Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

February 9, 1983

Mr. Robert Gilbert
Project Manager
Operating Reactor Branch No. 5
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden 2
SEP Topic: III-2, Wind and Tornado Loadings
NRC Docket 50-237

References: (a) D. M. Crutchfield's letter to L. Del George dated January 19, 1983; Subject: SEP Integrated Assessment Status

(b) T. J. Rausch's letter to P. O'Connor dated November 22, 1982

Dear Mr. Gilbert:

The NRC staff has requested verification of the design windload capacity of the ventilation stack. Failure of the stack could affect the integrity of seismic Category I structures because the stack is in close proximity to these structures. Therefore, the stack should be evaluated for tornado (or high wind) induced failure and its consequences.

Item: The staff per Reference (a) indicated that ACI Standard 307-79 using the ultimate strength methods is excluded for chimneys due to lack of experimental data on hollow concrete cylinders. The staff currently accepts only working stress design for chimneys. Therefore, it is the staff position that you analyze the wind capacity of the ventilation stack using working stress methods. In addition, you should perform an analysis of the potential consequences of failing the stack with regard to radiological impact and the ability to achieve and maintain a safe shutdown condition.

A035

Response: Reference (b) addressed the original FSAR analysis using the ACI ultimate strength based on the yield strength of the reinforcing steel and showed that the ventilation stack would fail if it was subjected to tornado wind speeds greater than 210 mph. It also stated that using the ultimate strength of the reinforcing steel, the chimney would fail at a tornado

wind speed of 255 mph at an elevation of 577'-0" (60 feet above grade or higher). The foundation will sustain this wind load. The probability of tornado wind speeds exceeding a value of 255 mph is approximately 1.35×10^{-6}. A conservative assumption was made that the probability of the stack damaging adjacent buildings or equipment would be 1.35×10^{-7} per year. The impact area would be within an angle of approximately 36° out of 360°.

Although the chimney was originally designed to ACI 307 for normal windloads using working stress for 110 mph, using ACI 318-77 for straight wind loads the chimney was designed for 210 mph using ultimate strength method. In consideration of material properties of steel and actual mill tests the chimney was calculated to be designed for 255 mph using ultimate strength of the steel.

Conclusion: In conclusion, taking into account the material properties of the reinforcing steel, the actual strength of the concrete does not govern loads on the ventilation stack. Also, because of the low probability of occurrence for a tornado windspeed exceeding 255 mph and the low probability of 1.35×10^{-7} per year of damage to structures and safety-related equipment, modifications to the plant are not warranted.

Please address any questions you may have concerning this matter to this office.

One (1) signed original and thirty-nine (39) copies of this transmittal have been provided for your use.

Very truly yours,

B. Rybak

for Thomas J. Rausch
Nuclear Licensing Administrator
Boiling Water Reactors

TJR/SPPJ/sc

cc: RIII Resident Inspector, Dresden
Gregg Cwalina, SEP Integrated Assessment Project Manager