FCI FLUID COMPONENTS INC.

August 11, 1993

U.S. Nuclear Regulatory Commission
ATTN.: Document Control Desk
Washington D.C. 20555

Subject: Reply to Notice of Nonconformance. (NRC Inspection Report 99901264/93-01)

On April 13-15 1993 an inspection was conducted at Fluid Components Inc. by the Vendor Inspection Branch of the Nuclear Regulatory Commission. This inspection focused on the flow calibration processes associated with our mass flow meter instruments used in Nuclear Safety Related applications. Two violations and one nonconformance were identified during the inspection. In the following paragraphs we have identified the causes of the Nonconformance and have outlined actions that have or will be taken to correct the situations and prevent their recurrence. This correspondence does not address the Notice of Violation that has been addressed previously.

The three areas of concern discussed in the Notice of Nonconformance are as follows: (1) Calibration procedures for FCI instruments. (2) Calibration procedures for FCI test stands. (3) Final (total) calibration accuracy of FCI instruments including errors caused by calibration inaccuracies in the test stands and in the primary standards used to calibrate the test stands.

Calibration procedures for FCI instruments:

Calibration procedure 008072, the procedure in question during the Inspection, has been rewritten and is in the review stage before general release. This procedure is used to calibrate FCI's LT81 mass flow meters. This is the only single point flow meter approved for Nuclear Safety applications at this time. The procedure has been updated to incorporate any changes in the calibration procedure that have occurred since the last revision in February of 1989. Estimated release date is Sept. 1, 1993.

Calibration procedure 008502 is currently being revised and updated as an approved Nuclear Safety procedure. This procedure is used for FCI's MT86 mass flow meter. This meter is the only multi-point meter approved for Nuclear Safety applications. Estimated release date is Oct. 1, 1993.

A general procedure for the calibration of Safety Related switches is being written. Estimated release date is Nov. 1, 1993.

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Calibration procedures for FCI calibration test stands:

The calibration procedures for the test stands will be written to accurately reflect what is done in a complete test stand calibration. At present, a calibration program for the computer is partially complete which will minimize hand entry of data. Much of the data acquisition will now be done by via automated data acquisition software. Estimated completion date is Nov. 1, 1993.

Final (total) calibration accuracy of FCI instruments:

The FCI flow stands that are calibrated in-house all using a series of turbine meters to measure the volumetric flowrate. Pressure and temperature are measured using pressure transducers and RTD's (resistance temperature detectors), respectively. These measurements are used to calculate the standard volumetric flowrate (SCFM). On stands used for calibration of instruments for Nuclear safety applications, data acquisition and calculations are done by computer program.

FCI uses two flow measurement technologies for calibration of the turbines in the test stands. For the lower flowrates (below 100-125 SCFM), sonic flow nozzles are used. Turbines with a flow range above this are calibrated with "master" turbine meters.

FCI is presently verifying our flow standards with outside laboratories. Our 4" "master" turbine meter has now been cross checked at both of our outside calibration sources for flow calibrations. At the present time, our "master" series of sonic flow nozzles are being checked at one of those sources.

Following the calibration of the sonic flow nozzles, the sonic nozzles will be directly compared to the master turbine meter in the overlap region between the two standards.

This data, and an analysis of the uncertainty limits of the instruments, will allow a total uncertainty limit of each test stand to be established. This will allow an overall instrument accuracy relative to NIST (National Institute of Standards and Technology) to be established.

Estimated completion date for this analysis is December 1, 1993.

Following the completion of the uncertainty analysis, the effects on already produced a shipped equipment shall be evaluated. Appropriate steps shall be taken at that time to correct any possible deviations that might be discovered.

I would now like to respond to an item that was discussed in the cover letter to the NRC Inspection Report. This was the use of Calibration Vendors that had not been audited to verify their technical and quality programs.

Most of the calibration source used by Fluid Components Int. have been audited prior to placing them on our approved suppliers' list. We have re surveyed them at three year intervals as suggested by our customers. However due to the costs involved and because these particular vendors were also the original manufacturers of the equipment being calibrated, a decision had been made to not survey OEMs in out of state locations. The reputation of these vendors was also a consideration. The one exception to the rule was a flow calibration facility in Colorado that we understood to be doing work directly for the NIST. For the past several years this has not been a problem with those from the Nuclear Industry who have performed audits of our calibration program.

In November of 1992 we were audited by NUPIC who brought to our attention a letter of clarification written by the NRC. This letter basically stated that all outside calibrations of measuring and test equipment used to test, calibrate or inspect Safety Related equipment must be performed by vendors who had been audited.

To correct this situation, we have investigated additional calibration sources with the capability of performing calibrations to the tolerances necessary who are more locally situated. We have founded these sources and will have them surveyed by October 1, 1993. Due to the specialized nature of the work performed by our calibration vendor in Colorado, we will perform an audit of their facility by October 1, 1993, as well.

In the next revision of the Q. A. Manual, the policy of auditing all calibration sources shall be clarified to assure this situation is not repeated.

If there are any questions concerning the above explanations and corrective actions for the Nonconformances please contact me.

Sincerely,
FLUID COMPONENTS INT.

Stephen R. Mitchell
Q.A. Manager

cc: Chief, Vendor Inspection Branch
Division of Reactor Inspection
and Licensee Performance
Office of Nuclear Reactor Regulation