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December 5, 1979

United States Nuclear Regulatory Commission
Attn: Mr. James P. O'Reilly
Director
Region II
101 Marietta Street, NW
Atlanta, Georgia 30303

Subject: V. C. Summer Nuclear Station
Unit #1
Reportable Item in Accordance
with 10CFR50.55(e)

Gentlemen:

The purpose of this letter is to provide a written report of a potential reportable item relative to undersize socket welds.

As a result of a Region II I&E investigation into allegations, SCE&G inspection efforts identified potential problems with the size of socket welds produced in the field. Based on the preliminary results of SCE&G inspection, the Region II Resident Inspector (J. Skolds), was notified on November 5, 1979 that a potential reportable item existed. During investigations into the extent of the problem, SCE&G discovered that undersize socket welds also existed on welds that were shop fabricated by its piping supplier, Southwest Fabricating and Welding Company, Inc. of Houston, Texas. On November 7, 1979, SCE&G notified its Principal (T. Burdette), who was at the construction site, that the potential reportable item had increased in scope from site welds to site and shop welds. On November 8, 1979, the NRC Resident Inspector (J. Skolds) was also given the information that the scope had expanded.

Nature of Condition

The fillet size of welds of socket-welding fittings and socket-welding flanges stipulated by ASME Section III Subsection NB 4427, was not met. Some of the welds are undersize in leg length, however, the majority of incorrect welds have insufficient throat thickness

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due to weld profiles which are concave. In addition, it was found that procedural inadequacies existed in stipulating the required weld size for socket welding flanges. The rate of nonconforming welds being found in schedule 160 two inch and under piping appears to be an order of magnitude higher than conditions noted in schedules 80 and 40 socket welds. There are approximately 13,700 safety related socket welds in various systems throughout the plant of which 10546 are schedule 40.

Both of the conditions reported are to be NRC Items of Non-compliance in a report to be issued by NRC Inspector, E. Girard.

Cause

The cause of this situation is the failure of welders and ASME code inspectors, including the Authorized Nuclear Inspector, employed by Daniel Construction Company and Southwest Fabricating and Welding Company, the Code stamp holders, to provide adequate weld size or reject welds that were undersize.

SCE&G has examined fillet weld size on piping welded by a variety of suppliers. In our opinion, a general lack of sensitivity to weld size with increasing schedule is apparent. This is felt due to the normally high proportion of schedule 40 socket welds associated with two inch and under piping systems and the general requirement for a minimum of two passes on all socket welds. This results in the welder and QC Inspector being "conditioned" to the appearance of a schedule 40 size fillet and applying this criteria to heavier schedule sockets. An acceptable schedule 160 socket weld (1.09t) gives the appearance of having an inordinate amount of filler metal added. A further contributor was found to be variations in using fillet weld gages on concave welds. This was found during SCE&G examinations used to qualify QC personnel for the "surrogate" organization here-in discussed. By contract, these personnel were required to have had previous AWS/ASME fillet weld inspection experience.

Safety Implications

Preliminary indications provided by our Architect Engineer for an apparent "worst case" schedule 160 socket weld have shown the design margin sufficient for OBE conditions including the undersize fillet. Although we cannot quantify the amount, we also feel that significant design conservatism does exist in the heavier schedule fillets and that our Architect Engineer has agreed that generally speaking, a conservative approach was used in specifying schedule size. On the basis of these considerations, we believe it is probable that the undersize fillets would not have been a source of safety concern if undetected. In view of the indeterminate nature of the existing degree of design conservatism

and the large number of loading combinations, we have elected to remove any doubt and add weld metal to any weld that might be questioned.

Actions to Correct Conditions

SCE&G is in the process of establishing a controlled program by which safety related socket welds will be identified, reinspected, and have weld metal added if determined undersize. This program entails training and inspection under the direct cognizance of SCE&G utilizing a surrogate QC organization that is being staffed and directed by SCE&G to perform the reinspection. The scope of re-inspection will include site and shop welds along with any safety related code socket welds provided by manufacturers of skid mounted equipment. Once this reinspection is completed, all suspected joints will be reworked and reinspected by the Contractor's QC organization for code stamp purposes. The SCE&G surrogate QC organization will then provide final QC acceptance of the reworked welds.

Corrective Actions to Prevent Recurrence

Actions have been initiated with the piping supplier to obtain corrective action for the problem identified. The purchase order with this supplier is currently complete, and SCE&G will, therefore, evaluate the corrective actions in terms of adequacy for future use.

In the case of the Constructor, ASME code welding and inspection efforts were stopped with the exception of certain scopes that had direct SCE&G involvement. SCE&G and the constructor have implemented a program of in-depth review of procedures to provide adequate work instruction to the welders and inspectors. Training of these crafts is to take place with SCE&G verification of adequacy. In addition, the SCE&G surrogate QC organization described above, will overview future inspections performed by the Constructor's ASME Code QC organization. The long term objectives of this corrective action is to re-establish confidence in the Constructor's QC organization and merge the SCE&G surrogate organization into the code program for future utilization.

As a result of the actions stipulated here, certain code work scopes have been released to continue, and in the near future all code work will resume.

SCE&G believes the actions outlined above will adequately resolve the weld size problem and provide welds that are without question, adequate. Since all necessary corrective actions have been identified and are in the

process of being implemented, we consider this a final report on this item. All actions taken regarding this item will be available at the construction site for NRC review. Should further information be required, please let us know.

Very truly yours,

DRM/DAN/MCJ/jls

cc: C. J. Fritz
G. C. Meetze
Office of Director
of Inspection & Enforcement

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