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**POLICY ISSUE**  
(Notation Vote)

SECY-90-314

September 6, 1990

For: The Commissioners

From: James M. Taylor  
Executive Director  
for Operations

Subject: DEPARTMENT OF ENERGY'S (DOE) REQUEST FOR ALLOCATION OF U.S. NUCLEAR REGULATORY COMMISSION (NRC) RESOURCES FOR THE LICENSING REVIEW OF AN ATOMIC VAPOR LASER ISOTOPE SEPARATION (AVLIS) URANIUM ENRICHMENT PLANT

Purpose: To obtain Commission approval to respond to DOE that NRC will make only a low level effort to monitor DOE activities concerning an AVLIS facility pending DOE's ongoing legislative actions to require NRC to license AVLIS.

Category: This paper covers a policy question requiring Commission consideration. Resource estimates are Category 1.

Summary: DOE has requested that NRC make resources available to work with DOE to develop a plan and schedule for the licensing review of an AVLIS uranium enrichment plant. The proposed DOE plan and schedule appear to be overly ambitious. The AVLIS technology is almost entirely new to the NRC staff and would require NRC to hire highly specialized staff to conduct either a licensing review or a licenseability review. The highly classified nature of AVLIS technology further complicates an NRC review. A licenseability review similar to that done for DOE for the Fast Flux Test Facility is not desirable for NRC since we would still have to hire specialized staff without any assurance of Congressional budget support. No NRC resources have been budgeted for work on AVLIS in either fiscal year 1990 or 1991. To date, Congress has not appropriated funds for AVLIS deployment and licensing. NRC is faced with potential cuts in FY 1991 resources pursuant to the Gramm-Rudman-Hollings budget deficit reduction act. This paper recommends no support for a licenseability review and only a low level of NRC effort to monitor DOE's activity pending Congressional action or legislation requiring NRC to license AVLIS.

Contact:  
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Background:

The AVLIS technology has been under development at Lawrence Livermore National Laboratory since 1975, and is now at a pilot plant stage. In hopes of avoiding the loss of its significant share in the world uranium enrichment market in the late 1990's, DOE has prepared a plan for the demonstration, transition and deployment of the AVLIS technology. The Secretary of Energy approved this plan and submitted it to Congress on January 19, 1990. This plan included submitting to NRC a license application in March 1991, demonstration of the technology in late 1992, and achieving an NRC license in 1993. By a memorandum of March 14, 1990, we informed the Commissioners of this plan. To date, DOE has involved NRC in this effort by a briefing of staff on the AVLIS deployment plan on January 25, 1990, a tutorial visit to Oak Ridge National Laboratory in April 1990, and a classified staff briefing on August 2, 1990. In addition, the staff briefed DOE on the NRC licensing process on April 17, 1990. On August 9, 1990, Mr. William H. Young, DOE's Assistant Secretary for Nuclear Energy, sent a letter to the NRC Chairman requesting that the NRC allocate resources for the licensing review of the AVLIS (Enclosure 1).

Discussion:

DOE's letter of August 9, 1990, cites two potential modes of NRC involvement. The first depends on Congress passing an act requiring NRC licensing of an AVLIS enrichment plant under 10 CFR Parts 40 and 70, thus requiring NRC to perform full safety, environmental, and safeguards reviews. In the other mode, the AVLIS plant would remain purely a DOE project, without a licensing requirement, but DOE would request NRC to perform a licensability review, as was done for DOE's Fast Flux Test Facility. Either mode would involve approximately the same depth of technical review, but a licensability review would require significantly less NRC procedural activities.

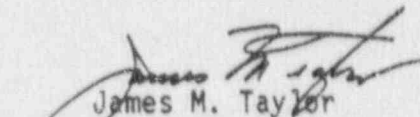
The licensing-related schedules in DOE's AVLIS deployment plan would be ambitious for a large new nuclear industry facility, even if it only involved replication of processes familiar to the NRC staff. The AVLIS technology itself, however, is a process almost totally new to the staff. Staff's scant exposure to it to date has been sufficient to learn of several issues where staff currently lacks the special expertise to address the environmental, health, and safety aspects involved, e.g., special explosion hazards, hazards associated with high-powered lasers, and dye toxicity issues. Staff considers it likely that other such issues will arise as more is learned about the processes involved. In addition, the security classification measures necessary to safeguard the AVLIS technology increase the difficulty of learning about it. Thus the staff does not believe NRC should become involved in the review of AVLIS unless required by legislation.

To date, all NRC resources spent on the AVLIS program have come from general allocations. Nothing has been specifically budgeted for work on AVLIS in either fiscal year 1990 or 1991. In anticipation of DOE's request for continued NRC involvement, staff has prepared an estimate of the resources required to gain a sufficient understanding of the AVLIS technology and its proposed deployment to enable the informed preparation of plans and schedules for both a licensability or licensing review. This estimate totals 75 staff-weeks and \$25,000 over a six-month period (Enclosure No. 2). This estimate is for a short-term staff action plan having objectives of understanding the AVLIS technology as it relates to safety, safeguards, security classification and other regulatory issues, and of determining the skills and disciplines that would be necessary to resolve these issues. This represents an investment that would be needed before undertaking the licensing planning requested by DOE.

It is clear from this estimate and the discussion above that NRC has already invested some man-weeks in the AVLIS technology. To date, however, Congress has not appropriated funds for AVLIS deployment and licensing. Instead, NRC is faced with the potential of significant cuts in FY 1991 resources pursuant to the Gramm-Rudman-Hollings budget deficit reduction act.

Recommendation:

That the Commission approve the enclosed letter to DOE (Enclosure 3) which states that the NRC does not believe that it is in the best interest of NRC to conduct a licensability review but will continue a low level effort on DOE's request, unless Congress passes legislation requiring NRC to license AVLIS.

  
James M. Taylor  
Executive Director  
for Operations

Enclosures:

- 1) DOE letter dated 08/09/90
- 2) Staff Action Plan in Reponse to DOE AVLIS Initiative
- 3) Draft letter to Secretary Watkins

Commissioners' comments or consent should be provided directly to the Office of the Secretary by COB Thursday, September 20, 1990.

Commission staff office comments, if any, should be submitted to the Commissioners NLT September 13, 1990, with an information copy to the Office of the Secretary. If the paper is of such a nature that it requires additional review and comment, the Commissioners and the Secretariat should be apprised of when comments may be expected.

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**Department of Energy**

Washington, DC 20585

August 9, 1990

The Honorable Kenneth M. Carr  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Chairman:

This letter requests the Nuclear Regulatory Commission (NRC) to work with the Department of Energy (DOE) to develop a plan and schedule for safety and licensing reviews for commercial deployment of Uranium-Atomic Vapor Laser Isotope Separation (U-AVLIS) technology.

DOE is facing a highly competitive enrichment market. U-AVLIS technology has the potential for enriching uranium at a cost about 50 percent less than any other enrichment process. Successful deployment of U-AVLIS technology would greatly enhance the competitiveness of the uranium enrichment enterprise.

Development of U-AVLIS has matured to the point where commercial application is now under consideration. Admiral Watkins forwarded a "Plan for the Demonstration, Transition and Deployment of U-AVLIS Technology" to Congress in January of this year. This plan identified steps that would lead to the construction of a U-AVLIS uranium enrichment production plant as early as 1993. Copies of this plan have been provided to NRC.

There are two possibilities for deployment of U-AVLIS technology. Legislation is pending before Congress that would create a Government corporation for uranium enrichment, and would require a U-AVLIS production plant to be licensed under 10 CFR 40 and 10 CFR 70. If this legislation is enacted, the process for safety reviews and licensing is defined.

If the pending legislation is not enacted, DOE would expect to deploy U-AVLIS technology as part of the existing uranium enrichment enterprise. In this case, we would request NRC to conduct a review similar to that performed for the Fast Flux Test Facility.

Accordingly, we are requesting that NRC make the necessary resources available to work with DOE to develop a plan and schedule for performing safety and licensing reviews for the U-AVLIS program. We will inform NRC and NRC staff about U-AVLIS technology through meetings, documentation, and facility tours.

Mr. Philip G. Sewell, Deputy Assistant Secretary for Uranium Enrichment, is in contact with NRC staff and will request a meeting to develop the plan and schedule.

Sincerely,

*William H. Young*

William H. Young  
Assistant Secretary  
for Nuclear Energy

AUG 10 1990

STAFF ACTION PLAN IN RESPONSE TO DOE AVLIS INITIATIVE

PURPOSE:

THE OBJECTIVE OF THE SHORT-TERM STAFF ACTION PLAN IS TO UNDERSTAND THE AVLIS TECHNOLOGY AS IT RELATES TO SAFETY, SAFEGUARDS, SECURITY, AND OTHER REGULATORY ISSUES, AND TO DETERMINE THE SKILLS AND DISCIPLINES THAT WOULD BE NECESSARY TO RESOLVE THESE ISSUES

SUMMARY:

BETWEEN AUGUST, 1990 - JANUARY, 1991 THE FOLLOWING RESOURCES ARE NEEDED IN RESPONSE TO THE DOE AVLIS INITIATIVE

- 75 MAN-WEEKS

- \$25,000

I. OVERVIEW OF THE AVLIS PROGRAM

1. A CLASSIFIED BRIEFING BY LLNL: AUGUST 2, 1990

A FOUR-HOURS BRIEFING ATTENDED BY 30 NRC MANAGEMENT AND TECHNICAL STAFF

- 3.0 MAN-WEEKS
- \$ 0

2. A ONE-DAY VISIT AT THE LLNL AVLIS SITE BY NRC MANAGEMENT AND TECHNICAL STAFF: IN LATE AUGUST OR EARLY SEPTEMBER, 1990

(1) PREPARATION FOR THE TEAM VISIT INCLUDES (a) COORDINATION AMONG THE INVOLVED NRC ORGANIZATIONS, DOE HEADQUARTERS AND THE LLNL AVLIS SITE, (b) DEVELOPMENT OF AGENDA, AND (c) IDENTIFICATION OF THE TEAM MEMBERS AS WELL AS SAFEGUARDS, SAFETY, SECURITY AND LEGAL ISSUES.

(2) A THREE-DAY TRIP (ONE FULL DAY ON SITE) BY A TEAM OF 16 PEOPLE

<u>17 PEOPLE</u>	NMSS/IMNS - 3 MANAGERS, 3 STAFF MEMBERS
	NMSS/SGTR - 3 MANAGERS, 3 STAFF MEMBERS
	SEC - 1 MANAGER, 1 STAFF MEMBER
	RES - 1 STAFF MEMBER
	OGC - 2 STAFF MEMBER

- 10.2 MAN-WEEKS
- \$17,000

(3) EVALUATION OF TECHNICAL INFORMATION GATHERED DURING THE TEAM VISIT AND PREPARATION OF TRIP REPORT

- 5.0 MAN-WEEKS
- \$ 0



II. DEVELOPMENT OF ISSUES & SKILLS NEEDED TO RESOLVE THESE ISSUES

1. A FOLLOW-UP SITE VISIT BY A SMALL TECHNICAL STAFF TEAM, DURING THE MONTH OF SEPTEMBER OR OCTOBER, 1990

(1) PREPARATION OF THE TECHNICAL STAFF TEAM VISIT INCLUDES (a) COORDINATION AMONG THE INVOLVED NRC ORGANIZATION, DOE HEADQUARTERS AND THE LLNL AVLIS SITE, (b) DEVELOPMENT OF AGENDA, AND (c) IDENTIFICATION OF TEAM MEMBERS AND THEIR COUNTER PARTS AT THE SITE.

- 2.0 MAN-WEEKS  
- \$ 0

(2) A TEAM OF TECHNICAL STAFF MEMBERS TO SPEND THREE DAYS ON SITE TO ENGAGE DETAILED DISCUSSIONS WITH DIFFERENT SPECIALISTS OF THE AVLIS PROGRAM.

6 PEOPLE (SAFETY AREA - 2  
SAFEGUARDS AREA - 2  
SECURITY AREA - 1  
RES - 1)

- 6 MAN-WEEKS  
- \$8,000

(3) EVALUATION OF TECHNICAL INFORMATION GATHERED DURING THE VISIT, PREPARATION OF TRIP REPORT, AND PREPARATION OF BRIEFING FOR NRC MANAGEMENT.

- 4.0 MAN-WEEKS  
- \$ 0

2. REVIEW OF APPROPRIATE AVLIS DOCUMENT (PLANT LAY-OUT AND SAFEGUARDS PLANS, ETC.)

SAFETY, SAFEGUARDS AND SECURITY STAFF TO PERFORM A CURSORY REVIEW OF APPROPRIATE AVAILABLE AVLIS DOCUMENTS TO GAIN A BETTER UNDERSTANDING OF THE PROGRAM AS WELL AS TO IDENTIFY UNIQUE SAFEGUARDS, SAFETY AND SECURITY ISSUES ASSOCIATED WITH AVLIS TECHNOLOGY.

SAFETY AREA	- 8 MAN-WEEKS
SAFEGUARDS AREA	- 8 MAN-WEEKS
SECURITY	- 2 MAN WEEKS
	- 18 MAN-WEEKS
	- \$ 0

3. REVIEW OF ADVANCE NOTICE OF PROPOSED RULEMAKING FOR URANIUM ENRICHMENT REGULATION TO DETERMINE APPLICABILITY OF GENERAL DESIGN CRITERIA TO AVLIS.

- 6 MAN-WEEKS  
- \$ 0

4. MONTHLY INFORMAL MEETINGS BETWEEN NRC AND DOE TECHNICAL STAFF

NRC AND DOE TECHNICAL STAFF MEMBERS TO MEET ONCE A MONTH TO EXCHANGE INFORMATION AND DISCUSS STATUS AS WELL AS ISSUES OF PROGRAM

- 3.0 MAN-WEEKS  
- \$ 0

III. CONSIDERATION OF THE NEED FOR SPECIAL CRITERIA AND PROCEDURES

1. OGC'S CONTRIBUTION IN PUBLIC NOTICES, ENVIRONMENTAL IMPACT STATEMENT, RULEMAKING AND NEW REGULATORY CONSIDERATIONS IN THE AVLIS TECHNOLOGY.

- 4.0 MAN-WEEKS  
- \$ 0

2. OGC'S REVIEW OF ADVANCE NOTICE OF PROPOSED RULEMAKING FOR URANIUM ENRICHMENT REGULATION WITH RESPECT TO THE APPLICABILITY OF THE LEGAL ASPECTS OF THE NOTICE TO AVLIS.

- 2.0 MAN-WEEKS  
- \$ 0

#### IV. REPORT

THE NRC TASK FORCE (COMPOSED OF MANAGERS AND TECHNICAL STAFF MEMBERS FROM WMSS, RES, ADM AND OGC) FOR THE AVLIS PROGRAM TO COMPLETE A REPORT BY JANUARY 30, 1991 TO INCLUDE:

1. AN ANALYSIS OF THE SAFEGUARDS, SAFETY, SECURITY AND LEGAL ISSUES IDENTIFIED IN I, II AND III
2. RESOURCE REQUIREMENTS (STAFF AND TECHNICAL ASSISTANCE CONTRACTS)
3. AN ACTION PLAN WITH MILESTONES AND TANGIBLE PRODUCTS TO RESOLVE THE IDENTIFIED ISSUES

- 10.0 MAN-WEEKS  
- \$ 0



## SPECIAL ISSUE IDENTIFICATION

### SAFETY

- FIRE, PYROPHORICITY, AND EXPLOSION CONSIDERATIONS IN PORTIONS OF THE PROCESS INVOLVING VAPORIZATION AND CONDENSATION OF URANIUM METAL
- TOXICITY OF LASER DYES
- MANAGEMENT, INCLUDING DISPOSITION, OF WASTE STREAMS OF UNKNOWN COMPOSITION AND QUANTITY
- FEED AND PRODUCT CONVERSION PROCESSES THAT ARE INCOMPATIBLE WITH THE PRESENT COMMERCIAL FUEL CYCLE
- NUCLEAR CRITICALITY SAFETY OF NOVEL FORMS OF ENRICHED URANIUM

### SAFEGUARDS

- CONTROLS AND MECHANISMS UTILIZED TO PRECLUDE OR DETECT UNAUTHORIZED ENRICHMENT
- THE PLANT'S ACCOUNTABILITY PROGRAM
- THE PLANT'S MEASUREMENT CONTROL PROGRAM
- THE SCOPE OF IAEA INSPECTION AT THESE FACILITIES
- THE FREQUENCY AND METHODOLOGY OF PHYSICAL INVENTORIES
- PROCESS MONITORING
- DESIGN BASIS THROUGHPUT ON FEED, TAIL, PRODUCT, AND WASTE MATERIALS
- PHYSICAL SECURITY ISSUES

SECURITY

- CLASSIFICATION OF TECHNOLOGY AND EQUIPMENT
- PERSONNEL CLEARANCE REQUIREMENT

LEGAL

- RULEMAKINGS TO COVER SPECIAL FEATURES OF FEED AND PRODUCT CONVERSION PROCESSES, IN PARTS 40, 51, 70
- RULEMAKING, PARTS 75, TO COVER IAEA ISSUES



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

The Honorable James D. Watkins  
Secretary  
U. S. Department of Energy  
Washington, D. C. 20535

Dear Secretary Watkins:

This is in response to the letter of August 9, 1990, in which Mr. William H. Young, Assistant Secretary for Nuclear Energy, requested the U. S. Nuclear Regulatory Commission (NRC) to make resources available for NRC to work with your Department on aspects of commercial deployment of the Uranium Atomic Vapor Laser Isotope Separation (AVLIS) technology. The prospect is that the NRC staff would perform safety and licensing reviews, or alternatively, a licensability review similar to NRC's review of the Fast Flux Test Facility (FFTF). The immediate request is for NRC to make available now <sup>the</sup> NRC resources needed to work with your Department to develop a plan and schedule for performing the safety and licensing reviews. For the reason discussed below, NRC will make available a low level effort to interface with DOE pending legislation that would require NRC to license AVLIS. If licensing is not required, a licensability review by NRC is not considered desirable from NRC's viewpoint.

An important consideration is the difference in NRC's preparedness for such reviews of AVLIS, compared to the FFTF. For the FFTF review, the NRC staff already had a broad range of technical skills and experience in reactor safety, containment performance, and many other aspects of reactor plant licensability review. In contrast, the comprehensive briefing we received from the Department on August 2, 1990, indicates to us that we do not now have the special expertise for many of the potential issues in the AVLIS technology that would be new to NRC, e.g., special explosion hazards, laser hazards, and dye toxicity issues. A licensability review performed without this special expertise could be a disservice and could unnecessarily put NRC on the critical path for this project resulting in additional costs while NRC obtains the broad range of skills needed to do such a review. NRC's current insufficiency in expertise also points to significant uncertainty in even the estimate of resources needed for the initial planning and scheduling.

Another consideration is a potentially large reduction in NRC's resources for Fiscal Year 1991, due to the implementation of the Gramm-Rudman-Hollings cuts. Therefore, we must continue to meet our public health and safety responsibilities under the budget constraints before committing to new undertakings, especially those whose impact on our resources remains undefined. We currently have no resources budgeted for review of AVLIS technology. However, we will continue a low level NRC effort to monitor DOE's AVLIS activities pending licensing legislation.

The Honorable James Watkins

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Your Department's "Plan for the Demonstration, Transition and Deployment of U-AVLIS Technology" is before Congress, as is proposed legislation which would require an AVLIS uranium enrichment plant to be licensed under 10 CFR Parts 40 and 70. If legislation is enacted which requires NRC licensing, we will take steps to request Congress to provide resources needed by NRC to conduct such a review. In the meantime Mr. Charles Haughney, Chief, Fuel Cycle Safety Branch, is designated as the NRC's contact for monitoring ongoing AVLIS activities. He can be reached on (301) 492-3328.

Sincerely,

Kenneth M. Carr