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Constellation Energy
Generation Group

March 6, 2006

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit Nos. 1 & 2; Docket Nos. 50-317 & 50-318
Request for Additional Information Regarding Measurement Uncertainty Recapture Power Uprate (TAC Nos. MC6210 and MC6211)

REFERENCES:

(a) Letter from P. D. Milano (NRC) to J. A. Spina (CCNPP), dated January 19, 2006, Request for Additional Information Regarding Measurement Uncertainty Recapture Power Uprate (TAC Nos. MC6210 and MC6211)

(b) Letter from K. J. Nietmann (CCNPP) to Document Control Desk (NRC), dated January 31, 2005, License Amendment Request: Appendix K Measurement Uncertainty Recapture - Power Uprate Request

The Nuclear Regulatory Commission (NRC) has requested (Reference a) additional information regarding our measurement uncertainty recapture license amendment request (Reference b). The information requested is contained in the attached response. Some of the information contained in the attached responses is proprietary. Accordingly, it is requested that the proprietary information contained in Attachment (1) be withheld from public disclosure in accordance with the provisions of 10 CFR 2.390 and that this material be appropriately controlled. The reasons for the classification of this material as proprietary are delineated in the affidavit provided in Attachment (2). The non-proprietary version of the response is provided in Attachment (3).

APO1

Should you have questions regarding this matter, please contact Mr. L. S. Larragoite at (410) 495-4922.

Very truly yours,

STATE OF MARYLAND :
: **TO WIT:**
COUNTY OF CALVERT :

I, James A. Spina, being duly sworn, state that I am Vice President - Calvert Cliffs Nuclear Power Plant, Inc. (CCNPP), and that I am duly authorized to execute and file this License Amendment Request on behalf of CCNPP. To the best of my knowledge and belief, the statements contained in this document are true and correct. To the extent that these statements are not based on my personal knowledge, they are based upon information provided by other CCNPP employees and/or consultants. Such information has been reviewed in accordance with company practice and I believe it to be reliable.

Subscribed and sworn before me, a Notary Public in and for the State of Maryland and County of St. Mary's, this 6th day of March, 2006.

WITNESS my Hand and Notarial Seal:

Notary Public

My Commission Expires: March 25 2007
Date

JAS/PSF/bjd

Attachment: (1) Proprietary -- Request for Additional Information Regarding Measurement Uncertainty Recapture Power Uprate
(2) Westinghouse Proprietary Affidavit
(3) Non-Proprietary -- Request for Additional Information Regarding Measurement Uncertainty Recapture Power Uprate

cc: P. D. Milano, NRC
S. J. Collins, NRC
Resident Inspector, NRC
R. I. McLean, DNR

ATTACHMENT (3)

NON-PROPRIETARY –

REQUEST FOR ADDITIONAL INFORMATION REGARDING

MEASUREMENT UNCERTAINTY RECAPTURE POWER UPRATE

NRC RAI Question 1

In Licensee Event Report 2005-003-01, dated December 15, 2005, the licensee described its actions to determine the root cause of non-conservative flow correction factors determined during chemical tracer testing for main feedwater flow.

Provide a summary description of the followup tracer testing and the computational fluid dynamics (CFD) analyses that have been accomplished and the findings of each analysis and test. In the case of the followup testing, provide the unrecalibrated AMAG-indicated flow rates for each of the installed instruments (Crossflow and/or X-Beam), the flow rates determined using tracer testing, and flow rates from the venturis obtained during followup testing.

CCNPP Response

Calvert Cliff Units 1 and 2 are two loop Combustion Engineering (CE) Pressurized Water Reactor (PWR) Nuclear Steam Supply System (NSSS) design plants. Unit 1's feedwater loops are designated as Loops 11 and 12, while Unit 2's loops are designated as Loops 21 and 22. Each of the loops includes a control valve, a run of pipe with several elbows and a Mitsubishi style flow straightener. CROSSFLOW meters were mounted on each of the loops approximately 11 pipe diameters downstream of the flow straighteners, but upstream of the venturi. On Loop 12, a second meter was mounted upstream of the flow straightener. At the time, this meter was believed to meet the requirements of the CROSSFLOW topical report (i.e., CENPD-397-P-A, Rev. 1) for a standard installation, where the flow was assumed to be stable and fully developed; because the meter was mounted more than 15 pipe diameters downstream of a standard 90° elbow. The plan was to use the Loop 12 upstream meter to calibrate the meter downstream of the flow straightener on Loop 12. It was then demonstrated through cold laboratory tests that the Loop 12 downstream meter calibration could be also used for the remaining three meters on Loops 11, 21 and 22.

As part of the commissioning process for a measurement uncertainty recapture (MUR) power uprate, it was decided to confirm the performance of the CROSSFLOW meters using a non-radioactive chemical tracer test. This test was not performed to calibrate the CROSSFLOW meters. Rather, the objective of this test was to compare the ratio of the tracer flow to the venturi flow, measured over approximately 200 seconds, to the ratio of the CROSSFLOW meter flow to venturi flow, measured over at approximately 5 hours. Approximately 5 hours of data are required to ensure that the measurement of flow using the CROSSFLOW meters satisfies the requirements of the uncertainty calculations. Since the duration of the tracer is only 200 seconds, the results of the tracer cannot be compared directly to CROSSFLOW results. However, assuming that the venturi and CROSSFLOW performance do not vary significantly at constant power, the ratio of the tracer flow to the venturi flow should be similar to the ratio of the CROSSFLOW measured flow to venturi flow.

Five hours of CROSSFLOW data was not available for the Loop 12 meter located downstream of the flow straightener, because it was not being used for power recovery, and was not going to be used for the proposed Appendix K uprate. Five hours of data are also not available for the CROSSFLOW X-Beam meters which were temporarily installed to investigate power dependency of the meters downstream of the flow straighteners.

Table 1 compares the tracer measurements (taken at the 100% power level) with the corresponding venturi readings. The venturi flow is the uncorrected flow (not corrected by the CROSSFLOW meter).

Table 1 Comparison of Tracer with Venturis			
Loop	Tracer (klbm/hr)	Venturi (klbm/hr)	Difference (%)
11	5998.9	6011.7	-0.213
12	5964.3	5990.5	-0.439
21	6060.2	6038.3	0.361
22	5991.1	5977.0	0.235

It can be seen from this data that all the tracer measurements compare favorably with the venturi readings. It should also be noted that the tracer tests for Loops 11 and 12 are lower than the venturis. This is consistent with plant operating experience that had indicated that the Unit 1 venturis were fouled, resulting in an approximately 0.6% loss in generation. If the effects of fouling were removed from the Unit 1 data, the relative difference between tracer flow and venturi flow would have been similar for both units (tracer flow approximately 0.3% greater than venturi flow).

Table 2 is a summary of CROSSFLOW data, averaged over approximately 5 hours, obtained prior to and following the tracer test. As requested, the venturi flow data has not been corrected by the CROSSFLOW meter. Also, the calibration factor determined from the relationship between the Loop 12 upstream meter and Loop 12 downstream meter has been removed from the Loop 11, 21, and 22 CROSSFLOW data to supply unrecalibrated flow rates. Only the meters that were continuously run to monitor venturi performance are included in the table. Data obtained from the X-Beam and Loop 12 downstream meters were limited to approximately one hour before and after the tracer test. Since 5 or more hours of data are required to obtain a satisfactory CROSSFLOW reading that is within the statistical uncertainty of the quality assured calculation, data for these meters has not been included.

Table 2 Pre-Test and Post-Test 5 Hour CROSSFLOW Data						
Loop	Pre-test Venturi (klbm/hr)	Pre-test CROSSFLOW/ (klbm/hr)	Pre-test CROSSFLOW/ Venturi Ratio	Post-test Venturi (klbm/hr)	Post-test CROSSFLOW/ (klbm/hr)	Post-test CROSSFLOW/ Venturi Ratio
11	6000.2	6025.9	1.0043	5993.9	6016.2	1.0037
12*	5959.8	5822.2	0.9769	5951.5	5816.4	0.9773
21	6050.3	6043.3	0.9988	6049.6	6040	0.9984
22	5976.4	5995.1	1.0031	5974.8	5999.1	1.0041

* Upstream Meter

As shown in Table 2, the pre-test and post-test ratios of CROSSFLOW to Venturi flow are similar, consistent with the assumptions for CROSSFLOW performance.

Table 3 is a comparison of the ratio of tracer to the venturi flow (from Table 1) to the ratio of CROSSFLOW to venturi flow (from Table 2). The average of the pre and post test data from Table 2 is presented in Table 3.

Table 3
Comparison of Tracer to CROSSFLOW

Loop	CROSSFLOW/ Venturi Ratio	Tracer/ Venturi Ratio	Difference (%)
11	1.0040	0.9979	0.61%
12	0.9771*	0.9956	-1.89%
21	0.9986	1.0036	-0.50%
22	1.0036	1.0024	0.12%

* Upstream Meter

As shown in Table 3, the Loop 12 upstream meter, used to calibrate the Loop 12 meter downstream of the flow straightener, has the largest difference from the tracer results. Therefore, the assumption that the flow at that location was both stable and developed was incorrect. Also, the wide variation in the results indicates that the Loop 12 calibration could not be used for the remaining three loops, contrary to the results from the cold laboratory testing.

For information only, the CROSSFLOW data obtained during the tracer test for all meter locations is presented in Table 4. The data is averaged over only approximately 2 hours and does not meet the criteria established in the uncertainty calculations. Therefore, this information cannot be used to make any meaningful conclusions regarding CROSSFLOW performance. Furthermore, the X-Beams are located downstream of a machined taper in the feedwater pipe. Hence, it would not be expected that the standard (I-beam) meters and X-Beam meters would read the same.

Table 4
Summary of Data for All CROSSFLOW Meters

Loop	Venturi (klbm/hr)	I-beam (klbm/hr)	X-Beam Path 1 (klbm/hr)	X-Beam PatYh 2 (klbm/hr)
11	5996.7	6044.4	6084.6	6078.5
12	5962.1	5949.2	5994.7	5979.2
12 Upstream	5962.1	5841.3		
21	6054.9	6051.2		
22	5979.8	6014.7		

Based on the tracer test results, it was decided to perform a Computational Fluid Dynamics (CFD) analysis of the piping upstream of the Mitsubishi flow straightener on Loop 12 in order to get a qualitative picture of what was happening to the flow field in the piping system. It was decided to model the piping up to the main feedwater control valve and to simulate the control valve by using an 8 inch pipe to represent the jetting action of the feedwater exiting the cage of the valve into the approximately 14 inch (inner diameter) feedwater pipe. For control purposes, a second model was also developed with the same piping configuration, but without the 8 inch control valve pipe simulation.

Figures 1 and 2 show the two CFD piping configurations with and without the 8 inch pipe. Figures 3 and 4 show the differences in swirl that are generated in the pipe due to the jetting action of the control valve and Figures 5 and 6 show the velocity profiles at the location in the feedwater pipe where the CROSSFLOW meter is located.

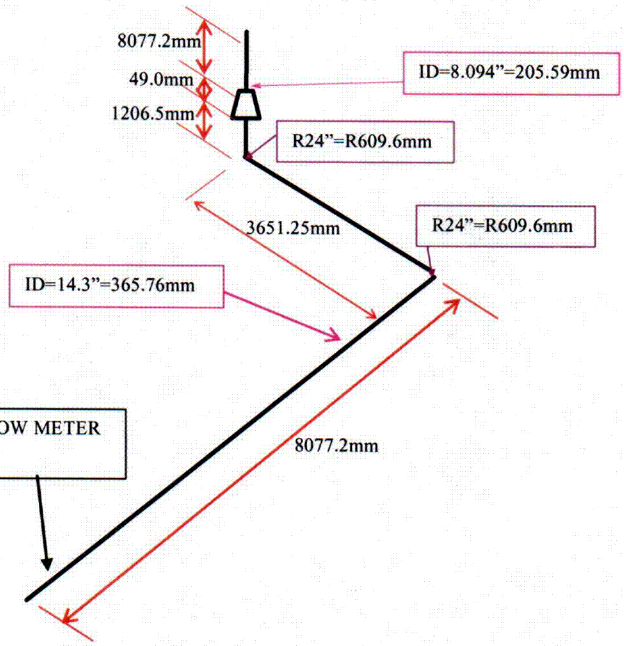

Figure 1: Loop 12 Piping Layout Upstream of the Mitsubishi Flow Straightener with the Main Feedwater Control Valve Simulated

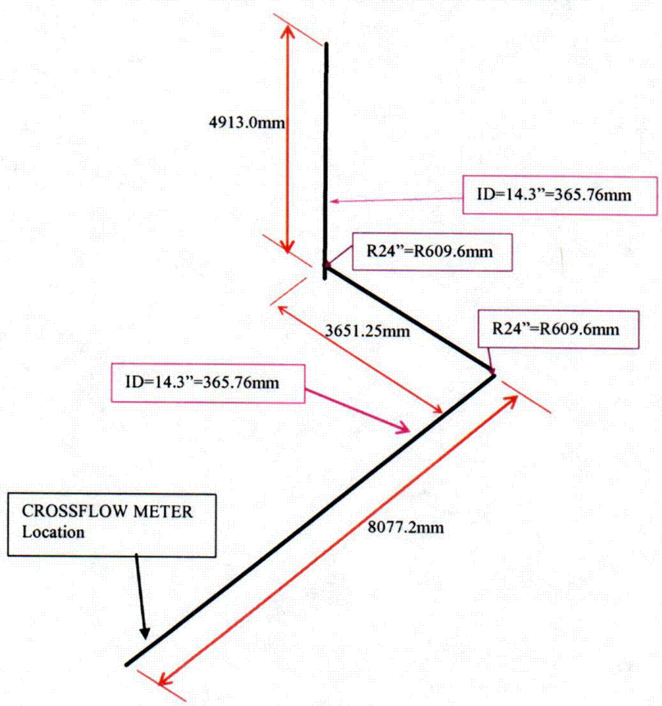

Figure 2: Loop 12 Piping Layout Upstream of the Mitsubishi Flow Straightener without the Main Feedwater Control Valve Simulated

C01

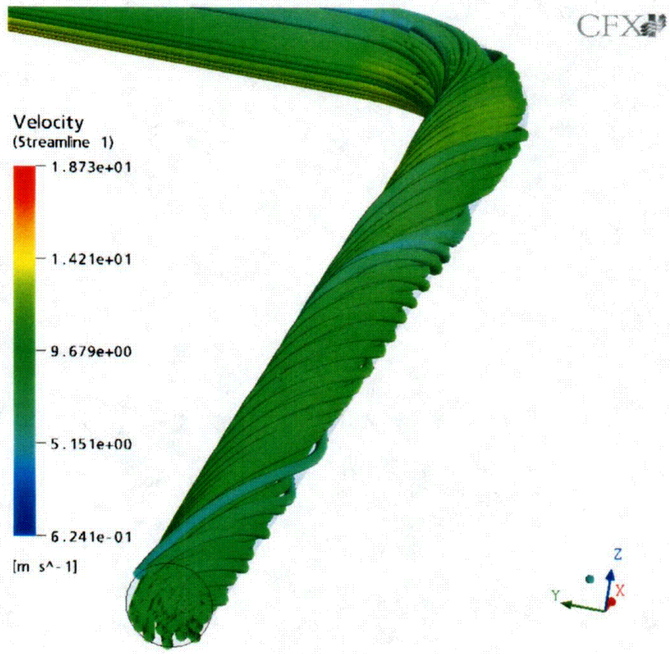

Figure 3: Loop 12 Swirl with the Main Feedwater Control Valve Simulated

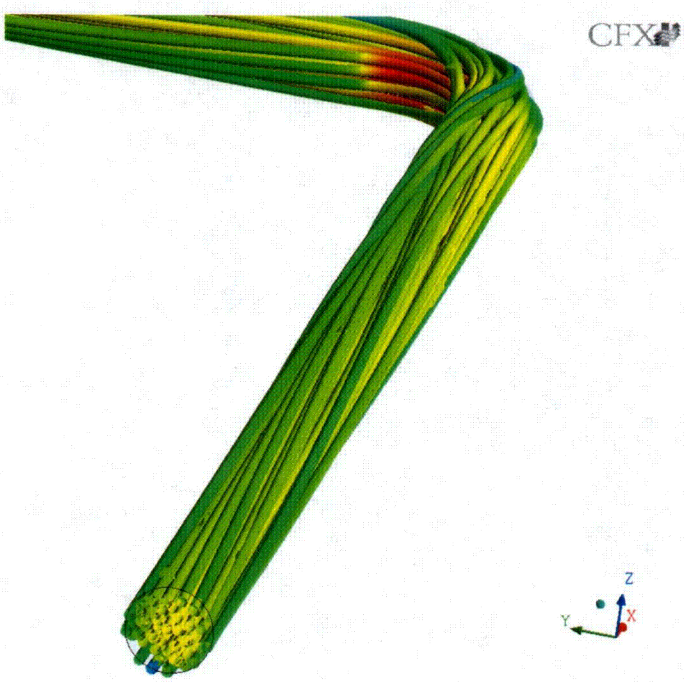

Figure 4: Loop 12 Swirl without the Main Feedwater Control Valve Simulated

C02

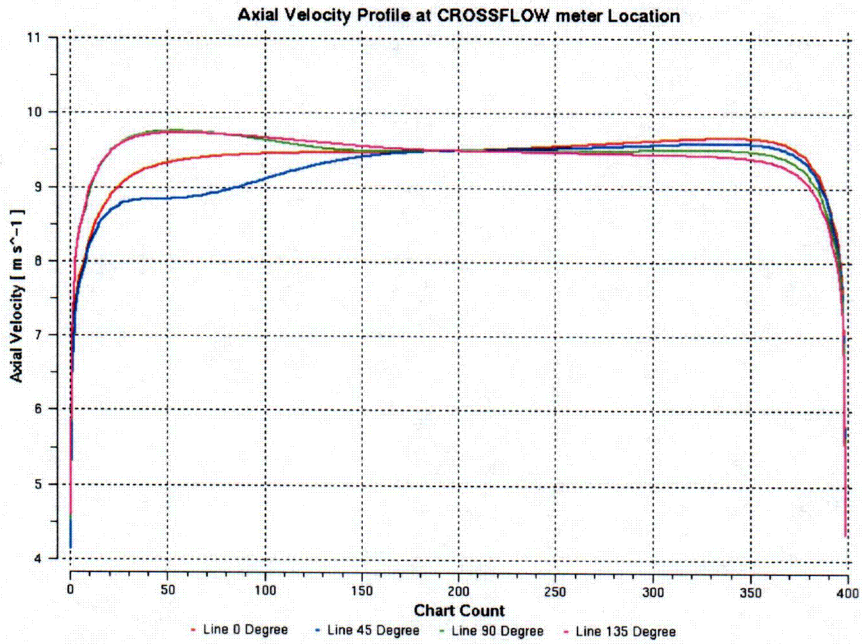

Figure 5: Loop 12 Velocity Profile at the Location of the CROSSFLOW meter with the Main Feedwater Control Valve Simulated

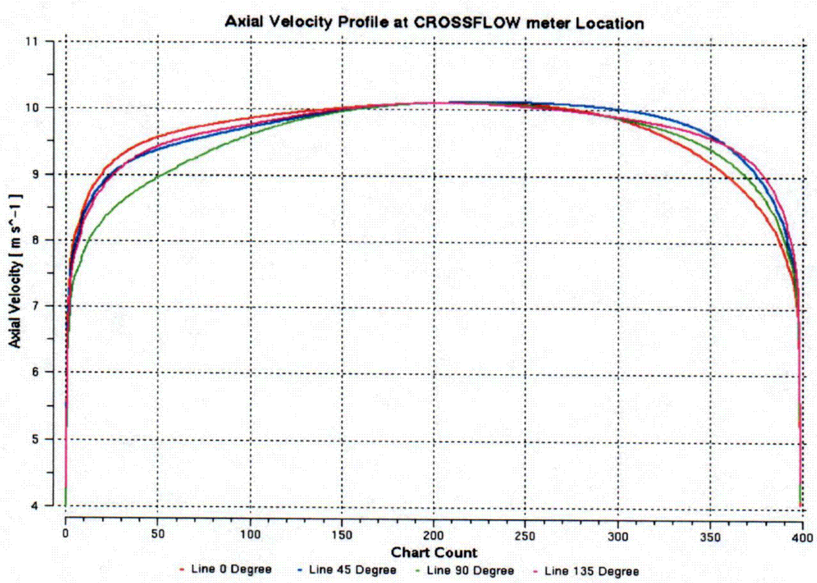

Figure 6: Loop 12 Velocity Profile at the Location of the CROSSFLOW meter without the Main Feedwater Control Valve Simulated

Figure 3 shows that a very strong swirling action is created when the jetting action of the main feedwater control valve is included in the simulation, while Figure 4 shows that swirling action is essentially eliminated if the simulated valve is not present. Figure 4 is the type of response that would have been expected in the pipe due to the fact that the two out-of-plane elbows are almost 10 pipe diameters apart.

Under these conditions, the velocity profile has a chance to reestablish itself prior to entering the second elbow, hence the effects of swirl was expected to have been mitigated. However, the CFD analysis shows that when the jetting action of the control valve is included, the flow profile cannot recover within the 10 pipe diameters, so the interaction with the second elbow causes a strong swirling action that had not been anticipated.

Figures 5 and 6 show the velocity profile at different orientations about the pipe where the CROSSFLOW meter is located, with 0 representing the vertical plane and 90 the horizontal plane. Since the meter is mounted in the plane of the upstream elbow, it sees the velocity profile in the horizontal plane, which is shown as green.

It is clear from Figures 5 and 6 that the velocity profiles are significantly different when the effects of the control valve are included in the simulation. The profile moves from the traditional parabolic shape to a concave shape. The swirl then causes the eddies nearer the wall that pass through the upstream ultrasonic beam to be rotated out of the downstream ultrasonic beam so that the meter tends to track the eddies in the central part of the profile, where the fluid is moving slower. This in turn causes the meter readings to be biased low, which is consistent with the conclusion of the tracer test.

NRC RAI Question 2

Provide a description of the tracer testing procedures to be used to support in-situ calibration of the Crossflow System. Include a discussion of (a) how the tracer testing is traceable to National standards, (b) the controls in place to assure the procedures are properly conducted, (c) the accuracy of the tracer testing, and (d) how the uncertainties associated with the tracer testing are factored into the overall uncertainty of the Crossflow system accuracy.

CCNPP Response

Although there are multiple parts to this question, the best way to address them is to incorporate the response into a general presentation on the subject of tracer testing, starting with the theory and test equipment followed by the steps in the test procedure and then the chemical analysis and finally the incorporation of the results of the tracer test into the CROSSFLOW system accuracy.

The tracer test measures the flow in a pipe based on the principle of conservation of mass, which states that the concentration of the tracer times its rate of injection must be equal to the concentration in the feedwater line times the feedwater flow rate. The only term in this equation that is not known is the feedwater flow rate. In practice, the conservation of mass equation is usually rearranged so that the feedwater flow rate is set equal to the injection rate of the tracer times the dilution ratio, where the dilution ratio is defined as the ratio of the concentration of the tracer being injected into the pipe divided by the concentration of the feedwater samples.

The concept of measuring the feedwater flow with a tracer is rather simple, however in order to achieve an accurate measurement, the injection, mixing and chemical analyses must be performed in a very precise and controlled manner. When performed properly, flow measurements with accuracies between 0.2% and 0.4% with a 95% confidence interval can be achieved. However, the actual accuracy of each feedwater flow measurement is determined based on the specific uncertainty of the injection rate and the chemical analysis. For example, the uncertainty of the test can be increased if the feedwater flow is not stable during the test, since the oscillations in the flow will cause the concentrations of the feedwater sample to increase and decrease, which results in a higher standard deviation.

When performing a chemical tracer measurement, injection and sampling points must first be selected that prevent the loss of tracer, while assuring complete mixing. The loss of tracer is minimized by avoiding flow branches prior to achieving complete mixing, plus large surface area such as feedwater heaters, where the large surface increases the chance of the tracer plating out on the surface. It should be noted that if tracer is lost, the flow measurement is biased high, so from an overpower perspective the lost of tracer is conservative. Complete mixing can be assured when the injection and sample points are at least 250 pipe diameters apart. This criteria is based on testing performed in England, see Reference 1.

For the Calvert Cliffs tracer test both of these requirements are met. The tracer is injected just upstream of the main feedwater control valves and samples are pulled downstream. There is only one branch line; the feedwater control valve bypass line which reenters the main feedwater line several pipe diameters downstream of the main control valve. Normally, this could result in a slight loss of tracer, biasing the results conservatively high. However, because of the relatively large pressure drop across the control valve, the equivalent mixing distance in just passing through the valve is over 2000 pipe diameters. Hence, a significant amount of mixing has already occurred upstream of the bypass line, minimizing the error. Given that the mixing created by the valve and even further mixing by the Mitsubishi style flow straighteners, the mixing requirements are easily met. Moreover, the injection and sampling points are all downstream of the last high pressure feedwater heater, so surface areas are not a concern.

During the actual tracer test, injection and sample carts are connected to the feedwater system.

Once the injection and sample carts are connected to the feedwater system, the metering pump is calibrated using a balance that has been calibrated on-site with weights that are traceable to the National Institute of Standard and Technology (NIST).

After the transfer from the drain to the feedwater system has been completed, an inspection of all connections between the discharge of the pump and the connection to the feedwater system are checked for leaks.

Once it is confirmed that there are no leaks, Operations is alerted that the tracer injection will begin.

The analysis is performed by laboratory personnel, who have been trained specifically for this type of analysis. Their skills include the preparation of the standards, the operation of the Atomic Absorption instrument plus the entry of the data into a spreadsheet and the quality control of all aspects of the job.

When the samples arrive at the laboratory, the background and sample bottles are unpacked. Since each background and sample bottle has a unique ID number that is recorded at the time of each test, there is no question about which set of samples goes with which loop.

As noted earlier, the uncertainty of the tracer test is dependent on the stability of the feedwater during the tests, the stability of the Atomic Absorption equipment and the repeatability of the pump at the time of the test. Hence, it is not possible to state a specific number, however, based on past experience the uncertainty is normally in the range of 0.2 to 0.4%.

References

1. C.G. Clayton, A.M. Ball, and R. Spackman, "Dispersion and Mixing During Turbulent Flow of Water in a Circular Pipe," Isotope Research Division, Wantage Research Laboratory, Wantage, Birkshire, 1968

NRC RAI Question 3

Provide a description of any periodic testing to be performed that will verify that the CROSSFLOW systems remains calibrated over the range of operating conditions and changes in flow that may occur over time due to degradation of, modification to, and/or operational changes in the main feedwater system.

CCNPP Response

As with any plant system, there are many levels of checks and cross-checks built into the CROSSFLOW system and its operation that assures its safe operation.

There are two key issues that must be addressed:

1) Has the meter been calibrated correctly?
2) How do you know that the calibration has not been compromised during operation?

The meter can be calibrated and then verified by a comparison with another diverse method of flow measurement. In the case of Calvert Cliffs a chemical tracer test is being used to calibrate the CROSSFLOW meter.

Once each meter has been calibrated correctly using the chemical tracer and its uncertainty has been established, it is an absolute requirement that the uncertainty of the meter remain within the operating limits established by the quality assured uncertainty calculation. Experience at Calvert Cliffs has demonstrated that the meters downstream of the Mitsubishi style flow straighteners are repeatable, as shown in Tables 5 and 6. Table 5 shows the Loop 11 data for the meter located downstream of the Mitsubishi flow. Data is not available for the Loop 12 meter downstream of the straightener since it was not used for venturi correction prior to performance of the initial tracer test. The Table 6 data covers a span of time from when the meter was first placed in operation to the time when it was taken out of service, a period of over 2 years. The Table 5 data includes the time period from when the meters were first placed in service to point in time when the feedwater venturi was first observed to foul in April of 2005, a period of one year 9 months. Fouling was corroborated by a corresponding drop in 1st stage pressure and reduction in the difference between reactor coolant system hot and cold leg temperatures.

It is clear from this data, that although the meters are all located in regions where the flow is not stable, they are capable of maintaining a precise calibration.

Table 5
Stability of Venturi Correction Factor Over Time

DATE	Venturi Correcton Factor
	Loop 11
7/21/03	1.0022
7/31/03	1.0027
9/3/03	1.0017
10/6/03	1.0019
11/5/03	1.0020
12/8/03	1.0017
1/12/04	1.0028
2/17/04	1.0035
3/18/04	1.0032
5/14/04	1.0041
6/16/04	1.0035
7/18/04	1.0044
8/8/04	1.0046
8/29/04	1.0028
10/4/04	1.0024
11/5/04	1.0018
12/7/04	1.0033
1/10/05	1.0025
2/10/05	1.0020
3/15/05	1.0037
4/7/05	1.0027
Average Correction Factor	1.0028
Relative Standard Deviation (%)	0.0886

Table 6
Stability of Venturi Correction Factor Over Time

DATE	Venturi Correcton Factor	
	Loop 21	Loop 22
7/8/03	0.9904	0.9938
7/16/03	0.9902	0.9931
8/20/03	0.9902	0.9942
9/23/03	0.9907	0.9941
10/27/03	0.9915	0.9944
11/25/03	0.9901	0.9940
12/31/03	0.9903	0.9939
1/31/04	0.9893	0.9931
3/3/04	0.9901	0.9935
4/5/04	0.9895	0.9929
5/7/04	0.9897	0.9928
6/8/04	0.9898	0.9924
7/12/04	0.9907	0.9935
8/9/04	0.9904	0.9935
9/8/04	0.9902	0.9933
9/28/04	0.9906	0.9948
11/1/04	0.9910	0.9942
12/1/04	0.9909	0.9940
1/3/05	0.9900	0.9937
2/2/05	0.9908	0.9939
3/18/05	0.9889	0.9943
4/18/05	0.9889	0.9930
5/19/05	0.9899	0.9935
6/20/05	0.9894	0.9945
7/22/05	0.9898	0.9948
8/24/05	0.9902	0.9949
Average Correction Factor	0.9901	0.9938
Relative Standard Deviation (%)	0.0642	0.0658

The system provides several critical alarms to identify potential problems with the CROSSFLOW system. These are summarized in Table 4-1 of WCAP-16437-P, "CROSSFLOW Ultrasonic Flow Meter User Guidelines" prepared by the Westinghouse Owners Group (WOG) CROSSFLOW Task Force (CTF).

These alarms assure that the CROSSFLOW system will continue to operate within the limits established by the quality assured calculation. Table 7 is a summary of key alarms presented in the guidelines.

Table 7 – UFM Critical Alarms

Alarm Name	Comment
FlowLessThanLimit	Flow is less than limit. CROSSFLOW could not reliably measure flow if it is less than limit. The correction factors while the flow is less than limit, would be marked as BAD.
CfLongBufferLow	Number of points with good quality in the Long Buffer is low.
CfShortBufferLow	Number of points with good quality in the Short Buffer is low.
CfLongUncertainty	Uncertainty for the Long Buffer is not met. The uncertainty limit is based on QA calc.
CfShortUncertainty	Uncertainty for the Short Buffer is not met.
CfOutOfLimit	C_f is out of range limits. If C_f is below the lower range limit it could lead to non-conservative reactor power calculations if the condition was caused by a fault.
CfSuddenChange	Sudden change in C_f (e.g. sudden defouling). Addition of reactivity, i.e., boron dilution, could lead to over power conditions.
SCUNeedsCalibration	SCU needs calibration. SCU self-test has failed.
CfShortBufferLow	CfShort Buffer contains less than CfPercentGoodFw of Good Quality Cfi. This is typical under steady state conditions. If the cause of this alarm persists, it could eventually lead to a bad C_f.

ATTACHMENT (2)

WESTINGHOUSE PROPRIETARY AFFIDAVIT

Westinghouse

Westinghouse Electric Company
Nuclear Services
P. O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

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

Direct tel: 412-374-4643
Direct fax: 412-374-4211
e-mail: greshaja@westinghouse.com
Our ref: CAW-06-2111
March 2, 2006

APPLICATION FOR WITHHOLDING PROPRIETARY INFORMATION FROM PUBLIC DISCLOSURE

Reference: CCNPI Letter, "Request for Additional Information Re: Measurement Uncertainty Recapture Power Uprate", dated March 3, 2006

The proprietary information for which withholding is being requested is contained in the above referenced Calvert Cliffs Nuclear Power Plant, Inc. (CCNPPI) letter in proprietary Attachment (1), "Proprietary Response to Request for Additional Information on the Measurement Uncertainty Recapture Power Uprate", as identified in Affidavit CAW-06-2111 signed by the owner of the proprietary information, Westinghouse Electric Company LLC (Westinghouse). The affidavit, which accompanies this letter, sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations.

Accordingly, this letter authorizes the utilization of the accompanying affidavit by Calvert Cliffs Nuclear Power Plant, Inc.

Correspondence with respect to the proprietary aspects of the application for withholding or the Westinghouse affidavit should reference this letter, CAW-06-2111, and should be addressed to J. A. Gresham, Manager, Regulatory Compliance and Plant Licensing, Westinghouse Electric Company LLC, P.O. Box 355, Pittsburgh, Pennsylvania 15230-0355.

Very truly yours,

for James A. Gresham
Manager
Regulatory Compliance and Plant Licensing

Enclosure: As stated

AFFIDAVIT

STATE OF CONNECTICUT)
) ss: WINDSOR, CT
COUNTY OF HARTFORD)

Before me, the undersigned authority, personally appeared Ian C. Rickard, who, being by me duly sworn according to law, deposes and says that he is authorized to execute this Affidavit on behalf of Westinghouse Electric Company LLC ("Westinghouse"), and that the averments of fact set forth in this Affidavit are true and correct to the best of his knowledge, information, and belief:

Ian C. Rickard, Licensing Project Manager
Systems and Safety Analysis, Nuclear Services
Westinghouse Electric Company, LLC

Sworn to and subscribed before me
this 2nd day of March 2006.

Notary Public

My commission expires 8/31/09.

(1) I, Ian C. Rickard, depose and say that I am the Licensing Project Manager, Systems and Safety Analysis, in Nuclear Services, Westinghouse Electric Company LLC ("Westinghouse"), and as such I have been specifically delegated the function of reviewing the proprietary information sought to be withheld from public disclosure in connection with nuclear power plant licensing and rule making proceedings, and am authorized to apply for its withholding on behalf of the Westinghouse Electric Company LLC.

(2) I am making this Affidavit in conformance with the provisions of 10 CFR Section 2.390 of the Commission's regulations and in conjunction with the Westinghouse application for withholding accompanying this Affidavit.

(3) I have personal knowledge of the criteria and procedures utilized by the Westinghouse Electric Company LLC in designating information as a trade secret, privileged or as confidential commercial or financial information.

(4) Pursuant to the provisions of paragraph (b)(4) of 10 CFR Section 2.390 of the Commission's regulations, the following is furnished for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld.

(i) The information sought to be withheld from public disclosure is owned and has been held in confidence by Westinghouse.

(ii) The information is of a type customarily held in confidence by Westinghouse and not customarily disclosed to the public. Westinghouse has a rational basis for determining the types of information customarily held in confidence by it and, in that connection, utilizes a system to determine when and whether to hold certain types of information in confidence. The application of that system and the substance of that system constitute Westinghouse policy and provide the rational basis required.

Under that system, information is held in confidence if it falls in one or more of several types, the release of which might result in the loss of an existing or potential competitive advantage, as follows:

(a) The information reveals the distinguishing aspects of a process (or component, structure, tool, method, etc.) where prevention of its use by any of Westinghouse's competitors without license from Westinghouse constitutes a competitive economic advantage over other companies.

(b) It consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), the application of which data secures a competitive economic advantage, e.g., by optimization or improved marketability.

(c) Its use by a competitor would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing a similar product.

(d) It reveals cost or price information, production capacities, budget levels, or commercial strategies of Westinghouse, its customers or suppliers.

(e) It reveals aspects of past, present, or future Westinghouse or customer funded development plans and programs of potential commercial value to Westinghouse.

(f) It contains patentable ideas, for which patent protection may be desirable.

(iii) There are sound policy reasons behind the Westinghouse system for classification of proprietary information, which include the following:

(a) The use of such information by Westinghouse gives Westinghouse a competitive advantage over its competitors. It is, therefore, withheld from disclosure to protect the Westinghouse competitive position.

(b) It is information that is marketable in many ways. The extent to which such information is available to competitors diminishes the Westinghouse ability to sell products and services involving the use of the information.

(c) Use of this information by our competitors would put Westinghouse at a competitive disadvantage by reducing their expenditure of resources at our expense.

(d) Each component of proprietary information pertinent to a particular competitive advantage is potentially as valuable as the total competitive advantage. If competitors acquire components of proprietary information, any one component may be the key to the entire puzzle, thereby depriving Westinghouse of a competitive advantage.

(e) Unrestricted disclosure of this information would jeopardize the position of prominence of Westinghouse in the world market, and thereby give a market advantage to the competition of those countries.

(f) The Westinghouse capacity to invest corporate assets in research and development depends upon the success in obtaining and maintaining a competitive advantage.

(iv) The information is being transmitted to the Commission in confidence and, under the provisions of 10 CFR Section 2.390; it is to be received in confidence by the Commission.

(v) The information sought to be protected is not available in public sources or available information has not been previously employed in the same original manner or method to the best of our knowledge and belief.

(vi) The proprietary information sought to be withheld by this submittal is that which is contained in proprietary Attachment (1), "Proprietary Response to Request for Additional Information on the Measurement Uncertainty Recapture Power Uprate", transmitted by Calvert Cliffs Nuclear Power Plant, Inc. letter, " Request for Additional Information Re: Measurement Uncertainty Recapture Power Uprate ", dated March 3, 2006, for submittal to the Commission, being transmitted herewith and Application for Withholding Proprietary Information from Public Disclosure, to the NRC Document Control Desk. The proprietary information as submitted for use by Westinghouse is expected to be applicable in other licensee submittals in response to certain NRC requirements for justification of the application of the CROSSFLOW Ultrasonic Flow Measurement System performance within its approved accuracy limit.

This information is part of that which will enable Westinghouse to:

(a) Validate CROSSFLOW Ultrasonic Flow Measurement System performance.

(b) Support licensees in implementing the CROSSFLOW Ultrasonic Flow Measurement System within its approved accuracy limit.

Further this information has substantial commercial value as follows:

(a) Westinghouse plans to sell the use of similar information to its customers for purposes of meeting NRC requirements for licensing documentation.

(b) Westinghouse can sell support and defense of the CROSSFLOW Ultrasonic Flow Measurement System performance within its approved accuracy limit.

(c) The information requested to be withheld reveals the distinguishing aspects of a methodology which was developed by Westinghouse

Public disclosure of this proprietary information is likely to cause substantial harm to the competitive position of Westinghouse because it would enhance the ability of competitors to provide similar advanced nuclear power plant designs and to provide licensing defense services for commercial power reactors without commensurate expenses. Also, public disclosure of the information would enable others to use the information to meet NRC requirements for licensing documentation without purchasing the right to use the information.

The development of the technology described in part by the information is the result of applying the results of many years of experience in an intensive Westinghouse effort and the expenditure of a considerable sum of money.

In order for competitors of Westinghouse to duplicate this information, similar technical programs would have to be performed and a significant manpower effort, having the requisite talent and experience, would have to be expended.

Further the deponent sayeth not.