April 16, 2020
L-2020-071
10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington DC 20555-0001

RE: Turkey Point Nuclear Plant, Unit 3 and 4
Docket Nos. 50-250 and 50-251
Renewed Facility Operating Licenses DPR-31 and DPR-41

Response to Request for Additional Information Regarding License Amendment Request 270, Modify Containment Atmosphere Radioactivity Monitoring, Containment Ventilation Isolation and RCS Leakage Detection System Requirements

References:

1) Florida Power & Light Company Letter L-2019-192, License Amendment Request 270, Modify Containment Atmosphere Radioactivity Monitoring, Containment Ventilation Isolation and RCS Leakage Detection System Requirements, November 4, 2019 (ADAMS Accession No. ML19315A003)

2) NRR E-Mail Capture, Request for Additional Information Containment Radiation Monitoring Instrumentation, Florida Power & Light Company, Turkey Point Nuclear Generating Unit Nos. 3 and 4, Docket Nos. 50-250 and 50-251, March 20, 2020

In Reference 1, Florida Power & Light Company (FPL) submitted license amendment request (LAR) 270 for Turkey Point Units 3 and 4. The proposed license amendments would modify the Turkey Point Technical Specifications (TS) by modifying the containment atmosphere radioactivity monitoring, containment ventilation isolation and Reactor Coolant System (RCS) leakage detection system requirements.

In Reference 2, the NRC requested additional information deemed necessary to complete its review.

The enclosure to this letter provides FPL's response to the request for additional information (RAI). Attachment 1 to enclosure provides portions of Turkey Point procedure 0-NCOP-067, Process Radiation Monitors Setpoint Determination, which summarize the setpoint methodology for the containment atmosphere radioactivity monitoring instruments. The supplements included in this RAI response provide additional information that clarifies the application, do not expand the scope of the application as originally noticed, and should not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register*.

This letter contains no regulatory commitments.

Should you have any questions regarding this submission, please contact Mr. Robert Hess, Turkey Point Licensing Manager, at 305-246-4112.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 16 day of April, 2020.

Sincerely,

Brian Stamp
Site Director, Turkey Point Nuclear Plant

Enclosure - Response to NRC Request for Additional Information dated March X, 2020

USNRC Regional Administrator, Region II
USNRC Project Manager, Turkey Point Nuclear Plant
USNRC Senior Resident Inspector, Turkey Point Nuclear Plant
Ms. Cindy Becker, Florida Department of Health

Enclosure

FPL Response to NRC Request for Additional Information (RAI) Regarding
License Amendment Request 270, Modify Containment Atmosphere Radioactivity Monitoring,
Containment Ventilation Isolation and RCS Leakage Detection System Requirements

In an e-mail memorandum dated March 20, 2020 (Reference 1), the NRC staff of the Office of Nuclear Reactor Regulation requested the additional information identified below regarding Modify Containment Atmosphere Radioactivity Monitoring, Containment Ventilation Isolation and RCS Leakage Detection System Requirements (Reference 2). FPL's response follows:

RAI #1

As discussed in Regulatory Guide 1.45, May 1973, the sensitivity and response time of each leakage detection system employed for unidentified leakage should be adequate to detect a leakage rate, or its equivalent, of one gpm in less than one hour.

Section 3.1 of the Enclosure to the submittal requests the conversion of the units of measure from counts per minute (cpm) to micro curies per cubic centimeter (µCi/cc) for the R-11 and R-12 radiation monitors and indicates the change is administrative in nature as FPL's design control program was used. A review of the ODCM, Rev. 26 submitted with the 2018 Annual Radiological Effluent Report (L-2019-017) finds that the methodology and parameters for determining the setpoints for each of its TS identified functions is similarly not provided for the Radioactive Gaseous Effluent Monitoring Instrumentation, Operability and Alarm/Trip Setpoints for the R-11 and R-12 containment purge isolation radiation monitors. Given that an NRC approved methodology for the conversion was not indicated in the submittal to support that the proposed TS "allowable value" and "Trip Setpoint" values have been accurately determined, the licensee is requested to provide the following information:

a. A discussion outlining the methodology used for establishing the setpoints for these monitors for each function. This discussion should include any relevant assumptions and/or conversion factors;

b. The calibration efficiency factor(s) and the isotope(s) to which the monitors are calibrated (e.g., Xe-133, Kr-85, Co-60, Rb-88, etc.); and,

c. A discussion addressing the effect the revised setpoint will have on the alarms and the operator's response to the alarms. This includes how the alarms, as well as the setpoints, are displayed and viewed by the operators in the control room.

FPL Response:

The ODCM describes methods which are acceptable for calculating radioactivity concentrations in the environment and potential offsite doses associated with liquid and gaseous effluents from Turkey Point. The calculations are performed to satisfy Technical Specifications and to ensure that the radioactive dose or dose commitment to any member of the public is not exceeded. LCO 6.14.2.a.1 requires the development of information sufficient to support proposed changes(s) to the Turkey Point ODCM, including appropriate analyses or evaluations justifying the changes.

In describing the R-11/R-12 instruments, the Turkey Point FSAR states that the alarm setpoints are set in accordance with the methodology and parameters of the ODCM. The excerpt derives from earlier plant design which supported realignment of the R-11/R-12 monitoring system to the plant vent exhaust as a backup to plant vent radiation monitor, R-14, during containment purging operations. Currently, plant vent gaseous radioactive effluent is measured using special particulate, iodine and noble gas (SPING) monitor, RaD-6304, with R-14 used as a backup. In the event RaD-6304 and R-14 are both unavailable, the ODCM requires grab samples every 12-hours. The methodologies for determining the setpoints for plant vent radiation monitors R-14 and RaD-6304 are in accordance with the ODCM. As a backup to R-14 at the time, the R-11/R-12 setpoints were also determined in accordance with the ODCM. Though R-11/R-12 no longer serve as a backup

to the plant vent radiation monitors, the underlying bases for the setpoints have not changed; namely to assure site boundary air concentrations remain at or below 10 CFR 20 breathing limits.

The R11 and R12 actuation setpoints initiate closure of the containment purge isolation valves, the containment instrument air bleed valves and the control room normal air intake isolation valves. The original containment process radiation monitoring system design accounted for continuous (i.e. 365 days/year), simultaneous purging of both containments. The R-11/R-12 actuation setpoints were selected such that with continuous purging from both containments, the containment airborne radioactivity at the setpoint level would result in a site boundary radionuclide concentration equal to the maximum permissible concentration (MPC) for airborne radioactivity in an unrestricted area, as specified in 10 CFR 20, Appendix B, Table II, Column 1. Though the maximum allowable containment purge flow was reduced ~80% following the Three Mile Island incident, the bases for the R-11/R-12 setpoints, which were originally calculated by Westinghouse in 1972, are effectively unchanged. In 1982, the setpoint for gaseous containment radiation monitor, R-12, was increased to more closely correspond to the release limit of 67 millicuries/second averaged over one-hour, as specified in the TS of that time. In the 1990s, the setpoints were recalculated to validate the design basis for the instruments and demonstrate sufficient margin to account for instrument measurement uncertainty. The effort confirmed that the containment atmosphere concentration at the R-11 and R1-2 setpoints do not result in a whole body dose rate at the site boundary in excess of 500 mrem/year, the current ODCM limit. The validation included consideration for plant changes since the original design such as reducing the allowable containment purge flowrate per unit from 35,000 to 7,000 cubic feet/minute (cfm), revised limits on the maximum permissible activity from any release point, and consideration for Rb^{88} as the dominant particulate isotope in gaseous releases. In 1995, the NRC reiterated their approval of the Westinghouse instrument setpoint methodology for various RPS and ESFAS instrumentation, including the R-11/R-12 instruments (Reference 6.3).

The current R-11/R-12 allowable range and alarm/trip setpoint values (in CPM) were derived from the µCi/cc to CPM conversion factors provided by the supplier, Sorrento Electronics, for Co^{60} for the particulate detector, R-11, and Xe^{133} for the gaseous detector, R-12. A detailed description of the methodology for determining the ESFAS instrument allowable range and trip setpoints, including R-11/R-12, is provided in Chapter 7.2 of the Turkey Point UFSAR. Attachment 1 to this RAI response provides portions of Turkey Point procedure 0-NCOP-067, Process Radiation Monitors Setpoint Determination, which summarize the setpoint methodology for the R-11 and R-12 instruments, including the calibration efficiency factors and other supporting assumptions (pages 6 and 8) and the µCi/cc to CPM conversion factors (pages 7 and 9). The proposed R-11 and R-12 allowable ranges (in µCi/cc) were determined from the current TS allowable ranges (in CPM) using these same conversion factors. The conversion factors are applied in plant maintenance procedures used to calibrate the R-11/R-12 detectors against known radiological sources to satisfy ESFAS instrument channel surveillance requirements (SRs). The conversion factors are also applied in Turkey Point offsite dose calculation procedures, which prescribe methods for estimating offsite doses to support formulation of protective action recommendations (PARs) and which are routinely employed during Turkey Point emergency planning (EP) drills and exercises. Hence, the proposed R-11/R-12 allowable range and alarm/trip setpoint values were determined using the approved methodology for measurement units independent of the monitor type and manufacturer, consistent with plant safety analyses inputs and assumptions. The proposed change accommodates planned upgrades to the R-11/R-12 instruments which include direct instrument readout in µCi/cc, thereby eliminating the otherwise unnecessary step of converting the measured readings during maintenance, EP drills, or in the unlikely event of a radiological emergency. The planned upgrades are designed to satisfy the original human factors considerations and the more recent NUREG-0700, Human-System Interface Design Review Guidelines, Revision 2 (Reference 6.4). As such, the revised setpoints will not adversely impact the alarms or displays associated with the R-11/R-12 instruments and thereby will not adversely impact control room operator response to the alarms or instrument readings. As stated above, the R-11/R-12 setpoints were developed to assure site boundary air concentrations remain at or below

10 CFR 20 breathing limits. However, restoring the measurement units to µCi/cc does not alter any ODCM methodologies, inputs or assumptions, and thereby LCO 6.14.2.a.1 does not apply.

RAI #2

Section 3.1.1 discusses that the proposed conversions are administrative in nature. The NRC staff reviewed the submittal, the TS and existing ODCM. The TS LCO 6.14.2.a.1 requires the development of "sufficient information to support the changes(s) together with the appropriate analyses or evaluations justifying the changes." For the following table of proposed changes, provide information detailing how the converted values were derived to satisfy TS 6.14.2.a.1. The information should include, but not be limited to, allowable value, nominal trip setpoint, the basis for selection, and any limitations pertaining to the conversions.

TS Table	Affected Requirement	Current	Proposed
3.3-3	Functional Unit 3.c.4 "Containment Radioactivity-High"	Allowable Value ≤ 6.8×10^5 CPM Setpoint ≤ 6.1×10^5 CPM	Allowable Value ≤ 5.00×10^{-5} µCi/cc Setpoint ≤ 4.49×10^{-6} µCi/cc
3.3-3	Note 2	Setpoint ≤ 3.2×10^4 CPM Allowable Value ≤ 3.5×10^4 CPM	Setpoint ≤ 1.11×10^{-3} µCi/cc Allowable Value ≤ 1.22×10^{-3} µCi/cc
3.3-4	Functional Unit 1.a "Containment Radioactivity-High"	Setpoint ≤ 6.1×10^5 CPM	Setpoint ≤ 4.49×10^{-6} µCi/cc
3.3-4	Note 2	Setpoint ≤ 3.2×10^4 CPM	Setpoint ≤ 1.11×10^{-3} µCi/cc

FPL Response:

See response to RAI #1 above, Turkey Point procedure 0-NCOP-067, and Notes 1 and 2 below:

Notes:

1. The R-11 proposed setpoint ($4.49\ 10^{-6}$ µCi/cc) is conservatively lower than the calculated setpoint (4.86×10^{-6} µCi/cc) derived using the methodology and assumptions specified in 0-NCOP-067, pages 6 and 7. The conservatism is similar to the current R-11 setpoint (6.1×10^5 cpm), which is conservatively lower than the calculated setpoint (6.6×10^5 cpm) also determined using the methodology and assumptions in 0-NCOP-067, pages 6 and 7.

2. The R-12 proposed setpoint (1.11×10^{-3} µCi/cc) derives from the R-12 setpoint (5.57×10^{-3} µCi/cc) specified in 0-NCOP-067, page 9, by removing the purge flowrate ratio (7.0×10^3 cfm)/(3.5×10^4 cfm) from the denominator, consistent with the release rate ratio, F, specified in Note 2 of TS 3.3.2, Table 3.3-3 and Note 2 of TS 3.3.3, Table 3.3-4.

RAI #3

Section 11.2.3, "Radiation Monitoring System" of the TPN Updated Final Safety Analysis Report (UFSAR) includes a description of the Process Radiation Monitoring System. The UFSAR states that the function of these monitors includes measuring radioactivity in the containment and to ensure that the release rate during purging is maintained below specified limits. Section 11.2.3 of the UFSAR states that the high radiation level for each channel initiates closure of the containment purge supply and exhaust duct valves. The UFSAR further states that the alarm setpoints for the R-11 and R-12 containment radiation monitors are derived from Table 3.3-3 of the TS and set in accordance with the methodology and parameters from the TPN ODCM.

Section 3.3 of the Enclosure to the submittal discusses that the containment purge supply and exhaust duct valves will be maintained in an administratively-controlled closed position or that a blind flange will be installed in Modes 1-4. Therefore, the R-11 and R-12 monitors will no longer function to initiate closure of the containment purge supply and exhaust valves. As a result, the current TS alarm/trip setpoints should no longer be necessary to ensure that the release rate during purging is maintained below specified limits, making the setpoints immaterial with respect to effluent control during purging.

However, the NRC staff identified that the R-11 and R-12 monitors remain credited for identification of RCS Leakage per TS 3/4.4.6, "Reactor Coolant System Leakage." Describe how the existing setpoints continue to support detection of RCS leakage at the operational limits identified in the TS.

FPL Response:

The allowable range and alarm/trip setpoints for the R-11 and R-12 instrumentation will continue to be verified for the ESFAS Containment Ventilation Isolation function, but only as they relate to the containment instrument air bleed penetrations. High radiation levels at the R-11 and R-12 detectors initiate closure of the containment instrument air bleed valves and this ESFAS function will continue to be demonstrated, in part, by verifying the R-11/R-12 alarm/trip setpoints in accordance with TS 3.3-2, Table 4.3-2, Functional Unit (FU) 3.c.4. In addition, the Radiation Monitoring for Plant Operation functional surveillance requirements of TS 3.3-3, Table 4.3-3, FU 1.a, remain applicable, which also require R-11/R-12 setpoint verification. However, since the containment purge supply and exhaust penetration isolation valves will be administratively sealed closed and deactivated in Modes 1 - 4, Table 4.3-2, FU 3.c.4, would no longer apply to the containment purge penetration isolation instrumentation and the R-11/R-12 setpoints need not be re-verified for this function.

Regarding RCS leakage detection, the current alarm/trip setpoints for R-11/R-12 are unchanged by the proposed change. Only the instrument measurement units are changed, i.e. by numerical conversion from CPM to µCi/cc. As stated above, the alarm/trip setpoints for R-11/R-12 will continue to be verified as specified in Table 4.3-2, FU 3.c.4 for the ESFAS containment instrument air bleed isolation function, and Table 4.3-3, FU 1.a, for the Radiation Monitoring for Plant Operations function. Hence, no changes are proposed to the RCS leakage detection capabilities of R11 and R-12 since the alarm/trip setpoints are unchanged by the proposed change. The existing R11 and R-12 setpoints will continue to support RCS leakage detection at the TS identified operational limits.

RAI #4

Section 3.3.3 discusses the proposed revisions to the purge valve TS SRs. This proposed change essentially creates two separate conditions that, in accordance with 10 CFR 50.36, need to be verified and maintained via surveillance requirements. The first condition is when the valves are administratively sealed closed and deactivated and the second condition is when the associated penetration(s) are isolated by blind flange. In addition, the licensee is proposing the addition of a footnote to TS 3/4.6.1.7, which states:

[p]erformance of SR 4.6.1.7.1 and SR 4.6.1.7.2 are not required when the associated purge supply and/or exhaust penetration is isolated by blind flange.

Discuss how the proposed TS SRs in SR 4.6.1.7 demonstrate operability of each containment purge supply and exhaust isolation valve, when the associated purge supply and/or exhaust penetration(s) is isolated by a blind flange.

FPL Response:

SR 4.6.1.7.1 verifies that each containment purge supply and exhaust isolation valves is either sealed closed or open in accordance with LCO 3.6.1.7.a. SR 4.6.1.7.2 verifies that each containment purge isolation valve measured leakage rate is within limit. The SRs assure the containment purge penetration isolation and leak tightness functions assumed in plant safety analyses remain valid. When SR 4.6.1.7.1 or SR 4.6.1.7.2 cannot be met, installation of a blind flange serves to replace the penetration isolation and leak tightness functions normally performed by the containment purge isolation valves. The flange features double O-rings, which provide the requisite redundant barrier isolation for the containment purge penetration. The blind flange is bolted to the purge penetration inlet or outlet flange such that once secured in place, its position cannot be inadvertently altered. The flange would be subject to satisfactory Type-B local leakage rate testing in accordance with 10 CFR 50, Appendix J, either before restoring the containment purge penetration to operability or prior to entering the applicable MODES, as appropriate. Hence, the proposed LCO would be met for the non-complying containment purge penetration upon installation of the blind flange, subject to satisfactory Type-B testing. As such, containment purge isolation valve operability need not be verified for the affected containment purge penetration since the penetration isolation and leak tightness functions assumed in plant safety analyses are assured by the blind flange. Moreover, the containment purge isolation valves would no longer satisfy 10 CFR 50.36(c)(2)(ii), Criterion 3, and thereby would no longer be subject to the surveillance requirements of 10 CFR 50.36(c)(3).

TS LCO 4.0.1 states that surveillance requirements shall be met during the operational MODES or other conditions specified for individual Limiting Conditions for Operation *unless otherwise stated in an individual surveillance requirement*. (LCO 4.0.1 is consistent with SR 3.0.1 of NUREG-1431 (Reference 6.5)). 10 CFR 50.36(c)(3) states that surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, *and that the limiting conditions for operation will be met*. The proposed change modifies SR 4.6.1.7.1 and SR 4.6.1.7.2 by adding a footnote which exempts SR performance whenever the associated penetration is isolated by a blind flange. The proposed change would not contravene LCO 4.0.1 since exceptions to SR performance are allowed where otherwise stated in the individual surveillance requirements. The proposed change would not contravene 10 CFR 50.36(c)(3) since the proposed LCO 3.6.1.7 provides two conditions for satisfying the LCO and specifies that only one condition need be met.

REFERENCES

1. NRR E-Mail Capture, Request for Additional Information Containment Radiation Monitoring Instrumentation, Florida Power & Light Company, Turkey Point Nuclear Generating Unit Nos. 3 and 4, Docket Nos. 50-250 and 50-251, March 20, 2020

2. Florida Power & Light Company Letter L-2019-192, License Amendment Request 270, Modify Containment Atmosphere Radioactivity Monitoring, Containment Ventilation Isolation and RCS Leakage Detection System Requirements, November 4, 2019 (ADAMS Accession No. ML19315A003)

3. Turkey Point Units 3 and 4 - Issuance of Amendments Re: Column Format for Reactor Protection System (RPS) and Engineered Safety Feature Actuation System (ESFAS) Setpoints (TAC NOS. M92402 AND M92403) August 24, 1995 (ADAMS Accession No. ML013390130)

4. NUREG-0700, Human-System Interface Design Review Guidelines, Revision 2, May 2002 (ADAMS Accession No. ML021700337)

5. NUREG-1431, Standard Technical Specifications - Westinghouse Plants, Revision 4.0, Volume 1, Specifications (ADAMS Accession No. ML12100A222)

Attachment 1

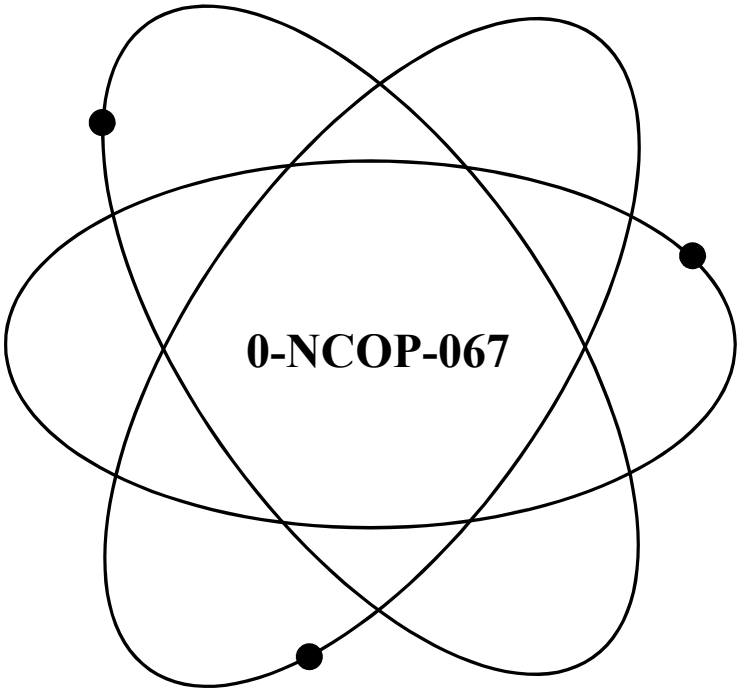
Turkey Point Nuclear Plant Procedure (excerpts)
0-NCOP-067, Process Radiation Monitors Setpoint Determination

(6 pages follow)

Florida Power & Light Company

This procedure may be affected by a T.C. (Temporary Change) Verify information prior to use.
Date verified_____ Initials____

Turkey Point Nuclear Plant



Title:

Process Radiation Monitors Setpoint Determination

(Information Use)

Quality Related Procedure	
Responsible Department:	Chemistry
Revision Number:	4
Revision Approval Date:	12/12/19

PCRs *09-2465, 1918112, 1803721, 2180452, 2252895, 2337181*
ECs *283021*

TABLE OF CONTENTS

7.0 PROCEDURE

7.1 Containment Airborne Radiation Monitors R-11/R-12

7.1.1 The Containment Airborne Radiation Monitors R-11/R-12 provides input to the Engineered Safety Features functions for Containment Ventilation Isolation and Control Room Ventilation Isolation. The monitor system also provides a diverse method of leak detection required by the Technical Specifications.

7.1.2 Channel 3&4 R-11, Containment Air Particulate Radiation Monitor

1. The monitor measures the particulate gamma radioactivity in the containment air. Channel R-11 ensures that the containment air particulate and vapor activity emissions rate during purging operations results in a site boundary air concentration at or below the offsite dose limits established in the Offsite Dose Calculation Manual (ODCM) and 10CFR20. The setpoint is based on not exceeding the limiting organ dose for the thyroid based on exposure to iodine. The iodine concentration was derived based on the ratio to the Rb-88 particulate. Rb-88 is the daughter product of Kr-88 and is in equilibrium with Kr-88.

2. Assumptions:

   a. Assumes a limit of < 1500 mrem/yr to any organ (2×10^{-10} uCi/cc, I-131 DAC).

   b. The ratio of Rb-88 to iodine activity of 0.70 was used based on Unit 3 reactor coolant activity. The factor consists of the actual ratio of Rb-88 to total iodine plus a reduction of 10% for not reaching total equilibrium.

   c. The dose conversion factors and the breathing rate will be assumed to be from RG 1.109.

   d. A continuous purge of 7,000 scfm from each Unit for a total of 14,000 scfm.

   e. The yearly X/Q will be based on steady state operation (4.3×10^{-6}sec/m^3).

7.1.2.2 (Cont'd)

f. Assumes Co-60 efficiency of 9.38×10^{-7} uCi/count and a sample flow rate of 127,450 cm^3/min. Co-60 efficiency is conservative when compared to Rb-88.

Set Point Calculation:

$$\text{Set Point (cpm)} = \frac{(2 \times 10^{-10} \text{ uCi/cc})(0.7)(60 \text{ sec})(1 \times 10^{6} \text{ cc/m}^3)}{(14{,}000 \text{ ft}^3/\text{m}^3)(2.83 \times 10^{4} \text{cc/ft}^3)(4.3 \times 10^{-6} \text{ sec/m}^3)(7.36 \times 10^{-12} \text{ uCi/cc/ct})}$$

$$= 6.6 \times 10^{5} \text{ cpm}$$

TS Set Point $= 6.1 \times 10^{5}$ cpm

Conversion to uCi/cc using Co-60

$$\text{Set Point Activity} = \frac{(6.6 \times 10^{5} \text{ cpm})(9.38 \times 10^{-7} \text{ uCi/count})}{(127{,}450 \text{ cc/min})}$$

$$= 4.86 \times 10^{-6} \text{ uCi/cc}$$

7.1.3 The Tech Spec trip setpoint for 3 and 4 R11 is 4.49E-6 μCi/cc.

7.1.4 The warning setpoint for 3 and 4 R11 is 8.00E-07 μCi/cc.

7.1.5 Channel 3&4 R-12, Containment Air Gas Radiation Monitor

1. This monitor is provided to measure the gaseous gamma radioactivity in the containment atmosphere. Channel R-12 ensures that the containment air gaseous activity emission rate during purging operations results in site boundary air concentration at or below the 10CFR20 off-site whole body submersion dose limits. Westinghouse originally calculated the set point for this monitor based on the following:

   a. Site boundary air Maximum Permissible Concentration (MPC) Limit for Xe-133 of 3.0E-7 μCi/cc (assumed effluent is 100 % Xe-133)

   b. Containment purge rate of 7.0E+4 scfm

   c. A 0-12 hours dispersion factor χ/Q of 1.15E-4 sec/m^3

   $$\text{Containment Con. Limit} = \frac{\text{10CFR20 Site Boundary Limit}}{(\text{Cont. Purge Rate})(\chi/Q)}$$

   $$\frac{(3.0\text{E-}7\ \mu\text{Ci/cc})(60\ \text{sec})(1\text{E}6\ \text{cc})}{(7.0\text{E+}4\ \text{ft}^3/\text{min})(2.83\text{E+}4\ \text{cc/ft}^3)(1.15\text{E-}4\ \text{sec/m}^3)(\text{min})(1\ \text{m}^3)}$$

   Containment Concentration Limit = 7.9E-5 μCi/cc

2. The monitor response corresponding to this value was 1.6E+3 cpm per Westinghouse. The original 1972 Technical Specification had a release rate limit of 6.7E+4 μCi/sec corresponding to the 10CFR20.1302 Dose rate limit of 2.0 mrem/hour to an individual member of the public. In 1982 the Technical Specification was adjusted to incorporate the release rate limit of 6.7E+4 μCi/sec and the MPC limit setpoint of 7.9E-5 μCi/cc. Taking the ratio of the two limits and a stack flow rate of 9.0E+4 cfm the new setpoint was derived.

   $$\text{Setpoint} = \frac{(6.7\text{E+}4\ \mu\text{Ci/sec})(1.6\text{E+}3\ \text{cpm})(60\ \text{sec/min})}{(7.9\text{E-}5\ \mu\text{Ci/cc})(9.0\text{E+}4\ \text{cfm})(2.83\text{E+}4\ \text{cc/ ft}^3)} = 3.2\text{E+}4\ \text{cpm}$$

   The R-12 Setpoint was specified as adjustable for reduced purge flow. As the purge flow rate is decreased, the trip setpoint can be increased proportionately per Tech Spec Table 3.3-3 note 2.

   R-12 Setpoint (cpm) = (3.2E+4 cpm)/ F

   $$\text{Where F} = \frac{\text{Actual Flow Rate cfm}}{\text{Design Flow Rate (3.5E+4 cfm)}}$$

7.1.4 (Cont'd)

3. In 1995 the old monitor was replaced with the current monitor made by Serrento Electronics. The Technical Specification Limit of (3.2E+4 cpm)/F was converted to μCi/cc based on the vendor calibration data for Xe-133 of 3.48E-8 μCi/cc - cpm and the maximum flow rate of 7.0E+3 cfm

$$\text{Setpoint} = \frac{(3.2E+4 \text{ cpm})(3.48E-8 \ \mu Ci/cc - cpm)}{(7.0E+3 \text{ cfm})/(3.5E+4 \text{ cfm})} = 5.57E-3 \ \mu Ci/cc$$

7.1.6 The Tech Spec trip setpoint for 3&4 R-12 is 5.57E-3 μCi/cc.

7.1.7 The warning setpoint for 3 and 4 R12 is 2.50E-03 μCi/cc.

7.2 Channel R-14, Plant Vent Radiation Gas Monitor

7.2.1 The Plant Vent Gas Monitor measures radioactivity being discharged through the plant vent to the environment. It consists of four, thin-walled, self-quenching type Geiger-Muller tubes (high sensitivity beta-gamma detectors) operated in parallel. Channel R-14 ensures that the gaseous releases from the waste gas decay tanks will result in a site boundary concentration at or below the 10 CFR 20 whole body submersion dose limits.

7.2.2 The trip setpoint is administratively set at 36000 cpm, which is equivalent to approximately 4 percent of MPC.

7.2.3 The warning setpoint for R-14 is administratively set at 27000 cpm.

7.2.4 Alarm setpoints are calculated for each gas release and containment purge permit per 0-NCOP-004, Preparation of Gas Release Permit