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

M-45

OCT 24 1990

Mr. Rudy Grafton
Route 4, Box 287-S
Homer, Louisiana 71040

Dear Mr. Grafton:

I am responding to your letter of October 2, 1990, in which you asked several questions about the Nuclear Regulatory Commission's (NRC) licensing procedures as they would apply to the prospective application by Louisiana Energy Services (LES) for a uranium enrichment plant in Homer, Louisiana.

Under the Atomic Energy Act, commercial uranium enrichment plants are required to be licensed as production facilities, that is, facilities designed or used for the separation of the isotopes of uranium. The applicable NRC regulations for this purpose are in Title 10, Code of Federal Regulations, Part 50, "Domestic Licensing of Production and Utilization Facilities," (10 CFR Part 50). No applications for licenses to construct and operate a uranium enrichment plant have ever been filed with the NRC; therefore, the review and any decision on licensing the proposed LES plant will be precedent-setting from that perspective.

10 CFR Part 50 was developed for and is geared primarily to the licensing of nuclear reactors, and therefore some guidance is necessary to apply these regulations to uranium enrichment plants. A few years ago, the NRC considered preparing a new 10 CFR Part 76 specifically for uranium enrichment regulation, but the Commission decided not to pursue it. In the Advance Notice of Proposed Rulemaking for 10 CFR Part 76, the Commission stated that the guidance included therein, comprising draft general design criteria and an item by item listing of which sections of 10 CFR Part 50 apply, would be used for licensing of uranium enrichment plants. This same guidance would apply in the licensing of government-owned and operated uranium enrichment plants, should legislation be enacted that would require NRC licensing. At present, the Department of Energy's uranium enrichment plants are exempt from licensing and have not been reviewed by the NRC. Furthermore, the general design criteria would apply to the construction and operation of uranium enrichment plants regardless of whether licensing is conducted pursuant to 10 CFR Part 50 or 10 CFR Parts 40 and 70, the latter being considered in pending legislation by deleting uranium enrichment plants from the definition of production facilities in the Atomic Energy Act. We have no assurance that the pending legislation will be passed in the current session of Congress.

Earlier this year, I testified before the House Subcommittee on Energy and the Environment concerning uranium enrichment regulation. In my written testimony, there was a comparison of the differences between the requirements of 10 CFR Part 50 and 10 CFR Parts 40 and 70, including those for foreign ownership, domination, and control as well as financial indemnification. I have enclosed a copy of this testimony for your review relative to these requirements. No decision has been made on LES' eligibility to apply for licenses due to restrictions on foreign ownership, domination, and control.



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The NRC has met with LES several times since its uranium enrichment plant project was announced in June 1989. The main objectives of these meetings have been for LES to familiarize the NRC staff with various aspects of the project and for the NRC to advise LES about the regulatory requirements with which it must comply so that LES may prepare a complete, high quality application containing all the information needed for NRC review. We believe the meetings have been useful and successful in accomplishing the objectives, and could lead Mr. Priory of Duke Power Company to be optimistic about obtaining an expeditious NRC review of LES' application for licenses.

We expect to receive in January 1991, as part of LES' application for licenses, information relative to its financial qualifications and management capabilities, as well as all other relevant matters, to construct and operate the proposed uranium enrichment plant. At that time, the NRC will establish in the vicinity of the proposed plant a Local Public Document Room where the application and all unclassified and non-proprietary NRC and applicant documents pertaining to the case will be placed for public inspection. I hope that you will take advantage of this system to learn more about the project and the NRC's licensing review process.

Sincerely,

(Signed) Robert M. Bernero

Robert M. Bernero, Director
Office of Nuclear Material Safety
and Safeguards

Enclosure:
Testimony

Distribution: (NMSS 90--510)

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TESTIMONY BY

ROBERT M. BERNERO, DIRECTOR

OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS

U. S. NUCLEAR REGULATORY COMMISSION

BEFORE THE

SUBCOMMITTEE ON ENERGY AND THE ENVIRONMENT

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS

Mr. Chairman and members of the Subcommittee, it is a pleasure to be here today to discuss the Nuclear Regulatory Commission's (NRC) program for regulating uranium enrichment plants and proposed legislation that might modify some aspects of such regulation. Accompanying me here today are Mr. Charles Haughney and Mr. Peter Loysen from my Office and Mr. Martin Malsch and Mr. Robert Fonner from the Commission's Office of the General Counsel.

The Atomic Energy Act of 1954, as amended, (the Act) provides the authorization for the Commission to issue licenses for utilization or production facilities for industrial or commercial purposes. In the Act, "production facility" is defined as any equipment or device determined by rule of the Commission to be capable of the production of special nuclear material in such quantity as to be of significance to the common defense and security, or in such manner as to affect the health and safety of the public; or any important component part especially designed for such equipment or device as determined by the Commission. Further, "produce" means to manufacture, make, produce, or refine special nuclear material, to separate special nuclear

material from other substances in which such material may be contained, or to make or produce new special nuclear material. The definition of "utilization facility" is similar to that of "production facility," except that a utilization facility is "capable of making use of special nuclear material." For all practical purposes, uranium enrichment plants and spent fuel reprocessing plants are production facilities, and nuclear reactors are utilization facilities. Absent an amendment to the Act, however, the Commission must apply the same statutory requirements to the licensing of both kinds of facilities.

The former Atomic Energy Commission (AEC) promulgated implementing rules for the domestic licensing of all production and utilization facilities in a single regulation, Part 50 of Title 10 of the Code of Federal Regulations. Since there have been no applications for commercial uranium enrichment plants and only a few for spent fuel reprocessing plants, it is not surprising that Part 50 has evolved primarily as a set of regulations for the licensing of nuclear reactors, and particularly of nuclear power reactors.

In 1972, the AEC announced that the private sector should be given full encouragement to engage in providing commercial uranium enrichment plants to be needed in the early 1980's and beyond. In consideration of resulting commercial interest and in recognition of the fact that Part 50 was so oriented toward the licensing of nuclear power reactors, the regulatory side of the AEC began development of a new rule for domestic licensing of uranium enrichment plants. General design criteria, a rough draft of the rule, a Regulatory Guide on standard format and content for a safety analysis report, and other guidance were prepared before the Energy Research and Development

Administration (a successor to the AEC) in 1977 withdrew support for commercial uranium enrichment, the private interest waned, and the regulatory effort was dropped. Renewed interest in commercial uranium enrichment was shown again in the mid-1980's by private companies as DOE initiated proposals for restructuring its uranium enrichment enterprise to include a federally chartered corporation which might be subject to regulation by the NRC. The NRC then published in 1988 an Advance Notice of Proposed Rulemaking on uranium enrichment regulation, 10 CFR Part 76, containing draft general design criteria for centrifuge and gaseous diffusion plants using uranium hexafluoride, which would form the foundation for a new rule. The Commission determined in early 1989, based on the apparently sluggish progress in commercial uranium enrichment activities and the need to conserve scarce resources, not to proceed with rulemaking. However, the Commission did state in the Advance Notice that it would use the draft general design criteria, either under the existing Part 50 rule or the new Part 76, if promulgated. I should note that, at the time of publication, there was no consideration in the Advance Notice of Proposed Rulemaking of licensing uranium enrichment plants under the materials licensing rules of 10 CFR Parts 40 and 70, because licensing an enrichment plant under these rules would have required a change in the law.

In early 1986, DOE requested expressions of interest for commercial participation in its uranium enrichment program, and a year later, submitted a report to Congress on the privatization of DOE's gaseous diffusion uranium enrichment enterprise. This was followed immediately by specific details on restructuring of the enterprise, including operation by a federally chartered enrichment corporation which might be subject to NRC regulation. In this situation, the

gaseous diffusion enrichment plants already exist, so that NRC regulation, if imposed, would be retroactive, raising questions about the suitability of the two-stage, Part 50 licensing process that would be required. Several bills were introduced to legislate the restructuring, beginning in the 99th Congress. The first bill, which included provisions that would require licensing of uranium enrichment plants under 10 CFR Parts 40 and 70, rather than Part 50, was S.2097, which was passed by the Senate in March 1988. Others have included these same provisions, including S.83 which was passed by the Senate in June 1989 and H.R.2783 as passed by the Senate in December 1989. The Commission wrote to Senator Bennett Johnston in April 1989, stating that as long as a facility is licensed as a materials licensee, existing NRC regulations in 10 CFR Parts 40 and 70 would serve as an adequate regulatory framework for licensing uranium enrichment facilities. The Commission again wrote to Senator Johnston in November 1989, stating that NRC agrees with his view that it would be more appropriate to regulate uranium enrichment plants under 10 CFR Parts 40 and 70 than under 10 CFR Part 50. The Commission further pointed out in its letter that the NRC has for many years regulated other chemical processing facilities, which also use uranium hexafluoride, under 10 CFR Parts 40 and 70; and that NRC requirements in 10 CFR Part 50 have been promulgated primarily for licensing of nuclear reactors, which are entirely different from uranium enrichment facilities in concept, complexity, and degree of risk.

A gas centrifuge uranium enrichment plant, of the type proposed by Louisiana Energy Services, receives uranium hexafluoride in 14-ton capacity cylinders. The cylinders are heated to about 200° F within autoclaves to liquify the uranium

hexafluoride and enable gaseous uranium hexafluoride to evolve. After reducing the pressure to much below atmospheric, the gas is fed to centrifuge machines in which enrichment occurs. The centrifuge machines function by rapidly spinning the gas so that the slightly heavier uranium-238 hexafluoride molecules tend to move toward the outside walls of the centrifuge, while the slightly lighter uranium-235 hexafluoride molecules tend to remain near the center of the centrifuge. By withdrawing the gas and feeding it to large numbers of additional centrifuges, the process is repeated until the desired degree of enrichment is attained. At the end, the gas is cooled and recondensed into solid uranium hexafluoride. Enriched uranium hexafluoride is filled in 2.5 ton cylinders for delivery to customers, and depleted uranium hexafluoride is filled in 14-ton cylinders for storage. Protection must be provided in a uranium enrichment plant against the accidental release of uranium hexafluoride from a feed or filling station where heated cylinders are handled. In such a release, hydrogen fluoride gas, a corrosive and hazardous chemical, is formed along with uranyl fluoride by reaction with the moisture in air. Natural and low-enriched uranium are only mildly radioactive, and present a modest chemical toxicity hazard. Hydrogen fluoride is the principal hazard, and is the same hazard that must be considered at uranium hexafluoride conversion plants. The conversion plants have some additional hazards from chemical processing of uranium ore concentrate (yellowcake). The hazards posed by this process are much less than those potentially presented by nuclear power plants which have large inventories of radionuclides and the stored energy for dispersing them.

There are a number of differences between licensing a plant pursuant to 10 CFR Part 50 versus 10 CFR Parts 40 and 70. These differences stem from differences in the Atomic Energy Act requirements for licensing production and utilization facilities, as contrasted to licensing materials. Facilities are licensed under Chapter 10 of the Act, materials under Chapters 6, 7, and 8 of the Act. Uranium enrichment plants, currently defined as production facilities, are therefore subject to the requirements in Chapter 10. These include restriction on foreign ownership, domination, or control (Section 103), need for an antitrust review (Section 105), and need to license operators (Section 107). Chapter 16 of the Atomic Energy Act also has special administrative requirements for production and utilization facilities. These include need for a construction permit, followed by an operating license (Section 185) and mandatory hearing on the issuance of a construction permit (Section 189). The Commission's rules for implementing these facility licensing requirements are in 10 CFR Parts 2 and 50. In addition, Section 170 of the Atomic Energy Act mandates financial protection for public liability, with Government indemnification, for facilities.

If the Commission were authorized to do so, licensing a uranium enrichment plant on a materials basis rather than as a facility would essentially eliminate the bar to foreign control, the antitrust review, the licensing of operators, the construction permit with mandatory hearing, and mandatory financial protection. Hearing procedures could change from formal to informal adjudication. The current statutory scheme would have to be modified, however, to allow the licensing of a uranium enrichment plant on a materials basis rather than as a production or utilization facility. I would like now

to address the more significant differences between 10 CFR 50 and 10 CFR Parts 40 and 70 in greater detail.

Foreign ownership, control, or domination -- Consistent with current statutory provisions, Part 50 prohibits any application for production or utilization facility licenses from an entity which is owned, controlled, or dominated by an alien, foreign government, or foreign corporation. Part 70 and safeguards requirements in Parts 73 and 74 have no such prohibition; however, information on foreign ownership, control, or domination must be submitted in the application in order to support the necessary determination that licensing would not be inimical to the common defense and security of the United States.

Licenses required -- Consistent with current statutory provisions, Part 50 requires that an applicant obtain a construction permit for authorization to construct a production or utilization facility and then obtain an operating license to operate such a facility. Parts 40 and 70 require a single license to possess and use radioactive material at the facility. In either case, construction may not commence until after completion of the environmental evaluation pursuant to Part 51.

Duration of licenses -- Licenses issued pursuant to Part 50 may be issued for periods up to 40 years, and all such licenses for nuclear power reactors have been issued for 40 years. Licenses for research reactors have been issued for periods ranging from five to 40 years, but are currently issued for 20 years, as are materials licenses for independent

spent fuel storage installations under Part 72. Licenses issued under Parts 40 and 70 have traditionally been issued for periods of five years and renewed upon review. The Commission has recently approved a proposal to extend the duration of major fuel facility licenses to ten years.

Safety/environmental reviews -- There are no essential differences between the Parts in the type of safety and environmental reviews that would be conducted by the NRC staff, except that Part 50 requires safety evaluation reports and Part 51 requires environmental impact statements at the construction permit stage and additional ones (or updates) at the operating license stage. Part 51 specifically requires environmental impact statements for uranium enrichment plants, regardless of licensing basis. Part 50 also requires that the Commission's Advisory Committee on Reactor Safeguards review the staff's safety evaluation reports, whereas there is no such requirement in Parts 40 and 70.

General design criteria -- Part 50 requires an applicant to provide in the facility design the principal design criteria and design bases, and an analysis and evaluation of the facility design and performance during normal and accident conditions. General design criteria, including consideration of natural phenomena, are listed in Appendix A for nuclear power reactors only; therefore, these general design criteria are not applicable to uranium enrichment plants. Parts 40 and 70 are less explicit and except for plutonium plants have no requirements for consideration of natural phenomena. Draft general design criteria for enrichment plants were proposed in the Advance Notice of Proposed Rulemaking on uranium enrichment regulation. The Commission intends to

apply these criteria, regardless of licensing procedure, in the licensing of uranium enrichment plants.

Safeguards -- Part 50 requires a licensee to have physical security and contingency plans, but does not address material control and accounting. Part 70, on the other hand, requires physical security and contingency plans, and a material control and accounting program. Material control and accounting requirements in Part 74, which presently exempts production and utilization facilities, will have to be modified in either case.

Adjudicatory hearings -- Under Part 50, whether or not an application is contested, a mandatory NRC adjudicatory hearing following the procedures of 10 CFR Part 2, Subpart G, is required on the application for a construction permit. Such a hearing involves discovery, submittal of written testimony, presentation of oral testimony and cross examination, and making findings of fact and law to reach a decision by a three-member Atomic Safety and Licensing Board. Decisions are appealable to the NRC's Atomic Safety and Licensing Appeal Board and to the Commission. A hearing on the application for an operating license is not mandatory but may be requested. A combined construction permit/operating license hearing may be feasible, following the concepts in 10 CFR Part 52, if an application for licenses is complete and final. However, the Commission would have to find that construction and other acceptance criteria have been met before the plant could operate. Under Parts 40 and 70, an NRC adjudicatory hearing following the procedures of 10 CFR Part 2, Subpart L, on an application for a license, is not mandatory but may be requested. The

Subpart L procedures are less formal and focus on providing a single presiding officer a full file of information about the proceeding. He may require additional material to be prepared for his use, and he may require oral testimony, but without cross examination. Decisions are appealable to the Atomic Safety and Licensing Appeal Board but not to the Commission.

Antitrust - Part 50 requires an antitrust review by the Department of Justice and the Commission. Parts 40 and 70 do not. Regardless, no license issued under the Atomic Energy Act confers monopoly status, and any licensee found to be in violation of the antitrust laws may have his license revoked or suspended for that reason.

Indemnification - Part 50 licensees are required to provide privately available nuclear liability insurance protection and are indemnified by the Commission above that. The Commission's rules in Part 140 do not address the level of protection deemed appropriate for uranium enrichment plants. With the exception of licensees authorized to possess and use certain quantities of plutonium, Part 40 and 70 licensees are not required to provide liability coverage and are not indemnified by the Commission. Extension of financial protection to materials licensees is discretionary on the part of the Commission.

Operator licensing - The Atomic Energy Act requires that persons who manipulate the controls of a production or utilization facility shall be licensed by the Commission. Part 55 contains requirements for such

licensing of the operators of nuclear power plants, but not other types of facilities. Appropriate requirements will have to be developed for licensing of the operators of uranium enrichment plants, as long as the plants are classed as production facilities. Parts 40 and 70 contain no requirements for licensing of the operators of plants, but they do contain requirements to demonstrate adequate training and experience.

Reporting and recordkeeping -- Part 50 contains some reporting and recordkeeping requirements which Parts 40 and 70 do not, notably ones related to construction deficiencies and annual operating reports.

Quality assurance -- Part 50 contains specific requirements that there be quality assurance programs for production and utilization facilities but provides guidance in Appendix B only on programs for nuclear reactors and spent fuel reprocessing plants. The NRC staff would attempt to apply appropriate sections of Appendix B on quality assurance programs for the safety-related aspects of uranium enrichment plants. Parts 40 and 70 do not contain specific requirements for quality assurance, but the staff has imposed explicit provisions which provide substantial quality assurance for fuel facilities through license conditions.

Inspections -- The frequency and type of inspections would be the same regardless of licensing procedure. This matter is a function of the kind of licensed activity, enforcement history of the plant, allegations of safety violations, and availability of inspection staff. The decision to place resident inspectors at plants and facilities is made on a

case-by-case basis, and NRC policy is to have resident inspectors at nuclear power plant sites. Occasionally, resident inspectors are stationed at plants licensed on a materials basis.

If the Commission were to be given the requisite statutory authority, I believe that regulation of uranium enrichment plants under the materials licensing regulations of 10 CFR Parts 40 and 70 would result in some streamlining of the process over that of Part 50. The upfront resources required to effect this streamlining make it difficult to determine if there will be an overall savings of NRC resources. However, I am convinced that there would be no diminution in the quality of review or difference in the safety and environmental impact of any plant thus regulated, and an adequate opportunity for public participation in the licensing process would be provided. The Commission has previously stated that it is prepared to regulate uranium enrichment pursuant to any existing or new regulation, and we are commited to that today. To illustrate our commitment, the NRC has held extensive discussions and meetings with Louisiana Energy Services, a prospective applicant for a license to construct and operate a gas centrifuge uranium enrichment plant in northern Louisiana. In these discussions and meetings, NRC has advised Louisiana Energy Services that they should prepare their application according to the requirements of Part 50, and that it will be considered by NRC in that manner. If Congress should legislate a change to allow licensing according to the technical and procedural requirements of Parts 40 and 70, appropriate adjustments to the format and content of the application, as well as its procedural consideration by NRC, will be made.