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ACCESSION NBR: 9909150205      DOC. DATE: 99/09/10      NOTARIZED: YES      DOCKET #  
FACIL: 50-315 Donald C. Cook Nuclear Power Plant, Unit 1, Indiana M 05000315  
50-316 Donald C. Cook Nuclear Power Plant, Unit 2, Indiana M 05000316  
AUTH. NAME      AUTHOR AFFILIATION  
POWERS, R.P.      Indiana Michigan Power Co.  
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SUBJECT: Application for amends to licenses DPR-58 & DPR-74, revising  
TS Surveillance Requirement 4.4.7, TS Tables 4.4-3, 3.4-1 & TS  
Surveillance Requirement 4.11:2.2 re RCS & gas storage tank  
sampling.

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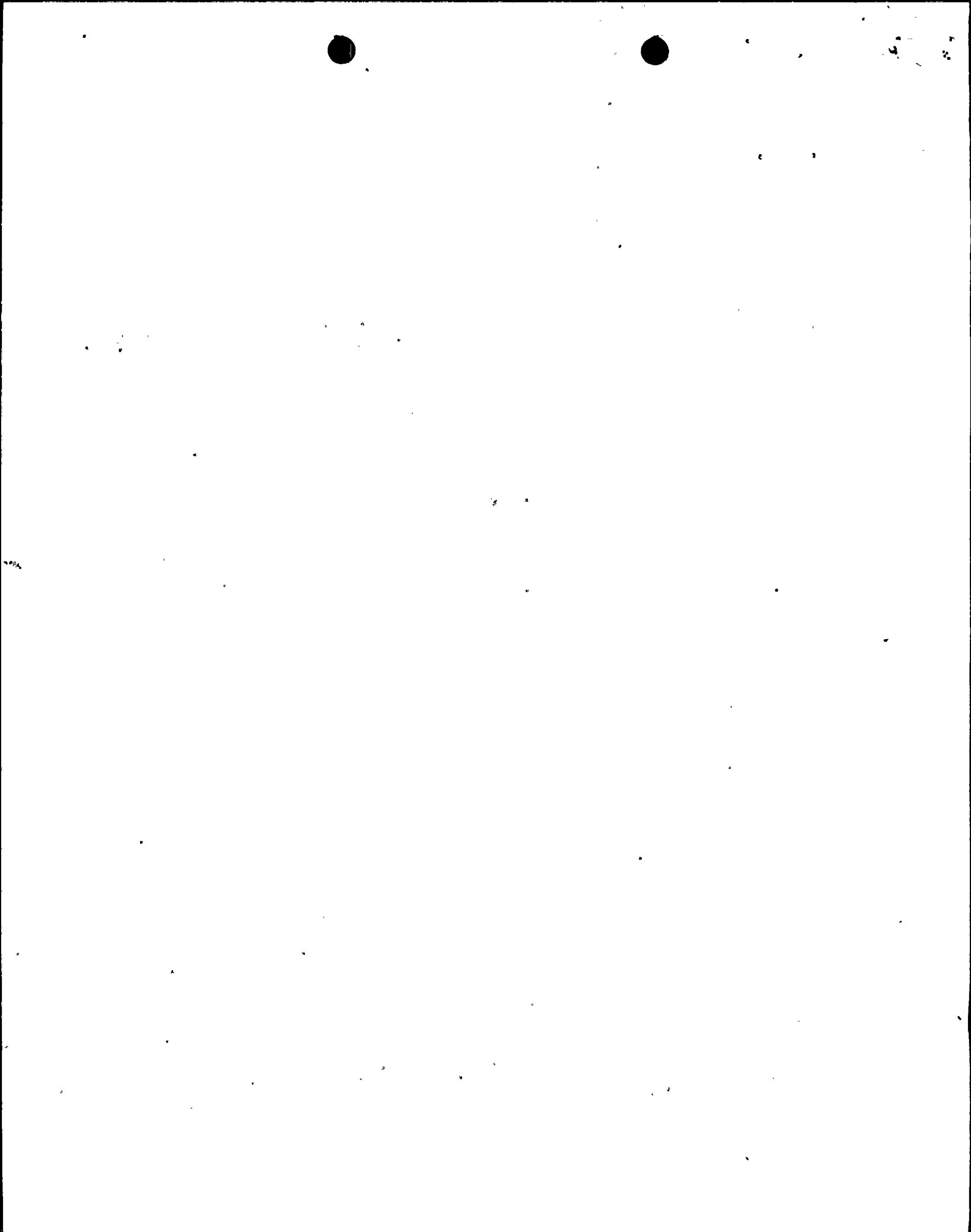
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September 10, 1999

C0999-02  
10 CFR 50.90

Docket Nos.: 50-315  
50-316

U.S. Nuclear Regulatory Commission  
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Donald C. Cook Nuclear Plant Units 1 and 2  
TECHNICAL SPECIFICATION CHANGE REQUEST  
REACTOR COOLANT SYSTEM AND GAS STORAGE TANK SAMPLING

Pursuant to 10 CFR 50.90, Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposes to amend Appendix A, Technical Specifications (T/S), of Facility Operating Licenses DPR-58 and DPR-74. I&M proposes the following T/S revisions.

- T/S Surveillance Requirement 4.4.7, "Reactor Coolant System Chemistry," - delete the requirement to perform this surveillance when the reactor is defueled with no forced circulation.
- T/S Table 4.4-3, "Reactor Coolant System Chemistry Limits Surveillance Requirements," Unit 1 only - change the reactor coolant system (RCS) chemistry sampling frequency from three times per seven days with a maximum interval of 72 hours to a frequency of at least once per 72 hours.
- T/S Tables 3.4-1, "Reactor Coolant System Chemistry Limits," and 4.4-3, "Reactor Coolant System Chemistry Limits Surveillance Requirements," - editorial changes to the footnote on the applicability of the dissolved oxygen chemistry limits.
- T/S Surveillance Requirement 4.11.2.2, "Radioactive Effluents, Gas Storage Tanks," - eliminate the prescriptive method for determining the quantity of radioactive material contained in each gas storage tank, while preserving the general requirement to verify compliance with this limit.

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Attachment 1 provides a detailed description and safety analysis to support the proposed changes. Attachments 2A and 2B provide marked-up T/S pages for Unit 1 and Unit 2, respectively. Attachments 3A and 3B provide the proposed T/S pages with the changes incorporated for Unit 1 and Unit 2, respectively. Attachment 4 describes the evaluation performed in accordance with 10 CFR 50.92(c), which concludes that no significant hazard is involved. Attachment 5 provides the environmental assessment.

I&M requests approval of this request by November 22, 1999, to support maintenance activities associated with replacement of the CNP Unit 1 steam generators. After the Unit 1 RCS is drained down in preparation for removal of the installed steam generators, it will not be possible to obtain representative RCS samples for Surveillance Requirements 4.4.7 or 4.11.2.2.

No previous submittals affect T/S pages that are submitted in this request. If any future submittals affect these T/S pages, I&M will coordinate changes to the pages with the NRC Project Manager to ensure proper T/S page control when the associated license amendment requests are approved. No commitments were identified in this submittal. This license amendment request satisfies a commitment made by Licensee Event Report No. 1999-004-01.

Copies of this letter and its attachments are being transmitted to the Michigan Public Service Commission and Michigan Department of Public Health, in accordance with the requirements of 10 CFR 50.91.

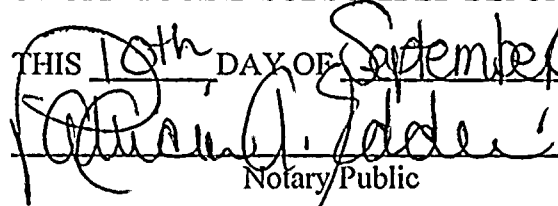
Should you have any questions, please contact Mr. Robert C. Godley, Director of Regulatory Affairs, at (616) 466-2698.

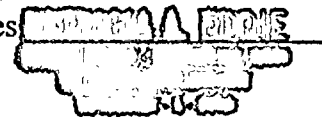
Sincerely,



R. P. Powers  
Vice President

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 10th DAY OF September 1999  
  
Notary Public

My Commission Expires 

vdms

Attachments



c: J. E. Dyer, w/attachments  
MDEQ - DW & RPD, w/attachments  
NRC Resident Inspector, w/attachments  
R. Whale, w/attachments

## ATTACHMENT 1 TO C0999-02

### DESCRIPTION AND SAFETY ANALYSIS FOR THE PROPOSED CHANGES

#### A. Summary of the Proposed Changes

Indiana Michigan Power Company (I&M), the Licensee for Donald C. Cook Nuclear Plant (CNP) Units 1 and 2, proposes to amend Appendix A, Technical Specifications (T/S), of Facility Operating Licenses DPR-58 and DPR-74. I&M proposes the following T/S revisions.

- T/S Surveillance Requirement 4.4.7, "Reactor Coolant System Chemistry," - delete the requirement to perform this surveillance when the reactor is defueled with no forced circulation.
- T/S Table 4.4-3, "Reactor Coolant System Chemistry Limits Surveillance Requirements," Unit 1 only - change the reactor coolant system (RCS) chemistry sampling frequency from three times per seven days with a maximum interval of 72 hours to a frequency of at least once per 72 hours.
- T/S Tables 3.4-1, "Reactor Coolant System Chemistry Limits," and 4.4-3, "Reactor Coolant System Chemistry Limits Surveillance Requirements," - editorial changes to the footnote on the applicability of the dissolved oxygen chemistry limits.
- T/S Surveillance Requirement 4.11.2.2, "Radioactive Effluents, Gas Storage Tanks," - eliminate the prescriptive method for determining the quantity of radioactive material contained in each gas storage tank, while preserving the general requirement to verify compliance with this limit.

The proposed changes are described in detail in Section E of this attachment. T/S pages that are marked to show the proposed changes are provided in Attachments 2A and 2B for Unit 1 and Unit 2, respectively. Note that these changes may reflect formatting that differs slightly from the current pages. These format changes are intended to improve appearance and are not intended to introduce other changes. The proposed T/S pages, with the changes incorporated, are provided in Attachments 3A and 3B for Unit 1 and Unit 2, respectively.

#### B. Description of the Current Requirements

T/S 3/4.4.7 requires periodic sampling and analysis of the RCS to verify that chemistry parameters are below established limits. This specification places limits on dissolved oxygen, chloride, and fluoride content in the RCS. Table 3.4-1 defines the chemistry limits in terms of steady-state and transient limits. Table 4.4-3 specifies a maximum time interval between samples of 72 hours for all chemistry parameters. Additionally, Unit 1 Table 4.4-3 requires a minimum RCS analysis



frequency of 3 times per 7 days. Tables 3.4-1 and 4.4-3 are annotated with a footnote indicating that the surveillance for dissolved oxygen does not apply when the average coolant temperature ( $T_{avg}$ ) is less than or equal to 250°F. When the unit is not in Modes 1 through 4, the T/S requires analysis of any out-of-specification condition to be performed prior to increasing pressurizer pressure above 500 pounds per square inch gauge (psig) or prior to proceeding to Mode 4. This T/S is applicable at all times.

T/S Surveillance Requirement 4.11.2.2 requires periodic verification that the quantity of radioactivity in each gas storage tank is less than the limit. The surveillance requirement specifies that storage tank radioactivity be determined by analysis of RCS noble gases. This T/S is applicable at all times.

#### C. Bases for the Current Requirements

The purpose of sampling primary coolant chemistry is to provide assurance that the concentration of corrosive contaminants in the RCS is within acceptable levels. Minimizing corrosion of the RCS reduces the potential for RCS leakage or failure due to stress corrosion and ultimately provides reasonable assurance that the structural integrity of the RCS is maintained over the life of the plant. The 72-hour surveillance interval provides adequate assurance that concentrations in excess of the T/S limits are detected in sufficient time to take corrective action.

The purpose of restricting the quantity of radioactive material in each gas storage tank is to provide assurance that in the event of an uncontrolled release of a tank's contents, the resulting total body exposure to an individual at the nearest site boundary will not exceed 0.5 rem. To verify that the quantity of radioactive material introduced into the gas storage tanks is within the T/S limits, the Surveillance Requirement specifies that the radioactive gases must be sampled at their source, the RCS. This approach provides a bounding determination of the radioactivity being added to the tanks. Additionally, it is more efficient to verify the radioactivity level by obtaining one sample from the RCS than obtaining samples directly from each of the eight individual gas decay tanks.

#### D. Need for Revision of the Requirement

CNP Units 1 and 2 are currently in an extended outage. The units are defueled with the RCS depressurized and forced circulation is not in use. Planned plant modifications and maintenance activities, including replacement of the Unit 1 steam generators, will necessitate changes to the RCS configuration and coolant levels. To implement these activities and avoid unnecessary schedule impacts, I&M has determined that Surveillance Requirements 4.4.7 and 4.11.2.2 must be amended.



In Modes 1 through 6, with fuel in the reactor vessel and coolant circulating through the RCS, samples are obtained via the normal sampling system for each unit. During these modes of operation, a primary coolant sample is obtained from one of several sample points located on two RCS hot legs and the two residual heat removal system trains. A liquid sample is analyzed to verify that chemical contaminant levels (i.e., fluoride, chloride, and dissolved oxygen) are within T/S limits. An RCS sample is also analyzed on a gamma spectrometer for noble gas activity levels. Using a conservative analytical approach, the higher of the two units' noble gas activity levels is then applied to the gas decay tank volume and maximum fill pressure to determine that the tank is below a maximum radioactivity level. The calculated radioactivity level is used to verify that the T/S limit is not exceeded.

However, when the reactor vessel is defueled with the RCS depressurized and no forced circulation, it is not possible to obtain representative RCS samples using the normal sampling system. Alternate sample locations are available; however, sampling from these locations will not produce representative samples when the RCS is drained below mid-loop.

Additionally, a T/S enhancement to revise the Unit 1 surveillance frequency and editorial changes to the RCS chemistry tables are proposed to provide consistency between the affected Unit 1 and Unit 2 T/S.

#### E. Description of the Proposed Changes

I&M proposes to revise T/S 3/4.4.7 so that the surveillance requirement does not need to be performed when the reactor is defueled with no forced circulation.

The proposed revision to T/S 3/4.4.7 also includes changes to Tables 3.4-1 and 4.4-3. A change is proposed to Unit 1 T/S Table 4.4-3 to revise the RCS chemistry sampling frequency from three times per seven days with a maximum interval of 72 hours to a frequency of at least once per 72 hours. An editorial change to Unit 1 Tables 3.4-1 and 4.4-3 relocates the asterisk for the footnote to a position adjacent to the parameter "dissolved oxygen," from its current position next to the allowable chemistry limit in Table 3.4-1 and the analysis frequency in Table 4.4-3. An editorial change corrects the footnote for Table 3.4-1 for Unit 1 and Unit 2 by making the word "limit" plural, as it applies to both the steady state and transient limits.

I&M proposes to revise Surveillance Requirement 4.11.2.2 by deleting the phrase "by analysis of the Reactor Coolant System noble gases." This change would eliminate the prescriptive method used to demonstrate compliance with this T/S, while preserving the general requirement to verify compliance with the T/S limit.

#### F. Bases for the Proposed Changes

Stress corrosion cracking is a process that occurs when austenitic stainless steels are exposed to halides in the presence of oxygen in high-temperature water. The Electric Power Research Institute document, TR-105714-V1R4, "PWR Primary Water Chemistry Guidelines," dated March 1999, indicates that coolant temperature contributes more directly to the rate at which stress corrosion cracking occurs than does coolant chemistry. The proposed change to suspend RCS chemistry sampling when fuel is off-loaded and forced coolant circulation is not in use would only be in effect during low-temperature, low-pressure conditions. As required by the current T/S, RCS chemistry is sampled and analyzed following core off-load until forced coolant circulation is secured. Any out-of-specification condition would be analyzed in accordance with the applicable action statement for RCS chemistry. Administrative controls on RCS make-up sources, including the primary water storage tank and refueling water storage tank, ensure that the concentration of chemical contaminants will not exceed the T/S limits while RCS chemistry sampling is suspended. Additionally, administrative controls will be in place to control chemical use during maintenance activities on the RCS, such as the Unit 1 steam generator replacement, and systems that come in contact with primary coolant, to ensure that there is no chemical containment intrusion into those systems. After the amendment request is approved, RCS chemistry sampling will be reinstated within 72 hours of returning forced circulation to operation and prior to entering Mode 6. The 72-hour delay is consistent with the current sampling interval and allows sufficient time to ensure RCS circulation is established and sampling activities are coordinated between the appropriate plant organizations. Since RCS chemistry sampling would only be suspended during low-temperature conditions, it is unlikely that an out-of-specification condition would accelerate the corrosion rate of components in the RCS during the period in which the sampling will be suspended.

A one-time T/S change to suspend RCS chemistry sampling during steam generator repairs was previously approved for CNP Unit 2 (Reference 1). The basis for approval of the change was the determination that the structural integrity of the RCS would not be diminished throughout the duration of the sampling suspension. Additionally, following re-establishment of sampling, any out-of-specification sampling results would be appropriately evaluated. This justification also applies to the change proposed by this license amendment request.

The proposed change to revise the Unit 1 requirement to determine the chloride and fluoride concentrations at least three times per seven days does not affect the maximum interval between samples. Retaining the bounding 72-hour surveillance requirement, while deleting the redundant requirement to sample three times per seven days, provides adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective actions. This change is consistent with the approved Unit 2 T/S and with guidance provided in NUREG-0452, "Standard Technical Specifications for Westinghouse Pressurized Water Reactors."

The proposed changes to the footnotes for Tables 3.4-1 and 4.4-3 provide consistency between the Unit 1 and Unit 2 T/S and NUREG-0452. These changes do not affect the T/S requirements or the method of complying with these requirements. Revising the T/S to provide consistency between the units enhances usability of the T/S.

The proposed change to eliminate the prescriptive method for determining the quantity of radioactive material in the gas storage tanks allows alternate approaches to demonstrate that the requirement is met. For example, obtaining gas samples directly from the gas storage tanks would allow a precise measurement of the radioactivity in each tank at the time the sample is obtained. Plant procedures will be revised to specify the two allowable sampling methods. In the future, other approaches may be adopted if they are determined to adequately demonstrate that the T/S Limiting Condition for Operation is met. Implementation of alternative sampling approaches will be evaluated in accordance with 10 CFR 50.59. The proposed change provides consistency with the gas storage tank sampling requirements in NUREG-0452, which does not prescribe the method for quantifying the radioactivity in the gas storage tanks.

The proposed revision to allow alternate methods, such as direct sampling from the gas storage tanks, will not result in a significant increase in radiation exposure. Although the individual dose associated with tank sampling could potentially be higher than that received from sampling from the RCS, this method of sampling would typically be used when fuel has been removed from the reactor. By that time, the radioactivity level in the shutdown unit's RCS will be at an acceptably low level. Furthermore, the occupational dose associated with all sampling and analysis activities will be maintained within the established regulatory and procedural limits. Adherence to as low as reasonably achievable (ALARA) principles will provide additional assurance that these activities will not result in a significant increase in radiation exposure.

NUREG-1431, "Standard Technical Specifications, Westinghouse Plants," does not include requirements for RCS chemistry or gas storage tank radioactivity. They are relocated to an owner-controlled document.

#### G. Related Industry Initiatives

A review of T/S for other nuclear power plants revealed an example of a licensee that adopted a similar approach to satisfying the RCS chemistry T/S when fuel is off-loaded. Florida Power & Light Company (FPL) requested a license amendment to incorporate a footnote to delete the RCS chemistry sampling requirement when the reactor is defueled and RCS forced circulation is unavailable (Reference 2). The NRC approved this change (Reference 3).



H. Impact on Previous Submittals

No previous submittals affect T/S pages that are submitted in this request. If any future submittals affect these T/S pages, then I&M will coordinate changes to the pages with the NRC Project Manager to ensure proper T/S page control when the associated license amendment requests are approved.

I. References

1. Letter, John F. Stang, NRC, to Milton P. Alexich, AEP, "Amendment No. 100 to Facility Operating License No. DPR-74: Steam Generator Repair Program (TACS Nos. 63997, 65113 and 65114)," dated March 8, 1988.
2. Letter, C. O. Woody, FPL, to U.S. Nuclear Regulatory Commission, "Turkey Point Units 3 and 4; Docket Nos. 50-250 and 50-251; Proposed License Amendment; Revised Technical Specifications," dated June 5, 1989.
3. Letter, Gordon E. Edison, NRC, to J. H. Goldberg, FPL, "Issuance of Amendments Re: Replacement of Current Technical Specifications with Revised Technical Specifications (TAC Nos. 63038 and 63039, 55915 and 55916, 55384 and 55385, 71864 and 71865)," dated August 28, 1990.