

From: Evangelos Marinou
To: Jim Dyer
Date: Tue, Aug 29, 2006 4:19 PM
Subject: Re: CONCERNS ON THE DIRECTION THE STAFF IS LEADING MANAGEMENT ON THE CROSSFLOW UFM

Jim,

I consider it my obligation to provide you with my best technical view and, therefore, I will be happy to review the SER. It is curious, however, that my view is characterized as a non-concurrence, while the DSS view is considered the office position. As you know I am only expressing the staff position as stated in the SER issued on March 20, 2000, by DSS/DE and further re-affirmed by the Allegation Closure Letter dated 2/25/2005, which was also concurred by DSS. It is unclear to me what caused the new DSS view that invalidates the present staff position on the Crossflow technology. As best as I can tell review of the Fort Calhoun and Calvert Cliffs applications, where implementation specific issues were being addressed by the licensees, may have been the excuse. Those implementation issues, which are not unusual, have been resolved. None the less I will provide you with my best technical view on the subject and not be concerned with the characterization .

>>> Jim Dyer 08/26/2006 12:02 PM >>>
Evangelos,

As we discussed in the elevator earlier this week, on Thursday (8/24) I had a process briefing on where we are with resolution of the Cross-Flow UFM technical concerns. Thanks to your e-mail I was aware that the staff is not of one opinion on this issue. The current status is that DSS is completing the SER that would propose to withdraw support for the Westinghouse AMAG UFM topical report. At the meeting we discussed next steps for communication and regulatory implementation. Before we do any regulatory or communication activities I want to offer you the opportunity to review the SER and nonconcur with the technical basis. I was planning to ask that DSS treat your 8/21 e-mail as a nonconcurrence, but realized that you may not have seen the SER and may have additional issues of concern. If you develop any new technical issues please send them to Tom Martin, DSS, with a copy to me. If you have no additional concerns, we'll just address the technical issues outlined in your 8/21 e-mail. I also asked Mike Mayfield to provide the SER to EICB staff to determine whether they have any technical concerns.

I want to assure you that my only goal is to get the best technical decision for safety. The Cross Flow UFM technical concerns are very challenging from several technical disciplines. I want to handle differing views in a constructive manner to provide the best product we can to the industry and public.

Jim.

>>> Evangelos Marinou 08/21/2006 11:14 AM >>>

Jim,

I, once again, feel compelled to bring to your attention my concerns with regard to the UFM issue that has for so long been lingering with the same SPWB (previously SRXB) staff. The SPWB staff have, since their reversal of their position in the SER, demonstrated inability/unwillingness to comprehend the technical principles involved when reviewing the Westinghouse/AMAG Crossflow instrument and continue to reach conclusions consistent with the grossly erroneous ones published in their Task Group Report of June 7, 2004.

Unfortunately, the Task Group Report has become the principal basis for the Law Suit, filed by Caldon, against Westinghouse. The Task Group Report findings are unsupportable and inconsistent with the conclusions reached in the Allegation Closure Letter to Caldon dated 2/25/2005, on the Topical Report generically approved by the staff including SPWB. There is no new information that invalidates the conclusions of the Allegation Closure Letter that the existing safety evaluation basis provides reasonable

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assurance that licensees that use Crossflow meters for measurement uncertainty recapture in accordance with staff-approved license amendments can operate within the licensed power level.

The Task Group was created by the office, as you recall, to end the badgering by Caldon that claimed that my staff and I in the Instrumentation and Controls Branch had unilaterally reviewed fluid dynamics aspects of the Crossflow instrument without proper authority and qualification. That claim is in error and so clarified in my attached email of 3/08/04.

Notwithstanding the unfounded conclusions reached in the Task Group Report, a practical recommendation was made to issue a Bulletin requiring users of all UFM's to demonstrate the accuracy claimed at installed facilities.

The task for developing the Bulletin was assigned to me which I prepared and the draft was shared with management prior to a public meeting. At the public meeting on July 1, 2004, Caldon violently objected to the Bulletin recommendation that UFM's be evaluated against a standard of known accuracy, such as a venturi instrument loop. Caldon disingenuously claimed that venturi loops are not sufficiently accurate to compare their instrument against them. Though they have used data obtained from such loops to support accuracy claims in their Topical Report and on specific applications where questions have been raised on the accuracy of their instrument. Further, as I previously reported, at the end of the public meeting Caldon requested a private session (attended by several NRC staff) to inform us that Caldon had assurance from NRC management that the Caldon instrument was not going to be included in the Bulletin.

At the following ACRS meeting on July 8, 2004, Caldon again argued against the draft bulletins proposed standards for accuracy, while Westinghouse supported them. Unfortunately, the ACRS did not follow-up on the issue because of staff internal disputes. The next step, however, was a presentation before the CRGR on August 5, 2004, where through the attached CRGR presentation we were to make our case with regard to the venturi loop accuracy. Two plants that had conducted extensive evaluations with their venturies, provided data that are used in the CRGR presentation. In fact, the venturi data are point-by-point compared with readings of the installed Crossflow UFM's and the results are remarkably consistent with the venturi readings. The UFM readings are not included in the proposed CRGR presentation because the intent of the presentation was to demonstrate the accuracy of the venturi loop and not promote one UFM over another. There are many other plant data referenced in the Westinghouse reports that support the accuracy claims.

The presentation to CRGR was canceled by Chris Grimes because of politics, which he did not explain. He, however, continued to obtain postponements from fulfilling the public commitment to issue the generic communication (Bulletin). In the mean time, the SPWB staff that have prepared the Task Group Report and whose conclusions have been invalidated by the allegation closure which they formally concurred on continue to challenge the integrity of the Crossflow instrument accuracy in the Fort Calhoun and Calvert Cliffs applications. Installation anomalies at those sites are claimed by the SPWB staff to be generic flaws in the technology, which are unsupported. Those anomalies are predictable during the implementation process and as the allegation closure letter acknowledges plant procedures provide the means by which nonconforming conditions can be identified and corrected. The anomalies have been corrected, the instrument has been declared operable and its performance has been successfully compared to the performance of a clean venturi instrument loop but the amendments are being held hostage by the staff.

The staff have been holding the Fort Calhoun and Calvert Cliffs amendments hostage until their Theoretical Assessment of Crossflow Uncertainty, is independently evaluated by RES. This theoretical assessment of the crossflow uncertainty is not new, because it was delivered to the LT prior and was considered before the LT's decision on the allegation. The RES evaluation was completed and transmitted to you by memorandum dated May 12, 2006. That evaluation concludes that in general, the analysis presented in the white paper does not support its conclusions. Yet, the staff extracted a troubling sentence from the RES memorandum, which is out of context, that appears to convey support for the white paper (Theoretical Assessment of Crossflow Uncertainty), to convey to the ET/LT, in the June 8, 2006 presentation the erroneous message that RES substantiated their position. The detail technical analysis, not transmitted with the RES memorandum but provided to the staff, unequivocally disputes that sentence

in the memorandum.

Another issue presented to ET/LT in the June 8, 2006 presentation, as a new concern, is the swirl velocity phenomenon that can affect the feedwater measurement. This is not a new concern and it is not a concern at all for the Crossflow instrument, from a regulatory perspective, since the phenomenon would cause the instrument to react in the conservative direction. The issue has been known to the staff and in particular to the SPWB presenters of the ET/LT briefing, because it was extensively discussed and has been the centerpiece of Caldons allegation against the Crossflow instrument. I will not burden you at this time with additional attachments of that record, but a review of the Allegation Closure Letter and my non-concurrence to it provide a good perspective. I will be happy to provide this documentation as needed. My non-concurrence is based on my view that we continue to appease Caldon on some technicalities that have no regulatory substance, such as the swirl velocity.

From a regulatory perspective the swirl and any other flow anomalies that may appear after installation of the Crossflow instrument would have no adverse effects on the instrument readings. They may present an operational nuisance by causing the operators to disconnect the instrument from service and continue operation at a lower power level, through their conventional flow instrumentation (Venturi / Flow Nozzle) . The UFM flow measurement values, from either vendor, are restricted to a 0.3% deviation and when the deviation is reached the system is alarmed and taken out of service.

One other major issue that the SPWB staff has created, since the formation of the Task Group in early 2003, is their claim that for the instrument to perform accurately it must be located in a fully developed flow regime. It has been repeatedly demonstrated by theoretical and empirical data that this instrument only needs a stable flow (isothermal and sub-cooled). This fact has further been reaffirmed in the analysis performed by RES on the white paper.

It is a travesty that we are denying the public a sound technology whose use will realize an increase in our power supply, that was projected to by now have been in the order of 3000 MWs , on our National Grid that is so desperately needed. This benefit would have been and can still be realized, by allowing legitimate competition on improved instrumentation that replaces the conventional means (Venturi/Flow Nozzle). These means though proven accurate to about 0.25% uncertainty, by numerous tests and applications, conducted by the ASME, that accuracy can not be maintained during prolonged application due to fouling. Fouling causes the instrument loop to over estimate flow and hence plants are further penalized, on the average, by 1% power reduction, in addition to the 2% Appendix K penalty. The CRGR presentation can best be viewed in color.

CC: Bruce Boger; Gary Holahan; Michael Mayfield; Michael Weber; Thomas Martin