CONFORMANCE TO REGULATORY GUIDE 1.97
NINE MILE POINT NUCLEAR STATION, UNIT NO. 1

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ABSTRACT

This EG&G Idaho, Inc., report reviews the submittal for Regulatory Guide 1.97, Revision 2, for the Nine Mile Point Nuclear Station, Unit No. 1. Any exception to the guidelines of Regulatory Guide 1.97 are evaluated and those areas where sufficient basis for acceptability is not provided are identified.

FOREWORD

This report is supplied as part of the "Program for Evaluating Licensee/Applicant Conformance to RG 1.97," being conducted for the U.S. Nuclear Regulatory Commission, Office of Nuclear Reactor Regulation, Division of Systems Integration, by EG&G Idaho, Inc., NRC Licensing Support Section.

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1. INTRODUCTION

On December 17, 1982, Generic Letter No. 82-33 (Reference 1) was issued by D. G. Eisenhut, Director of the Division of Licensing, Nuclear Reactor Regulation to all licensees of operating reactors, applicants for operating licenses and holders of construction permits. This letter included additional clarification regarding Regulatory Guide 1.97, Revision 2 (Reference 2), relating to the requirements for emergency response capability. These requirements have been published as Supplement No. 1 to NUREG-0737. "TMI Action Plan Requirements" (Reference 3).

Niagara Mohawk Power Corporation, the licensee for the Nine Mile Point Nuclear Station, provided a response to Section 6.2 of the generic letter on April 2, 1984 (Reference 4).

This report provides an evaluation of that material.

2. REVIEW REQUIREMENTS

Section 6.2 of NUREG-0737, Supplement No. 1, sets forth the documentation to be submitted in a report to the NRC describing how the licensee complies to Regulatory Guide 1.97 as applied to emergency response facilities. The submittal should include documentation that provides the following information for each variable shown in the applicable table of Regulatory Guide 1.97.

1. Instrument range

2. Environmental qualification

3. Seismic qualification

4. Quality assurance

5. Redundance and sensor location

6. Power supply

7. Location of display

8. Schedule of installation or upgrade.

Furthermore, the submittal should identify deviations from the regulatory guide and provide supporting justification or alternatives.

Subsequent to the issuance of the generic letter, the NRC held regional meetings on February and March 1983, to answer licensee and applicant questions and concerns regarding the NRC policy on this subject. At these meetings, it was noted that the NRC review would only address exceptions taken to Regulatory Guide 1.97. Furthermore, where licensees or applicants explicitly state that instrument systems conform to the provisions of the guide it was noted that no further staff review would be necessary. Therefore, this report

only addresses exceptions to Regulatory Guide 1.97. The following evaluation is an audit of the licensee's submittals based on the review policy described in the NRC regional meetings.

3. EVALUATION

The licensee provided a response to Item 6 of Generic Letter 82-33 on April 2, 1984. The response describes the licensee's position on post-accident monitoring instrumentation. This evaluation is based on that material.

3.1 Adherence to Regulatory Guide 1.97

The licensee has provided a review of their post-accident monitoring instrumentation that compares the instrumentation characteristics against the recommendations of Regulatory Guide 1.97, Revision 2. The licensee concludes that those Regulatory Guide 1.97 variables that are applicable to the Nine Mile Point Nuclear Station, Unit No. 1, are monitored and displayed in the control room. Therefore, we conclude that the licensee has provided an explicit commitment on conformance to Regulatory Guide 1.97. Exceptions to and deviations from the regulatory guide are noted in Section 3.3.

3.2 Type A Variables

Regulatory Guide 1.97 does not specifically identify Type A variables, i.e., those variables that provide information required to permit the control room operator to take specific manually controlled safety actions. As plant specific emergency operating procedures are not fully developed, the licensee has not defined the Type A variables. By the licensee's explicit commitment on conformance, we assume that all Type A variables will comply with Category 1 recommendations. However, the licensee should identify these Type A variables and verify that the instrumentation is Category 1.

3.3 Exceptions to Regulatory Guide 1.97

The licensee identified deviations and exceptions to Regulatory Guide 1.97. These are discussed in the following paragraphs.

3.3.1 Neutron Flux

Regulatory Guide 1.97 recommends environmentally qualified instrumentation. The licensee has instrumentation for this variable that has not been environmentally qualified. The licensee states that protective action is initiated prior to exposure to a harsh environment.

In the process of our review of neutron flux instrumentation for boiling water reactors (BWRs), we note that the mechanical drives of the detectors have not satisfied the environmental qualification requirement of Regulatory Guide 1.97. A Category 1 system that meets all the criteria of Regulatory Guide 1.97 is an industry development item. Based on our review, we conclude that the existing instrumentation is acceptable for interim operation. The licensee should follow industry development of this equipment, evaluate newly developed equipment, and install Category 1 instrumentation when it becomes available.

3.3.2 Reactor Coolant System Soluble Boron Concentration

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 0 to 1000 parts per million. The licensee has supplied instrumentation for this variable with a range of 50 to 2000 parts per million. Thus, the licensee cannot resolve between 0 and 50 parts per million.

The licensee takes exception to the guidance of Regulatory Guide 1.97 with respect to post-accident sampling capability. This exception goes beyond the scope of this review and is being addressed by the NRC as part of the review of NUREG-0737, Item II.B.3.

3.3.3 Drywell Pressure

Regulatory Guide 1.97 recommends monitoring the pressure in the drywell. The range recommended is from 12 psia to design pressure (62 psig). Category 1 instrumentation is recommended. The instrumentation supplied for this variable has a range of 0 to 75 psig, is not environmentally qualified and the redundant channels have a common power supply (thus the channels are not fully redundant).

The licensee does not justify not having instrumentation that covers from 12 psia to 0 psig. The licensee considers environmental qualification of the pressure transmitters unnecessary, as 0 to 250 psig transmitters, stated as being capable of serving the same function, are environmentally qualified. These instruments are described as being in the drywell for the variable primary containment pressure. The licensee considers the common power supply acceptable, as this instrumentation does not initiate automatic protective action.

The licensee should either provide for monitoring of subatmospheric pressures or provide justification for not monitoring them.

Environmental qualification has been clarified since Revision 2 of Regulatory Guide 1.97 was issued. The clarification is in the environmental qualification rule, 10 CFR 50.49. It is concluded that the guidance of Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

We find the common power supply not acceptable because the primary containment pressure instrumentation (drywell pressure), which has redundant channels, does not cover the subatmospheric portion of the recommended range. The licensee should provide redundant power supplies for this variable.

3.3.4 Drywell Sump Level
Drywell Drains Sump Level

The licensee has supplied Category 3 instrumentation; a single channel with a span of 600 gallons for the drywell equipment drain tank and a single channel with a span of 200 gallons for the drywell floor drain tank. The licensee states that (a) the drywell pressure and temperature are more appropriate to detect a breach of the reactor coolant system and (b) the sump level equipment does not initiate any automatic protective action and (c) the sump level equipment would not be available if containment were isolated.

We conclude that the instrumentation supplied by the licensee will provide appropriate monitoring for the parameters of concern. Based on (a) for small leaks, the instrumentation is not expected to experience harsh environments during operation, (b) for larger leaks, the sumps fill promptly and the sump drain lines isolate due to the increase in drywell pressure, thus negating the drywell sump level and drywell drain sumps level instrumentation, (c) the drywell pressure and temperature can be used to detect leakage in the drywell, and (d) this instrumentation neither automatically initiates nor alerts the operator to initiate operation of a safety related system in post-accident situation, we find the Category 3 instrumentation provided acceptable.

3.3.5 Primary Containment Pressure

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of from 10 psia to four times the design pressure of 62 psig (248 psig). The licensee has redundant instrumentation in the drywell with a range of 0 to 250 psig (the subatmospheric 10 psia to 0 psig is not measured) and non-redundant instrumentation in the torus with a range of 0 to 4 psig.

The licensee has not provided justification for not monitoring any subatmospheric pressure. For the torus instrumentation, they state that instrumentation with a higher range is not necessary, even though the torus design pressure is 35 psig. This is because of vacuum breakers between the torus and the drywell that keeps the torus within 3 psi of the drywell. Thus,

the drywell pressure instrumentation is applicable to the torus pressure. We conclude that with the exception of subatmospheric pressures, the instrumentation provided for this variable is acceptable. The licensee should either provide for the monitoring of subatmospheric pressures or provide justification for not monitoring them.

3.3.6 Primary Containment Isolation Valve Position

Regulatory Guide 1.97 recommends Category 1 instrumentation for this variable. Thus, environmental qualification, seismic qualification and redundancy are recommended for this instrumentation. The licensee provides instrumentation for these variables, however, deviations are identified in the above criteria.

The licensee states that environmental qualification of those valves which are normally in their accident mitigation position is not needed as the valves are not required to change state during an accident.

Environmental qualification has been clarified since Revision 2 of Regulatory Guide 1.97 was issued. The clarification is in the environmental qualification rule, 10 CFR 50.49. It is concluded that the guidance of Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

The licensee states that the seismic qualification of all isolation valve position switches has not been substantiated. The mounting of the position switches is seismically designed and installed on isolation valves and the licensee states that this provides assurance that the switches will remain operable following seismic activity. The isolation valve, its actuator, and its limit switches were typically procured as a unit with seismic specifications applied.

We have no basis to believe that non-seismically qualified position switches will operate after a seismic event because they are installed on seismically qualified valves. Therefore, for those position switches that are

not seismically qualified to the original plant licensing requirements, the licensee should commit to replacing or upgrading the existing non-qualified components with seismically qualified parts.

From the information provided, we find the applicant deviates from a strict interpretation of the Category 1 redundancy recommendation. Only the active valves have position indication (i.e., check valves have no position indication). Since redundant isolation valves are provided, we find that redundant indication per valve is not intended by the regulatory guide. Position indication of check valves is specifically excluded by Table 2 of Regulatory Guide 1.97. Therefore, we find that the redundancy for this variable is acceptable.

3.3.7 Radiation Level in Circulating Primary Coolant

The licensee indicates that radiation level measurements to indicate fuel cladding failure are provided by monitoring containment radiation and by utilizing the post-accident sampling systems.

Based on the alternate instrumentation provided by the licensee, we conclude that the instrumentation supplied for this variable is adequate, and therefore, acceptable.

3.3.8 Suppression Pool Water Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the bottom of the ECCS suction line to five feet above the normal water level. The licensee's instrumentation has a range from 3 ft. 3 in. below the ECCS suction to 3 ft 8.5 in. above the normal water level. The licensee has not justified the deviation in the upper limit of the range.

The licensee has not shown that the provided range will not be exceeded. We conclude that the licensee should either re-range the instrumentation to include the recommended range, or provide justification for not doing so.

3.3.9 Containment and Drywell Hydrogen Concentration

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of 0 to 30 percent. The licensee's instrumentation for this variable has a range of 0 to 20 percent.

The licensee states that for an inerted containment, the primary concern is oxygen concentration. This is because combustion could not occur if sufficient oxygen is not present. Therefore, the licensee states that a maximum range of 20 percent is acceptable.

The licensee deviates from Regulatory Guide 1.97 with respect to hydrogen concentration instrumentation. This deviation goes beyond the scope of this review and is being addressed by the NRC as part of the review of NUREG-0737, Item II.F.1.6.

3.3.10 Radiation Exposure Rate

Regulatory Guide 1.97, Revision 2, specifies Category 2 instrumentation for this variable with a range of 10^{-1} to 10^{-4} R/hr. The licensee has provided instrumentation for this variable with ranges that vary, dependent on location, from the recommended range. The licensee has stated that containment breach is detected by the noble gas effluent monitors, and that release assessment is better performed with portable radiation instruments and secondary containment sample analysis. The licensee concludes that Category 3 instrumentation is adequate for the radiation exposure rate instrumentation.

Regulatory Guide 1.97, Revision 3 (Reference 5), changes this variable to Category 3. Therefore the only deviation of the Nine Mile Point station for this variable is the range supplied for a given location. While supplying plant specific ranges, the licensee has not shown any analysis of radiation levels expected for the monitor locations.

The licensee should show that the existing radiation exposure rate monitors have ranges that encompass the expected radiation levels in their locations.

3.3.11 Suppression Chamber Spray Flow
Drywell Spray Flow

Regulatory Guide 1.97 specifies Category 2 instrumentation for these variables with a range from 0 to 110 percent of design flow. These two sprays are not provided with dedicated flow measurement channels. Instead, a flow element common to these two sprays is used in their common header. This measures the total system flow that is going to both of these sprays. The licensee indicates that a predetermined portion of the total flow is delivered to each spray via a throttling valve. The licensee concludes that indication of total flow and valve position is sufficient to monitor the operation of these sprays. We find this deviation acceptable.

3.3.12 Drywell Atmospheric Temperature

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of 40 to 440°F. The licensee has instrumentation for this variable with a range of 50 to 300°F, and states that the range is sufficient to provide the operator with information relative to the potential for flashing in the level sensing instrument lines.

We agree that the given range is sufficient to monitor the potential for flashing in the instrumentation lines for reactor vessel level.

Our examination of the Final Safety Analysis Report (FSAR, Reference 6) shows that the maximum internal drywell design temperature is 310°F. The actual peak temperature would be less than this and of short duration. Based on this, the licensee's upper limit of 300°F for the post-accident period is sufficient. We have no basis on which to accept the lower limit of 50°F rather than the recommended 40°F.

We conclude that the licensee should justify this deviation from the recommended range or re-span the instrumentation to coincide with the range recommended by Regulatory Guide 1.97.

3.3.13 Standby Liquid Control System Flow

Exception has been taken by the licensee to Regulatory Guide 1.97 for the variable standby liquid control system flow. The licensee states that proper functioning of the system can be verified by monitoring the pump discharge header pressure, tank level, neutron flux change and valve position.

Based on the licensee's justification, we find the licensee's position meets the requirements of Regulatory Guide 1.97 for this variable.

3.3.14 Standby Liquid Control System Storage Tank Level

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from the bottom to the top. The instrumentation supplied by the licensee for this variable has a range from 350 to 4150 gallons.

The licensee states that the range of the liquid poison level indicator covers the minimum (2000 gallons) to maximum (4080 gallons) volume of liquid poison maintained in the tank, as required by Technical Specifications. The licensee concludes that the range is sufficient for the operator to determine that the liquid poison system is operating properly.

The range supplied corresponds to the height of the pump suction inlet and the tank overflow. Based on the licensee's justification, the deviation from the recommended range is acceptable.

3.3.15 Residual Heat Removal System Flow
Residual Heat Removal Heat Exchanger Outlet Temperature

Regulatory Guide 1.97 recommends monitoring the residual heat removal system for flow (0 to 110 percent of design flow) and heat exchanger outlet temperature (32 to 350°F) with environmentally qualified instrumentation. Unit No. 1 at Nine Mile Point has no direct indication of flow rate for this variable. The licensee states that the shutdown cooling system flow is manually adjusted to maintain the cooldown rate below 100°F/hr. Thus, flow is controlled by the shutdown cooling system temperature. Loss of flow is not

indicated in this manner. Therefore, we find that the licensee should provide the recommended flow instrumentation.

Individual heat exchanger outlet temperatures have ranges of 40 to 400°F, the common header temperature instrumentation has a range of 0 to 400°F. Thus the recommended temperature range is satisfied.

The instrumentation is not environmentally qualified. The licensee states that the system does not mitigate the consequences of a loss of coolant accident or a high energy line break. Environmental qualification has been clarified since Revision 2 of Regulatory Guide 1.97 was issued. The clarification is in the environmental qualification rule, 10 CFR 50.49. It is concluded that the guidance of Regulatory Guide 1.97 has been superseded by a regulatory requirement. Any exception to this rule is beyond the scope of this review and should be addressed in accordance with 10 CFR 50.49.

3.3.16 Cooling Water Temperature to ESF System Component Cooling Water Flow to ESF System Components

Unit No. 1 at Nine Mile Point does not use a separate cooling water system to cool these components, which according to the licensee consist of the core spray and the containment spray pumps. These pumps are cooled by recirculation of the discharge flow. Pump suction is from the torus. Thus, the cooling water temperature is essentially the torus water temperature, and flow is coincident with pump operation. We find that these deviations are acceptable.

3.3.17 High Radioactivity Liquid Tank Level

Regulatory Guide 1.97 recommends instrumentation for this tank with a from top to bottom. The indicated range for this variable is 0 to 100 percent (corresponding to 0 to 166 in. height, whereas the tank is 180 in. high). The existing range is adequate to indicate storage volume. Therefore, this is an acceptable deviation from Regulatory Guide 1.97.

3.3.18 Emergency Ventilation Damper Position

Regulatory Guide 1.97 recommends Category 2 instrumentation to monitor the operation of the emergency ventilation dampers. The licensee has provided two types of instrumentation for this variable. First, there are damper position indicator lights which are not Category 2. Second, system flow is monitored by Category 2 instrumentation.

Based on this diversity, we find that the deviation from Category 2 to Category 3 instrumentation for damper position indication is acceptable. System operation can be observed by the Category 2 flow instrumentation.

3.3.19 Reactor Building or Secondary Containment Radiation

Regulatory Guide 1.97 recommends Category 2 instrumentation for this variable with a range of 10^{-1} to 10^{4} R/hr for the Nine Mile Point Mark I containment. The licensee has 34 instruments for this variable, some with a range of 10^{-5} to 10^{-1} R/hr, some with a range of 10^{-4} to 1 R/hr and one with a range of 10^{-2} to 10^{3} R/hr. These instruments are Category 3 rather than Category 2. The ranges were chosen on a plant analysis of expected radiation levels. The licensee's position is that secondary containment area radiation is not an appropriate parameter to use for assessing primary containment leakage or detecting significant releases. The licensee also states that the reactor building ventilation system is automatically isolated and the emergency ventilation system initiated at an exposure rate of 20 mR/hr (2×10^{-2} R/hr). The licensee concludes that the existing Category 3 instrumentation for this variable is adequate.

Based on the above, we find that the existing Category 3 instrumentation and ranges are acceptable.

3.3.20 Noble Gas and Vent Flow Rate--Common Plant Vent

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 10^{-6} to 10^{+4} μCi/cc. The licensee has provided instrumentation with a range that goes up to 10^{+3} μCi/cc.

The licensee indicates that their evaluation of the capabilities of this system is not complete and that changes regarding the range of the equipment may occur. They further state that several other monitors are available to monitor stack releases with ranges from 10^{-1} to 10^{6} counts per second and 10^{-1} to 10^{6} counts per minute. They did not indicate that the alternate instrumentation will register up to 10^{+4} μCi/cc. Therefore, we cannot accept this deviation. The licensee should report on the final configuration, describing modifications to bring the range into compliance with the regulatory guide or provide additional justification for not doing so.

3.3.21 Particulates and Halogens--all Identified Plant Release Points

Regulatory Guide 1.97 recommends instrumentation for this variable with a range from 10^{-3} to 10^{+2} μCi/cc. The licensee has provided instrumentation for this variable with a range from 10^{-3} to 10 μCi/cc. They have not supplied justification for the deviation from the recommended upper limit of the range.

We conclude that the licensee should either provide instrumentation that covers up to the recommended upper limit of the range or provide justification for accepting the present instrumentation.

3.3.22 Plant and Environs Radioactivity

Revision 2 of Regulatory Guide 1.97 recommends a multichannel gamma-ray spectrometer for this variable for isotopic analysis in release assessment and analysis.

The licensee has not provided the information required by Section 6.2 of NUREG-0737, Supplement No. 1 for this variable. Their equipment evaluation was in progress when Reference 4 was submitted. We conclude that the licensee should provide the information required, identify any deviation from the regulatory guide recommendations and provide satisfactory justification for any deviation.

3.3.23 Estimation of Atmospheric Stability

Regulatory Guide 1.97 recommends instrumentation for this variable with a range of -9 to +18°F or an analogous range for alternative stability analysis. The licensee has supplied instrumentation with a range of -8 to +20°F. The licensee has not provided justification for the deviation from -9 to -8°F.

Table 1 of Regulatory Guide 1.23 (Reference 7) provides seven atmospheric stability classifications based on the difference in temperature per 100 meters evaluation change. These classifications cover from extremely unstable to extremely stable. Any temperature difference greater than +4°C or less than -2°C does nothing to the stability classification. Therefore, we find that this instrumentation is acceptable to determine atmospheric stability.

3.3.24 Accident Sampling (Primary Coolant, Containment Air and Sump).

This variable is part of Regulatory Guide 1.97 for release assessment, verification and analysis. The licensee's post-accident sampling system provides sampling and analysis as recommended by the regulatory guide except for the following deviations.

1. Boron content--the minimum observable concentration is 50 ppm.

2. Chloride content--the minimum observable concentration is 0.1 ppm.

3. Dissolved hydrogen--the minimum observable concentration is 25 cc/kg.

4. Dissolved oxygen--the minimum observable concentration is 0.1 ppm.

5. Air hydrogen content--the minimum observable concentration is 0.1 percent.

6. Air oxygen content--the minimum observable concentration is 0.5 percent.

7. Coolant pH--the range is 2 to 12 rather than the recommended 1 to 13.

8. A grab sample from the primary containment sump cannot be obtained.

The licensee takes exception to the guidance of Regulatory Guide 1.97 with respect to post-accident sampling capability. This exception goes beyond the scope of this review and is being addressed by the NRC as part of their review of NUREG-0737, Item II.B.3.

4. CONCLUSIONS

Based on our review, we find that the licensee either conforms to or is justified in deviating from Regulatory Guide 1.97, with the following exceptions:

1. The licensee should identify specify Type A variables, and verify that they are Category 1 (Section 3.2).

2. Neutron flux--the licensee's present instrumentation is acceptable on an interim basis until Category 1 instrumentation is developed and installed (Section 3.3.1).

3. Drywell pressure--the licensee should either provide for monitoring of subatmospheric pressures or justify not monitoring them; environmental qualification should be addressed in accordance with 10 CFR 50.49 (Section 3.3.3).

4. Primary containment pressure--the licensee should either provide for monitoring of subatmospheric pressures or justify not monitoring them; redundant power supplies should be provided (Section 3.3.5).

5. Primary containment isolation valve position--environmental qualification should be addressed in accordance with 10 CFR 50.49; the licensee should upgrade non-seismically qualified position switches to include seismic qualification (Section 3.3.6).

6. Suppression pool water level--the licensee should either re-range the existing instrumentation or provide justification for not doing so (Section 3.3.8).

7. Radiation exposure rate--the licensee should show that the ranges supplied for this variable encompass the radiation level at the instrument location (Section 3.3.10).

8. Drywell atmosphere temperature--the licensee should justify a deviation from the recommended range or supply the recommended range (Section 3.3.12).

9. Shutdown cooling system flow--the licensee should provide the recommended instrumentation (Section 3.3.15).

10. Shutdown cooling system temperature--environmental qualification of this instrumentation should be addressed in accordance with 10 CFR 50.49 (Section 3.3.15).

11. Noble gas and vent flow rate-common plant vent--the licensee should provide the recommended range or provide justification for not doing so (Section 3.3.20).

12. Particulates and halogens--all identified plant release points--the licensee should provide instrumentation of the recommended range or justification for the deviation in the upper limit of the range (Section 3.3.21).

13. Plant and environs radioactivity--the licensee should provide the information required by Section 6.2 of NUREG-0737, Supplement No. 1, identify any deviation from the recommendations of Regulatory Guide 1.97, and provide satisfactory justification for any deviation (Section 3.3.22).

5. REFERENCES

1. NRC letter, D. G. Eisenhut to All Licensees of Operating Reactors, Applicants for Operating Licenses, and Holders of Construction Permits, "Supplement No. 1 to NUREG-0737--Requirements for Emergency Response Capability (Generic Letter No. 82-33)," December 17, 1982.

   Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 2, U.S. Nuclear Regulatory Commission (NRC), Office of Standards Development, December 1980.

3. Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability, NUREG-0737 Supplement No. 1, NRC, Office of Nuclear Reactor Regulation, January 1983.

4. Niagara Mohawk Power Corporation letter, C. V. Mangan to Director of Nuclear Reactor Regulation, NRC, "Nine Mile Point Unit 1, Docket No. 50-220, DPR-63," April 2, 1984.

5. Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant Environs Conditions During and Following an Accident, Regulatory Guide 1.97, Revision 3, NRC, Office of Nuclear Research, May 1983.

6. Final Safety Analysis Report, Nine Mile Point Nuclear Station, Niagara Mohawk Power Corporation, Syracuse, NY 13202, June 1967.

7. Onsite Meteorological Programs, Regulatory Guide 1.23 (Safety Guide 23), NRC, February 17, 1972 or Meteorological Programs in Support of Nuclear Power Plants, Proposed Revision 1 to Regulatory Guide 1.23, NRC, Office of Standards Development, September 1980.