

# Office Memorandum • UNITED STATES GOVERNMENT

*cu*

TO : Alvin R. Luedcke, General Manager  
 THRU : A. Tammaro, Assistant General Manager  
 for Research and Industrial Development  
 FROM : Frank K. Pittman, Director  
 Division of Reactor Development

DATE: 720704

SUBJECT: ESTABLISHMENT OF AN "AEROSPACE NUCLEAR SAFETY BOARD"

SYMBOL: RD:AIR:MP:JAC

OPENNET ENTRY	
<input type="checkbox"/> Authorized for Public Release	Date: <i>12/1/94</i>
By: <i>RS for S. Kelly</i>	Date:
Entered in OpenNet	Date:
<input type="checkbox"/> Not Authorized for Public Release	Date:
By:	Date:

The use of nuclear energy in space introduces a new dimension to the scope of the Atomic Energy Commission's responsibilities. Your consideration of and guidance on our proposal for the formation of an Aerospace Nuclear Safety Board within the Atomic Energy Commission is requested.

This new dimension toward space extends the Commission's traditional role in health protection from radiation and in nuclear safety. Heretofore the Commission's basic role has been confined to the limits of this country and its territorial holdings. Use of nuclear energy in space raises the possibility of introducing new sources of radiation to the earth's atmosphere and oceans, to other solar system bodies, and into areas along probable orbit paths. It becomes incumbent upon the AEC to insure that devices developed under its cognizance can be and are safely used, with conceivable hazard minimized. It is also noted that the introduction of new radioactive materials in outer space and on other solar system bodies may complicate certain long-range scientific studies.

It is proposed to establish an "Aerospace Nuclear Safety Board" to:

1. Analyze and project the effect of nuclear space devices upon the health of the peoples of the world.
2. Analyze and maintain cognizance over the present and future radiation from space nuclear power sources on earth and in those outer space regions of special interest, within the prerogatives of the United States.
3. Provide policy guidance and set standards of safe practice for the employment of nuclear powered space devices proposed by the United States.
4. Regulate the use of nuclear energy for devices in space vehicles and satellites proposed for use by the United States.

**WITH ATTACHMENTS/ENCE**

DEPARTMENT OF ENERGY DECLASSIFICATION REVIEW
DETERMINATION (CIRCLE NUMBER(S))
1. CLASSIFICATION
2. CLASSIFICATION CHANGED
3. CONTAINS NO CONFIDENTIAL INFO
4. COOPERATE WITH
5. RELATIONSHIP CANCELLED
6. CLASSIFIED BY
7. OTHER SPECIAL
SINGLE REVIEW AUTHORIZED BY:
<i>M. Luedcke</i>
REVIEWER (ADB): <i>11-2-94</i>
NAME: <i>Alvin R. Luedcke</i>
DATE: <i>11-1-94</i>

326 U.S. ATOMIC ENERGY COMMISSION ORGANIZATION & MANAGEMENT

Collection *ARM*

Box *3376*

Folder *9*

*2*

~~CONFIDENTIAL DATA~~

This document contains restricted data as defined in the Atomic Energy Act of 1954. Its transmission or the disclosure of its contents is prohibited.

1153091

BEST COPY AVAILABLE

The Aerospace Nuclear Safety Board would report to the Director of Reactor Development of the Atomic Energy Commission. Its membership would be wholly within the Commission and AEC consultants. Suggested Board membership would include representation from:

1. Division of Reactor Development (Chairmanship)
2. Division of Biology and Medicine
3. Division of Licensing and Regulation
4. Division of International Affairs
5. Office of the General Counsel
6. Consultants as required

By mutual agreement among the Department of Defense, the Atomic Energy Commission, and the National Aeronautics and Space Administration an ad hoc study group has been formed to consider technical and safety problems of using nuclear energy in space. To preclude conflict of jurisdiction or activity between this ad hoc study group and the AEC Aerospace Nuclear Safety Board, to specify areas of responsibility of both groups, and to foster mutual assistance between these groups, it is recommended that:

1. The ad hoc study group:
  - a. Be provided such technical assistance by the AEC Aerospace Nuclear Safety Board as may be required.
  - b. Focus its attention upon the projected use of radioisotopes for nuclear energy in space over the next eighteen months.
  - c. Upon completion of its analysis, provide the President's Space Council and other interested agencies with a report of its findings in order to help establish broad national policy for the use of nuclear energy in space.
2. The AEC Aerospace Nuclear Safety Board:
  - a. Serve to meet the Commission's operational responsibilities in the development, testing, and employment of nuclear energy in space, in particular the discharge of Commission responsibility to safeguard the public interest in radiation protection and safety.
  - b. Provide the basis for formulating Commission position in this field.

**CONFIDENTIAL**

3. The Commission explore AEC relationships with the Space Council in this new field in order to define areas of jurisdiction and prerogative, and to insure AEC fulfillment of its responsibilities already directed by law.

The National Aeronautics and Space Administration and the Defense Department's Advanced Research Projects Agency have ambitious plans for earth satellites, lunar, planetary, and space probes and ultimately manned space vehicles. Three important features stand out:

1. Several of these projects already have been implemented.
2. These programs are deemed vital to our national security.
3. Nuclear energy for both auxiliary power and propulsion will be used in many of them.

The international implications of US nuclear energy sources orbiting over foreign countries may present thorny situations. In accordance with the U. S. Policy on outer space established by the National Security Council, the AEC Aerospace Nuclear Safety Board would be expected to provide comprehensive data and recommendations for policy formulation to avoid the origination of these international situations. The AEC Aerospace Nuclear Safety Board would also be expected to guide the efforts of industry in providing adequate nuclear safety to protect the populace.

It is recommended that the Aerospace Nuclear Safety Board be formed at an early date in order to consider and provide guidance for the use of nuclear auxiliary power in a space vehicle in the first quarter of 1960. This first SNAP unit, to power a beacon in an Air Force weapon system, will probably employ several thousand curies of promethium or cerium. Future units, in development, will use large amounts of cerium to attain higher power levels. Reactors now under development will be available by 1963 for sustained higher power requirements. Present requirements are for units up to 300 kW (thermal) with projection into the megawatt range. While waste materials will be contained in the fuel elements, adequate consideration must be given to re-entry.

NOVER (nuclear rocket) and PLUTO (nuclear ramjet) programs are progressing toward feasibility demonstration. Program planning indicates that flight systems with reactor powers up to several hundred megawatts will be available in the next five to ten year period.

~~CONFIDENTIAL~~

Alvin R. Lueders

As background, a Hazards Subcommittee of the SHAP (Systems for Nuclear Auxiliary Power) Coordinating Committee was established in 1957 as an outgrowth of the Martin Company's hazards analysis associated with its effort toward developing the SHAP 1 and SHAP 1a power systems. This group has been working on specific problems associated with development of this SHAP power unit. It is evident that the role of this subcommittee can only be a part of a much larger national and international area of interest, since many of the problems associated with this project can be resolved only by a group operating at a higher, broader level of government responsibility.

In view of AEC representation on the President's Space Council, which has already established a preliminary U. S. policy on outer space, such a Board would serve you in strengthening the position of the Atomic Energy Commission in its new role in space. For example, the enclosed statement, "Proposed Draft Statement on Use of Nuclear Energy in Space, etc. - -" was prepared on short notice for the Commission Chairman's Office by an ad hoc intra-office group. Once the Aerospace Nuclear Safety Board is established, it will be able to support this type of staff function for the AEC.

In summary, it seems timely to form an Aerospace Nuclear Safety Board, including in its sphere of cognizance all programs having the potential to use sources of nuclear energy in space vehicles.

Enclosure

Proposed Draft Statement . . . . U.S. Policy on Outer Space

~~CONFIDENTIAL~~

**CONFIDENTIAL**

**PROPOSED DRAFT STATEMENT ON USE OF NUCLEAR ENERGY IN SPACE  
FOR REVISION OF THE NATIONAL SECURITY COUNCIL PRELIMINARY  
U. S. POLICY ON OUTER SPACE**

---

51. Study the implications for international and national political and social institutions of outer space exploitation by the United States and other nations using nuclear energy in satellites and space vehicles for auxiliary or main power sources or other applications. Establish a Space Nuclear Safety Committee chaired by the AEC to:
1. Analyze and keep track of cumulative amounts of radiation from space nuclear power sources both while located on earth and in outer space regions within the prerogative of the United States.
  2. Analyze the probable effects of nuclear space devices upon the health of world populations.
  3. Provide policy guidance and set standards of safe practice for the employment of nuclear energy in space devices proposed by the United States.
  4. Govern and regulate the use of nuclear energy in accordance with policy guidance for devices in space vehicles and satellites proposed for use by the United States.

July 23, 1959

AEC

Copy made July 27, 1959

**CONFIDENTIAL**

1153095

DOE ARCHIVES