

## GENERAL INFORMATION or OTHER

EVENT NUMBER: 29535

LICENSEE: GENERAL ELECTRIC

CITY: SAN JOSE

COUNTY:

LICENSE#:

DOCKET:

REGION: 4

STATE: CA

AGREEMENT: Y

NOTIFICATION DATE: 11/01/95

NOTIFICATION TIME: 09:22 [ET]

EVENT DATE: 11/01/95

EVENT TIME: 00:00 [PST]

LAST UPDATE DATE: 11/01/95

## NOTIFICATIONS

NRC NOTIFIED BY: NOEL SHIRLEY

HQ OPS OFFICER: JOSEPH SEBROSKY

VERN HODGE

NRR

EMERGENCY CLASS: NOT APPLICABLE

10 CFR SECTION:

CCCC 21.21

UNSPECIFIED PARAGRAPH

## EVENT TEXT

GENERAL ELECTRIC IS ISSUING A PART 21 REPORT DUE TO IMPROPER VALVE PACKING MATERIAL USED IN VALVES THAT WERE SUPPLIED TO THE PILGRIM NUCLEAR POWER PLANT.

GE NUCLEAR ENERGY (GE-NE) BOUGHT FROM RING-O VALVE SpA OF ITALY, AND PROVIDED TO THE BOSTON EDISON COMPANY PILGRIM PLANT, FOUR GATE VALVES INTENDED FOR SAFETY RELATED APPLICATIONS (TWO IN THE HPCI SYSTEM AND TWO IN THE RWC SYSTEM). AS PART OF THE VALVE DELIVERY IMPROPER VALVE PACKING BUSHINGS WERE SUPPLIED WHICH CONTAINED BABBITT, A LEAD BEARING ALLOY WHICH IS KNOWN TO CAUSE EMBRITTLEMENT IN STAINLESS STEEL. THIS DID NOT MEET THE GE-NE VALVE SPECIFICATION.

THE IMPROPER MATERIAL WAS IDENTIFIED DURING THE INSTALLATION PERIOD AND THE BUSHINGS WERE REPLACED WITH BUSHINGS CONTAINING AN ACCEPTABLE MATERIAL. THE VALVES WERE NOT YET PLACED INTO NUCLEAR SERVICE AT THE TIME OF DISCOVERY. GE-NE HAS EVALUATED THE SAFETY SIGNIFICANCE OF THE IMPROPER BUSHING MATERIAL IN ALL FOUR VALVES AND HAS CONCLUDED THAT FOR THE VALVES IN THE HPCI SYSTEM, A SIGNIFICANT SAFETY CONCERN DID NOT EXIST. HOWEVER GE-NE ENGINEERING HAS NOT BEEN ABLE TO CONCLUSIVELY RULE OUT THE POSSIBILITY THAT THE POTENTIAL CONSEQUENCES OF HAVING THIS MATERIAL IN THE RWC SYSTEM WOULD NOT RESULT IN A SUBSTANTIAL SAFETY CONCERN AND HAS THEREFORE ELECTED TO REPORT THIS UNDER 10CRF21. GE-NE HAS NOT SUPPLIED THIS VALVE TO ANY OTHER NUCLEAR POWER PLANT TO DATE.

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S PDR

November 1, 1995

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MFN #248-95

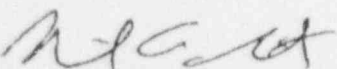
Document Control Desk  
Nuclear Regulatory Commission  
Washington, D. C. 20555

Subject: 10CFR Part 21, Reportable Condition, Improper Valve Packing Bushing  
Material

This letter is to inform the NRC of a reportable defect per 10 CFR Part 21, as reported to Mr. Joe Sebrosky the duty officer in the NRC's emergency operations center by N.C. Shirley for M.A. Smith, Manager, Safety Evaluations Project, on October November 1, 1995.

GE Nuclear Energy (GE-NE) bought from Ring-O Valve SpA of Italy, and provided to the Boston Edison Company Pilgrim Plant, four gate valves intended for safety related applications (two in the HPCI system and two in the RWCU system). As part of the valve delivery improper valve packing bushings were supplied which contained Babbitt, a lead bearing alloy which is known to cause embrittlement in stainless steel. This did not meet the GE-NE valve specification. The improper bushing material was identified during the installation period, and the bushings were replaced with bushings containing an acceptable material. The valves were not yet placed into nuclear service at the time of discovery. GE-NE has evaluated the safety significance of the improper bushing material in all four valves and has concluded that, for the valves in the HPCI system, a significant safety concern did not exist. However, GE-NE Engineering has not been able to conclusively rule out the possibility that the potential consequences of having this material in service in the RWCU system would not result in a substantial safety concern, and has therefore elected to report this under 10CFR21. GE-NE has not supplied this valve to any other nuclear power plant to date. Ring-O Valve SpA of Italy has implemented internal measures to assure strict compliance with GE-NE specifications requirements in all future orders of these valves.

Very truly yours,



M. A. Smith, Manager

Safety Evaluations Project 030022

M/C 187, (408) 925-1019

JE 9/1

Attachment

cc: G. C. Cwalina (NRC-NRR/DISP/PSIB)  
C. R. Shockley (GE-NE)  
PRC File

## ATTACHMENT

### REPORTABLE CONDITION

- (i) Name and address of the individual informing the Commission:

M.A. Smith, Manager, Safety Evaluations Project, GE Nuclear Energy, 175 Curtner Avenue, San Jose, CA 95125

- (ii) Identification of the facility, the activity, or the basic component supplied for such facility or such activity within the United States which fails to comply or contains defect:

GE-NE supplied two gate valves, designed and manufactured by Ring-O Valve SpA of Italy, to the Pilgrim Nuclear Power Station. These valves were intended to function as inboard and outboard containment isolation valves in the Reactor Water Cleanup (RWCU) system effluent line.

- (iii) Identification of the firm constructing the facility or supplying the basic component which fails to comply or contains the defect:

GE Nuclear Energy, San Jose, California

- (iv) Nature of the defect or failure to comply and safety hazard which is created or could be created by such defect or failure to comply:

The RWCU inboard and outboard containment isolation valves are normally open and are closed upon receipt of an isolation signal to conserve reactor coolant and to isolate the containment to control release of radioactivity to the atmosphere.

The GE valve specification required that non-metallic materials comply with trace material control requirements and also requires the bushings, which are in contact with the valve stem, to be made of graphite. The valves were supplied with bushings made of Babbitt Graphalloy, which is a 50% graphite matrix that is impregnated with roughly 50% Babbitt, a lead bearing alloy. The Graphalloy bushing is a 50% graphite matrix that is impregnated with roughly 50% Babbitt, a lead bearing alloy. This Lead alloy has a melting temperature of approximately 400 °F, whereas the actual service temperature is expected to be close to 550 °F. Under these conditions the lead alloy could attack the grain boundaries of the neighboring ferrous parts and result in embrittlement and cracking.

For a normally open valve, the valve disc is continually buffeted by flow induced vibration. Since the stem is connected to the disc, the stem is also affected by this vibration. Should an embrittled stem crack, the crevice would become a stress concentration point. Such crevice could propagate under continuous vibration,

and the stem could fracture due to fatigue cycles. The valve stem connects the valve actuator to the disc. If the stem is fractured, the actuator would no longer be capable of either opening or closing the disc. The disc would begin to drop into the flow stream, however it might not fall to the fully closed position as the differential pressure across the disc might induce a friction force that is greater than the weight of the disc.

Since a partially closed disc might not reduce the flow through the valve by a noticeable amount a fractured stem might not be detected under normal plant operation. Although this sequence of events is highly unlikely, especially with the existing leak detection system sensitivity and the low probability of the RWCU pipe break, a decision was still made to report this under 10CFR21.

- (v) Date on which the information of such defect or failure to comply was obtained:

October XXXX 1995

- (vi) In the case of a basic component which contains a defect or failure to comply, the number and locations of all such components in use at, supplied for, or being supplied for one or more facilities or activities subject to the regulations in this part:

Pilgrim Nuclear Plant

- (vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action:

Upon discovery of the incorrect bushing material installation, Ring-O Valve SpA supplied replacement Nickel Graphalloy bushings; these were approved and installed by GE-NE prior to placing the valves into nuclear service. In addition, Ring-O Valve SpA of Italy has implemented a policy to identify specific and detailed ordering data including a "Nuclear Plant Application" statement incorporating media and design temperature and pressure information for parts ordered for application and use in valves being supplied for use in nuclear plant applications.

- (viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees:

Since the subject valves were ordered solely for the Pilgrim Station, and since Ring-O Valve SpA of Italy has changed their ordering policy, there is no planned communication to other licensees.