

CATEGORY 1

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 9610150259 DOC. DATE: 96/10/04 NOTARIZED: YES DOCKET #
FACIL: 50-220 Nine Mile Point Nuclear Station, Unit 1, Niagara Power 05000220
AUTH. NAME AUTHOR AFFILIATION
TERRY, C.D. Niagara Mohawk Power Corp.
RECIP. NAME RECIPIENT AFFILIATION
Document Control Branch (Document Control Desk)

SUBJECT: Responds to NRC Bulletin 96-03, "Potential Plugging of ECC Suction Strainers by Debris in BWRs."

DISTRIBUTION CODE: IE73D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 8
TITLE: NRC Bulletin 96-03, "Potential Plugging of ECCS Strainers by Debris i

NOTES:

	RECIPIENT		COPIES		RECIPIENT		COPIES	
	ID CODE/NAME		LTR	ENCL	ID CODE/NAME	LTR	ENCL	
	NRR/LYNCH, D.		1	1	PD1-1 PD	1	1	
	HOOD, D		1	1				
INTERNAL:	<u>FILE CENTER 02</u>		1	1	NRR/DE/ECGB	1	1	
	NRR/DE/ECGB/A		1	1	NRR/DSSA/SCSB	4	4	
	NRR/DSSA/SRXB		1	1	NRR/DSSA/SRXB/A	1	1	
	NRR/PD3-2		1	1	RES/DET/GSIB	2	2	
EXTERNAL:	NOAC		1	1	NRC PDR	1	1	

C
A
T
E
G
O
R
Y
1

D
O
C
U
M
E
N
T

NOTE TO ALL "RIDS" RECIPIENTS:
PLEASE HELP US TO REDUCE WASTE. TO HAVE YOUR NAME OR ORGANIZATION REMOVED FROM DISTRIBUTION LISTS OR REDUCE THE NUMBER OF COPIES RECEIVED BY YOU OR YOUR ORGANIZATION, CONTACT THE DOCUMENT CONTROL DESK (DCD) ON EXTENSION 415-2083

TOTAL NUMBER OF COPIES REQUIRED: LTR 17 ENCL 17





NIAGARA MOHAWK

GENERATION
BUSINESS GROUP

NINE MILE POINT NUCLEAR STATION/LAKE ROAD, P.O. BOX 63, LYCOMING, NEW YORK 13093/TELEPHONE (315) 349-7263
FAX (315) 349-4753

CARL D. TERRY
Vice President
Nuclear Engineering

October 4, 1996
NMP1L 1139

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: NRC Bulletin 96-03, "Potential Plugging Of Emergency Core Cooling Suction Strainers By Debris In Boiling-Water Reactors."

Gentlemen:

By letter dated May 6, 1996, the Commission issued NRC Bulletin 96-03, "Potential Plugging of Emergency Core Cooling Suction Strainers by Debris in Boiling-Water Reactors." Bulletin 96-03 was issued to have licensees implement appropriate procedural measures and plant modifications to minimize the potential for clogging of emergency core cooling system (ECCS) suppression pool suction strainers by debris generated during a loss-of-coolant accident (LOCA). Also, the Bulletin required that licensees report to the Commission within 180 days as to whether, and to what extent, the requested actions would be taken and to notify the Commission when actions associated with this Bulletin were complete. All licensees were requested to implement these actions by the end of the first refueling outage starting after January 1, 1997.

Subsequent to the issuance of Bulletin 96-03, the Staff requested that each licensee with plants having refueling outages during the Spring of 1997 and that would be unable to meet the schedular requirements of the Bulletin, submit an initial response as soon as possible. This initial response would detail the actions to be taken, the mitigative strategies to be used, and a schedule for final implementation.

Nine Mile Point Unit 1's (NMP1) next refueling outage (REFOUT97) is scheduled to begin in February 1997. The purpose of this letter is to provide notification that NMP1 cannot implement certain of the requested actions identified in Bulletin 96-03 by the end of REFOUT97. Accordingly, the attachment to this letter provides the initial response discussed above, including the bases for not being able to implement a final resolution by the end of REFOUT97.

15007

9610150259 961004
PDR ADOCK 05000220
G PDR



JE73
1/1



11

Page 2

Niagara Mohawk will submit its response to the Bulletin by November 3, 1996 (i.e., 180 days from issuance of the Bulletin) as required.

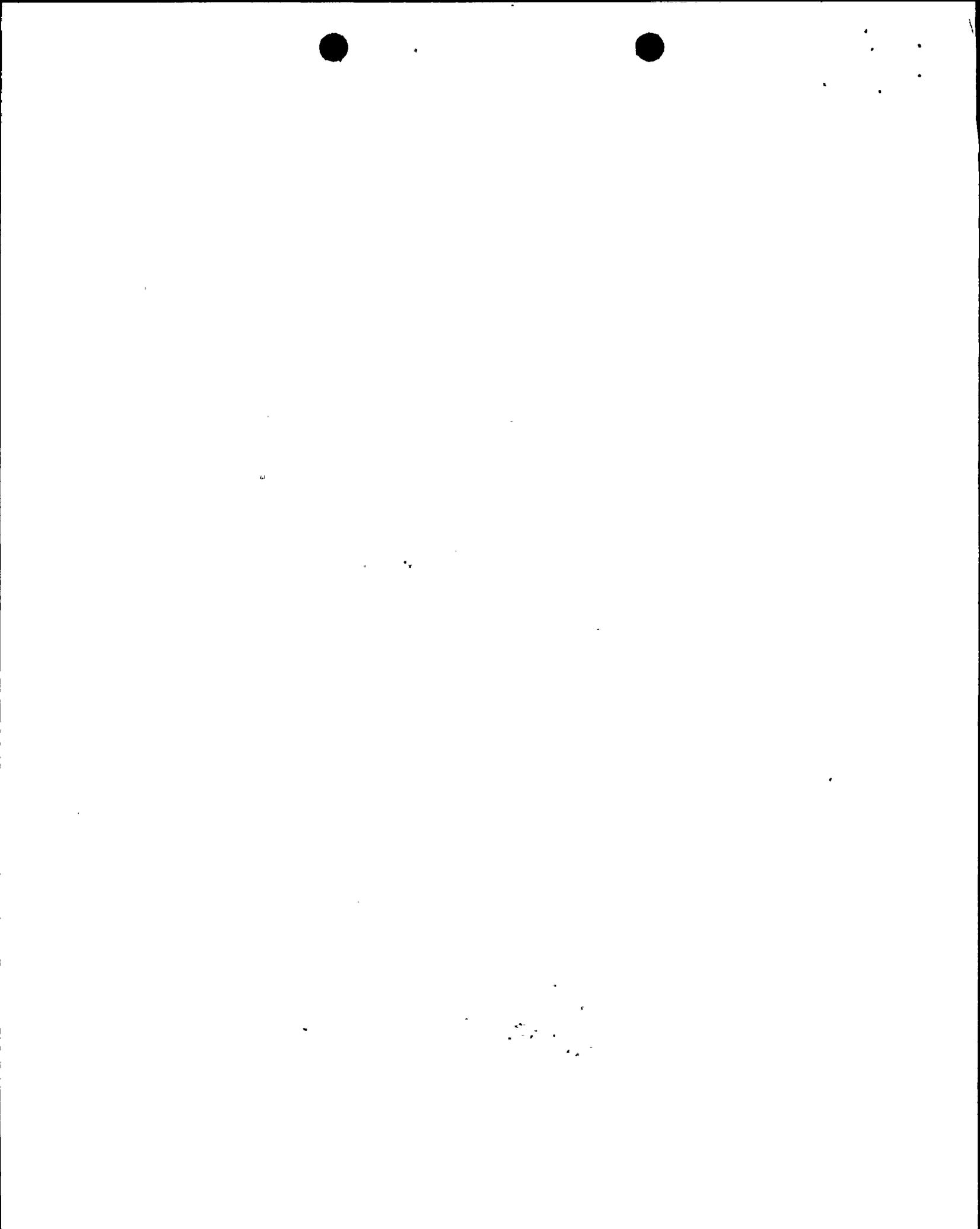
Very truly yours,



C. D. Terry
Vice President - Nuclear Engineering

CDT/JMT/lmc
Attachment

xc: Regional Administrator, Region I
Mr. S. S. Bajwa, Director, Project Directorate I-1, NRR
Mr. B. S. Norris, Senior Resident Inspector
Mr. D. S. Hood, Senior Project Manager, NRR
Records Management

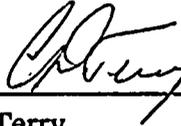


UNITED STATES NUCLEAR REGULATORY COMMISSION

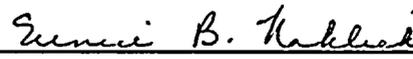
In the Matter of)
)
NIAGARA MOHAWK POWER CORPORATION) Docket No. 50-220
)
Nine Mile Point Nuclear Station Unit 1)

C. D. Terry, being duly sworn, states that he is Vice President, Nuclear Engineering 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 document attached hereto; and that the document is true and correct to the best of his knowledge, information, and belief.

NIAGARA MOHAWK POWER CORPORATION

By 
C. D. Terry
Vice President - Nuclear Engineering

Subscribed and sworn to before me, a Notary Public in and for the State of New York and the County of OSwego, this 4th day of October 1996.


Notary Public in and for

Jefferson County, New York

My Commission Expires:

4/2/98

Eunice B. Naklick #4964683
Notary Public, State of New York
Qualified in Jefferson County
My Commission Expires April 2, 1998

THE UNIVERSITY OF CHICAGO
PRESS
50 EAST LAUREL STREET
CHICAGO, ILL. 60607
& HARVARD UNIVERSITY PRESS

ATTACHMENT

BASES FOR NOT BEING ABLE TO IMPLEMENT A FINAL RESOLUTION BY RFO14

NRC Bulletin 96-03 requests that all licensees implement the requested actions by the end of the first refueling outage starting after January 1, 1997. Nine Mile Point Unit 1's next refuel outage (REFFOUT97) is scheduled to begin in February 1997. Accordingly, compliance with the schedular requirements of Bulletin 96-03 would require implementation of a final resolution by the end of REFOUT97. Based on the following, Niagara Mohawk (NMPC) does not believe this schedule is feasible.

The use of the Boiling Water Reactor Owners' Group (BWROG) methodology and data being developed will be necessary in order to develop a satisfactory resolution. However, the BWROG recommended strainer design methodology, which will be documented in the "Utility Resolution Guidance (URG) for Resolution of ECCS Suction Strainer Blockage," will not be provided to the Commission as a final version until November 1996. The BWROG has completed testing that supports the development of a calculational methodology which will be employed to design alternate passive strainers. However, delays in air jet impact testing and Reflective Metal Insulation (RMI) head loss testing has contributed to delays in completing the URG. Following receipt, the Commission plans to review the URG and issue a Safety Evaluation Report (SER) approving the calculational methodology. Difficult calculational methodology issues exist involving insulation debris zone of destruction, percent destruction within the zone, and transport from the drywell to the suppression pool and would potentially affect the Commission's review process. Accordingly, the Commission's SER is not projected to be issued until early 1997.

Although alternate strainer designs can be completed based on the draft URG, NMPC does not believe it is prudent to order strainers until the Commission approves the URG documented design methodology. Therefore, based on the current schedule for Commission approval of the URG (early 1997), our outage schedule (February 1997), and current vendor proposals, which indicate that fabrication of the strainers would take between 15 and 20 weeks, the schedular requirements of Bulletin 96-03 are not feasible. In addition, NMP1's in-line strainers (located downstream of our pumps discharge) provide a unique situation for evaluation and assessment of solutions to Bulletin 96-03. Because NMP1 has no torus suction strainers, our suction piping design is not conducive to installation of a "bolt-on" high capacity strainer. Consequently, options using a unique, single common strainer per every two suction lines, or an out of pool strainer design are also being evaluated. Depending on the selection made, prior Commission review and approval of our plant-specific change might be required before implementing.

In conclusion, the time frame specified in Bulletin 96-03 does not allow sufficient time for the completion of necessary BWROG testing and evaluation activities, Staff review of the BWROG recommended resolution guidance, completion of plant specific final design changes (and Commission approval, if required), and procurement and installation of new alternate high capacity strainers.



BASES FOR DEFERRING IMPLEMENTATION OF THE REQUESTED ACTIONS OF BULLETIN 96-03 FROM SPRING 1997 (RFO14) UNTIL SPRING 1999 (RFO15)

NMPC proposes to defer the implementation of the requested actions delineated in Bulletin 96-03 from REFOUT97 (Spring 1997) to REFOUT99 (Spring 1999). Based on current design features, procedures and controls (Emergency Operating Procedures, Foreign Material Exclusion (FME), etc.), tests and actions taken to date, and the additional compensatory actions proposed, deferring completion of the requested actions to REFOUT99 will not adversely affect the ability of NMPC to respond to an accident. The basis for this conclusion is presented below.

Plant-Specific Background and Current Mitigative Strategies

As detailed in NMPC's November 16, 1995 response to Bulletin 95-02, "Unexpected Clogging of a Residual Heat Removal (RHR) Pump Strainer While Operating in Suppression Pool Cooling Mode," the Nine Mile Point Unit 1 (NMP1) Emergency Core Cooling System (ECCS) consists of four core spray pump sets (core spray pump and core spray topping pump) and four containment spray pumps that normally take suction from the torus. No other pumps are in the scope of Bulletin 96-03 for NMP1. If ECCS flows were affected by strainer clogging, the operators would employ redundant pump/pump sets to maintain required ECCS flows. The NMP1 ECCS configuration allows for alternate injection sources other than the torus. Specifically, core spray can be supplied from two redundant, independent containment spray raw water pumps (i.e., lake water) with power supplied by the emergency diesel generators. The containment spray system can be supplied likewise. In addition, the core spray system can be manually aligned to take suction from the condensate surge and storage tanks. All of these alternate ECCS injection sources are procedurally controlled and referenced in the NMP1 Emergency Operating Procedure (EOPs).

Subsequent to our November 16, 1995, Bulletin 95-02 response, NMPC was requested to respond to a series of questions listed in a NRC Request for Additional Information (RAI) dated March 28, 1996. Our RAI response dated April 26, 1996, provided additional information regarding NMP1's design. Specifically, our letter indicated NMP1 had less than 5% fibrous insulation in the containment thereby limiting the potential for strainer clogging. NMP1's strainers are equipped with local differential pressure gage readouts and control room alarms providing a means for early detection of strainer clogging. Also, because of the relative ease for on-line strainer inspections (NMP1 has in-line strainers downstream of the core spray pumps), one strainer is inspected every quarter ensuring that all strainers are inspected at least once every two years. Strainer differential pressure data is trended for all strainers during periodic tests to ensure early detection of fouling.

To validate system capabilities, NMPC has taken several actions. During a forced outage in April of 1996, NMPC performed an extended pump test to agitate the suppression pool to the maximum extent possible. For this test, one train of core spray and one train of containment spray ran in recirculation mode for over six hours. No fibrous material was found during the



post-test strainer inspections. Only minimal debris, i.e., some inconsequential pieces of tape were found. Previous to this suppression pool agitation test, during our 1995 refueling outage, NMP1 extracted three suppression pool sludge samples for analysis and characterization. This analysis showed the sludge to be composed only of iron-oxide and water. No evidence of fibrous debris was found. Sizing analysis indicated that 98% of the sludge (by weight) was composed of particles in the 0-10 micron range (i.e., very small particles which did not exhibit any cohesive tendencies).

To raise Nuclear employees awareness of the strainer clogging issue, continuing training programs have been updated to discuss recent industry events and provide examples of good practices with regards to foreign material control.

With regards to event mitigation, the NMP1 design basis accident which will generate the greatest amount of fibrous debris post-Loss of Coolant Accident (LOCA) is a double-ended guillotine break of one of the five recirculation loops (a break of any other high energy line develops approximately 50% less fibrous debris for transport). Initiation of such a break would most likely start with the development and subsequent growth of an Intergranular Stress Corrosion Crack (IGSCC). Studies to date have shown that for initiated cracks to grow, three distinct conditions must exist. They are susceptible material, presence of a tensile stress, and poor water chemistry. NMP1 has taken significant steps in controlling two of these contributors by replacing all five recirculation loops (both suction and discharge) with stainless steel pipe having carbon contents low enough to make the piping reasonably resistant to cracking and by maintaining tight control on reactor water chemistry limits.

Finally, while not a basis for compliance with 10CFR50.46, industry studies and past experience has shown that through-wall crack growth rates are very small, and while pipe cracking will reduce a pipe segment's section modulus, it will still provide significant strength to sustain the stress flow field, thereby allowing the pipe to leak-before-break. NMP1 has a stringent containment leak detection program where containment leakage is continually monitored and trended for adverse performance.

Compensatory Interim Actions

Because NMP1 will be unable to comply with the Bulletin's requested actions by the scheduled Spring 1997 refueling outage, NMPC will perform the following compensatory actions:

1. As previously committed to in our response to Bulletin 95-02, NMP1 will desludge and clean the torus during the next outage of sufficient duration (i.e., minimum duration of 17 days), but no later than our upcoming refueling outage currently scheduled for February 1997.



2
3
4
5

2. During the Spring 1997 refueling outage, NMP1 personnel will perform a detailed inspection of each torus vent downcomer (total of ten) along with a 360° vent header inspection to remove any foreign materials which may be present.
3. One of NMP1's alternate water sources to the core is from the containment spray raw water system (i.e., lake water). These pumps are tested each quarter to validate pump capacity for head and flow. The raw water intertie has a safety-related, passive check valve which must open to allow forward flow into the reactor vessel. Although this valve cannot be forward flow tested (forward flow would cause direct injection of raw water into the reactor vessel), it can be tested using a torque wrench. NMPC will validate free movement of the check valve disks using a torque wrench quarterly starting during our Spring 1997 refueling outage. This data will be performance trended.
4. After desludging the suppression pool, NMPC will again confirm adequate flow through our in-line strainers by rerunning an abbreviated torus agitation test within three months following the end of the Spring 1997 outage. After the test, the strainers in service will be inspected to confirm whether or not fibrous debris is collecting on the strainer surfaces.
5. During the Spring 1997 refueling outage, the drywell will be cleaned. Specific goals and objectives on the level of cleanliness will be outlined and approved by Engineering so that an appropriate level of cleanliness can be achieved.
6. Less than 5% of the insulation located in NMP1's drywell is fibrous. NMPC will change to RMI, or jacket and band this fibrous insulation to the greatest extent practical. Final workscope estimates are under development and will be provided in our final response to Bulletin 96-03.
7. Insulation in the drywell will be inspected for damage and proper installation. Defects will be corrected to minimize the potential for generation of operational debris.
8. Improved FME training will be provided to NMPC and contractor personnel with outage work responsibilities prior to our Spring 1997 refueling outage.
9. A thorough inspection will be conducted of the drywell just prior to closure by members of our ECCS Modification Team and plant management to assure that foreign material which may have been introduced during the outage has been removed.

As previously discussed, NMPC will be unable to install high capacity strainers by the end of our Spring 1997 outage. However, NMPC believes that the actions listed above provide adequate compensatory measures to justify deferring installation until the Spring of 1999 and represent virtually all the options currently available to NMP1.



11
12
13
14
15

Summary

The time frame specified in Bulletin 96-03 does not allow sufficient time for completion of necessary BWROG testing and evaluation activities, required Staff reviews and approvals, completion of design work, and procurement and installation of new strainers. Based on current design features, procedures and controls (Emergency Operating Procedures, FME, etc.), tests and actions taken to date, and the additional compensatory actions proposed, deferring completion of the requested actions to REFOUT99 will not adversely affect the ability of NMPC to respond to an accident.

In addition to the BWROG interim safety assessment, which provided a generic conclusion that interim operation of BWRs was acceptable, NMP1's design contains features which make it inherently diverse in mitigating and coping with a design basis LOCA. Namely, NMP1 has multiple alternate water sources procedurally controlled under the EOPs, a low containment fiber load as we are primarily a Reflective Metal Insulation plant, reactor vessel recirculation loops which were replaced in 1982 with material resistant to IGSCC, and finally, strong containment leakage criteria which assures that pipe crack leakage would be detected far in advance of any catastrophic break.

Since the issuance of Bulletin 93-02 and its Supplement 1, industry awareness and programmatic actions on FME and control has increased at NMP1. Radiation worker training lesson plans and FME procedures have been reviewed and appropriately updated to reflect the latest industry information on strainer clogging due to combined debris affects. Site specific actions include torus sludge sampling, rotating on-line strainer inspections and performance monitoring. Under Bulletin 95-02, special torus agitation tests were conducted to confirm ECCS performance.

Proposed compensatory actions include desludging the torus no later than our Spring 1997 refueling outage, inspecting the torus vent downcomer and vent header, validating movement of the raw water intertie check valve, cleaning the drywell and inspecting drywell insulation, reducing the overall fiber load in the containment, and performing a torus agitation test following the torus desludge.



11/11/11

11/11/11