PRIORITY 1
(ACCELERATED RIDS PROCESSING)

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR:9412120172 DOC.DATE: 94/12/05 NOTARIZED: YES DOCKET #
FACIL:50-220 Nine Mile Point Nuclear Station, Unit 1, Niagara Powe 05000220
AUTH.NAME AUTHOR AFFILIATION
SYLVIA,B.R. Niagara Mohawk Power Corp.
RECIP.NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

See Report

SUBJECT: Forwards response to NRC 941103 RAI re proposed license amend to allow use of range 10 on intermediate range monitors.GE proprietary repts GENE-909-16-0393,Rev 1 & GENE-909-39-1093 also encl.GE proprietary repts withheld.

DISTRIBUTION CODE: AP01D COPIES RECEIVED:LTR 1 ENCL 1 SIZE: 13+49
TITLE: Proprietary Review Distribution - Pre Operating License & Operating R

NOTES:

	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL	RECIPIENT ID CODE/NAME	COPIES LTTR	COPIES ENCL
	PD1-1 LA	1	1	PD1-1 PD	1	1
	BRINKMAN,D.	3	3			
INTERNAL:	ACRS	6	6	FILE CENTER 01	1	1
	OGC/HDS3	1	0			
EXTERNAL:	NRC PDR	1	1 NP			

P R I O R I T Y 1 D O C U M E N T

NOTE TO ALL "RIDS" RECIPIENTS:

PLEASE HELP US TO REDUCE WASTE! CONTACT THE DOCUMENT CONTROL DESK, ROOM P1-37 (EXT. 504-2083) TO ELIMINATE YOUR NAME FROM DISTRIBUTION LISTS FOR DOCUMENTS YOU DON'T NEED!

TOTAL NUMBER OF COPIES REQUIRED: LTTR 14 ENCL ~~12~~ 13

AA2

NIAGARA MOHAWK

NIAGARA MOHAWK POWER CORPORATION/NINE MILE POINT, P.O. BOX 63, LYCOMING, NY 13093/TELEPHONE (315) 349-2882

B. Ralph Sylvia
Executive Vice President
Nuclear

December 5, 1994
NMP1L 0883

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

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: *Response to Request for Additional Information Regarding Proposed License Amendment to Allow Use of Range 10 on Intermediate Range Monitors (IRMs) for Nine Mile Point Nuclear Station Unit No. 1 (NMP1) (TAC No. M89981)*

Gentlemen:

By letter dated July 21, 1994 (NMP1L 0838), Niagara Mohawk proposed a license amendment to revise Technical Specification 2.1.2, 3.1.7, and 3.6.2/4.6.2 and associated Bases to allow the use of Range 10 on the IRMs. Niagara Mohawk also proposed changes to calibration frequency of certain neutron monitoring instrumentation. By letter dated November 3, 1994, the Staff requested that Niagara Mohawk submit additional information in order to complete the review of Niagara Mohawk's submittal. Attached is Niagara Mohawk's response to the Staff's November 3, 1994 request for additional information. The response includes three enclosures. Enclosures 1 and 2 were prepared by General Electric and have been identified as Proprietary Information. Enclosure 3 provides General Electric's affidavit to that effect. Therefore, in accordance with 10CFR2.790 on behalf of General Electric, it is requested that Enclosures 1 and 2 be withheld from public disclosure in accordance with Enclosure 3.

Niagara Mohawk has provided a copy of this response to the appropriate state representative.

Very truly yours,

B. Ralph Sylvia
Executive Vice President - Nuclear

BRS/MGM/kab
Enclosure 120095

Change: NRC PDR 1 1 NP

Ltr. Encl. APD1 1/1

xc: Regional Administrator, Region I
Mr. L. B. Marsh, Director, Project Directorate I-1, NRR
Mr. D. S. Brinkman, Senior Project Manager, NRR
Mr. B. S. Norris, Senior Resident Inspector
Ms. Donna Ross
Division of Policy Analysis and Planning
New York State Energy Office
Agency Building 2
Empire State Plaza
Albany, NY 12223
Records Management

NINE MILE POINT UNIT 1
DOCKET NO. 50-220
DPR-63
TAC NO. M89981

Response to Request for Additional Information Regarding Proposed License Amendment to allow use of Range 10 on Intermediate Range Monitors (IRMs) for Nine Mile Point Nuclear Station Unit No. 1

Information Request 1

In Niagara Mohawk Power Corporation's submittal, reference is made to GENE-909-16-0393 and GENE-909-39-1093. These reports provide information on the overlap between average power range monitor (APRM) and IRM ranges and are required for more fully evaluating the proposed changes. Please provide these documents.

Response 1

GENE-909-16-0393 and GENE-909-39-1039 are provided as enclosures 1 and 2 to this response.

Information Request 2

The proposed TSs require recirculation flow to be greater than 20% for entry into Range 10, and also require a rod withdrawal block until recirculation flow exceeds 30%. A minimum flow of 30% is required when reactor power is greater than 20% to satisfy minimum critical power ratio (MCPR) limits, and the proposed rod block is to ensure that power stays near approximately 12% upon entry into range 10 until 30% flow is achieved. It is not clear that the 20% flow requirement together with the rod withdrawal block will offer sufficient margin to MCPR limits for events that may raise power above 30%. Provide supporting analysis to show that the rod block with the minimum flow requirement will offer sufficient margin to MCPR limits. Is the rod withdrawal block in effect for all rods? Does the minimum recirculation flow criteria bound future operating cycles? Also, provide supporting information on existing limits which ensure 30% recirculation flow in "run" mode. Increasing the minimum recirculation requirement to 30% for entry into Range 10 would provide increased margin against MCPR limits.

Response 2

The proposed amendment indicates the use of procedural controls which require the operator to ensure that recirculation flow is greater than 30% of rated when control rods are being withdrawn while operating in the startup mode in Intermediate Range Monitor (IRM) range 10. It is not the intent to have a rod withdrawal block circuit which automatically provides a rod withdrawal block if recirculation flow is reduced below 30% rated recirculation flow. The basis for the 30% flow requirement is to

is to ensure that any potential control rod withdrawal error transient is bounded by the Rod Withdrawal Error (RWE) analysis assuming that the Average Power Range Monitor (APRM) flow biased rod block and scram do not function and taking no credit for the IRM rod block or scram, which is conservative. These assumptions ensure that the minimum flow requirements provides sufficient margin to the MCPR limits.

The current technical specifications require recirculation flow to be greater than 20% prior to entry into run. This is procedurally controlled. After entering the run mode, the applicable rod block is the flow biased APRM rod block. No automatic rod block enforces the 20% flow limit in run mode. The APRM flow biased rod blocks and scrams are functional in both the run mode and startup mode. The proposed amendment stipulates that the current procedure apply for IRM ranges 1 through 9 and that for transition from range 9 to range 10, the flow should be increased to a minimum flow of 30% of rated core flow with the Limiting Condition for Operation (LCO) being control rods shall not be withdrawn if recirculation flow is less than 30% of rated. In the proposed IRM range 10, all the APRM protective functions remain enabled. The only uncertainty in the APRM protective function is that the APRM's may not have cleared the downscale setpoints, and therefore, the IRM upscale rod block and scram are evaluated as the primary protective trip. The probability that all the APRM channels are below the downscale trip because of APRM malfunction is considered an extremely low probability condition which has not been experienced in the operating history of NMP1 or any BWR. The APRM system response characteristics in the 1% to 5% of scale region are considered reliable neutron flux indication and degraded APRM response to flux increase transients is considered extremely unlikely. Failure of the APRM such that the system does not respond to increasing neutron flux requires multiple failures which are beyond the design basis for the system. The APRM system protective trips are expected to function in startup when in IRM range 10 since the APRMs would have begun to respond to flux even if not sufficiently increased to greater than the downscale setpoint. This is the basis for the current practice of increasing the channel gains on the APRMs and bypassing the downscale LPRM inputs to the APRM channel averaging circuit to achieve overlap for transition from startup to run.

The IRM range 10 administrative limit of requiring recirculation flow to be greater than 30% is based on the conservative assumption that the APRM trips will not occur and the IRM is considered the primary protective trip. In addition, it is assumed that real power exceeds 20% of rated power and that the low power RWM controls have been bypassed. This is not an intended or anticipated operating region for IRM range 10. However, it is conservatively analyzed because protective interlocks are not provided to prevent operation in this region. In this region, the RWE event is analyzed for compliance with the safety limit MCPR. The IRM upscale rod block at 35% and scram at 38.4% are conservative compared to the existing APRM flow biased protection provided for the RWE event in this region. Considering this design feature, a minimum flow above that required for run mode operation is not required.

The reason for the additional administrative controls on minimum recirculation flow is based on the uncertainty associated with the ability of the IRMs to respond equivalent to the APRMs due to the number and location of the IRMs. The review completed by GE (GENE-909-39-1093) concluded that the MCPR typically remains well above 1.7 for powers below 40% of rated (Kf curve requires MCPR greater than 1.7 when flow is less than 40%). This review also concluded that a RWE to full out position unblocked when the initial MCPR is 1.7 or greater and core flow is greater than 30% ensures that the SLMCPR (1.07) is not exceeded. The overall conclusion of this analysis is that in the operating region from 20% rated power to 40% rated power with core flow greater than 30%, an unblocked rod withdrawal error satisfies the Safety Limit Minimum Critical Power Ratio (SLMCPR). Therefore any uncertainty associated with the IRMs ability to adequately block rod withdrawal assuming no credit for the APRM rod block is bounded. This analysis bounds any reload which has a RWE analysis for an unblocked full rod withdrawal. If this amendment is approved, the validity of this condition must be established on a reload basis as specified in the GE report (GENE-909-39-1093, page 5, 3rd paragraph). If future reloads require the APRM system to mitigate the delta CPR for a RWE transient, then the 30% IRM range 10 minimum recirculation flow restriction would require review and disposition.

Increasing recirculation flow to 30% for entry into IRM range 10, or an automatic rod block is not required because it is not the intent of IRM range 10 to provide for operation above 20% rated power. IRM range 10 is only intended to expand the overlap between the IRM and APRM to achieve a smooth transition between the IRM range and the APRM range. This is expected to only require operation up to a real power within a few percent of 12% of rated. Based on the above, the recirculation flow restriction for IRM range 10 operating conditions and the administrative limit placed on control rod withdrawal is conservative. The restriction on recirculation flow is only required because of the extremely small potential for inadvertent operation above 20% rated power. The potential for operation above 20% rated power is considered extremely small because of the large mismatch in major reactor heat balance indications which would exist and alert operators to investigate why the APRMs have not cleared the downscale setpoint nominally set at 5.28% of scale (e.g. bypass valve position, feedwater flows, etc.).

Information Request 3

The proposed TSs have eliminated the downscale APRM reactor scram, and have reduced the setpoint for downscale APRM rod withdrawal block. The submittal states that justification for the change is provided by the increased overlap between IRM and APRM with the addition of Range 10, and the proposed IRM/APRM overlap surveillance. Due to the fact that reliance is being placed on this overlap, the licensee will be required to use Range 10 when moving between APRM operation and IRM operation. Provide further information on how the requirement to use Range 10 will be incorporated into the TSs. Although operator error events have been evaluated, address the possibility of other events that are affected by the deletion of the APRM scram and describe the outcome.

Response 3

It is not the intent of the proposed amendment to require that the IRM range 10 be used if the additional overlap is not required to clear the APRM downscale setpoint. As stated in the bases section 2.1.2b, if the APRMs clear the APRM downscale setpoint in IRM range 9 and the reactor pressure 850 psig interlock, then the mode switch can be transferred to run.

The analysis of the deletion of the APRM downscale scram considered the design basis functions and the impact of deletion of the coincident APRM downscale/IRM upscale scram (GENE-909-39-1093 section 6). This analysis concluded that the APRM downscale rod block function provided more than adequate protection during the transition between the startup and run modes. This analysis section discusses all the potential events affected by the deletion of this scram.

The increased overlap provided by the IRM range 10 amendment provides for the ability to complete an IRM/APRM overlap surveillance similar to later generation BWR designs. In the later generation designs an APRM downscale only provides a rod block in the run mode. In these later designs, the IRM/APRM, overlap is achieved by using the full IRM range function capability. However, the maximum IRM range is not required to be used to transfer into run. The higher IRM range is available if required, but the IRM is maintained on the appropriate scale based on its indication. In a similar sense the IRM range 10 capability is available to the operators if it is required, but if transition can be completed on IRM range 9 while maintaining the IRMs within the operating guidelines of between 25% and 75% of scale, then IRM range 10 would not be needed. The capability is provided if the operator finds that the IRMs indicate significantly above 75% of scale and the APRM downscales or reactor pressure interlocks have not cleared, then range 10 would be used.

The IRM range 10 expanded operating range to allow this overlap reduces the potential for operation above 75% of scale on the IRMs, thus reducing the potential for inadvertent scrams. The intent of the IRM range 10 change is not achieved if the operator is forced to increase power more than necessary to achieve range 10. The safety basis for the deletion of the APRM downscale is satisfied independent of whether or not the IRMs are on range 10.

The intent of the proposed amendment as discussed in the supporting information provides the functional capability to achieve 1/2 decade overlap between the IRM and APRM neutron monitoring sub-systems. This ability reduces the potential for premature transition into run to avoid an IRM upscale scram if the APRM downscales have not been cleared.

Use of IRM range 10 for all transitions from run to startup or startup to run, will potentially create conditions which are not consistent with the operating procedures used at NMP1 and is not required, that being conditions which force operation on

IRM range 10 inconsistent with the operating guidelines for the IRMs. This practice would complicate the transition without any associated safety benefit.

As discussed in GENE-909-39-1093, operator errors of prematurely going to the run mode during startup or delaying shifting from run mode during shutdown (resulting in too many APRM channels having downscale) do not result in a significantly degraded APRM safety function. The APRM downscale rod block trip will continue to both prohibit control rod withdrawal errors and power ascension during the time period needed to take corrective action required by the technical specifications. The 120 percent APRM upscale trip will provide the necessary protection against design basis events previously evaluated in the Final Safety Analysis Report (FSAR).

Information Request 4

What upscale trips are in place for the APRMs for rod withdrawal block and reactor scram when the mode switch is in other than "run" mode. Specifically, are upscale trips at 15% for reactor scram and 12% for rod withdrawal block in effect for modes other than "run"? Discuss how operation near 40% power in the "startup" mode will be affected by these APRM trip signals.

Response 4

The existing APRM upscale trips remain functional in all reactor mode switch positions. The NMP1 APRM upscale trips are the flow biased rod block and flow biased scram. These scrams are identified in technical specification section 2.1.1. NMP1 does not have the APRM setdown 15% scram and 12% rod block trips in the startup mode. This function is performed by the IRM as discussed in the proposed technical specification bases 2.1.2b.

As discussed in response to question 2, it is not the intent of IRM range 10 to allow operation in the startup mode at power normally greater than 20%. It is expected that IRM range 10 will allow operation in the 10 to 15% power range for transition to the APRMs. This intent is stated in the technical specification bases section 2.1.2.b. Operation near 40% power is not planned and is considered very low probability. However, because the upscale IRM scram trip in range 10 and rod block do not prevent operation in this region, the safety analysis considered events in this region as bounding. GENE 909-39-1093 section 5 reviewed operation in the IRM range 10 region for powers less than 40% for this reason only.

The APRM flow biased scram and flow biased rod block remain functional and will perform their design basis function when in startup mode when operating in the IRM range 10 in the power range from 20 to 40% power. Any transient which could potentially increase reactor power from the 15% range to the 38% IRM scram trip setpoint would also cause the APRM channels to respond. The APRM will respond the same as they currently respond at low powers in the 10 to 15% power region.

Inadvertent operation at greater than 15% of rated power in IRM range 10 is not required for the APRM channels to clear the downscale trip setpoint. The data collected during several startups has demonstrated that increasing the APRM gains and bypassing downscale LPRM channel inputs increases the APRM readings approximately 2 to 4% which is sufficient to achieve transition to run mode. Therefore, operation above 20% power in startup IRM range 10 is not considered an operating region and is only postulated to be conservative. Prior to exceeding 25% power, a heat balance is required. Significant heat balance indicators will alert the operator that a severe anomaly exists if the APRMs have not cleared the downscale trip setpoint. Multiple channel APRM failures would be required which goes beyond any of the design basis required failure conditions.

Information Request 5

Provide more information on the analysis done, computer codes and methods used for the control rod withdrawal event and rod drop event, along with the resulting fuel and clad conditions. Describe how use of the proposed APRM/IRM setpoints will affect these events, particularly noting peak fuel enthalpy limits with and without the use of Range 10.

Response 5

Section 5 of GENE-909-39-1093 discusses the review of the rod withdrawal error transient (RWE) and control rod drop accident (RDA) and provides the specific analysis references.

NMP1 was evaluated by General Electric in comparison with the standard analytical models developed to represent the RWE and RDA events, and upon which the 170 cal/g (RWE) and 280 cal/g (RDA) criteria are based. The RWE analysis of Reference 10.8 concludes that the criterion of 170 cal/g will not be violated for continuous rod withdrawal in the startup range with complete failure of the IRMs. NMP1 is enveloped by this analysis. The RDA is evaluated with credit for only a reactor scram from the APRMs at 120% of rated power, and therefore, the proposed change to provide IRM Range 10 will not impact the RDA analysis. IRM Range 10 with associated plant modifications do not effect the current licensing basis, therefore, no plant specific analyses were required. Consequently, no specific enthalpy limits with and without use of Range 10 are available.

The proposed APRM/IRM setpoints have no impact on RDA because this event only credits the 120 percent APRM high neutron flux trip. The IRM scram setpoints have no effect on the results of this analysis. Similarly, the IRM scram setpoints have no impact on the RWE evaluations performed since no credit was taken in this analysis for any control rod block. The event analysis assumes a complete unblocked control rod withdrawal.

Enclosures

1. GENE-909-16-0393, "IRM/APRM Overlap Analysis for Nine Mile Point Nuclear Station Unit One," Revision 1, dated April 14, 1993

2. GENE-909-39-1093, "IRM/APRM Overlap Improvement for Nine Mile Point Nuclear Station Unit One," dated March 8, 1994

3. General Electric Affidavit on GENE-909-16-0393 and GENE-909-39-1093

ENCLOSURE 3

General Electric Company

AFFIDAVIT

I, **George B. Stramback,** being duly sworn, depose and state as follows:

(1) I am Project Manager, Licensing Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE proprietary reports GENE-909-16-0393, *IRM/APRM Overlap Analysis for Nine Mile Point Nuclear Station Unit One*, Revision 1 (GE Company Proprietary), dated April 14, 1993, and GENE-909-39-1093, *IRM/APRM Overlap Improvement for Nine Mile Point Nuclear Station Unit One*, (GE Proprietary Information), dated March 8, 1994. The proprietary information is delineated by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified in paragraph (2), above, is classified as proprietary because the IRM/APRM overlap improvement contains detailed results of analytical models,

methods and processes, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of the BWR.

The development of the IRM/APRM overlap improvement and analysis was achieved at a significant cost, on the order of a hundred thousand dollars, to GE.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 22nd day of November 1994.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 22ND day of November 1994.

Notary Public, State of California

JULIE A. CURTS
COMM. # 974657
Notary Public — California
SANTA CLARA COUNTY
My Comm. Expires SEP 30, 1996

013