ATTACHMENT 1

PROPOSED McGUIRE UNIT 1 AND 2 TECHNICAL SPECIFICATION CHANGES

3/4.4.8 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the reactor coolant shall be limited to:

a. Less than or equal to 1.0 microCurie per gram DOSE EQUIVALENT I-131, and

b. Less than or equal to 100/$\bar{E}$ microCuries per gram of gross specific activity.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

ACTION:

MODES 1, 2 and 3*:

a With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours;

b. With the specific activity of the reactor coolant greater than 100/E microCuries per gram, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours; and

c. The provisions of Specification 3.0.4 are not applicable.

* With T_{avg} greater than or equal to 500°F.

ACTION: (Continued)

MODES 1, 2, 3, 4, and 5:

With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 or greater than 100/$\bar{E}$ microCuries per gram, perform the sampling and analysis requirements of Item 4.a) of Table 4.4-4 until the specific activity of the reactor coolant is restored to within its limits.

SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

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 reactor coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 dose guideline values 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 McGuire 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 reactor coolant's specific activity greater than 1.0 microCurie/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.

SPECIFIC ACTIVITY (Continued)

The sample analysis for determining the gross specific activity and $\bar{E}$ can exclude the radioiodines because of the low reactor coolant limit of 1 micro-Curie/gram DOSE EQUIVALENT I-131, and because, if the limit is exceeded, the radioiodine level is to be determined every 4 hours. If the gross specific activity level and radioiodine level in the reactor coolant were at their limits, the radioiodine contribution would be approximately 1%. In a release of reactor coolant with a typical mixture of radioactivity, the actual radioiodine contribution would probably be about 20%. The exclusion of radionuclides with half-lives less than 10 minutes from these determinations has been made for several reasons. The first consideration is the difficulty to identify short-lived radionuclides in a sample that requires a significant time to collect, transport, and analyze. The second consideration is the predictable delay time between the postulated release of radioactivity from the reactor coolant to its release to the environment and transport to the SITE BOUNDARY, which is relatable to at least 30 minutes decay time. The choice of 10 minutes for the half-life cutoff was made because of the nuclear characteristics of the typical reactor coolant radioactivity. The radionuclides in the typical reactor coolant have half-lives of less than 4 minutes or half-lives of greater than 14 minutes, which allows a distinction between the radionuclides above and below a half-life of 10 minutes. For these reasons the radionuclides that are excluded from consideration are expected to decay to very low levels before they could be transported from the reactor coolant to the SITE BOUNDARY under any accident condition.

Based upon the above considerations for excluding certain radionuclides from the sample analysis, the allowable time of 2 hours between sample taking and completing the initial analysis is based upon a typical time necessary to perform the sampling, transport the sample, and perform the analysis of about 90 minutes. After 90 minutes, the gross count should be made in a reproducible geometry of sample and counter having reproducible beta or gamma self-shielding properties. The counter should be reset to a reproducible efficiency versus energy. It is not necessary to identify specific nuclides. The radiochemical determination of nuclides should be based on multiple counting of the sample with typical counting basis following sampling of less than 1 hour, about 2 hours, about 1 day, about 1 week, and about 1 month.

STARTUP REPORT (Continued)

6.9.1.2 The Startup Report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in License conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the STARTUP test program, or (2) 90 days following resumption or commencement of commercial POWER OPERATION, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of STARTUP test program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS[1/]

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions,[2/] e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions.

[1/] A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

[2/] This tabulation supplements the requirements of §20.407 of 10 CFR Part 20.

ANNUAL REPORTS[1/] (Continued)

b. Primary Coolant Specific Activity

Reports required on an annual basis shall include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: 1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; 2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; 3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; 4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and 5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 Routine Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, with operational controls as appropriate, and with previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 3.12.2.

The Annual Radiological Environmental Operating Reports shall include the results of analysis of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the Table and Figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

* A single submittal may be made for a multiple unit station.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT* (Continued)

The reports shall also include the following: a summary description of the Radiological Environmental Monitoring Program; at least two legible maps** covering all sampling locations keyed to a table giving distances and directions from the centerline of one reactor; the results of licensee participation in the Interlaboratory Comparison Program, required by Specification 3.12.3; discussion of all deviations from the sampling schedule of Table 3.12-1; and discussion of all analyses in which the LLD required by Table 4.12-1 was not achievable.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT***

6.9.1.7 Routine Radioactive Effluent Release Reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The period of the first report shall begin with the date of initial criticality.
The Radioactive Effluent Release Reports shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a quarterly basis following the format of Appendix B thereof.

The Radioactive Effluent Release Report to be submitted within 60 days after January 1 of each year shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing on magnetic tape of wind speed, wind direction, atmospheric stability, and precipitation (if measured), or in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.* This same report shall include an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the unit or station during the previous calendar year. This same report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY (Figures 5.1-3 and 5.1-4) during the report period.

*In lieu of submission with the first half year Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

**One map shall cover stations near the site boundary; a second shall include the more distant stations.

***A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate Radwaste Systems, the submittal shall specify the releases of radioactive material from each unit.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (Continued)

All assumptions used in making these assessments, i.e., specific activity, exposure time and location, shall be included in these reports. The meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents, as determined by sampling frequency and measurement, shall be used for determining the gaseous pathway doses. The assessment of radiation doses shall be performed in accordance with the methodology and parameters in the OFFSITE DOSE CALCULATION MANUAL (ODCM).

The Radioactive Effluent Release Report to be submitted 60 days after January 1 of each year shall also include an assessment of radiation doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operation." Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Regulatory Guide 1.109, Rev. 1, October 1977.

The Radioactive Effluent Release Reports shall include the following information for each type of solid waste shipped offsite during the report period:

a. Total container volume, in cubic meters,

b. Total Curie quantity (determined by measurement or estimate),

c. Principal radionuclides (determined by measurement or estimate),

d. Type of waste (e.g., dewatered spent resin, compacted dry waste, evaporator bottoms),

e. Number of shipments, and

f. Solidification agent or absorbent (e.g., cement, or other approved agents (media)).

The Radioactive Effluent Release Reports shall include a list and description of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.

The Radioactive Effluent Release Reports shall include any changes made during the reporting period to the PROCESS CONTROL PROGRAM (PCP) and to the OFFSITE DOSE CALCULATION MANUAL (ODCM), as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to Specification 3.12.2.

MONTHLY OPERATING REPORTS

6.9.1.8 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the PORVs or safety valves, shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the NRC Regional Office, no later than the 15th of each month following the calendar month covered by the report.

RADIAL PEAKING FACTOR LIMIT REPORT

6.9.1.9 The W(z) functions for RAOC and Base Load operation and the value for APL^{ND} (as required) shall be provided to the Director, Nuclear Reactor Regulations, Attention: Chief, Core Performance Branch, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 at least 60 days prior to cycle initial criticality. In the event that these values would be submitted at some other time during core life, it will be submitted 60 days prior to the date the values would become effective unless otherwise exempted by the Commission.

Any information needed to support W(z), $W(z)_{BL}$ and APL^{ND} will be by request from the NRC and need not be included in this report.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Regional Administrator of the NRC Regional Office within the time period specified for each report.

TABLE NOTATION

#Until the specific activity of the Reactor Coolant System is restored within its limits.

*Sample to be taken after a minimum of 2 EFPD and 20 days of POWER OPERATION have elapsed since reactor was last subcritical for 48 hours or longer.

**A gross radioactivity analysis shall consist of the quantitative measurement of the total specific activity of the reactor coolant except for radionuclides with half-lives less than 10 minutes and all radioiodines. The total specific activity shall be the sum of the beta-gamma activity in the sample within 2 hours after the sample is taken and extrapolated back to when the sample was taken. Determination of the contributors to the gross specific activity shall be based upon those energy peaks identifiable with a 95% confidence level. The latest available data may be used for pure beta-emitting radionuclides.

***A radiochemical analysis for $\bar{E}$ shall consist of the quantitative measurement of the specific activity for each radionuclide, except for radionuclides with half-lives less than 10 minutes and all radioiodines, which is identified in the reactor coolant. The specific activities for these individual radionuclides shall be used in the determination of $\bar{E}$ for the reactor coolant sample. Determination of the contributors to $\bar{E}$ shall be based upon those energy peaks identifiable with a 95% confidence level.

ATTACHMENT II

PROPOSED CATAWBA UNIT 1 TECHNICAL SPECIFICATION CHANGES

3/4.4.8 SPECIFIC ACTIVITY

LIMITING CONDITION FOR OPERATION

3.4.8 The specific activity of the reactor coolant shall be limited to:

a. Less than or equal to 1.0 microCurie per gram DOSE EQUIVALENT I-131, and

b. Less than or equal to 100/$\bar{E}$ microCuries per gram of gross specific activity.

APPLICABILITY: MODES 1, 2, 3, 4, and 5.

ACTION:

MODES 1, 2 and 3*:

a. With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 for more than 48 hours during one continuous time interval or exceeding the limit line shown on Figure 3.4-1, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours;

b. With the specific activity of the reactor coolant greater than 100/E microCuries per gram, be in at least HOT STANDBY with T_{avg} less than 500°F within 6 hours; and

c. The provisions of Specification 3.0.4 are not applicable.

* With T_{avg} greater than or equal to 500°F.

ACTION: (Continued)

MODES 1, 2, 3, 4, and 5:

With the specific activity of the reactor coolant greater than 1.0 microCurie per gram DOSE EQUIVALENT I-131 or greater than 100/$\bar{E}$ microCuries per gram, perform the sampling and analysis requirements of Item 4.a) of Table 4.4-4 until the specific activity of the reactor coolant is restored to within its limits.

SURVEILLANCE REQUIREMENTS

4.4.8 The specific activity of the reactor coolant shall be determined to be within the limits by performance of the sampling and analysis program of Table 4.4-4.

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 reactor coolant ensure that the resulting 2 hour doses at the site boundary will not exceed an appropriately small fraction of Part 100 dose guideline values 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 McGuire 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 reactor coolant's specific activity greater than 1.0 microCurie/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.

SPECIFIC ACTIVITY (Continued)

The sample analysis for determining the gross specific activity and $\bar{E}$ can exclude the radioiodines because of the low reactor coolant limit of 1 micro-Curie/gram DOSE EQUIVALENT I-131, and because, if the limit is exceeded, the radioiodine level is to be determined every 4 hours. If the gross specific activity level and radioiodine level in the reactor coolant were at their limits, the radioiodine contribution would be approximately 1%. In a release of reactor coolant with a typical mixture of radioactivity, the actual radioiodine contribution would probably be about 20%. The exclusion of radionuclides with half-lives less than 10 minutes from these determinations has been made for several reasons. The first consideration is the difficulty to identify short-lived radionuclides in a sample that requires a significant time to collect, transport, and analyze. The second consideration is the predictable delay time between the postulated release of radioactivity from the reactor coolant to its release to the environment and transport to the SITE BOUNDARY, which is relatable to at least 30 minutes decay time. The choice of 10 minutes for the half-life cutoff was made because of the nuclear characteristics of the typical reactor coolant radioactivity. The radionuclides in the typical reactor coolant have half-lives of less than 4 minutes or half-lives of greater than 14 minutes, which allows a distinction between the radionuclides above and below a half-life of 10 minutes. For these reasons the radionuclides that are excluded from consideration are expected to decay to very low levels before they could be transported from the reactor coolant to the SITE BOUNDARY under any accident condition.

Based upon the above considerations for excluding certain radionuclides from the sample analysis, the allowable time of 2 hours between sample taking and completing the initial analysis is based upon a typical time necessary to perform the sampling, transport the sample, and perform the analysis of about 90 minutes. After 90 minutes, the gross count should be made in a reproducible geometry of sample and counter having reproducible beta or gamma self-shielding properties. The counter should be reset to a reproducible efficiency versus energy. It is not necessary to identify specific nuclides. The radiochemical determination of nuclides should be based on multiple counting of the sample with typical counting basis following sampling of less than 1 hour, about 2 hours, about 1 day, about 1 week, and about 1 month.

STARTUP REPORT (Continued)

6.9.1.2 The Startup Report shall address each of the tests identified in the FSAR and shall include a description of the measured values of the operating conditions or characteristics obtained during the test program and a comparison of these values with design predictions and specifications. Any corrective actions that were required to obtain satisfactory operation shall also be described. Any additional specific details required in License conditions based on other commitments shall be included in this report.

6.9.1.3 Startup Reports shall be submitted within: (1) 90 days following completion of the STARTUP test program, or (2) 90 days following resumption or commencement of commercial POWER OPERATION, or (3) 9 months following initial criticality, whichever is earliest. If the Startup Report does not cover all three events (i.e., initial criticality, completion of STARTUP test program, and resumption or commencement of commercial operation), supplementary reports shall be submitted at least every 3 months until all three events have been completed.

ANNUAL REPORTS[1/]

6.9.1.4 Annual Reports covering the activities of the unit as described below for the previous calendar year shall be submitted prior to March 1 of each year. The initial report shall be submitted prior to March 1 of the year following initial criticality.

6.9.1.5 Annual Reports shall include the activities of the unit as described below:

a. Personnel Exposures

Reports required on an annual basis shall include tabulation on an annual basis of the number of station, utility, and other personnel (including contractors) receiving exposures greater than 100 mrem/yr and their associated man-rem exposure according to work and job functions,[2/] e.g., reactor operations and surveillance, inservice inspection, routine maintenance, special maintenance (describe maintenance), waste processing, and refueling. The dose assignments to various duty functions may be estimated based on pocket dosimeter, TLD, or film badge measurements. Small exposures totalling less than 20% of the individual total dose need not be accounted for. In the aggregate, at least 80% of the total whole-body dose received from external sources should be assigned to specific major work functions.

[1/] A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

[2/] This tabulation supplements the requirements of §20.407 of 10 CFR Part 20.

ANNUAL REPORTS[1/] (Continued)

b. Primary Coolant Specific Activity

Reports required on an annual basis shall include the results of specific activity analysis in which the primary coolant exceeded the limits of Specification 3.4.8. The following information shall be included: 1) Reactor power history starting 48 hours prior to the first sample in which the limit was exceeded; 2) Results of the last isotopic analysis for radioiodine performed prior to exceeding the limit, results of analysis while limit was exceeded and results of one analysis after the radioiodine activity was reduced to less than limit. Each result should include date and time of sampling and the radioiodine concentrations; 3) Clean-up system flow history starting 48 hours prior to the first sample in which the limit was exceeded; 4) Graph of the I-131 concentration and one other radioiodine isotope concentration in microcuries per gram as a function of time for the duration of the specific activity above the steady-state level; and 5) The time duration when the specific activity of the primary coolant exceeded the radioiodine limit.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT*

6.9.1.6 Routine Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, with operational controls as appropriate, and with previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of land use censuses required by Specification 3.12.2.

The Annual Radiological Environmental Operating Reports shall include the results of analysis of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the Table and Figures in the ODCM, as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

* A single submittal may be made for a multiple unit station.

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT* (Continued)

The reports shall also include the following: a summary description of the Radiological Environmental Monitoring Program; at least two legible maps** covering all sampling locations keyed to a table giving distances and directions from the centerline of one reactor; the results of licensee participation in the Interlaboratory Comparison Program, required by Specification 3.12.3; discussion of all deviations from the sampling schedule of Table 3.12-1; and discussion of all analyses in which the LLD required by Table 4.12-1 was not achievable.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT***

6.9.1.7 Routine Radioactive Effluent Release Reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The period of the first report shall begin with the date of initial criticality.
The Radioactive Effluent Release Reports shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a quarterly basis following the format of Appendix B thereof.

The Radioactive Effluent Release Report to be submitted within 60 days after January 1 of each year shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing on magnetic tape of wind speed, wind direction, atmospheric stability, and precipitation (if measured), or in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.* This same report shall include an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the unit or station during the previous calendar year. This same report shall also include an assessment of the radiation doses from radioactive liquid and gaseous effluents to MEMBERS OF THE PUBLIC due to their activities inside the SITE BOUNDARY (Figures 5.1-3 and 5.1-4) during the report period.

*In lieu of submission with the first half year Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

**One map shall cover stations near the site boundary; a second shall include the more distant stations.

***A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate Radwaste Systems, the submittal shall specify the releases of radioactive material from each unit.

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (Continued)

All assumptions used in making these assessments, i.e., specific activity, exposure time and location, shall be included in these reports. The meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents, as determined by sampling frequency and measurement, shall be used for determining the gaseous pathway doses. The assessment of radiation doses shall be performed in accordance with the methodology and parameters in the OFFSITE DOSE CALCULATION MANUAL (ODCM).

The Radioactive Effluent Release Report to be submitted 60 days after January 1 of each year shall also include an assessment of radiation doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operation." Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Regulatory Guide 1.109, Rev. 1, October 1977.

The Radioactive Effluent Release Reports shall include the following information for each type of solid waste shipped offsite during the report period:

a. Total container volume, in cubic meters,

b. Total Curie quantity (determined by measurement or estimate),

c. Principal radionuclides (determined by measurement or estimate),

d. Type of waste (e.g., dewatered spent resin, compacted dry waste, evaporator bottoms),

e. Number of shipments, and

f. Solidification agent or absorbent (e.g., cement, or other approved agents (media)).

The Radioactive Effluent Release Reports shall include a list and description of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.

The Radioactive Effluent Release Reports shall include any changes made during the reporting period to the PROCESS CONTROL PROGRAM (PCP) and to the OFFSITE DOSE CALCULATION MANUAL (ODCM), as well as a listing of new locations for dose calculations and/or environmental monitoring identified by the land use census pursuant to Specification 3.12.2.

MONTHLY OPERATING REPORTS

6.9.1.8 Routine reports of operating statistics and shutdown experience, including documentation of all challenges to the PORVs or safety valves, shall be submitted on a monthly basis to the Director, Office of Resource Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, with a copy to the NRC Regional Office, no later than the 15th of each month following the calendar month covered by the report.

RADIAL PEAKING FACTOR LIMIT REPORT

6.9.1.9 The W(z) functions for RAOC and Base Load operation and the value for APL^{ND} (as required) shall be provided to the Director, Nuclear Reactor Regulations, Attention: Chief, Core Performance Branch, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 at least 60 days prior to cycle initial criticality. In the event that these values would be submitted at some other time during core life, it will be submitted 60 days prior to the date the values would become effective unless otherwise exempted by the Commission.

Any information needed to support W(z), $W(z)_{BL}$ and APL^{ND} will be by request from the NRC and need not be included in this report.

SPECIAL REPORTS

6.9.2 Special reports shall be submitted to the Regional Administrator of the NRC Regional Office within the time period specified for each report.

ATTACHMENT III

JUSTIFICATION AND SAFETY ANALYSIS

A. Reactor Coolant System Specific Activity Reporting and Shutdown Requirements:

These proposed changes to the McGuire and Catawba Nuclear Stations Technical Specifications seek to:

1. Delete unnecessary reporting requirements related to primary coolant specific activity levels from Technical Specitication 3/4.4.8 and 6.9.1; and

2. Eliminate unnecessary Technical Specifications requirements to shut down the plant if coolant iodine activity limits are exceeded for 800 hours in a 12-month period from Technical Specification 3/4.4.8 and 6.9.1.

NRC's Generic Letter No. 85-19 states that the reporting requirements for iodine spiking can be reduced from a short-term report (Special Report or Licensee Event Report) to an item which is to be included in the Annual Report. The information to be included in the Annual Report is similar to that previously required in the Licensee Event Report but has been changed to more clearly designate the results to be included from the specific activity analysis and to delete the information regarding fuel burnup by core regions. This proposed simplification in reporting requirements would not have an adverse safety impact.

In addition, NRC's Generic Letter No. 85-19 states that the existing requirements to shut down the plant, if coolant iodine activity limits are exceeded for 800 hours in a 12-month period, can be eliminated. The quality of nuclear fuel has been greatly improved over the last decade so that normal coolant iodine activity is well below the limit. Also, 10 CFR 50.72 (b)(1)(ii) requires the NRC to be immediately notified of fuel cladding failures that exceed expected values or that are caused by unexpected factors. Therefore, this Technical Specification limit is no longer considered necessary on the basis that proper fuel management by the licensee and existing reporting requirements pursuant to 10 CFR 50.72 (b)(1)(ii) should preclude ever approaching the limit.

Also, McGuire and Catawba Technical Specification 3/4.4.8 has been revised to reflect the deletion of shut down requirements if coolant iodine activity limits are exceeded for 800 hours in a 12-month period. This proposed change is based on NRC's Generic Letter No. 85-19 and is covered by the preceding analysis. The change would thus not have an adverse safety impact.

B. Reactor Coolant System Isotopic Sampling and Analysis:

The new pressurized dilution method of reactor coolant sampling involves the use of a Rheodyne Model 7010 6-port rotary valve for pressurized sample collection. This valve was adapted from liquid chromatography (LC) where it is widely used because of it's high volumetric precision. The Model 7010 Valve can be equipped with 5.0 microliter to 5.0 milliliter sample loops and has a maximum temperature and pressure rating of 150°C and 5000 psi, respectively.

A known volume of reactor coolant water is trapped with the Rheodyne Model 7010 valve and is injected into a 14 milliliter gas sample vial by flushing with a known volume of dilution water. This diluted sample, which contains both gaseous and dissolved nuclides, then can be counted on a GeLi detector for quantification of total specific activity. A reactor coolant sample can be obtained in 15 minutes by use of the Model 7010 valve; thereby, resulting in a 75% decrease in time of sampling (and exposure to ionizing radiation) for plant chemistry personnel.

To verify the accuracy of this new method, a reactor coolant sampling and GeLi analysis program was initiated at McGuire Nuclear Station to compare the new pressurized dilution method with the current stripping method of radiochemical analysis. Reactor Coolant sampling and GeLi analyses were performed on samples from both Units 1 and 2. The specific activity of Unit 1 reactor coolant water is greater than Unit 2. This will represent a direct comparison of the two methods on a relatively high activity (approximately 1.5 μC/ml) and relatively low activity (approximately 0.30 μC/ml) samples.

The MNS total specific activity sampling program consisted of obtaining 10 representative reactor coolant hot leg samples from Units 1 and 2. Total specific activity was calculated for each reactor coolant sample collected by the Rheodyne valve and the stripping technique. Then the results are compared against each other for relative accuracy.

Table I contains the Unit 2 total specific activity comparison data. The average relative error between the two methods is +14.3%. The error ranges from +3.5% (sample #6) to +28.0% (sample #10).

Table II contains the Unit 1 total specific activity comparison data. The Unit 1 data reveals an average relative error between the two methods of +17.0%. The error ranges from +6.7% (sample #1) to +25.0% (sample #10).

A comparison of Units I and 2 total specific activity data indicates good agreement between the two sampling methods. The fact that the average relative error is less than 20.0% for both high and low activity samples is a positive indication that new pressurized dilution method can provide accurate data for trending purposes and compliance to Technical Specification 3.4.8.

The total specific activity data from Tables I and II indicates the presence of a positive systematic error between the two methods of sampling and isotopic analysis. The source of this apparent systematic error is from a combination of: sample geometry, detector efficiencies, and sampling technique.

Geometry errors are partly a result of differences in the calibration standards used to generate detector efficiency curves. Calibration standards are unique for each sampling technique. The stripping technique requires that separate liquid and gas calibration standards are used for this purpose. The new pressurized dilution technique has the advantage of a single calibration standard to assay both gaseous and non-gaseous nuclides.

Detector errors are a result of the efficiency differences between GeLi detectors. The accuracy of the four detectors used during this study were assayed daily and are known to have a ±5.0% accuracy level. All of the samples collected during this study could not be counted on the same detector due to time constraints imposed by the Surveillance Requirements of Technical Specification 3.4.8.

Sampling technique can be a severe source of experimental error. The complexity of the stripping technique, relative to the simplicity of the pressurized dilution technique, provides more opportunity for operator error. The stripping technique requires both gaseous and non-gaseous sample dilutions to be performed by the operator. After initial calibration of the installed sample loop, all sample dilutions using the pressurized dilution technique are performed mechanically by the Model 7010 Rheodyne valve. The precision of volumetric delivery by the Model 7010 Rheodyne valve can be easily verified by boron titrations of the sample collected for isotopic analysis.

The new pressurized dilution technique provides a more accurate measurement of reactor coolant total specific activity. The positive systematic error exhibited by the pressurized dilution technique is a direct result of the greater sampling efficiency offered by this new technique.

The primary justification for changing Technical Specification 3.4.8 to permit isotopic analysis of a non-degassed reactor coolant sample is ALARA. The estimated cumulative radiation exposure dose from obtaining samples by the stripping method is approximately 2.3 person-rem per year (refer to Table III). This rate of exposure (assuming this rate does not increase) from sampling by the stripping method would result in a total exposure of 94 man-Rem over the life time of one operating nuclear unit. This estimate can be doubled at McGuire since there are two operating nuclear units.

The new pressurized dilution method of reactor coolant sample collection would dramatically reduce the radiation exposure to the sampler, because the reactor coolant sample volume required to obtain a sample is reduced from 1000 milliliters to 1.5 milliliters and the time of sampling is reduced from 1 hour to 15 minutes. For example, this sampling program required 43 entries into the Nuclear Sampling Lab to obtain reactor coolant samples by the pressurized dilution method resulting in a cumulative radiation exposure of 35 mRem whole body (less than 1 mRem whole body per sample) compared to 15 mRem whole body per sample for the stripping technique.

TABLE I
UNIT 2 NC HOTLEG

Rheodyne versus Stripped Total Specific Activity Report

SAMPLE #	RHEODYNE (µC/ml)	STRIPPED (µC/ml)	% ERROR
1	0.31	0.27	+15.0
2	0.31	0 27	+15.0
3*	0.11	0.11	Ø
4	0.32	0.28	+14.0
5	0.31	0.26	+19.0
6	0.30	0.29	+3.5
7	0.32	0.25	+10.0%
8	0.32	0.27	+19.0%
9	0.32	0.27	+19.0%
10	0.32	0.25	+28.0%
			$\overline{X}$=+14.3%

$$\%E = \frac{\text{Rheodyne (µc/ml)} - \text{Stripped (µc/ml)}}{\text{Stripped (µc/ml)}} \times 100$$

* Unit 2 was at zero power in Mode 4 (Hot Shutdown)

TABLE II
UNIT 1 NC HOTLEG

Rheodyne versus Stripped Total Specific Activity Report

SAMPLE #	RHEODYNE (μC/ml)	STRIPPED (μC/ml)	% ERROR
1	1.6	1.5	+ 6.7
2	1.6	1.3	+23.0
3	1.6	1.4	+14.0
4	1.7	1.5	+14.7
5	1.9	1.7	+12.0
6	2.2	1.8	+22.0
7	1.8	1.5	+20.0
8	2.1	1.7	+24.0
9	2.0	1.8	+11.0
10	2.0	1.6	+25.0
			$\bar{X}$=+17.0%

$$\%E = \frac{\text{Rheodyne (μc/ml)} - \text{Stripped (μc/ml)}}{\text{Stripped (μc/ml)}} \times 100$$

TABLE III

ESTIMATE OF CUMULATIVE RADIATION EXPOSURE FROM SAMPLING
BY THE STRIPPING METHOD

Frequency of sampling = 3 time/week

Estimate of exposure per sample = 15 mRem/sample

3 x 15 = 45 mRem/week

52 weeks x 45 mRem/week = 2340 mRem/year

Life expectancy of a nuclear unit = 40 years

40 years x 2340 mRem/year = 93,600 mRem ≅94 Rem

TABLE IV

ESTIMATE OF CUMULATIVE RADIATION EXPOSURE FROM SAMPLING
BY THE PRESSURIZED DILUTION METHOD

Frequency of Sampling = 3 times/week

Estimate of exposure per sample = 0.8 mRem

3 x .8 = 2.4 mRem/week

52 weeks x 2.4 mRem/week = 124.8 mRem/year

Life expectancy of a nuclear unit = 40 years

40 years x 124.8 mRem/year = 4992 mRem ≅5 Rem

ATTACHMENT IV

ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATIONS

As required by 10 CFR 50.91 this analysis provides a determination that the proposed changes to the Technical Specifications do not involve any significant hazards consideration as defined by 10 CFR 50.92.

A. Reactor Coolant System Specific Activity Reporting and Shutdown Requirements:

The proposed changes would delete unnecessary reporting requirements and an unnecessary plant shut down requirement from Technical Specification 4.3.4.2 and 6.9.1 for McGuire and Catawba Nuclear Stations. The proposed reduction of the reporting requirements for iodine spiking is an administrative procedure. The information to be included in the Annual Report is similar to that previously required in the Licensee Event Report, and it has just been revised for clarity and completeness. Also, the proposed change to eliminate the existing requirements to shut down the plant if coolant iodine activity limits are exceeded for 800 hours in a 12-month period will not have any adverse impact on the power plant operation, safety, or safety related equipment. The McGuire and Catawba Nuclear Stations operational records show that at no instance did the plants operate near or above the present limits. This Technical Specification limit is no longer necessary on the basis that proper fuel management and existing reporting requirements preclude ever approaching the limit.

CRITERION 1

Operation in accordance with the proposed changes would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed reduction of the reporting requirements for iodine spiking is administrative in nature and does not have an effect on the probability or consequences of an accident previously evaluated since the actual characteristics of plant systems are unaffected.

The proposed change to eliminate existing shutdown requirements of coolant iodine activity limits are exceeded for 800 hours in a 12-month period eliminates an unnecessary requirement. Proper fuel management and existing reporting requirements would preclude ever approaching this limit. The proposed change does not affect the actual characteristics of any plant system and thus has no effect on the probability or consequences of an accident previously evaluated.

CRITERION 2

Operation in accordance with the proposed changes would not create the possibility of a new accident from any accident previously evaluated.

The proposed changes do not involve any physical change to any plant system. No new or different kind of accident from any previously evaluated could be created since the proposed administrative change and the proposed deletion of unnecessary shutdown requirements can have no effect on causal mechanisms.

CRITERION 3

Operation in accordance with the proposed changes would not involve a significant reduction in a margin of safety.

The proposed deletion of unnecessary reporting requirements is administrative in nature and could not involve a reduction in a margin of safety since all applicable accident analyses remain unaffected.

Also, proper fuel management and existing reporting requirements would preclude approaching the situation in which activity limits would be exceeded for 800 hours in a 12-month period. Therefore, the deletion of unnecessary shut down requirements does not involve a reduction in a margin of safety.

B. Reactor Coolant System Isotopic Sampling and Analysis:

This proposed change to the McGuire Technical Specifications would allow the use of a new analysis technique to quantify reactor coolant system activity that is consistent with ALARA considerations. The proposed change would affect only the amount of reactor coolant sample taken and how it is subsequently treated.

CRITERION 1

Operation in accordance with the proposed changes would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The reactor coolant sample collection point is the same for both the proposed and the existing method and therefore does not have an effect on the probability or consequences of an accident previously evaluated since the actual characteristics of plant systems are unaffected.

CRITERION 2

Operation in accordance with the proposed changes would not create the possibility of a new accident from any accident previously evaluated.

The proposed changes do not involve any change to any plant system other than a decrease in the quantity of reactor coolant involved. Thus no new or different kind of accident from any previously evaluated could be created since the proposed change can have no effect on causal mechanisms.

CRITERION 3

Operation in accordance with the proposed changes would not involve a significant reduction in a margin of safety.

The proposed isotopic sampling and analysis method involves smaller quantities of reactor coolant as to reduce the consequences of any coolant release. In addition, the proposed method provides a more accurate measurement of reactor coolant total specific activity than the current method. Also, the proposed changes result in improved ALARA considerations.

The proposed changes involve more restrictive testing conditions which increase the margins of safety and result in improved ALARA considerations. Therefore, the proposed changes do not involve any reduction in any margin of safety.

C. Summary

The proposed amendments would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

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 of safety.

Based upon the preceding analysis Duke Power Company concluded that the proposed amendments do not involve a significant hazards consideration.