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AUG 31 1983

Docket Nos. 50-315
and 50-316

Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

SUBJECT: NUREG-0737, ITEM II.B.1, REACTOR COOLANT SYSTEM VENTS - DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

By letter dated January 15, and March 10, 1980, July 15, 1981, and June 28, 1982, the Indiana and Michigan Electric Company has provided information and details "relating to the design of the reactor coolant system vents (RCSV) for Donald C. Cook Nuclear Plant Units 1 & 2. However, the implementation, schedule and requirement for a pre-implementation review have been superseded by the requirements of 10 CFR 50.44(c)(3)(iii). All operating reactors, in order to provide the improved operational capability required by the rule, must have the RCS vents installed, operational, procedures established and personnel trained in accordance with the schedule provided in the rule. An exemption is necessary if the specific design or schedular requirements of 10 CFR 50.44(c)(3)(iii) cannot be complied with.

The guidance in NUREG-0737, Item II.B.1, provides an acceptable means of meeting the design requirements of the rule for the RCS vents. Prior to promulgation of the rule, we have reviewed your responses identified above. The enclosed Safety Evaluation (SE) is based on the Technical Evaluation Report (TER) prepared by our consultant, Lawrence Livermore National Laboratory, and additional items which were outside the scope of the TER. The TER is attached to the SE. You will note our evaluation identifies specific items which are being addressed in conjunction with other ongoing NRC actions and areas where deficiencies may exist or confirmation is necessary to assure conformance with the rule.

We are providing the results of our review for your information. In addition, we have provided the information to Region III to assist them, as they deem appropriate, in determining your compliance with the requirements of 10 CFR 50.44(c)(3)(iii). If you have any questions relative to the enclosed SE, please contact Mr. David Wigginton, the NRC Project Manager for your facility.

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DATE ▶	.....	.....	.....	.....	.....	.....	.....

We consider NUREG-0737, Item II.B.1, actions to be conpleted based on the requirements and promulgation of 10 CFR 50.44(c)(3)(iii).

Sincerely,

Original signed by:
S. A. Varga
Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

OFFICE	ORB 1 DWigginton/rs	ORB SVarga	D. McDonald ORB				
SURNAME							
DATE	8/30/83	8/31/83	8/31/83				

Mr. John Dolan
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The Honorable Tom Corcoran
United States House of Representatives
Washington, D. C. 20515

James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

ENCLOSURE 1

SAFETY EVALUATION

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

INDIANA & MICHIGAN ELECTRIC COMPANY

INTRODUCTION

The requirement for RCS vessel head and high point vents is stated in 10 CFR 50.44 paragraph (c)(3)(iii). Guidance is provided in NUREG-0737 "Clarification of TMI Action Plan Requirements," November 1980, Item II.B.1 Reactor Coolant System Vents and NUREG-0800 "Standard Review Plan," July 1981, Section 5.412 Reactor Coolant System High Point Vents. The requirements of 10 CFR 50.44 for RCS high point vents specifically provide that the vent system shall: (1) be designed to ensure low probability of inadvertent or irreversible actuation and a high probability of operating when needed, (2) be remotely operable from the control room, (3) not aggravate the challenge to containment or the course of the accident, and (4) conform to the requirements of Appendix A and B of 10 CFR 50.

The licensee has responded to the above requirements in references 1 through 4. These responses have been evaluated by Lawrence Livermore Laboratory under contract to the Nuclear Regulatory Commission (NRC). The results of this evaluation are presented in the enclosure entitled "Reactor Coolant Systems Vents (NUREG-0737, Item II.B.1), Final Technical Evaluation Report for D. C. Cook 1 and 2." The NRC staff review is based upon the Technical Evaluation Report (TER) and has been extended to items outside the scope of the TER, as specifically identified herein.

Certain items identified below may be subject to confirmation including a post-implementation review and audit to ensure compliance with 10 CFR 50.44(c)(3)(iii).

EVALUATION

The staff concurs with the TER recommendation that the D. C. Cook 1 and 2 vent system design is acceptable provided the following items are satisfactorily resolved:

NUREG-0737 Item II.B.1 Clarification A (12) concerning human factor analysis requires consideration of the addition of vent system controls to the control room. Although this was discussed in the TER, the human factor analysis of control room modifications will be further addressed on an audit basis as part of the review of TMI Item I.D.1 "Control Room Design Reviews."

The construction codes and standards for the piping and valves used in the Reactor Coolant System Vents were not specifically identified. The codes and standards shall be identified and available for NRC audit.

The current design does not provide for continuous valve position indication in the control room per the requirements of NUREG-0737, Item II.B.1 sub-item A(5) and sub-item (6) concerning the requirement for operability of the vent system from the control room. An acceptable resolution would be for the licensee to restore continuous control power supply to the RCS vents system by deleting its commitment to rack out the related circuit breakers during normal operation. The staff has evaluated that the related requirements in 10 CFR 50.44(c)(3)(iii) for the inadvertent or irreversible actuation of a vent have been adequately met by the switching systems proposed for the individual valves on the vent system. Therefore, removal of power is not necessary. The licensee is required to take the necessary action to meet these requirements. This item must be confirmed by the licensee.

The following items are identified in the TER as being outside the scope of the contractor's review: seismic and environmental qualification, operating guidelines and procedures, Technical Specifications, and the inservice inspection program. The resolution of these items is as follows:

Seismic and Environmental Qualification: Seismic and environmental qualification will be audited in conjunction with generic audits of the licensee's Seismic and Environmental qualification program.

Operating Guidelines and Procedures: NUREG-0737 item II.B.1 requested procedures and analyses for operator use of the vents including the identification of the information available to the operator for initiating or terminating vent usage. The staff review of NUREG-0737 Item I.C.1 includes vent operating guidelines as an integral part of emergency operating procedures guidelines.

It is our judgment that the owners group emergency operating guidelines as approved by the staff will provide an acceptable basis for the development of plant specific operating procedures. The plant procedures will be subject to NRC audits. We consider this approach a satisfactory resolution of operating procedures for RCS vents.

Technical Specifications: It is currently proposed to issue a generic letter to all licensees regarding the submittal of Proposed Technical Specifications for a number of NUREG-0737 items, including item II.B.1, which were required to be implemented after December 31, 1981. Technical Specification requirements for the RCS vents will be included in this forthcoming licensing action.

Inservice Inspection Program: The vent system is an extension of the reactor coolant pressure boundary and must meet applicable inservice inspection requirements described by 10 CFR 50.55(g). The staff requires that the licensee include the RCS vent system in the inservice inspection program which is subject to NRC review and audit.

CONCLUSION

The staff safety evaluation is based on a review of the Technical Evaluation Report (TER) performed by Lawrence Livermore National Laboratory (enclosure 2), and the staff reviews of additional items outside the scope of the TER. The staff finds that the vent system at D. C. Cook 1 and 2 is acceptable and in conformance with the requirements of 10 CFR 50.44 paragraph (c)(3)(iii) and the guidelines of NUREG-0737 Item II.B.1, and NUREG-0800 section 5.4.12. Certain items are subject to confirmation including post implementation NRC audit in conjunction with other ongoing actions/programs. These items are: (1) human factors analysis of control room modifications, (2) identification of construction codes and standards, (3) confirm restoration of continuous positive valve position indication within, and operability of the RCS vents from the control room, (4) seismic and environmental qualification, (5) operating procedures, and (6) the in-service inspection program.

Technical Specifications will be the subject of a separate future licensing action.

REFERENCES

1. Letter, J. E. Dolan (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRP-74," with attachment providing information concerning the proposed design for reactor coolant system venting in compliance with the requirements of NUREG-0578, dated January 15, 1980.

2. Letter, J. E. Dolan (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Units Nos. 1 and 2, Docket Nos. 50-315, and 50-316, License Nos. DPR-58 and DPR-74," with attachment containing information that was requested to complete the post-implementation review of the Category "A" requirements of NUREG-0578 for Cook Plant, dated March 10, 1980.

3. Letter, R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC) "Donald C. Cook Nuclear Plant Units Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.

ENCLOSURE 2

Selected Operating Reactor Issues Program II

Reactor Coolant System Vents (NUREG-00737, Item II.B.1.)
NRC FIN A0250 - Project 9

FINAL TECHNICAL EVALUATION REPORT FOR D.C. COOK 1 AND 2

Docket Numbers 50-315 and 50-316
NRC TAC Numbers 44365 and 44366

Prepared by J. T. Held of Energy Incorporated - Seattle (Subcontract 4324401) for Lawrence Livermore National Laboratory under contract to the NRC Office of Nuclear Reactor Regulation, Division of Licensing.

NRC Lead Engineer - Gus Alberthal

TF-333/0805a

February 14, 1983

TECHNICAL EVALUATION REPORT ON REACTOR COOLANT SYSTEM VENTS FOR D.C. COOK 1 AND 2

INTRODUCTION

The requirements for reactor coolant system high point vents are stated in paragraph (c)(3)(iii) of 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors," and are further described in Standard Review Plan (SRP) Section 5.4.12, "Reactor Coolant System High Point Vents," and Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements." In response to these and previous requirements, the Indiana & Michigan Electric Company has submitted information in References 1 through 4 in support of the vent system at Units 1 and 2 of the Donald C. Cook Nuclear Plant.

EVALUATION

The function of the reactor coolant system (RCS) vent system is to vent noncondensible gases from the high points of the RCS to assure that core cooling during natural circulation will not be inhibited. The D.C. Cook 1 and 2 RCS vent system provides venting capability from high points of the pressurizer and the reactor vessel head. The noncondensible gases, steam, and/or liquids vented from either the pressurizer or the reactor vessel head are discharged directly to the upper containment atmosphere. The RCS vent system is designed to vent a volume of hydrogen approximately equal to one half of the RCS volume in one hour at system design temperature and pressure. A flow restriction orifice in each RCS vent path, however, limits the flow from a pipe rupture or from inadvertent actuation of the vent system to less than the capability of the reactor coolant makeup system. Hence, the licensee's compliance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," is not affected by the addition of the RCS vent system.

The vent from the pressurizer and the vent from the reactor vessel head to the containment atmosphere each have two parallel sets of two solenoid-operated valves in series which are remotely controlled from the main control room. Indication of individual valve position for the eight valves is provided by means of position switches located on the valve stems and indicating lights in the main control room. Redundancy has been provided for both the pressurizer and the reactor vessel head vents by powering the valves in the parallel piping paths from each high point vent from separate DC power trains to ensure that RCS venting capability from each high point is maintained. RCS vent system valve seat leakage can be detected by way of RTD assemblies downstream of the solenoid valves with associated alarms in the main control room.

The portion of each RCS vent path up to and including the second normally closed valve forms a part of the reactor coolant pressure boundary and thus must meet reactor coolant pressure boundary requirements. The licensee has stated that this portion of the vent system is designated Safety Class 2 (Safety Class 1 upstream of the flow restriction orifices) in compliance with 10 CFR 50.55a and Regulatory Guide 1.26. The entire RCS vent system has been designed to withstand the safe shutdown earthquake and is classified by the licensee as Seismic Class I. The RCS vents are designed for pressures and temperatures corresponding to the RCS design pressure and temperature. In addition, the vent system materials are compatible with the reactor coolant chemistry and are as follows:

Piping - A 376 Type 304 and/or Type 316, Stainless Steel
Valves - SA-182 Type 316, Stainless Steel

Furthermore, the materials of construction were fabricated and tested in accordance with SRP Section 5.2.3. The reactor vessel head vent and the pressurizer vent are also acceptably separated and protected from missiles and the dynamic effects of postulated piping ruptures. We therefore conclude that the design of the portions of the RCS vent system up to and including the second normally closed valve conforms to all reactor coolant pressure boundary requirements, including 10 CFR 50.55a and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31. The licensee has further ascertained that the essential operation of other safety-related systems will not be impaired by postulated failures of RCS vent system components.

We have reviewed the licensee's RCS vent system design to assure an acceptably low probability exists for inadvertent or irreversible actuation of the vent system. Each vent path has two solenoid-operated valves in series, and each valve has a separate two-position control switch which is maintained under administrative control. In addition, the valves fail to the closed position in the event of loss of power. The licensee has also stated that the controls and displays added to the main control room will be considered in the human factors analysis required by NUREG-0737 Item I.D.1, "Control-Room Design Reviews." We therefore find that no single active component failure or human error should result in inadvertent opening or irreversible actuation (i.e., failure to close after intentional opening) of the RCS vent system.

The licensee has stated that control power is removed from the RCS vent system valves during normal operation by racking out the respective breakers. Removal of the circuit breakers causes a loss of valve position indication. We recommend that the circuit breakers be reconnected to provide continuous valve position indication in the control room and operability from the control room, since it is our judgment that this will not cause an unacceptable increase in the chances of inadvertent or irreversible operation.

We have also examined the locations where the vent system normally discharges to the upper volume of the containment atmosphere at elevations 660.0 ft and 673.0 ft. Based on a word description provided by the licensee, these locations are in areas that assure good mixing with the containment atmosphere to prevent the accumulation or pocketing of high concentrations of hydrogen in compliance with 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors." Additionally, these locations are such that the operation of safety-related systems would not be adversely affected by the discharge of the anticipated mixtures of steam, liquids, and noncondensible gases.

The licensee has stated that operability testing will be done in accordance with the requirements of subsection IWV-3000 of Section XI of the ASME Code for Category B valves during refueling outages.

CONCLUSION

We conclude that the D.C. Cook 1 and 2 RCS vent system design is sufficient to effectively vent noncondensible gases from the reactor coolant system without leading to an unacceptable increase in the probability of a LOCA or a challenge to containment integrity, meets the design requirements of NUREG-0737 Item II.B.1 and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31, and conforms to the requirements of paragraph (c)(3)(iii) of 10 CFR 50.44. We therefore recommend that the D.C. Cook 1 and 2 RCS vent system design be found acceptable. It should be noted, however, that the following items were excluded from the scope of our review: seismic and environmental qualification of the RCS vent system, RCS vent system operating guidelines and procedures, and required modifications to the plant technical specifications and in-service inspection program for the RCS vent system.

REFERENCES

1. Letter, J.E. Dolan (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74," with attachment providing information concerning the proposed design for reactor coolant system venting in compliance with the requirements of NUREG-0578, dated January 15, 1980.

2. Letter, J.E. Dolan (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315, and 50-316, License Nos. DPR-58 and DPR-74," with attachment containing information that was requested to complete the post-implementation review of the Category "A" requirements of NUREG-0578 for Cook Plant, dated March 10, 1980.

3. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.

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Docket Nos. 50-315
and 50-316

Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

SUBJECT: NUREG-0737, ITEM II.B.1, REACTOR COOLANT SYSTEM VENTS - DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

By letter dated January 15, and March 10, 1980, July 15, 1981, and June 28, 1982, the Indiana and Michigan Electric Company has provided information and details "relating to the design of the reactor coolant system vents (RCSV) for Donald C. Cook Nuclear Plant Units 1 & 2. However, the implementation, schedule and requirement for a pre-implementation review have been superseded by the requirements of 10 CFR 50.44(c)(3)(iii). All operating reactors, in order to provide the improved operational capability required by the rule, must have the RCS vents installed, operational, procedures established and personnel trained in accordance with the schedule provided in the rule. An exemption is necessary if the specific design or schedular requirements of 10 CFR 50.44(c)(3)(iii) cannot be complied with.

The guidance in NUREG-0737, Item II.B.1, provides an acceptable means of meeting the design requirements of the rule for the RCS vents. Prior to promulgation of the rule, we have reviewed your responses identified above. The enclosed Safety Evaluation (SE) is based on the Technical Evaluation Report (TER) prepared by our consultant, Lawrence Livermore National Laboratory, and additional items which were outside the scope of the TER. The TER is attached to the SE. You will note our evaluation identifies specific items which are being addressed in conjunction with other ongoing NRC actions and areas where deficiencies may exist or confirmation is necessary to assure conformance with the rule.

We are providing the results of our review for your information. In addition, we have provided the information to Region III to assist them, as they deem appropriate, in determining your compliance with the requirements of 10 CFR 50.44(c)(3)(iii). If you have any questions relative to the enclosed SE, please contact Mr. David Wigginton, the NRC Project Manager for your facility.

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DATE	.....	.....	.....	.....	.....	.....	.....

We consider NUREG-0737, Item II.B.1, actions to be conpleted based on the requirements and promulgation of 10 CFR 50.44(c)(3)(iii).

Sincerely,

Original signed by:
S. A. Varga
Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

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SURNAME							
DATE	8/30/83	8/31/83	8/31/83				

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO: 1981—335-960

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Indiana and Michigan Electric Company

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U. S. Nuclear Regulatory Commission
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The Honorable Tom Corcoran
United States House of Representatives
Washington, D. C. 20515

James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

ENCLOSURE 1

SAFETY EVALUATION

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

INDIANA & MICHIGAN ELECTRIC COMPANY

INTRODUCTION

The requirement for RCS vessel head and high point vents is stated in 10 CFR 50.44 paragraph (c)(3)(iii). Guidance is provided in NUREG-0737 "Clarification of TMI Action Plan Requirements," November 1980, Item II.B.1 Reactor Coolant System Vents and NUREG-0800 "Standard Review Plan," July 1981, Section 5.412 Reactor Coolant System High Point Vents. The requirements of 10 CFR 50.44 for RCS high point vents specifically provide that the vent system shall: (1) be designed to ensure low probability of inadvertent or irreversible actuation and a high probability of operating when needed, (2) be remotely operable from the control room, (3) not aggravate the challenge to containment or the course of the accident, and (4) conform to the requirements of Appendix A and B of 10 CFR 50.

The licensee has responded to the above requirements in references 1 through 4. These responses have been evaluated by Lawrence Livermore Laboratory under contract to the Nuclear Regulatory Commission (NRC). The results of this evaluation are presented in the enclosure entitled "Reactor Coolant Systems Vents (NUREG-0737, Item II.B.1), Final Technical Evaluation Report for D. C. Cook 1 and 2." The NRC staff review is based upon the Technical Evaluation Report (TER) and has been extended to items outside the scope of the TER, as specifically identified herein.

Certain items identified below may be subject to confirmation including a post-implementation review and audit to ensure compliance with 10 CFR 50.44(c)(3)(iii).

EVALUATION

The staff concurs with the TER recommendation that the D. C. Cook 1 and 2 vent system design is acceptable provided the following items are satisfactorily resolved:

NUREG-0737 Item II.B.1 Clarification A (12) concerning human factor analysis requires consideration of the addition of vent system controls to the control room. Although this was discussed in the TER, the human factor analysis of control room modifications will be further addressed on an audit basis as part of the review of TMI Item I.D.1 "Control Room Design Reviews."

The construction codes and standards for the piping and valves used in the Reactor Coolant System Vents were not specifically identified. The codes and standards shall be identified and available for NRC audit.

The current design does not provide for continuous valve position indication in the control room per the requirements of NUREG-0737, Item II.B.1 sub-item A(5) and sub-item (6) concerning the requirement for operability of the vent system from the control room. An acceptable resolution would be for the licensee to restore continuous control power supply to the RCS vents system by deleting its commitment to rack out the related circuit breakers during normal operation. The staff has evaluated that the related requirements in 10 CFR 50.44(c)(3)(iii) for the inadvertent or irreversible actuation of a vent have been adequately met by the switching systems proposed for the individual valves on the vent system. Therefore, removal of power is not necessary. The licensee is required to take the necessary action to meet these requirements. This item must be confirmed by the licensee.

The following items are identified in the TER as being outside the scope of the contractor's review: seismic and environmental qualification, operating guidelines and procedures, Technical Specifications, and the inservice inspection program. The resolution of these items is as follows:

Seismic and Environmental Qualification: Seismic and environmental qualification will be audited in conjunction with generic audits of the licensee's Seismic and Environmental qualification program.

Operating Guidelines and Procedures: NUREG-0737 item II.B.1 requested procedures and analyses for operator use of the vents including the identification of the information available to the operator for initiating or terminating vent usage. The staff review of NUREG-0737 Item I.C.1 includes vent operating guidelines as an integral part of emergency operating procedures guidelines.

It is our judgment that the owners group emergency operating guidelines as approved by the staff will provide an acceptable basis for the development of plant specific operating procedures. The plant procedures will be subject to NRC audits. We consider this approach a satisfactory resolution of operating procedures for RCS vents.

Technical Specifications: It is currently proposed to issue a generic letter to all licensees regarding the submittal of Proposed Technical Specifications for a number of NUREG-0737 items, including item II.B.1, which were required to be implemented after December 31, 1981. Technical Specification requirements for the RCS vents will be included in this forthcoming licensing action.

Inservice Inspection Program: The vent system is an extension of the reactor coolant pressure boundary and must meet applicable inservice inspection requirements described by 10 CFR 50.55(g). The staff requires that the licensee include the RCS vent system in the inservice inspection program which is subject to NRC review and audit.

CONCLUSION

The staff safety evaluation is based on a review of the Technical Evaluation Report (TER) performed by Lawrence Livermore National Laboratory (enclosure 2), and the staff reviews of additional items outside the scope of the TER. The staff finds that the vent system at D. C. Cook 1 and 2 is acceptable and in conformance with the requirements of 10 CFR 50.44 paragraph (c)(3)(iii) and the guidelines of NUREG-0737 Item II.B.1, and NUREG-0800 section 5.4.12. Certain items are subject to confirmation including post implementation NRC audit in conjunction with other ongoing actions/programs. These items are: (1) human factors analysis of control room modifications, (2) identification of construction codes and standards, (3) confirm restoration of continuous positive valve position indication within, and operability of the RCS vents from the control room, (4) seismic and environmental qualification, (5) operating procedures, and (6) the in-service inspection program.

Technical Specifications will be the subject of a separate future licensing action.

REFERENCES

1. Letter, J. E. Dolan (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRP-74," with attachment providing information concerning the proposed design for reactor coolant system venting in compliance with the requirements of NUREG-0578, dated January 15, 1980.

2. Letter, J. E. Dolan (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Units Nos. 1 and 2, Docket Nos. 50-315, and 50-316, License Nos. DPR-58 and DPR-74," with attachment containing information that was requested to complete the post-implementation review of the Category "A" requirements of NUREG-0578 for Cook Plant, dated March 10, 1980.

3. Letter, R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC) "Donald C. Cook Nuclear Plant Units Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.

ENCLOSURE 2

Selected Operating Reactor Issues Program II

Reactor Coolant System Vents (NUREG-00737, Item II.B.1.)
NRC FIN A0250 - Project 9

FINAL TECHNICAL EVALUATION REPORT FOR D.C. COOK 1 AND 2

Docket Numbers 50-315 and 50-316
NRC TAC Numbers 44365 and 44366

Prepared by J. T. Held of Energy Incorporated - Seattle (Subcontract 4324401) for Lawrence Livermore National Laboratory under contract to the NRC Office of Nuclear Reactor Regulation, Division of Licensing.

NRC Lead Engineer - Gus Alberthal

TF-333/0805a

February 14, 1983

TECHNICAL EVALUATION REPORT ON REACTOR COOLANT SYSTEM VENTS FOR D.C. COOK 1 AND 2

INTRODUCTION

The requirements for reactor coolant system high point vents are stated in paragraph (c)(3)(iii) of 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors," and are further described in Standard Review Plan (SRP) Section 5.4.12, "Reactor Coolant System High Point Vents," and Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements." In response to these and previous requirements, the Indiana & Michigan Electric Company has submitted information in References 1 through 4 in support of the vent system at Units 1 and 2 of the Donald C. Cook Nuclear Plant.

EVALUATION

The function of the reactor coolant system (RCS) vent system is to vent noncondensible gases from the high points of the RCS to assure that core cooling during natural circulation will not be inhibited. The D.C. Cook 1 and 2 RCS vent system provides venting capability from high points of the pressurizer and the reactor vessel head. The noncondensible gases, steam, and/or liquids vented from either the pressurizer or the reactor vessel head are discharged directly to the upper containment atmosphere. The RCS vent system is designed to vent a volume of hydrogen approximately equal to one half of the RCS volume in one hour at system design temperature and pressure. A flow restriction orifice in each RCS vent path, however, limits the flow from a pipe rupture or from inadvertent actuation of the vent system to less than the capability of the reactor coolant makeup system. Hence, the licensee's compliance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," is not affected by the addition of the RCS vent system.

The vent from the pressurizer and the vent from the reactor vessel head to the containment atmosphere each have two parallel sets of two solenoid-operated valves in series which are remotely controlled from the main control room. Indication of individual valve position for the eight valves is provided by means of position switches located on the valve stems and indicating lights in the main control room. Redundancy has been provided for both the pressurizer and the reactor vessel head vents by powering the valves in the parallel piping paths from each high point vent from separate DC power trains to ensure that RCS venting capability from each high point is maintained. RCS vent system valve seat leakage can be detected by way of RTD assemblies downstream of the solenoid valves with associated alarms in the main control room.

The portion of each RCS vent path up to and including the second normally closed valve forms a part of the reactor coolant pressure boundary and thus must meet reactor coolant pressure boundary requirements. The licensee has stated that this portion of the vent system is designated Safety Class 2 (Safety Class 1 upstream of the flow restriction orifices) in compliance with 10 CFR 50.55a and Regulatory Guide 1.26. The entire RCS vent system has been designed to withstand the safe shutdown earthquake and is classified by the licensee as Seismic Class I. The RCS vents are designed for pressures and temperatures corresponding to the RCS design pressure and temperature. In addition, the vent system materials are compatible with the reactor coolant chemistry and are as follows:

Piping - A 376 Type 304 and/or Type 316, Stainless Steel
Valves - SA-182 Type 316, Stainless Steel

Furthermore, the materials of construction were fabricated and tested in accordance with SRP Section 5.2.3. The reactor vessel head vent and the pressurizer vent are also acceptably separated and protected from missiles and the dynamic effects of postulated piping ruptures. We therefore conclude that the design of the portions of the RCS vent system up to and including the second normally closed valve conforms to all reactor coolant pressure boundary requirements, including 10 CFR 50.55a and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31. The licensee has further ascertained that the essential operation of other safety-related systems will not be impaired by postulated failures of RCS vent system components.

We have reviewed the licensee's RCS vent system design to assure an acceptably low probability exists for inadvertent or irreversible actuation of the vent system. Each vent path has two solenoid-operated valves in series, and each valve has a separate two-position control switch which is maintained under administrative control. In addition, the valves fail to the closed position in the event of loss of power. The licensee has also stated that the controls and displays added to the main control room will be considered in the human factors analysis required by NUREG-0737 Item I.D.1, "Control-Room Design Reviews." We therefore find that no single active component failure or human error should result in inadvertent opening or irreversible actuation (i.e., failure to close after intentional opening) of the RCS vent system.

The licensee has stated that control power is removed from the RCS vent system valves during normal operation by racking out the respective breakers. Removal of the circuit breakers causes a loss of valve position indication. We recommend that the circuit breakers be reconnected to provide continuous valve position indication in the control room and operability from the control room, since it is our judgment that this will not cause an unacceptable increase in the chances of inadvertent or irreversible operation.

We have also examined the locations where the vent system normally discharges to the upper volume of the containment atmosphere at elevations 660.0 ft and 673.0 ft. Based on a word description provided by the licensee, these locations are in areas that assure good mixing with the containment atmosphere to prevent the accumulation or pocketing of high concentrations of hydrogen in compliance with 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors." Additionally, these locations are such that the operation of safety-related systems would not be adversely affected by the discharge of the anticipated mixtures of steam, liquids, and noncondensible gases.

The licensee has stated that operability testing will be done in accordance with the requirements of subsection IWV-3000 of Section XI of the ASME Code for Category B valves during refueling outages.

CONCLUSION

We conclude that the D.C. Cook 1 and 2 RCS vent system design is sufficient to effectively vent noncondensible gases from the reactor coolant system without leading to an unacceptable increase in the probability of a LOCA or a challenge to containment integrity, meets the design requirements of NUREG-0737 Item II.B.1 and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31, and conforms to the requirements of paragraph (c)(3)(iii) of 10 CFR 50.44. We therefore recommend that the D.C. Cook 1 and 2 RCS vent system design be found acceptable. It should be noted, however, that the following items were excluded from the scope of our review: seismic and environmental qualification of the RCS vent system, RCS vent system operating guidelines and procedures, and required modifications to the plant technical specifications and in-service inspection program for the RCS vent system.

REFERENCES

1. Letter, J.E. Dolan (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74," with attachment providing information concerning the proposed design for reactor coolant system venting in compliance with the requirements of NUREG-0578, dated January 15, 1980.

2. Letter, J.E. Dolan (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315, and 50-316, License Nos. DPR-58 and DPR-74," with attachment containing information that was requested to complete the post-implementation review of the Category "A" requirements of NUREG-0578 for Cook Plant, dated March 10, 1980.

3. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.

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Docket Nos. 50-315
and 50-316

Mr. John Dolan, Vice President
Indiana and Michigan Electric Company
c/o American Electric Power Service Corporation
1 Riverside Plaza
Columbus, Ohio 43216

Dear Mr. Dolan:

SUBJECT: NUREG-0737, ITEM II.B.1, REACTOR COOLANT SYSTEM VENTS - DONALD C. COOK NUCLEAR PLANT, UNIT NOS. 1 AND 2

By letter dated January 15, and March 10, 1980, July 15, 1981, and June 28, 1982, the Indiana and Michigan Electric Company has provided information and details "relating to the design of the reactor coolant system vents (RCSV) for Donald C. Cook Nuclear Plant Units 1 & 2. However, the implementation, schedule and requirement for a pre-implementation review have been superseded by the requirements of 10 CFR 50.44(c)(3)(iii). All operating reactors, in order to provide the improved operational capability required by the rule, must have the RCS vents installed, operational, procedures established and personnel trained in accordance with the schedule provided in the rule. An exemption is necessary if the specific design or schedular requirements of 10 CFR 50.44(c)(3)(iii) cannot be complied with.

The guidance in NUREG-0737, Item II.B.1, provides an acceptable means of meeting the design requirements of the rule for the RCS vents. Prior to promulgation of the rule, we have reviewed your responses identified above. The enclosed Safety Evaluation (SE) is based on the Technical Evaluation Report (TER) prepared by our consultant, Lawrence Livermore National Laboratory, and additional items which were outside the scope of the TER. The TER is attached to the SE. You will note our evaluation identifies specific items which are being addressed in conjunction with other ongoing NRC actions and areas where deficiencies may exist or confirmation is necessary to assure conformance with the rule.

We are providing the results of our review for your information. In addition, we have provided the information to Region III to assist them, as they deem appropriate, in determining your compliance with the requirements of 10 CFR 50.44(c)(3)(iii). If you have any questions relative to the enclosed SE, please contact Mr. David Wigginton, the NRC Project Manager for your facility.

OFFICE							
SURNAME							
DATE							

We consider NUREG-0737, Item II.B.1, actions to be conpleted based on the requirements and promulgation of 10 CFR 50.44(c)(3)(iii).

Sincerely,

Original signed by:
S. A. Varga
Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing

Enclosures:
As stated

cc w/enclosures:
See next page

OFFICE	ORB 1 DWigginton/rs	ORB SVarga	D.McDonald ORB				
SURNAME							
DATE	8/30/83	8/31/83	8/31/83				

Mr. John Dolan
Indiana and Michigan Electric Company

cc: Mr. M. P. Alexich
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U. S. Nuclear Regulatory Commission
Resident Inspectors Office
7700 Red Arrow Highway
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The Honorable Tom Corcoran
United States House of Representatives
Washington, D. C. 20515

James G. Keppler
Regional Administrator - Region III
U. S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

ENCLOSURE 1

SAFETY EVALUATION

DONALD C. COOK NUCLEAR PLANT UNITS 1 AND 2

INDIANA & MICHIGAN ELECTRIC COMPANY

INTRODUCTION

The requirement for RCS vessel head and high point vents is stated in 10 CFR 50.44 paragraph (c)(3)(iii). Guidance is provided in NUREG-0737 "Clarification of TMI Action Plan Requirements," November 1980, Item II.B.1 Reactor Coolant System Vents and NUREG-0800 "Standard Review Plan," July 1981, Section 5.412 Reactor Coolant System High Point Vents. The requirements of 10 CFR 50.44 for RCS high point vents specifically provide that the vent system shall: (1) be designed to ensure low probability of inadvertent or irreversible actuation and a high probability of operating when needed, (2) be remotely operable from the control room, (3) not aggravate the challenge to containment or the course of the accident, and (4) conform to the requirements of Appendix A and B of 10 CFR 50.

The licensee has responded to the above requirements in references 1 through 4. These responses have been evaluated by Lawrence Livermore Laboratory under contract to the Nuclear Regulatory Commission (NRC). The results of this evaluation are presented in the enclosure entitled "Reactor Coolant Systems Vents (NUREG-0737, Item II.B.1), Final Technical Evaluation Report for D. C. Cook 1 and 2." The NRC staff review is based upon the Technical Evaluation Report (TER) and has been extended to items outside the scope of the TER, as specifically identified herein.

Certain items identified below may be subject to confirmation including a post-implementation review and audit to ensure compliance with 10 CFR 50.44(c)(3)(iii).

EVALUATION

The staff concurs with the TER recommendation that the D. C. Cook 1 and 2 vent system design is acceptable provided the following items are satisfactorily resolved:

NUREG-0737 Item II.B.1 Clarification A (12) concerning human factor analysis requires consideration of the addition of vent system controls to the control room. Although this was discussed in the TER, the human factor analysis of control room modifications will be further addressed on an audit basis as part of the review of TMI Item I.D.1 "Control Room Design Reviews."

The construction codes and standards for the piping and valves used in the Reactor Coolant System Vents were not specifically identified. The codes and standards shall be identified and available for NRC audit.

The current design does not provide for continuous valve position indication in the control room per the requirements of NUREG-0737, Item II.B.1 sub-item A(5) and sub-item (6) concerning the requirement for operability of the vent system from the control room. An acceptable resolution would be for the licensee to restore continuous control power supply to the RCS vents system by deleting its commitment to rack out the related circuit breakers during normal operation. The staff has evaluated that the related requirements in 10 CFR 50.44(c)(3)(iii) for the inadvertent or irreversible actuation of a vent have been adequately met by the switching systems proposed for the individual valves on the vent system. Therefore, removal of power is not necessary. The licensee is required to take the necessary action to meet these requirements. This item must be confirmed by the licensee.

The following items are identified in the TER as being outside the scope of the contractor's review: seismic and environmental qualification, operating guidelines and procedures, Technical Specifications, and the inservice inspection program. The resolution of these items is as follows:

Seismic and Environmental Qualification: Seismic and environmental qualification will be audited in conjunction with generic audits of the licensee's Seismic and Environmental qualification program.

Operating Guidelines and Procedures: NUREG-0737 item II.B.1 requested procedures and analyses for operator use of the vents including the identification of the information available to the operator for initiating or terminating vent usage. The staff review of NUREG-0737 Item I.C.1 includes vent operating guidelines as an integral part of emergency operating procedures guidelines.

It is our judgment that the owners group emergency operating guidelines as approved by the staff will provide an acceptable basis for the development of plant specific operating procedures. The plant procedures will be subject to NRC audits. We consider this approach a satisfactory resolution of operating procedures for RCS vents.

Technical Specifications: It is currently proposed to issue a generic letter to all licensees regarding the submittal of Proposed Technical Specifications for a number of NUREG-0737 items, including item II.B.1, which were required to be implemented after December 31, 1981. Technical Specification requirements for the RCS vents will be included in this forthcoming licensing action.

Inservice Inspection Program: The vent system is an extension of the reactor coolant pressure boundary and must meet applicable inservice inspection requirements described by 10 CFR 50.55(g). The staff requires that the licensee include the RCS vent system in the inservice inspection program which is subject to NRC review and audit.

CONCLUSION

The staff safety evaluation is based on a review of the Technical Evaluation Report (TER) performed by Lawrence Livermore National Laboratory (enclosure 2), and the staff reviews of additional items outside the scope of the TER. The staff finds that the vent system at D. C. Cook 1 and 2 is acceptable and in conformance with the requirements of 10 CFR 50.44 paragraph (c)(3)(iii) and the guidelines of NUREG-0737 Item II.B.1, and NUREG-0800 section 5.4.12. Certain items are subject to confirmation including post implementation NRC audit in conjunction with other ongoing actions/programs. These items are: (1) human factors analysis of control room modifications, (2) identification of construction codes and standards, (3) confirm restoration of continuous positive valve position indication within, and operability of the RCS vents from the control room, (4) seismic and environmental qualification, (5) operating procedures, and (6) the in-service inspection program.

Technical Specifications will be the subject of a separate future licensing action.

REFERENCES

1. Letter, J. E. Dolan (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRP-74," with attachment providing information concerning the proposed design for reactor coolant system venting in compliance with the requirements of NUREG-0578, dated January 15, 1980.

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3. Letter, R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter R. S. Hunter (Indiana & Michigan Electric Company) to H. R. Denton (NRC) "Donald C. Cook Nuclear Plant Units Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.

ENCLOSURE 2

Selected Operating Reactor Issues Program II

Reactor Coolant System Vents (NUREG-00737, Item II.B.1.)
NRC FIN A0250 - Project 9

FINAL TECHNICAL EVALUATION REPORT FOR D.C. COOK 1 AND 2

Docket Numbers 50-315 and 50-316
NRC TAC Numbers 44365 and 44366

Prepared by J. T. Held of Energy Incorporated - Seattle (Subcontract 4324401) for Lawrence Livermore National Laboratory under contract to the NRC Office of Nuclear Reactor Regulation, Division of Licensing.

NRC Lead Engineer - Gus Alberthal

TF-333/0805a

February 14, 1983

Docket Numbers 50-315 and 50-316
NRC TAC Numbers 44365 and 44366

TECHNICAL EVALUATION REPORT ON REACTOR COOLANT SYSTEM VENTS FOR D.C. COOK 1 AND 2

INTRODUCTION

The requirements for reactor coolant system high point vents are stated in paragraph (c)(3)(iii) of 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors," and are further described in Standard Review Plan (SRP) Section 5.4.12, "Reactor Coolant System High Point Vents," and Item II.B.1 of NUREG-0737, "Clarification of TMI Action Plan Requirements." In response to these and previous requirements, the Indiana & Michigan Electric Company has submitted information in References 1 through 4 in support of the vent system at Units 1 and 2 of the Donald C. Cook Nuclear Plant.

EVALUATION

The function of the reactor coolant system (RCS) vent system is to vent noncondensible gases from the high points of the RCS to assure that core cooling during natural circulation will not be inhibited. The D.C. Cook 1 and 2 RCS vent system provides venting capability from high points of the pressurizer and the reactor vessel head. The noncondensible gases, steam, and/or liquids vented from either the pressurizer or the reactor vessel head are discharged directly to the upper containment atmosphere. The RCS vent system is designed to vent a volume of hydrogen approximately equal to one half of the RCS volume in one hour at system design temperature and pressure. A flow restriction orifice in each RCS vent path, however, limits the flow from a pipe rupture or from inadvertent actuation of the vent system to less than the capability of the reactor coolant makeup system. Hence, the licensee's compliance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light Water Nuclear Power Reactors," is not affected by the addition of the RCS vent system.

The vent from the pressurizer and the vent from the reactor vessel head to the containment atmosphere each have two parallel sets of two solenoid-operated valves in series which are remotely controlled from the main control room. Indication of individual valve position for the eight valves is provided by means of position switches located on the valve stems and indicating lights in the main control room. Redundancy has been provided for both the pressurizer and the reactor vessel head vents by powering the valves in the parallel piping paths from each high point vent from separate DC power trains to ensure that RCS venting capability from each high point is maintained. RCS vent system valve seat leakage can be detected by way of RTD assemblies downstream of the solenoid valves with associated alarms in the main control room.

The portion of each RCS vent path up to and including the second normally closed valve forms a part of the reactor coolant pressure boundary and thus must meet reactor coolant pressure boundary requirements. The licensee has stated that this portion of the vent system is designated Safety Class 2 (Safety Class 1 upstream of the flow restriction orifices) in compliance with 10 CFR 50.55a and Regulatory Guide 1.26. The entire RCS vent system has been designed to withstand the safe shutdown earthquake and is classified by the licensee as Seismic Class I. The RCS vents are designed for pressures and temperatures corresponding to the RCS design pressure and temperature. In addition, the vent system materials are compatible with the reactor coolant chemistry and are as follows:

Piping - A 376 Type 304 and/or Type 316, Stainless Steel
Valves - SA-182 Type 316, Stainless Steel

Furthermore, the materials of construction were fabricated and tested in accordance with SRP Section 5.2.3. The reactor vessel head vent and the pressurizer vent are also acceptably separated and protected from missiles and the dynamic effects of postulated piping ruptures. We therefore conclude that the design of the portions of the RCS vent system up to and including the second normally closed valve conforms to all reactor coolant pressure boundary requirements, including 10 CFR 50.55a and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31. The licensee has further ascertained that the essential operation of other safety-related systems will not be impaired by postulated failures of RCS vent system components.

We have reviewed the licensee's RCS vent system design to assure an acceptably low probability exists for inadvertent or irreversible actuation of the vent system. Each vent path has two solenoid-operated valves in series, and each valve has a separate two-position control switch which is maintained under administrative control. In addition, the valves fail to the closed position in the event of loss of power. The licensee has also stated that the controls and displays added to the main control room will be considered in the human factors analysis required by NUREG-0737 Item I.D.1, "Control-Room Design Reviews." We therefore find that no single active component failure or human error should result in inadvertent opening or irreversible actuation (i.e., failure to close after intentional opening) of the RCS vent system.

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We have also examined the locations where the vent system normally discharges to the upper volume of the containment atmosphere at elevations 660.0 ft and 673.0 ft. Based on a word description provided by the licensee, these locations are in areas that assure good mixing with the containment atmosphere to prevent the accumulation or pocketing of high concentrations of hydrogen in compliance with 10 CFR 50.44, "Standards for Combustible Gas Control System in Light Water Cooled Power Reactors." Additionally, these locations are such that the operation of safety-related systems would not be adversely affected by the discharge of the anticipated mixtures of steam, liquids, and noncondensible gases.

The licensee has stated that operability testing will be done in accordance with the requirements of subsection IWV-3000 of Section XI of the ASME Code for Category B valves during refueling outages.

CONCLUSION

We conclude that the D.C. Cook 1 and 2 RCS vent system design is sufficient to effectively vent noncondensible gases from the reactor coolant system without leading to an unacceptable increase in the probability of a LOCA or a challenge to containment integrity, meets the design requirements of NUREG-0737 Item II.B.1 and the applicable portions of General Design Criteria 1, 2, 4, 14, 30, and 31, and conforms to the requirements of paragraph (c)(3)(iii) of 10 CFR 50.44. We therefore recommend that the D.C. Cook 1 and 2 RCS vent system design be found acceptable. It should be noted, however, that the following items were excluded from the scope of our review: seismic and environmental qualification of the RCS vent system, RCS vent system operating guidelines and procedures, and required modifications to the plant technical specifications and in-service inspection program for the RCS vent system.

REFERENCES

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3. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DRR-74, NUREG-0737; Item II.B.1 - Reactor Coolant System Vents," dated July 15, 1981.

4. Letter, R.S. Hunter (Indiana & Michigan Electric Company) to H.R. Denton (NRC), "Donald C. Cook Nuclear Plant Unit Nos. 1 and 2, Docket Nos. 50-315 and 50-316, License Nos. DPR-58 and DPR-74, NUREG-0737, Item II.B.1, Reactor Coolant System Vents, Request for Additional Information," dated June 28, 1982.