



May 1, 1975

Mr. Benard C. Rusche, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

MAY 6, 1975

Dear Mr. Rusche:

ABNORMAL OCCURRENCE NO. 251-75-4
OCCURRENCE DATE: MARCH 12, 1975
SUPPLEMENTARY REPORT
TURKEY POINT UNIT NO. 4
LATERAL RESTRAINTS FOR SPENT
FUEL RACKS BROKEN

I INTRODUCTION

Our abnormal occurrence report 251-75-4 on the broken spent fuel rack lateral restraints (leaf springs) dated March 21, 1975, indicated a supplementary report would be issued if additional corrective action was required. This supplementary report provides information relative to the results of our investigations which were incomplete at the time of the abnormal occurrence letter dated March 21, 1975 and also provides information relative to the additional corrective action taken.

Subsequent to our March 12, 1975 inspection, an additional seven springs were discovered broken on March 27, 1975. This information was verbally given to the NRC-I&E inspectors on site at that time and is discussed in their inspection report Nos. 50-250/75-4 and 50-251/75-4, transmitted to FPL by letter dated April 17, 1975.

II ADDITIONAL INVESTIGATION AND RESULTS

As mentioned in the previous report one of the broken springs was sent to a laboratory for metallurgical analysis. This analysis indicates that the spring failed in a stress corrosion mode. There was no evidence of hydrogen embrittlement or quench cracking. The analysis further revealed a high inclusion content but the inclusion was determined to be insufficient to have caused the spring failure. Chemical analysis showed that the material was as specified.

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Further investigation included a load test of an unbroken spring. An unbroken spring was removed from the spent fuel racks and loaded to design capacity. The spring functioned satisfactorily.

In addition to the load test, the restraint design was reviewed by the original designer - the plant engineer constructor. As a result of the design review they concluded that the restraint design was satisfactory. The design review also included an investigation into the possibility of utilizing a rigid restraint in place of the spring type of design. As a result of this investigation they concluded that use of rigid restraints was not feasible with the existing spent fuel rack design and continued use of the spring type of design was recommended.

III ADDITIONAL CORRECTIVE ACTION

Because of the additional failed springs that were found on March 27, 1975, it was decided to replace all of the original springs installed on the Unit No. 4 spent fuel racks. Based on the above investigations it was concluded that the springs should be of the same basic design as the original springs except that the improved fabrication procedures should be utilized.

In procuring the material for fabrication of the replacement springs, it became necessary to obtain a substitute for the originally used 420 stainless steel which was not available. Based on metallurgical properties and availability, 440C^② stainless steel was selected as a suitable substitute material. The replacement springs were then fabricated, utilizing the following special quality control measures:

- a) The hole in the spring was drilled rather than punched.
- b) Sharp edges that could possibly result in "stress risers" were removed.
- c) The bends in the spring were hot formed.
- d) The springs were de-scaled by sandblasting after heat treatment.
- e) A liquid penetrant examination was conducted after heat treatment.

^② Corrosion resistance & failure mechanisms characteristic of 440C stainless steel (316) is dependent on proper heat treatment.

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- f) A hardness test was performed after heat treatment.
- g) A replacement spring was load tested to verify design adequacy.

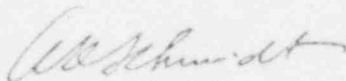
The springs were installed on the Unit No. 4 spent fuel racks utilizing an approved procedure. The installation was completed on April 5, 1975.

IV UNIT NO. 3

As stated in our March 21, 1975 Abnormal Occurrence letter, a broken restraint has been found by visual inspection in the Unit No. 3 spent fuel pool. We are presently conducting an underwater television inspection of the Unit No. 3 spent fuel racks to determine if more restraints are broken. Our review of the spent fuel rack design with the plant engineer constructor revealed that the racks will satisfactorily maintain their function under the Turkey Point design seismic conditions with one lateral restraint missing on each of the four spent fuel pool walls. Thus, the single broken restraint that exists on Unit No. 3 will not render the restraint system inoperable.

We will advise you of the results of the Unit No. 3 inspection as soon as they are available. We will also advise you regarding plans for any additional corrective action at that time.

Very truly yours,



A.D. Schmidt
Vice President
Power Resources

HNP/dd

cc: Mr. Norman C. Moseley
Jack R. Newman, Esquire