February 3, 2000

Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 AND 2 - CLOSURE OF USI A-46, "SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS," AND REVIEW OF LICENSEE'S USI A-46 IMPLEMENTATION PROGRAM (TAC NOS. M69437 AND M69438)

Dear Mr. Powers:

By letter dated January 30, 1996, the American Electric Power Company (AEP) submitted a report summarizing the results of its unresolved safety issue (USI) A-46 implementation program in response to Supplement 1 of Generic Letter 87-02, "Verification of Seismic Adequacy of Mechanical and Electrical Equipment in Operating Reactors, USI A-46." The NRC staff reviewed the report and issued two requests for additional information (RAI), dated October 21, 1996, and January 23, 1998. AEP's responses to the NRC staff RAIs are dated March 10 and July 27, 1999.

The purpose of this letter is to inform you that the NRC staff has completed its review of the report. The staff concludes that the licensee's USI A-46 implementation program meets the purpose and intent of the criteria in Generic Implementation Program, Revision 2, and the staff's Supplemental Safety Evaluation Report, Number 2, for the resolution of USI A-46. The staff also concludes that the licensee's implementation program to resolve USI A-46 at the facility has adequately addressed the purpose of the 10 CFR 50.54 (f) request. The staff's review is enclosed. Your activities related to the USI A-46 implementation will be subject to future NRC inspections. Contact John F. Stang, Senior Project Manager, at 301 415-1345, for any additional information or questions.

Sincerely,

/RA/

John F. Stang, Jr., Senior Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-315 and 50-316

Enclosure: Safety Evaluation

cc w/encl: USI A-46 Service List

February 3, 2000

Mr. Robert P. Powers, Senior Vice President
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cc w/enclosure: USI A-46 Service List
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

EVALUATION OF AMERICAN ELECTRIC POWER COMPANY''S

RESPONSE TO SUPPLEMENT NO. 1

TO GENERIC LETTER 87-02

D C. COOK NUCLEAR POWER PLANT, UNITS 1 AND 2

DOCKET NOS. 50-315 AND 316

1.0 BACKGROUND

In December of 1980, the NRC designated "Seismic Qualification of Equipment in Operating Plants" as an unresolved safety issue (USI A-46). The safety issue of concern was that equipment in nuclear plants for which construction permit applications had been docketed before about 1972 had not been reviewed according to the 1980-81 licensing criteria for seismic qualification of equipment, such as Regulatory Guide 1.100, IEEE Standard 344-1975, and Section 3.10 of the Standard Review Plan. To address the USI A-46 issue, most of the affected utilities formed the Seismic Qualification Utility Group (SQUG) in 1982.

On February 19, 1987, the NRC issued Generic Letter (GL) 87-02 to implement the resolution to USI A-46. It concluded that the seismic adequacy of certain equipment in operating nuclear power plants should be reviewed against seismic criteria not in use when these plants were being constructed. In 1987, SQUG, representing its member utilities, committed to develop a Generic Implementation Procedure (GIP) for implementing the resolution of USI A-46. SQUG requested a deferment of GL 87-02's 60-day response period until after the NRC issued its final safety evaluation report (SER) on the final version of the GIP.

On May 22, 1992, the NRC issued Supplement 1 to GL 87-02, including the staff's Supplemental Safety Evaluation Report No. 2 (SSER-2), pursuant to the provisions of 10 CFR 50.54(f), which required that all addressees provide either (1) a commitment to use both the SQUG commitments and the implementation guidance described in Revision 2 of the GIP (GIP-2) as supplemented by the staff's SSER-2, or (2) an alternative method for responding to GL 87-02. The supplement also required that those addressees committing to implement GIP-2 provide an implementation schedule as well as detailed information including the procedures and criteria used to generate the in-structure response spectra (IRS) to be used for USI A-46.

GIP-2 provides an experience database, technical approach, generic procedures, and documentation requirements which can be used by licensees to address the concern of GL 87-02 for verifying seismic adequacy of the equipment needed for plant safe shutdown following an SSE event. Thus, GIP-2 and SSER-2 are two documents that contain acceptable guidance for implementing the resolution of USI A-46.

In a letter dated January 30, 1996 (Reference 1), the licensee, American Electric Power Company (AEP) submitted a report summarizing the results of its USI A-46 implementation program, which consists of safe shutdown path selection, equipment selection, equipment seismic evaluation, relay evaluation, and a list of all identified outliers. In the report, the licensee stated that it has completed USI A-46 walkdown during the 1993 - 1995 time period, and that the provisions in GIP-2 and SSER-2 were used in the implementation process at the D. C. Cook Nuclear Plant (DCCNP). The report also identified all outliers, which the licensee plans to resolve by the year 2000. The staff reviewed the report and issued two requests for additional information (RAI) that are discussed in References 2 and 3. The licensee's response to the staff's first RAI is discussed in Reference 4, and to the second RAI in Reference 5.

2.0 DISCUSSION AND EVALUATION:

2.1 Seismic Demand Determination (Ground Spectra and In-structure Response Spectra)

As indicated in the DCCNP Final Safety Analysis Report (FSAR) and in Section 2.0 of Attachment 2 to Reference 1, the ground response spectra (GRS) for DCCNP Units 1 and 2 are Housner Spectra with a peak ground acceleration of 0.10g for the operating basis earthquake (OBE) and 0.2g for the design basis earthquake (DBE). The licensee utilized actual earthquake records (i.e., El Centro, Taft and Olympia time histories) to develop IRS for the USI A-46 project, and demonstrated in Reference 6 that GRS developed by using the earthquake records envelope the original licensing design basis GRS specified in the DCCNP FSAR.

In order to develop IRS, (1) a set of four earthquake records (El Centro 1940 N-S, El Centro 1940 E-W, Taft 1952 S-W, and Taft 1952 N-W) for the containment building (CB) and (2) a set of four earthquake records (El Centro 1934 N-S, El Centro 1940 N-S, Olympia 1949 S-W, and Taft 1952 N-E) for the auxiliary building (AB) with a peak ground acceleration of 0.2g were used. The time histories were applied as seismic input at the foundation level of the buildings. The method of developing IRS presented in Reference 6 had been evaluated by the staff and documented in Reference 7.

The IRS is designated as "median center." This designation had the following impacts on the evaluation: (1) anchorage calculations were performed using an additional 1.25 factor for computing the seismic demand, and (2) an additional 1.50 factor was used for the seismic demand spectra when comparing to generic equipment ruggedness spectra (GERS).

2.2 Seismic Evaluation Personnel

In accordance with the guidance in GIP-2, the licensee's seismic evaluation team designated for determining equipment seismic adequacy should consist of degreed

engineers in system, mechanical, electrical, and structural engineering with adequate experience, SQUG training, and knowledge in nuclear power plant operation, seismic evaluation, equipment and relay functionality, and walkdown procedures.

As indicated in Section 1.3 of Attachment 1 to the licensee's submittal (Reference 1), an AEP SQUG task group of thirteen individuals was formed to implement the requirements of GL 87-02 at DCCNP. In addition, equipment seismic evaluations and walkdowns were performed jointly by the task group and a licensee's consultant. The staff reviewed the resumes of the task group and the consultant personnel presented in Appendix A of Attachment 2 to the submittal of Reference 1, and found that they received SQUG training and appear to have adequate educational background in engineering and working experience in seismic evaluation. In addition, the staff also reviewed resumes of personnel involved in relay evaluation, shutdown path selection, and establishing of equipment list, and found that they have adequate backgrounds and experience in plant systems, equipment functionality, and plant operation procedures. Thus, the staff concludes that the personnel involved in the USI A-46 program implementation, have met the qualification provisions in GIP-2 in regard to education, experience and training, and are therefore, acceptable.

2.3 Safe Shutdown Path

GL 87-02 specifies that the licensee should be able to bring the plant to, and maintain it in a hot shutdown condition during the first 72 hours following an SSE. To meet this provision, in Attachment 1 to Reference 1, the licensee addressed the following plant safety functions: reactor reactivity control, pressure control, inventory control, and decay heat removal. Primary and alternate safe shutdown success paths with their support systems and instrumentation were identified for each of these safety functions to ensure that the plant is capable of being brought to, and maintained in a hot shutdown condition for 72 hours following an SSE. Tables 4.1 through 4.4 in Section 4 of the submittal provide the safe shutdown success paths. Appendix B provides the safe shutdown equipment list (SSEL).

The decay heat removal function is accomplished by relieving steam from the steam generator via the steam generator (SG) atmospheric power operated relief valves. Makeup water to the SG will be supplied by the motor driven auxiliary feedwater (AFW) pumps which take suction from the condensate storage tank (CST) and the essential service water system (SWS), once the CST has been depleted. Lake Michigan is the source of the essential SWS. The turbine driven AFW pump is also available as the alternate success path. When the reactor coolant system pressure and temperature are below the residual heat removal (RHR) system entry limits, the RHR will be placed in service to continue decay heat removal. The decay heat is removed from reactor coolant to the component cooling water (CCW) system via the RHR heat exchangers. The heat from the CCW is then rejected to the essential SWS via the CCW heat exchangers.

The plant operations department reviewed the equipment listed in Appendix B against the plant operating procedures and operator training and concluded that the plant operating procedures and operator training were adequate to establish and maintain the plant in a safe shutdown condition following an SSE.

The staff concludes that the approach to achieve and maintain cold shutdown for 72 hours during a seismic event is acceptable.

2.4 Seismic Screening Verification and Walkdown of Mechanical and Electrical Equipment

At DCCNP, the procedure used by the licensee for performing the seismic screening verification and walkdown of mechanical and electrical equipment is based on guidelines in GIP-2 and SSER-2, which consist of comparison of seismic capacity with demand, conformance with specific caveats, adequate anchorage, and proper consideration of seismic interactions. The following are staff evaluation results of these aspects.

2.4.1 Equipment Seismic Capacity Compared to Seismic Demand

The licensee stated in Attachment 2 to Reference 1 that the SSE GRS was used as a seismic demand and was compared to the seismic capacities (Method A) described in the GIP-2 by the bounding spectrum (BS) for equipment with natural frequencies greater than about 8 Hz and located within 40-feet above the effective grade. However, the staff noted from Reference 1 that, in some cases, the amplitude of the IRS for equipment with natural frequency greater than about 8 Hz and located within 40-feet above the effective grade is larger than 1.5 times the amplitude of the GRS.

Section 4 of GIP-2 specifies the restrictions and limitations on the use of Method A. It states that the amplification factor between the GRS and the IRS should not be more than 1.5. The staff asked about the use of Method A in the RAI issued in October 1996 (Reference 2). In their response to the RAI in July 1999 (Reference 5), the licensee indicated that the only cases where the IRS exceeds 1.5 times the GRS occur at a specific elevation in the containment. However, for all the equipment at that elevation, 1.5 times the BS envelopes the IRS at the natural frequencies of the equipment. Considering this and the large conservatism in the development of the IRS, the use of Method A is allowable at these limited number of locations for verification of the seismic adequacy of equipment for USI A-46 resolution at DCCNP.

For equipment with natural frequency less than about 8 Hz and located at any elevation, the licensee used Method B (1.5xBS) as a capacity and it was compared to the IRS as a demand. The licensee stated that the GERS were also used. This is consistent with GIP-2 provisions and acceptable for use in USI A-46 at DCCNP.

2.4.2 Assessment of Equipment Caveats

According to the GIP, caveats are defined as the set of particular inclusion and exclusion rules which identify the important characteristics and features that a specific class of equipment should have in order to verify its seismic adequacy. A summary of caveats for each earthquake experience equipment class is described in Appendix B of GIP-2.

As indicated in Section 4.2.2 of Attachment 2 to Reference 1, when the earthquake experience data was used to represent the seismic capacity of an item of equipment, the licensee performed seismic adequacy evaluations and walkdowns and determined whether (1) the equipment characteristics are generally similar to the earthquake

experience equipment class, and (2) the equipment meets the intent of the specific caveats for the equipment class. When equipment-specific seismic qualification data was used, the licensee then applied only the specific restrictions applicable to that equipment-specific qualification data as needed. In addition, the "rule of box" was also used by the licensee in certain equipment included in either the earthquake or testing equipment class. In such cases, all of the components mounted on or in the equipment are considered to be part of that equipment and do not need to be evaluated separately. However, the licensee indicated that evaluations were performed whenever certain uncommon details or situations which could make the equipment vulnerable were identified. The staff found that the licensee's approaches as described above are in conformance with GIP-2 and SSER-2 guidance.

The staff has reviewed a list of 20 cases in Table 4-7 of Attachment 2 to Reference 1, which contained the licensee's explanation of how each equipment item met the intent of the GIP-2 caveats. Generally, engineering judgement or analysis was used by the licensee's seismic review team (SRT) to determine whether the intent of the GIP-2 caveats were met. The staff found that these explanations are reasonable and represent good engineering practice.

2.4.3 Equipment Anchorages

The licensee stated that the seismic adequacy of equipment anchorages was verified in accordance with the GIP-2 guidelines. During the walkdowns, the licensee's SRT inspected the seismic adequacy of anchorage installation and its connection to the base of the equipment and determined the allowable capacity of the anchorage used to secure the equipment. The inspection consisted of visual checks, measurements, review of plant documentation and drawings, and anchor bolt tightness and embedment checks for concrete expansion anchors.

The SRT identified anchorage outliers, which did not have enough capacity compared to the demand. Sections 4.6.0 and 4.6.4 of Attachment 2 to Reference 1 discuss the equipment anchorage outliers identified during the A-46 walkdowns at DCCNP. Tables 4.5 and 4.6 of Attachment 2 include the resolutions for the outliers. The licensee resolved the outlier issues by tightening anchor bolts, confirming capacity of anchorages and performing detailed calculations.

Tables 4.5 and 4.6 of Attachment 2 to Reference 1 also identify a list of unresolved outliers and proposed methods for their resolutions. The licensee indicated that it intends to close out all the outlier issues before the conclusion of the refueling outages (RFO) in the year 2000. This is adequate to resolve the equipment anchorage issues for the licensee's A-46 program.

2.4.4 Seismic Spatial Interaction Evaluation

The licensee performed plant walkdowns to verify the seismic adequacy of the SSEL items with respect to spatial interaction with nearby equipment, systems, and structures. The licensee indicated that the walkdowns were performed in accordance with GIP-2 guidelines by considering the following aspects: (1) proximity effects, (2) structural

failure and falling, (3) flexibility of attached lines and cables, and (4) any other possible interactions.

As indicated in Section 4.6.6 of Attachment 2 to Reference 1, during the licensee's plant walkdowns, a total of 38 equipment items were identified in Unit 1 and 2 to have interaction concerns. The walkdowns were performed by the SRT which includes seismic capability engineers to determine whether adverse seismic spatial interactions with nearby structures or equipment exist. The licensee identified no vulnerabilities with regard to the distribution systems and noted that these systems were well supported.

The 38 interaction concerns identified, included two valves tightly up against a pipe whip restraint, two valves close to a railing that can swing into the valves, three valves with inadequate clearance from a beam or wall, fourteen panels with essential relays not bolted to an adjacent wall or panel, two RTDs that bear directly on grating, one MOV close to a fire distinguisher, two panels with essential relays with an unsecured shear panel and a ladder nearby, four panels with essential relays with a pendant light, two switchgear with essential relays not bolted to an adjacent panel, two pumps with an overhead fan, one tube off a hydraulic controller bearing on a railing, one panel with essential relays with an inadequately secured chain above it, and one heat exchanger with a valve touching a tubing line. All these 38 interaction concerns were treated as outliers by the licensee, and were listed in Tables 4-5 and 4-6 of Attachment 2 to Reference 1. In these tables, actions for resolving these concerns were described.

The staff has reviewed the licensee's approach to identify interaction concerns and the bases for resolving the concerns, and concludes that the licensee's performance in this aspect reflects sound engineering judgement, meets GIP-2 provisions, and is therefore acceptable for resolution of USI A-46 at DCCNP.

2.5 Tanks and Heat Exchangers

The licensee stated that it reviewed the tanks and heat exchangers at DCCNP in accordance with the rules and procedures described in Section 7 of GIP-2. The licensee reviewed four (4) vertical tanks and sixteen (16) horizontal tanks and heat exchangers.

Table 5.1 of Attachment 2 to Reference 1 shows vertical tank description at DCCNP and Section 5.1.2 of the report describes the methods of evaluation for the vertical tanks. The licensee evaluated the vertical tanks regarding the seismic demand on the tank, the seismic capacity of the tank, and the tank's critical components, and concluded that all vertical tanks reviewed met the intent of the GIP-2 requirements.

Table 5.2 of Attachment 2 to Reference 1 includes the description of the horizontal tanks and heat exchangers at DCCNP. The licensee reviewed the horizontal tanks and heat exchangers in accordance with the rules and procedures of GIP-2. It concluded that all horizontal tanks and heat exchangers meet the GIP-2 requirements.

The staff concurs that the licensee has adequately addressed the tank and heat exchanger outlier issues in accordance with the provisions of GIP-2 for the resolution of USI A-46 at DCCNP.

2.6 Cable and Conduit Raceways

The licensee stated that it had followed the guidelines and inclusion rules provided in Section 8 of GIP-2. Based on its walkdown results, the licensee identified four (4) cable and conduit raceway outliers. The description and the resolution of the outliers are presented in Section 6.5 of Attachment 2 to Reference 1. In addition, the licensee chose thirty (30) worst case samples for limited analytical review (LAR). Out of these 30 samples, 28 passed the LAR guidelines while 2 did not satisfy these guidelines. They were identified as outliers. Table 6.2 of Attachment 2 to Reference 1 provides the description of the outliers.

All outlier issues have been resolved except for one that will require minor plant modifications. The licensee indicated in Reference 1 that it intends to close out the outlier issue before the conclusion of the refueling outages following the next three operating cycles. The staff review concludes that this is adequate to resolve the cable and conduit raceway issues for the DCCNP A-46 program because the described outlier resolutions are consistent with GIP-2 and SSER-2 guidelines.

2.7 Essential Relays

As indicated in the relay evaluation report in Attachment 3 to Reference 1, the licensee reviewed all relays associated with systems involved in various safe shutdown paths for the purpose of initial screening, from which a further screening assisted by circuit analysis was conducted to identify essential relays. The essential relays are those relays for which chatter of its electrical contacts resulting from seismic motion could adversely impact the safe shutdown function of components associated with the SSEL.

The essential relays were reviewed in accordance with the guidelines of GIP-2 to establish that their seismic capacity is not exceeded by the seismic demand, and that each related component housing essential relays is adequately anchored and not subject to adverse interaction during seismic motion. In Appendix F to Attachment No. 3 of the relay evaluation report, outlier relays were identified with the resolution method and implementation date specified. Outlier resolutions include replacement of low ruggedness relays, relocation of relays to ensure adequate seismic capacity to meet demand, and plant procedure modification of operator actions, such that a relay or its associated component function can be verified after a seismic event. The staff found that the described resolution of relay outliers, although brief, is in general conformance with the guidelines of GIP-2, and thus acceptable for resolution of USI A-46 at DCCNP.

2.8 Human Factors Aspects

The licensee provided information which outlined the use of the "desk-top" and simulator based evaluation method by a senior licensed operator to verify that existing normal, abnormal and emergency operating procedures were adequate to mitigate the postulated transient and that operators could place and maintain the plant in a safe shutdown condition. The staff verified that the licensee had considered its operator training programs and verified that its training was sufficient to ensure that those actions specified in the procedures could be accomplished by the operating crews. The licensee developed two additional procedures, “Earthquake,” and “Loss of Control Air

Recovery," as a result of their analysis. The procedures were reviewed by the operations staff and training was conducted for all licensed operators and shift technical advisors. The present level of operator training is sufficient to assure that the operators are proficient in the use of the procedures to assure the selected success path will be used.

In addition, the staff requested verification that the licensee had adequately evaluated potential challenges to operators, such as lost or diminished lighting, harsh environmental conditions, potential for damaged equipment interfering with the operators tasks, and the potential for placing an operator in unfamiliar or inhospitable surroundings. The licensee provided information regarding their evaluations to substantiate that operator actions could be accomplished in a time frame required to mitigate the transient. Specifically, the licensee provided assurance that ample time existed for operators to take the required actions to safely shut down the plant. The licensee verified that existing procedures, availability of lighting equipment, and operator training were adequate to ensure the operators could perform the required actions credited in the submittal. The licensee further analyzed potential barriers to successful performance including availability, or partial availability, of system components, loss of plant lighting, and the need to consider alternate ingress/egress routes. The licensee verified that all required actions were located in accessible and familiar areas of the plant. The licensee performed seismic verification walkdowns which identified four potential interaction issues which could impact the operators, although none were considered significant missile hazards. These were: (1) general housekeeping in the control room, (2) overhead sodium lamps in the diesel generator rooms, (3) portable fire extinguishers mounted on small hooks, and (4) loose tie down cables on emergency battery lights. The licensee has taken corrective actions to modify or further restrain the equipment. Therefore the potential for physical barriers resulting from equipment or structural damage which could inhibit operator ability to access plant equipment is not considered to be a significant hazard during an earthquake. The licensee has provided the staff with sufficient information to demonstrate conformance with the NRC-approved review methodology outlined in GIP-2 and is, therefore, acceptable for resolution of USI A-46 at DCCNP.

2.9 Outlier Identification and Resolutions

The licensee used GIP-2 screening guidelines as a generic basis for identifying outliers. According to GIP-2, an outlier is defined as an item of equipment or relay which does not comply with GIP-2 screening guidelines. By conducting walkdowns and seismic review for 21 classes of equipment, the licensee identified 47 outliers in Unit 1 and 39 outliers in Unit 2. Within the outliers in Unit 1, 9 equipment items were identified to have 2 outlier issues in each item. Therefore, Unit 1 had 56 total outlier issues, which included 13 due to seismic capacity vs demand, 12 due to caveats, 10 due to anchorage, 20 due to seismic interaction, and 1 due to other concerns. Within the outliers in Unit 2, 8 equipment items were identified to have 2 outlier issues in each item. Therefore, Unit 2 had 47 total outlier issues, which included 9 due to seismic capacity vs demand, 11 due to caveats, 7 due to anchorage, 18 due to seismic interaction, and 2 due to other concerns.

These outlier issues and the recommended resolution by the SRT were described in Tables 4-5 and 4-6 for Unit 1 and Unit 2, respectively, of Attachment 2 to Reference 1. Resolution of the outliers were either by performing additional analytical evaluations or by performing minor plant modifications. The licensee also tracked 23 action items of equipment in Table 4-8 that were not designated as outliers but required either minor plant modification or document modification, such as replacing missing tags and tightening loose bolts.

As indicated in Attachment 3 to Reference 1, relay capacities were determined from either the relay-related GERS, or from shake table testing in accordance with the IEEE 344-1975 Standard. The licensee's relay evaluation concludes that all essential relays associated with safe shutdown equipment have been shown not to be seismically vulnerable, chatter acceptable, and seismically adequate except for the 44 relay outliers, which were considered as low ruggedness relays in accordance with the EPRI report. All these relay outliers were resolved by replacement of the relays by high ruggedness relays.

In general, the staff found that the licensee's effort to identify outliers and the technical basis used for their resolution in conformance with the guidelines set in GIP-2 and SSER-2, and are acceptable for resolution of USI A-46 at DCCNP.

3.0 SUMMARY OF MAJOR STAFF FINDINGS

The staff's review of the licensee's USI A-46 implementation program, as provided for each area discussed above, did not identify any significant or programmatic deviation from GIP-2 regarding the walkdown and the seismic adequacy evaluations at DCCNP.

4.0 CONCLUSION

The licensee's USI A-46 program at DCCNP was established in response to Supplement 1 to GL 87-02 through a 10 CFR 50.54(f) letter. The licensee conducted the USI A-46 implementation in accordance with GIP-2 and the staff's SSER-2. The licensee's submittal on the USI A-46 implementation (Reference 1) indicated that the licensee's seismic verification and evaluation walkdowns included the evaluation of a total of 1778 equipment items in both units, in which 149 equipment items contain essential relays. Outliers identified include a total of 86 equipment items and 44 relays. Because 17 outlier equipment items have two outlier issues, there are a total of 103 equipment outlier issues. As indicated in the licensee's letter of Reference 1, some of the outliers have been resolved and modifications have been implemented at the plant. The low ruggedness relays identified in Appendix E of EPRI-7148 report have been replaced with seismically rugged relays in accordance with the recommendations of GIP-2. The licensee is continuing to evaluate the unresolved outliers and will implement plant modifications as needed. As indicated in the letter of Reference 5, the licensee has committed that all of the outlier resolutions (including modifications as required) are scheduled for completion prior to the restart of Unit 1 and 2 from the refueling outages in the year 2000. In accordance with GIP-2 guidelines, the licensee will submit a completion letter to the NRC after all outliers and open items have been resolved. As described in Section 3.0, the staff's review did not identify any areas where the

licensee's program deviated from GIP-2 and the staff's SSER-2 on SQUG/GIP-2 issued in 1992.

The staff concludes that the licensee's A-46 implementation program has, in general, met the purpose and intent of the criteria in GIP-2 and the staff's SSER-2 for the resolution of USI A-46. The staff has determined that the licensee's already completed actions will result in safety enhancements, in certain aspects, that are beyond the original licensing basis. As a result, the licensee's actions provide sufficient basis to close the USI A-46 review at the facility. The staff also concludes that the licensee's implementation program to resolve USI A-46 at the facility has adequately addressed the purpose of the 10 CFR 50.54(f) request. Licensee activities related to the USI A-46 implementation may be subject to NRC inspection.

Regarding future use of GIP-2 in licensing activities, the licensee may revise its licensing basis in accordance with the guidance in Section I.2.3 of the staff's SSER-2 on SQUG's GIP-2, and the staff's letter to SQUG's Chairman, Mr. Neil Smith on June 19, 1998. Where plants have specific commitments in the licensing basis with respect to seismic qualification, these commitments should be carefully considered. The overall cumulative effect of the incorporation of the GIP-2 methodology, considered as a whole, should be assessed in making a determination under 10 CFR 50.59. An overall conclusion that no unresolved safety question (USQ) is involved is acceptable so long as any changes in specific commitments in the licensing basis have been thoroughly evaluated in reaching the overall conclusion. If the overall cumulative assessment leads a licensee to conclude a USQ is involved, incorporation of the GIP-2 methodology into the licensing basis would require the licensee to seek an amendment under the provisions of 10 CFR 50.90. In addition, although the licensee indicated in the letter of Reference 1 that USI A-46 methodology may be applied for verification of seismic qualification of repaired or replaced equipment, the licensee further clarified in the letter of Reference 5 that such applications will be based on NRC endorsement and consistent with any previous licensing commitments, such as those involving RG 1.97 and TMI action plan items. These commitments should not be superseded by the resolution methods of GIP-2.

Principal Contributors: S. Hou
Y.S. Kim

Date: February 3, 2000

References

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2. Letter, U.S. NRC to American Electric Power Company, “Request for Additional Information on A-46 Resolution, D. C. Cook Nuclear Plant, Units 1 and 2,” dated October 21, 1996.

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7. Safety Evaluation Reports to Licensee's 120-day Response to Supplement No. 1 to Generic Letter (GL) 87-02, from G. Bagchi, ECGB, to L. Marsh, PD 3-1, dated October 28, 1992, and May 14, 1993.