February 8, 2002

Mr. Oliver D. Kingsley, President
and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1), LICENSE AMENDMENT FROM THE HYDROGEN CONTROL REQUIREMENTS (TAC NO. MB0067)

Dear Mr. Kingsley:

The Commission has issued the enclosed Amendment No. 240 to Facility Operating License No. DPR-50 for the Three Mile Island Nuclear Station, Unit 1, in response to your application dated September 20, 2000, as supplemented August 2 and September 28, 2001.

The amendment deletes the specification for hydrogen monitoring instrumentation from Technical Specification (TS) Sections 3.5.5.2, 3.6, and Tables 3.5-3 and 4.1-4, corrects a typographical error in Item 8 of Table 4.1-4, deletes the specifications for hydrogen recombiners in TS Section 4.4.4, and changes the Bases for TS Section 4.12.2 to delete its reference to hydrogen purge and hydrogen recombiners.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Timothy G. Colburn, Senior Project Manager, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosures: 1. Amendment No. 240 to DPR-50
2. Safety Evaluation

cc w/encls: See next page

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AMERGEN ENERGY COMPANY, LLC

DOCKET NO. 50-289

THREE MILE ISLAND NUCLEAR STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 240
License No. DPR-50

1. The Nuclear Regulatory Commission (the Commission or NRC) has found that:

   A. The application for amendment by AmerGen Energy Company, LLC (the licensee), dated September 20, 2000, as supplemented August 2 and September 28, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.c.(2) of Facility Operating License No. DPR-50 is hereby amended to read as follows:

    (2) Technical Specifications

    The Technical Specifications contained in Appendix A, as revised through Amendment No. 240, are hereby incorporated in the license. The AmerGen Energy Company, LLC shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days including the designation of hydrogen monitoring instrumentation as Category 3 variables as defined in Regulatory Guide 1.97.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Joel T. Munday, Acting Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: February 8, 2002

ATTACHMENT TO LICENSE AMENDMENT NO. 240

FACILITY OPERATING LICENSE NO. DPR-50

DOCKET NO. 50-289

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove	Insert
3-40b	3-40b
3-40d	3-40d
3-41	3-41
3-41c	3-41c
4-10a	4-10a
4-10b	4-10b
4-38	4-38
4-55c	4-55c

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 240 TO FACILITY OPERATING LICENSE NO. DPR-50

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

1.0 INTRODUCTION

By letter dated September 20, 2000, as supplemented August 2 and September 28, 2001, AmerGen Energy Company, LLC (AmerGen, the licensee), submitted a request for approval of changes to the Three Mile Island Nuclear Station, Unit 1 (TMI-1), Technical Specifications (TSs).

The requested changes delete the specification for hydrogen monitoring instrumentation from TS Sections 3.5.5.2, and 3.6, and Tables 3.5-3 and 4.1-4, corrects a typographical error in Item 8 of Table 4.1-4, deletes the specifications for hydrogen recombiners in TS Section 4.4.4, and changes the Bases for TS Section 4.12.2 to delete its reference to hydrogen purge and hydrogen recombiners. Camera-ready TS pages were provided by letter dated January 24, 2002.

2.0 DISCUSSION

2.1 Containment Hydrogen Monitoring

In its request, AmerGen asserts that the TMI-1 containment has sufficient safety margin against hydrogen burn following design-basis and severe accidents without use of the hydrogen monitoring or concentration control systems. The TMI-1 probabilistic risk assessment indicates that none of the accident sequences addressed that could realistically threaten containment due to hydrogen combustion are impacted by the hydrogen monitoring or concentration control systems. Nuclear Regulatory Commission (NRC) sponsored studies, such as NUREG-1150, "Severe Accident Risks: An Assessment For Five U.S. Nuclear Power Plants," December 1990, and NUREG/CR-5662, "Hydrogen Combustion, Control And Value Impact Analysis For PWR [pressurized water reactor] Dry Containments," June 1991, have found hydrogen combustion to be a small contributor to containment failure for large, dry containment designs due to the robustness of these containment types and the likelihood of a spurious ignition source.

However, the NRC staff does not support AmerGen's related request for an exemption (also included in its September 20, 2000, and August 2 and September 28, 2001, submittals) from the requirements for hydrogen monitoring as promulgated in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix E, Section VI, "Emergency Response Data System

(ERDS)," or elimination of any commitments made in regard to NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1980, Item II.F.1, Attachment 6, "Containment Hydrogen Monitor." The basis for the NRC staff's determination is contained in the Exemption dated February 8, 2002.

The NRC staff believes, however, that there is sufficient justification to remove the hydrogen monitors from the TMI-1 TSs and their associated Bases because they no longer meet the definition of Category 1 or Type A variables as defined in Regulatory Guide (RG) 1.97, "Control of Combustible Gas Concentrations in Containment Following a Loss-of-Coolant Accident [LOCA], Revision 2, November 1978. Currently, the hydrogen monitors are retained in TSs because they are classified as Category 1 or Type A variables. NUREG-1430, Revision 2, "Standard Technical Specifications Babcock and Wilcox Plants," states, "post accident monitoring instrumentation that meets the definition of Type A variables in RG 1.97 satisfies Criterion 3 of 10 CFR 50.36(c)(2)(ii). Category 1, non-Type A, instrumentation must be retained in Technical Specifications because it is intended to assist operators in minimizing the consequences of accidents. Therefore, Category 1, non-Type A variables are important for reducing public risk."

RG 1.97 defines Type A variables as those that provide primary information needed to permit the control room operating personnel to take the specified manual control actions for which no automatic control is provided and that are required for safety systems to accomplish their safety functions during design-basis accidents. Section 3.0 of this safety evaluation concludes that TMI-1 could withstand the consequences of uncontrolled hydrogen-oxygen recombination without loss of safety function without credit for the hydrogen recombiners or the hydrogen purge system for design-basis accident events. Therefore, the hydrogen monitors no longer meet the definition of a Type A variable as defined in RG 1.97.

Section 4.3.1 of Attachment 2 to SECY-00-198, "Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.44 (Combustible Gas Control)," September 14, 2000, and Section 2.3 of this evaluation find that failure of large, dry containments due to hydrogen combustion is not a significant contributor to public risk. This conclusion is based on the robustness of these containment types and the likelihood of a spurious ignition source. Operator action is not credited or anticipated for design-basis events and beyond design-basis accidents that have been analyzed. Therefore, for large, dry containments, the hydrogen monitors also no longer meet the definition of a Category 1 variable as defined in RG 1.97, and the NRC staff finds that the hydrogen monitors can be removed from the TMI-1 TSs and their associated Bases.

As stated in SECY-00-198, the NRC staff continues to believe that the special treatment requirements associated with the hydrogen monitors are overly burdensome. RG 1.7 recommends that the monitors should meet the design, quality assurance, redundancy, energy source, and instrumentation requirements for an engineered safety feature. Special treatment requirements associated with the hydrogen monitors are also invoked by either order or commitments to RG 1.97. RG 1.97 recommends that the hydrogen monitors be Category 1, which includes environmental qualification, seismic qualification, redundancy, being energized from station standby power sources, and being backed up by batteries where momentary interruption is not tolerable. As discussed above, the hydrogen monitors no longer meet the definition of Category 1 in RG 1.97. RG 1.97 states that Category 3 is intended to provide requirements that will ensure that high-quality off-the-shelf instrumentation is obtained and applies to backup and diagnostic instrumentation. Category 3 is a more appropriate categorization for the hydrogen monitors because the hydrogen monitors are primarily needed to assess the degree of core damage, and confirm that spurious ignition has taken place and that containment integrity is not threatened by an explosive mixture. The NRC staff is requiring, as a condition of this license amendment, that even though the continuous hydrogen monitors may be removed from the TSs, they must be designated by the licensee as Category 3 variables as defined in RG 1.97. The remainder of this safety evaluation will address the necessity of requirements for a combustible gas concentration control system as part of the design basis for TMI-1.

2.2 TMI-1 Hydrogen Control System

The TMI-1 combustible gas control system consists of the hydrogen monitoring system and the hydrogen recombiner system. A backup means of post-accident hydrogen control is also available by use of the hydrogen purge system. The hydrogen recombiner system consists of 2 safety-related thermal recombiners. Air flow is by natural convection through the unit at a rate of 50 standard cubic feet per minute. Heating elements cause the hydrogen to chemically combine with atmospheric oxygen. As presently described in the TMI-1 Emergency Operating Procedures, the hydrogen recombiners are manually started by the control room operators before the hydrogen concentration reaches 3.0 volume percent. Following the methodology of RG 1.7, a hydrogen concentration of 3.0 percent is not reached for at least 8 days after the start of the accident.

As a backup to the hydrogen recombiners, the hydrogen purge system is designed to maintain the hydrogen concentration of the reactor building below the lower flammability limit of 4.0 volume percent. This is accomplished by introducing fresh outside air into the reactor building and allowing the displaced containment atmosphere to be discharged in a controlled manner to the plant vent through exhaust filters. The hydrogen purge system would be placed in service if the hydrogen monitoring system indicates that the reactor building hydrogen concentration has reached 2.5 percent and the hydrogen recombiners are not available. At this time, preparations for purging the reactor building begin.

2.3 Regulatory Requirements For Combustible Gas Control Systems

Regulatory requirements for the hydrogen control system are specified in 10 CFR 50.44 and 10 CFR Part 50, Appendix A, (General Design Criteria 41, 42, and 43). Additional NRC staff guidance is provided in RG 1.7. NRC staff review and acceptance criteria are specified in Section 6.2.5 of the Standard Review Plan. Different requirements apply to facilities according to the date of publication of the Notice of Hearing for the Construction Permit. With regard to combustible gas control system requirements, TMI-1 is subject to the requirements of 10 CFR 50.44(g).

A combustible gas control system is defined by 10 CFR 50.44(h) as a system that operates after a LOCA to maintain the concentrations of combustible gases within the containment, such as hydrogen, below flammability limits. Combustible gas control systems are of two types: (1) systems that allow controlled release from containment such as a purge system, and (2) systems that do not result in a significant release from containment such as recombiners.

The purpose of this amendment request and the related exemption request is to remove requirements for hydrogen recombiners from the TMI-1 design basis.

TMI-1 is also subject to 10 CFR 50.44(d) which states:

> For facilities that are in compliance with Section 50.46(b), the amount of hydrogen contributed by core metal-water reaction (percentage of fuel cladding that reacts with water), as a result of degradation, but not total failure, of emergency core cooling functioning shall be assumed either to be five times the total amount of hydrogen calculated in demonstrating compliance with Section 50.46(b)(3), or to be the amount that would result from reaction of all the metal in the outside surfaces of the cladding cylinders surrounding the fuel (excluding the cladding surrounding the plenum volume) to a depth of 0.00023 inch (0.0058 mm), whichever amount is greater.

The amount of hydrogen described by 10 CFR 50.44(d) was clearly an attempt to address accident sequences beyond the design basis. As stated in the statement of considerations (41 FR 46467), and RG 1.7, the factor of five is intended to provide an appropriate safety margin against unpredicted events during the course of accidents. More specifically, it is to account for a more degraded condition of the reactor than the Emergency Core Cooling Systems design basis permits. RG 1.7 assumes oxidation of up to 5 percent of the zircalloy surrounding the active fuel. The amount of hydrogen due to radiolysis, as recommended by RG 1.7 is based on these assumptions: 50 percent of the halogens and 1 percent of the solids present in the core are intimately mixed with the coolant water, all noble gases are released to the containment, and all other fission products remain in the fuel rods.

Subsequent risk studies have shown that the majority of risk to the public is from accident sequences that lead to containment failure or bypass, and that the contribution to risk from accident sequences involving hydrogen combustion is actually quite small for large, dry containments. This is true despite the fact that the hydrogen amounts produced in these events are substantially larger than the hydrogen production postulated by 10 CFR 50.44(d) and RG 1.7. Hydrogen combustion sequences that could lead to early containment failure typically involve up to 75 percent core metal-water reaction. Hydrogen combustion sequences that could lead to late containment failure involve additional sources of hydrogen due to the interaction of corium and the concrete basemat after vessel breach. Although the recombiners are effective in maintaining the RG 1.7 (post-LOCA) hydrogen concentration below the lower flammability limit of 4.0 volume percent, they are overwhelmed by the larger quantities of hydrogen associated with severe accidents, which are typically released over a much shorter time period (e.g., 2 hours).

The NRC staff evaluated the risk from hydrogen combustion as part of NUREG-1150. Because the Zion containment was found to be quite strong by the structural experts who considered the issue, early containment failure due to hydrogen burns was not modeled for Zion. Figure 7.3 of NUREG-1150, Volume 1, displays information in which the conditional probabilities of four accident progression bins, e.g., early containment failure, are presented for the Zion plant, which has a large, dry containment similar to TMI-1. This information indicates that, on a plant damage state frequency-weighted average, the mean conditional probabilities from internal events of: (1) early containment failure from a combination of in-vessel steam explosions, overpressurization, and containment isolation failures is 0.014; (2) late containment failure, mainly from basemat melt through is 0.24; (3) containment bypass from interfacing-system

LOCA and induced steam generator tube rupture is 0.006; and (4) probability of no containment failure is 0.73. The accident progression event trees used to generate these bins are described in NUREG/CR-4551, Revision 1, Volume 7, Part 1, “Evaluation of Severe Accident Risks: Zion Unit 1,” March 1993. NUREG/CR-4551 goes on to state that hydrogen combustion in the period before vessel failure is now generally considered to present no threat to large, dry containments. Table A.4-5 of NUREG/CR-4551 shows that the contribution of hydrogen combustion to late containment failure is also very small (only 0.5 percent of the late containment failure bin, 8.376E-4, is from hydrogen combustion). Although the modeling of the accident progression event trees may have changed since 1990, the relative importance of hydrogen combustion for large, dry containments with respect to containment failure has not changed and continues to be quite low.

The TMI-1 Individual Plant Examination (IPE) concluded containment survival is almost certain following hydrogen combustion when the reactor building cooling units and the reactor building spray system are operating. The licensee’s plant-specific containment integrity analysis for TMI-1 indicates that the ultimate pressure capacity of the containment is between 137 and 147 psig (TMI-1 Probabilistic Risk Assessment, Level 2, Appendix 1). This estimate is reasonable when compared to Table 6.1 of NUREG/CR-6475, “Resolution of the Direct Containment Heating Issue for Combustion Engineering Plants and Babcock & Wilcox Plants.” A safety margin exists for containment integrity even for conservative hydrogen concentration levels. The NRC staff estimates the pressure for an adiabatic and complete hydrogen burn involving up to 75 percent core metal-water reaction to be 94 psig. Sequences involving up to 75 percent core metal-water reaction are expected to bound the majority of severe accident sequences including almost all that remain in-vessel. For sequences involving up to 100 percent core metal-water reaction, the NRC staff estimated a pressure of 114 psig. The NRC staff used the methodology in Section 2.6 of NUREG/CR-5662, “Hydrogen Combustion, Control, and Value-Impact Analysis for PWR Dry Containments,” June 1991, assumed a containment free volume of 61,200 cubic meters, and assumed the inventory of zirconium in the core to be 18,700 Kg, to estimate the pressure. These estimates are considered conservative because of the adiabatic assumption, and because the hydrogen burn is expected at much lower hydrogen concentrations than those assumed in the estimates, 13 and 16 percent, respectively. For example, the hydrogen burn during the accident at TMI-2 resulted from a hydrogen concentration of 8.1 percent. Therefore, the licensee’s mean value estimate of the ultimate pressure capacity of the containment building bounds conservative estimates of the most likely hydrogen combustion modes.

Although hydrogen igniter systems would provide some added margin that containment integrity can be maintained during hydrogen burns, Generic Issue (GI)-121, "Hydrogen Control for PWR Dry Containments,” found that hydrogen combustion was not a significant threat to dry containments and concluded that there was no basis for new generic hydrogen control measures (i.e., igniters).

From this information, the NRC staff concludes that the quantity of hydrogen, prescribed by 10 CFR 50.44(d) and assumed in RG 1.7, which necessitates the need for hydrogen recombiners is bounded by the hydrogen generated during a severe accident. The NRC staff finds the relative importance of hydrogen combustion for large, dry containments with respect to containment failure to be quite low. This finding supports the argument that the hydrogen recombiners are not risk significant from a containment integrity perspective.

2.4 Analysis

As mentioned in the previous section, the risk associated with hydrogen combustion is not from design-basis accidents but from severe accidents. The hydrogen recombiners are overwhelmed by the metal-water reaction and are incapable of removing appreciable amounts of hydrogen in the time period prior to spurious ignition. The TMI-1 probabilistic risk assessment indicates that none of the analyzed sequences that could threaten containment due to hydrogen combustion are impacted by the hydrogen recombiner system. The recombiners are, however, capable of preventing a subsequent hydrogen burn in the long term due to radiolytic decomposition of water and corrosion.

The NRC staff has performed analyses of a plant with a large, dry containment similar to that at TMI-1. The purpose of these analyses was to ascertain the value of the hydrogen recombiners in preventing the uncontrolled burning of hydrogen in the long term under best-estimate severe accident conditions versus the design-basis case. The NRC staff used its confirmatory code COGAP to estimate the amount of hydrogen due to radiolytic decomposition of water and corrosion. COGAP was developed by the NRC staff for determining hydrogen concentrations within reactor containments following a design-basis LOCA. The following are some of the input assumptions the NRC staff changed to make the calculations more appropriate for a best-estimate severe accident analysis: (1) the amount of solid fission product decay energy absorbed by the sump water solution was increased from 1 percent to 8 percent, (2) the iodine isotope decay energy absorbed by the sump water solution was increased from 50 percent to 75 percent, (3) the hydrogen yield was reduced from 0.5 molecule/100 ev to 0.4 molecule/100 ev, and (4) best estimate corrosion rates were assumed. The amount of solid fission product and iodine isotope decay energy were based on the release fractions in NUREG-1465, “Accident Source Terms for Light-Water-Cooled Nuclear Power Plants,” February 1995, and the decay energy in NUREG/CR-4169. The corrosion rates were based on the proceedings of the Second International Conference on the Impact of Hydrogen on Water Reactor Safety, Albuquerque, New Mexico, October 1982. The analysis calculated the hydrogen concentration to be 5.4 percent at 30 days and did not exceed the lower flammability limit of 4.0 percent for 16 days.

Hydrogen concentrations on the order of 6 percent or less are clearly bounded by hydrogen generated during a severe accident and would not be a threat to containment integrity as discussed in the previous section. Such a burn would impose a temperature transient to available instrumentation and equipment. In the range of 4 to 6 percent, the temperature transient is fairly benign because the rate of flame propagation is less than the rate of rise of the flammable mixture. Therefore, the flame can propagate upward, but not horizontally or downward. In this case, complete combustion will not occur until the concentration is increased above 6 percent.

Equipment survivability in concentrations greater than 6 percent was addressed as part of GI-121, which references NUREG/CR-5662, which in turn assessed the benefits of hydrogen igniters. NUREG/CR-5662 concluded that simulated equipment can withstand a LOCA and single burn resulting from a 75-percent metal-water reaction in a large, dry containment. However, the multiple containment burns due to the operation of ignition systems could pose a serious threat to safety-related equipment located in the source compartment. The multiple burn environment was found potentially to be a threat because the source compartment temperature remains elevated from the previous burn. However, for TMI-1, this is not a concern for the above radiolysis and corrosion case because there is ample time between burns to reduce elevated containment temperatures via containment heat removal systems.

Therefore, an additional burn in the long term due to radiolysis and corrosion is not expected to have a similar impact on equipment survivability at TMI-1.

2.5 Risk Reduction Due to Instruction Simplification

In a postulated LOCA, the TMI-1 emergency operating instructions (EOIs) direct the control room operators to monitor and control the hydrogen concentration inside the containment after they have carried out the steps to maintain and control the higher priority critical safety functions. Key operator actions associated with the control of hydrogen include placing the hydrogen recombiners or hydrogen purge system in operation at very low hydrogen concentration levels. These hydrogen control activities could distract operators from more important tasks in the early phases of accident mitigation and could have a negative impact on the higher priority critical operator actions. Elimination of hydrogen recombiner and purge-repressurization system requirements from the TSs and design basis will eliminate the need for these systems in the EOIs and hence simplify the EOIs. The NRC staff still expects the licensee's severe accident management guidelines to address combustible gas control. The NRC staff concludes that this simplification would be a safety benefit and, therefore, is acceptable.

3.0 EVALUATION

Based on the above, which includes the NRC staff's evaluation of the risk from hydrogen combustion, resolution of GI-121, "Hydrogen Control for PWR Dry Containments," and the TMI-1 IPE, it has been successfully demonstrated that the plant could withstand the consequences of uncontrolled hydrogen-oxygen recombination without loss of safety function without credit for the hydrogen recombiners or the hydrogen purge system for not only the design-basis case, but also for more limiting severe accident sequences. The NRC staff further believes that the requirements for hydrogen recombiners and the backup hydrogen purge capability as part of the TMI-1 design basis are unnecessary, and their removal from the design basis is justified. Therefore, the requested license amendments for these systems are justified. Additionally, elimination of the hydrogen recombiners and the hydrogen purge system from the EOIs would be a simplification and a safety benefit.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Pennsylvania State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes requirements with respect to installation or use of facility components located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding (66 FR 57118). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: M. Snodderly
J. Pulsipher

Date: February 8, 2002

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Three Mile Island Nuclear Station, Unit No. 1

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