



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 78 TO LICENSE NO. DPR-49

IOWA ELECTRIC LIGHT AND POWER COMPANY  
CENTRAL IOWA POWER COOPERATIVE  
CORN BELT POWER COOPERATIVE

DOCKET NO. 50-331

DUANE ARNOLD ENERGY CENTER

1.0 Introduction

By letter dated August 16, 1977, Iowa Electric Light and Power Company (licensee) transmitted an application for amendment of operating license DPR-49 for Duane Arnold Energy Center (DAEC). Proposed technical specification (TS) change, RTS-92 (forwarded with the August 16, 1977 letter) requested a change in TS section 6.11.2.a(4) to clarify the specifications for reportable occurrences under the category of reactivity anomalies.

2.0 Evaluation

We have completed our review and evaluation of the proposed change concerning the clarification of reporting requirements under the category of reactivity anomalies to avoid possible misinterpretation of the reporting requirements. It is the intent of TS section 6.11.2.a(4) not to include transient flux spikes at power or arising from anticipated operational occurrences such as, turbine trips, closure of main steam isolation valves or condenser isolation, as reportable occurrences, provided that these reactivity increases are, in fact, expected conditions and are not indicative of an anomalous (irregular) condition.

The particular paragraph at issue defines reactivity anomalies as, among other things, "short term reactivity increases that correspond to a reactor period of less than 5 seconds." The licensee proposed to clarify this definition to read, "reactivity increases that correspond to a sustained reactor period of less than 5 seconds that increases power by more than one-half of a decade or a factor of 3.162." The 5-second period mentioned in the current specification has, traditionally, been interpreted to be an asymptotic (stable) period. Quite small increases in reactivity can result in short "pseudo" (transient) periods that have no physical significance as reactor periods and make only transient contribution to the neutron flux. These transient periods soon become negligible and affect the rate at which the neutron flux changes for a short time only after the effective multiplication factor has been increased (or decreased). For example, a reactivity increase of fifty cents (0.25 to 0.35 percent reactivity change) which takes place over a 2-second time interval (for example, from moving a control rod with a notch worth of fifty cents a distance of one notch) produces an asymptotic period of 6-seconds, but a pseudo period of 2.7 seconds during the 2-second insertion. This transient contribution of the neutron flux will soon become negligible as compared to the stable period. Smaller reactivity insertions will produce such pseudo period if the insertion rate is larger.

The licensee's proposal that the power increase by a half-decade or a factor of 3.162 is not acceptable. This portion of the change was subsequently withdrawn by the licensee.

The licensee is required to report a reactivity anomaly that produces a sustained period of less than 5 seconds independent of the amount of power increase resulting.

Based on our review, as discussed above we conclude that the proposed TS change clarifying the definition to read, "short term reactivity increases that correspond to a sustained reactor period of less than 5 seconds" is acceptable.

### 3.0 Environmental Consideration

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement, or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

### 4.0 Conclusion

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of an accident previously evaluated, does not create the possibility of an accident of a type different from any evaluated previously, and does not involve a significant reduction in a safety margin, the amendment does not involve a significant hazards consideration (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Date: October 27, 1982

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