UNITED STATES
ATOMIC ENERGY COMMISSION
DIVISION OF COMPLIANCE
REGION III
799 ROOSEVELT ROAD
GLEN ELLYN, ILLINOIS 60137

TELEPHONE
(312) 858-2660

June 22, 1972

Northern States Power Company
ATTN: Leo Wachter, Vice President
Power Production
419 Nicollet Avenue
Minneapolis, Minnesota 53401

Docket No. 50-263

Gentlemen:

The attached Directorate of Regulatory Operations Bulletin No. 72-1, "Failed Hangers for Emergency Core Cooling System Suction Header," is sent to you to provide you with information we recently received from the Commonwealth Edison Company concerning the Quad Cities Unit 2 boiling water reactor. This information may relate to the design, fabrication and operating experience of certain components at your facility.

Sincerely yours,

Boyce H. Grier
Regional Director

Attachment:
Bulletin No. 72-1

bcc: RO Files
DR Central Files
PDR
Local PDR

misc
appl.

Date: June 22, 1972
Directorate of Regulatory
Operations Bulletin 72-1

FAILED HANGERS FOR EMERGENCY CORE COOLING SYSTEM SUCTION HEADER

We recently received information from the Commonwealth Edison Company concerning a problem found during startup testing of the Quad-Cities 2 boiling water reactor which may relate to the design and long term performance capability of the torus and the emergency core cooling suction header at your facility. The information is as follows:

a. Description of Circumstances

During startup testing the licensee found that four of the pipe hangers which support the 24-inch diameter torus suction header had failed. The 24-inch suction header serves as the main source of water for the emergency core cooling systems. Water is supplied to the header from the torus through four 20-inch diameter pipes spaced 90 degrees apart. The header is supported by three equally spaced sets of vertical and horizontal hangers which are attached to support plates welded to the torus and which are located between each of the four 20-inch pipes which join the suction header to the torus. A total of 12 hangers support the 24-inch suction header. The reactor was promptly shut down for investigation and repair following the discovery of the failed hangers.

Three of the four failed hangers were located within a 90 degree section of the header and resulted in a maximum sag in the header pipe of approximately six inches within that section. Four 3/4-inch diameter bolts (threaded their entire length), which secured pairs of shackles to the support plates welded to the torus and to the 24-inch diameter pipe, were found to have failed in double shear. The cause of the bolt failures has not as yet been determined; however, it is known that the suction header experienced vibration as a result of operational testing of the emergency core cooling system. In addition, the bolt holes, which were formed by flame cutting and punching, were found to be irregularly shaped and poorly aligned.

Chicago Bridge and Iron Company, the contractor for the torus and suction header design and installation, has provided a revised design requiring use of 1-inch diameter high strength bolts with smooth unthreaded bearing surface, and appropriately increased the size of the shackles. The change is being implemented for all the hangers.

Commonwealth Edison Company and General Electric Company plan to conduct additional investigation to determine the effect on the suction header and torus of routine plant operations and testing of the emergency core cooling systems.

We have also been informed that the Northern States Power Company's Monticello reactor found one bent suction header hanger bolt and is also currently replacing the hanger bolts with 1-inch diameter bolts.

b. Action Requested of the Licensee

It is requested that you conduct the following inspections for each of your facilities and provide this office with the results of your inspection.

1. An inspection of the hangers, shackles and support plates for the torus suction header to assure that all components are in accordance with design, are in proper position, and do not indicate damage.

2. Inspect each bolt used to attach the shackle and support plate of each hanger (1) for deformation, (2) to establish that bolts are of the specified design, (3) to establish that specified locking devices are installed and (4) that the bolt shank supporting the header weight from the support and shackle is not threaded in the bearing area.

If the results of your inspection indicate the existence of conditions similar to those described above, or if any problems have previously been experienced with failed hangers or bent hanger bolts at your facility, please include in your response a description of the problem and the corrective action taken or planned, if any, and the date of scheduled completion of any planned corrective action. This information should be provided to this office, in writing, within ten days of your receipt of this letter.

MEMO ROUTE SLIP

Form AEC-93 (Rev. May 14, 1947) AECM 0240

☐ See me about this. ☐ For conference. ☐ For action.
☐ Note and return. ☐ For signature. ☐ For information.

TO (Name and unit)	INITIALS	REMARKS
J. B. Henderson, RO J. G. Keppler, RO R. H. Engelken, RO P. A. Morris, RO H. D. Thornburg, RO	DATE	Northern States Power Company - Docket No. 50-263
TO (Name and unit)	INITIALS	REMARKS
A. Giambusso, L RO Files DR Central Files PDR Local PDR	DATE	
TO (Name and unit)	INITIALS	REMARKS
NSIC DTIE	DATE	
FROM (Name and unit)		REMARKS
G. Fiorelli RO:III		Attached is a copy of licensee's adequate reply to Bulletin No. 72-1.
PHONE NO. 858-2660	DATE 7-20-72	

USE OTHER SIDE FOR ADDITIONAL REMARKS

GPO : 1966 O—294-619

NSP

NORTHERN STATES POWER COMPANY

MINNEAPOLIS, MINNESOTA 55401

July 5, 1972

Mr B H Grier
Regional Director
United States Atomic Energy Commission
Directorate of Regulatory Operations
Region III, 799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr Grier:

MONTICELLO NUCLEAR GENERATING PLANT
Docket No. 50-263 License No. DPR-22

Inspection of Support Hangers for Emergency Core
Cooling System Suction Header

The following report is being submitted in response to your request for information as outlined in Directorate of Regulatory Operations Bulletin 72-1.

At Monticello, a general visual inspection of the torus externals is performed after each plant shut down involving relief valve operation. On Tuesday, May 23, 1972 such an inspection revealed a damaged bolt in one of the vertical support sections for the 20" torus suction ring header. The nut had backed off and the bolt was moderately bowed and exhibited crushed threads in the load-bearing area.

On Thursday, June 1, 1972 six bolts were removed for examination and replaced with SAE Grade 9 bolts. Subsequent inspections were performed on June 5 and 6, 1972 of the entire 20" torus suction ring header support assembly system, with photographs taken for documentation. On June 8, 1972 some reinspection was performed to complete the photographic records. All bolts were replaced with SAE Grade 8 and 9 bolts and all support assemblies were examined for conformance with the original design.

The support structure and bolting arrangement are exhibited in Figures 1 and 2. For clarity, the bolting arrangement has been identified as "upper vertical, lower vertical, outboard horizontal and inboard horizontal". The sixteen mitered sections of the torus have been numbered arbitrarily for ease of inspection location as indicated on Figure 1. Of these sections only twelve are support assembly locations. As specified by the Chicago Bridge and Iron Company the bolting should consist of 3/4" HEX HD BOLTS, 2 3/4" in length and 3/4" REG HEXLOCK NUTS both meeting ASME specification A307.

The "as found" bolting consisted of 3/4" HEX HD BOLTS, 2 3/4" in length, full threaded and without lock nuts. No identification markings were stamped on the bolts to specify grade. The bolts exhibited thread damage on the bearing surface varying from crushed threads to moderate thread damage. In several instances localized thread damage was apparent due to the irregularity of a torch cut hole. Of the 48 bolts, only one other exhibited bowing and that to a slight extent.

As indicated in Table 1, nine sections had torch cut holes in the bracket gusset plate, pipe web or support straps. The torch cut holes were in addition to the drilled hole. A hydraulic jack was required for removal of the outboard horizontal bolts in section nine and section three, indicating horizontal compressive loading on the torus at these points. A qualitative judgment based on the jack size and discussion with the personnel who performed this work indicates the horizontal loading force at these points was in the range of one to two thousand pounds.

A visual inspection of the welds was completed on June 8th. The torus butt plates and padeyes were welded all around with a 1/4" fillet. The pipe webs were spaced welds with 1/4" fillets on both sides providing approximately 15" of lineal weld. The only discrepancies noted were that the web was not flush with the ring header in five sections. All welds were magnetic particle inspected by Twin City Testing and Engineering Laboratory Inc. and no defects or discontinuities were found. Static loads on each vertical hanger have been measured and range from 0 to 8340 pounds.

As of June 8, 1972, all the support bolts for the 20" torus suction ring header were replaced with SAE grade 8 or 9; 3/4" HEX HD partially threaded bolts having no threads in the shear load area. The bolts were locked with double nuts.

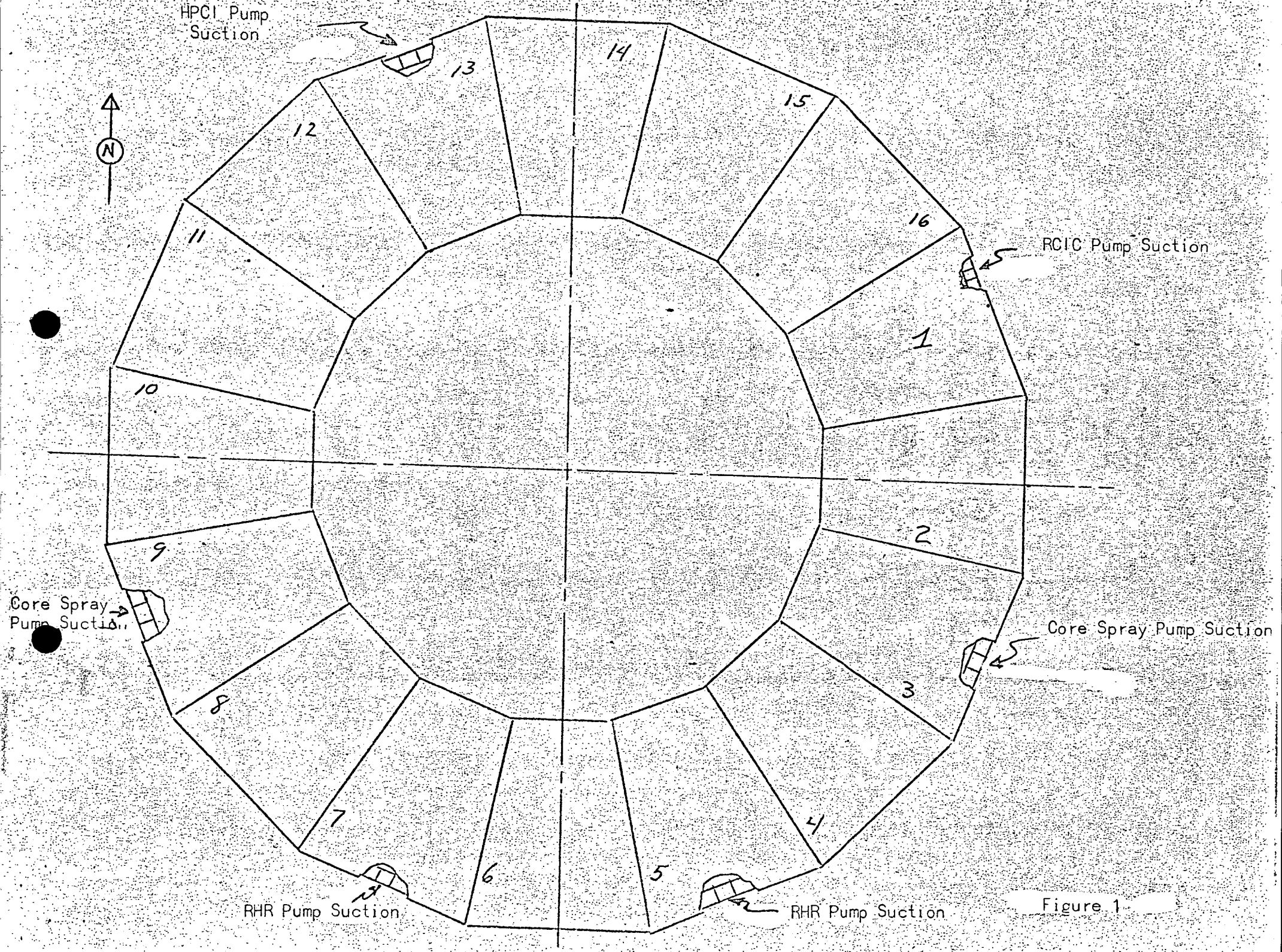
General Electric and Chicago Bridge and Iron are providing services to return the support assembly system to the original design. A static load analysis of vertical loading has been completed to provide a basis for adjusting the system to balanced loading on the support assemblies. Welding and inspection procedures for repair of bolt holes are currently being reviewed. It is intended that all bolting will be replaced with ASME A325 HEX HD 3/4" BOLTS with no threads in the load-bearing area, and lock nuts will be provided. Any replacement of support straps will be made using original specification material. We currently anticipate completion of all work by the end of July 1972.

Yours very truly,

L. J. Wachter

L J Wachter, Vice President
System Operation & Power Production

LJW/ma


HPCI Pump Suction
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Core Spray Pump Suction
Core Spray Pump Suction
RHR Pump Suction
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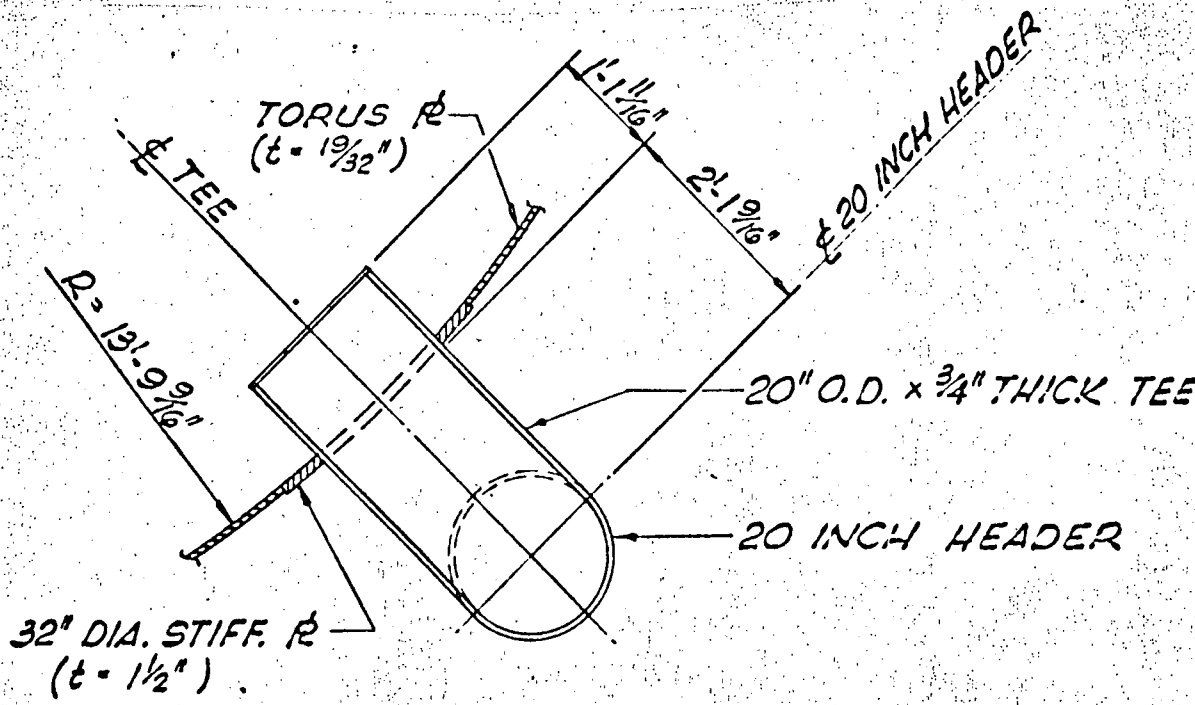
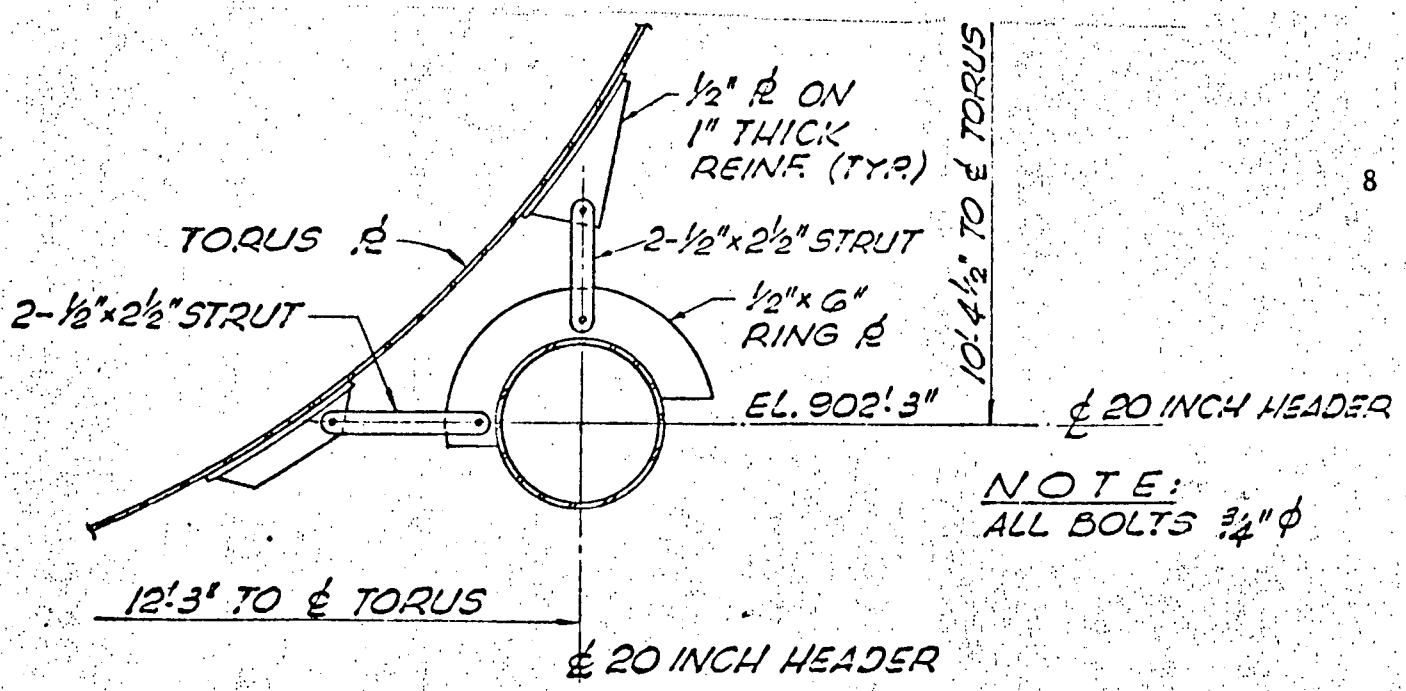
Figure 1



Section - Torus Suction Header Supply



Section - Torus Suction Header Support Structure

FIGURE 2

TABLE 1

Section	Upper Vertical	Lower Vertical	Outboard Horizontal	Inboard Horizontal
1	Torch cut and partially drilled	Drilled	Drilled	Drilled
2	Drilled	One Torch cut. One drilled	Web Drilled and Strap Torch Cut.	Drilled
3	Drilled	One Drilled and one Torch Cut	One Drilled and one Torch Cut	Web Drilled and Strap Torched
4	Torus Suction Header Supply Line - No Additional Supports			
5	Drilled	Drilled	Drilled	Drilled and Partial Torch Cut
6	Drilled	Drilled	Drilled	Drilled
7	Drilled	Drilled	Drilled	Drilled
8	Torus Suction Header Supply Line - No Additional Supports			
9	Drilled	Torch Cut	Drilled	Web and Strap Torch Cut
10	Drilled	Drilled	Drilled	Drilled
11	Drilled	One Drilled and one Torch Cut	One Drilled and one Torch Cut	Drilled
12	Torus Suction Header Supply Line - No Additional Supports			
13	One Torch Cut and One Drilled	One Torch Cut and One Drilled	One Torch Cut and One Drilled	Drilled
14	Drilled	One Torch Cut and One Drilled	One Torch Cut and One Drilled	Drilled
15	Drilled	Three Torch Cut Holes	Drilled	Drilled
16	Torus Suction Header Supply Line - No Additional Supports			

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799 ROOSEVELT ROAD
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TELEPHONE
(312) 858-2660

July 21, 1972

J. G. Keppler, Chief, Reactor Testing and Operations Branch
Directorate of Regulatory Operations, Headquarters

WISCONSIN MICHIGAN POWER COMPANY
LICENSE NO. DPR-24
POINT BEACH UNIT 1
BORIC ACID TANK CONCENTRATION

The attached inquiry report is forwarded for information.

The licensee failed to detect an increase in tank level coupled with a decrease in the boric acid concentration.

The licensee will issue a report within ten days as required by the technical specifications.

This item will be reviewed during a routine, unannounced inspection scheduled for July 19-20, 1972.

D. M. Hunnicutt

D. M. Hunnicutt, Chief
Reactor Testing and Startup Branch

Attachment:
RO Inquiry Rpt No. 050-266/72-02
(2 cys)

cc: H. D. Thornburg, RO
J. B. Henderson, RO
R. B. Minogue, RS (3)
R. S. Boyd, L (2)
R. C. DeYoung, L (2)
D. J. Skovholt, L (3)
H. R. Denton, L (2)
P. A. Morris, RO
R. H. Engelken, RO
RO Files
DR Central Files

U. S. ATOMIC ENERGY COMMISSION
DIRECTORATE OF REGULATORY OPERATIONS

REGION III

RO Inquiry Report No. 050-266/72-02

Subject: Wisconsin Michigan Power Company
License No. DPR-24
Point Beach Unit 1
Boric Acid Tank Concentration

Prepared By: for D M Hunnicutt J. H. Sniezek July 20, 1972 (Date)

A. Date and Manner AEC was Informed:

Mr. Glenn A. Reed, Manager - Nuclear Power Division, notified Region III by telephone on July 18, 1972.

B. Description of Particular Event or Circumstance:

Boric acid tank A was lined up to supply the charging pumps for Unit 1. Analysis of the boron concentration in the A tank on July 18, 1972, indicated a concentration of 11.0% boric acid by weight. Technical Specification 15.3.2.B.3 requires that the boron concentration be greater than 11.5% by weight. On July 11, 1972, the concentration in the A tank was determined to be 12.9% by weight and on July 14, 1972, it was 11.8%. The reactor was operating at significant power.

C. Action By Licensee:

The licensee sampled the B and C boric acid tanks and verified that the concentration was 12.9% by weight. The supply for Unit 1 was shifted to the B boric acid tank. The C tank was lined up to Unit 2 originally.

Mr. Reed stated that a review of the matter revealed that the makeup water supply valve to the A tank was cracked off of its seat thus diluting the tank contents. A review of the facility records for the period July 11-18, 1972, indicated that the tank level increased from 40% to 52%.

The licensee intends to report this matter to the Directorate of Licensing within ten days as required by Technical Specification 15.6.6.A.2.