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

Joseph M. Farley Nuclear Plant
Response to Request for Additional Information Related to WCAP-14750,
"RCS Flow Verification Using Elbow Taps at Westinghouse 3-Loop PWRs"

Ladies and Gentlemen:

By letter dated November 26, 1996, Southern Nuclear Operating Company (SNC) submitted a Westinghouse Owners Group (WOG) technical report, WCAP-14750, "RCS Flow Verification Using Elbow Taps at Westinghouse 3-Loop PWRs," for NRC Staff review and approval. On August 5, 1997, SNC received a NRC Staff request for additional information (RAI), dated July 30, 1997, related to the elbow tap flow measurement method described in WCAP-14750. The SNC response to the RAI is provided in the Attachment.

If you have any questions, please advise.

Respectfully submitted,

DN Morey

Dave Morey

MGE/maf rcsflow7.doc

Attachments

cc: Mr. L. A. Reyes, Region II Administrator
Mr. J. I. Zimmerman, NRR Project Manager
Mr. T. M. Ross, Plant Sr. Resident Inspector

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ATTACHMENT

SNC Response To NRC
Request For Additional Information On WCAP-14750, "RCS Flow Verification Using Elbow Taps At Westinghouse 3-Loop PWRs," Joseph M. Farley Nuclear Plant, Units 1 & 2

NRC Question No. 1

Page 3, last paragraph, states, "Typically, the core exit and hot leg gradients remain relatively stable, changing only slightly as the radial power distribution changes during a fuel cycle."

Discuss the phenomenon of temperature switching experienced by some plants and its impact on flow measurement by the proposed elbow tap flow method.

SNC Response No. 1

The temperature switching phenomenon, called the "upper plenum anomaly," affects hot leg temperatures in some 4-loop plants, but has not been detected in 3-loop plants. The phenomenon appears to be associated with the adjacent pairs of hot leg nozzles on 4-loop plants. A bistable-type switching of the flows approaching a pair of hot leg nozzles causes some flow in the boundary between the nozzles that normally enters one nozzle to switch to the other nozzle, while an equal flow switches in the opposite direction. When the temperatures of the switching flows differ, hot leg temperatures change. Typical changes in the average hot leg temperature are $\pm 1^{\circ}F$.

Measurements of other parameters (including elbow tap flows and core exit temperatures) during temperature switching transients at 4-loop plants detected no concurrent transients in the other parameters. Since temperature switching does not change RCS flow, the phenomenon has no impact on the elbow tap flow measurement method, whether used at a 3-loop or 4-loop plant.

W/wgl - 9/11/97

NRC Question No. 2

Page 6, last paragraph, discusses the magnitudes of observed calorimetric flow biases and discusses the relationship between power and the onset of calorimetric flow biases. Discuss how the hot leg gradients remain relatively stable as compared to power distribution based on the fact that on page 6 calorimetric flow bias[es] are shown to occur based on power level.

SNC Response No. 2

The correlation, and the data plotted on Figure 3-4, is all based on measurements at or near 100% power, since calorimetric flow is measured at or near 100% power. The correlation is not based on measurements at part load. The power parameter plotted on Figure 3-4 is the difference between the average power generated by fuel assemblies in the row (defined as the 2nd row) adjacent to the outer row and the average power generated in the outer row. For example, with the total core generating 100% power, a difference of 60% power would exist if 2nd row average fuel assembly power were 90% and outer row average fuel assembly power were 30%. As this difference increases, core exit temperature gradients increase at the edge of the core, c... ing larger hot leg temperature gradients and increased biases in the mea...red calorimetric f...

The core radial power distribution will change slightly during the fuel cyc..., and the power difference and hot leg streaming gradients will tend to decrease slightly. ... relatively stable" relates to these changes occurring over period of months.

W/dct - 8/20/97

NRC Question No. 3

Page 11, first paragraph. Discuss how the repeatability term for the installed elbow tap element at Farley was determined. The topical states that the elbow tap flow measurement procedure relies on the repeatability of the elbow differential pressure (dp) measurement. WCAP-14750 states in Table A-5 that the elbow tap repeatability is 0.5% dp. Confirm the value assumed in WCAP-14750 and state it specifically in the topical report.

SNC Response No. 3

The repeatability term magnitude was determined by a combination of the instrument uncertainties considered appropriate for two different cycle measurements of RCS flow at 100% RTP by all of the cold leg elbow tap channels. The uncertainties considered appropriate are:

- PEA - cold leg elbow tap noise;
- SCA - transmitter calibration accuracy;
- SMTE - measurement and test equipment accuracy for the transmitter;
- STE - transmitter temperature effects;
- RCA - process rack calibration accuracy; and
- RMTE - measurement and test equipment accuracy for the racks.

Within the accuracy of roundoff, the Farley specific magnitudes of these terms are defined in Table A-4. These terms were combined as follows:

$$\varepsilon = (PEA)^2 + (SCA + SMTE)^2 + (STE)^2 + (RCA + RMTE)^2$$

$$repeatability = \sqrt{\left(\frac{\varepsilon}{NC}\right)^2 + \left(\frac{\varepsilon}{NC}\right)^2}$$

Where NC equals the number of cold leg elbow tap channels, in this specific instance, nine (9). The magnitude of this combination is 0.4 % flow. The repeatability term is used as an acceptance criterion for predicted vs measured RCS flow comparisons. Therefore, the conservative direction for this term is smaller than actual, i. e., results in smaller tolerances.

None of the tables of Appendix A of WCAP-14750 note or explicitly use the repeatability term in the uncertainty calculations. However, the repeatability term does have components that are common with the uncertainty calculations. The magnitude of the repeatability term calculated above is currently noted on pages 15, 27, 28, 82 and 83 of WCAP-14750. With regard to PEA term on Tables A-4 and A-5, the PEA term is, as noted above, an allowance for process noise in the cold leg elbow and is a component of the repeatability term.

W/crt 9/16/97

NRC Question No. 4

Page 13, fourth paragraph, the topical stated that calorimetric baseline flows can be based on one cycle or the average of multiple cycles with consistent measurements. The staff has only considered the average of multiple cycles for previous amendment requests for elbow tap measurement. Provide a discussion on the acceptability of utilizing only a single cycle of data with regard to adequate margin and conservatism.

SNC Response No. 4

In the elbow tap flow measurement procedure, the elbow tap Δp is normalized to one baseline calorimetric flow measurement, typically obtained during initial plant startup. A future cycle flow is then determined by correcting the baseline calorimetric flow for any flow change detected by the elbow taps. The uncertainty of this flow measurement is slightly higher than a calorimetric flow measurement uncertainty, since it includes the uncertainty for the comparison of a new cycle elbow tap Δp to baseline elbow tap Δp as well as the uncertainty for the baseline calorimetric flow. The original baseline calorimetric flow was, and still is considered to be, a valid measurement since the plant was permitted to operate at full power for that cycle.

If several calorimetric flow measurements are used to define the baseline flow, each measurement should be corrected for the effect of known changes in system hydraulics, so all calorimetric measurements are based on the same hydraulics configuration. Otherwise, the average calorimetric flow would include changes also measured by the elbow taps, and the flow correction could be in error. The use of several calorimetric flow measurements also introduces the possibility that the most recent cycles would include flow biases resulting from increased hot leg streaming gradients --- the condition that the elbow tap flow measurement procedure is attempting to correct. Therefore, any calorimetric flow measurement that appears to be affected by large hot leg streaming gradients would not be used to define the baseline flow.

The preferred procedure for determining baseline calorimetric flow is to use only one precision calorimetric flow measurement. If more than one measurement is used, the number should be limited to no more than two or three measurements to minimize the impact of factors such as uncertainties in hydraulics changes and flow measurement biases due to hot leg streaming.

Note that the decision process for the procedure uses the best estimate flow analysis and evaluation of several calorimetric flow measurements to confirm that the flow for any cycle used in determining the baseline flow is not unusually high and possibly non-conservative.

W/wgl - 9/29/97

NRC Question No. 5

Based on the topical report discussion that the calorimetric flow bias can be defined, discuss the feasibility of incorporating this known bias into the precision flow calorimetric as opposed to utilizing the elbow tap methodology.

SNC Response No. 5

The correlation relating calorimetric flow measurement biases to core power distribution is intended to illustrate the impact of power distribution on hot leg streaming and flow measurements, and to provide an indication of the potential impact of a proposed power distribution on RCS total flow for a future cycle. An uncertainty for the correlation has not been defined. If the correlation were to be used to verify RCS flow, elbow tap measurements would be used to confirm the magnitude of the bias determined by the correlation. Elbow tap measurements have demonstrated repeatability and consistency with best estimate flow trends, and the uncertainty defined for the measurement is reasonable. Considering uncertainty and repeatability, the direct use of elbow taps to confirm flow is a more effective procedure which can be applied with confidence, without loss in margin or significant increase in flow measurement uncertainty.

W/wgl - 9/16/97

NRC Question No. 6

Assuming typical accuracy of an elbow tap flow meter, discuss any change in measurement accuracy of the elbow flow tap element over an operational range of 85% to 100% flow.

SNC Response No. 6

The elbow tap flow measurement is a normalized rather than an absolute measurement. The uncertainty of the elbow tap measurement is based on the repeatability of the comparison of two measurements — the baseline Δp measurement and the new cycle Δp measurement. If the new cycle flow were lower than the baseline flow, the uncertainty of the new cycle flow would be slightly higher than for the baseline flow measurement, and the uncertainty of the comparison would increase slightly. For a new cycle flow of 85% of the baseline, the uncertainty of the comparison would increase by 10% or less. The plant specific repeatability uncertainty, which is included in the overall flow measurement uncertainty, is typically between ±0.4% and ±0.8% flow; so the increase in uncertainty would be 0.08% or less and would be covered in the plant specific setpoints and safety analysis.

Note that plants have never had, and are not likely to have a flow reduction to 85% of baseline flow.

W/wgl - 9/16/97

NRC Question No. 7

Page 14 states that the baseline elbow tap flow coefficient is based on the average dp from all elbow taps in all loops. Discuss how the outputs from each group of dp transmitters from each loop are averaged. Please explain why it is appropriate to average all nine transmitters' instrument output[s] as described in WCAP-14750 although there are three distinct flows and three distinct flow elements.

SNC Response No. 7

For the baseline cycle and for a new cycle, all elbow tap Δp's and cold leg temperatures for all loops are measured, and an average elbow tap Δp and cold leg specific volume are calculated. These average values are used to define the change in total flow from the flow measured for the baseline cycle. This change in total flow results in essentially the same total flow as obtained by calculating the flow measured by each elbow tap, averaging the three loop measurements, and summing the three loop flows. The use of the average elbow tap Δp therefore provides a more direct means of determining total reactor flow, which is the objective of the flow measurement.

Although the three Δp's in a loop differ in magnitude, the Δp's still change in proportion to the square of the flow change, regardless of the flow rate or the absolute value of the Δp. An evaluation of loop elbow tap Δp's from several plants confirmed that the three Δp's on each loop detect the same loop flow changes to well within the expected repeatability range. Therefore, the average value of the three Δp's accurately defines the loop flow.

The loop average Δp's also differ in magnitude, and these Δp differences would be expected to bias the flow defined by the average of all Δp's, if the flow changes in each loop differed significantly. The evaluation of data from several plants has shown that this potential bias is negligible. An example of this evaluation for Farley Unit 2 (shown on the following table, "Farley Unit 2 Elbow Tap Δp Data Evaluation") identified a bias of no more than ±0.01% flow. Based on this evaluation, the use of individual flow coefficients was not justified.

W/wgl - 9/16/97

FARLEY UNIT 2 ELBOW TAP ΔΓ DATA EVALUATION
(Elbow Tap ΔP's in Inches of Water at 100% Flow)
(Response to Q\ estion No. 7)

Cycle Transmitter	5*	6	7	8	9	10	11
414	277.29	278.26	279.24	271.39	274.51	269.44	270.90
415	273.68	275.63	259.79	268.68	270.49	265.69	267.22
416	264.10	262.71	262.99	258.40	261.04	256.53	258.96
Loop A Avg	271.69	272.20	267.34	266.16	268.68	263.89	265.59
424	262.08	263.06	266.74	261.18	263.33	259.31	262.57
425	264.17	265.14	266.11	263.26	266.60	259.44	261.53
426	254.03	249.86	254.93	252.15	253.75	252.15	253.26
Loop B Avg	260.09	259.35	262.59	258.87	261.23	256.97	259.12
434	268.89	266.04	270.83	265.07	265.83	263.19	264.79
435	278.33	281.46	279.38	266.11	273.75	272.22	276.18
436	271.67	270.21	266.74	261.74	267.08	268.68	271.04
Loop C Avg	272.96	272.57	272.31	264.31	268.89	268.03	270.67
Plant Avg	268.25	268.04	267.42	263.11	266.27	262.96	265.16
T-cold, deg F	543.8	542.1	541.6	542.2	543.6	542.0	541.6
SP. Vol. Cu $ft^3/_{lb}$	0.02117	0.02112	0.02111	0.02112	0.02116	0.02112	0.02111

ELBOW TAP FLOWS IN PERCENT OF BASELINE FLOW

Loop A Avg	100.00	99.97	99.05	98.86	99.42	98.44	98.75
Loop B Avg	100.00	99.73	100.33	99.64	100.19	99.28	99.67
Loop C Avg	100.00	99.80	99.74	98.29	99.23	98.98	99.44
Avg of Loops	100.00	99.83	99.71	98.93	99.61	98.90	99.29
Plant Avg (9)	100.00	99.84	99.70	98.92	99.61	98.89	99.28
Difference	0.00	+0.01	0.00	−0.01	−0.01	−0.01	−0.01

* Baseline Cycle

NRC Question No. 8

The revised thermal design procedure (RTDP) states that uncertainties are combined statistically to obtain an overall departure from nucleate boiling ratio (DNBR) uncertainty factor such that the probability that DNB will not occur on the most limiting fuel rod is at least 95% (at a 95% confidence level) for any condition I or II event. Provide a discussion on the relationship of a "best estimate" flow model as the basis for comparison to the elbow tap flows with respect to the previous precision calorimetric calculated to a 95/95 measurement uncertainty and the 95/95 DNBR analysis.

SNC Response No. 8

The RTDP analyses assume an RCS flow which is currently verified by a beginning of cycle RCS flow calorimetric measurement, with an uncertainty less than or equal to that assumed in the RTDP analyses. The elbow tap flow measurement is referenced (or baselined) to early cycle RCS flow calorimetric measurement(s). The uncertainty associated with the baseline cycle measurement is included in the uncertainty for the elbow tap flow measurement process. Therefore, the RCS flow measurement uncertainty associated with an elbow tap flow measurement maintains the same probability/confidence level as a BOC RCS flow calorimetric measurement. Comparison of the elbow tap flow measurement results to a best estimate flow model predicted value is for the purposes of a cross-check and does not provide a direct input to verification of the safety analyses RCS flow assumption. The best estimate flow analysis defines the expected change in flow for a new cycle. If the elbow tap measured flow is less than the best estimate flow, the elbow tap measured flow is used to define the RCS flow for the cycle. If the elbow tap measured flow is greater than the best estimate flow by more than the repeatability uncertainty for the elbow taps, then the more conservative (smaller) of the two values is used to define the RCS flow for the cycle. In this specific instance, the more conservative of the two values would be the best estimate flow. This does not imply that the RCS flow verified by the elbow taps is inaccurate, but rather defines a position of conservatism in the event the elbow tap measured flow is significantly greater than the estimated flow. In either case, the RCS flow has been verified to within the same probability/confidence level as a BOC calorimetric measurement.

W/wgl&crt - 9/30/97

NRC Question No. 9

Discuss the impact of imbalanced loop flows, the averaging of the elbow tap flows, on the elbow tap flow procedure and whether additional uncertainty should be considered. Will the assumptions of the t[illegible]al report remain valid for larger percentages of steam generator tube plugging? What is th[illegible]um tube plugging criteria for Farley?

SNC Response No. 9

Reactor core heat transfer is sensitive only to the total flow through the core. Imbalances in loop flows entering the reactor vessel are eliminated in the downcomer and the lower plenum. Therefore, loop flow imbalances have no impact on core performance. The elbow tap measures total flow accurately regardless of loop flow imbalances that might be present.

Loop flow imbalances exist in all plants. Calorimetric flow measurements in 3-loop plants with balanced steam generator tube plugging typically show loop flow imbalances of up to ±3%, mostly resulting from errors in measured loop hot leg temperatures. However, the best estimate hydraulics analysis indicates that loop flow imbalances due to differences in loop-to-loop pump performance and loop component flow resistances are no more than ±1% flow with balanced plugging. Current loop plugging imbalances of less than 10% would increase the peak-to-peak loop flow spread by less than 2% flow.

The total flow measurement based on the average of all elbow tap Δp's is only slightly impacted by an imbalance in loop flows, as discussed in the response to question No. 7. Each loop flow is measured accurately by the elbow taps regardless of the flow magnitude. The elbow taps flow measurement will maintain the required accuracy regardless of a steam generator tube plugging level.

Section 4.2 in WCAP-14750 provided a comparison of total estimated flow and total flow measured by elbow taps for several cycles at a plant with a large tube plugging imbalance. The comparison showed that the estimated and measured flows agreed well as average tube plugging progressed from 4% to 16%, and as tube plugging imbalance reached a maximum of 7%. Based on this comparison and other evaluations, it was concluded that the procedure using an average elbow tap Δp was justified, even for larger tube plugging percentages and imbalances.

The maximum tube plugging limits for Farley are currently defined at 15% average plugging for all steam generators and 20% peak plugging in any one generator. The average tube plugging level at both Farley Units is about 7%.

W/wgl - 9/29/97

NRC Question No. 10

Page 24, third paragraph, the topical report states that Farley Unit 1 calorimetric flow measurements for cycles 2 and 3 were obtained at the end of the previous cycle but were not considered appropriate for a baseline calorimetric. Provide a discussion as to why these end-of-cycle measurements were not utilized in determining a baseline flow. Are end-of-cycle measurements supported by the plant analysis (RTDP)?

SNC Response No. 10

End of cycle RCS flow calorimetric measurements historically, have not been recommended by Westinghouse. These measurements have the potential for non-conservative influence from fouling of the secondary-side feedwater flow venturis. This is generally precluded by the use of beginning of cycle measurements after the venturis have been inspected and if necessary, cleaned. ITDP/RTDP uncertainty calculations generally do not include allowances for venturis fouling.

W/crt 9/16/97

NRC Question No. 11

Page 27, third paragraph, states that the elbow tap flow measurement repeatability is estimated at 0.4% of flow. Since the repeatability of the elbow tap flow element is crucial, provide a discussion on the determination of the elbow tap flow measurement repeatability. (See question 3.)

SNC Response No. 11

This question is addressed in the response to question No. 3, above.

W/crt 9/16/97

NRC Question No. 12

Page 32, Table 6-4, "Comparison of Best Estimate and Elbow Tap Flows." How was elbow tap flow baseline determined for comparison to best estimate flow?

SNC Response No. 12

Table 6-4 is a normalized comparison of best estimate and elbow tap flows. Best estimate flow is defined to be 100% flow in Cycle 1. Best estimate flows for later cycles are expressed as a percentage of the initial flow based on a best estimate of the effect of RCS hydraulics changes. The first elbow tap flow measurement, normalized to the baseline calorimetric flow, is usually obtained at initial plant startup and specified as 100% flow. Elbow tap flows for later cycles are expressed as a percentage of the first measurement, based on the changes determined by elbow tap measurements. Table 6-4 thus compares flow changes from cycle to cycle as determined by best estimate calculations and elbow tap measurements.

For Farley Unit 1, the first elbow tap flow measurement was obtained during the initial plant startup, so both the best estimate and elbow tap flows were specified at 100% flow in Cycle 1. For Farley Unit 2 the elbow tap flow measurement from Cycle 5 was used as the elbow tap baseline and normalized to the calorimetric flow measurement average of Cycles 2, 3 and 5. To obtain a meaningful comparison on Table 6-4 of best estimate and elbow tap flow changes after Cycle 5, the elbow tap flow in Cycle 5 was set equal to the Cycle 5 best estimate flow of 98.64%. Best estimate and elbow tap flows for later cycles are therefore compared on a consistent basis.

W/wgl - 9/16/97

NRC Question No. 13

Figure 6-1, "Comparison of Farley Unit 1 RCS Flows," and Figure 6-2, "Comparison of Farley Unit 2 RCS Flows," show the best estimate flow exceeding the calorimetric and elbow tap flows during cycles 9, 10, 11, 12, 13 and 14 for Unit 1 and cycle 10 for Unit 2. Explain why the elbow tap flow exceeds the best estimate flow for cycles 6 and 7.

SNC Response No. 13

Elbow tap flow measurements are expected to define changes that are consistent with best estimate flow changes from cycle to cycle, differing only by the allowance for repeatability of the elbow tap measurements. As shown on Figures 6-1 and 6-2, some of the Farley elbow tap flow measurements are above and some are below the best estimate trend. The measurements above the best estimate trend (Unit 2 cycles 6 & 7) are well within the repeatability allowance acceptance criterion of +0.4% and are considered to be valid indications of RCS flow. Some of the measurements below the best estimate trend exceed the repeatability allowance, but define a conservative flow which would still be used.

W/wgl - 8/15/97

NRC Question No. 14

Page 40, Table AI, "Baseline Flow Calorimetric Instrumentation Uncertainties." The table references an uncertainty term "SRA" that is not identified in the Farley setpoint methodology or the Farley RTDP. Additionally, Table AI deletes the notes and assumptions stated in the RTDP for Farley. Provide a description of the new term "SRA" and provide a basis for the deletion of the notes and assumptions of this table.

SNC Response No. 14

Sensor Reference Accuracy (SRA) — this term is an allowance for those aspects of the device reference accuracy that are not verified as part of the calibration process. Typically these aspects encompass repeatability and hysteresis effects which are generally considered random and independent effects.

The uncertainty calculation is bounding for Unit 1 cycle 1, Unit 2 cycles 2, 3 and 5; therefore, the notes of WCAP-12771, Rev. 0, May 1991, which postdates these cycles, may not be applicable to all sets of measurements and are therefore not included. However, for the bounding calculation the following is noted.

1) Feedwater temperature is measured by RTDs via the process computer.
2) Feedwater pressure is not measured, but is assumed based on steam pressure. A conservative value for the uncertainty has been utilized.
3) Feedwater Δp is measured by a Barton 200 local readout gauge.
4) Steam pressure is measured by Foxboro transmitters via the process computer.
5) T_H and T_C are measured by the installed RTDs via a Fluke 8375 DVM.
6) Pressurizer pressure is measured by the installed Barton 763 transmitters via the process computer.

W/ert 9/16/97

NRC Question No. 15

Page 40, Table AI, instrument spans are revised. What accounts for the change in span shown? Instrument errors are also shown to be reduced for feedwater instrumentation. What accounted for these reductions?

SNC Response No. 15

As noted in the response to question No. 14, Table A-1 represents the bounding uncertainty calculation for Unit 1 cycle 1 and Unit 2 cycles 2, 3 and 5. The span noted for feedwater Δp was provided by Farley Nuclear Plant, is the most limiting of the cycle data provided, and therefore is appropriate for the limiting calculation. The noted spans for T_H and T_C are T_{avg} span on Table A-1 of WCAP-14750, while WCAP-12771 notes the spans as ΔT span. RTD resistance values are typically read directly and converted to °F via use of the RTD calibration tables. Identification of span for these two parameters is not significant as the uncertainties are already in °F and thus are ready to use in the calculations. Westinghouse requested, and received, the calorimetric data and instrumentation information specific to the cycle measurements noted above. Therefore, while there may be differences between WCAP-14750 and WCAP-12771, Rev. 0, the instrumentation uncertainties noted in Table A-1 of WCAP-14750 are bounding for the specific calorimetric measurements used in the baseline flow evaluation. Even with the instrumentation differences, the total RCS flow calorimetric instrument uncertainties presented in WCAP-14750 are equivalent to WCAP-12771, Rev. 0 (which are separated by over five years calendar time).

W/crt 9/16/97

NRC Question No. 16

Table A–4, "Cold Leg Elbow Tap Flow Uncertainty (Process Computer) Instrument Uncertainties." Uncertainty terms for I/D, and A/D have been eliminated from the calculation although the information appears to be read from the process computer. Explain these eliminations.

SNC Response No. 16

The terms I/D and A/D represent isolator drift and analog to digital converter calibration allowances. A review of the Farley calibration procedures notes that the A/D converter is calibrated as part of the process rack instrument channel as one string of modules, front to back, instead of being calibrated by itself. Therefore, this allowance is not necessary and has been removed from this uncertainty calculation. The process rack calibration term (RCA) is sufficient in magnitude to encompass the entire instrument channel up to and including the process computer for this function. The plant calibration procedures ensure that this allowance is not exceeded. Westinghouse has evaluated process rack drift for several plants and has determined that the magnitude of the RD allowance in WCAP-14750 is sufficient to encompass the expected drift of the entire instrument channel up to and including the process computer for this function.

W/crt 9/16/97

NRC Question No. 17

Page 47. Discuss why the Final Safety Analysis Report (FSAR) update does not include a reference to the RTDP, Setpoint WCAP, and WCAP-14750 as well as FSAR Chapters 15, 7, and 4 as currently referenced in the Farley FSAR.

SNC Response No. 17

Page 47 is a sample 50.92 and suggested ITS modifications written on a generic basis. As the RCS flow measurement uncertainty must be determined on a plant specific basis, page 47 may be affected or it may not. With regards to FSAR changes, these must also be determined on a plant specific basis as discussed in Section 7.3 of WCAP-14750. Specific to Farley Nuclear Plant, the RCS flow calorimetric uncertainty (Table A-3) did not change as part of this effort, i.e., the value in WCAP-14750 is equivalent to that in Table 5 of WCAP-12771. Thus there is no impact. The cold leg elbow tap flow uncertainty (Table A-4 of WCAP-14750) increased over that noted in Table 6 of WCAP-12771. However, it is equivalent to the value noted in Technical Specification 3.2.5 (after accounting for the feedwater venturi fouling allowance). Thus, there is no impact on the Technical Specifications. In addition, there is no impact on the RTDP assumptions in the safety analyses or FSAR. The setpoint calculation for the RCS loop low flow reactor trip (Table A-5 of WCAP-14750) notes that positive margin still exists after accounting for appropriate uncertainties. Thus, there is no need to change the nominal trip setpoint in the Technical Specifications. With regards to the specifics of uncertainties for this trip function, WCAP-14750 replaces the Setpoint Study (WCAP-13751) until such time as it is revised. Thus, page 47 of WCAP-14750 is believed to marked appropriately for Farley Nuclear Plant.

W/ert 9/16/97