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December 15, 1981

Director, Office of Nuclear Reactor Regulation
Attention: D. M. Crutchfield, Chief
Operating Reactors Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555



Gentlemen:

Subject: Docket No. 50-206
SEP Topic III-6
Seismic Design Considerations
San Onofre Nuclear Generating Station
Unit 1

In accordance with our letter dated November 3, 1981, SCE is in the process of designing modifications to the north turbine building extension and west heater platform. Part of the design process involved a visual verification of the existing conditions at each bracing location. The inspection of column H-12 of the west heater platform revealed an unusual amount of oxidation at the column-slab interface. As a result of this discovery, a visual field inspection was performed of all of the turbine building columns. The purpose of this letter is to inform you of the results of that inspection and the impact of those results on our previous conclusions with respect to the structural capacity of the turbine building.

The inspection of the turbine building columns revealed a total of three columns that were oxidized to the point that the structural properties would be affected. All other columns were found to be in good condition without any signs of structural degradation. The three columns were H-12 in the west heater platform and H-2 and G-5 in the east heater platform. A description of the extent of the oxidation for each column is provided in the following paragraphs.

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- A. Column H-12 is oriented with its strong axis in the east-west direction. The oxidized portion of the column is on the east face of the east flange, the west face of the north half of the east flange, the north face of the web and the east face of the north half of the west flange. Oxidation on the east face of the east flange extends to a depth of $1/8$ " from the floor slab upward for 2'6". Oxidation on the west face of the east flange extends to a depth of $1/4$ " to $3/8$ " for the entire length of the north half of the flange from the floor slab upward for 2'6". Oxidation on the north face of the web extends to a depth of $1/8$ " to $1/4$ " from the floor slab upward for 6". Oxidation on the east face of the west flange extends to a depth of $1/8$ " to $1/4$ " for the entire length of the north half of the flange from the floor slab upward for 6".
- B. Column H-2 is oriented in the east-west direction. The oxidized portion of the column is on the west face of the north half of the east flange, the north face of the web and the east face of the north half of the west flange. Oxidation on the west face of the east flange extends to a depth of $1/4$ " for the entire length of the north half of the flange from the floor slab upward for 1'. Oxidation on the north face of the web extends to a depth of $1/4$ " from the floor slab upward for 1'. Oxidation on the east face of the west flange extends to a depth of $1/4$ " for the entire length of the north half of the flange from the floor slab upward for 1'.
- C. Column G-5 is oriented in the north-south direction. The oxidized portion of the column is on the east face of the web. Oxidation extends to a depth of $1/16$ " to $1/8$ " from the floor slab upward for 1'3".

In order to determine the impact of the observed oxidation on the evaluation of the west and east heater platforms reported in our August 11, 1981 letter, calculations were performed to determine the column capacity reductions for both axial loading and bending about their major axes. The maximum depths indicated above for the oxidation were utilized in the calculations. These values are conservative since the actual oxidation in many cases does not extend in depth or length to the extent indicated. The calculations indicate that the overall structural capacity is reduced by 25 to 30% for column H-12, 20 to 25% for column H-2 and 5 to 10% for column G-5. These capacity reductions are for individual columns. However, the important point is not the local reduction of an individual column but the overall capacity of the structure.

For the west heater platform, column H-12 is one of 17 moment-resisting columns, 8 of which are oriented the same as H-12. Although column H-12 was not analyzed in our August 11, 1981 submittal, it is presumed that this column would now be the first structural element of the west heater platform to reach its elastic limit. However, the reduction in capacity of this column will not significantly alter the overall structural capacity of

the west heater platform. This is due to the 8 1/2" thick concrete posttensioned deck which acts as a rigid diaphragm and enables the redistribution of loads to other columns. Therefore, the overall conclusion of our August 11 submittal that the west heater platform is capable of withstanding earthquakes in excess of 0.3 to 0.4g Housner ground motion is considered still valid.

For the east heater platform the two columns are oriented orthogonally to each other and therefore primarily act independently to different earthquake components. These columns are also connected to an 8 1/2" thick concrete posttensioned deck which will enable the redistribution of loads to other columns. Although the columns in the east heater platform were not specifically analyzed in our August 11, 1981 submittal, it was concluded that this structure is capable of withstanding earthquakes in excess of 0.3 to 0.4g Housner ground motion. This conclusion is considered still valid.

Notwithstanding the above conclusions, it is our intention to correct the oxidized columns. Specifically, the concrete around the columns will be chipped away, the oxidized metal will be cleaned off the columns and weldplates will be added to the columns. In addition, to eliminate the source of the oxidation, grout will be placed around the base of each column at the floor slab. This will prevent any future water leakage from coming in contact with the steel columns. These corrective actions will be implemented during the steam generator inspection outage scheduled to occur prior to June 1, 1982.

If you have any questions on this matter or require additional information, please let us know.

Subscribed on this 15th day of December, 1981.

Very truly yours,

By K. P. Baskin
K. P. Baskin
Manager of Nuclear Engineering,
Safety, and Licensing

Subscribed and Sworn to before me
this 15th day of December, 1981

Agnes Crabtree
Notary Public in and for the County
of Los Angeles, State of California

