UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

50-254

Peter A. Morris, Director
Division of Reactor Licensing

SAFETY ANALYSIS REPORT

Reference is made to the letters of October 16 and October 17, 1968, from Roger S. Boyd, Assistant Director for Reactor Projects, DRL, to the Environmental Science Services Administration requesting comments on the following safety analysis reports, respectively:

Donald C. Cook Nuclear Plant
Indiana and Michigan Electric Company
Preliminary Safety Analysis Report
Amendment Letter dated September 30, 1966

Quad-Cities Station, Units 1 and 2
Commonwealth Edison Company and
Iowa-Illinois Gas and Electric Company
Safety Analysis Report
Volumes I, II and III dated August 30, 1968

Review by the Air Resources Environmental Laboratory, ESSA, has now been completed and their comments are enclosed.

Milton Shaw, Director
Division of Reactor Development
and Technology

RDT:NS:S540

Enclosure:
Comments (Orig. and 1 cy.)

cc: R. S. Boyd, Assistant Dir. for Reactor Projects, DRL

Comments on

Quad-Cities Station, Units 1 and 2
Commonwealth Edison Company and
Iowa-Illinois Gas and Electric Company
Safety Analysis Report
Volumes I, II and III dated August 30, 1968

Prepared by

Air Resources Environmental Laboratory
Environmental Science Services Administration
October 21, 1968

Since no new meteorological information is presented other than that in the original Plant Design Analysis Report, our comments of June 29, 1966, are still valid. The conclusion at that time was that for the accidental elevated release, the most critical atmospheric condition was one which would tend to bring the elevated plume rapidly to the surface. This could occur under very unstable or under fumigation conditions. Thus, at the site boundary of 400 m an average 2-hour relative concentration of 2×10^{-5} sec m^{-3} could result assuming a 100 m effective stack height, Pasquill Type A diffusion and a 1 m/sec wind speed. A somewhat more conservative estimate would be to assume inversion fumigation conditions to exist for the first 30 minutes of the accident followed by very unstable conditions, for the remainder of the 2 hours, all with a wind speed of 1 m/sec. The resulting concentration would be about 6×10^{-5} sec m^{-3}. This compares with a value of 1×10^{-5} sec m^{-3} at 400 m as listed under category U-1 in Table XIV-4-4 of the applicant's initial report.

On an annual basis, the long term climatic record from Moline, which is the closest available to the site, shows a maximum frequency of wind direction of 7.7% in the 22 1/2° sector from the south. This does not include "calm" conditions which totaled 10.2 percent over all directions. The recent Dresden data for the 15-ft level shows a maximum frequency of 9.9% in the 22 1/2° sector from the south, including calms. Thus, a reasonable maximum annual wind frequency in a 22 1/2° sector would be about 10 percent. Assuming that during the year the diffusion conditions would be equally divided among Pasquill Types B, D and F with a 5 m/sec wind and a subsequent effective stack height of 138 m for Unit 1 alone, the average annual relative ground concentration would reach a maximum at 1000 m to the north of 5×10^{-8} sec m^{-3}. Based on a continuous I-131 stack release rate of 1×10^{-6} Ci/sec, the maximum ground concentration would be 5×10^{-14} μCi/cc. This is 36 percent of the adjusted Maximum Permissable

Concentration (MPC_a) for radioiodine as compared to Figure 18 of Appendix A of the Safety Analysis Report, which shows a maximum of 15 percent. The difference (36 vs. 15 percent) is attributed to our use of a surface reflection factor of 2.