Gilbert/Commonwealth engineers and consultants

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September 16, 1981

United States Nuclear Regulatory Commission
Office of Inspection and Enforcement
Washington, DC 20555

Attention: Mr. V. Stello
Director

Subject: Reportable Event -
HVAC Ductwork Subject To
Negative Pressure

Dear Mr. Stello:

This documents my report under 10CFR Part 21 to Mr. Roy Woods, by telephone, on September 11, 1981.

Individual Who Reported

Norman R. Barker, Gilbert Associates - Quality Assurance Division - General Manager, at the above address, made the call.

Facility Involved

Three Mile Island Unit No. 1 - GPU Nuclear

Components Involved

Two (redundant) duct sections connecting the Control Building Emergency Recirculation Fans (AHE-18A and B) with their associated filter plenums (AHF-3A and B). Each of the ducts is 60" X 60" square and approximately 15 feet long.

Nature of Defect

Based on new design information (see below) it appears that the referenced ducts could collapse if subjected to high negative pressure resulting from dirty filters. Collapse, with or without rupture, would result in restricting air flow, preventing the system from performing its safety function.

Date Information Obtained

The QA Division General Manager was informed of the final results of the engineering evaluation on September 11, 1981.

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Corrective Action

A review of GAI design of safety related HVAC ducts on other domestic nuclear projects indicates that the potential problem exists only with the two referenced ducts. There is a possibility that a detailed analysis of these two ducts would prove them to be adequate. In lieu of the analysis, GAI has recommended that supplemental stiffener angles be welded to the existing stiffeners as this was expedient and cost effective. GPU Nuclear will be responsible for implementation of corrective action.

Additional Information

Prior to 1975, Gilbert Associates designed HVAC ductwork based on the 1969, 2nd Edition of the Sheet Metal and Air Conditioning Contractor National Association (SMACNA) High Velocity Duct Construction Standard. We recently learned through a discussion with a representative of SMACNA, that tests performed in 1971/1972 by SMACNA, proved that some ducts constructed in accordance with the referenced standard failed tests for negative pressure.

In reviewing the 1975, 3rd Edition of the SMACNA standard, it is obvious that most duct sizes in most pressure categories have been strengthened by specifying heavier steel members, and it also indicates that negative pressures require additional reinforcing.

The above information raised the concern that certain ducts designed and constructed to the 1969 SMACNA standard could be operating in a marginal range. Our review has limited our concern to the two referenced ducts.

Very truly yours,

Norman R. Barker

N. R. Barker
Vice President & General Manager
Quality Assurance Division

NRB:kb

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