

NUCLEAR REGULATORY COMMISSION
Notice of Availability of Model Application Concerning Technical Specification
Improvement To Eliminate Hydrogen Recombiner Requirement, and
Relax the Hydrogen and Oxygen Monitor Requirements for Light Water Reactors
Using the Consolidated Line Item Improvement Process

AGENCY: Nuclear Regulatory Commission.

ACTION: Notice of Availability

SUMMARY: Notice is hereby given that the staff of the Nuclear Regulatory Commission (NRC) has prepared a model safety evaluation (SE), a model no significant hazards consideration (NSHC) determination, and a model application relating to the elimination of hydrogen recombinder requirements, and relaxation of the hydrogen and oxygen monitor requirements for Light Water Reactors (LWRs). The purpose of these models is to permit the NRC to efficiently process amendments that propose to remove requirements for hydrogen recombiners, and hydrogen and oxygen monitors from Technical Specifications (TS). Licensees of nuclear power reactors to which the models apply may request amendments using the model application.

DATES: The NRC staff issued a *Federal Register* Notice (67 FR 50374, August 2, 2002) soliciting comments on a model safety SE and a model NSHC determination for the elimination of requirements for hydrogen recombiners, and hydrogen and oxygen monitors from TS. The NRC staff hereby announces that the attached model SE and model NSHC determination (which differ only slightly from the versions previously published) may be referenced in plant-specific applications to eliminate requirements for hydrogen recombiners, and hydrogen and oxygen monitors from TS. The staff has posted a model application on the NRC web site to assist licensees in using the consolidated line item improvement process (CLIIP) to apply for the proposed TS change. The NRC staff can most efficiently consider applications based upon the model application if the application is submitted within a year of this *Federal Register* Notice.

FOR FURTHER INFORMATION CONTACT: William Reckley, Mail Stop: O-7D1, Division of Licensing Project Management, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone 301-415-1323.

SUPPLEMENTARY INFORMATION:

Background

Regulatory Issue Summary 2000-06, "Consolidated Line Item Improvement Process for Adopting Standard Technical Specification Changes for Power Reactors," was issued on March 20, 2000. The CLIIP is intended to improve the efficiency of NRC licensing processes. This is accomplished by processing proposed changes to the standard technical specifications (STS) in a manner that supports subsequent license amendment applications. The CLIIP includes an opportunity for the public to comment on proposed changes to the STS following a preliminary assessment by the NRC staff and finding that the change will likely be offered for adoption by licensees. The NRC staff evaluates any comments received for a proposed change to the STS and either reconsiders the change or proceeds with announcing the availability of the change for proposed adoption by licensees. Those licensees opting to apply for the subject change to TS are responsible for reviewing the staff's evaluation, referencing the applicable technical justifications, and providing any necessary plant-specific information. Each amendment application made in response to the notice of availability will be processed and noticed in accordance with applicable rules and NRC procedures.

This notice involves the elimination of requirements for hydrogen recombiners, and hydrogen and oxygen monitors in TS for LWRs. This proposed change was proposed for incorporation into the STS and is designated TSTF-447, Revision 1. TSTF-447, Revision 1 is supported by the implementation of a revision to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors." The amended standards

eliminated the need for requirements for hydrogen recombiners and for hydrogen and oxygen monitors in TS. TSTF-447, Revision 1 can be viewed on the NRC Web site (www.nrc.gov).

Applicability

This proposed change to remove requirements for hydrogen recombiners, and hydrogen and oxygen monitors from TS is applicable to LWRs (i.e., all operating plants).

To efficiently process the incoming license amendment applications, the staff requests each licensee applying for the changes addressed by TSTF-447, Revision 1 using the CLIP to address the following plant-specific verifications and regulatory commitments. The CLIP does not prevent licensees from requesting an alternative approach or proposing the changes without the requested verifications and regulatory commitments. Variations from the approach recommended in this notice may, however, require additional review by the NRC staff and may increase the time and resources needed for the review. In making the requested regulatory commitments, each licensee should state: (1) that the subject capability exists (or will be developed) and will be maintained; (2) where the capability or procedure will be described (e.g., severe accident management guidelines, emergency operating procedures, emergency plan implementing procedures); and (3) a schedule for implementation. The amendment request need not provide details about designs or procedures.

Each licensee should verify that it has, and make a regulatory commitment to maintain (or make a regulatory commitment to develop and maintain):

- a. a hydrogen monitoring system capable of diagnosing beyond design-basis accidents; and
- b. an oxygen monitoring system capable of verifying the status of the inert containment for plant designs with an inerted containment. (for applicable boiling water reactors)

Public Notices

In a notice in the *Federal Register* dated August 2, 2002 (67 FR 50374), the staff requested comment on the use of the CLIIP to process requests to delete hydrogen recombiner, and hydrogen and oxygen monitor requirements from TS.

TSTF-447, Revision 1, and documents associated with the revision of 10 CFR 50.44 may be examined, and/or copied for a fee, at the NRC's Public Document Room, located at One White Flint North, Public File Area O1 F1, 11555 Rockville Pike (first floor), Rockville, Maryland. Publicly available records are accessible electronically from the ADAMS Public Library (the Electronic Reading Room) component on the NRC Web site (www.nrc.gov).

The staff received one comment (from an individual licensee) following the notice soliciting comments about modifying the TS requirements regarding hydrogen recombiners, and hydrogen and oxygen monitors for LWRs. The comment on the model SE was offered, and is summarized and discussed below:

1. **Comment:** A licensee recommended that the SE also include conclusions as to the acceptability of eliminating containment purging as the design basis method for post-loss-of-coolant accident (LOCA) hydrogen control. Some licensees use containment purging as the design basis method for compliance with the current 10 CFR 50.44, rather than hydrogen recombiners. Although the containment purge requirements were not incorporated into the TS, as was done for hydrogen recombiners, the requirement for purging exists in docketed commitments to the NRC and in the Final Safety Analysis Report (FSAR). The process of changing the FSAR and the docketed commitments would be simplified if the NRC SE included consideration of containment purging.

Response: The NRC model SE only addresses requirements in the STS or plant-specific TS. In this case, the NRC model SE is for the elimination of the requirements of

hydrogen recombiners, and hydrogen and oxygen monitors from TS. Since containment purging requirements are not in the STS, the NRC model SE did not make conclusions about the acceptability of eliminating containment purging as the design basis method for post-LOCA hydrogen control. However, the following statement from the Statements of Considerations was added to the model SE to address the comment:

...the Commission eliminated the hydrogen release associated with a design-basis LOCA from § 50.44 and the associated requirements that necessitated the need for the hydrogen recombiners and the backup hydrogen vent and purge systems.

In addition, the staff has made some minor changes to the model SE as a result of internal reviews. A specific change involves the reference to Criterion 2 (10 CFR 50.36(c)(2)(ii)(B)) as the basis for retention of primary containment oxygen concentration in the TS. In the model SE, the staff had proposed to change the basis to Criterion 4 (10 CFR 50.36(c)(2)(ii)(D)) since combustible gas generated from severe accidents was not risk significant for Mark I and II containments, provided that the required inerted atmosphere was maintained. Criterion 4 is intended to capture those constraints that probabilistic risk assessment or operating experience show to be significant to public health and safety, consistent with the Commission's Probabilistic Risk Assessment (PRA) Policies. Upon further review by the staff, it was determined that the basis for the primary containment oxygen concentration should remain Criterion 2 since the typical Updated FSAR Chapter 6 analyses assume that the primary containment is inerted when a design basis LOCA occurs. Therefore, primary containment oxygen concentration is a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Licensees wishing to eliminate the requirements for hydrogen recombiners, and hydrogen and oxygen monitors from TS must submit an application in accordance with

applicable regulatory requirements. As described in the model application prepared by the staff, licensees may reference the following model SE, NSHC determination, and environmental assessment in their plant-specific applications to eliminate the TS requirements for hydrogen recombiners, and hydrogen and oxygen monitors.

MODEL SAFETY EVALUATION
U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Consolidated Line Item Improvement
Technical Specification Task Force (TSTF) Change TSTF-447, Revision 1
Elimination of Requirements for Hydrogen Recombiners and Change
of Requirements for Hydrogen and Oxygen Monitors

1.0 INTRODUCTION

By application dated [], [Licensee] (the licensee) requested changes to the Technical Specifications (TSs) for [Plant]. The proposed changes would delete the TS requirements associated with hydrogen recombiners, and hydrogen [and oxygen] monitors.

The Nuclear Regulatory Commission (NRC) has revised 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors." The amended standards eliminated the requirements for hydrogen recombiners and relaxed the requirements for hydrogen and oxygen monitoring. In letters dated December 17, 2002, and May 12, 2003, the Nuclear Energy Institute (NEI) Technical Specification Task Force (TSTF) proposed to remove requirements for hydrogen recombiners and hydrogen and oxygen monitors from the standard technical specifications (STS) (NUREGs 1430 - 1434) on behalf of the industry to incorporate the amended standards. This proposed change is designated TSTF-447.

The NRC staff prepared this model safety evaluation (SE) for the elimination of requirements regarding containment hydrogen recombiners and the removal of requirements from TS for containment hydrogen and oxygen monitors and solicited public comment (67 FR 50374, published August 2, 2002) in accordance with the Consolidated Line Item Improvement Process (CLIIP). The use of the CLIIP in this matter is intended to help the NRC to efficiently process amendments that propose to remove the hydrogen recombiner and hydrogen and oxygen monitor requirements from TS. Licensees of nuclear power reactors to which this model applies were informed [FR] that they could request amendments conforming to the model, and, in such requests, should confirm the applicability of the SE to their reactors and provide the requested plant-specific verifications and commitments.

2.0 BACKGROUND

Regulatory Issue Summary 2000-06, "Consolidated Line Item Improvement Process for Adopting Standard Technical Specification Changes for Power Reactors," was issued on March 20, 2000. The CLIIP is intended to improve the efficiency of NRC licensing processes. This is accomplished by processing proposed changes to the STS in a manner that supports subsequent license amendment applications. The CLIIP includes an opportunity for the public to comment on proposed changes to the STS following a preliminary assessment by the NRC staff and finding that the change will likely be offered for adoption by licensees. The NRC staff evaluates any comments received for a proposed change to the STS and either reconsiders the change or proceeds with announcing the availability of the change for proposed adoption by licensees. Those licensees opting to apply for the subject change to TS are responsible for reviewing the staff's evaluation, referencing the applicable technical justifications, and providing any necessary plant-specific information. Each amendment application made in response to the notice of availability would be processed and noticed in accordance with applicable rules and NRC procedures.

The Commission's regulatory requirements related to the content of TS are set forth in 10 CFR 50.36. This regulation requires that the TSs include items in five specific categories. These categories include 1) safety limits, limiting safety system settings and limiting control settings, 2) limiting conditions for operation (LCO), 3) surveillance requirements, 4) design features, and 5) administrative controls. However, the regulation does not specify the particular TSs to be included in a plant's license.

Additionally, 10 CFR 50.36(c)(2)(ii) sets forth four criteria to be used in determining whether an LCO is required to be included in the TS. These criteria are as follows:

1. Installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.
2. A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that assumes either the failure of or presents a challenge to the integrity of a fission product barrier.
3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.
4. A structure, system or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

Existing LCOs and related surveillances included as TS requirements which satisfy any of the criteria stated above must be retained in the TSs. Those TS requirements which do not satisfy these criteria may be relocated to other licensee-controlled documents.

As part of the rulemaking that revised 10 CFR 50.44, the Commission retained requirements for ensuring a mixed atmosphere, inerting Mark I and II containments, and providing hydrogen control systems capable of accommodating an amount of hydrogen

generated from a metal-water reaction involving 75 percent of the fuel cladding surrounding the active fuel region in Mark III and ice condenser containments. The Commission eliminated the design-basis loss-of-coolant accident (LOCA) hydrogen release from 10 CFR 50.44 and consolidated the requirements for hydrogen and oxygen monitoring to 10 CFR 50.44 while relaxing safety classifications and licensee commitments to certain design and qualification criteria. The Commission also relocated without change the hydrogen control requirements in 10 CFR 50.34(f) to 10 CFR 50.44 and the high point vent requirements from 10 CFR 50.44 to 10 CFR 50.46a.

3.0 EVALUATION

The ways in which the requirements and recommendations for combustible gas control were incorporated into the licensing bases of commercial nuclear power plants varied as a function of when plants were licensed. Plants that were operating at the time of the Three Mile Island (TMI), Unit 2 accident are likely to have been the subject of confirmatory orders that imposed the combustible gas control functions described in NUREG-0737, "Clarification of TMI Action Plan Requirements," as obligations. The issuance of plant specific amendments to adopt these changes, which would remove hydrogen recombiner and hydrogen and oxygen monitoring controls from TS, supersede the combustible gas control specific requirements imposed by post-TMI confirmatory orders.

3.1 Hydrogen Recombiners

The revised 10 CFR 50.44 no longer defines a design-basis LOCA hydrogen release, and eliminates requirements for hydrogen control systems to mitigate such a release. The installation of hydrogen recombiners and/or vent and purge systems required by 10 CFR 50.44(b)(3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release

does not contribute to the conditional probability of a large release up to approximately 24 hours after the onset of core damage. In addition, these systems were ineffective at mitigating hydrogen releases from risk-significant beyond design-basis accidents. Therefore, the Commission eliminated the hydrogen release associated with a design-basis LOCA from 10 CFR 50.44 and the associated requirements that necessitated the need for the hydrogen recombiners and the backup hydrogen vent and purge systems. As a result, the staff finds that requirements related to hydrogen recombiners no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TS and may be relocated to other licensee-controlled documents for all plants.

3.2 Hydrogen Monitoring Equipment

Section 50.44(b)(1), the STS, and plant-specific TS currently contain requirements for monitoring hydrogen. Licensees have also made commitments to design and qualification criteria for hydrogen monitors in Item II.F.1, Attachment 6 of NUREG-0737 and Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident." The hydrogen monitors are required to assess the degree of core damage during a beyond design-basis accident and confirm that random or deliberate ignition has taken place. If an explosive mixture that could threaten containment integrity exists during a beyond design-basis accident, then other severe accident management strategies, such as purging and/or venting, would need to be considered. The hydrogen monitors are needed to implement these severe accident management strategies.

With the elimination of the design-basis LOCA hydrogen release, hydrogen monitors are no longer required to mitigate design-basis accidents and, therefore, the hydrogen monitors do not meet the definition of a safety-related component as defined in 10 CFR 50.2. RG 1.97 recommends classifying the hydrogen monitors as Category 1. RG 1.97 Category 1, is

intended for key variables that most directly indicate the accomplishment of a safety function for design-basis accident events and, therefore, are items usually addressed within TS. As part of the rulemaking to revise 10 CFR 50.44, the Commission found that the hydrogen monitors no longer meet the definition of Category 1 in RG 1.97. The Commission concluded that Category 3, as defined in RG 1.97, is an appropriate categorization for the hydrogen monitors because the monitors are required to diagnose the course of beyond design-basis accidents. Hydrogen monitoring is not the primary means of indicating a significant abnormal degradation of the reactor coolant pressure boundary. Section 4 of Attachment 2 to SECY-00-0198, "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)," found that the hydrogen monitors were not risk-significant. Therefore, the staff finds that hydrogen monitoring equipment requirements no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TS and, therefore, may be relocated to other licensee-controlled documents.

[Note: The elimination of Post-Accident Sampling System requirements from some plant-specific TS (and associated CLIP notices) indicated that during the early phases of an accident, safety-grade hydrogen monitors provide an adequate capability for monitoring containment hydrogen concentration. The staff has subsequently concluded that Category 3 hydrogen monitors also provide an adequate capability for monitoring containment hydrogen concentration during the early phases of an accident.]

However, because the monitors are required to diagnose the course of beyond design-basis accidents, each licensee should verify that it has, and make a regulatory commitment to maintain, a hydrogen monitoring system capable of diagnosing beyond design-basis accidents.

3.3 Oxygen Monitoring Equipment (for applicable plants)

STS and plant-specific TS currently require oxygen monitoring to verify the status of the inert containment. Combustible gases produced by beyond design-basis accidents involving both fuel-cladding oxidation and core-concrete interaction would be risk-significant for plants with Mark I and II containments if not for the inerted containment atmospheres. If an inerted containment was to become de-inerted during a beyond design-basis accident, then other severe accident management strategies, such as purging and venting, would need to be considered. The oxygen monitors are needed to implement these severe accident management strategies. Oxygen concentration also appears extensively in the emergency procedure guidelines/severe accident guidelines of plants with inerted containment atmospheres.

With the elimination of the design-basis LOCA hydrogen release, the oxygen monitors are no longer required to mitigate design-basis accidents and, therefore, the oxygen monitors do not meet the definition of a safety-related component as defined in 10 CFR 50.2. RG 1.97 recommends that, for inerted containment plants, the oxygen monitors be Category 1 which is intended for key variables that most directly indicate the accomplishment of a safety function for design-basis accident events. As part of the rulemaking to revise 10 CFR 50.44, the Commission found that Category 2, as defined in RG 1.97, is an appropriate categorization for the oxygen monitors, because the monitors are required to verify the status of the inert containment. Oxygen monitoring is not the primary means of indicating a significant abnormal degradation of the reactor coolant pressure boundary. Oxygen monitors have not been shown by a probabilistic risk assessment to be risk-significant. Therefore, the staff finds that oxygen monitoring equipment requirements no longer meet any of the four criteria in 10 CFR 50.36(c)(2)(ii) for retention in TS and, therefore, may be relocated to other licensee-controlled documents.

However, for plant designs with an inerted containment, each licensee should verify that it has, and make a regulatory commitment to maintain, an oxygen monitoring system capable of verifying the status of the inert containment. In addition, separate requirements for primary containment oxygen concentration will be retained in TS for plant designs with an inerted containment. The basis for retention of this requirement in TS is that it meets Criterion 2 of 10 CFR 50.36(c)(2)(ii) in that it is a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier. This is based on the fact that calculations typically included in Chapter 6 of Updated Final Safety Analysis Reports assume that the primary containment is inerted, that is, oxygen concentration < 4.0 volume percent, when a design basis LOCA occurs.

[The deletion of the requirements for the hydrogen recombiner and hydrogen [and oxygen] monitors resulted in numbering and formatting changes to other TS, which were otherwise unaffected by this proposed amendment. The NRC staff has confirmed that the related changes are appropriate and do not affect the technical requirements.]

4.0 VERIFICATIONS AND COMMITMENTS

As requested by the staff in the notice of availability for this TS improvement, the licensee has addressed the following plant-specific verifications and commitments.

- 4.1 Each licensee should verify that it has, and make a regulatory commitment to maintain, a hydrogen monitoring system capable of diagnosing beyond design-basis accidents.

The licensee has verified that it has a hydrogen monitoring system capable of diagnosing beyond design-basis accidents. The licensee has committed to maintain the hydrogen monitors within its [specified document or program]. The licensee has [implemented this commitment or will implement this commitment by (specific date)].

- 4.2 For plant designs with an inerted containment, each licensee should verify that it has, and make a regulatory commitment to maintain, an oxygen monitoring system capable of verifying the status of the inert containment. (for applicable plants)

The licensee has verified that it has an oxygen monitoring system capable of verifying the status of the inert containment. The licensee has committed to maintain the oxygen monitors within its [specified document or program]. The licensee has [implemented this commitment or will implement this commitment by (specific date)].

The NRC staff finds that reasonable controls for the implementation and for subsequent evaluation of proposed changes pertaining to the above regulatory commitments are provided by the licensee's administrative processes, including its commitment management program. Should the licensee choose to incorporate a regulatory commitment into the emergency plan, final safety analysis report, or other document with established regulatory controls, the associated regulations would define the appropriate change-control and reporting requirements. The staff has determined that the commitments do not warrant the creation of regulatory requirements which would require prior NRC approval of subsequent changes. The NRC staff has agreed that NEI 99-04, Revision 0, "Guidelines for Managing NRC Commitment Changes," provides reasonable guidance for the control of regulatory commitments made to the NRC staff. (See Regulatory Issue Summary 2000-17, "Managing Regulatory Commitments Made by Power Reactor Licensees to the NRC Staff," dated September 21, 2000.) The commitments should be controlled in accordance with the industry guidance or comparable criteria employed by a specific licensee. The staff may choose to verify the implementation and maintenance of these commitments in a future inspection or audit.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the [State] State official was notified of the proposed issuance of the amendment. The State official had [(1) no comments or (2) the following comments - with subsequent disposition by the staff].

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component 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 (FR [citation and date]). 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.

7.0 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

MODEL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Description of Amendment Request: The proposed amendment deletes requirements from the Technical Specifications to maintain hydrogen recombiners and hydrogen [and oxygen] monitors. Licensees were generally required to implement upgrades as described in NUREG-0737, "Clarification of TMI [Three Mile Island] Action Plan Requirements," and Regulatory Guide (RG) 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident." Implementation of these upgrades was an outcome of the lessons learned from the accident that occurred at TMI, Unit 2. Requirements related to combustible gas control were imposed by Order for many facilities and were added to or included in the technical specifications (TS) for nuclear power reactors currently licensed to operate. The revised 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors," eliminated the requirements for hydrogen recombiners and relaxed safety classifications and licensee commitments to certain design and qualification criteria for hydrogen and oxygen monitors.

Basis for proposed no significant hazards consideration determination: As required by 10 CFR 50.91(a), an analysis of the issue of no significant hazards consideration is presented below:

Criterion 1 - The Proposed Change Does Not Involve a Significant Increase in the Probability or Consequences of an Accident Previously Evaluated.

The revised 10 CFR 50.44 no longer defines a design-basis loss-of-coolant accident (LOCA) hydrogen release, and eliminates requirements for hydrogen control systems to mitigate such a release. The installation of hydrogen recombiners and/or vent and purge systems required by 10 CFR 50.44(b)(3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release does not contribute to the conditional probability of a large release up to

approximately 24 hours after the onset of core damage. In addition, these systems were ineffective at mitigating hydrogen releases from risk-significant accident sequences that could threaten containment integrity.

With the elimination of the design-basis LOCA hydrogen release, hydrogen [and oxygen] monitors are no longer required to mitigate design-basis accidents and, therefore, the hydrogen monitors do not meet the definition of a safety-related component as defined in 10 CFR 50.2. RG 1.97 Category 1, is intended for key variables that most directly indicate the accomplishment of a safety function for design-basis accident events. The hydrogen [and oxygen] monitors no longer meet the definition of Category 1 in RG 1.97. As part of the rulemaking to revise 10 CFR 50.44 the Commission found that Category 3, as defined in RG 1.97, is an appropriate categorization for the hydrogen monitors because the monitors are required to diagnose the course of beyond design-basis accidents. [Also, as part of the rulemaking to revise 10 CFR 50.44, the Commission found that Category 2, as defined in RG 1.97, is an appropriate categorization for the oxygen monitors, because the monitors are required to verify the status of the inert containment.]

The regulatory requirements for the hydrogen [and oxygen] monitors can be relaxed without degrading the plant emergency response. The emergency response, in this sense, refers to the methodologies used in ascertaining the condition of the reactor core, mitigating the consequences of an accident, assessing and projecting offsite releases of radioactivity, and establishing protective action recommendations to be communicated to offsite authorities. Classification of the hydrogen monitors as Category 3, [classification of the oxygen monitors as Category 2] and removal of the hydrogen [and oxygen] monitors from TS will not prevent an accident management strategy through the use of the SAMGs, the emergency plan (EP), the emergency operating procedures (EOP), and site survey monitoring that support modification of emergency plan protective action recommendations (PARs).

Therefore, the elimination of the hydrogen recombiner requirements and relaxation of the hydrogen [and oxygen] monitor requirements, including removal of these requirements from TS, does not involve a significant increase in the probability or the consequences of any accident previously evaluated.

Criterion 2 - The Proposed Change Does Not Create the Possibility of a New or Different Kind of Accident from any Previously Evaluated.

The elimination of the hydrogen recombiner requirements and relaxation of the hydrogen [and oxygen] monitor requirements, including removal of these requirements from TS, will not result in any failure mode not previously analyzed. The hydrogen recombiner and hydrogen [and oxygen] monitor equipment was intended to mitigate a design-basis hydrogen release. The hydrogen recombiner and hydrogen [and oxygen] monitor equipment are not considered accident precursors, nor does their existence or elimination have any adverse impact on the pre-accident state of the reactor core or post accident confinement of radionuclides within the containment building.

Therefore, this change does not create the possibility of a new or different kind of accident from any previously evaluated.

Criterion 3 - The Proposed Change Does Not Involve a Significant Reduction in the Margin of Safety.

The elimination of the hydrogen recombiner requirements and relaxation of the hydrogen [and oxygen] monitor requirements, including removal of these requirements from TS, in light of existing plant equipment, instrumentation, procedures, and programs that provide effective mitigation of and recovery from reactor accidents, results in a neutral impact to the margin of safety.

The installation of hydrogen recombiners and/or vent and purge systems required by

10 CFR 50.44(b)(3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release does not contribute to the conditional probability of a large release up to approximately 24 hours after the onset of core damage.

Category 3 hydrogen monitors are adequate to provide rapid assessment of current reactor core conditions and the direction of degradation while effectively responding to the event in order to mitigate the consequences of the accident. The intent of the requirements established as a result of the TMI, Unit 2 accident can be adequately met without reliance on safety-related hydrogen monitors.

[Category 2 oxygen monitors are adequate to verify the status of an inerted containment.]

Therefore, this change does not involve a significant reduction in the margin of safety. [The intent of the requirements established as a result of the TMI, Unit 2 accident can be adequately met without reliance on safety-related oxygen monitors.] Removal of hydrogen [and oxygen] monitoring from TS will not result in a significant reduction in their functionality, reliability, and availability.

Based upon the reasoning presented above and the previous discussion of the amendment request, the requested change does not involve a significant hazards consideration.

Dated at Rockville, Maryland, this 12th day of September 2003.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Herbert N. Berkow, Director
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

10 CFR 50.44(b)(3) was intended to address the limited quantity and rate of hydrogen generation that was postulated from a design-basis LOCA. The Commission has found that this hydrogen release is not risk-significant because the design-basis LOCA hydrogen release does not contribute to the conditional probability of a large release up to approximately 24 hours after the onset of core damage.

Category 3 hydrogen monitors are adequate to provide rapid assessment of current reactor core conditions and the direction of degradation while effectively responding to the event in order to mitigate the consequences of the accident. The intent of the requirements established as a result of the TMI, Unit 2 accident can be adequately met without reliance on safety-related hydrogen monitors.

[Category 2 oxygen monitors are adequate to verify the status of an inerted containment.]

Therefore, this change does not involve a significant reduction in the margin of safety. [The intent of the requirements established as a result of the TMI, Unit 2 accident can be adequately met without reliance on safety-related oxygen monitors.] Removal of hydrogen [and oxygen] monitoring from TS will not result in a significant reduction in their functionality, reliability, and availability.

Based upon the reasoning presented above and the previous discussion of the amendment request, the requested change does not involve a significant hazards consideration.

Dated at Rockville, Maryland, this 12th day of September 2003.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Herbert N. Berkow, Director
Project Directorate IV
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Office of Nuclear Reactor Regulation

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FOR INCLUSION ON TECHNICAL SPECIFICATION WEB PAGE

THE FOLLOWING EXAMPLE OF AN APPLICATION WAS PREPARED BY THE NRC STAFF TO FACILITATE THE USE OF THE CONSOLIDATED LINE ITEM IMPROVEMENT PROCESS (CLIIP). THE MODEL PROVIDES THE EXPECTED LEVEL OF DETAIL AND CONTENT FOR AN APPLICATION TO ELIMINATE HYDROGEN RECOMBINERS AND HYDROGEN/OXYGEN MONITORS USING CLIIP. LICENSEES REMAIN RESPONSIBLE FOR ENSURING THAT THEIR ACTUAL APPLICATION FULFILLS THEIR ADMINISTRATIVE REQUIREMENTS AS WELL AS NRC REGULATIONS.

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

SUBJECT: PLANT NAME
DOCKET NO. 50-
APPLICATION FOR TECHNICAL SPECIFICATION IMPROVEMENT TO
ELIMINATE REQUIREMENTS FOR HYDROGEN RECOMBINERS AND
HYDROGEN[/OXYGEN] MONITORS USING THE CONSOLIDATED LINE ITEM
IMPROVEMENT PROCESS

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, [license holder] hereby requests an amendment to the Technical Specifications (TS) for [PLANT NAME, UNIT NOS.].

The proposed amendment will delete the TS requirements related to hydrogen recombiners, and hydrogen [/oxygen] monitors. The proposed TS changes support implementation of the revisions to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors," that became effective on [DATE]. The changes are consistent with Revision 1 of NRC-approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-447, "Elimination of Hydrogen Recombiners and Change to Hydrogen and Oxygen Monitors." The availability of this TS improvement was announced in the *Federal Register* on [DATE OF NOTICE OF AVAILABILITY] as part of the consolidated line item improvement process (CLIIP).

Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific verifications and commitments. Attachment 2 provides the existing TS pages marked-up to show the proposed change. Attachment 3 provides revised, clean TS pages. Implementation of TSTF-447 also involves various changes to the TS Bases. The TS Bases changes will be submitted with a future update in accordance with TS 5.5.11, "Technical Specifications (TS) Bases Control Program."

[LICENSEE] requests approval of the proposed License Amendment by [DATE], with the amendment being implemented [BY DATE OR WITHIN X DAYS].

In accordance with 10 CFR 50.91, a copy of this application, with attachments, is being provided to the designated [STATE] State Official.

I declare under penalty of perjury under the laws of the United States of America that I am authorized by [LICENSEE] to make this request and that the foregoing is true and correct.

If you should have any questions regarding this submittal, please contact [Name/contact information].

Sincerely,

Name, Title

Attachments: 1. Description and Assessment
2. Proposed Technical Specification Changes
3. Revised Technical Specification Pages

cc: NRR Project Manager
Regional Office
Resident Inspector
State Contact

ATTACHMENT 1

Description and Assessment

1.0 INTRODUCTION

The proposed License amendment deletes Technical Specification (TS) [3.6.x, "Hydrogen Recombiners,"] and references to the hydrogen [and oxygen] monitors in TS [3.3.x, "Post Accident Monitoring (PAM) Instrumentation."] The proposed TS changes support implementation of the revisions to 10 CFR 50.44, "Standards for Combustible Gas Control System in Light-Water-Cooled Power Reactors," that became effective on [DATE]. [The deletion of the requirements for the hydrogen recombiner and references to hydrogen/oxygen monitors resulted in numbering and formatting changes to other TS, which were otherwise unaffected by this proposed amendment.]

The changes are consistent with Revision 1 of NRC-approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification Change Traveler, TSTF-447, "Elimination of Hydrogen Recombiners and Change to Hydrogen and Oxygen Monitors." The availability of this TS improvement was announced in the *Federal Register* on [DATE OF NOTICE OF AVAILABILITY] as part of the consolidated line item improvement process (CLIIP).

2.0 DESCRIPTION OF PROPOSED AMENDMENT

Consistent with the NRC-approved Revision 1 of TSTF-447, the proposed TS changes include:

TS 3.3.x, Condition D	Inoperable Hydrogen Monitors	Deleted
Table 3.3.x-1	[Item 10, Containment Hydrogen Concentration] [Item 10, Drywell H ₂ & O ₂ Analyzer] [Item 11, Containment H ₂ & O ₂ Analyzer]	Deleted
TS 3.6.x	Hydrogen Recombiners	Deleted

[Other TS changes included in this application are limited to renumbering and formatting changes that resulted directly from the deletion of the above requirements related to hydrogen recombiners and hydrogen [and oxygen] monitors.]

As described in NRC-approved Revision 1 of TSTF-447, the changes to TS requirements [and associated renumbering of other TSs] results in changes to various TS Bases sections. The TS Bases changes will be submitted with a future update in accordance with TS 5.5.11, "Technical Specifications (TS) Bases Control Program."

3.0 BACKGROUND

The background for this application is adequately addressed by the NRC Notice of Availability published on [date] (xx FR xxxxx), TSTF-447, the documentation associated with the 10 CFR 50.44 rulemaking, and other related documents.

4.0 REGULATORY REQUIREMENTS AND GUIDANCE

The applicable regulatory requirements and guidance associated with this application are adequately addressed by the NRC Notice of Availability published on [date] (xx FR xxxxx), TSTF-447, the documentation associated with the 10 CFR 50.44 rulemaking, and other related documents.

5.0 TECHNICAL ANALYSIS

[LICENSEE] has reviewed the safety evaluation (SE) published on [date] (68 FR xxxxx) as part of the CLIIP Notice of Availability. This verification included a review of the NRC staff's SE, as well as the supporting information provided to support TSTF-447. [LICENSEE] has concluded that the justifications presented in the TSTF proposal and the SE prepared by the NRC staff are applicable to [PLANT, UNIT NOS.] and justify this amendment for the incorporation of the changes to the [PLANT] TS.

6.0 REGULATORY ANALYSIS

A description of this proposed change and its relationship to applicable regulatory requirements and guidance was provided in the NRC Notice of Availability published on [date] (xx FR xxxxxx), TSTF-447, the documentation associated with the 10 CFR 50.44 rulemaking, and other related documents.

6.1 Verification and Commitments

As discussed in the model SE published in the *Federal Register* on [date] (xx FR xxxxx) for this TS improvement, [LICENSEE] is making the following verifications and regulatory commitments:

1. [LICENSEE] has verified that a hydrogen monitoring system capable of diagnosing beyond design-basis accidents is installed at [PLANT] and is making a regulatory commitment to maintain that capability. The hydrogen monitors will be included in [specified document or program]. This regulatory commitment [has been implemented or will be implemented by (specific date)].
2. [PLANT] has [does not have] an inerted containment.

For has inerted
containment:

[LICENSEE] has verified that an oxygen monitoring system capable of verifying the status of the inerted containment is installed at [PLANT] and is making a a regulatory commitment to maintain that capability. The oxygen monitors will be included in [specified document or program].

This regulatory commitment [has been implemented or will be implemented by (specific date)].

7.0 NO SIGNIFICANT HAZARDS CONSIDERATION

[LICENSEE] has reviewed the proposed no significant hazards consideration determination published on [date] (68 FR xxxxx) as part of the CLIIP. [LICENSEE] has concluded that the proposed determination presented in the notice is applicable to [PLANT] and the determination is hereby incorporated by reference to satisfy the requirements of 10 CFR 50.91(a).

8.0 ENVIRONMENTAL EVALUATION

[LICENSEE] has reviewed the environmental evaluation included in the model SE published on [date] (68 FR xxxxxx) as part of the CLIIP. [LICENSEE] has concluded that the staff's findings presented in that evaluation are applicable to [PLANT] and the evaluation is hereby incorporated by reference for this application.

9.0 PRECEDENT

This application is being made in accordance with the CLIIP. [LICENSEE] is not proposing variations or deviations from the TS changes described in TSTF-447 or the NRC staff's model SE published on [date] (68 FR xxxxxx).

10.0 REFERENCES

Federal Register Notice: Notice of Availability of Model Application Concerning Technical Specification Improvement To Eliminate Hydrogen Recombiner Requirement, and Relax the Hydrogen and Oxygen Monitor Requirements for Light Water Reactors Using the Consolidated Line Item Improvement Process, published [date], (68 FR xxxxxx).

ATTACHMENT 2

PROPOSED TECHNICAL SPECIFICATION CHANGES (MARK-UP)

ATTACHMENT 3

PROPOSED TECHNICAL SPECIFICATION PAGES
