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Subject: Cooper-MB6821-Request for Code Relief-RP-06-IST for Core Spray Pump
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From: Bhalchandra Vaidya
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CooperReliefRP06-RAI-071103.wpd		8860
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From: Bhalchandra Vaidya
To: Reroger@nppd.com
Date: 7/11/03 2:53PM
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Attached document is the list of RAIs from the Mechanical and Civil Engineering Branch (EMEB), on the subject Relief Request.

I had sent e-mails to you on 6-3-2003 and 6-5-2003 on the same subject. The attached list of RAIs should be considered as the governing list of RAIs. Please substitute my e-mails with the attached list.

Please acknowledge the receipt of this e-mail and let me know the date when I can expect to receive the response to these RAIs.

Also, please contact me, if you have any questions.

Thanks.

Bhalchandra Vaidya
NRR/DLPM
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Grand Gulf Nuclear Station, Unit 1
301-415-3308
M/S: O-7D1

CC: Gramm, Robert; Thadani, Mohan

**Request for Additional Information
Relief Request RP-06
Cooper Nuclear Station
Docket No. 50-298
TAC No. MB6281**

RP-06 requests relief from the requirements to obtain vibration measurements for Core spray Pump CS-P-B from one-third minimum pump shaft rotational speed to at least 1000 Hz. Nebraska Public Power District (NPPD), the licensee, proposes that the vibration data be filtered, removing the measurement associated with the piping induced vibration occurring at less than 1/2 of the pump operating speed. Currently, the vibration measurements are taken from one-third of pump minimum rotational speed to 1000Hz. The proposed relief would allow exclusion of vibration data between 1/3 and 1/2 pump speed.

The licensee has provided the following statements for the relief request:

1. A similar relief request has been approved by the NRC for the Sequoyah Nuclear Plant (SNP) on October 5, 2000.
2. The relief request will restore the affected pump to its normal testing frequency and will prevent unnecessary pump wear, potential challenges to the plant, and entry into Technical Specifications Limiting Conditions for Operation associated with the increased testing frequency.
3. Vibrations occurring at these low frequencies should not be detrimental to the long term reliability of either the pump or the motor.

With regard to Item #1, RP-06 is different from SNP's relief request in two respects.

- a) At SNP, the pumps are tested quarterly using the minimum flow recirculation line. However, during each refueling outage, the pumps are tested at full flow in accordance with Code requirements, i.e., the relief request is only applicable to quarterly mini-flow.
- b) At SNP, the higher vibration only occurs during mini-flow tests, and is primarily caused by low frequency flow pulsations combined with low structural resonant frequencies of the pump assembly. Although the pumps have experienced high vibration during previous mini-flow tests, the licensee for SNP has monitored this high vibration condition since original installation of these pumps and was able to conclude that there has been no degradation of the pump/motor/foundation assembly from the inherent high vibration in this range during mini-flow tests. Another key element for approving SNP's relief request is that the pump operability can be demonstrated and verified each refueling outage by full flow test without the relief from Code requirements. Therefore, the vibration data between 1/3 and 1/2 pump speed are excluded only from mini-flow tests but the vibration between 1/3 and 1/2 pump speed continues to be monitored by full flow tests during each refueling outage.

The licensee should address the above differences between Cooper and SNP, and determine if SNP's relief request is applicable to Cooper. If so, the licensee should revise the relief request and resubmit it along with documentation and justification similar to SNP.

With regard to Item #2, NPPD alludes that increased test frequency and associated high vibrations can cause unnecessary pump wear, potential challenges to the plant, and entry into Technical Specifications Limiting Conditions for Operation. If the licensee has so many concerns about mini-flow test, they need address whether (1) a mini-flow test should even be performed for the affected pump, and (2) the vibration impact (regardless the sources of vibration) on the pump reliability of prolonged operation following a design basis accident. It should be noted that high vibration level at any frequency range (regardless it is caused by pump internals, piping, piping supports or foundation) may result in pump degradation during a prolonged operation. Therefore, the licensee should justify or provide additional information to demonstrate that high vibrations during mini-flow tests have not caused any pump degradation, and that high vibration will not occur during full flow condition as in the case at SNP.

With regard to Item #3, NPPD should address the four key components recommended by NRC NUREG/CP-0152 in order to conclude that vibrations occurring at these low frequencies should not be detrimental to the long term reliability of either the pump or the motor. The licensee may want to review more thoroughly the SNP submittal regarding how those components were addressed. The licensee should also discuss whether there are alternative means to monitor the vibration in the excluded range so that action can be taken if they are trending higher. A review of vibration histories at Cooper indicates that the vibration data varied widely and the variation at locations 1H and 5H could be as high as .25 in/sec. The licensee should provide a justification why vibration measurements could vary so widely and discuss actions taken to reduce them. The key issue for the proposed relief request is to provide justification along with alternative to show that doubling the test frequency does not provide any additional information nor additional assurance as to the condition of the pump and its ability to perform its safety function.