FROM: Reactor Development & Technology (Milton Shaw, Director)

DATE OF DOCUMENT: 1-22-68

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TO: Dr. Morris

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ACTION NECESSARY ☐ | NO ACTION NECESSARY ☐ | CONCURRENCE ☐ | COMMENT ☐ | DATE ANSWERED: | BY:

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DESCRIPTION: (Must Be Unclassified)

Memo trans. the following in ref. to our 11-22, 12-11 and 12-26-67 letters., requesting comments, respectively:

ENCLOSURES: (1 orig. & 1 cc rec'd of each)

Comments on Rancho Seco (SMUD) - Vols. I-IV, dated 1-8-68, by ESSA

Comments on Russellville (Ark.), Vols. I & II, dated 1-10-68, by ESSA

Comments on Vols. I-III of Indiana Power.. dated 1-17-68, prepared by ESSA

Distribution: 4-suppl. file copies

REFERRED TO	DATE	RECEIVED BY	DATE
Mail: 1-23 w/1 cy. -- FOR ACTION			
Info Copies to:			
Dr. Morris		Knuth: w/orig. memo & comments on SMUD	
H. Price & Staff			
Boyd		3-extras	
Levine			
Skovholt		Long: w/orig. comments on Ark. & Indiana	
T. Conner (OGC)			
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Comments on

Russellville Nuclear Unit
Arkansas Power and Light
Preliminary Safety Analysis Report
Volumes I and II dated November 29, 1967

Prepared by

Air Resources Environmental Laboratory
Environmental Science Services Administration
January 10, 1968

The analysis of the Fort Smith and Little Rock meteorological data indicates that a continental diffusion climate can be expected at the Russellville site. This means a pronounced difference between daytime and nighttime atmospheric diffusion rates, with the lower wind speeds and slower diffusion occurring at night. The predominant daytime wind direction for the general area would be from the southwest as shown by the Little Rock wind rose. Nighttime wind directions with inversion conditions will most likely be towards the Dardanelle Reservoir of the Arkansas River.

The analysis of the Little Rock hourly weather reports with regard to diffusion types shows an average frequency of about 35% for Pasquill F condition during the four months considered (see Table 2A.15). The annual nighttime wind speeds were less than 3 knots about 20% of the time at Little Rock (see Table 2A.6). On this basis, it would seem appropriately conservative to use inversion diffusion conditions (Type F) and a 1 m/sec wind speed to compute the initial two-hour average concentration. This would result in a concentration of 6.4×10^{-4} sec m^{-3} at the site boundary assuming a ground source with no credit for building-induced dilution. Taking credit for the building effect as determined empirically in tests at the National Reactor Testing Station would result in a concentration value of about 2×10^{-4}, which agrees with the applicant's value.

The analysis of the persistence of a diffusion condition in a unidirectional flow (Tables 2A.17 and 18) shows that no cases persisted longer than 10 hours. Consequently, for the 24-hour average concentration it would be conservative to assume inversion conditions, a 2 m/sec wind with concentrations averaged over a 22 1/2 degree arc. At the site boundary this would result in an average concentration of 7×10^{-5} sec m^{-3}, which is in reasonable agreement with the applicant's computation.

In summary, a reasonable, conservative analysis has been made of the atmospheric diffusion conditions of the Russellville site which provides a sound basis for a preliminary safety evaluation of the proposed nuclear plant.