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COMMENTS Per Telecon with S. LaBruna, VP-Nuclear Operations, attached is the Part 21 Summary concerning deficiencies in G.H. Betts Actuators for Hope Creek Generating Station. A 30 day report will be submitted by 6/28/92.

Should you have any questions, Please contact Ken O'Cara (609) 339-1370

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Initial 10CFR21 Notification Concerning G.H. Bettis Actuators Used at Public Service Electric and Gas Company, Hope Creek Generating Station

PSE&G Supplier Source Surveillance Report VS-92-021 was issued to document the results of the functional testing and final inspection of G.H. Bettis actuators to be utilized on Containment Atmospheric Control Valves (PSE&G tag numbers 1GS-HV-11541, 4952, 4950, 4964, 4962 and 5029). These valves provide a containment isolation function following a design basis accident. (It is noted that these valves are currently planned to be installed during the next Hope Creek Outage.) Functional testing was performed to verify that all actuators failed closed when the solenoid was deenergized, and that all actuators stroked to the full closed position in less than 3 seconds with various air pressures applied. A 24 hour hydraulic leak test was also completed for three of the actuators. All actuators were found to satisfy the test acceptance criteria.

However, during testing it was noted that one pilot valve operated erratically when the actuator cycled to the fail closed position. The cause of this erratic operation was found to be the presence of pipe dope in the pilot valve as well as inside the actuator cylinder on the piston near the inlet port. Pipe dope was used during the assembly process. A partial cleaning of the excess pipe dope in the pilot valve performed by G.H. Bettis allowed the device to function properly confirming that the pipe dope was the cause of the erratic operation. Pipe dope was identified in the pilot valve as well as inside the actuator cylinder. All actuator units were disassembled, cleaned, reassembled and leak tested (manual override) in accordance with the test plan and found to be acceptable.

G.H. Bettis Corporation completed an evaluation of all six actuators. The pilot valve manufacturer, Automatic Valve confirmed the presence of pipe dope. ASCO also confirmed the presence of pipe dope in 3 of the six units. New replacement solenoid valves will be provided upon ASCO's recommendation. Automatic Valve is rebuilding the pilot valves and certifying them as new.

The functional acceptance test performed prior to release by PSE&G verified the actuators' ability to perform their intended design function in accordance with purchase order P1-381331 although one valve on an actuator did operate erratically. G.H.

Bettis did not identify any previous instances of malfunction or erratic operation resulting from the presence of pipe dope.

The root cause of this concern was determined to be lack of procedural controls during the manufacturing process and inadequate training of G.H. Bettis personnel. G.H. Bettis personnel used an excessive amount of pipe dope during the assembly of the actuators, which resulted in the introduction of the contaminants into the valves. This activity was not controlled by any assembly procedures. In addition, it was noted during testing that the control air that was used to operate the valves was not filtered to trap any contaminants (oil, water, particles) in excess of 50 microns as required in the ASCO assembly instructions. This could also introduce contaminants into the valves.

NUREG 1275, Volume 6 addresses the use of Loctite materials and other potential contaminants that may cause this kind of erratic operation or failure. Several instances of SOV failures were identified as a result of the introduction of contaminants. The use of pipe dope as a sealant may also contribute to similar failures of solenoid valves and pilot valves based on what was witnessed during the functional test. G.H. Bettis' review did not identify any previous instances of erratic operation or malfunction of their actuators due to the presence of pipe dope. However, the long term operability of these valves, based on the past operating experiences documented in NUREG-1275. could be significantly affected. Should these actuators have failed from the presence of pipe dope a substantial safety hazard may be created by loss of containment isolation function following a DBA. Therefore, this issue is considered reportable pursuant to 10CFR21.

G.H. Bettis has ordered replacement SOVs and pilot valves for installation at the butterfly valve manufacturer, C&S Valve (Westmont, IL). Upon assembly, the butterfly valves will be functionally tested prior to shipment to PSE&G.

F. X. Thomson
Manager - Licensing and
Regulation