

SJR

42

SENATE COMMITTEE REPORT

FIRST COMMITTEE OF REFERRAL

Date of 29 April 1987 5-DAY NOTICE
IN ACCORDANCE WITH UNIFORM RULE 23

FURTHER: LABOR & COMMERCE
FINANCE

**FISCAL NOTE(S) ATTACHED **
IN ACCORDANCE WITH AS 24.08.035
(see below)

4/21/87

DATE TURNED INTO OFFICE 11 May 1987

Mr. President:

STATE AFFAIRS

Committee considered

SJR 42

use of state airports for plutonium shipments under a proposed
United States agreement with Japan.

and recommended:

[] replace with CS _____ [] same title
[] attached amendment(s) and [] new title

[] do pass

[] do not pass

[] no recommendation

[] indiv' ual recommendations

[] further referral to _____

[] letter of intent adopted and attached

** Committee [] attached or [] adopted fiscal note(s)
[] zero [] fiscal impact

MEMBERS SIGNING DO PASS

OTHER RECOMMENDATIONS

[Signature]
Rich (do pass)
[Signature]

[Signature] No Rec

[Signature]
Chairman signature (and recommendation)

[] Committee Backup Attached

**STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE**

REQUEST: _____

Bill Version : SJR 42
Publish Date : _____

Revision Date: _____
Title: Use of state airports for
plutonium shipments...
Sponsor: Senator Uehling
Requestor: Senate State Affairs

Agency Affected: _____
BRU: _____
Components : _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	-0-	-0-	-0-	-0-	-0-	-0-
CAPITAL	-0-	-0-	-0-	-0-	-0-	-0-
REVENUE	-0-	-0-	-0-	-0-	-0-	-0-

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS : (Attach a separate page if necessary)

Prepared by : _____
Division : _____
Approved by ^{Chairman} Senator Mitch Abood
Agency : Senate State Affairs Committee

Phone : _____
Date : _____
Date : 5/6/87

Distribution (by preparer) :
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)
Senate Secretary



Alaska State Legislature

Senate

MEMORANDUM

P.O. BOX V
State Capitol
Juneau, Alaska 99811

Official Business

TO: Senator Mitch Abood, Chairman
Senate State Affairs Committee

FROM: Senator Rick Uehling *[Signature]*

DATE: May 4, 1987

RE: Backup For SJR42, "An Act relating to the use of state airports for plutonium shipments under a proposed United States agreement with Japan"

I have asked staff to provide the following backup for SJR42, regarding the shipment of plutonium through Alaskan airports. Attached is a brief summary, a copy of the resolution, information from the Governor's Office, a report from the Nuclear Control Institute, and miscellaneous newspaper articles.

Summary

The United States and Japan have recently negotiated a 30 year agreement permitting the shipment of plutonium by air between European reprocessing factories and Japanese nuclear plants. Alaska is the likely refueling point for the cargo planes due to the guidelines of the agreement which specify using a polar route to avoid major population centers and to decrease flight time. Once submitted, Congress has 90 days to disapprove or recommend changes to the agreement.

There are three major concerns raised by the proposed shipment of plutonium through Alaska. First, the agreement does not specify which safety standards will be used to guarantee the safe transport of the plutonium. The United States' Nuclear Regulatory Commission standards are much more stringent than those established by the International Atomic Energy Agency.

Also, a cask or container for safely shipping large amounts of plutonium by plane has not been designed yet. However, there is apparently nothing in the agreement which precludes air shipment even if a safe cask is not developed.

Finally, no Environmental Impact Statement has been prepared yet. Obviously, the proposed shipments pose potentially great risks to the people of Alaska, especially in the event of an aircraft crash, collision, or terrorist attack. The level of that risk and the potential health hazards have not yet been determined.

This resolution opposes the proposed shipment of plutonium through Alaska because of the lack of information about the hazards involved and because it appears that there is no currently available method for safely shipping large quantities of plutonium.

March 24, 1987

MEMORANDUM

TO: STEVE COWPER, Governor

FROM: ERIC LASCHEVER, Associate Director of Fisheries
and the Environment

THROUGH: JOHN W. KATZ, Director of State/Federal Relations
and Special Counsel to the Governor

SUBJECT: PLUTONIUM SHIPMENTS

This memorandum discusses the issue of plutonium shipments which could require landing in Alaska and summarizes discussions which we have had with State Department officials and members of the Nuclear Control Institute.

Background

The United States and Japan have recently concluded the negotiation of a 30 year agreement which would permit shipments of plutonium, an extremely toxic nuclear fuel, between European reprocessing factories and Japanese nuclear plants. The agreement contemplates that the shipments would occur by air; the guidelines for air shipment specify using a polar route to avoid major population centers and decrease air time. Because of the weight of such shipments the planes would have to refuel in North America. Alaska is the most likely location for such refueling, although the agreement does not authorize or require landing in Alaska explicitly. This agreement would replace the current agreement which requires a case by case review of shipment requests.

President Reagan strongly supports the agreement. According to the State Department officials with whom we met, the United States is interested in protecting its share of the commerce in nuclear fuels and in using U.S. involvement as a way of policing the use of these fuels. Japan considers approval of this agreement to be an important element in the cooperative relationship between the two countries.

Approval and Timing. Several federal agencies are currently reviewing the agreement. Following this review the President must submit the agreement to Congress. Congress must act affirmatively within ninety days to disapprove or recommend changes to the agreement otherwise the agreement is considered approved. The President could make his submittal as early as April or as late as June, according to our sources. At this time the agreement is classified.

Issues

The proposed shipment raises a number of issues. First, the agreement does not specify which standards will be followed to ensure the safety of these shipments. Domestic standards established by the Nuclear Regulatory Commission (NRC) are more stringent than those set by the International Atomic Energy Agency (IAEA), the international organization with responsibility in this area. For example, according to the Nuclear Control Institute, the IAEA impact test for the shipment cask requires that it survive a crash at a velocity of 44 ft./sec., the NRC standard is 422 ft./sec. The State Department is unwilling to say at this time that the shipments be subject to the more stringent NRC requirements.

Second, a cask for shipping such large quantities of plutonium safely has not yet been designed. The State Department indicated that an alternative shipping method would be used if a cask is not developed. According to the Nuclear Control Institute staff, nothing in the agreement precludes using airshipments, even if a new cask is not developed. Based on their discussions with the designer of past casks which are used for smaller shipments, the Institute feels that it is unlikely that a safe cask will be designed in the foreseeable future..

Finally, no Environmental Impact Statement (EIS) has been prepared. The attached district court opinion provides some precedent for the proposition that movement of nuclear fuel is a major federal action that could significantly affect the human environment and therefore requires the preparation of an Environmental Impact Statement.

The State Department believes that it is too early in the process to subject the agreement to the National Environmental Policy Act (NEPA). They concede that it might be necessary to complete an environmental assessment (EA) or statement after the specifics for the shipment are worked out. An EA is a less thorough analysis than an EIS. The Nuclear Control Institute argues that from a legal stand point an EIS should be prepared earlier in the process. They further note that it could be much more difficult politically to prepare an EIS after Congress approves a

general agreement. They argue that the best time to prepare an EIS is before the general agreement has been approved by Congress. Further, pressure to allow shipment to occur will increase along with Japan's needs for the reprocessed fuel.

There are a number of policy options for you to consider. We will be prepared to discuss them in our conversation with you on this subject.

Attachment

cc: Nadine Winters
David Ramseur

STATE OF ALASKA

OFFICE OF THE GOVERNOR
JUNEAU

STEVE COWPER
GOVERNOR

NEWS RELEASE



FOR INFORMATION CONTACT
David Ramseur
Press Secretary

Laury Roberts Scandling
Deputy Press Secretary

Office of the Governor
Box A, Juneau, AK 99811

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FOR IMMEDIATE RELEASE
April 2, 1987
No. 87-35

COWPER REQUESTS STUDY ON JAPANESE PLUTONIUM SHIPMENTS

JUNEAU--Gov. Steve Cowper today requested the federal government to conduct an environmental impact statement before proceeding further with plans to permit aircraft carrying the highly toxic nuclear fuel plutonium from Japan to refuel in Alaska.

In a Thursday letter to Secretary of State George Shultz, Cowper said the proposed shipments could have "tremendous consequences for the health and safety of Alaskans as well as for the state's environment."

He urged that an EIS be undertaken before the issue reaches Congress so the full range of alternatives to shipping the fuel through Alaska can be considered.

"In my opinion, it is not sufficient to prepare an EIS at the time when a stopover site is actually designated," Cowper wrote. ". . . Once the President and Congress have approved the 30-year blanket acceptance embodied in the cooperative agreement, it is difficult to perceive how a truly objective analysis of possible airport sites, safety measures and other relevant considerations could occur."

-MORE-

At issue is a Reagan administration agreement which would permit the shipments of plutonium between European reprocessing factories and Japanese nuclear plants. The 30-year agreement contemplates flying the fuel using a polar route and the weight of the shipments require that they refuel in North America, and perhaps in Alaska.

President Reagan is currently reviewing the agreement and is expected to submit it for congressional approval this spring or early summer. Congress must act affirmatively within 90 days to disapprove the agreement or it becomes effective.

The shipments raise a number of questions which prompted Cowper's concern. For example, there are no safety standards which apply to the shipments nor does a cask for carrying the plutonium exist.

Cowper said federal law requires the preparation of an EIS for major federal action significantly affecting the quality of the human environment. He said there is no question "that a decision to ship plutonium through an Alaskan airport is a major federal action which could affect the human environment."

April 8, 1987

Dear Secretary _____:

I am writing to you in your capacity as a member of the inter-agency team which is reviewing the proposed nuclear cooperation agreement between the United States and Japan.

This agreement may result in the designation of an Alaska airport as an intermediate stop-over point for the shipment of plutonium from Europe to Japan and could have tremendous consequences for the health and safety of Alaskans, as well as for the State's environment. For these reasons, I have requested that the State Department, as lead agency in the process, prepare an Environmental Impact Statement (EIS) which examines the consequences of shipping plutonium through Alaska before the President makes a final decision regarding the agreement.

The enclosed letter to Secretary Schultz outlines in greater details my concerns and the legal basis for this request. I would appreciate your consideration of this request and assistance in ensuring that the full range of alternatives for accommodating Japan's needs for the recycled plutonium are considered prior to reaching a final decision on the matter.

Sincerely,

Steve Cowper
Governor

Enclosure

cc: Delegation
The Honorable George Schultz

bcc: Nadine Winters
Grace Schaible
John Katz
Brenda Yager, State Department
Gerald Brubaker, Assistant for Non-proliferation
Policy, Office of the Secretary, Pentagon, 2D526,
Washington, D.C. 20301-2600
Sen. Glenn's Staff person

Identical letters to:

The Honorable Caspar Weinberger
Secretary of Defense
The Pentagon
Washington, D.C. 20301

The Honorable Elizabeth Hanford Dole
Secretary of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

The Honorable John S. Herrington
Secretary of Energy
Forrestal Bldg.
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Mr. Lando Zech, Jr.
Chairman
Nuclear Regulatory Commission
Matomic Bldg.
1717 H. Street, N.W.
Washington, D.C. 20555

April 2, 1987

TRANSMITTAL MEMORANDUM

TO: STEVE COWPER, Governor

ATTN: NADINE WINTERS, Special Assistant

FROM: JOHN W. KATZ, Director of State/Federal Relations
and Special Counsel to the Governor

ERIC A. LASCHEVER, Associate Director for
Fisheries and the Environment

SUBJECT: LETTER REQUESTING PLUTONIUM EIS

President Reagan is likely to submit the agreement to Congress as soon as the interagency review is completed. We should get this letter in as soon as possible for maximum effect.

This has been reviewed by an expert on NEPA and atomic energy law.

April 2, 1987

Honorable George P. Shultz
Secretary of State
U.S . Department of State
2201 C. Street, N.W.
Washington, D.C. 20520

Dear Secretary Shultz:

As you know, the United States and Japan have recently completed negotiation of a nuclear cooperation agreement which may result in the designation of an Alaska airport as an intermediate stopover point for the shipment of plutonium from Europe to Japan. This agreement could have tremendous consequences for the health and safety of Alaskans, as well as for the state's environment. Based on the information which I have received from my staff, the press, and other sources, I have concluded that there are a number of critical unanswered questions regarding this agreement. . Therefore, I am writing to request that the Departments of State and Energy prepare an Environmental Impact Statement (EIS) which would address these questions before you conclude the executive decision making process and submit the agreement to the Congress for review. My concerns and the legal basis for this request are outlined below.

The National Environmental Policy Act (NEPA) requires that the Federal government prepare a detailed statement on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. This requirement serves two purposes: protection of the environment, and protection of the integrity of the decision making process to ensure that there is an opportunity adequately to review the environmental consequences of a Federal act. Both of these purposes are best served by the preparation of an EIS to accompany the submission of the agreement to Congress.

First, there is no question that a decision to ship plutonium through an Alaskan airport is a major Federal action which could affect the human environment. In this regard, the Nuclear Regulatory Commission (NRC) prepared a site specific analysis of shipping radioactive fuels through New York City. This document analyzed a range of scenarios, including an accident which resulted in thousands of latent cancer fatalities and billions of dollars in economic loss.

In addition, the United States District Court for Western Washington held in September, 1986 that the shipment of such fuels from a foreign country to the United States is covered by NEPA. In that case, the court directed the Department of Energy to prepare an EIS. Finally, regulations promulgated by the Council of Environmental Quality and by the Departments of State and Energy recognize that international agreements with significant domestic environmental consequences are "proposals for legislation" under NEPA.

Second, a systematic presentation of the alternatives to the President and Congress, as contemplated by NEPA, is especially important in this case, given the number of possible scenarios and the different risks involved in each. For example, the agreement does not specify what safety standards the casks which will be used for the shipments must meet. Both the International Atomic Energy Agency (IAEA) and the Nuclear Regulatory Commission have standards for testing the ability of the shipment casks to withstand a crash. However, the international standards are less stringent than those used by the NRC. An EIS is necessary to assess the environmental and health risks which would result from using either of these or some other set of standards.

Similarly, it is unclear whether it will be possible to build a cask which can survive an airplane crash and which is large enough to ship the quantities of fuel contemplated in the agreement. An EIS is needed to evaluate the alternatives which will be used in the event that a safe cask cannot be developed.

In 1980, the Department of Energy prepared an analysis of the storage and shipment of foreign power reactor fuel. With regard to shipment, the analysis listed the following factors which should be covered by an EIS: demography along the transportation routes, emergency response capabilities, weather patterns along the routes, and location of drinking water and food sources for the surrounding population. No information regarding these factors has been presented so far. Without this type of analysis, the President and Congress will be unable to make a reasoned decision regarding the agreement.

In my opinion, it is not sufficient to prepare an EIS at the time when a stopover site is actually designated. (From our discussions with Federal officials, it is by no means clear that an EIS is contemplated even at this point.) For one thing, relevant NEPA case law indicates that a statement should be prepared at the earliest reasonable junction in a Federal decision making process which involves several sequential but related steps. For another, once the President and the Congress have approved the thirty year blanket acceptance embodied in the cooperative agreement, it is difficult to perceive how a truly objective analysis of

possible airport sites, safety measures, and other relevant considerations could occur. In other words, execution of the agreement will generate a momentum that will make stringent protective measures or outright negative decision making far more difficult and less acceptable in the international relations context.

To conclude, I believe that this agreement represents a major Federal action which could significantly affect the human environment in Alaska. Final action by the President and the submission of the agreement to Congress prior to preparing an EIS could foreclose opportunities for decision makers, as well as the public, to consider the full range of alternatives for accommodating Japan's needs for recycled plutonium. For these reasons, I respectfully request that the Departments of State and Energy prepare an EIS prior to concluding their review of the Agreement and its submission to Congress.

Sincerely,

Steve Cowper
Governor

cc: Senator Ted Stevens
Senator Frank Murkowski
Senator John Glenn
Congressman Don Young



NUCLEAR CONTROL INSTITUTE

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SPECIAL REPORT

AIR TRANSPORT OF PLUTONIUM OBTAINED BY THE JAPANESE FROM NUCLEAR FUEL SUPPLIED BY THE UNITED STATES

Paul Leventhal, Milton Hoenig and Alan Kuperman

March 3, 1987

Paul Leventhal is president of the Nuclear Control Institute. Milton Hoenig is the scientific director. Alan Kuperman is a research associate. The report was jointly researched, and was written by Mr. Kuperman. The Nuclear Control Institute is non-partisan and non-profit and conducts independent research on problems relevant to the spread of nuclear weapons.

PRESIDENT
Paul L. Leventhal

BOARD OF DIRECTORS

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NUCLEAR CONTROL INSTITUTE

1000 Connecticut Avenue, N.W., Suite 406, Washington, D.C. 20036 (202) 822-8444

FOR IMMEDIATE RELEASE
Tuesday, March 3, 1987

BIWEEKLY FLIGHTS OF HUNDREDS OF POUNDS OF PLUTONIUM TO BE AUTHORIZED UNDER U.S.-JAPAN NUCLEAR ACCORD

President Reagan is preparing to submit to Congress a new 30-year nuclear-cooperation agreement with Japan that would require biweekly flights of cargo planes carrying about 500 pounds of plutonium from Europe to Japan. Because of the enormous weight of shipping casks to be used to transport the plutonium, the flights would cross Canada and land for refueling in Anchorage, Alaska, and then take off again for Japan.

A crash-proof cask being developed for these plutonium shipments failed to survive a high-velocity impact test at Sandia National Laboratories last summer. No new tests have been scheduled, and some experts close to the project believe that it will not be possible to build a large cask, for use in large-scale shipments of plutonium, that can survive a realistic crash test. The cask being developed weighs 5,000 pounds and holds about 15 pounds of plutonium. There would be as many as 40 of these casks on a single Boeing-747 cargo plane.

It is possible that the Reagan Administration will permit Japanese plutonium flights in and out of Anchorage utilizing casks that fail to meet strict safety criteria spelled out by the Nuclear Regulatory Commission after Congress mandated the development of crash-proof casks in a 1975 law.

Plutonium, a manmade element created as a waste byproduct of reactor operation, is highly toxic and can be used in nuclear weapons. The Japanese plan to use recovered plutonium as fuel in their power reactors---an approach that has been rejected by Congress as too hazardous and costly for the United States domestic nuclear power program.

Details of the planned air shipments of plutonium are disclosed in a Special Report, "Air Transport of Japanese Plutonium Obtained from U.S.-Controlled Nuclear Fuel," prepared by the Nuclear Control Institute and released today. The Institute is non-partisan and non-profit and conducts independent research on problems relevant to the spread of nuclear weapons.

The new nuclear agreement---negotiated by the Reagan Administration but still not submitted for Congressional approval---would give the Japanese a 30-year advance approval to recover and use plutonium produced in nuclear fuel originally supplied by the United States for Japanese power reactors. The new agreement would replace the present agreement, which does not expire until the year 2003. Under the existing agreement, the United States can withhold approval on a case-by-case basis of Japanese plutonium activities on safety or security grounds.

The U.S. government blocked for two years a large plutonium shipment by boat that originally was to proceed on its five-week journey from France to Japan without military escort or surveillance. The large risks and costs associated with this shipment, which finally involved the use of French and U.S. warships and satellites in 1984, led to plans to send future shipments by air. Under the new U.S.-Japan agreement, however, the United States would lose its veto power over safety and security arrangements for these shipments, as well as over use of the plutonium itself.

The United States presently exercises legal control over most of the 85 metric tons (187,000 pounds) of plutonium that the Japanese want to recover from their nuclear spent fuel by the year 2000. About half of the plutonium is contained in spent fuel that Japan has sent or has contracted to send, with U.S. consent, to France and the United Kingdom for reprocessing. U.S. controls now apply to at least 80 percent of the 45 metric tons (99,000 pounds) of Japanese plutonium to be separated in France and the U.K., according to an analysis by David Albright, a physicist with the Federation of American Scientists.

Under the new agreement, the United States would provide one approval, in advance, for Japanese shipment and use of plutonium derived from U.S.-supplied nuclear fuel or fuel used in U.S.-supplied reactors, for the 30-year life of the agreement.

The Nuclear Control Institute report was co-authored by Paul Leventhal, the Institute's president, Milton Hoenig, the scientific director, and Alan Kuperman, a research associate.

The report concludes: "There are many technical issues to be resolved before it can be determined whether commercial air transport of plutonium, as envisioned in the upcoming U.S.-Japan nuclear agreement, can be achieved safely and securely It is premature, therefore, for the Reagan Administration to negotiate away U.S. authority over how Japan makes use of plutonium contained in spent nuclear fuel originally supplied by the United States. The President should not submit the new U.S.-Japan agreement to Congress until all technical issues with regard to air transport of plutonium are resolved."

In addition, the report concluded: ". . . there are also questions concerning the vulnerability of commercial, weapon-usable plutonium to attacks or thefts by terrorists, as well as the eventual spread of this material to nations seeking the capability to build nuclear weapons. From both counter-terrorism and non-proliferation perspectives, the risks of commercial use of plutonium may far outweigh any energy benefits of 'using this fuel.'"

SPECIAL REPORT

AIR TRANSPORT OF PLUTONIUM OBTAINED BY THE JAPANESE FROM NUCLEAR FUEL SUPPLIED BY THE UNITED STATES

Paul Leventhal, Milton Hoenig and Alan Kuperman

I. Overview of the Problem

President Reagan may soon approve and submit to Congress a new nuclear cooperation agreement that his Administration has negotiated with Japan. The agreement would give Japan advance approval to reprocess, over the next 30 years, U.S.-supplied and -controlled nuclear fuel after it is removed from Japanese power reactors. The reprocessing of the spent fuel would result in chemical separation of plutonium for use as a fuel in Japan's nuclear power program.

If the new agreement is approved by the President and is not rejected by Congress, the Japanese will have a blanket authorization to separate all the U.S.-controlled plutonium produced in Japanese reactors. This plutonium will make up most of the 85 metric tons [187,000 pounds] of plutonium that will be produced in Japanese spent fuel by the year 2000.

Plutonium is a man-made element that is created as a waste byproduct of reactor operation. It is highly toxic, and it can be used in nuclear weapons. Laboratory experiments show that microgram quantities can cause cancer. Five to eight kilograms [11 to 18 pounds] is sufficient for use in a "primitive" fission bomb of the type that destroyed Nagasaki. (The United States now has about 100 metric tons [220,000 lbs.] of plutonium in its stockpile of nuclear weapons.)

More than half of the 85 metric tons would be separated by reprocessors in Europe, and then transported back to Japan. The first such shipment was made by ship from France to Japan in 1984. The five-week voyage involved such large risks and required such massive military escort and surveillance activities, that both the United States and Japan agreed that future shipments should be made by air.

Present plans call for air shipments of plutonium to cross over Canada, land for refueling in Alaska, and then proceed to Japan. There are a number of problems with the execution of these plans:

1. Commercial air shipment of multi-ton quantities of plutonium is unprecedented. A few flights of no more than 100 pounds each had come into the United States before enactment of the Scheuer Amendment (P.L. 94-79) in 1975. This law barred the Nuclear Regulatory Commission from licensing "any shipments by air transport of plutonium in any form, whether exports, imports or domestic shipments" until the NRC certified a cask capable of surviving "the crash and explosion of a high-flying aircraft."

2. A cask large enough for efficient, large-scale shipment of the Japanese plutonium has not been certified by the NRC. A prototype cask, weighing 5,000 pounds and designed to hold about 15 pounds of plutonium, failed a crash test last summer.

3. If the cask now being developed is eventually used, one Boeing-747 shipment of more than 500 pounds of plutonium would be required every two weeks---taking off from France or the United Kingdom, overflying Canada, landing for refueling in Alaska, and then taking off again and finally landing in Japan. These flights may prove to be of considerable local and national concern. Canada has had one experience with radioactive fuel falling from the sky, during the reentry of an orbiting Soviet satellite in January, 1978.

4. If the cask proves to be technically unfeasible---as some experts advise us will be the outcome---plutonium air transport (PAT) may have to be accomplished with existing, smaller PAT-1 casks, which were never intended for such large-scale transport.

5. The Japanese shipments may not be subject to licensing by the NRC because, although the Commission is responsible for licensing initial exports of uranium fuel, all subsequent arrangements involving spent fuel and the plutonium contained in it are approved by the Department of Energy. The safety of DOE-approved shipments of separated plutonium comes under the jurisdiction of the U.S. Department of Transportation when any such shipments are flown into U.S. airports and/or air space. According to a DoT official, the Transportation Department probably would consult with the NRC on approving a cask, but the DoT would make clear to the NRC that only the International Atomic Energy Agency (IAEA) standards for safe transport need be met.

The IAEA standards are far less demanding than those set by the NRC. For example, the IAEA impact test requires a velocity of only 44 ft./sec., while the NRC-mandated test requires a velocity of at least 422 ft./sec. Further, the IAEA crash standards are no more stringent for plutonium casks than they are for casks used for less hazardous nuclear materials.

The Scheuer Amendment prescribes extra precautions for NRC-licensed plutonium transportation, owing to plutonium's extreme toxicity. The Administration, however, appears to be interpreting the Atomic Energy Act in a way that could permit foreign plutonium to be flown into an Anchorage airport in casks that need not meet the NRC's strict crash standards.

The Atomic Energy Act requires NRC licensing of domestic, commercial plutonium shipments, as well as imports of plutonium for commercial use in the United States. (There are presently no such shipments because of Congressional actions resulting in the shutdown of all elements of the U.S. commercial plutonium program---spent-fuel reprocessing, fresh-fuel fabrication and breeder-reactor development.) However, plutonium-bearing cargo planes landing for refueling in the United States, on their way from Europe to Japan, apparently are viewed by the Administration as neither domestic nor import shipments. This interpretation could create a loophole not intended by Congress:

flights of foreign plutonium stopping in the United States may be approved by the DoE on the basis of cask-safety criteria substantially inferior to those set by the NRC.

In the face of known dangers and high clean-up costs associated with environmental releases of plutonium, the United States---under the agreement negotiated by the Reagan Administration with Japan---would acquiesce in the development of a Japanese plutonium fuel economy that could result in a payload of plutonium landing in Anchorage as often as every two weeks.

Crashes of two U.S. military aircraft carrying nuclear warheads, which resulted in the release of substantial amounts of plutonium, serve to illustrate the problem. One crash occurred at Palomares, Spain, in January, 1966 after a bomber and a tanker collided in a routine mid-air refueling operation. Clean-up of 1,400 tons of contaminated soil and vegetation at Palomares cost \$500-million. The crash of a bomber carrying four nuclear weapons at Thule, Greenland, in January, 1968, required the removal of one and a half million gallons of contaminated snow, ice and water at a cost of \$300-million. Both of these sites were unpopulated. Plutonium contamination of a more densely populated crash site would involve a public health risk, and evacuation and decontamination costs would be many times higher.

Under the present U.S.-Japan nuclear agreement, which expires in 2003, the Japanese must obtain U.S. approval of each of their reprocessing, plutonium-transfer and plutonium-use requests. Thus, the existing agreement permits the United States to withhold approval of air shipments of U.S.-controlled plutonium in the absence of a crash-proof cask that meets NRC's specifications. The new agreement would replace the existing case-by-case review process with a blanket U.S. approval of Japanese plutonium activities for the 30-year life of the agreement.

By the late 1990s, Japan will have 5,250 kg. [11,550 lbs.] of plutonium separated each year from spent fuel by reprocessors in the UK and France---the equivalent of 5,950 kg. [13,090 lbs.] of plutonium oxide---according to David Albright in "Civilian Inventories of Plutonium and Highly Enriched Uranium."¹ Out of a total of 48 metric tons of plutonium to be separated in Europe for Japan by the year 2000, 45 metric tons are from fuel irradiated in light water reactors (LWRs). According to Albright, a physicist with the Federation of American Scientists, at least 80 percent, if not virtually all, of this LWR-produced plutonium was separated from fuel supplied by the U.S. or used in U.S.-supplied reactors and, therefore, comes under U.S. control.

Air shipments of commercial plutonium of the magnitude to be authorized by the Japanese agreement have never occurred. Indeed, these shipments may exceed the amounts of plutonium now shipped by air for the U.S. nuclear weapons-program.

^{1/} This paper appears in Preventing Nuclear Terrorism: The Report and Papers of the International Task Force on Prevention of Nuclear Terrorism, A Nuclear Control Institute Book, Lexington Books, 1987, pp. 265-291.

The significance of the plans to ship plutonium by air is underscored by the on-going development of a communications system for the International Atomic Energy Agency to continuously monitor the integrity of casks during flight. The system, called Artemis, is being designed and set up by the U.S. Arms Control and Disarmament Agency. It will use the private Inmorsat satellite to monitor tamper-indicating seals in "real-time" and the U.S. Navstar Global Positioning System to accurately track the position of the aircraft.

II. Brief Historical Background

In January 1978, the NRC, pursuant to the Scheuer Amendment, published NUREG-0360, "Qualification Criteria to Certify a Package for Air Transport of Plutonium," which detailed: (1) a rigorous set of crash, burn and submersion simulations, to which any potential cask would have to be subjected before its certification; and (2) operational conditions for air transport of plutonium, which would have to be followed to ensure the integrity of the cask and its contents.

By June 1978, the safety analysis report on the first prototype cask, the PAT-1, was published, and by August 1978, the NRC officially certified the cask for use. The PAT-1 weighed approximately 500 lbs. and was cylindrically shaped, with a length of 42.5 inches and a diameter of 24.5 inches. It was authorized to hold up to 2 kg. [4.4 pounds] of plutonium oxide, uranium oxide, their daughter products, or any mixture thereof.

The only real need for air transport of plutonium at the time, however, was for quick, international delivery of IAEA plutonium samples---for analysis as part of their international safeguards procedure. The amounts with which the IAEA was dealing were very small, but were still large enough to require a cask under the law's provisions. The size of the PAT-1 was overkill for these small samples, and as a result, its use would have strained the budget of the IAEA.

The IAEA thus asked the U.S. government to help develop a Light Weight Air Transportable Accident Resistant Container (LATARC), later known as the PAT-2. By September 1981, the PAT-2 had been developed, tested and licensed for use by the NRC, weighing only 73 pounds but holding only 40 grams of plutonium oxide, which was satisfactory for the IAEA's needs, but clearly inadequate for large scale transport. Because the operating procedures specified by NUREG-0360 still made the casks' use prohibitively expensive, the NRC reviewed these operational guidelines and eventually relaxed the restrictions on tying-down the casks and on what other types of hazardous cargo could be aboard flights containing the casks. The NRC concluded that the new, less stringent guidelines did not "significantly" affect the ability of the PAT-2 package to withstand the crash and explosion of a high flying aircraft.

Since then, the only major advance in the development of these casks was the development of a modified PAT-1, which could carry 3.15

kg. of plutonium metal, as opposed to the original 2 kg. of plutonium oxide. This modified PAT-1 was licensed for use by the Department of Energy, but was never submitted to the NRC, because there were no NRC-licensed transports of plutonium taking place at the time. There are no indications that the Japanese are considering shipping the plutonium in its highly flammable (pyrophoric) metallic form, which is also the preferred form for use in weapons.

III. The Present Situation

The PAT-1 and PAT-2 are thus the only two NRC-certified casks in existence for air transport of plutonium. A number of firms around the world, including PNC (Japan), COGEMA (France), and BNFL (UK), are working on developing a larger cask that would make commercial shipment of reprocessed plutonium economically viable.

The only acknowledged test of such a cask took place at Sandia National Laboratories in the summer of 1986. It was an impact test of a prototype PAT-3 cask developed jointly by PNC and Battelle-Columbus. The cask weighed about 5000 lbs. and was designed to hold 6-7 kg. [about 13-15 lbs.] of plutonium oxide. The cask was propelled into a hard target at more than 422 ft/sec. (250 knots---the maximum legal air speed below 10,000 ft. and the speed specified by NUREG-0360). The cask failed the test, and no new prototype has yet been tested or scheduled for testing at Sandia, according to knowledgeable Sandia officials. One such official said Battelle has "gone back to the drawing board."

When we asked a leading expert on the engineering of casks to predict when a large, crash-proof cask with a capacity of 6-10 kg. of plutonium oxide would be developed, he replied: "Never." He explained that due to the rigor of the NUREG-required tests, there was a limit to the size of any cask, because past a certain size, the cask "committed suicide"---that is, it collapsed on itself. Thus, he felt that there was an absolute limit---barring an unforeseen developmental breakthrough---to the size of a crash-proof cask, and a corresponding limit to the amount of plutonium that it could hold.

The limitation on size results from a basic principle of engineering which states that as the size of a structure is increased, the weight of the structure grows much faster than the strength. Thus, as bigger casks are developed, the force of impact eventually overwhelms the strength of the package.

IV. Air Transportation Facts for Proposed New PAT-3

According to various informed sources, the PAT-3 cask, if successfully developed, would weigh 5,000 pounds, hold 6 to 7 kilograms of plutonium oxide, and be packed three casks at a time into shipping containers for transport in Boeing-747 cargo planes. The 747s have a maximum cargo load of 255,000 lbs. according to NUREG-0360.

Thus, we can calculate the maximum capacity of plutonium flights using the PAT-3 casks:

Each shipping container would hold 3 casks. A typical container would have a capacity of 12.5 short tons and itself weigh 2,600 lbs. The weight of a packed container would be at least 15,000 pounds for the casks [3 x 5,000 lbs.] plus 2,600 lbs. for the container, or a total of 17,600 pounds. With the addition of packing materials, the total weight of a filled container would likely be as large as 20,000 pounds, or 10 short tons.

Based on its total weight capacity, a 747 could carry some 12 or 13 containers, depending on the added packing materials. Given that each cask can hold 6-7 kg. of plutonium oxide, each container would hold 18-21 kg. [40-46 lbs.] of plutonium oxide, and there would be from 216 kg. to 273 kg. [475 to 600 lbs.] of plutonium oxide in a single 747. Thus, the likely load on each 747 shipment to Japan would be about 250 kg. [550 lbs.] of plutonium oxide. Because of the heavy load, a 747 would need to refuel in Alaska enroute from Europe to Japan.

Volume capacity would not be a problem. According to our calculations, a 747 cargo flight could hold 14 of the above-discussed containers plus additional containers of smaller size if weight were not a factor.

As discussed above, the Japanese will have 5,250 kg. of plutonium per year separated by reprocessors in Europe by the late 1990s, or the equivalent of 5,950 kg. of plutonium oxide. At 250 kg. [550 lbs.] per 747 flight, that would mean at least 23 flights per year.

Thus, in order to move the estimated 45 metric tons of plutonium that European reprocessors will separate from LWR spent fuel for Japan by the year 2000, a 747 carrying over 500 pounds of plutonium would have to fly over Canada and land in Alaska every two weeks by the mid-to late 1990s.

It is by no means clear, however, that a PAT-3 crash-proof cask can be developed. Such flights may use a cask that does not meet the NRC's present strict requirements, if DoE and DoT choose not to require it. It also should be noted that the last time the NRC's operational requirements hindered use of a cask (the PAT-2), those safety restrictions were relaxed by the NRC itself.

7. Calculations for Air Transport Using PAT-1

If use of a PAT-3 cask eventually is barred because one cannot be developed to meet the NUREG 0360 crash standard, the only NRC-certified cask that exists for potential large-scale shipment of plutonium is the PAT-1.

We estimate that as many as 350 PAT-1 casks, each weighing 500 lbs., could be carried on one dedicated 747 flight. At 2 kg. of plutonium oxide per cask, this yields a capacity of 700 kg. [1540

lbs.] of plutonium oxide per flight. Thus, transporting 5,950 kg. [about 13,000 lbs.] of plutonium oxide per year could be done with as few as nine flights, each carrying about 1,500 pounds of plutonium oxide per 747.

There are serious obstacles, however, to the use of this cask for such commercial transport. According to an NRC official, substantial safety issues would have to be resolved in connection with shipments of such large quantities of plutonium. For example, a 747 fully loaded with PAT-1 casks would be more vulnerable to severe consequences from an engine-rotor accident or a mid-air collision (see next section).

An additional problem is that neither of the two versions of PAT-1 now in existence is capable of holding a COGEMA plutonium container, which is used to store Japanese plutonium in France. Nevertheless, according to an NRC official, there were indications in 1986 of possible Japanese interest in using the PAT-1 for large-scale plutonium transport. However, when COGEMA was asked to modify its plutonium container for use in the PAT-1, the French plutonium producer refused, according to a knowledgeable source. Further, this official said, the three firms actively working on casks---PNC (with Battelle-Columbus), BNFL, and COGEMA---all have resisted suggestions simply to modify the PAT-1 design in order to fit the COGEMA plutonium container, even though, according to him, that modification could be performed by the right engineer. The clear preference has been to develop a crash-proof PAT-3 cask.

VI. Other Cask Issues

1. If a PAT-3 cask is developed that survives the simulated crash test required by NUREG 0360, it would be desirable to further ascertain, and to demonstrate to the public, that a full complement of casks will survive an actual plane crash. This objective can be accomplished by crashing a 747 with a full load of casks containing non-radioactive material. As learned from a December 1984 FAA crash test of a Boeing-720, actual crashes can have very different consequences than simulated crashes in a laboratory. In a test that cost \$11.8-million, flame-proof fuel that had been tested successfully in laboratory crash tests, burst into a fireball when the Boeing 720, using the fuel, was actually crashed.

According to knowledgeable officials, the NRC originally considered crashing the PAT-1 cask in a retired naval plane, which was set aside at Sandia specifically for such a test, but they decided not to because of the expense---less than \$10-million---of monitoring equipment. An actual crash test of the PAT-3 casks and containers in a Boeing-747 may cost (including the price of an older 747) as much as \$25-million---an expense that should be considered in relation to the enormous cost of cleaning up a plutonium spill, and in the context of increased assurance of the casks' integrity.

2. There is the possibility of a terrorist attack on a plane carrying these casks, especially during take-off and landing, during

refueling, and during loading and unloading of the cargo. When the cask specifications were developed, the terrorist contingency was not specifically considered, according to knowledgeable officials.

3. The NUREG-0360 cask specifications do not take into account the possible consequences of a mid-air collision in which a cask is directly hit. The regulation states (page 47) that "in the event of fuselage-to-fuselage collision,.. if the package is in a position to be struck directly, the severity of the resulting impact is difficult to predict." Such a collision could occur near a busy airport or during mid-air refueling, as occurred at Palomares, Spain. At present, Japanese plans are to land for refueling in Alaska, not to refuel in mid-air.

4. At the time NUREG-0360 was written, there was concern that an engine-rotor accident could damage a cask. Since the NRC was considering the transport of no more than a few casks at a time, it required that the casks be placed in the aft-most section of the main deck in order to preclude placement near the engine rotors. A plane that is fully loaded with casks would, however, have casks near the engine rotors. According to an NRC official, a complete reevaluation would be required before a cask for use in a plane fully loaded with casks would be licensed, and the issue of an engine-rotor accident would have to be reconsidered.

5. Three firms are known to be working on PAT-3 casks: PNC (through Battelle-Columbus), BNFL, and COGEMA. At the PATRAM-86 (Packaging and Transportation of Radioactive Materials) conference in Davos, Switzerland, each gave presentations on the progress of their work and predicted success by the end of 1986. To date, there have been no reports of any tests in the technical journals. The PATRAM-86 proceedings are being published, but are not yet available. Attempts to acquire the individual presentations through the firms and their embassies, as well as any test results, have not yet proved successful. It is understood within the technical community, however, that the French tested their prototype PAT-3 about one year ago and that the test was a complete failure, resulting in a shattered cask.

6. The Japanese are developing their own plutonium air transport regulations, which are likely to be very similar to the NUREG specifications. It is not clear, however, what the final Japanese specifications will be in the event a crash-proof PAT-3 cannot be developed. It is expected that the Japanese will require at least two more years to develop their regulations and that the first air shipments of plutonium will begin after 1990.

IX. Conclusion

There are many technical issues to be resolved before it can be determined whether commercial air transport of plutonium, as envisioned in the upcoming U.S.-Japan nuclear agreement, can be achieved safely and securely. Considerable uncertainty still surrounds the development of a crash-proof cask suitable for use in large shipments of plutonium. Further, there are environmental and

security implications important to the United States in the establishment of a plutonium fuel economy in Japan. It is premature, therefore, for the Reagan Administration to negotiate away U.S. authority over how Japan makes use of plutonium contained in spent nuclear fuel originally supplied by the United States. The President should not submit the new U.S.-Japan agreement to Congress until all technical issues with regard to air transport of plutonium are resolved.

In addition to air-transport safety questions, there are questions concerning the vulnerability of commercial, weapon-usable plutonium to attacks or thefts by terrorists, as well as the eventual spread of this material to nations seeking the capability to build nuclear weapons. From both counter-terrorism and non-proliferation perspectives, the risks of commercial use of plutonium may outweigh any energy benefits of using this fuel. Further, use of plutonium fuel is no longer regarded as economical because of abundant, low-cost supplies of uranium now available on the world market. The uranium used to fuel nuclear power plants, in contrast to plutonium, is not suitable for use in nuclear weapons.

#

U.S. Negotiates a 30-Year Draft Accord Approving Japan's Plutonium Shipments

By ROBERT E. TAYLOR

Staff Reporter of THE WALL STREET JOURNAL

WASHINGTON—With Japan planning to step up international shipments of bomb-grade plutonium, the Reagan administration is moving toward ending case-by-case approval of such shipments.

The administration has negotiated a draft 30-year agreement with Japan that would give blanket U.S. approval of all Japanese shipments of such plutonium, administration officials said.

The agreement also covers shipments of spent nuclear fuel from Japan's electricity generating plants to Europe for reprocessing into a form of plutonium that can be returned to Japan for use in a new type of nuclear reactor.

Currently, the U.S. must separately approve each Japanese shipment of plutonium made from U.S.-supplied fuel or fuel from U.S.-made plants.

Reagan Pledge

The draft agreement, circulating for comment within the Reagan administration and the Japanese government, would carry out a pledge by President Reagan to give Europe and Japan a more predictable supply of plutonium reprocessed from nuclear reactors' spent fuel, according to the officials, who declined to be identified.

The draft agreement stems from the administration's belief that it cannot stop the spread of civilian uses of plutonium, so it should focus on improving security arrangements.

But the Nuclear Control Institute, a Washington group dedicated to reducing nuclear weapons proliferation, argues that the agreement should be delayed because the U.S. and Japan haven't demonstrated that they have found a safe way to ship large amounts of plutonium. The agreement, which still must be submitted to Congress, can be blocked only if both houses reject it. The institute concedes this is unlikely.

"There are many technical issues to be resolved," the institute said in a report to be released today. The report calls it "premature" for the administration to "negotiate away U.S. authority over" the shipments.

Air Shipments

The report predicts air shipments of the material as often as twice a month from Europe to Japan, starting in the next few years. The group cites estimates that about 45 metric tons of plutonium will be produced for Japan in European reprocessing plants by the year 2000.

It says flights are expected to cross Canada and refuel in Alaska, which would require approval by the U.S. Transportation Department. Brian Smith, energy counselor in the Canadian Embassy in Washington, said Canada has discussed the prospect with Japan and the U.S., but won't assess the issue until a specific proposal is made.

Japan, France, West Germany and Britain have or are building plants to reprocess spent nuclear reactor fuel to pro-

duce plutonium, which then is used in specially designed reactors. Plutonium arouses far more concern than other radioactive materials because only 11 to 18 pounds of it are needed to make a bomb the size of the one dropped on Nagasaki, Japan, during World War II. It also is long-lived and is among the most toxic materials on Earth.

The U.S. forged agreements with European countries in the 1950s and with Japan in 1968 while it had a monopoly on nuclear fuel. The agreements give the U.S. extensive control of any reprocessing and shipment, but the pressure is rising to relax those controls.

Concern Voiced

In an interview, Nuclear Control Institute president Paul Leventhal expressed concern that no plutonium cask large enough for bulk air shipments has passed stringent crash tests mandated by the U.S. Nuclear Regulatory Commission.

The NRC has certified a cask capable of carrying about 4.5 pounds of plutonium, but only for single-cask flights. Several nations are working to develop clusters of crash-proof casks, each of which would carry about 15 pounds of plutonium. Joe Stiegler, manager of nuclear transportation system development at the Sandia National Laboratory, confirmed that one cask developed by Battelle Memorial Institute's Columbus, Ohio, lab had failed the tough NRC crash test.

Mr. Leventhal argued that it may be impossible to design a large cask capable of passing the NRC test. He also doubted that international safeguards can keep plutonium out of the hands of terrorists or prevent high levels of radioactivity at accident sites.

The only large plutonium shipment so far from Europe to Japan was by boat in 1984, escorted by French and U.S. war ships. The cumbersome effort forced Japan to look to the air for the future. In the meantime, reprocessed fuel from Japan has been stored in France.

Large-Scale Shipments

Mr. Leventhal's group hopes to prevent large-scale international shipments of plutonium. But the Reagan administration contends that Europe and Japan already are well on their way toward launching a plutonium reprocessing industry and developing sources of fuel independent of the U.S.

The U.S. "is simply not in a position to dictate or prescribe a policy on reprocessing or plutonium use" by advanced nuclear nations, Richard Kennedy, U.S. non-proliferation ambassador, told the Senate Governmental Affairs Committee recently. "Our only realistic course," he said, "is to work with these select countries to help improve safeguards and controls."

agreement on plutonium

Flights with nuclear cargo would refuel in Alaska

By DAVID WHITNEY
Daily News reporter

WASHINGTON — An agreement giving the Japanese a blanket waiver to fly plutonium from Europe — with a likely fueling stop in Alaska — could be ready for submission to Congress for approval within three months, Alaska Sen. Frank Murkowski said Thursday.

But Murkowski said the agreement would be in exchange for Japanese accep-

lance of tough standards for handling all nuclear materials under non-proliferation treaties. He said the United States has been trying to negotiate such agreements with other countries using nuclear power since 1978 to minimize the chance that terrorists might seize the materials.

The standards would deal with such issues as the number of people assigned to protect a nuclear shipment, a Murkowski aide said.

In addition, Murkowski said, no flights in which a lot of plutonium would pass over or land in Alaska are likely for many years because there is no safety-certified containers of the sort the Japanese want and because Japanese law prohibits an aircraft carrying plutonium from landing there.

"I am not underplaying the significance of this," Mur-

See Page B-3, PLUTONIUM

PLUTONIUM flights to Japan

Continued from Page B-1

lowski said in an interview. "But we need to find out what we are talking about before we get overly excited."

"I am not going to condone anything that's a threat to my state. But there's nothing going to happen in the near future. And to me, it's probably safer (flying the plutonium) than moving it by ship."

Concern about plutonium-carrying flights was raised in a report March 2 by the Nuclear Control Institute in Washington, D.C.

Murkowski's comments came after his chief counsel, Thomas C.L. Roberts, was briefed on the agreement and its implications by representatives from the State Department, Department of Transportation and the Nuclear Regulatory Commission this week.

According to Roberts, the NRC said that contamination from a ruptured cask in case of an aircraft crash most like-

ly would be confined to a relatively small area.

"If there is a breach (of a cask), the area affected would probably be between five and 15 acres," Roberts said. "Plutonium oxide is very heavy. Even if there were a fire, it would fall quickly to the ground."

Anchorage Daily News

Friday, March 20, 1987

Nuclear cooperation agreement may bring plutonium through Anchorage

By DAVID HULEN
Daily News reporter

Jumbo jets carrying highly toxic, bomb-grade plutonium may regularly fly in and out of Anchorage within several years under a nuclear cooperation agreement being negotiated by the United States and Japan, according to a Washington, D.C., group following the talks.

If approved by both governments, the agreement

would permit shipments of nuclear fuel between European reprocessing factories and Japanese nuclear plants. The possibility of refueling stops in Alaska is causing concern among members of Alaska's congressional delegation and officials in state government.

Officials in the U.S. State Department are reluctant to discuss what would happen under the agreement until it is approved by President Ron-

ald Reagan. Once signed, the deal will be sent to Congress for consideration.

But a report last week by the Nuclear Control Institute, a group concerned with nuclear weapons proliferation, said the agreement, if ratified, would mean flights as often as twice a month from France and Great Britain to Japan, with refueling stops in An-

See Back Page, PLUTONIUM

PLUTONIUM: Anchorage me

Continued from Page A-1

4
chorage. The group predicts that as much as 40 metric tons of plutonium would be shipped from Europe to Japan over several years, starting in the early 1990s.

The institute argues that the agreement is premature because neither the U.S. nor Japan has developed a safe way to transport large amounts of the material.

Plutonium is a by-product of uranium fuel used in nuclear power plants. It is considered one of the most long-lived and toxic materials on earth, and is the primary ingredient in nuclear explosives. Microscopic amounts of plutonium have been found to cause cancer and other health problems when ingested, and a bomb can be made from as little as 33 pounds of it.

Japan now sends much of the spent fuel from its electric-generating nuclear plants to a reprocessing factory in France, where plutonium is extracted from other wastes. Japan would like to ship the plutonium — oxidized into a powder — from France back to Japan, where it would be combined with uranium oxide to produce fresh fuel, officials have said. Great Britain also is building a plant expected to reprocess spent Japanese reactor fuel into plutonium.

Currently, the U.S. must separately approve each Japanese shipment of plutonium made from U.S.-supplied fuel or fuel from U.S.-made plants. Because of security and safety concerns, there has only been one large-scale plutonium delivery from Europe to Japan, aboard a ship in 1964. The vessel, carrying 187 pounds of plutonium, had a crew of more than 40 armed guards and was accompanied by U.S. warships and tracked by spy satellites as it made

its way across the Atlantic and Pacific oceans, according to news reports at the time.

The new agreement would give a 30-year, blanket U.S. approval of certain plutonium shipments, with stipulations over how the material can be moved, according to officials involved in the discussions. The idea is to give Japan a more predictable supply of plutonium. European countries already can ship U.S.-originated plutonium without U.S. approval.

John Moseman, legislative director for Sen. Frank Murkowski, R-Alaska, said officials from the State Department told him Thursday that specifics about how the material would be shipped will not be finalized until after the agreement is ratified. But they said the plutonium likely would be shipped "by the shortest route possible away from populated areas," which would apparently be over Canada and Alaska, he said.

Paul Leventhal, director of the nuclear institute, said his group understands that tentative plans call for the material to be shipped in Boeing 747 cargo jets, with refueling stops in Anchorage. It has not been decided whether Anchorage International Airport or Elmendorf Air Force Base would be used, he said. The institute learned of the plans from officials involved in the negotiations and others familiar with the proposal, Leventhal said.

Some flights travel nonstop between Europe and Japan using polar routes, but the weight of the heavy metal casks used to ship the material would make refueling necessary, Leventhal said. There are few, if any, other airports on the route capable of handling refueling of a jumbo jet aside from those in Alaska, he said.

: Anchorage may one day be on flight plan

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In its report, Leventhal's group raises questions about the safety of the casks now available, and it contends there is little evidence that safe containers can be developed that could survive a plane crash without releasing high levels of radioactivity into the environment. The group also says the shipments would boost the chance of terrorists getting control of materials to make nuclear weapons.

The U.S. Nuclear Regulatory Commission has certified a cask capable of carrying about five pounds of plutonium, but only on single-cask flights. The report says at least three countries are working to develop larger casks to make shipments of plutonium more economical. The only such cask tested under the NRC crash standards failed a test last summer, although it is unclear whether the shipments would have to meet U.S. standards or less-stringent international guidelines, the report says.

The new casks being developed would weigh about 5,000 pounds each and hold about 18 pounds of plutonium oxide. Citing NRC data, the report says a 747 cargo plane would be capable of holding about 40 casks, containing a total of between 500 and 600 pounds of plutonium — the same amount that was carried under such tight security on the ocean freighter three years ago.

The material would be shipped as a powder, which is far less flammable than when plutonium is in its metallic form, and also is more difficult to use in a nuclear explosive device, according to the report. But plutonium oxide also may present a greater health risk when being transported because it could be more easily dispersed into the

air if it left its casks, the group contends.

Officials in the State Department, and an official in the Japanese embassy in Washington, all of whom declined to be identified, disputed that detailed plans for plutonium shipments have been developed, and stressed in telephone interviews that it would be years after the agreement is approved before the flights would occur.

Murkowski's aide, Moseman, said the State Department officials assured him that a series of safeguards would have to be met for the flights to ever occur.

Once submitted to Congress by the president, the agreement can be blocked only if rejected by Congress within 90 days, and Leventhal conceded that's not likely. He suggested that an environmental impact statement on the project be required before the agreement is sent to Congress.

Nadine Winters, an aide to Alaska Gov. Steve Cowper, said state officials were trying to learn more about the agreement and were scheduled to speak with State Department officials within the next several days. But she said it was unclear what jurisdiction, if any, state government would have over such shipments. U.S. Rep. Don Young and Sen. Ted Stevens also have asked for more information after learning of the agreement this week, aides said.

"This is nasty stuff," said Winters. "The state hasn't been consulted. It is a few years in the future, apparently, but we're definitely concerned." Young's spokesman, Chuck Davis, said the congressman "would certainly oppose" the flights landing in Alaska if casks fall short of NRC safety standards.

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BY ROBERT B. JAYLOR
Staff Reporter of THE WALL STREET JOURNAL
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Bally Buys Complex At Atlantic City, N.J., From Golden Nugget

By O WALL STREET JOURNAL Staff Reporter
CHICAGO—Bally Manufacturing Corp.
said it completed its previously announced
acquisition of the Golden Nugget casino
and hotel complex in Atlantic City, N.J.,
from Golden Nugget Inc.

Bally, which said last week that it ex-
pected to close the transaction shortly,
paid \$140 million in cash and stock and as-
sumed a \$299 million mortgage on the

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It says flights are expected to cross
Canada and refuel in Alaska, which would
require approval by the U.S. Transporta-
tion Department. Brian Smith, energy
counselor in the Canadian Embassy in
Washington, said Canada has discussed the
prospect with Japan and the U.S., but
won't assess the issue until a specific pro-
posal is made.

Japan, France, West Germany and
Britain have or are building plants to re-
process spent nuclear reactor fuel to pro-
duce plutonium, which is used in specially
designed reactors. Plutonium arouses far
more concern than other radioactive materi-
als because only about 33 pounds of it are
needed to make a bomb. It also is long-
lived and among the most toxic materials
on Earth.

Previous Agreements

The U.S. forged agreements with Euro-
pean countries in the 1950s and with Japan
in 1968 while it had a monopoly on nuclear
fuel. The agreements give the U.S. exten-
sive control of any reprocessing and ship-

ment by the U.S. nuclear regulatory commis-
sion. The NRC has certified a cask capable of
carrying about 4.5 pounds of plutonium,
but only for single-cask flights. Several na-
tions are working to develop clusters of
crash-proof casks, each of which would
carry about 15 pounds of plutonium. Joe
Stiegler, manager of nuclear transporta-
tion system development at the Sandia Na-
tional Laboratory, confirmed that one cask
developed by Battelle Memorial Institute's
Columbus, Ohio, lab had failed the tough
NRC crash test.

Mr. Leventhal argued that it may be
impossible to design a large cask capable
of passing the NRC test. He also doubted
that international safeguards can keep plu-
tonium out of the hands of terrorists or
prevent high levels of radioactivity at ac-
cident sites.

Shipping Methods

The only large plutonium shipment so
far from Europe to Japan was by boat in
1984, escorted by French and U.S. war-
ships. The cumbersome effort forced Ja-
pan to look to the air for the future.

Mr. Leventhal's group hopes to prevent
large-scale international shipments of plu-
tonium. But the Reagan administration
contends that Europe and Japan already
are well on their way toward launching a
plutonium reprocessing industry and devel-
oping sources of fuel independent of the
U.S.

The U.S. "is simply not in a position to
dictate or prescribe a policy on reprocess-
ing or plutonium use" by advanced nu-
clear nations, Richard Kennedy, U.S. non-
proliferation ambassador, told the Senate
Governmental Affairs Committee recently.
"Our only realistic course," he said, "is to
work with these select countries to help
improve safeguards and controls."

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Plutonium Warning

A few pounds of plutonium suffice to make an atom bomb. Ingested into a human body, even a minute amount of plutonium can be lethal for it is the most poisonous existing substance. These facts are well known.

Yet incredibly enough two shipments of plutonium, each weighing about 100 lbs., were recently flown into Kennedy Airport, with full official permission. The shipments were allowed even though the plutonium was packed in containers that would have broken into many pieces had the planes crashed.

Revelation of these dangerous flights has brought justified anger in many quarters, as well as badly needed action by the new Nuclear Regulatory Commission. The N.R.C. has now temporarily stopped issuing licenses for the import or export of nuclear reactors and related materials such as plutonium. A comprehensive review of regulations and procedures is under way.

Some needed additional safeguards—such as a ban on plutonium shipments by air—are almost self-evident. But the problems raised by the very existence of plutonium as well as by its increasing importance as a commercial material used by the nuclear power industry go far beyond anything one regulatory commission or even one nation alone can solve.

However, plutonium is transported, it creates serious risks. If a ship carrying it should sink, unprecedented pollution problems would be created, while trucks loaded with plutonium can crash or suffer other disasters that might liberate the material into the atmosphere. Equally frightening is the prospect of the hijacking of plutonium for political or other purposes.

Tighter N.R.C. regulations could reduce the risks arising from plutonium in this country; but the United States has a monopoly now neither in nuclear weapons nor in nuclear power nor in the manufacture of nuclear reactors and their fuels, including plutonium. Canada, France, Britain, West Germany and the Soviet Union are all involved in international commerce flowing from nuclear power development. New and concerted international action is needed to minimize the dangers of a catastrophe from the accidental spread of poisonous plutonium material or from theft of plutonium by fanatics or criminals anxious to make amateur atomic bombs.

STATE OF ALASKA
THE LEGISLATURE
LEGISLATIVE AFFAIRS AGENCY

POUCH Y STATE CAPITOL
JUNEAU ALASKA 99811
907 465 3800

MEMORANDUM

May 5, 1987

SUBJECT: Use of AS 18.45.027 to
prevent plutonium shipments

TO: Senator Rick Uehling

FROM: Theresa L. Bannister *TB*
Legislative Counsel

You have asked whether AS 18.45.027 forbids the shipment of plutonium between Europe and Japan with a stopover at an Anchorage airport. It is my opinion that the section does not prevent the federal government from allowing the shipments.

Although AS 18.45.027 generally prohibits the transportation of specified nuclear material in the state, the flight requiring the stopover is part of foreign commerce and is also the subject of a proposed foreign treaty. Therefore, the federal government has the exclusive authority under the U.S. Constitution to regulate the stopover. Although the state may on occasion use its police powers to regulate matters of local health and environment that affect foreign commerce, it is likely that the conflict between the state's local concerns and the federal government's foreign commerce goals would be resolved in favor of the federal government.

If I may be of further assistance, please advise.

TLB:mkr
m11/118

(b) The legislature shall designate by law the land in the state on which a nuclear fuel production, nuclear utilization, nuclear reprocessing, or nuclear waste disposal facility may be located. In designating the land in the state on which a nuclear fuel production, nuclear utilization, nuclear reprocessing, or nuclear waste disposal facility may be located, the legislature shall act to protect the public health and safety.

(c) The Department of Environmental Conservation shall adopt regulations governing the issuance of permits required by (a) of this section. However, a permit may not be issued until

(1) *[Repealed, § 1 ch 93 SLA 1981.]*

(2) the municipality with jurisdiction over the proposed facility site has approved the permit; and

(3) *[Repealed, § 1 ch 93 SLA 1981.]*

(4) the governor has approved the permit. (§ 8 ch 172 SLA 1978; am § 1 ch 93 SLA 1981)

Cross references. — For radiation protection, see AS 18.60.475.

Sec. 18.45.027. Transportation of nuclear waste material. (a) The transportation of high level nuclear waste material, except for purposes of disposal outside the state, is prohibited.

(b) For purposes of this section, "high level nuclear waste material"

(1) means

(A) used nuclear reactor fuel;

(B) waste produced during the reprocessing of used nuclear reactor fuel; and

(C) elements having an atomic number greater than 92 and containing 10 or more nanocuries per gram;

(2) does not include radioactive materials used in medicine, education, or scientific research that are stored or disposed of in conformity with procedures established by the Department of Environmental Conservation by regulation adopted under AS 46.03.250(3). (§ 2 ch 93 SLA 1981)

Sec. 18.45.030. Conduct of studies concerning changes in laws and regulations with a view to atomic industrial development. The following departments and agencies of the state are directed to initiate and to pursue continuing studies as to the need for changes in the laws and regulations administered by it that would arise from the presence within the state of special nuclear, by-product, and radioactive materials, from the operation of production or utilization facilities, and from the generation of radiation, and, on the basis of these studies, to make the recommendations for the enactment of