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M. C. JOHNSON

VICE PRESIDENT AND GROUP EXECUTIVE
SPECIAL SERVICES AND PURCHASING

October 31, 1978

United States Nuclear Regulatory Commission
ATTN: Mr. James P. O'Reilly
Director
Region II - Suite 1217
230 Peachtree Street, Northwest
Atlanta, Georgia

Re: V. C. Summer Nuclear Station
Unit #1
Supplemental Response to
RII:RMC 50-395/78-12

Gentlemen:

In accordance with our telephone discussions on October 24, the purpose of this letter is to provide a supplementary response to our August 18, 1978 letter in relation to your item of noncompliance 78-12-02. In our August 18 response, we did not provide information to indicate FW-23 and FW-24 had been satisfactorily repaired. This is information that does reflect on the proper completion of these reactor coolant piping welds. QA records document that grinding and repairs were accepted by liquid penetrant inspection on September 7 and September 17 for FW 23 and FW 24, respectively.

An accurate presentation in relation to the corrective action taken to ensure adequate control of these inprocess welds as of August 18 was presented in our letter to you. In order that this transmittal be self-sufficient, we will repeat the information contained in the August 18 transmittal together with any information that has been identified since. In accordance with your request, we will also supplement your standard response format with a discussion of "Cause".

Item 78-12-02 concerns itself with a reactor to coolant pipe stainless to inconel weld FW-23 and a steam generator to coolant pipe stainless to stainless weld FW-24. Both welds at the time of your inspection were inprocess, having had the root pass and one subsequent pass made with manual

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gas tungsten arc welding (GTAW) and at least one pass made with manual shielded metal arc welding (SMAW). An "information only" radiograph was taken of each weld on July 11, 1978 and both were evaluated to have relevant indications on July 12, 1978. Our evaluation of the facts of this situation indicate:

1. CAUSE

There is no single, predominant cause. The following are considered the major contributors:

- a) The inherent difficulty of making stainless to inconel heavy wall pipe welds. It should be noted that the stainless to stainless weld (FW 24) had a much smaller occurrence of relevant indication.
- b) The lack of prior experience with the coolant pipe modified "J" with 20° included angle weld prep in a thick wall section.
- c) Training and qualification have been established around the requirements of the ASME Code Section IX, which are not always representative of field conditions or joint geometry.
- d) In the interest of using only the best qualified welders to make these welds, welder fatigue became a considerable factor. Post weld record review indicated that some welders had been working for over 20 hours.
- e) Cleanliness in the immediate area of welding was less than required by procedures.

2. IMMEDIATE CORRECTIVE STEPS & RESULTS

As was indicated to you during the exit presentation on July 13, 1978, a meeting of the Field Review Board (FRB) was in progress on July 11, 1978, when the NRC Inspectors arrived at the construction site. As a result of review efforts of welding during that meeting and subsequent review of "information" radiographs, a stop work was placed by Nuclear Site Management on all reactor coolant pipe welding effective July 12, 1978. A special welding meeting of the FRB was held on July 19 to discuss overall corrective action, determination of cause, and alternate means of defect removal. As a result of this meeting, improved methods of repair were initiated, a protective shelter was built around the weld area and a general clean-up and improvement in housekeeping was initiated. The welders involved were returned to the test shop for a training program with emphasis on weld quality. Retraining simulated the base material and joint geometry which would be encountered in Reactor Coolant Loop Welding. Welders techniques were changed to include

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proper bead placement, electrode angle, and replacing their weave techniques with stringers for the first layers of welding. Emphasis was also placed on inter-pass cleanup. The duration of training was approximately two weeks, depending on the proficiency of the welder. There was coordination between the Training Supervisor and the Field Supervisors to insure that the newly acquired welding techniques would be continued in the field. Documentation of both Field Review Board Meeting and the welding training program is available.

Based on the results of the above efforts, production welding was re-initiated on August 4, 1978. As indicated previously, repairs were complete on both welds by September 17, 1978.

3. CORRECTIVE STEPS TAKEN TO AVOID FUTURE NONCOMPLIANCE

Action on the part of the Field Review Board, such as that taken in this circumstance, will continue to be utilized whenever indications of less than desired results in the area of process control are noted. In this case, the action taken by the Field Review Board was taken within one day of initiation of welding on the reactor coolant piping. In addition, future welders assigned to work on reactor coolant piping will be instructed to joint geometry and base material involved in the welding. This training and qualification program in addition to satisfying ASME III and IX, will be more representative of actual field conditions. Efforts will be continued to stress housekeeping and cleanliness in relation to this and other work. In addition, efforts will be exerted to limit welders work day to 12 hours with a limit of sixteen hours per day.

4. FULL COMPLIANCE DATE

Items identified as nonconforming in Appendix A of 395/78-12 were complete including removal of relevant defects and repair welding as of September 17, 1978.

As additional information, as was discussed with RII inspectors during their October 19, 1978 visit, we have strengthened the overall welding program in several other ways not directly related to this item. We have qualified an automatic gas tungsten arc welding process for use on heavy wall piping (including primary loop piping). This method still requires the use of the original manual process for the first two passes and is being used as an adjunct to manual heavy wall pipe welding. We intend to maintain both the automatic GTAW and the SMAW processes as qualified and utilize the method which provides the best repeatable end results. We have also had additional welding engineering staff added to the Constructors welding department. As was observed, SCE&G Construction has also substantially

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increased available expertise with additional staff. Some of these measures were in the process of being implemented prior to July 11 and others have transpired since. SCE&G considers control of the welding program a very important part of the QA Program and although we have experienced problems, we feel we have never lost control and have moved quickly to react to indicators provided by our program. We also feel it is important that we communicate this to you.

Please feel free to contact us if you desire any additional information in relation to this matter.

Very truly yours,



DAN/MCJ/jls

cc: C. J. Fritz
G. C. Meetze