



June 19, 2001
RC-01-0121

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

ATTN: K. R. Cotton

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
TECHNICAL SPECIFICATION CHANGE REQUEST - TSP 99-0301
REACTOR COOLANT SYSTEM (RCS) OPERATIONAL LEAKAGE -
INCREASED PRESSURE ISOLATION VALVE (PIV) ALLOWABLE LEAKAGE

South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, hereby requests an amendment to the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS). This request is being submitted pursuant to 10 CFR 50.90.

This request proposes to change Technical Specification Section 3/4 4.6.2, including its bases, to increase the allowed operational leakage for Reactor Coolant System (RCS) Pressure Isolation Valves (PIV). The present criteria of 1 gallon per minute for all size valves will be changed to the industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute per valve, consistent with NUREG-1431. This request also proposes to revise Table 3.4-1 to reflect the allowable leakage rates for each PIV.

The TS change request is contained in the following attachments:

| | |
|----------------|--|
| Attachment I | Explanation of Changes Summary Table of Revised Pages Marked-up Technical Specification Pages Revised Technical Specification Pages |
| Attachment II | Safety Evaluation |
| Attachment III | No Significant Hazards Evaluation Environmental Impact Considerations |

This Technical Specification Change Request is similar to a request submitted by Tennessee Valley Authority (TVA) on June 30, 1999 for the Sequoyah Nuclear Power Station (Docket Numbers 50-327 and 50-328). Whereas TVA proposed several changes to the "Reactor Coolant Leakage Detection" and "Reactor Coolant System Operational Leakage" sections of

A001

the Sequoyah TS, this request proposes only to increase the allowed operational leakage for RCS PIV.

SCE&G has determined that there are no significant hazards considerations associated with this proposed amendment and that this change is exempt from environmental review pursuant to the provisions of 10CFR51.22(c)(9). Additionally, this proposed amendment has been reviewed and approved by the Plant Safety Review Committee and the Nuclear Safety Review Committee.

The V. C. Summer Pressure Isolation Valves are discussed in FSAR sections 5.2.2.4 and 6.3.4.3.

There are no other outstanding changes to the subject Technical Specification sections.

A copy of this application and associated attachments is being provided to the designated South Carolina State official in accordance with 10 CFR 50.91.

SCE&G requests approval of this proposed change by March 1, 2002. Approval of this Technical Specification change is needed to support the next operational leakage surveillance inspection scheduled for the Spring of 2001. Additionally, SCE&G requests a 30 day implementation period for this change.

I declare under penalty of perjury that the statements and matters set forth herein are true and correct.

If you have any questions regarding this request or require additional information, please contact Mr. Jim Turkett at (803) 345-4047.

Very truly yours,



Stephen A. Byrne

JT/SAB/dr
Attachments

c: N. O. Lorick
N. S. Carns
T. G. Eppink (w/o Attachments)
R. J. White
L. A. Reyes
N. M. Smith
W. R. Higgins

NRC Resident Inspector
P. Ledbetter
K. M. Sutton
T. P. O'Kelley
RTS (TSP 99-0301)
File (813.20)
DMS (RC-01-0121)

Attachment To License Amendment No. XXX
To Facility Operating License No. NPF-12
Docket No. 50-395

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 Pages

3/4 4-19
 3/4 4-21
 B 3/4 4-4
 B 3/4 4-5
 B 3/4 4-6

Insert Pages

3/4 4-19
 3/4 4-21
 B 3/4 4-4
 B 3/4 4-5
 B 3/4 4-6

SCE&G -- EXPLANATION OF CHANGES

| <u>Page</u> | <u>Affected Section</u> | <u>Bar #</u> | <u>Description of Change</u> | <u>Reason for Change</u> |
|-------------|-------------------------|--------------|---|---|
| 3/4 4-19 | 3.4.6.2.f | 1 | Revised Pressure Isolation Valve (PIV) allowable leakage from 1 gallon per minute to the values shown on Table 3.4-1. | Changed PIV allowable leakage to the industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431. |
| | ACTION 3.4.6.2.c | 2 | Editorial change to delete the word "above." | Allowable leakage limits are shown on Table 3.4-1 instead of "above" on this page. |
| 3/4 4-21 | Table 3.4-1 | 1 | Added columns for "NOMINAL SIZE" and "ALLOWABLE LEAKAGE" to Table 3.4-1. | Changed PIV allowable leakage to the industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431. |

SCE&G -- EXPLANATION - OF CHANGES

| <u>Page</u> | <u>Affected Section</u> | <u>Bar #</u> | <u>Description of Change</u> | <u>Reason for Change</u> |
|-------------|-------------------------|--------------|--|--|
| B 3/4 4-4 | B 3/4.4.6.2 | 1 | Expanded BASES section for PIV allowable leakage consistent with the criteria of NUREG-1431. | To reflect the change in PIV allowable leakage to the industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431. |
| | | 2 | Added statement to address leakage value adjustments. Statement on new page B 3/4 4-5. | To reflect that leakage values identified during heatup or cooldown need adjustment to 2235 psig. |
| B 3/4-4-5 | B 3/4.4.6.2 | 1 | Expanded BASES section for PIV allowable leakage consistent with the criteria of NUREG-1431. | To reflect the change in PIV allowable leakage to the industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431. |
| B 3/4-4-6 | B 3/4.4.8 | 1 | Relocated text from section B 3/4.4.8 from page B 3/4 4-5 to page B 3/4 4-6. | Due to repagination process. |

REACTOR COOLANT SYSTEM

OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. 1 GPM total primary-to-secondary leakage through all steam generators not isolated from the Reactor Coolant System and 500 gallons per day through any one steam generator not isolated from the Reactor Coolant System,
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and
- e. 33 GPM CONTROLLED LEAKAGE at a Reactor Coolant System pressure of 2235 ± 20 psig.
- f. ~~1 GPM leakage at a Reactor Coolant System pressure of 2235 ± 20 psig from any Reactor Coolant System Pressure Isolation valve specified in Table 3.4-1.~~

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With any Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE and Leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With any Reactor Coolant System Pressure Isolation Valve Leakage greater than the above limit, isolate the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two closed manual or deactivated automatic valves, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.6.2.1 Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by;

- a. Monitoring the reactor building atmosphere (gaseous or particulate) radioactivity monitor at least once per 12 hours.

f. The leakage rate specified for each Reactor Coolant System Pressure Isolation Valve in Table 3.4-1 at a Reactor Coolant System pressure of 2235 ± 20 psig.

REACTOR COOLANT SYSTEM

TABLE 3.4-1

REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES

| NOMINAL SIZE (IN.) | ALLOWABLE LEAKAGE PER VALVE (GALLONS PER MINUTE) | VALVE NO. | DESCRIPTION |
|--------------------|--|-------------|-------------------------------------|
| 6 | 3 | 8993 A,B,C | SI to Hot Legs |
| 2 | 1 | 8992 A,B,C | SI High Head to Hot Legs |
| 2 | 1 | 8990 A,B,C | SI High Head to Hot Legs |
| 6 | 3 | 8988 A,B | SI Low Head to Hot Legs |
| 2 | 1 | 8997 A,B,C | Primary SI High Head to Cold Legs |
| 2 | 1 | 8995 A,B,C | Alternate SI High Head to Cold Legs |
| 6 | 3 | 8998 A,B,C | SI to Cold Legs |
| 6 | 3 | 8973 A,B,C | RHR Low Head to Cold Legs |
| 12 | 5 | *8948 A,B,C | Accumulators to Cold Legs |
| 12 | 5 | *8956 A,B,C | Accumulators to Cold Legs |
| 12 | 5 | 8701 A,B | RHR Suction from Hot Legs |
| 12 | 5 | 8702 A,B | RHR Suction from Hot Legs |
| 10 | 5 | 8974 A,B | RHR Low Head to Cold Legs |

* See Specification 4.4.6.2.2.c.

REACTOR COOLANT SYSTEM

BASES

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the Reactor Coolant Pressure Boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3/4.4.6.2 OPERATIONAL LEAKAGE

Industry experience has shown that while a limited amount of leakage is expected from the RCS, the unidentified portion of this leakage can be reduced to a threshold value of less than 1 GPM. This threshold value is sufficiently low to ensure early detection of additional leakage.

The 10 GPM IDENTIFIED LEAKAGE limitation provides allowance for a limited amount of leakage from known sources whose presence will not interfere with the detection of UNIDENTIFIED LEAKAGE by the leakage detection systems.

The CONTROLLED LEAKAGE limitation restricts operation when the total flow supplied to the reactor coolant pump seals exceeds 33 GPM with the modulating valve in the supply line fully open at a nominal RCS pressure of 2235 psig. This limitation ensures that in the event of a LOCA, the safety injection flow will not be less than assumed in the accident analyses.

The surveillance requirements for RCS Pressure Isolation Valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. Leakage from the RCS Pressure Isolation Valves is IDENTIFIED LEAKAGE and will be considered as a portion of the allowed limit.

The total steam generator tube leakage limit of 1 GPM for all steam generators not isolated from the RCS ensures that the dosage contribution from the tube leakage will be limited to a small fraction of Part 100 limits in the event of either a steam generator tube rupture or steam line break. The 1 GPM limit is consistent with the assumptions used in the analysis of these accidents. The 500 gpd leakage limit per steam generator ensures that steam generator tube integrity is maintained in the event of a main steam line rupture or under LOCA conditions.

Leakage from the RCS Pressure Isolation Valves may be identified by surveillance testing performed during plant heatup or cooldown above 2000 psig and may be adjusted to obtain the leakage value at 2235 ± 20 psig using calculation guidance provided by ASME Code, Section XI, Part OM-10.

INSERT ATTACHMENT "A" HERE

Attachment A

Insert into TS section B 3/4.4.6.2, "Operational Leakage"
Pages B 3/4.4-4 and B 3/4.4-5

10CFR50.2, 10CFR50.55a(c), and GDC 55 of 10CFR50, Appendix A define RCS PIVs as any two normally closed valves in series within the reactor coolant pressure boundary (RCPB) which separate the high pressure RCS from an attached low pressure system. During their service lives, these valves can produce varying amounts of reactor coolant leakage through either normal operational wear or mechanical deterioration. The RCS PIV leakage LCO allows leakage through these valves in amounts that do not compromise safety.

The PIV LEAKAGE limit applies to each individual valve. Leakage through both series PIVs in a line must be included as part of IDENTIFIED LEAKAGE governed by LCO 3.4.6.2, "REACTOR COOLANT SYSTEM, OPERATIONAL LEAKAGE." This is true during operation only when the loss of RCS mass through two series valves is determined by water inventory balance (SR 4.4.6.2.1.d). A known component of the identified leakage before operation begins is the least of the two individual leak rates determined for leaking series PIVs during the required surveillance testing. Leakage measured through one PIV in a line is not RCS operational LEAKAGE if the other PIV is leaktight.

Although this specification provides a limit on allowable PIV leakage rate, its main purpose is to prevent overpressure failure of the low-pressure portions of connecting systems. The leakage limit is an indication that the PIVs between the RCS and the connecting system are degraded or degrading. Excessive PIV leakage could lead to overpressure of the low-pressure piping or components, potentially resulting in a loss of coolant accident (LOCA) outside of containment.

The PIV leakage limit is 0.5 GPM per nominal inch of valve size with a maximum limit of 5 GPM. The NRC, through NUREG-1431, has endorsed this PIV leakage rate limit.

REACTOR COOLANT SYSTEM

NO CHANGES.
REPAINATION
ONLY.

BASES

OPERATIONAL LEAKAGE (Continued)

PRESSURE BOUNDARY LEAKAGE of any magnitude is unacceptable since it may be indicative of an impending gross failure of the pressure boundary. Therefore, the presence of any PRESSURE BOUNDARY LEAKAGE requires the unit to be promptly placed in COLD SHUTDOWN.

3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The surveillance requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 limits following a steam generator tube rupture accident in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 1.0 GPM. The values for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the Virgil C. Summer site, such as site boundary location and meteorological conditions, were not considered in this evaluation.

NO CHANGES.
RE PAGINATION
ONLY

REACTOR COOLANT SYSTEM

BASES

SPECIFIC ACTIVITY (Continued)

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than 1.0 microcuries/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

Reducing T_{avg} to less than 500°F prevents the release of activity should a steam generator tube rupture since the saturation pressure of the primary coolant is below the lift pressure of the atmospheric steam relief valves. The surveillance requirements provide adequate assurance that excessive specific activity levels in the primary coolant will be detected in sufficient time to take corrective action. Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

The temperature and pressure changes during heatup and cooldown are limited by curves developed using the methodology from Westinghouse Topical Report, WCAP-14040-NP-A, updated to include the requirements of the 1996 ASME Boiler and Pressure Vessel Code, Section XI, Appendix G along with ASME Code Case N-640.

- 1) The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figures 3.4-2 and 3.4-3.
 - a) Allowable combinations of pressure and temperature for specific temperature change rates are below and to the right of the limit lines shown. Limit lines for cooldown rates between those presented may be obtained by interpolation.

REACTOR COOLANT SYSTEM

OPERATIONAL LEAKAGE

LIMITING CONDITION FOR OPERATION

3.4.6.2 Reactor Coolant System leakage shall be limited to:

- a. No PRESSURE BOUNDARY LEAKAGE,
- b. 1 GPM UNIDENTIFIED LEAKAGE,
- c. 1 GPM total primary-to-secondary leakage through all steam generators not isolated from the Reactor Coolant System and 500 gallons per day through any one steam generator not isolated from the Reactor Coolant System,
- d. 10 GPM IDENTIFIED LEAKAGE from the Reactor Coolant System, and
- e. 33 GPM CONTROLLED LEAKAGE at a Reactor Coolant System pressure of 2235 ± 20 psig.
- f. The leakage rate specified for each Reactor Coolant System Pressure Isolation Valve in Table 3.4-1 at a Reactor Coolant System pressure of 2235 ± 20 psig.

APPLICABILITY: MODES 1, 2, 3 and 4

ACTION:

- a. With any PRESSURE BOUNDARY LEAKAGE, be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.
- b. With any Reactor Coolant System leakage greater than any one of the above limits, excluding PRESSURE BOUNDARY LEAKAGE and Leakage from Reactor Coolant System Pressure Isolation Valves, reduce the leakage rate to within limits within 4 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With any Reactor Coolant System Pressure Isolation Valve Leakage greater than the limit, isolate the high pressure portion of the affected system from the low pressure portion within 4 hours by use of at least two closed manual or deactivated automatic valves, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.4.6.2.1 The Reactor Coolant System leakages shall be demonstrated to be within each of the above limits by:

- a. Monitoring the reactor building atmosphere (gaseous or particulate) radioactivity monitor at least once per 12 hours.

REACTOR COOLANT SYSTEM

TABLE 3.4-1

REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES

| VALVE NO. | DESCRIPTION | NOMINAL SIZE (Inches) | ALLOWABLE LEAKAGE PER VALVE (Gallons per Minute) |
|---------------|-------------------------------------|-----------------------|--|
| 8993 A, B, C | SI to Hot Legs | 6 | 3 |
| 8992 A, B, C | SI High Head to Hot Legs | 2 | 1 |
| 8990 A, B, C | SI High Head to Hot Legs | 2 | 1 |
| 8988 A, B | SI Low Head to Hot Legs | 6 | 3 |
| 8997 A, B, C | Primary SI High Head to Cold Legs | 2 | 1 |
| 8995 A, B, C | Alternate SI High Head to Cold Legs | 2 | 1 |
| 8998 A, B, C | SI to Cold Legs | 6 | 3 |
| 8973 A, B, C | RHR Low Head to Cold Legs | 6 | 3 |
| *8948 A, B, C | Accumulators to Cold Legs | 12 | 5 |
| *8956 A, B, C | Accumulators to Cold Legs | 12 | 5 |
| 8701 A, B | RHR Suction from Hot Legs | 12 | 5 |
| 8702 A, B | RHR Suction from Hot Legs | 12 | 5 |
| 8974 A, B | RHR Low Head to Cold Legs | 10 | 5 |

*See Specification 4.4.6.2.2.c

REACTOR COOLANT SYSTEM

BASES

3/4.4.6 REACTOR COOLANT SYSTEM LEAKAGE

3/4.4.6.1 LEAKAGE DETECTION SYSTEMS

The RCS leakage detection systems required by this specification are provided to monitor and detect leakage from the Reactor Coolant Pressure Boundary. These detection systems are consistent with the recommendations of Regulatory Guide 1.45, "Reactor Coolant Pressure Boundary Leakage Detection Systems," May 1973.

3/4.4.6.2 OPERATIONAL LEAKAGE

Industry experience has shown that while a limited amount of leakage is expected from the RCS, the unidentified portion of this leakage can be reduced to a threshold value of less than 1 GPM. This threshold value is sufficiently low to ensure early detection of additional leakage.

The 10 GPM IDENTIFIED LEAKAGE limitation provides allowance for a limited amount of leakage from known sources whose presence will not interfere with the detection of UNIDENTIFIED LEAKAGE by the leakage detection systems.

The CONTROLLED LEAKAGE limitation restricts operation when the total flow supplied to the reactor coolant pump seals exceeds 33 GPM with the modulating valve in the supply line fully open at a nominal RCS pressure of 2235 psig. This limitation ensures that in the event of a LOCA, the safety injection flow will not be less than assumed in the accident analyses.

10CFR50.2, 10CFR50.55a(c), and GDC 55 of 10CFR50, Appendix A define RCS PIVs as any two normally closed valves in series within the reactor coolant pressure boundary (RCPB) which separate the high pressure RCS from an attached low pressure system. During their service lives, these valves can produce varying amounts of reactor coolant leakage through either normal operational wear or mechanical deterioration. The RCS PIV leakage LCO allows leakage through these valves in amounts that do not compromise safety.

The PIV LEAKAGE limit applies to each individual valve. Leakage through both series PIVs in a line must be included as part of IDENTIFIED LEAKAGE governed by LCO 3.4.6.2, "REACTOR COOLANT SYSTEM, OPERATIONAL LEAKAGE." This is true during operation only when the loss of RCS mass through two series valves is determined by water inventory balance (SR 4.4.6.2.1.d). A known component of the identified leakage before operation begins is the least of the two individual leak rates determined for leaking series PIVs during the required surveillance testing. Leakage measured through one PIV in a line is not RCS operational LEAKAGE if the other PIV is leaktight.

Although this specification provides a limit on allowable PIV leakage rate, its main purpose is to prevent overpressure failure of the low-pressure portions of connecting systems. The leakage limit is an indication that the PIVs between the RCS and the connecting system are degraded or degrading. Excessive PIV leakage could lead to overpressure of the low-pressure piping or components, potentially resulting in a loss of coolant accident (LOCA) outside of containment.

REACTOR COOLANT SYSTEM

BASES

OPERATIONAL LEAKAGE (Continued)

The PIV leakage limit is 0.5 GPM per nominal inch of valve size with a maximum limit of 5 GPM. The NRC, through NUREG-1431, has endorsed this PIV leakage rate limit.

The surveillance requirements for RCS Pressure Isolation Valves provide added assurance of valve integrity thereby reducing the probability of gross valve failure and consequent intersystem LOCA. Leakage from the RCS Pressure Isolation Valves is IDENTIFIED LEAKAGE and will be considered as a portion of the allowed limit.

Leakage from the RCS Pressure Isolation Valves may be identified by surveillance testing performed during plant heatup or cooldown above 2000 psig and may be adjusted to obtain the leakage value at 2235 ± 20 psig using calculation guidance provided by ASME Code, Section XI, Part OM-10.

The total steam generator tube leakage limit of 1 GPM for all steam generators not isolated from the RCS ensures that the dosage contribution from the tube leakage will be limited to a small fraction of Part 100 limits in the event of either a steam generator tube rupture or steam line break. The 1 GPM limit is consistent with the assumptions used in the analysis of these accidents. The 500 gpd leakage limit per steam generator ensures that steam generator tube integrity is maintained in the event of a main steam line rupture or under LOCA conditions.

PRESSURE BOUNDARY LEAKAGE of any magnitude is unacceptable since it may be indicative of an impending gross failure of the pressure boundary. Therefore, the presence of any PRESSURE BOUNDARY LEAKAGE requires the unit to be promptly placed in COLD SHUTDOWN.

3/4.4.7 CHEMISTRY

The limitations on Reactor Coolant System chemistry ensure that corrosion of the Reactor Coolant System is minimized and reduces the potential for Reactor Coolant System leakage or failure due to stress corrosion. Maintaining the chemistry within the Steady State Limits provides adequate corrosion protection to ensure the structural integrity of the Reactor Coolant System over the life of the plant. The associated effects of exceeding the oxygen, chloride and fluoride limits are time and temperature dependent. Corrosion studies show that operation may be continued with contaminant concentration levels in excess of the Steady State Limits, up to the Transient Limits, for the specified limited time intervals without having a significant effect on the structural integrity of the Reactor Coolant System. The time interval permitting continued operation within the restrictions of the Transient Limits provides time for taking corrective actions to restore the contaminant concentrations to within the Steady State Limits.

The surveillance requirements provide adequate assurance that concentrations in excess of the limits will be detected in sufficient time to take corrective action.

REACTOR COOLANT SYSTEM

BASES

3/4.4.8 SPECIFIC ACTIVITY

The limitations on the specific activity of the primary coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 limits following a steam generator tube rupture accident in conjunction with an assumed steady state primary-to-secondary steam generator leakage rate of 1.0 GPM. The values for the limits on specific activity represent limits based upon a parametric evaluation by the NRC of typical site locations. These values are conservative in that specific site parameters of the Virgil C. Summer site, such as site boundary location and meteorological conditions, were not considered in this evaluation.

The ACTION statement permitting POWER OPERATION to continue for limited time periods with the primary coolant's specific activity greater than 1.0 microcuries/gram DOSE EQUIVALENT I-131, but within the allowable limit shown on Figure 3.4-1, accommodates possible iodine spiking phenomenon which may occur following changes in THERMAL POWER.

Reducing T_{avg} to less than 500°F prevents the release of activity should a steam generator tube rupture since the saturation pressure of the primary coolant is below the lift pressure of the atmospheric steam relief valves. The surveillance requirements provide adequate assurance that excessive specific activity levels in the primary coolant will be detected in sufficient time to take corrective action. Information obtained on iodine spiking will be used to assess the parameters associated with spiking phenomena. A reduction in frequency of isotopic analyses following power changes may be permissible if justified by the data obtained.

3/4.4.9 PRESSURE/TEMPERATURE LIMITS

The temperature and pressure changes during heatup and cool down are limited by curves developed using the methodology from Westinghouse Topical Report, WCAP-14040-NP-A, updated to include the requirements of the 1996 ASME Boiler and Pressure Vessel Code, Section XI, Appendix G along with ASME Code Case N-640.

- 1) The reactor coolant temperature and pressure and system heatup and cooldown rates (with the exception of the pressurizer) shall be limited in accordance with Figures 3.4-2 and 3.4-3.
 - a) Allowable combinations of pressure and temperature for specific temperature change rates are below and to the right of the limit lines shown. Limit lines for cooldown rates between those presented may be obtained by interpolation.

SAFETY EVALUATION
REVISION OF RCS OPERATIONAL LEAKAGE
FOR PRESSURE ISOLATION VALVES
FOR THE VIRGIL C. SUMMER NUCLEAR STATION
TECHNICAL SPECIFICATIONS

Description of Amendment Request

South Carolina Electric and Gas (SCE&G) proposes to revise the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS) to revise the allowable leakage criteria for Reactor Coolant System Pressure Isolation Valves (PIV). These changes have been developed consistent with the criteria provided in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants". SCE&G proposes to revise the following Technical Specifications:

TS LCO 3.4.6.2.f will be revised to increase the allowed operational leakage for RCS Pressure Isolation Valves (PIV). The present criteria of 1 gallon per minute for all size valves will be deleted and a reference to the values shown on Table 3.4-1, "REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES" will be added.

Table 3.4-1, "REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES" will be revised to show the allowable leakage rate for each applicable valve based on the current industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431.

The BASES for Technical Specification 3.4.6.2 will be expanded to present the technical background for this change in allowable leakage criteria, consistent with the BASES section of NUREG-1431.

The TS leakage limit for PIVs is 0.5 gallon per minute per nominal inch of valve size with a maximum limit of 5 gallons per minute. The previous criteria of 1 gallon per minute for all valve sizes imposes an unjustified penalty on the larger valves without providing information on potential valve degradation. Additionally, the previous criteria can result in higher personnel radiation exposures due to unwarranted rework and retesting. An NRC sponsored study (Reference 1) concluded a leakage rate limit based on the valve size was superior to a single allowable value.

Safety Evaluation

RCS Pressure Isolation Valves are defined as any two normally closed valves in series within the reactor coolant pressure boundary (RCPB) which separate the high pressure RCS from an attached low pressure system. During their service lives, these valves can produce varying amounts of reactor coolant leakage through either normal operational wear or mechanical

deterioration. The revised RCS PIV leakage requirements in the Technical Specifications allows RCS high-pressure operation when leakage through these valves exists in amounts that do not compromise safety.

Although this TS requirement provides a limit on allowable PIV leakage rate, its main purpose is to prevent overpressure failure of the low-pressure portions of connecting systems. Exceeding this leakage limit is an indication that the PIVs between the RCS and the connecting system are degraded or degrading. PIV leakage could lead to overpressurization of the low-pressure piping or components. Failure consequences could be a loss of coolant accident (LOCA) outside of containment that could degrade the ability for low-pressure injection.

The proposed change requires the PIV leakage to be less than or equal to 0.5 gallons per minute per nominal inch of valve size, up to a maximum limit of 5 gallons per minute. The TS will continue to require the RCS to be at nominal operating pressure of 2235 pounds per square inch gauge (psig) with a tolerance of plus or minus 20 psig. The leakage requirement provides a relaxation of the current 1 gallon per minute limit that imposed an unjustified penalty on the larger valves without providing information on potential valve degradation. The 1 gallon per minute limit also has the potential to increase personnel radiation exposures because the time to perform surveillance testing could be greater due to increased work activities such as repair and re-testing in radiation fields.

The revision to a leakage criterion related to valve size is acceptable because associated systems that have larger valves also have greater pressure relief capability. The new criteria allows for leakage above 1 gallon per minute, although limited to a maximum of 5 gallons per minute, because the isolated low pressure system will not be overpressurized based on their relief capacity being greater than their allowed leakage limit. Therefore, the proposed change to the Limiting Condition for Operation will result in lower radiation exposures to personnel and a superior leak rate limit based on valve size as compared to a single allowable value.

The proposed change to specification 3.4.6.2.f for the RCS Pressure Isolation Valves will continue to ensure that excessive leakage through these valves is properly identified and resolved. The existing surveillance will provide the appropriate test to detect leakage in excess of the established limits. When these limits are exceeded, the existing actions will initiate appropriate activities to minimize the impact of the leakage. While the LCO requirements have been modified to be more reasonably based on valve size, they will continue to provide a limit that will maintain nuclear safety. This change is consistent with NUREG-1431 and will not result in an adverse impact to nuclear safety.

References

1. "Inservice Leak Testing of Primary Pressure Isolation Valves," EGG-NTAP-6175, dated February, 1983

NO SIGNIFICANT HAZARDS EVALUATION
REVISION OF RCS OPERATIONAL LEAKAGE
FOR PRESSURE ISOLATION VALVES
FOR THE VIRGIL C. SUMMER NUCLEAR STATION
TECHNICAL SPECIFICATIONS

Description of Amendment Request

South Carolina Electric and Gas (SCE&G) proposes to revise the Virgil C. Summer Nuclear Station (VCSNS) Technical Specifications (TS) to revise the allowable leakage criteria for Reactor Coolant System Pressure Isolation Valves (PIV). These changes have been developed consistent with the criteria provided in NUREG-1431, "Standard Technical Specifications, Westinghouse Plants". SCE&G proposes to revise the following Technical Specifications:

TS LCO 3.4.6.2.f will be revised to increase the allowed operational leakage for RCS Pressure Isolation Valves (PIV). The present criteria of 1 gallon per minute for all size valves will be deleted and a reference to the values shown on Table 3.4-1, "REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES" will be added.

Table 3.4-1, "REACTOR COOLANT SYSTEM PRESSURE ISOLATION VALVES" will be revised to show the allowable leakage rate for each applicable valve based on the current industry standard of 0.5 gallons per minute per nominal inch of valve size, up to a maximum of 5 gallons per minute, consistent with NUREG-1431.

The BASES for Technical Specification 3.4.6.2 will be expanded to present the technical background for this change in allowable leakage criteria, consistent with the BASES section of NUREG-1431.

The TS leakage limit for PIVs is 0.5 gallon per minute per nominal inch of valve size with a maximum limit of 5 gallons per minute. The previous criteria of 1 gallon per minute for all valve sizes imposes an unjustified penalty on the larger valves without providing information on potential valve degradation. Additionally, the previous criteria can result in higher personnel radiation exposures due to unwarranted rework and retesting. An NRC sponsored study (Reference 1) concluded a leakage rate limit based on the valve size was superior to a single allowable value.

Basis for No Significant Hazards Consideration Determination

In accordance with 10CFR50.92, a proposed change to the Operating License involves no "significant hazards" if operation of the facility, in accordance with the proposed change, would not:

- 1) involve a significant increase in the probability or consequences of any accident previously evaluated;
- 2) create the possibility of a new or different kind of accident from any accident previously evaluated, or;
- 3) involve a significant reduction in a margin to safety.

This request is evaluated against each of these criteria as follows:

- 1) *This proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.*

This proposed change provides a more appropriate Pressure Isolation Valve (PIV) allowable leakage criteria in consideration of the safety significance and design capabilities of the plant as determined by the improved standard technical specification industry effort.

The TS leakage limit for PIVs is 0.5 gallon per minute per nominal inch of valve size with a maximum limit of 5 gallons per minute. The previous criteria of 1 gallon per minute for all valve sizes imposed an unjustified penalty on the larger valves without providing information on potential valve degradation and can result in higher personnel radiation exposures due to unwarranted rework and retesting. An NRC sponsored study (Reference 1) concluded a leakage rate limit based on the valve size was superior to a single allowable value.

The revision to a leakage criterion related to valve size is acceptable because associated systems that have larger valves also have greater pressure relief capability. The new criteria allows for leakage above 1 gallon per minute, although limited to a maximum of 5 gallons per minute, because the isolated low pressure system will not be overpressurized based on their relief capacity being greater than their allowed leakage limit. Therefore, the proposed change to the Limiting Condition for Operation will result in lower radiation exposures to personnel and a superior leak rate limit based on valve size as compared to a single allowable value.

Since this proposed revision would continue to support the required safety functions, without modification to the plant features, neither the probability nor the consequences of an accident are increased.

- 2) *This proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.*

The proposed revision is not a result of changes to plant equipment, system design, testing methods, or operating practices. The modified LCO requirement will allow some relaxation of the current operability criteria for the PIVs, consistent with NUREG-1431. This change provides a more appropriate requirement in consideration of the safety significance and design capabilities of the plant as determined by the improved standard technical specification industry effort. Since the functions of the associated systems will continue to perform without change, the proposed change will not create the possibility of a new or different kind of accident from any accident previously evaluated.

- 3) *This proposed change does not involve a significant reduction in a margin to safety.*

The proposed revision to the PIV leakage acceptance criteria will not result in changes to system design or setpoints that are intended to ensure timely identification of plant conditions that could be precursors to accidents or potential degradation of accident mitigation systems. These systems will continue to operate without change and only the associated allowable leakage criteria has been altered.

Since the setpoints and design features that support the margin of safety are unchanged and actions for inoperable systems continue to provide appropriate time limits and compensatory measures, the proposed changes will not significantly reduce the margin of safety.

References

1. "Inservice Leak Testing of Primary Pressure Isolation Valves," EGG-NTAP-6175, dated February, 1983

Environmental Impact Consideration

SCE&G has reviewed this request against the criteria of 10CFR51.22 for environmental considerations. Since this request involves (i) no significant hazard consideration, (ii) no significant change in the types or increase in the amounts of any effluents that may be released offsite, and (iii) no significant increase in individual or cumulative occupational radiation exposure, SCE&G has concluded that the proposed change meets the criteria given in 10CFR51.22 (c)(9) for a categorical exclusion from the requirement for an environmental impact statement.