Commonwealth Edison
1400 Opus Place
Downers Grove, Illinois 60515

December 23, 1993

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

Subject: Braidwood Station Units 1 and 2
Byron Station Units 1 and 2
Dresden Station Units 1, 2, and 3
LaSalle County Station Units 1 and 2
Quad Cities Station Units 1 and 2
Zion Station Units 1 and 2

Commonwealth Edison Supplemental Response to Request for Additional Information (RAI) Submittal of NUMARC/NESP-007 Methodology Emergency Action Level (EAL) Classification Scheme for NRC Review and Approval

NRC Dockets 50-454 and 50-455
NRC Dockets 50-456 and 50-457
NRC Dockets 50-10, 50-237 and 50-249
NRC Dockets 50-373 and 50-374
NRC Dockets 50-254 and 50-265
NRC Dockets 50-295 and 50-304

Reference:
1) Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors"

2) Letter from J. Burns to Mr. J. B. Martin dated September 1, 1993

3) Letter from Mr. G. Dick to D. Farrar dated November 12, 1993

4) Letter from M. Vonk to Document Control Desk dated November 30, 1993

5) Letter from M. Vonk to Document Control Desk dated December 17, 1993

6) December 22, 1993, Teleconference between Commonwealth Edison and the Nuclear Regulatory Commission, Clarification of December 17, 1993, letter to Document Control

Pursuant to our telephone call on December 22, 1993 Commonwealth Edison is submitting additional information pertaining to our conversion on Regulatory Guide 1.101/NESP-007 Emergency Action Level (EAL) Philosophy.

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Commonwealth Edison will add an additional threshold value for evaluating the Fuel Clad and Fission Product Barrier Matrix. For the Potential Loss of the Fuel Clad Barrier condition CECo will add an additional Threshold Value to account for when the average of the ten highest Core Exit Thermocouples (CETCs) indicate 708°F for Byron and Braidwood Stations, and 700°F for Zion Station. This criteria will be evaluated independently from the Core Cooling Critical Safety Function Status Tree evaluation which requires consideration of the degree of subcooling before reading the CETCs. In addition, CECo will add an additional Threshold Value for a Loss of the Fuel Clad Barrier condition when the average of the ten highest CETCs indicate 1200 °F for Braidwood, Byron and Zion Stations. The Loss indication will be identical to the Core Cooling CSF RED path criteria existing as a Fuel Clad Fission Product Barrier criteria. Issuance of these additional EALs will be completed within 90 days of this submittal.

NUMARC allows the use of the Core Cooling CSF ORANGE path as an indicator for Reactor Vessel Water Level Potential Loss criteria (FPB Reference Table - Fuel Clad Barrier Example 4). The Core Cooling CSF ORANGE path is incorporated into the Fuel Clad Barrier matrices (2.a) for Braidwood, Byron and Zion Stations. Commonwealth Edison deviates from the NUMARC/NESP-007 criteria in that a Reactor Vessel Water Level (RVLIS) indication at the Top of Active Fuel is suggested as an indicator of a Potential Loss of the Fuel Clad Barrier.

For the CECo PWRs, RVLIS is primarily used in conjunction with the Pressurizer level to indicate whether a bubble has formed in the vessel head. The installed RVLIS at Braidwood, Byron and Zion provide indication of level within the Reactor Vessel head region. Byron and Braidwood Stations' RVLIS does not indicate in the active fuel region of the vessel. Zion Station's RVLIS indicates a head void when Reactor Coolant Pumps (RCPs) are not running, otherwise the system indicates mass inventory and not level. With RCPs running, a homogeneous mixture of water and steam exists and with the pumps operating, circulating this mixture, there is no distinct water level indicator for the top of active fuel. Therefore, the RVLIS is not an accurate indication for Fuel Clad damage.

In practice, Fuel Clad degradation would be used to determine that a Site or General Emergency exists assuming a Loss of Coolant Accident (LOCA) sequence. Classification for Site and General Emergencies should be based on accurate indicators, therefore core temperatures, heat sink conditions, coolant activity, and radiation levels provide the most appropriate determinations. The use of these indicators provides sufficient redundancy for the determination of the potential for Fuel Clad degradation. The use of RVLIS as an indicator could impede an appropriate classification level, and its omission would not prevent an appropriate classification.

Commonwealth Edison deviates from the NUMARC/NESP-007 criteria in that the annual average meteorology is suggested to be used for determining the gaseous effluent release criteria. CECo uses a modification of the annual average meteorology provided in the Offsite Dose Calculation Manual (ODCM). The modification is that the frequency factor is removed from the equation. The rational is that the annual average meteorology is based on a ten year period. Distribution over the 10 years would include all 16 sectors in a time weighted distribution. The frequency factor describes the time differences between the sectors receiving the prevailing wind. The calculations are based on a one hour release. Commonwealth Edison does not believe that the real distribution during the relatively short duration of an accident release condition can be compared to the 16 sector distribution over a ten year period. Therefore, an assumption was made to remove the relative time distribution factors and assume the release occurs in one sector and is not as a weighted distribution over the 16 sectors. This allows a more accurate determination to be made by the dose projection models which use real meteorological conditions.

The EAL values provided for the General Emergency classification indicate substantial core degradation and are calculated using the EPA Protective Action Guidelines. The EAL values provided for the Site Emergency classification indicate major failures of plant functions and are also calculated using a fraction of the EPA Protective Action Guidelines. Therefore, Commonwealth Edison regards these values as appropriate indicators which meet the criteria of the classification levels of General and Site Emergency.

If there are any questions or comments, please contact Ms. Leslie Holden at (708) 663-6673 or Mr. Dave Stobaugh at (708) 663-6480.

Sincerely,

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Nuclear Licensing Administrator

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File: EPG-00-P20
File: EPG-00-G35

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