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50-341/362

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FORWARDING SECOND CONSTRUCTION DEFICIENCY REPT CONCERNING APPARENT BREAKDOWN  
IN THE FIELD PROCUREMENT SYSTEM OF SUBJECT FACILITY.

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SAN ONOFRE - UNIT 3

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JACK B. MOORE  
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April 28, 1978

Mr. R. H. Engelken, Director  
Office of Inspection and Enforcement  
U. S. Nuclear Regulatory Commission  
Region V  
Suite 202, Walnut Creek Plaza  
1990 North California Boulevard  
Walnut Creek, California 94596

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U.S. NUCLEAR REGULATORY COMMISSION  
REGULATORY SERVICES

Dear Mr. Engelken:

Subject: Docket Nos. 50-361 and 50-362  
San Onofre Nuclear Generating Station, Units 2 and 3

By letter dated March 9, 1978, we submitted an interim report concerning a reportable condition discovered in procurement of certain materials and commodities from the San Onofre Units 2 and 3 jobsite wherein requirements of our quality assurance program relative to qualification of suppliers were apparently not fully implemented.

Enclosed, in accordance with 10CFR50.55(e), are twenty-five (25) copies of a second interim report concerning this matter entitled, "Second Interim Report Concerning Field Procurement Deficiencies, San Onofre Nuclear Generating Station, Units 2 and 3." A final report will be submitted by July 1, 1978.

If you have any questions regarding this report, we would be pleased to discuss this matter with you at your convenience.

Very truly yours,

REGULATORY DOCKET FILE COPY

Enclosures

cc: Dr. Ernst Volgenau (NRC, Director I&E) ✓

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Book 5 //

SECOND INTERIM REPORT CONCERNING  
FIELD PROCUREMENT DEFICIENCIES

San Onofre Nuclear Generating Station,  
Units 2 and 3

INTRODUCTION

By letter dated February 9, 1978, Southern California Edison (SCE) confirmed notification to the NRC concerning an apparent breakdown in the field procurement system. An interim report was submitted pursuant to 10CFR50.55(e) by letter dated March 9, 1978. By letter dated April 5, 1978, the final report was scheduled for submittal by April 28, 1978. This second interim report is in lieu of a final report. The final report will include disposition of the item which is identified as remaining open in this report.

DISCUSSION

The following discussion is responsive to 10CFR50.55(e)(3).

Description of the Deficiency

The first interim report includes a general discussion of the deficiency and its cause. In summary, due to inadequate procedural controls and inadequate training, Bechtel field procurements prior to 1978 did not fully comply with project requirements for use of approved vendors. Instead, supplier lists, and other considerations such as experience with suppliers, were used as bases for procurement approval.

A review has been completed of all field procurements. Those which involved a safety-related item wherein project requirements were not fully satisfied were evaluated in detail. Where appropriate user tests were performed at the jobsite, or where procurement was from firms approved by Bechtel for use elsewhere and the requirements for approval were compatible with project requirements, the items were accepted as meeting project requirements.

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FIELD PROCUREMENT DEFICIENCIES  
San Onofre Nuclear Generating Station, Units 2 and 3

The remaining procurements were identified for further evaluation. They are categorized as follows and listed in Table 1.

- A. Welding, brazing and piping material
- B. Liquid penetrant examination material
- C. Minimum commercial grade steel
- D. Steel products other than C. above
- E. Fasteners

The further evaluation conducted resulted in dispositions in each of these categories as follows.

A. Welding, Brazing and Piping Material

All suppliers performed warehousing functions only and procured items from separate material manufacturers. Each lot of material was received at the San Onofre jobsite with certified material test reports for the material supplied by the material manufacturer. The material certificates were reviewed during receiving inspection to assure that they were identified to the material supplied and that the material properties were in conformance with the procurement requirements. A review of these material certifications has been conducted and it indicates that the manufacturers of the material were on a listing of approved manufacturers provided by Bechtel for use in nuclear projects. The requirements for approval of these manufacturers have been determined to be compatible with project requirements for supplier approval.

Disposition. All material procured is acceptable based on receipt of certified material test reports (evidencing conformance with procurement requirements) from approved material manufacturers via the suppliers to the project.

B. Liquid Penetrant Examination Material

One supplier was used in this procurement category. This supplier provides the product to all segments of the nuclear and aerospace industry consistent with pertinent military specifications. Each lot of material received at the San Onofre jobsite was accompanied by a certification that indicates the material was in conformance with the chemical limitations imposed by the procurement documents. Certifications were checked during receiving inspection to assure identification of the material supplied.

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San Onofre Nuclear Generating Station, Units 2 and 3

Disposition. All material procured is acceptable based on industry experience and receipt of chemical certification for each lot of material.

C. Minimum Commercial Grade Steel

Material supplied to the San Onofre jobsite was received with material certifications which indicate conformance with procurement requirements. These certifications consisted of certified material test reports or certificates of conformance. Receiving inspection at the jobsite included checks for damage, limited checks of dimensional conformance with specifications and drawings and verification that material certifications were identified to the material supplied.

As a rolled shape, A-36 steel is the minimum grade commercially available structural steel material. As a plate or in bar form, A-36 steel is the most common grade commercially available steel. As an all-purpose structural carbon steel, it is widely used and has replaced lower grade materials such as A-7 and A-373 steels.

Finally, the prescribed allowable shear and tension loads for this material have safety factors with respect to yield strength of at least 1.67 and with respect to ultimate capacity of at least 2.67. This discussion also applies to 1015 and 1020 carbon steel material.

Disposition. Accordingly, based on evaluation that the correct material was obtained and on inherent design margins, it has been determined that minimum commercial grade steel procured from suppliers which were not fully approved in accordance with project requirements nevertheless is adequate to meet its intended safety function.

D. Steel Products Other Than C. Above

These products are itemized in Table 1. They were received with certified material test reports which indicate conformance with procurement requirements. Receiving inspection at the jobsite included checks for damage, limited checks of dimensional conformance with specifications and drawings, and verification that material certifications were identified to the material supplied.

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Specific uses of this material are being identified, and additional action required to assure adequacy to meet intended safety function will be determined appropriate to these uses.

Disposition. The disposition of this category of material will be described in the final report.

E. Fasteners

Material supplied to the San Onofre jobsite was received with material certifications which indicate conformance with procurement requirements. These certifications usually consisted of certificates of conformance or compliance supplied by the material suppliers. Receiving inspection at the jobsite included a limited check for thread damage, dimensional conformance with specifications and drawings and verification that material certifications were identified to supplied material.

The loading to which high strength fastener items (A193, A194, A325, A449, A490) are subjected during installation serves to verify their critical strength properties. This fact may be considered as constituting a user's test in lieu of evaluation of the quality assurance programs of suppliers of these fastener items. The validity of this is based on the principle that a tensile force applied in service to a pretensioned fastener relieves the compression in the connected parts without increasing the tension in the fastener. Unless the tensile force is large enough to permit the connected parts to separate, the tension in the fastener will not exceed the pretension.

In our case, the construction specifications require that A325 fasteners be pretensioned to 70% of specified minimum tensile strength. Applied loads allowed by design are approximately 40% of specified minimum strength. Therefore, a properly installed and pretensioned high strength fastener has demonstrated the capability of withstanding the maximum stress to which it will be subjected in service.

The use of A307 fastener material purchased from suppliers which were not fully approved in accordance with project requirements nevertheless is adequate to meet the intended safety function for the following reasons:

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- a. A307 is the minimum strength commercially available fastener material currently in use in structural steel fabrication and erection. Therefore, the fasteners supplied may be considered as meeting the material requirements of A307.
- b. The allowable design shear and tension loads for these bolts provide safety factors with respect to ultimate capacity of at least 3.5 and 3.0, respectively.

In order to assess the quality level of fastener material supplied to the San Onofre jobsite, a fastener testing program has been conducted since January 1978. This testing program consists of selecting samples from warehousing stock and from lots undergoing receiving inspection with subsequent testing by an independent test laboratory. Results of testing to date indicate an acceptable overall quality level from material suppliers and manufacturers sampled.

Disposition. Based on the foregoing evaluation, and the results of testing performed, it has been determined that fasteners procured from suppliers which were not fully approved in accordance with project requirements nevertheless are adequate to meet their intended safety function. The fastener testing activity will continue to measure fastener quality directly until SCE determines that such testing is no longer required.

#### Analysis of Safety Implications

Field procured items are utilized in a range of safety-related applications. Evaluation of those affected by this breakdown in a portion of our QA program indicates that they are adequate to meet their intended safety function. This evaluation is not yet complete for steel products other than minimum commercial grade steel.

#### Corrective Action Taken

The corrective action identified in the first interim report has been taken.

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CONCLUSION

A thorough review has been made of all field procurements. Evaluations have been conducted as described above where project requirements for supplier approval were not fully met. A final report will be submitted following completion of evaluation of item D.



TABLE 1

Unapproved Suppliers

<u>Supplier and Location</u>	<u>Material Supplied</u>
<u>A. Welding, Brazing and Piping Material</u>	
Hobart-Pacific (La Mirada, Calif.)	E7018 and E6011 electrode
McJuncan (Alhambra, Calif.)	SA 106 GRB seamless pipe
Northwestern Supply (Berkeley, Calif.)	E7018 electrode
G. S. Parsons (Oceanside and Escondido, Calif.)	E308L and E309 electrode
San Diego Welders (San Diego, Calif.)	E309 electrode
Shira Welding (El Cajon, Calif.)	E705 welding wire
United Weld Supply (Los Angeles, Calif.)	AWS brazing material
Victor of California (Los Angeles and San Diego, Calif.)	E7018 and E6011 electrode
L&V Industrial (Encinitas, Calif.)	SFA-5.8 brazing material
<u>B. Liquid Penetrant Examination Material</u>	
TURCO Products (Carson, Calif.)	penetrant, remover and developer
<u>C. Minimum Commercial Grade Steel</u>	
Crest Steel (Wilmington, Calif.)	A-36 steel
F&S Metals (Signal Hill, Calif.)	A-36, 1015 and 1020 steel
Percival Steel (Los Angeles, Calif.)	A-36 steel
Reliance Steel (National City, Calif.)	A-36 and 1020 steel
Triangle Steel (El Cajon, Calif.)	A-36 steel
General Pipe and Supply (Compton, Calif.)	A-36 steel

TABLE 1 - (continued)  
Unapproved Suppliers

<u>Supplier and Location</u>	<u>Material Supplied</u>
<u>D. Steel Products Other Than C. Above</u>	
ESCO (Los Angeles, Calif.)	A240 type 304 sheet and plate
F&S Metals (Signal Hill, Calif.)	A-572 GR50 plate
Schmitt Steel (Portland, Oregon)	A-540 GR B-23 heavy hex nut
Reliance Steel (National City, Calif.)	A-500 GRB steel, A-569 plate
Thomas Machine (South Gate, Calif.)	Kaisalloy 100 (SA 533 CL-3 equivalent)
Warren & Bailey (Los Angeles, Calif.)	708 SFF tubing
<u>E. Fasteners</u>	
Cordova Bolt (Santa Fe Springs, Calif.)	A-194, A-307, A-325, A-449 and A-490 nuts, bolts and washers
Cold Forming Specialties (Fullerton, Calif.)	A-325 and A-490 nuts, bolts and washers
Bulldog Bolt (Los Angeles, Calif.)	A-307, A-325 and A-490 nuts, bolts, and washers
California Nut and Bolt (Anaheim, Calif.)	A-325 and A-490 nuts, bolts and washers
Cardinal (Las Vegas, Nevada)	A-193 studs, A-194 and A-490 nuts, bolts and washers
Circle Bolt (Santa Fe Springs, Calif.)	A-325 and A-490 nuts, bolts and washers
Percival Steel (Los Angeles, Calif.)	A-307 nuts, bolts and washers
Schmitt Steel (Portland, Oregon)	A-490 nuts, bolts and washers
T&F Supply (Paramount, Calif.)	A-307 and A-325 nuts, bolts and washers