INDUSTRIAL VALVES | DRESSER

DRESSER VALVE AND CONTROLS DIVISION
Dresser Industries, Inc.

Industrial Valve North American Operations
P.O. Box 1430 • Alexandria, Louisiana 71301

May 1, 1986

United States Nuclear Regulatory Commission
Mail Stop EW/W332
Washington, DC 20555

Attn: Gary G. Zech, Chief
Vendor Program Branch
Division of Quality Assurance
Vendor and Technical Training
Center Programs Office of
Inspection and Enforcement

Docket No. 999000054/85-01

Gentlemen:

Your letter dated April 11, 1986 has been reviewed and questions answered as follows:

Toledo Edison Company/Davis-Besse (Safety Valve Serial No. BM8635)

Question 1 When was this valve manufactured?
Answer 1 February, 1972

Question 2 What was the carbon and nickel content of the collar (CB-30)? What was the carbon content in the Type 304 stainless steel cotter pin analysis? What was the method of chemical analysis used to generate your alloy compositions?
Answer 2 Collar: carbon content .169; nickel content .246
(Lab report C-246 attached)
Cotter pin: Carbon content .073
(Lab report C-247 attached)
The method of analysis was x-ray fluorescence, using a Kevex 6600 machine for all elements except carbon. Carbon analysis was performed by the thermo conductivity method on a Leco WR12 carbon analyzer.

Question 3 Where exactly were your hardness readings taken?
Answer 3 The collar was halved, and hardness readings were taken on the outside diameter surface of each half, supported below. The cotter pin readings were taken on the inner straight flat middle of a segment. The cotter pin was directly supported.

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Question 4 Were the failed spindle threads flat, bright and shiny?
Answer 4 Spindle threads were extremely flattened, some threads were 100% destructed. Bright and shiny is not appropriate.

Question 5 What was the chemical analysis of the metal chips that were scattered on the top surface of the lower spring washer and the top surface of the cover plate?
Answer 5 The chips were not of sufficient volume to obtain meaningful chemical analysis results.

Question 6 Were there any unique qualities about the spindles post-failure microstructure?
Answer 6 Microstructure analysis of the spindle was not performed and the spindle has since been scrapped and is no longer available for future testing.

Question 7 Did the cotter pin show any evidence of necking down? Did the fracture surfaces show evidence of bench markings?
Answer 7 Reference our report dated October 22, 1981. The cotter pin had a marked "ironing" of one pin end which is considered to be "necking down". No bench marks were in evidence. Figure 2 of the report shows the observed condition of the failed cotter pin.

Pacific Gas & Electric Co./Diablo Canyon, Units 1 and 2 (Serial No. BN1741)

Question 1 Was there a metallurgical failure analysis performed to determine the cause of the defective disc collar/spindle threads? If so, what were the results?
Answer 1 No, a metallurgical failure analysis was not performed.

Question 2 What are the major changes that have occurred in Dresser quality inspection program since 1973 to reasonably assure future nonrecurrence of the subject problem?
Answer 2 The overall quality program has improved in all areas since 1973. Inspectors have gained considerable knowledge through experience and training. The most significant change to assure nonrecurrence of this problem is that written assembly instructions now require 100% visual inspection of each part by the assembly inspector and the assembler prior to valve assembly.

Question 3 Which other nuclear power stations, excluding Davis-Besse, have safety valves of the same type and design (as mentioned in your response paragraph 1.7)?

-continued-

Answer 3

1. Alabama Power Co.
   Joseph M. Farley 1
2. Alabama Power Co.
   Joseph M. Farley 2
3. Arkansas Power & Light
   Nuclear One 1
4. Baltimore Gas & Elec.
   Calvert Cliffs 1
5. Baltimore Gas & Elec.
   Calvert Cliffs 2
6. Duquesne Light Co.
   Beaver Valley 1
7. Florida Power Corp.
   Crystal River 3
8. Florida Pwr. & Light
   Turkey Point 3
9. Florida Power & Light
   Turkey Point 4
10. Indiana & Michigan Light AEP
    Donald C. Cook 1
11. Indiana & Michigan Light AEP
    Donald C. Cook 2
12. Metropolitan Edison
    Three Mile Island 1
13. Northeast Utilities
    Millstone 2
14. Northern States Pwr.
    Prairie Island 1
15. Northern States Pwr.
    Prairie Island 2
16. Omaha Pub. Pwr.Dist.
    Fort Calhoun 1
17. Tennessee Valley Auth.
    Browns Ferry 1
18. Tennessee Valley Auth.
    Browns Ferry 2
19. Vermont Yankee Nuc. Pwr.
    Vermont Yankee
20. Virginia Elec. & Pwr.
    Surry 1
21. Virginia Elec. & Pwr.
    Surry 2
22. Sacramento Municipal
    Utility District
    Rancho Seco

I trust that this is sufficient information and satisfactorily answers your questions. If there is need for additional information, do not hesitate to contact me.

B G Brunson

B. G. Brunson
Manager Quality Systems
Dresser Industrial Valve
Operations

BGB:bb
Attachments - 2

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INDUSTRIAL VALVE & INSTRUMENT DIVISION ☐ BOX 1430 ☐ ALEXANDRIA, LOUISIANA 71301
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METALLURGY LABORATORY REPORT

Chemical Analysis

ORDER NUMBER: Product Engineering Report SV-231

PART NUMBER: VJ 800

HEAT NUMBER:

DESCRIPTION: CB-30Adjusting Collar

CHEMICAL ANALYSIS:

Cr	21.0
Mn	.621
Ni	.246
Mo	.160
C	.169

LAB NUMBER: C-246

P W Greene
MATERIAL ANALYST

4/24/86
DATE

DRESSER INDUSTRIES

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METALLURGY LABORATORY REPORT

Chemical Analysis

ORDER NUMBER: Product Engineering Report SV-231

PART NUMBER: 2220219

HEAT NUMBER:

DESCRIPTION: 304 Stainless Steel Cotter Pin

CHEMICAL ANALYSIS:

Cr 19.0

Mn .836

Ni 8.2

Mo .500

C .073

LAB NUMBER: C-247

R W Gruener
MATERIAL ANALYST

4/24/86
DATE