UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION
HAROLD R. DENTON, DIRECTOR

In the Matter of	)	
IOWA ELECTRIC LIGHT & POWER COMPANY, ET. AL. (Duane Arnold Energy Center)	)	Docket No. 50-331

DIRECTOR'S DECISION UNDER 10 CFR 2.206

In a request dated March 20, 1979, Ms. Jane E. Magers on behalf of Citizens United for Responsible Energy (CURE) requested pursuant to 10 CFR 2.206 of the Commission's regulations that the Nuclear Regulatory Commission institute a proceeding to suspend Amendment No. 9 to Facility Operating License No. DPR-49 for the Duane Arnold Energy Center (DAEC) which was issued by the Commission on June 3, 1975. Amendment No. 9 was an action initiated by the Commission in December 1974 to standardize the wording in all licenses with respect to (1) conditions relating to the receipt, possession, and use of by-product, source and special nuclear materials, and (2) Technical Specifications which provide for leakage testing and related surveillance and reporting requirements for miscellaneous radioactive material sources.

The asserted bases for the request by CURE are (1) "special nuclear material (material containing at least 20% enriched uranium 235, uranium 233 or plutonium 239) is not needed for <u>any</u> purpose at a nuclear electric facility like the DAEC", (2) Iowa Electric Light and Power Company (IELPC) has received several notes threatening "nuclear terrorism" and contending that "at least two members of this group work in the DAEC", (3) in 1971, Dr. Hanauer, an AEC employee, stated that a disgruntled or psychotic utility employee may have the knowledge, the means and

the opportunity, if so motivated, to concoct trouble at a nuclear plant, (4) in February 1979, a locked cabinet in a restricted zone at DAEC was broken into and a small strontium-90 calibration source was stolen, which, although recovered, "clearly shows that some one(s) at the DAEC is (are) disgruntled or psychotic or both".

With respect to the first contention, the only locations at DAEC using special nuclear material are in sources inside the reactor pressure vessel. As discussed below, these sources are necessary and required for operation of the plant. They are absolutely inaccessible during plant operation and because of the radiation levels emitted by them (resulting from their being irradiated in the core), are considered "theft proof" even if a person had access to them during a refueling operation.

The power level of a nuclear reactor at any instant and any location is proportional to the neutron flux. Instruments are available which measure this flux with an instantaneous response. They are particularly suitable for indicating power levels and for providing signals to automatic control and safety mechanisms.

The function of a neutron monitoring system in a nuclear reactor is (1) to indicate and record neutron flux from the source level (reactor startup) to greater than full power, in order to detect conditions in the core that would threaten fuel integrity; (2) to provide signals to the reactor protection system and (3) to provide information for the efficient operation and control of the reactor.

Neutron monitoring systems for a Duane Arnold type light water reactor consist of three major subsystems which are the Source Range Monitors (SRM), the Intermediate Range Monitors (IRM), and the Local Power Range Monitors (LPRM). The

combination of these monitors detect the neutron flux in the reactor from the source range to greater than the full power range. In addition, there are Traversing In-Core Probes (TIP) which are utilized to provide data to calibrate the LPRM subsystem. These probes can also be used to provide substitute readings for LPRM's which may have failed. The TIP signals are supplied to the computer, and together with other inputs, the computer calculates the whole core distribution. Additionally, there are Fuel Loading Chambers (FLC) which are utilized to monitor neutron flux in core locations where fuel has been removed during off-load periods.

All of the above mentioned detectors are fission chambers which utilize uranium enriched to about 90% U235 (i.e., special nuclear material). The detectors produce output signals at rates proportional to thermal neutron flux in their regions of the core. They are not only needed for safe and efficient operation of a nuclear power reactor, but are indeed required by the operating license. These detectors account for all of the special nuclear material which is enriched to greater than 20%. The total quantity of this special nuclear material utilized at the Duane Arnold facility is estimated to be less than 200 grams.

With respect to the second contention, Iowa Electric has received several threatening letters regarding operation of DAEC. The receipt of these letters has been promptly reported to appropriate authorities including the Commission. Iowa Electric has significantly upgraded physical security at DAEC during the past two years in response to the requirements in Commission regulation 10 CFR 73.55, "Requirements for Physical Protection of Licensed Activities in Nuclear Power Reactors Against Industrial Sabotage". This regulation was issued in early 1977. During the past two years there has been extensive review, evaluation and

refinements of the Security Plan for DAEC by Iowa Electric and the Commission staff. By letter dated April 19, 1979, we approved the Security Plan, having concluded that the plan will provide the protection needed to meet the general performance requirements of 10 CFR 73.55.

With respect to the third contention, the statement cited by CURE in the basis for their request was made in 1971. Conditions have changed considerably since this statement was made. As noted above, in early 1977 the Commission issued the requirements set forth in 10 CFR 73.55. Under this regulation, licenses must establish and maintain physical protection systems and a security organization which will provide protection with high assurance against successful industrial sobotage by an insider, either working alone or in conjunction with other individuals. The general methods of protection include physical barriers, control of access to vital areas and employee screening programs.

As a result of our review, the plant modifications and control procedures implemented by Iowa Electric will provide high assurance against both internal and external threats as described in 10 CFR 73.55.

With respect to the fourth contention, the source that was "stolen" is what is commonly referred to as a "check" source. The source, containing by-product material, was about the size of a dime and was contained in a holder located in a locked cabinet in a restricted area. The total amount of strontium-90 in the source was only 0.3 millicuries and was sealed in a metal and foil matrix. The amount of activity in one of these sources is so low that a person could remain in proximity to the source all day and not incur a whole body dose in excess of that permitted by regulations. DAEC used to keep 6 of these sources throughout the plant in cabinets in restricted areas to be used by operating personnel to check

that radiation survey instruments were operating (i.e., that the battery in the instrument was not dead and that the instrument was responding to a radiation source as it should). On February 8, 1979, the licensee found that one of these sources had been forcibly removed from its housing. The source was found within the reactor building later that day. The contractor employee responsible for removing the source was dismissed. This incident was investigated by the Commission's Office of Inspection and Enforcement who concluded that the licensee's actions were timely and adequate (see Inspection Report 50-331 79-06 dated March 21, 1979).

Since that incident, even these small check sources are now kept in locked facilities in locked rooms. The larger calibration sources have always been kept in locked containers with strict procedural controls on access and use. The check and calibration sources that exist at DAEC are necessary for plant operation and to insure compliance with NRC regulations. The sources are used to calibrate and to verify that the radiation survey instruments, the inplant radiation monitors and the effluent radiation monitors are functioning and accurately measuring the type and amount of radioactivity they are intended to monitor.

In summary, the sources are DAEC are necessary for plant operation. The check and calibration sources are kept in locked containers, with appropriate procedural controls on access commensurate with the amount of radioactivity in the sources. The only sources containing special nuclear material are in sealed capsules that are located inside the reactor pressure vessel; these sources are only accessible when the reactor vessel is open (e.g., during a refueling). Special tools and procedures are required to remove a capsule. If a capsule were to be removed, the level of radioactivity is so high that the capsule must be

stored in the spent fuel pool under water or in a heavy shipping cask; as such, these sources are considered essentially "theft proof".

Based on the foregoing discussion, I have determined that there exists no basis for suspending Amendment No. 9 to Facility Operating License No. DPR-49. The request of Citizens United for Responsible Energy is hereby denied.

A copy of this determination will be placed in the Commission's Public Document Room at 1717 H Street, N. W., Washington, D. C. 20555, and at the Local Public Document Room for the Duane Arnold Energy Center located at the Cedar Rapids Public Library, 426 Third Avenue, S.E., Cedar Rapids, Iowa 52401. A copy of this document will also be filed with the Secretary of the Commission for its review in accordance with 10 CFR 2.206(c) of the Commission's regulations.

In accordance with 10 CFR 2.206(c) of the Commission's Rules of Practice, this decision will constitute the final action of the Commission 20 days after the date of issuance, unless the Commission on its own motion institutes the review of this decision within that time.

Roger J. Mattson for

Harold R. Denton, Director
Office of Nuclear Reactor Regulation