DUKE POWER COMPANY

OCONEE NUCLEAR STATION

ATTACHMENT 1

TECHNICAL SPECIFICATIONS

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Table 4.1-3

Minimum Sampling Frequency And Analysis Program

	Item	Check	Frequency
1.	Reactor Coolant	a. Gamma Isotopic Analysis b. Boron Concentration c. $\bar{E}$ Determination (2)	a. 3 times/week* b. 2 times/week** c. Semi-annually
2.	Borated Water Storage Tank Water Sample	Boron Concentration	Weekly* and after each makeup
3.	Core Flooding Tank	Boron Concentration	Monthly* and after each makeup
4.	Spent Fuel Pool Water Sample	Boron Concentration	Monthly and after each makeup
5.	OTSG or Final Feedwater	Gamma Isotopic Analysis	Weekly*
6.	Concentrated Boric Acid Tank	Boron Concentration	Weekly*

* Not applicable if reactor is in a cold shutdown condition for a period exceeding the sampling frequency.

** Applicable only when fuel is in the reactor.

TABLE 4.1-3 NOTES

(1) (Not Used)

(2) $\overline{E}$ determination will be started when gross gamma activity analysis indicates greater than 10μCi/ml and will be determined for each 10μCi/ml increase in gross gamma activity analysis thereafter. A radiochemical analysis for this purpose shall consist of a quantitative measurement of 95 percent of the radionuclides in the reactor coolant with half lives greater than 30 minutes.

(3) (Not Used)

(4) (Not Used)

(5) (Not Used)

(6) (Not Used)

(7) (Not Used)

(8) (Not Used)

(9) (Not Used)

(10) (Not Used)

(11) (Not Used)

DUKE POWER COMPANY

OCONEE NUCLEAR STATION

ATTACHMENT 2

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2/20/96 TECHNICAL SPECIFICATIONS SUBMITTAL

Table 4.1-3

Minimum Sampling Frequency And Analysis Program

	Item	Check	Frequency
1.	Reactor Coolant	a. Gamma Isotopic Analysis	a. 3 times/week*
		~~b. Radiochemical Analysis for Sr 89, 90~~	~~b. Monthly*~~
		~~c. Tritium~~	~~c. Monthly*~~
		~~d. Gross Beta Activity (1)~~	~~d. 3 times/week*~~
		~~e. Chemistry (Cl, F and O_2)~~	~~e. 5 times/week*~~
		b~~f~~. Boron Concentration	b~~f~~. 2 times/week**
		~~g. Gross Alpha Activity~~	~~g. Monthly*~~
		c~~h~~. E Determination (2)	c~~h~~. Semi-annually
2.	Borated Water Storage Tank Water Sample	Boron Concentration	Weekly* and after each makeup
3.	Core Flooding Tank	Boron Concentration	Monthly* and after each makeup
4.	Spent Fuel Pool Water Sample	Boron Concentration	Monthly~~***~~ and after each makeup
5.	OTSG or Final Feedwater	~~a. Gross Beta Activity~~	~~a. Weekly*~~
		~~b. Gamma Isotopic Analysis (3)~~	
6.	Concentrated Boric Acid Tank	Boron Concentration	~~Twice w~~Weekly*

* Not applicable if reactor is in a cold shutdown condition for a period exceeding the sampling frequency.

** Applicable only when fuel is in the reactor.

~~*** Applicable only when fuel is in the wet storage in the spent fuel pool.~~

TABLE 4.1-3 NOTES

(1) (Not Used) ~~When radioactivity level is greater than 10 percent of the limits of Specification 3.1.4, the sampling frequency shall be increased to a minimum once each day.~~

(2) ~~E~~determination will be started when gross gamma activity analysis indicates greater than 10μCi/ml and will be determined for each 10μCi/ml increase in gross gamma activity analysis thereafter. A radiochemical analysis for this purpose shall consist of a quantitative measurement of 95 percent of the radionuclides in the reactor coolant with half lives greater than 30 minutes. ~~This is expected to consist of gamma isotopic analysis of the primary coolant, including dissolved gaseous activities, radiochemical analysis for Sr-89 and Sr-90, and tritium analysis.~~

(3) (Not Used) ~~When gross beta activity increase by a factor of two above background iodine concentrations will be determined by gamma isotopic analysis and performed thereafter when the gross beta activity increase by 10 percent.~~

(4) (Not Used)

(5) (Not Used)

(6) (Not Used)

(7) (Not Used)

(8) (Not Used)

(9) (Not Used)

(10) (Not Used)

(11) (Not Used)

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ATTACHMENT 3

REVISED TECHNICAL JUSTIFICATION

Technical Specification Change

The proposed Technical Specification revision which is provided in Attachment 1 removes several Chemistry surveillance requirements for the Reactor Coolant System (RCS). The surveillances which will be removed from the Technical Specifications include the radiochemical analysis for Sr^{89} and Sr^{90}, tritium, gross beta activity, chloride, fluoride, oxygen, gross alpha activity, and dissolved gas concentration. The surveillance requirements for tritium, chloride, fluoride, and oxygen will be relocated to the Selected Licensee Commitment (SLC) Manual. In addition, the once through steam generator (OTSG) or final feedwater gross beta activity analysis is removed. A reduction in the surveillance frequency for the concentrated boric acid storage tank (CBAST) is included to reduce the current twice a week requirement to a weekly requirement. Finally, a miscellaneous note on the applicability of the Spent Fuel Pool sample is removed.

Background/Technical Justification

This section provides the background and technical justification for each proposed Technical Specification revision separately.

Radiochemical Analysis for Sr^{89} and Sr^{90}

The first proposed Technical Specification change involves the deletion of the monthly requirement to perform a radiochemical analysis of the RCS for Sr^{89} and Sr^{90} per Technical Specification Table 4.1-3 Item 1b. The isotopes Sr^{89} and Sr^{90} have been analyzed and trended since the beginning of operation at Oconee Nuclear Station (ONS). These isotopes are of interest due to their biological hazard and long half-life, 52 days and 28.1 years respectively. In addition, strontium (Sr^{89} and Sr^{90}) is factored into the semi-annual calculations for 224/Ebar due to a Technical Specification requirement to account for 95% of the RCS activity in the event of a postulated steam generator tube rupture (SGTR) accident.

With Oconee's operational history and two decades of strontium data trending, an accurate baseline has been established for normal operating conditions. Strontium activity is within a range of 1.0E-5 and 1.0E-7 during normal operations. This amount would not impact the total related activities when performing the semi-annual Ebar calculations. Also, the strontium activity constitutes less than 2.0E-3% of the total RCS activity.

If any potential biological threats and/or abnormal activity increased in the RCS, the gamma spectral analysis (3/week) would identify the anomalies. In addition, the current methodology for evaluating the SGTR accident doses is tied to a technical specification requirement, along with Ebar determination, which puts a specific limit on the dose equivalent iodine (DEI) in the RCS. This requirement is a more conservative approach to determining the SGTR accident doses as opposed to the Ebar technical specifications.

An additional Technical Specification requirement in Table 4.1-3, page 4.1-12, Note: (2) will be maintained. This will require an Ebar determination to be initiated when the gross gamma analysis indicates greater than 10μCi/ml and will be redetermined for each additional 10μCi/ml increase.

The proposed elimination of the radiochemical analysis of strontium is justified due to the low strontium activity levels, the ability to detect RCS anomalies with the gamma spectral analysis (3/week), the conservative approach in evaluating the SGTR accident doses, and the additional requirement to perform an Ebar determination when the gross gamma analysis increases above the acceptable limits. The absence of the strontium analysis will in no way impair the qualitative or quantitative assessment of the RCS isotopic inventory under normal operations. However, the elimination of the strontium analysis will present a cost savings and a substantial dose reduction.

Tritium Analysis

Tritium is a known biological hazard with a half-life of 12.3 years. The production mechanism of the tritium in the RCS is well known and projections can be made in regards to the RCS inventory. Ternary fission and fast neutron reactions with the RCS constituents are the major production mechanisms. The fast neutron reaction production mechanism is the only area where ONS can exercise any significant control. In order to control the fast neutron reactions, 99.9% pure Li^7 is utilized to control the RCS pH level as opposed to Li^6. In

addition, the use of 99.9% pure Li^7 is a commitment to the American Nuclear Insurers.

ONS has programs, as required by NUREG 0472, implemented by SLC 16.11, to monitor all effluents which leave the site for tritium content. Processed water from the Radwaste facility is composited daily and analyzed monthly for tritium content. Samples from the chemical treatment pond discharge are composited daily and analyzed monthly for tritium content. Also, an air monitoring analysis is performed within containment whenever the Reactor Building is entered.

Removal of this surveillance from Technical Specification Table 4.1-3 Item 1c, will not eliminate the commitment to perform the tritium analysis. The tritium analysis will be placed in the SLC manual with a quarterly surveillance frequency. The proposed Technical Specification change can be justified due to the effluent monitoring programs in place at ONS, the use of Li^7 to reduce the amount of tritium in the RCS, and the placement of the surveillance in the SLC manual with a quarterly frequency. The removal of the tritium analysis from Technical Specifications will in no way impair the protection of the public health and safety. However, the Technical Specification change will present a cost savings and a dose reduction.

Gross Beta and Alpha Activity Analysis

The gross beta and alpha analyses were instituted in the early 1970s when ONS began commercial operation. Since the advanced multichannel gamma isotopic analyzer (MCA) technology was not available at the time, the RCS fission products and fuel cladding integrity were trended using the gross beta and alpha analyses. In the past two decades, the radiochemistry program at ONS has advanced to the state of the art in MCA technology. The MCA equipment allows for precise identification of the individual isotopes in the RCS. This includes the identification of the beta and alpha emitting fission products from their gamma emissions, except for pure beta emitters such as tritium and Sr^{90}.

Consistent with INPO and EPRI guidelines, ONS maintains numerous programs for tracking and analysis of RCS activity. These activities are outlined in the ONS Chemistry Section Manual 3.36, "Radiochemistry Program." Currently these programs include the sampling program for RCS liquids and cruds (including count times for delayed counting), daily, weekly, monthly and three times per year trending and review of specified isotopes and a formalized extended delayed counting program. Any adverse trends are identified and investigated for cause that may include sample preparation errors, counting interfaces, fuel defects,

containment ingress and component wear/failure. Currently, the isotopes reviewed include, Ag^{110M}, Cd^{115}, IN^{115M}, Ar^{41}, Cs^{134}, Cs^{137}, Cs^{138}, Co^{51}, Co^{58}, Co^{60}, Mn^{54}, Mn^{56}, I^{131}, I^{133}, Kr^{85M}, Kr^{88}, Na^{24}, Nb^{95}, Zr^{95}, Zr^{97}, Np^{239}, Xe^{133}, Xe^{135}, Xe^{135M}. An additional review of the analysis data is conducted 3 times per year to evaluate the behavior characteristics of individual isotopes.

The elimination of the gross beta and alpha activity analysis from Technical Specification Table 4.1-3 Item 1d and 1g will not impair the assessment of the RCS isotopic inventory. Finally, the elimination of this surveillance requirement will result in a cost savings and dose reduction for ONS. The associated note #1 on page 4.1-12 has been deleted because the gross beta and alpha activity analysis was deleted.

Chemistry (oxygen, chloride, and fluoride) Analysis

The limits on the oxygen, chloride and fluoride levels for the RCS in Technical Specification Section 3.1.5 and Table 4.1-3 Item 1e are intended to protect the integrity of the RCS against stress corrosion cracking. This concern is based on laboratory data which demonstrates stress corrosion cracking in high temperature water in the presence of oxygen and ionic chloride.

While these concerns are valid over a period of time and high concentration levels, the chemistry specifications for these parameters are not based on the operability of any of the associated systems. Therefore, the chemistry specifications should be relocated to the SLC manual with a reduced surveillance frequency of three times per week. This change will not alter the current operating practices and limits for the RCS which are derived from the Electric Power Research Institute's (EPRI) "Pressurized Water Reactor Primary Water Chemistry Guidelines" Revision 2. FSAR Chapter 5.2.1.7 contains Oconee's commitment to utilize the EPRI guidelines for the RCS chemistry specifications. These EPRI guidelines contain various action levels which require plant shutdown dependent on the oxygen, chloride, and fluoride levels in the RCS. EPRI action level 2 allows 24 hours to shutdown the plant if oxygen, chloride and fluoride levels exceed 100, 150, and 150 ppb respectively. EPRI action level 1 requires immediate shutdown if the limits of 1000, 1500 and 1500 ppb respectively are exceeded.

The removal of the chemistry specifications from Technical Specifications will not impair the protection of the public safety and health. ONS has programs in place to monitor the oxygen, chloride and fluoride levels in the RCS. In addition, the requirements of this

program will be contained in the SLC manual with a surveillance frequency of 3 times per week and shutdown requirements consistent with the EPRI guidelines. The reduced frequency is justified due to the fact that these RCS parameters develop over several days or even weeks during normal operation. The reduced frequency ensures that changes in the oxygen, chloride, and fluoride levels will be determined in advance and corrected prior to exceeding the shutdown requirements. Finally, the sampling frequency reduction will result in a cost savings and a dose reduction for ONS.

OTSG or Final Feedwater Gross Beta Activity

The current Technical Specification, Item 5 of Table 4.1-3, for gross beta activity requires that the gamma isotopic analysis be performed if the gross beta activity increases by a factor of two above the background iodine concentrations. In addition, a gamma isotopic analysis is required when the gross beta activity increases by 10 percent. Currently, the ONS Chemistry Manual requires gamma isotopic analysis regardless of the gross beta results. These programs provide an adequate means of monitoring the isotopic analysis. Removal of this analysis from the Technical Specifications will not impair the assessment of the gamma isotopic activity. Finally, the elimination of this requirement will result in a cost savings and dose reduction for ONS.

Boron Concentration Analysis of the CBAST

Boron precipitation is prevented by the normal operational restrictions that are associated with the CBAST. The CBAST is utilized for the addition of borated water to the RCS and is maintained in a normally isolated condition. The level of the CBAST is monitored in the ONS Control Room on instrumentation monitors. The operator aided computer (OAC) provides alarms for the operator if the temperature of the CBAST exceeds preset values. In addition, operational procedures require evaluation of the CBAST boron concentration within four hours after completing any volume transfers.

Reduction of the CBAST boron concentration surveillance requirements in Technical Specification Table 4.1-3 Item 6 to a weekly frequency will not impair the protection of the public health and safety. Remote monitoring instrumentation, OAC alarms and operational procedure requirements ensure that daily plant activities do not result in the CBAST boron concentration exceeding the Technical Specifications. This proposed change will result in a cost savings for ONS due to a reduced sampling frequency.

Dissolved Gas Concentration Analysis

The B&W total dissolved gas specifications of 100 standard cc/liter of water evolved from an incident that occurred during the initial testing of ONS Unit 1 in 1971. During the testing, a nitrogen overpressure of 400 psig was established on the pressurizer to operate the reactor coolant pumps. This resulted in a concentration of 300 standard cc N^2/liter of water in the pressurizer. Following pressurization of the system, a pressurizer valve failed which resulted in a sudden depressurization to about 60 psig. A gas pocket formed in the reactor vessel and some of the control rod drive mechanisms (CRDM). In conjunction with this event, the control rod drop tests were being conducted. When the control rods dropped, several of the control rods were damaged because the CRDMs did not have the necessary inventory of six inches of water above the snubbing springs for proper dampening action.

During the operational history of ONS, the dissolved gas concentration has not exceeded the Technical Specification limits. The total dissolved gas is normally less than 50 standard cc/liter of water. The potential problems with the dissolved gases are likely to occur during periods other than normal operations (i.e., heatup, power movement operation, and cooldown). Dissolved gases can come out of solution if there is a pressure reduction to the point where the total system pressure is less than the sum of the partial pressures of the dissolved gases and the partial pressure of the reactor coolant. At Oconee, procedures are in place to ensure that the appropriate actions are taken for conditions that would result in a "gas-out" problem. Control of gases during heatup, power operation, and cooldown is by procedures OP/1,2,3/A/1103/02, Filling and Venting, and procedure OP/1,2,3/A/1102/01, Controlling Procedure for Unit Start-up. The CRDMs and the RCS loops are vented by Operations following the RCS refill. Procedure OP/0/A/1105/09, Control Rod Drive System, contains the Technical Specification curve for gases in solution and limits the RCS level and pressure when the RCS is pressurized to prevent a gas-out problem.

The elimination of Technical Specification Section 3.1.10 on the dissolved gas concentration in the RCS will not impair the protection of the public health and safety. OAC parameters and operational procedures are in place to ensure that a potential gas-out problem does not occur. In addition, the elimination of this requirement will result in a cost savings to ONS.

Spent Fuel Pool Sampling Note Deletion

The note on Page 4.1-10 for the Spent Fuel Pool (SFP) Water sampling will be deleted by this amendment. This note indicates that the SFP sampling is applicable only when fuel is in wet storage in the pool. This note was in the original Technical Specification to prevent excessive monitoring prior to storing fuel in the pool. Since fuel will be in the SFP for wet storage, this note is no longer necessary.

Justification

Each specification being removed from the Technical Specifications was reviewed against the four criteria from 10 CFR 50.36. If none of the criteria are met, then a Technical Specification is unnecessary. The following information addresses each criterion and indicates that no Technical Specifications are required.

Criterion 1 - Installed instrumentation that is used to detect and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary.

Response - The deletion of the surveillances from Technical Specifications will not impact the ability of the control room to detect a significant abnormal degradation of the reactor coolant pressure boundary. The required instrumentation in the control room to detect significant degradation of the reactor coolant pressure boundary is not affected by the associated surveillances or surveillance frequencies.

Criterion 2 - A process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Response - The removal of the surveillances by this amendment does not involve a process variable, design feature, or operating restriction that is an initial condition of a design basis accident or transient analysis.

Criterion 3 - A structure, system, or component (SSC) that is part of the primary success path and which functions to mitigate a design basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier.

Response - The removal of the chemistry surveillances by this amendment does not involve an SSC which is required to mitigate a design basis accident or transient.

Criterion 4 - A SSC which operating experience or probabilistic risk assessment (PRA) has shown to be significant to public health and safety.

Response - Operating experience and the PRA has not shown the surveillances removed by this amendment to be safety significant.

Based on the information provided in this attachment, Duke Power concludes that the proposed amendment is acceptable.