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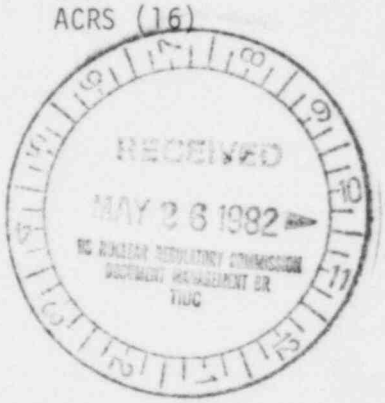

Mr. William J. Cahill Jr.
Senior Vice President
River Bend Nuclear Group
Gulf States Utilities Company
P. O. Box 2951
Beaumont, Texas 77704
Attn: Mr. J.E. Booker

Dear Mr. Cahill:

Subject: River Bend Station, Units 1 & 2 - Submittal of Information
Notice No. 82-12, "Surveillance of Hydraulic Snubbers"

As requested by Mr. R. King, attached is a copy of Information Notice No. 82-12 for your consideration and appropriate action.

A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing

Attachment:
As stated

cc: See next page

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ATTN: Mr. J.E. Booker

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SSINS No.: 6835
IN 82-12

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF INSPECTION AND ENFORCEMENT
WASHINGTON, D.C. 20555

April 21, 1982

IE INFORMATION NOTICE NO. 82-12: SURVEILLANCE OF HYDRAULIC SNUBBERS

Addressees:

All nuclear power reactor facilities holding an operating license or construction permit.

Purpose:

This information notice is provided as an early notification of a potentially significant problem pertaining to hydraulic snubbers on safety related systems. It is expected that recipients will review the information for applicability to their facilities. No specific action or response is required at this time.

Description of Circumstances:

On March 18, 1981, Carolina Power and Light Company (CP&L) reported (LER 81-041/03L) that 21 out of 101 Bergen-Patterson hydraulic snubbers were considered inoperable after functional testing at the Brunswick 2 facility. This represented a failure rate of approximately 20 percent. Failures were identified in systems such as residual heat removal, reactor building closed cooling water, fuel pool cooling, core spray, reactor core isolation cooling, and high pressure coolant injection. Of the snubbers that failed to meet the acceptance criteria, about 30 percent were declared inoperable because they failed to lock up within the required velocity. As a result of the high percentage of failures and the modes of failure, the licensee shut the reactor down on March 4, 1981, and implemented an extended snubber test program.

CP&L's supplements to the LER, submitted on June 1, 1981, and January 7, 1982, reported that 130 out of a total of 640 snubbers had failed the functional test. This represented a failure rate slightly in excess of 20 percent. In addition to rebuilding all failed snubbers, another 80 which had marginally met the acceptance criteria were rebuilt for purposes of preventive maintenance.

CP&L's evaluation of the test and examination results indicated that a major cause of failure to pass the functional test was low bleed rate (45 percent of those rebuilt). Table I lists the reasons snubbers failed the functional tests.

Those snubbers that were rebuilt were examined by CP&L and the types of degradation observed were noted. Table II lists the types of degradation that were observed. The most common types of degradation were worn poppets (62 percent), spring capture (36 percent), piston/cylinder wear (31 percent), and deteriorated seals (28 percent). Some of the snubbers exhibited more than one form of degradation accounting for a percentage total greater than 100 percent.

CP&L attempted to relate the observed degradation to the reason the snubber failed the functional test. Table III lists all of the identified rejection modes. The most common rejection modes were worn poppets (27 percent) and spring capture (16 percent). That is, although worn poppets were observed in 62 percent of the snubbers examined, only 27 percent of the test failures could be positively attributed to that cause.

The three major types of degradation (worn poppets, spring capture, and piston/cylinder wear) appear to be consequences of service-related conditions. Pipe vibrations cycle the snubbers to the extent that the grooves on the poppet heads begin to wear, and the pistons wear on the cylinder walls. Continued cycling causes the retaining springs to fail or deform in such a way that the springs can be captured. Of the snubbers rebuilt, 37 percent were determined by CP&L to be service sensitive. That is, the operating conditions of the line or snubber were found to have signs of vibration or water hammer and these conditions could cause the type of degradation found. Most of the service-sensitive snubber failures were attributed to vibration; a nominal number were caused by water hammer.

CP&L is replacing the poppet valve bodies with a new, more vibration resistant one developed by Bergen-Patterson. However, until lengthy service demonstrates the effectiveness of this modification, it would be prudent to maintain high levels of surveillance and preventive maintenance on hydraulic snubbers subject to vibration or shock loadings that can reduce their service life. Additionally, consideration should be given to system design alternatives which reduce, to the maximum extent possible, or preclude such vibrations or shock loadings.

In order to help identify the systems with high failure rates, the staff compared the list of failed snubbers contained in the LER with the list of safety related hydraulic snubbers contained in Table 3.7.5-1 of the technical specifications for Brunswick 2. Table IV contains a ranking of the systems by the failure rates of their attached safety-related hydraulic snubbers. The difference in the total number of snubbers reported in the LER (640) and shown in the technical specification table (631) results in a negligible increase in the average failure rate.

Review of Table IV shows that failures were found in 17 of the 20 systems. However, the failures were not distributed evenly among these 17 systems. Rather, the wide range of failure rates in these systems (6 to 83 percent) indicates that the failures tended to be concentrated in certain systems. This is further emphasized by the fact that although the nine systems with failure rates in excess of the overall average account for 68 percent of the failures (88 out of 130), these systems contain only 39 percent of the snubbers (244 out of 631) in the plant. These nine systems are ones where vibrations or shock loadings are likely to be encountered.

A similar problem at Rancho Seco was discussed in IE Information Notice 79-01 based on information reported on December 4, 1978, (LER 78-015/01T) and January 12 and 15, 1979, (LER 78-017/03L) by Sacramento Municipal Utility District. Subsequent correspondence from Bergen-Patterson indicated that its intended modifications to these snubbers would include case hardening of the

entire valve body, extending the cavity in which the end of the spring coil is guided, and reducing the axial travel of the poppet by increasing the length of the poppet stop.

The number of failures experienced tends to compromise capability of the affected systems to function properly during operational transients and to withstand seismic events.

If you have any questions regarding this matter, please contact the Regional Administrator of the appropriate NRC Regional Office, or this office.

Sincerely,

Edward L. Jordan, Director
Division of Engineering and
Quality Assurance
Office of Inspection and Enforcement

Technical Contact: R. J. Kiessel
301-492-4796

Attachment:
1. Tables I, II, III and IV
2. Recently Issued IE Information Notices

TABLE I

REASON SNUBBER FAILED FUNCTIONAL TEST

Reason	Percent of Total Rebuilt
Low Bleed	45
High Lockup	17
High Bleed	13
No Lockup	13
Other	12

TABLE II

TYPES OF DEGRADATIONS FOUND

Reason	Percent of Total Rebuilt
Worn Poppets	62
Spring Capture	36
Piston/Cylinder Wear	31
Deteriorated Seals	28
Grease in Fluid	7
Side Loading	7
None	8

TABLE III

REJECTION MODE

Reason	Percent of Total Rebuilt
Worn Poppets	27
Spring Capture	16
Deteriorated Seals	3
Piston/Cylinder Wear	3
Side Loading	1
Grease in Fluid	1
Inconclusive Evidence	41
Miscellaneous	8

*Note: These percentages total more than 100 percent because some of the snubbers exhibited more than one form of degradation.

TABLE IV

HYDRAULIC SNUBBER FAILURE RATES BY SYSTEM

System	Failures	Snubbers	Failure Rate(%)
Off Gas	5	6	83
Control Rod Drive	4	7	57
Standby Liquid Control	4	10	40
Steam Relief Discharge	36	93	38
Reactor Core Isolation Cooling	12	33	36
Reactor Feedwater	10	32	31
High Pressure Coolant Injection	11	39	28
Condensate Drains	2	8	25
Nuclear Steam Vent	4	16	25
Service Water	9	45	20
Reactor Circulation	3	21	14
Reactor Building Closed Cooling Water	4	30	13
Residual Heat Removal	19	192	10
Instrument Sensing	1	11	9
Primary Steam	3	34	8
Core Spray	2	24	8
Fuel Pool Cooling	1	16	6
Reactor Water Cleanup	0	1	0
Standby Gas Treatment	0	1	0
Reactor Vessel Instrumentation	0	12	0
Totals	130	631	
Overall Average			21

Attachment 2
IN 82-12
April 21, 1982

RECENTLY ISSUED
IE INFORMATION NOTICES

Information Notice No.	Subject	Date of Issue	Issued to
82-11	Potential Inaccuracies in Wide Range Pressure Instruments used in Westinghouse Designed Plants	04/09/82	All power reactor facilities holding an OL or CP
82-10	Following up Symptomatic Repairs to Assure Resolution of the Problem	04/09/82	All power reactor facilities holding an OL or CP
82-09	Cracking in Piping of Makeup Coolant Lines at B&W Plants	03/31/82	All power reactor facilities holding an OL or CP
82-08	Check Valve Failures on Diesel Generator Engine Cooling System	03/26/82	All power reactor facilities holding an OL or CP
82-07	Inadequate Security Screening Programs	03/16/82	All power reactor facilities holding an OL or CP
82-06	Failure of Steam Generator Primary Side Manway Closure Studs	03/12/82	All power reactor facilities holding an OL or CP
82-05	Increasing Frequency of Drug-Related Incidents	03/10/82	All power reactor facilities holding an OL or CP
82-04	Potential Deficiency of Certain AGASTAT E-7000 Series Time-Delay Relays	03/10/82	All power reactor facilities holding an OL or CP
82-03	Environmental Tests of Electrical Terminal Blocks	03/04/82	All power reactor facilities holding an OL or CP

OL = Operating License
CP = Construction Permit