22-80<br>12-08-80  | 80-25(10-14-80)            | Closed 1                          |
| Diablo Canyon 1 | PG&E    | 50-275 | CP                          | V          | W    | 11-25-80<br>04-10-81  | 81-19(08-12-81)            | Closed 2                          |
| Diablo Canyon 2 | PG&E    | 50-323 | CP                          | V          | W    | 11-25-80<br>04-10-81  | 81-13(08-12-81)            | Closed 2                          |
| Dresden 2       | CECO    | 50-237 | OL                          | III        | GE   | 08-29-80              | 84-03(04-10-84)            | Closed 1                          |
| Dresden 3       | CECO    | 50-249 | OL                          | III        | GE   | 08-29-80              | 84-02(04-10-84)            | Closed 1                          |
| Duane Arnold    | IELPCO  | 50-331 | OL                          | III        | GE   | 07-01-80              | 80-13(09-24-80)            | Closed 2                          |
| Farley 1        | APCO    | 50-348 | OL                          | II         | W    | 08-06-80<br>04-08-86  | 81-29(01-28-82)            | Closed 2                          |
| FitzPatrick     | PASNY   | 50-333 | OL                          | I          | GE   | 09-05-80              | 80-15(12-10-80)            | Closed 2                          |
| Fort Calhoun 1  | OPPD    | 50-285 | OL                          | IV         | C-E  | 08-25-80              | 81-14(07-23-81)            | Closed 2                          |
| Ginna           | RG&E    | 50-244 | OL                          | I          | W    | 08-29-80              | 81-24(01-11-82)            | Closed 2                          |

Notes indicated by numbers in parentheses are located on page B-7.

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES (contd)

| Facility          | Utility | Docket | Facility Status | NRC Region | Utility Response Date | Inspection Report and Date       | Closeout Status and Criterion (2) |
|-------------------|---------|--------|-----------------|------------|-----------------------|----------------------------------|-----------------------------------|
|                   |         |        | (1)             | NSSS       |                       |                                  |                                   |
| Haddam Neck       | CYAPCO  | 50-213 | OL              | I          | W                     | 08-27-80                         | 84-12 (07-24-84) Closed 2         |
| Hatch 1           | GPC     | 50-321 | OL              | II         | GE                    | 08-29-80<br>10-23-80             | 81-09 (05-06-81) Closed 2         |
| Hatch 2           | GPC     | 50-366 | OL              | II         | GE                    | 08-29-80<br>10-23-80             | 81-09 (05-06-81) Closed 2         |
| Indian Point 2    | ConEd   | 50-247 | OL              | I          | W                     | 09-02-80                         | 83-11 (05-11-83) Closed 1         |
| Indian Point 3    | PASNY   | 50-286 | OL              | I          | W                     | 08-29-80                         | 83-11 (05-11-83) Closed 1         |
| Keweenaw          | WPS     | 50-305 | OL              | III        | W                     | 09-11-80<br>03-04-81             | 80-20 (10-28-80) Closed 2         |
| Maine Yankee      | MYAPCO  | 50-309 | OL              | I          | C-E                   | 08-28-80                         | 81-12 (06-15-81) Closed 1         |
| McGuire 1         | DUPCO   | 50-369 | CP              | II         | W                     | 80-32 (01-14-81)                 | (3)                               |
| Millstone 1       | NU      | 50-245 | OL              | I          | GE                    | 08-25-80                         | 80-17 (10-27-80) Closed 2         |
| Millstone 2       | NU      | 50-336 | OL              | I          | C-E                   | 08-25-80                         | 80-19 (10-27-80) Closed 2         |
| Monticello        | NSP     | 50-263 | OL              | III        | GE                    | 08-05-80                         | 80-20 (01-16-81) Closed 2         |
| Nine Mile Point 1 | NMP     | 50-220 | OL              | I          | GE                    | 08-15-80<br>09-03-80<br>10-29-80 | 80-08 (10-09-80) Closed 1         |
| North Anna 1      | VEPCO   | 50-338 | OL              | II         | W                     | 09-05-80                         | 81-11 (04-29-81) Closed 1         |
| North Anna 2      | VEPCO   | 50-339 | CP              | II         | W                     | 09-05-80                         | 81-07 (04-29-81) Closed 1         |
| Oconee 1          | DUPCO   | 50-269 | OL              | II         | B&W                   | 08-27-80<br>09-16-80             | 85-15 (07-09-85) Closed 2         |

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES (contd)

| Facility         | Utility        | Docket | Facility Status | NFC | Utility Response Date      | Inspection Report and Date | Closeout Status and criterion (2) |
|------------------|----------------|--------|-----------------|-----|----------------------------|----------------------------|-----------------------------------|
| (1)              |                |        |                 | (1) |                            |                            |                                   |
| Oconee 2         | DUPCO          | 50-270 | OL              | II  | B&W<br>09-16-80            | 85-15 (07-09-85)           | Closed 2                          |
| Oconee 3         | DUPCO          | 50-287 | OL              | II  | B&W<br>09-16-80            | 85-15 (07-09-85)           | Closed 2                          |
| Oyster Creek 1   | JCP&L/<br>GPUN | 50-219 | OL              | I   | GE<br>11-10-80             | 84-28 (02-11-85)           | Closed 2                          |
| Palisades        | CPC            | 50-255 | OL              | III | C-E<br>09-04-80            | 81-05 (04-15-81)           | Closed 1                          |
| Peach Bottom 2   | PECO           | 50-277 | OL              | I   | GE<br>08-29-80             | 82-01 (02-12-82)           | Closed 1                          |
| Peach Bottom 3   | PECO           | 50-278 | OL              | I   | GE<br>08-29-80             | 82-01 (02-12-82)           | Closed 1                          |
| Pilgrim 1        | BECO           | 50-293 | OL              | I   | GE<br>10-08-80<br>11-07-80 | 85-11 (06-28-85)           | Closed 1                          |
| Point Beach 1    | WEPCO          | 50-266 | OL              | III | W<br>07-08-80              | 80-12 (08-21-80)           | Closed 2                          |
| Point Beach 2    | WEPCO          | 50-301 | OL              | III | W<br>07-08-80              | 80-12 (08-21-80)           | Closed 2                          |
| Prairie Island 1 | NSP            | 50-282 | OL              | III | W<br>10-03-80              | 80-19 (12-17-80)           | Closed 1                          |
| Prairie Island 2 | NSP            | 50-306 | OL              | III | W<br>10-03-80              | 80-19 (12-17-80)           | Closed 1                          |
| Quad Cities 1    | CECO           | 50-254 | OL              | III | GE<br>07-02-85             | 80-19 (11-24-80)           | Closed 2                          |
| Quad Cities 2    | CECO           | 50-265 | OL              | III | GE<br>07-02-85             | 80-21 (11-24-80)           | Closed 2                          |

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES (contd)

| Facility      | Utility          | Docket | Facility Status<br>06-18-80 | NRC Region<br>(1) | Utility Response Date | Inspection Report and Date                               | Closeout Status and Criterion (2)  |
|---------------|------------------|--------|-----------------------------|-------------------|-----------------------|--|------------------------------------|
| Rancho Seco 1 | SMUD             | 50-312 | OL                          | V                 | B&W                   | 08-27-80<br>09-30-80<br>12-15-80<br>01-19-81<br>04-29-83 | 80-27(10-22-80) Closed 2           |
| Robinson 2    | CP&L             | 50-261 | OL                          | II                | W                     | 08-14-80<br>09-30-80<br>12-15-80                         | 81-05(03-16-81) Closed 1           |
| Salem 1       | PSE&G            | 50-272 | OL                          | I                 | W                     | 08-29-80   | 80-21(10-28-80) Closed 1           |
| Salem 2       | PSE&G            | 50-311 | CP                          | I                 | W                     | 08-29-80   | 80-17(10-28-80) Closed 1           |
| San Onofre 1  | SCE              | 50-206 | OL                          | V                 | W                     | 08-28-80<br>10-16-80<br>11-05-86<br>05-15-87             | 80-27(10-17-80) Closed 1           |
| Sequoyah 1    | TVA              | 50-327 | CP                          | II                | W                     | 09-05-80<br>03-03-81<br>11-05-86                         | 82-11(07-02-82) Closed 1           |
| St. Lucie 1   | FPL              | 50-335 | OL                          | II                | C-E                   | 09-02-80   | 80-35(12-10-80) Closed 1<br>(4)(5) |
| Summer 1      | SCE&G            | 50-395 | CP                          | II                | W                     | 82-16(03-22-82)  | (3)                                |
| Surry 1       | VEPCO            | 50-280 | OL                          | II                | W                     | 09-05-80   | 84-10(02-01-85) Closed 1           |
| Surry 2       | VEPCO            | 50-281 | OL                          | II                | W                     | 09-05-80   | 84-10(02-01-85) Closed 1           |
| TMI 1         | Met-Ed /<br>GPUN | 50-289 | OL                          | I                 | B&W                   | 09-29-80<br>10-31-80                                     | 82-15(08-26-82) Closed (6)         |

Notes indicated by numbers in parentheses are located on page B-7.

TABLE B.1 BULLETIN CLOSEOUT STATUS FOR NUCLEAR POWER FACILITIES (contd)

| Facility         | Utility | Docket | Facility Status | NRC 06-18-80 Region | Utility Response Date | Inspection Report and Date       | Closeout Status and Criterion (2)           |
|------------------|---------|--------|-----------------|---------------------|-----------------------|----------------------------------|---|
|                  |         |        | (1)             | NSSS                |                       |                                  |   |
| Trojan           | PGE     | 50-344 | OL              | V                   | W                     | 08-14-80<br>10-23-80<br>06-03-86 | 81-01(01-29-81) Closed 1                    |
| Turkey Point 3   | FPL     | 50-250 | OL              | II                  | W                     | 09-04-80                         | 81-13(06-09-81) Closed 2                    |
| Turkey Point 4   | FPL     | 50-251 | OL              | II                  | W                     | 09-04-80                         | 81-13(06-09-81) Closed 2                    |
| Vermont Yankee 1 | VYNP    | 50-271 | OL              | I                   | GE                    | 08-28-80                         | 84-05(04-26-84)<br>84-08(06-04-84) Closed 1 |
| Yankee-Rowe 1    | YAEKO   | 50-029 | OL              | I                   | W                     | 08-29-80                         | 80-12(09-16-80) Closed 2                    |
| Zion 1           | CECO    | 50-295 | OL              | III                 | W                     | 08-29-80                         | 80-17(10-14-80)<br>83-02(04-20-83) Closed 1 |
| Zion 2           | CECO    | 50-304 | OL              | III                 | W                     | 08-29-80                         | 80-17(10-14-80)<br>83-02(04-20-83) Closed 1 |

Notes indicated by numbers in parentheses are located on page B-7.

Notes for Tables B.1:

1. Facility status relates to 06-18-80, and is based on Reference 1 below. The following abbreviations apply: CP, construction permit; OL, operating license.
2. The closeout criteria appear below.
3. On 05-C4-90, Kerry Landis (RII) informed Alan Hennick (PARAMETER) by telephone, that McGuire 1 and Summer 1 had been originally listed as NTOLs but have been given exemptions from responding because of licensing delays of over a year.
4. In a meeting on 01-25-90 at NRC Headquarters, Kerry Landis (RII) informed Carl H. Berlinger and Alan Hennick that IR 80-35 closes the bulletin for St. Lucie 1 and that IR 81-21 does not reopen it.
5. As a general extension of Note 4, Kerry Landis indicated that Region II intends to retain a closeout unless a later IR specifically reopens the bulletin.
6. In a memo to Charles E. Rossi (NRR) from John F. Stoltz (NRR), TMI 1 is closed because "all open items identified in IR 82-15 (08-26-82) have been formally closed out".

CRITERIA FOR BULLETIN CLOSEOUT

1. The licensee response and an NRC/Region inspection report indicate that: (1) the necessary modifications have been made to insure that acceptable power will be available to the ENS during abnormal occurrences, and (2) the test was completed satisfactorily.
2. The licensee response indicates that: (1) no modifications are necessary to insure that acceptable power will be available to the ENS during abnormal occurrences, and (2) the test was completed satisfactorily.

REFERENCES

1. United States Nuclear Regulatory Commission, Licensed Operating Reactors, Status Summary Report, Data as of 01-31-90, NUREG-0020, Volume 14, Number 2, February 1990.
2. United States Nuclear Regulatory Commission, Code of Federal Regulations, Energy, Title 10, Parts 1 to 50 revised as of January 1, 1990, cited as 10 CFR 0.735-1.

TABLE B.2 REVISED LIST OF NUCLEAR POWER FACILITIES  
WITH EMERGENCY NOTIFICATION SYSTEM (ENS)  
POWERED BY LOCAL TELEPHONE COMPANY

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Region I

Beaver Valley 1  
Calvert Cliffs 1,2  
FitzPatrick  
Ginna  
Indian Point 3  
Nine Mile Point 1

Region II

Farley 1 (changed to on-site powered ENS indicated in  
April 8, 1986 response)  
Hatch 1,2

Region III

Cook 1,2  
Duane Arnold

Region IV

Cooper Station  
Fort Calhoun 1

Region V

Tricjan

Note: This table is based on the information provided in the utility responses identified in Table B.1.

TABLE B.3 REVISED LIST OF NUCLEAR POWER FACILITIES  
WITH EMERGENCY NOTIFICATION SYSTEM (ENS)  
USING ON-SITE POWER

Region I

Haddam Neck  
Indian Point 2  
Maine Yankee  
Millstone 1,2  
Oyster Creek 1  
Peach Bottom 2,3  
Pilgrim 1  
Salem 1,2  
TMI 1 (with complete backup by telephone company)  
Vermont Yankee 1  
Yankee-Rowe 1

Region II

Browns Ferry 1,2,3  
Brunswick 1,2  
Crystal River 3  
North Anna 1,2  
Oconee 1,2,3 (emergency power is supplied by the  
telephone company)  
Robinson 2  
Sequoyah 1  
St. Lucie 1  
Surry 1,2  
Turkey Point 3,4

Region III

Big Rock Point 1  
Davis-Besse 1  
Dresden 2,3  
Kewaunee  
Monticello  
Palisades  
Point Beach 1,2  
Prairie Island 1,2  
Quad Cities 1,2  
Zion 1,2

Region IV

Arkansas 1,2

Region V

Diablo Canyon 1,2  
Rancho Seco 1  
San Onofre 1

Note: This table is based on information provided by the  
utility responses identified in Table B.1

## APPENDIX C

Utility Manhours Expended on IEB 80-15  
For Nuclear Power Facilities

TABLE C.1

| Facility           | Conducting<br>Review and<br>Preparing<br>Report | Performing<br>Corrective<br>Actions | Total | Closeout<br>Status and<br>Criterion |
|--------------------|---|-------------------------------------|-------|-------------------------------------|
| Arkansas 1,2       | 40  | 0                                   | 40    | Closed 2                            |
| Beaver Valley 1    | 30  | 0                                   | 30    | Closed 1                            |
| Browns Ferry 1,2,3 | 28  | 200                                 | 228   | Closed 1                            |
| Cook 1,2           | 12  | 0                                   | 12    | Closed 2                            |
| Cooper Station     | 3   | 0                                   | 3     | Closed 2                            |
| Crystal River 3    | 64  | 0                                   | 64    | Closed 2                            |
| Davis-Besse 1      | 18  | 8                                   | 26    | Closed 1                            |
| Farley 1           | 25  | 0                                   | 25    | Closed 2                            |
| Fort Calhoun 1     | 60  | 12                                  | 72    | Closed 2                            |
| Ginna              | 1   | 0                                   | 1     | Closed 2                            |
| Indian Point 3     | 6   | 0                                   | 6     | Closed 2                            |
| Kewaunee           | 40  | 0                                   | 40    | Closed 2                            |
| Maine Yankee       | 10  | 120                                 | 130   | Closed 1                            |
| Millstone 1,2      | 32  | 0                                   | 32    | Closed 2                            |
| Monticello         | 16  | 4                                   | 20    | Closed 2                            |
| Nine Mile Point 1  | 80  | 0                                   | 80    | Closed 1                            |
| Oconee 1,2,3       | 10  | 0                                   | 10    | Closed 2                            |
| Oyster Creek 1     | 50  | 0                                   | 50    | Closed 2                            |
| Peach Bottom 2,3   | 80  | 0                                   | 80    | Closed 1                            |
| Pilgrim 1          | 16  | 0                                   | 16    | Closed 1                            |
| Point Beach 1,2    | 8   | 0                                   | 8     | Closed 2                            |
| Robinson 2         | 50  | 0                                   | 50    | Closed 1                            |
| Salem 1,2          | 8   | 0                                   | 8     | Closed 1                            |

TABLE C.1 (contd)

| <u>Facility</u>  | <u>Conducting<br/>Review and<br/>Preparing<br/>Report</u> | <u>Performing<br/>Corrective<br/>Actions</u> | <u>Total</u> | <u>Closeout<br/>Status and<br/>Criterion</u> |
|------------------|---|--|--------------|--|
| Sequoyah 1       | 40  | 200  | 240          | Closed 1                                     |
| St. Lucie 1      | 14  | 434  | 448          | Closed 1                                     |
| TMI 1            | 75  | 0  | 75           | Closed<br>(see note 6<br>page B-7)           |
| Trojan           | 12  | 0  | 12           | Closed 1                                     |
| Turkey Point 3,4 | 31  | 2  | 33           | Closed 2                                     |
| Vermont Yankee 1 | 32  | 240  | 272          | Closed 1                                     |
| Yankee-Rowe 1    | 50  | 0  | 50           | Closed 2                                     |
|                  |   | Total  | 2161         |  |

APPENDIX D  
Abbreviations

|        |  |
|--------|--|
| APCO   | Alabama Power Company  |
| AP&L   | Arkansas Power and Light Company                                     |
| BECO   | Boston Edison Company  |
| BG&E   | Baltimore Gas and Electric Company                                   |
| B&W    | Babcock & Wilcox Company   |
| C-E    | Combustion Engineering Incorporated                                  |
| CECO   | Commonwealth Edison Company  |
| CFR    | Code of Federal Regulations  |
| ConEd  | Consolidated Edison Company of New York, Inc.                        |
| CP     | Construction Permit  |
| CPC    | Consumers Power Company  |
| CP&L   | Carolina Power and Light Company                                     |
| CR     | Contractor Report  |
| CYAPCO | Connecticut Yankee Atomic Power Company                              |
| DLC    | Duquesne Light Company   |
| DUPCO  | Duke Power Company   |
| ENS    | Emergency Notification System  |
| FPC    | Florida Power Corporation  |
| FPL    | Florida Power & Light Company  |
| FSAR   | Final Safety Analysis Report   |
| GAO    | Government Accounting Office   |
| GE     | General Electric Company   |
| GPC    | Georgia Power Company  |
| GPUN   | GPU Nuclear Corporation  |
| IE     | (See NRC/IE)   |
| IEB    | Inspection and Enforcement Bulletin (NRC)                            |
| IEC    | Inspection and Enforcement Circular (NRC)                            |
| IELPCO | Iowa Electric Light and Power Company                                |
| IMECO  | Indiana and Michigan Electric Company                                |
| IN     | Information Notice (NRC)   |
| IR     | Inspection Report (NRC/Region)                                       |
| JCP&L  | Jersey Central Power and Light Company                               |
| LER    | Licensee Event Report  |
| Met-Ed | Metropolitan Edison  |
| MYAPCO | Maine Yankee Atomic Power Company                                    |
| NMP    | Niagara Mohawk Power Company   |
| NMSS   | Nuclear Materials Safety and Safeguards                              |
| NPPD   | Nebraska Public Power District                                       |
| NRC/IE | Nuclear Regulatory Commission/<br>Office of Inspection & Enforcement |
| NRR    | Office of Nuclear Reactor Regulation (NRC)                           |
| NSP    | Northern States Power Company  |
| NSSS   | Nuclear Steam System Supplier  |
| NTOL   | Near Term Operating License  |
| NU     | Northeast Utilities  |
| OL     | Operating License  |
| OPPD   | Omaha Public Power District  |
| PASNY  | Power Authority of the State of New York                             |
| PECO   | Philadelphia Electric Company  |
| PGE    | Portland General Electric Company                                    |

|       |  |
|-------|--|
| PG&E  | Pacific Gas and Electric Company         |
| PSE&G | Public Service Electric and Gas Company  |
| R     | Region (NRC)                             |
| RG&E  | Rochester Gas and Electric Corporation   |
| SCE   | Southern California Edison Company       |
| SCE&G | South Carolina Electric and Gas Company  |
| SDI   | Shut Down Indefinitely                   |
| SMUD  | Sacramento Municipal Utility District    |
| TECO  | Toledo Edison Company                    |
| TMI   | Three Mile Island                        |
| TVA   | Tennessee Valley Authority               |
| VEPCO | Virginia Electric and Power Company      |
| VYNP  | Vermont Yankee Nuclear Power Corporation |
| W     | Westinghouse Electric Corporation        |
| WEPCO | Wisconsin Electric Power Company         |
| WPS   | Wisconsin Public Service Corporation     |
| YAEKO | Yankee Atomic Electric Company           |

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

2. TITLE AND SUBTITLE

Closeout of IE Bulletin 80-15:  
Possible Loss of Emergency Notification  
System (ENS) With Loss of Offsite Power

5. AUTHOR(S)

W. J. Foley, R. S. Dean, A. Hennick

8. PERFORMING ORGANIZATION - NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address. If contractor, provide name and mailing address.)

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Elm Grove, WI 53122

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Division of Operational Events Assessment  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

Documentation is provided in this report for the closeout of IE Bulletin 80-15 for nuclear power reactors. This bulletin pertained to a possible loss of the Emergency Notification System (ENS) upon loss of offsite power. Closeout is based on the implementation and verification of six (6) required actions by licensees of nuclear power reactors in operation or near to receiving an operating license when the bulletin was issued on June 18, 1980. Evaluation of utility responses and NRC/Region inspection reports indicates that the bulletin is closed for all of the 69 nuclear power reactors to which it was issued for action and which were not shut down indefinitely or permanently at the time of issuance of this report. Background information is supplied in the Introduction and Appendix A. Nuclear fuel facilities as well as nuclear power facilities were identified in the enclosures to the bulletin. However, per an NRC memorandum, the closeout of the bulletin for nuclear fuel facilities is not within the scope of this report.

12. KEY WORDS DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)

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