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**BY FAX AND OVERNIGHT MAIL**

March 6, 2003

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Subject: 10 CFR 21 Notification for Aalborg Flow Meters

Dear Sir:

Pursuant to Holtec Quality Procedure HQP 15.1, "Reporting of Defects and Noncompliances per 10CFR21," Holtec International hereby notifies the Commission of a potential defect in flow measuring instruments provided by a U.S. supplier to verify the correct amount of helium is backfilled into dry spent fuel storage canisters. These instruments were never used on a Holtec cask system containing spent nuclear fuel because the problem was discovered during the preparatory phase before fuel loading. A summary of the issue is provided below.

Name and Address of Individual Informing the Commission:

Mr. Brian Gutherman  
Manager, Licensing and Technical Services  
Holtec International  
Holtec Center  
555 Lincoln Drive West  
Marlton, NJ 08053

Identification of the Basic Component Supplied Which Contains a Defect:

Aalborg flow meter Model GFM671S

Identification of the Firm Supplying the Basic Component Which Contains a Defect:

Aalborg Instruments and Controls  
20 Corporate Drive  
Orangeburg, NY 10962

IE20



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Nature of the Defect and the Safety Hazard Which Could Be Created by the Defect:

Four Aalborg model GFM671S mass flow rate meters were purchased for use at the Trojan nuclear plant<sup>1</sup> to measure the amount of helium gas injected into a loaded Holtec dry spent fuel Multi-purpose Canister (MPC). One flow rate meter was to be used as the measurement device on the MPC helium flow and a second meter was to be used to cross check the calibration of the first meter following completion of the helium backfill. Two additional flow rate meters were purchased as spares. The flow rate meters were procured as commercial items from a distributor. All of the flow rate meters were calibrated at the original manufacturer (Aalborg) using nitrogen test gas and correction factors published by Aalborg to indicate helium flow rate. Three of the flow rate meters were subsequently sent to Holtec's approved calibration facility (Laboratory Testing Inc. (LTI)). LTI subcontracted the calibration work to its approved supplier (Edison). After calibration, the three flow rate meters were sent to Trojan and used during dry runs and demonstrations. The fourth flow rate meter was not calibrated or used.

During pre-loading activities, the helium volumes indicated by flow totalizers were confirmed to be consistently lower than the actual volumes depleted from the helium cylinders. The flow totalizers calculate total helium volume using input from the flow rate meters. It was determined that erroneous data was coming from the flow rate meters and that the flow totalizers were operating correctly. Numerous tests were run using all three calibrated flow rate meters and they consistently indicated low values. Although the flow rate meters were within calibration tolerances when tested with nitrogen and corrected per the manufacturers directions, when helium was actually run through the meters, the indicated flow rate was lower than the actual flow rate. The three calibrated flow rate meters were returned to Aalborg for evaluation where it was determined by Aalborg that the published correction factors for helium/nitrogen were incorrect for this model flow meter.

As received at the Trojan site, the flow rate meters indicated values approximately 40% lower than the actual flow rate of helium through the meter based on the depletion of the helium bottles. Use of the mis-calibrated could cause approximately 67% more helium to be injected into the MPC than permitted by the Trojan ISFSI Technical Specifications. The addition of excess helium beyond the range specified in the Technical Specifications would have placed the MPC in an unanalyzed condition. The maximum initial helium fill pressure inside the MPC is used in the evaluation of off-normal and accident overpressure events. Too high an initial fill pressure could result in the computed pressure in the MPC after certain accidents to be higher than previously analyzed. For

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<sup>1</sup> Trojan plant is being decommissioned and is currently in the process of moving its spent fuel from the spent fuel pool to an on-site Independent Spent Fuel Storage Installation (ISFSI) under a site-specific 10 CFR 72 license.



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normal operations, higher MPC backfill pressure (indicative of higher helium backfill mass) would provide better heat transfer and would, therefore, provide better protection of the fuel cladding during storage of the ISFSI.

At the time the discrepant condition was identified, none of the flow meters had been used on an MPC loaded with spent fuel and they were subsequently removed from service until they could be correctly calibrated.

The Date on Which the Information of Such Defect was Obtained:

January 3, 2003

The Number and Location(s) of the Basic Component Which Contains the Defect

Four flow rate meters were procured and delivered to the Trojan nuclear power plant. Three were calibrated by a QA-qualified calibration facility and destined for use, but were not used in actual fuel loading activities due to the discovery of the mis-calibration during dry run activities. The fourth flow rate meter has been removed from the site.

Corrective Action Which Has Been, Is Being, or Will Be Taken

The three affected flow rate meters were removed from service and sent back to Aalborg for re-calibration. Holtec witnessed the re-calibration and the flow meters were subsequently placed into service at Trojan plant. Aalborg is developing new helium correction factors. In the interim, they have committed to using helium to calibrate all flow meters destined for use in measuring helium.

Any Advice Related to the Defect about the Basic Component That Has Been, Is Being, or Will Be Given to Purchasers or Licensees:

Trojan plant was the first plant where flow rate meters and flow totalizers were to be used to confirm adequate helium backfill in Holtec MPCs loaded with spent fuel. Therefore, no other Holtec client is affected for past loading operations. For future MPC loading operations, Holtec's users, as well as other purchasers and licensees are being notified via this report that Aalborg flow meters procured for use in important-to-safety activities may not be calibrated correctly and



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that certain catalogue correction factors have been determined to be incorrect. The calibration of Aalborg flow meters should be confirmed prior to use in important-to-safety activities.

If you have any questions or require additional information, please contact the undersigned at (856) 797-0900, extension 668.

Sincerely,

Brian Gutherman, P.E.  
Manager, Licensing and Technical Services

emcc: Mr. Mark Soler, Holtec  
Mr. Joel Westvold, PGE  
Mr. David Larkin, HUG Chairman  
Mr. Chris Regan, USNRC

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