TECHNICAL SPECIFICATION AND OFFSITE DOSE CALCULATION MANUAL METEOROLOGICAL REQUIREMENTS

November 1, 1991

by

R. Brad Harvey, CCM
Yankee Atomic Electric Company

Yankee Atomic Electric Company
580 Main Street
Bolton, Massachusetts 01740, USA

TECHNICAL SPECIFICATION AND OFFSITE DOSE CALCULATION MANUAL METEOROLOGICAL REQUIREMENTS

R. Brad Harvey, CCM
Yankee Atomic Electric Company

1.0 Introduction

There are several EPA and NRC regulations limiting the routine release of radioactive materials in the gaseous effluents of nuclear power plants. The intent of these regulations is to control the resulting offsite radiation exposures to the public to "as low as is reasonably achievable". Consequently, operating conditions for the control of radioactive effluents have been imposed on these facilities. To implement these operating conditions (i.e., Technical Specifications), the dispersion of effluents in the atmospheric and the resulting radiation doses to man must be determined.

The intent of this paper is to review the current and potential future needs for meteorological and atmospheric dispersion data in implementing nuclear power plant Technical Specifications. Standards for protection against radiation as promulgated by both the EPA and NRC are reviewed and the meteorological requirements of the resulting Radiological Effluent Technical Specifications and related Offsite Dose Calculation Manual are discussed. Finally, potential impacts of recent changes in the NRC Standards for Protection Against Radiation and the initiation of the NRC Technical Specification Improvement Program are reviewed.

The information presented in this paper is based on published NRC guidance materials as well as Yankee's experience in supporting Radiological Effluent Technical Specifications and Offsite Dose Calculation Manuals for five operating nuclear power plants in New England.

2.0 Standards for Protection Against Radiation

Both the EPA and the NRC have promulgated regulations designed to limit the amount of radiation exposure allowed offsite due to licensee's activities. A synopsis of these regulations follows:

1. **10 CFR Part 20: NRC Standards for Protection Against Radiation**
   Section 20.106, "Radioactivity in Effluents to Unrestricted Areas", of 10 CFR Part 20, "Standards for Protection Against Radiation", states that releases of radioactive materials to unrestricted areas should not result in annual average airborne concentrations exceeding those specified in Appendix B, Table II, Column 1, of 10 CFR Part 20.

2. **40 CFR Part 190: EPA Radiation Protection Standards for Nuclear Power Operations**
   Section 190.10, "Standards for Normal Operation", of Subpart B, "Environmental Standards for the Uranium Fuel Cycle", of 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations", states that the dose equivalent to any member of the public from uranium fuel cycle operations (including such activities as uranium ore milling, uranium enrichment, fuel fabrication, and electricity generation) should not exceed 25 mrem/yr to the whole body, 75 mrem/yr to the thyroid, and 25 mrem/yr to any other organ as the result of offsite discharges of radioactive materials.

3. **10 CFR Part 50, Appendix I: NRC Design Objectives for Control of Radioactive Materials in Nuclear Power Reactor Effluents**

Section 50.34a, "Design Objectives for Equipment to Control Releases of Radioactive Material in Effluents - Nuclear Power Reactors", to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities", states that each application for a license to either construct or operate a nuclear power reactor should include a description of the equipment and procedures to be used for keeping levels of radioactive material in effluents to unrestricted areas "as low as is reasonably achievable". Appendix I to 10 CFR Part 50 provides numerical guidance on the design objectives of radwaste treatment systems and states that the annual total quantity of radioactive material released to the atmosphere from all units at a site should not result in gamma and beta air doses exceeding 10 mrad/yr and 20 mrad/yr, respectively, at or beyond the site boundary. These design objectives are intended to limit doses to any individual in an unrestricted area to less than 5 mrem/yr to the total body and 15 mrem/yr to the skin. In addition, the annual total quantity of radioactive iodine and particulates released to the atmosphere from all units at a site should not result in a dose or dose commitment exceeding 15 mrem/yr to any organ of an individual in an unrestricted area.

The NRC promulgated a complete revision to 10 CFR Part 20 in May 1991 which has the effect of lowering the dose limits for individual members of the public. Licenses have until January 1, 1993 to implement the new 10 CFR Part 20 rule. This paper will primarily address the Technical Specification and ODCM requirements for the old 10 CFR Part 20 rule since, to the author's knowledge, the NRC has not yet published Technical Specification and ODCM guidance addressing the new rule. Potential impacts of the new 10 CFR Part 20 rule on Technical Specifications and the ODCM will be discussed in a later section of this paper.

3.0 Technical Specifications

Section 182a of the Atomic Energy Act of 1954 (as amended) mandates the inclusion of Technical Specifications in the licenses of facilities allowed to produce and utilize special nuclear materials. Technical Specifications impose limits, operation conditions, and other regulatory requirements on the facility operation for the protection of the health and safety of the public.

Section 50.36, "Technical Specifications", of 10 CFR Part 50 was promulgated in the late 1960's to implement Section 182a of the Atomic Energy Act and delineates requirements for the contents of Technical Specifications. Subsequently, Standard Technical Specifications have been developed by the NRC staff for each appropriate nuclear steam supply system vendor to provide guidance to licensees in preparing and maintaining their facility's Technical Specifications. These Standard Technical Specifications include the following:

NUREG-0103 "Standard Technical Specifications for Babcock and Wilcox Pressurized Water Reactors"

NUREG-0123 "Standard Technical Specifications for General Electric Boiling Water Reactors"

NUREG-0212 "Standard Technical Specifications for Combustion Engineering Pressurized Water Reactors"

NUREG-0452 "Standard Technical Specifications for Westinghouse Pressurized Water Reactors"

The NRC published a new series of draft Standard Technical Specifications for public comment earlier this year. These new Standard Technical Specifications were developed based on the criteria in the interim NRC Policy Statement on

Technical Specification Improvements for Nuclear Power Reactors published in 1987 (52 FR 3788). This section will discuss the meteorological-related Specifications presented in the current set of Standard Technical Specifications; a later section of this paper will discuss the meteorological-related Specifications presented in the new draft Standard Technical Specifications.

Meteorological-related Standard Technical Specification requirements are fairly consistent among the various plant types. Consequently, the remaining portions of this section will refer to the section numbering system and wording presented in the latest revision to NUREG-0452 (draft Revision 5 issued in the mid-1980's).

1. **Meteorological Monitoring Instrumentation**

   Specification 3.3.3.4, "Meteorological Instrumentation", of Section 3.0, "Limiting Conditions for Operation", states that the wind speed, wind direction, and temperature difference (delta-T) channels listed in the accompanying Table 3.3-8 should be Operable at all times. The channels listed include the following:

   - Wind speed and direction measured at approximately 10 and 60 meters above plant grade, and if necessary, at a higher level representative of diffusion conditions from stack release points, and

   - Delta-T measured between the 10 and 60 meters and, if necessary, between the 10 meter and a higher level representative of diffusion conditions from stack release points.

   Operability implies that the instrumentation and its related components are all capable of performing their intended functions. If one or more of the required channels are inoperable for more than 7 days, a Special Report must be

submitted to the NRC within the next 10 days outlining the cause of the malfunction and the plans for restoring the channel(s) to operable status.

Specification 4.3.3.4, "Meteorological Instrumentation", of Section 4.0, "Surveillance Requirements", states that each of the meteorological monitoring channels listed in Table 3.3-8 be demonstrated Operable by the performance of a daily Channel Check and a semi-annual Channel Calibration. A Channel Check is defined as a qualitative assessment of channel behavior during operation by observation and, if possible, comparison with other indications and channel readouts. A Channel Calibration is the adjustment, as necessary, of the channel such that it responds within the required range and accuracy to known values of input. (Note that meteorological channel ranges and accuracies are not specified as part of the Standard Technical Specifications).

Specification 5.5, "Meteorological Tower Location", of Section 5.0, "Design Features", references Figure 5.1-1 showing the location of the meteorological tower on a site map.

According to the Standard Technical Specification bases for Specifications 3.3.3.4 and 4.3.3.4, the Operability of the meteorological instrumentation ensures that sufficient meteorological data are available for estimating potential radiation doses to the public as a result of routine or accidental release of radioactive materials to the atmosphere. This capability is required to evaluate the need for initiating protective measures to protect the health and safety of the public and is consistent with the recommendations of Regulatory Guide 1.23, "Onsite Meteorological Programs".

2. Radiological Effluent Technical Specifications

In order to keep releases of radioactive materials to unrestricted areas during normal operator operations to as low as is reasonably achievable, Section

50.36a, "Technical Specification on Effluents from Nuclear Power Reactors", to CFR Part 50 requires nuclear power reactor Technical Specifications to contain provisions requiring compliance to 10 CFR 20.106 and commitments made to 10 CFR 50.34a and Appendix I to CFR Part 50 as part of the license application. Operating reactors licensed before 1979 had their Technical Specifications amended during the mid-1980's to include Radiological Effluent Technical Specifications (RETS); reactors licensed after 1979 included RETS as part of their initial Technical Specifications.

RETS contain the operating criteria for complying with 10 CFR 20.106, 40 CFR 190.10, and Appendix I to 10 CFR Part 50. The equations for dose calculations and effluent monitor setpoint determinations used to comply with RETS are documented in a separate document entitled the Offsite Dose Calculation Manual (ODCM).

Copies of model RETS have only been available in draft form. The documents which eventually become the NRC staff's acceptance criteria for operating reactor RETS were draft revisions of NUREG-0472, "Radiological Effluent Technical Specifications for PWRs", and NUREG-0473, "Radiological Effluent Technical Specifications for BWRs". Guidance for the general contents of the ODCM was provided in an appendix to a paper presented at an Atomic Industrial Forum (AIF) conference in 1981; a copy of this paper is also provided as Appendix B to NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors". Initial guidance for the preparation of RETS and the ODCM was also provided in NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants".

A summary of RETS requiring meteorological and atmospheric dispersion data for implementation is provided in Exhibit 1. A brief discussion and

interpretation of each of these Specifications follows; the implementation of each of these RETS is reviewed in a following subsection describing the ODCM.

a. TS 3.3.3.11: Radioactive Gaseous Effluent Monitoring Instrumentation

Radioactive gaseous effluent monitoring instrumentation channels should have their Alarm/Trip Setpoints set to ensure that the limits of Technical Specification 3.11.2.1 are not exceeded (see following section). The Setpoints for these instruments are intended to ensure that the instantaneous dose rates at any time at and beyond the Site Boundary from noble gas effluents from all units on the site will be within the annual dose limits associated with the 10 CFR Part 20 airborne concentration limits (i.e., $\leq$ 500 mrem/yr to the whole body and $\leq$ 3000 mrem/yr to the skin).

The Alarm/Trip Setpoints for any gaseous effluent radiation monitor are based on measured instantaneous release rates (i.e., μCi/sec). The Setpoints are based only on radioactive noble gases in the gaseous effluents; it is not considered practicable to apply instantaneous Setpoints to integrating radiation samplers sensitive to radioiodines or radioactive materials in particulate form.

b. TS 3.11.2.1: Gaseous Effluents - Dose Rate

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary should be limited to:

1. For noble gases: $\leq$ 500 mrem/yr to the whole body and $\leq$ 3000 mrem/yr to the skin, and

2. For ^{131}I, ^{133}I, ^{3}H, and all radionuclides in particulate form with half-liver greater than 8 days: $\leq$ 1500 mrem/yr for any organ.

This specification provides reasonable assurance that radioactive material discharged in gaseous effluents from all units on the site will not result in the exposure of a member of the public in an unrestricted area to annual average concentrations exceeding the limits specified in Appendix B, Table II, Column 1 of 10 CFR Part 20. The annual dose limits specified are the doses associated with the radionuclide concentrations listed in 10 CFR Part 20.

This specification is implemented in actual practice by limiting peak release rates (i.e., μCi/sec) such that the dose rate at any time predicted from releases at the peak rate will always be within the annual dose limits (i.e., no time averaging). For example, by limiting the peak release rate to a value equivalent to the maximum site boundary whole body dose rate limit of 500 mrem/yr (0.057 mrem/hr), the maximum whole body dose incurred in any one year by any member of the public will be less than 500 mrem.

Note that if all noble gas releases occur through one monitored release pathway, compliance with the dose rate limits for noble gases can be demonstrated when effluent release rates are continuously below the vent's noble gas activity monitor alarm setpoint by virtue of the fact that the alarm setpoint is based on values which correspond to the offsite dose rate limit.

c. **TS 3.11.2.2: Dose - Noble Gases**

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the Site Boundary should be limited to the following:

1. During any calendar quarter: ≤ 5 mrad for gamma radiation and ≤ 10 mrad for beta radiation, and

2. During any calendar year: ≤ 10 mrad for gamma radiation and ≤ 20 mrad for beta radiation.

Cumulative dose contributions for the current calendar quarter and current calendar year should be determined at least once per 31 days.

This Specification is provided to implement the design objectives of Appendix I to 10 CFR Part 50.

d. **TS 3.11.2.3: Dose - ^{131}I, ^{133}I, ^{3}H, and Radioactive Material in Particulate Form**

The dose to a member of the public from ^{131}I, ^{133}I, ^{3}H, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each unit, to areas at and beyond the Site Boundary should be limited to the following:

1. During any calendar quarter: ≤ 7.5 mrem to any organ, and

2. During any calendar year: ≤ 15 mrem to any organ.

Cumulative dose contributions for the current calendar quarter and current calendar year should be determined at least once per 31 days.

This Specification is also provided to implement the design objectives of Appendix I to 10 CFR Part 50.

e. **TS 3.11.2.4: Gaseous Radwaste Treatment System**

The Gaseous Radwaste Treatment System should be used to reduce releases of radioactivity when the projected doses in 31 days due to gaseous effluent releases, from each unit, to areas at and beyond the site boundary would exceed:

1. 0.2 mrad to air from gamma radiation, or
2. 0.4 mrad to air from beta radiation, or
3. 0.3 mrem to any organ of a member of the public.

Doses should be projected at least once per 31 days when Gaseous Radwaste Treatment Systems are not being fully utilized.

The requirement that these systems be used, when specified, provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable", thus implementing the design objectives of Appendix I to 10 CFR Part 50. This specification provides impetus to maintain and use the gaseous radioactive waste system as required in Section 50.36a of 10 CFR Part 50.

Note that the values for the projected impact, given above, correspond to approximately 2 percent of the annual design dose objective values of Appendix I of 10 CFR Part 50 in a month, and if continued for a year, these values would correspond to less than 25 percent of the values limited by Specifications 3.11.2.2b and 3.11.2.3b.

f. **TS 3.11.4: Total Dose**

The annual (calendar year) dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources should be limited to $\leq$ 25 mrem to the whole body or any organ, except the thyroid, which should be limited to $\leq$ 75 mrem.

This specification is provided to meet the dose limitations of 40 CFR Part 190. Dose commitments to the members of the public from other uranium fuel cycle sources are considered negligible if there are no other nuclear fuel cycle facilities at the same site or within a radius of 5 miles.

3. **Semiannual Radioactive Effluent Release Report**

Section 50.36a of 10 CFR Part 50 requires each licensee to submit a report twice a year to the NRC specifying the quantity of radionuclides released in liquid and gaseous effluents to unrestricted areas during the previous six months. Also to be included in these reports is any other information deemed necessary by the NRC for estimating maximum potential annual radiation doses to the public resulting from effluent releases. Consequently, Section 6.9.1.4, "Semiannual Radioactive Effluent Release Report", has been added to Standard Technical Specifications.

This Specification requires that, among other items, the Semiannual Effluent Release Report submitted within 60 days after January 1 of each year include the following:

- An annual summary of hourly meteorological data collected over the previous year,

- An assessment of the radiation doses from liquid and gaseous effluents to Members of the Public due to their activities inside the Site Boundary, and

- An assessment of 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 to show conformance with 40 CFR Part 190.

The assessment of doses should be in accordance with the methodology and parameters in the ODCM. The meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents should be used for determining the gaseous pathway doses.

Yankee typically reports potential maximum quarterly and yearly offsite organ doses resulting from airborne iodines, tritium, and particulate radionuclides, and potential maximum offsite gamma air and beta air doses from airborne noble gases utilizing concurrent quarterly-averaged meteorology. In addition, if applicable, doses associated with gaseous effluent are also reported for "special" receptor locations inside the site boundary. These maximum gamma air, beta air, and organ doses are then compared to the dose limits specified in Specifications 3.11.2.2 and 3.11.2.3 (Appendix I to 10 CFR Part 50 Design Objectives). The sum of the maximum whole body doses from all exposure pathways for liquid and gaseous effluents, plus the direct whole body dose from station operation, are also calculated and compared to 40 CFR Part 190 Standards.

4. Offsite Dose Calculation Manual

The Offsite Dose Calculation Manual (ODCM) contains, among other items, the methodology and parameters employed in the calculation of offsite doses

and gaseous effluent monitoring Alarm/Trip Setpoints used to implement the RETS and produce the Semiannual Radioactive Effluent Release report. This section outlines some of the techniques available for generating atmospheric dispersion factors utilized by the ODCM to produce dose projections, based on guidance provided by NUREG-0133 and techniques developed and implemented by Yankee.

There are four types of atmospheric dispersion and deposition factors utilized by Yankee in producing dose assessments within the ODCM:

- Undepleted CHI/Q dispersion factors used for estimating noble gas concentrations for evaluating beta air and skin doses,

- Depleted CHI/Q dispersion factors used for estimating radioiodines and particulate concentrations for evaluating organ doses,

- Gamma CHI/Q dispersion factors used for estimating gamma dose rates from a finite noble gas cloud for evaluating gamma whole body, skin, and air doses, and

- D/Q deposition factors for evaluating dry deposition of radioiodines and particulates for evaluating organ doses.

Appropriate techniques for determining the undepleted and depleted CHI/Q dispersion factors and the D/Q deposition factors are provided in Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors", and in NUREG/CR-2919, "XOQDOQ: Computer Code for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations". However, we have seen poor correlations between the dispersion and

deposition factors utilizing the Regulatory Guide 1.111 relative deposition curves for stack (elevated) releases. For example, the maximum offsite dispersion and deposition factors have been predicted to occur at different downwind distances in different sectors, primarily due to the limited ability of the Regulatory Guide 1.111 deposition curves to quantify the effects of plume height and vertical plume standard deviation. Consequently, Yankee has opted for utilizing a deposition velocity modeling approach for determining D/Q factors for stack release pathways.

Yankee calculates gamma dose rates using the finite cloud model presented in Section 7-5.2.5, "Average Gamma Dose from Continuous Releases over Long Time Periods", in Meteorology and Atomic Energy - 1968. The finite cloud model is implemented through the definition of an effective gamma CHI/Q dispersion factor. The gamma CHI/Q dispersion factor is defined such that the standard gamma dose rate equation for a semi-infinite cloud is converted to the dose rate equation for a finite cloud by replacing the undepleted CHI/Q factor in the semi-infinite cloud dose equations with the gamma CHI/Q factor. The gamma CHI/Q factor is applied for both ground-level and elevated releases and accounts for the gamma radiation spectrum associated with the airborne radioactivity.

Historic atmospheric dispersion conditions are typically utilized for making dose estimates within the ODCM. The frequency and duration of the releases should be considered in developing the appropriate dispersion and deposition factors as follows:

- "Long-term" releases are generally continuous ($>$ 500 hrs/yr) with stable release rates such as is experienced in normal ventilation system effluents. Historic annual average dispersion and deposition factors can be utilized in dose rate equations evaluating long-term releases.

- "Short-term" releases are intermittent in either radionuclide concentrations or flow rates due to operational variations (i.e., containment purge or venting to the atmosphere of the Waste Gas System). Short-term releases have been defined in NUREG-0133 as those which occur for a total of ≤ 500 hours in a calendar year. Dose estimates for short-term releases can be determined using historic annual average dispersion conditions if the releases are random in both duration and time-of-day. Otherwise, the short-term dispersion and deposition factors should be determined as a function of the estimated total hours of release using the intermittent release analyses described in NUREG/CR-2919.

Yankee has developed a two-tier approach for performing dose analyses within the ODCM. "Method I" consists of generating doses utilizing simple equations derived from five-year average dispersion and deposition factors. If a dose rate greater than a Technical Specification limit is predicted, or if a more refined dose calculation is desired, the ODCM also allows the use of a "Method II" option to estimate doses utilizing actual meteorology to obtain release-specific dispersion factors.

The Semiannual Radioactive Effluent Release Report filed 60 days after January 1 each year requires that meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents be used for determining gaseous pathway doses. For long-term release sources, Yankee typically utilizes concurrent quarterly average meteorology along with the total quarterly release to perform the dose calculations. For short-term releases requiring discharge permits, concurrent meteorology during the period of release is used to determine doses.

The most limiting site boundary location in which individuals are, or might be located as a place of residence, is assumed to be the receptor for all the

gaseous release pathways considered, over-water and over-marsh areas excepted. Note that the maximum site boundary undepleted CHI/Q, depleted CHI/Q, gamma CHI/Q, and D/Q values can occur in different sectors. If so, Method I uses the highest calculated dispersion factors, regardless of actual location, to calculate the maximum offsite dose; Method II utilizes the dispersion factors calculated for each receptor location in evaluating offsite doses.

4.0 Technical Specification Improvement Program and Generic Letter 89-01

The NRC issued an Interim Policy Statement in February 1987 (52 FR 3788) announcing a Technical Specification Improvement Program. The intent of the Interim Policy Statement was to reverse a trend of including essentially all NRC requirements governing the operation of nuclear power reactors in the Technical Specifications. This trend was contributing to a several fold increase in the number of license amendment applications requesting changes to Technical Specifications, requiring significant NRC staff and licensee attention.

The Interim Policy Statement offers criteria for determining which regulatory requirements and operating restrictions should be included in Technical Specifications. Specification items involving maintaining the integrity of the physical barriers designed to contain radioactivity are to be continued to be maintained in the Technical Specifications and require NRC approval prior to modification. The remaining specification items can be removed from the Technical Specification and relocated to other licensee-controlled documents such as the FSAR or licensee procedures which require 10 CFR 50.59 safety reviews prior to modification. Licensees are being encouraged (but not required) to upgrade their Technical Specifications consistent with the Interim Policy Statement.

In fulfillment of the goal of its Interim Policy Statement, the NRC issued guidance on how to implement the Technical Specification Improvement Program with respect to RETS in Generic Letter 89-01. This guidance stated that programmatic controls to satisfy existing regulatory requirements for RETS should be implemented in Technical Specification Section 6.0, "Administrative Controls", while the procedural details of RETS should be relocated essentially unchanged to the ODCM. A synopsis of the meteorological-related Technical Specification revisions suggested by Generic Letter 89-01 is provided in Exhibit 2. Guidance on implementing the provisions of Generic Letter 89-01 can be found in NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors" (Generic Letter 89-01, Supplement No. 1).

A new set of draft Standard Technical Specifications based on the Technical Specification Improvement Program criteria have also been recently released for public comment:

NUREG-1430 "Standard Technical Specifications, Babcock and Wilcox Plants"

NUREG-1431 "Standard Technical Specifications, Westinghouse Plants"

NUREG-1432 "Standard Technical Specifications, Combustion Engineering Plants"

NUREG-1433 "Standard Technical Specifications, General Electric Plants, WR/4"

NUREG-1434 "Standard Technical Specifications, General Electric Plants, BWR/6"

As expected, the provisions of Generic Letter 89-01 have been implemented in these new Standard Technical Specifications, except that the descriptions of the ODCM and Radioactive Effluent Controls Program have been moved to Section 5.7.4, "Administrative Controls - Programs and Procedures".

As should be expected, Section 3/4.3.3.4 of the old Standard Technical Specifications, "Meteorological Monitoring Instrumentation", has also been eliminated from the new draft set of Standard Technical Specifications. Although not explicitly discussed by existing NRC guidance materials, the intent may be to relocate specifications such as these to a new Section 16.3 of the FSAR, "The Technical Specification Improvement Program", and include them in a new controlled document entitled "The Requirement Specifications Manual".

5.0 Revised 10 CFR Part 20

The NRC issued a complete revision to 10 CFR Part 20 in May 1991 to reflect changes in the basic philosophy of radiation protection. The new 10 CFR Part 20 reflects a more conservative approach to assessing risk to the public from low level radiation exposure. The new 10 CFR Part 20 also incorporates updated scientific information on radionuclide uptake and metabolism.

Section 20.1301 of the new 10 CFR Part 20, "Dose Limits for Individual Members of the Public", replaces Section 20.106 of the old 10 CFR Part 20. The new Section 20.1301 states that the "total effective dose equivalent" to individual members of the public from licensee operations should not exceed 100 mrem in a year and the dose in any unrestricted area from external sources should not exceed 2 mrem in any one hour. Note that the hourly limit is also the lower limit for a Radiation Area. The hourly limit is intended to provide a more readily measurable quantity than the yearly limit since it can be more easily verified by short-term measurements.

The new 10 CFR Part 20 regulations became effective on June 30, 1991, but licensees may defer implementation of the new rule until January 1, 1993. To the author's knowledge, there has been no guidance issued by the NRC concerning the implementation of the new 10 CFR Part 20 within the RETS and the ODCM. Specification 3.3.3.11 (Alarm/Trip Setpoints) and Specification 3.11.2.1 (dose rate limits) are both based on the old 10 CFR Part 20 Standards, and, consequently, will likely be revised. It is uncertain if the new 10 CFR Part 20 annual dose limit will continue to be interpreted as a release rate limit or if RETS will be amended to implement the new 10 CFR Part 20 hourly dose limit.

6.0 Conclusion

There is an ongoing need for the continued collection and analysis of site-specific meteorological information to support implementation of the Radiological Effluent Technical Specifications and the Offsite Dose Calculation Manual. Although the format of each plant's Technical Specification and ODCM may change in response to the NRC's Technical Specification Improvement Program, the basic applications for meteorological information in implementing Radiological Effluent Technical Specifications are not changing. The one potential exception is the implementation of the new 10 CFR Part 20 annual and hourly dose limits for Individual Members of the Public.

EXHIBIT 1

Summary of Radiological Effluent Technical Specifications
With Meteorological Data Requirements

Technical Specification		Applicable Regulation	Controls
3.3.3.11	Gaseous Effluent Monitor Alarm/Trip Setpoint (for Noble Gases)	10 CFR Part 20[a]	Whole Body Dose Rate: ≤ 500 mrem/yr Skin Dose Rate: ≤ 3000 mrem/yr
3.11.2.1	Gaseous Effluent Dose Rate	10 CFR Part 20[a]	Whole Body Dose Rate from Noble Gases: ≤ 500 mrem/yr Skin Dose Rate from Noble Gases: ≤ 3000 mrem/yr Organ Dose Rate from Iodines and Particulates: ≤ 1500 mrem/yr
3.11.2.2	Gaseous Effluent Doses from Noble Gases	10 CFR Part 50, Appendix I	Gamma Air Dose ≤ 5 mrad/qtr and ≤ 10 mrad/yr Beta Air Dose ≤ 10 mrad/qtr and ≤ 20 mrad/yr
3.11.2.3	Gaseous Effluent Doses from Iodines and Particulates	10 CFR Part 50, Appendix I	Organ Dose ≤ 7.5 mrem/qtr and ≤ 15 mrem/yr
3.11.2.4	Gaseous Radwaste Treatment System	10 CFR Part 50, Appendix I	Gamma Air Dose ≤ 0.2 mrad/month Beta Air Dose ≤ 0.4 mrad/month Organ Dose ≤ 0.3 mrem/month
3.11.4	Total Dose (from uranium fuel cycle)	40 CFR Part 190	Whole Body Dose ≤ 25 mrem/yr Organ Dose ≤ 25 mrem/yr Thyroid Dose ≤ 75 mrem/yr

[a] Section 20.106 of the "old" 10 CFR Part 20.

EXHIBIT 2
(Sheet 1 of 3)

Meteorological-Related Technical Specification Revisions
Suggested by Generic Letter 89-01

1.0 Definitions

1.17 Offsite Dose Calculation Manual

The Offsite Dose Calculation Manual (ODCM) should contain, among other items:

- The methodology and parameters used in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints,
- The Radioactive Effluent Controls Program required by Section 6.8.4, and
- Descriptions of the information that should be included in the Semiannual Radioactive Effluent Release Report required by Technical Specification 6.9.1.4.

6.0 Administrative Controls

6.8 Procedures and Programs

6.8.4(g) Radioactive Effluent Controls Program

A Radioactive Effluent Controls Program should be provided conforming to 10 CFR 50.36a for the control of radioactive effluents and for maintaining the doses to Members of the Public from radioactive effluent as low as reasonable achievable. The program should be contained in the ODCM, implemented by operating procedures, and include remedial actions to be taken whenever the program limits are exceeded. The program should include the following elements:

- Limitations on the operability of radioactive gaseous monitoring instrumentation, including set-point determination, in accordance with the methodology in the ODCM (relocation of Specification 3.3.3.11)

- Determination of cumulative and projected dose contributions from radioactive effluents for the current calendar quarter and current calendar year in accordance with the methodology and parameters in the ODCM at least every 31 days (relocation of a portion of Specification 6.9.1.4)

- Limitations on the operability and use of the gaseous effluent treatment systems to ensure that the appropriate portions of these systems are used to reduce releases of radioactivity when the projected doses in a 31-day period would exceed 2 percent of the guidelines for the annual dose or dose commitment conforming to Appendix I to 10 CFR Part 50 (relocation of Specification 3.11.2.4).

- Limitations on the dose rate resulting from radioactive material released in gaseous effluents to area beyond the Site Boundary conforming to the doses associated with 10 CFR Part 20, Appendix B, Table II, Column 1 (relocation of Specification 3.11.2.1).

- Limitations on the annual and quarterly air doses resulting from noble gases released in gaseous effluents from each unit to areas beyond the Site Boundary conforming to Appendix I to 10 CFR Part 50 (relocation of Specification 3.11.2.2)

- Limitations on the annual and quarterly doses to a Member of the Public from radioiodines and particulates with half-lives greater than 8 days in gaseous effluents released from each unit to areas beyond the Site Boundary conforming to Appendix I to 10 CFR Part 50 (relocation of Specification 3.11.2.3)

- Limitations on the annual dose or dose commitment to any Member of the Public due to releases of radioactivity and to radiation from uranium fuel cycle sources conforming to 40 CFR Part 190 (relocation of Specification 3.11.4).

6.9 Reporting Requirements

6.9.1.4 Semiannual Radioactive Effluent Release Report

The Semiannual Radioactive Effluent Release Report should include a summary of the quantities of radioactive gaseous effluents release from the unit. The material provided should be in conformance with 10 CFR 50.36a and Section IV.B.1 of Appendix I to 10 CFR Part 50 (10 CFR 50.36a requires the submittal of any other information as may be required by the NRC to estimate maximum potential annual radiation doses to the public; Section IV.B.1 of Appendix I to 10 CFR Part 50 requires specific actions be taken if the quantity of radioactive materials actually released in effluents to unrestricted areas during any calendar quarter result in radiation exposure exceeding one-half the Appendix I design objectives).

Note that the previous explicit requirement for an annual meteorological data summary has been eliminated. However, if this requirement already exists in a specific plant's Technical Specifications, it will probably be relocated as a requirement for the Semiannual Radioactive Effluent Release Report as defined in the ODCM.

6.14 Offsite Dose Calculation Manual

Changes to the ODCM:

- Should be documented with a determination that the change will maintain the level of radioactive effluent control required by 10 CFR 20.106, 40 CFR Part 190, 10 CFR 50.36a, and Appendix I to 10 CFR Part 50,
- Should be reviewed and accepted by the Unit Review Group and approved by the Plant Manager, and
- Should be submitted to the NRC concurrent with the Semiannual Radioactive Effluent Release Report for which any change to the ODCM was made.