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SUBJECT: Forwards Rev 1 to offsite dose calculation manual, per 860502 request. Sections containing equations & methodology significantly expanded to clarify source of equations. Franklin Research Ctr comments also encl.

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	HAUGHEY,M	1	1	BWR PSB	1	1
	BWR RSB	1	1			
INTERNAL:	ACRS 11	2	2	ADM/LFMB	1	0
	ELD/HDS1 19	1	0	NRR BWR ADTS	1	1
	NRR PWR-A ADTS	1	1	NRR PWR-B ADTS	1	1
	NRR/TAMB	1	1	REG FILE 04	1	1
	RGN1	1	1			
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NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/300 ERIE BOULEVARD WEST, SYRACUSE, N.Y. 13202/TELEPHONE (315) 474-1511

June 5, 1986
(NMP2L 0733)

Ms. Elinor G. Adensam, Director
BWR Project Directorate No. 3
U.S. Nuclear Regulatory Commission
7920 Norfolk Avenue
Washington, DC 20555

Dear Ms. Adensam:

Re: Nine Mile Point Unit 2
Docket No. 50-410

The enclosed Revision 1 to the Nine Mile Point Nuclear Station Unit 2 Offsite Dose Calculation Manual (ODCM) is submitted in response to your request of May 2, 1986. The general requirements of the Request for Additional Information as well as the specific comments provided by Franklin Research Center have been addressed in revision 1 of the Offsite Dose Calculation Manual, as summarized below and in the attachment to this letter.

The seventeen specific references to the Technical Specifications listed in paragraph 2 of the Request for Additional Information have been included as a cross-reference in the Table of Contents. Specific references to the Technical Specifications are also included within each section. The sections containing equations and methodology have been significantly expanded to clarify the source of the equations, and examples are given for many of them.

The referenced tables, Table 2.1 for liquid effluent monitors and Table 3.1 for offgas, have been provided as representative values. Sections 2.1.3, for liquid monitors and 3.1.3, for gaseous monitors, have been provided to discuss periodic calibration to confirm these values.

Section 6 has been added to provide the discussion of several table notations which resulted from the development of the Environmental Monitoring Program specifications.

Figure 5.1.3-1 of the Technical specifications has been provided in addition to the maps showing envrionmental sampling locations.

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Attachment 1 of this letter is an item-by-item response to the comments provided by Franklin Research Center.

Additional information and further clarification has been provided to produce a complete and comprehensive Offsite Dose Calculation Manual. Your further suggestions for improvements will receive our immediate attention.

Very truly yours,

C. V. Mangan
Senior Vice President

NLR:saa
Enclosure
1684G

xc: R. A. Gramm, NRC Resident Inspector
Project File (2)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)

Niagara Mohawk Power Corporation) Docket No. 50-410

(Nine Mile Point Unit 2))

AFFIDAVIT

C. V. Mangan, being duly sworn, states that he is Senior Vice President of Niagara Mohawk Power Corporation; that he is authorized on the part of said Corporation to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.

C V Mangan

Subscribed and sworn to before me, a Notary Public in and for the State of New York and County of Onondaga, this 5th day of June, 1986.

Christine Austin
Notary Public in and for
Onondaga County, New York

My Commission expires:
CHRISTINE AUSTIN
Notary Public in the State of New York
Qualified in Onondaga Co. No. 4787687
My Commission Expires March 30, 1987

CHRISTINE AUSTIN
Notary Public in the State of New York
Qualified in Onondaga Co. No. 4787697
My Commission Expires March 30, 19__

ATTACHMENT 1

Franklin Research Center ODCM Comments (Unit 2)

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
Table of Contents	--	° The Licensee should provide a table of contents for the ODCM.	A table of contents has been provided.	--
Liquid Radwaste Effluent Monitor Alarm Setpoint (Sec. 2.1.2.1)	1	° The Licensee should specify the units for the alarm setpoints.	The units (cpm) are given in Section 2.1.2.1.	2
	1	° In the equation for the setpoint, the factor k is not clearly defined. The Licensee may apply the laboratory experience to introduce an appropriate safety factor for the setpoint calculation: the factor should be a specific number.	The factor has been set at 0.8 in Section 2.1.2.1	2
	1, 2	° The Licensee should provide nominal flow rates for the effluent line (f) and the dilution flow (F). Also, the sources of dilution water should be identified.	The nominal flow rates are provided in Section 2.1.3.1.	7
Service Water A and B and Cooling Tower Blowdown Radiation Detector Alarm Setpoint (Sec. 2.1.2.2)	2	° Same as above, specify the units for alarm setpoint.	The units (cpm) are given in Section 2.1.2.3.	5

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
	2	° Same as above, specify the factor k.	The factor hs been set at 0.8 in Section 2.1.2.3.	5
Service Water A and B and Cooling Tower Blowdown Radiation Detector Alarm Setpoint (Sec. 2.1.2.2)	2	° Specify the nominal flow rates for service water A and B, and the cooling tower blowdown.	The nominal flow rates are provided in Section 2.1.3.2.	10
	2	° The Licensee has not considered the simultaneous releases from more than one effluent line in the setpoint calculation.	Provision for setting Radwaste Monitor set point concurrent with contamination of a dilution stream are provided in Section 2.1.2.2.	4
Liquid Effluent Detectors Responses (Table 2-1)	3	° It is not clear to what types of radiation (gamma, beta, or both) the detector responses provided in Table 2-1 are related.	Liquid Effluent Detector discussion provides this info. in Section 2.1.3.1	6
	3	° What is the justification for considering only the isotopes listed in the tables? Are other isotopes ignored?	Response of the detector to liquid samples from appropriate waste streams is described in Section 2.1.3.1.	6
Liquid Concentration	--	° To demonstrate that the Licensee's Technical Specification 3.11.1.1 is met, the surveillance requirements specify that the sampling and analysis program be implemented according to Table 4.11-1 of the RETS. According to the NRC Branch Technical Position, the Licensee should:	Liquid Effluent Concentration will be calculated and compared to MPC in accordance with the equation of Section 2.2 for all effluent streams for all periods of release. This summation will therefore account for combined discharges to the same release point.	12

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
		"Provide the equations and methodology to be used at the station or unit for each liquid release point according to the Specification 3.11.1.1. For systems with continuous or batch releases, and for systems designed to monitor and control both continuous and batch releases, provide the assumptions and parameters to be used to compare the output of the monitor with the liquid concentration specified. State the limitations for combined discharges to the same release point.		
		In addition, provide the method and assumptions for obtaining representative samples from each batch and describe the previous post-release analyses or composite sample analyses used to meet the specification."	Section 2.5 addresses sample representativeness. The results of sampling and analysis in accordance with Table 4.11-1 provide the concentration data used in Section 2.2.	15
Liquid Effluent Dose Dose Calculation Methodology (Sec. 2.2)	4	° Liquid pathways are not clearly identified for the dose calculation.	All effluents are discharged via the same pathway. See figure 2-9 and Section 2.3 for discussion of the dose pathways to be included in dose calculation.	28, 13

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
	4	° Equations for the dose factor $A_i t$ should be provided in the ODCM.	Section 2.4 provides the equation from NUREG 0133 Section 4.3.1 which was referenced in Rev. 0.	14
Table 2-2	5	° The Licensee should explain why the table provides data only for the isotopes listed.	Section 2.4 explains why only the isotopes listed were provided and describes the action to be taken if nuclides are encountered in addition to those provided in Table 2-2.	15
Stack Noble Gas Detector Alarm Setpoint (Sec. 3.1.2.1)	6	° Units for the alarm setpoint not specified.	The units (uCi/sec) are given in Section 3.1.2.1.	30
	6	° The factor k used for the setpoint equation is not defined or specified.	The factor has been set at 0.8 in Section 3.1.2.1.	31
	-	° What is the height of the stack and the level of effluent releases (elevated vs. ground level)?	The elevated releases discharged from the stack (@ 131 meters) are discussed in Section 3.1.3.	33
Vent Nobel Gas Detector Setpoint (Sec. 3.1.2.2)	7	° Same comments as stated for stack monitor above.	The units (uCi/sec) are given in Section 3.1.2.2.	31
	7		The factor has been set at 0.8 in Section 3.1.2.2.	31

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
	-		The vent is considered a ground level or combined elevated/ground level release, as discussed in Sections 3.1.3, 3.4.5 and 3.4.6.	33, 58, 59
	7	° Simultaneous releases not considered in the setpoint calculation.	Section 3.1.3 includes a discussion of simultaneous release.	33
Vent Noble Gas Detector Setpoint (Sec. 3.1.2.2)	7	° The resulting unit for the setpoint equation is not consistent with what it is intended for: the end result will read "(m^3/cc) (cpm)" rather than just "(cpm)".	The equation given in Section 3.1.2.2 yields uCi/sec, as required.	31
Offgas Pretreatment Noble Gas Detector Setpoint (Sec. 3.1.2.3)	7	° The Licensee has not been consistent in choosing the units for the flow rates: (m^3/sec) was used in Sec. 3.1.2.2 and (cc/min) was used in Sec. 3.1.2.3.	The units of Sections 3.1.2.2 and 3.1.2.3 are now given in ml/sec and CFM, corresponding to the two separate systems. It is not desirable to make these the same.	31, 32
Nobel Gas Detector Response (Table 3-1)	9	° Specify the types of radiation (gamma or beta) for the detector responses.	The off-gas monitor detector is described in Section 3.1.3.3	36
	9	° Provide justifications for having only a few isotopes for the table.	Section 3.1.3.3 describes OG Monitor calibration and addresses Table revision based on isotopic analysis of offgas samples during operation.	36

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
Dose Rate Calculation Methodology (Sec. 3.2)	10	° The Licensee has not referenced the dose limits with which compliance is to be demonstrated for the dose calculations.	Section 3.2 identifies the Dose Rate limits which apply.	37
	12	° The Licensee uses 1.7E-06 (sec/m^3) for the highest calculated annual (X/Q), which is lower than 2.0E-06 (sec/m^3) provided by the Licensee in Section 3.1.2.2 (p. 7). Explain the discrepancy.	Changed X/Q to 2.0E-6 in Sections 3.2.1 and 3.2.2 to be consistent with value used for setting alarm point (Section 3.1.2.2) which is also based on dose rate at the Site Boundary.	38, 39, 31
Plume Shine Parameters (Table 3-2)	13	° The Licensee has not provided a methodology to calculate the plume shine factors Bi and Vi.	The methodology of calculation is provided in Section 3.4.1.	45
		° The Licensee did not provide any data for Table 3-2. (The Licensee stated that "The values in this table will be provided at a later time".)	The values have been provided in Table 3-2.	62
Tables 3-4 to 3-21	15 to 32	° Provide equations in the ODCM for the parameters calculated in the tables.	The equations for calculating the parameters for Tables 3-4 to 3-6 are in Section 3.4.3 and those for Tables 3-7 to 3.21 are in Section 3.4.4.	47-58
Uranium Fuel Cycle	35	° The Licensee stated that fish consumption and shoreline sediment are the pathways used for liquid dose calculation. However, the drinking water pathway is not considered. Also, the methodology to calculate doses from shoreline sediment is not provided in the ODCM.	The drinking water pathway is not significant. Methodology for calculating doses from shoreline sediment is provided in Section 4.1.	90, 91

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
	35	° No methodology is provided to estimate the direct radiation.	The methodology using environmental TLD's is given in Section 4.3.	92
	36	° The equation given for factor R is incorrect: some typographic errors may have been committed.	The differences in the equation given and the equations of Sections C-3 and C-4 of Reg. Guide 1.109 are identified in Section 4.4. (X/Q is in units of sec/m^3). The equation is correct.	94
Environmental Monitoring Program	41-43	° In Table 5.1 for sampling locations, the nature of the locations (such as on-site, control, or indicator) is not clearly specified for each location. Since Nine Mile Point Units 1 and 2 and the Fitzpatrick plant are located at the same site, the envrionmental sample locations, by agreement between the respective licensees, are supposed to be identical. However, numerous differences are found between the sample locations of Nine Mile Point Unit 2 and the locations provided in the FitzPatrick ODCM (Rev. 2 dated June 25, 1985). It appears that Nine Mile Point Unit 2 has a complete list of the most up-to-date information on sample locations. However, the differences may reflect lack of coordination between the respective licensees on environmental sample programs.	No on-site monitoring locations are required. Control locations are those located at map locations 30, 31, 38, 43, 47, 54, 55; all easily distinguished by distance and direction. Unit 1 and Unit 2 ODCM's now indicate identical locations; the JAF recent revision should be the same.	98-100

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
Monthly Liquid Dose Projection (RETS 4.11.1.3.1)	--	° The Licensee did not provide a section to describe the methodology for monthly liquid dose projection per the Licensee's RETS 3.11.1.3.	Section 2.6 was provided to address TS 3.11.1.3. Note that it is expected the liquid radwaste system will be fully utilized at all times, thus negating the need to make such a projection, except in unusual circumstances.	16
Liquid and Gaseous Effluent Flow Diagrams	-	° The NRC Branch Technical Position as issued in 1979 specifies needs for the licensees to provide effluent flow diagrams to clarify and explain the operability of the radwaste treatment systems. The Branch Technical Position states: "Provide a flow diagram(s) defining the treatment paths and the components of the radioactive liquid, gaseous and solid waste management systems that are to be maintained and used, pursuant to 10CFR50.36a, to meet Technical Specifications 3.11.1.3, 3.11.2.4 and 3.11.3.1. Subcomponents of packaged equipment can be identified by a list. For operating reactors whose construction permit applications were filed prior to January 2, 1971, the flow diagram(s) shall be consistent with the information provided in conformance with Section V.B.1 of Appendix I to 10CFR50. For OL applications whose construction permits were filed after January 2, 1971, the flow diagram(s) shall be consistent with the information provided in Chapter 11 of the Final Safety Analysis Report (FSAR) or amendments thereto."	Figures 2-1, 2-2 and 2-3 define the Low Conductivity Liquid Waste System. Figures 2-4, 2-5 and 2-6 define the High Conductivity Liquid Waste System. Figures 2-7 and 2-8 define the Regenerant Waste System. Solidification of waste is addressed in the Process Control Program, separately submitted (see TS 3.11.3). The figures provided are from the FSAR, Chapter 11.	20, 21, 22 23, 24, 25 26, 27

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
Liquid and Gaseous Effluent Flow Diagram (Cont.)	-	The flow diagrams should also contain information on the effluent monitoring instrumentation regarding the setpoint calculation. Thus, the information as required by the Branch Technical Position includes: "The instrumentation for each alarm and trip setpoint, including radiation monitoring and sampling systems and effluent control features, should be identified by reference to the FSAR (or Final Hazard Summary). This information should be consistent with the recommendations of Section I of Standard Review Plan 11.5, NUREG-75/087 (Revision 1)."	ODCM Figure 2-9 identifies the Service Water monitors (RE 146A and RE 146B), the Cooling Tower Blowdown monitor (RE157), and the Liquid Radwaste Effluent monitor (RE 206). Figure 3-5 identifies the Gaseous Effluent pathways. Figure 3-6 provides a block diagram of the stack monitor (RE 170). The vent monitor (RE 180) is essentially identical.	28 87 88
Estimation of I-133	-	° The licensee did not provide a method to estimate the release of I-133. On estimating the radioactivity of I-133, the NRC staff has specific guidance as follows: "Under appropriate conditions, the I-133 contribution could be important to the Part 20 dose rates and to the Appendix I doses. Therefore, Specifications 3/4.11.2.1 and 3/4.11.2.3 should be written as shown in the enclosures.	Section 3.5 was provided to indicate the methods of estimating I-133 release. See Section 3.5	59 59

Subject	Rev. 0 Page Number	Rev. 0 Comments	Rev. 1 Response	Rev. 1 Page Number
Estimation of I-133 (Cont.)		These specifications will not explicitly require sampling and analysis to determine the I-133 releases. Therefore, Table 4.11-2 need not specify I-133. Conversely, the Specifications will require accounting for I-133 and the method for so doing must be detailed in the ODCM. Acceptable methods will be addressed in NUREG-0133, Rev. 1. Acceptable approaches to estimating I-133 releases are as follows: 1. Convert the samples for I-133 (as well as I-131) and assume a constant release rate so buildup is proportional to $[1 - \exp(-\lambda t)]/\lambda$. 2. Periodically take short-period samples to determine the ratio of I-131 to I-133 activity. Then, use this ratio to estimate I-133 releases based on measurements of I-131 releases. 3. In special cases, where a plant lacks capability for measuring I-133, assume that the I-133 activity release is 4 times the I-131 activity."	Method 2 or Method 3 will be used depending on analytical results obtained. Method 1 is ambiguous; we do not plan to use it.	59

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Estimation of I-133 (Cont.)		This requirement is applicable to a BWR such as Nine Mile Point Unit 2, especially since I-133 is not included in the sampling analysis program described in their RETS Table 4.11-2.		