JUL 13 1981

FCTC:WHL
71-9150

MEMORANDUM FOR: Charles E. MacDonald, Chief
Transportation Certification Branch

FROM: William H. Lake
Transportation Certification Branch

SUBJECT: DOE REQUEST FOR APPROVAL OF ALTERNATE OPERATIONAL CONTROL FOR PU-AIR TRANSPORT

In order to evaluate DOE's request for approval of the Model PAT-2, I have considered the DOE application of April 3, 1981, the Sandia Report, SAND 81-0001, as amended May 27, 1981, and file data for the PAT-1. I have concluded that the DOE has not demonstrated that a significant problem arises in requiring aft-most, main deck stowage for PAT packages, nor have they shown how the alternative proposal satisfies the intent of the stowage requirement.

I have conducted telephone inquiries to verify DOE's statements regarding shipper problems associated with the aft-most main deck stowage requirement (see enclosure). I have found the DOE statements to be unsupported and find that it is questionable to assume that changing the stowage requirement as proposed by DOE would significantly change Pu-air transport problems.

In reviewing PAT-1 history, I find that the aft-most main deck stowage requirement was a subjective requirement recommended by an ad hoc committee of aircraft experts set up by NAS; they apparently felt that the proposed location presented no significant operational difficulty and represented the safest location for this relatively small package. Since they suggested no evident quantifiable criteria, I can see only two possible reasons for change:

1. Significant operational difficulties are identified and NAS is reconsulted or the Commission decides independently that the NAS recommendation is invalidated by the existence of significant operational difficulty; or

2. It is shown that an alternate location or control will result in improved or equivalent package protection.

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Since neither of the reasons above appear to be met, I recommend that we give no further consideration to DOE's request as presented in their April 3 and May 27, 1981 submittals.

Original Signed by

William H. Lake
Transportation Certification Branch
Division of Fuel Cycle and
Material Safety, NMSS

Enclosure: As stated

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INVESTIGATION OF THE STOWAGE LOCATION OPERATIONAL CONTROL FOR PU-AIR TRANSPORT

Summary and Conclusion

The Department of Energy (DOE) requested NRC approval for shipment of safeguard samples of plutonium by air. They also requested an alternate to the operational control that requires aft-most main deck stowage of plutonium air transport packages. The DOE claims[1] that the present operational control has made the use of the PAT-1 package impractical and will have a similar effect on the PAT-2 package. I have investigated this claim concluding that the aft-most main deck stowage requirement was in conflict with a Department of Transportation (DOT) requirement for crew accessibility for hazardous materials. The DOT requirement has been revised and the stowage requirement no longer significantly effects the practicality of using plutonium air transport packages.

Background

In order to satisfy PL 94-79 enacted August 9, 1975, the NRC began a program to: (1) develop criteria and (2) design and develop a container capable of withstanding crash and blast-testing equivalent to the crash and explosion of a high flying aircraft. The NRC sought the advice of the Commission's Advisory Committee on Reactor Safeguards (ACRS) and the National Academy of Sciences (NAS). A specific recommendation of the NAS was to require such a package be stowed in the aft-most position on the main deck.[2] The staff incorporated this operational control requirement into its criteria[3], and the PAT-1 Certificate of Compliance[4]. Although NAS had considered and found acceptable the evaluation for under-belly stowage[5], they strongly recommended the operational control. The expert opinion of NAS was that an extra margin of safety would be afforded by main deck stowage, and if stowed on the main deck, the package(s) should be stowed in the aft-most position to avoid possible crushing from heavier packages if a crash should occur. The NAS and the NRC staff assumed that such a requirement would not be difficult to comply with.

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[1] SANDIA Draft Report, SAND 81-0001, paragraph 2.8.12, pp 2-57 to 2-60.
[2] NAS Report, NUREG/CR-0428, 1978, pg 14.
[3] Qualification Criteria, NUREG-0360, Jan. 1978, pp 9, 10.
[4] NRC Certificate of Compliance No. 0361, Sept. 5, 1978.
[5] NUREG-0360, Jan. 1978, pp 29, 30, 31.

Neither the NRC staff nor NAS was aware of an existing DOT requirement that hazardous materials be accessible to the aircraft crew. The only apparent way of satisfying both the DOT and NRC requirements would be to stow a package on the main cargo deck in the rear of the aircraft with no cargo between the package and crew, making it crew accessible. The DOT revised its requirement in 1980 to eliminate radioactive materials from the hazardous materials that have to be accessible to the crew.[6]

Discussion

The DOE claims that the aft-most main deck stowage requirement makes use of the PAT packages impractical; they identify the problem of loading/unloading at intermediate stops, claiming a direct connection with the reported Flying Tigers, Inc. offer to carry a PAT-1 from JFK Airport in NYC to Europe in a sole use aircraft.[7]

I investigated DOE's claim by conducting telephone inquiries of people involved in air cargo operations, an individual involved in arranging plutonium sample shipments[8], and J. A. Andersen, Sandia Laboratories.

The important points of my investigation are listed below:

1. The reported offer by Flying Tigers, Inc. to ship a single package in one plane occurred sometime in 1979; it was probably due to the conflicting DOT/NRC requirements that existed prior to March 1980, and had nothing to do with loading/unloading at intermediate stops.

2. The shipper would not incur additional costs due to aft-most main deck stowage vs. under-belly stowage.

3. A number of cargo only flights are available which originate from major U.S. airports and terminate at major European airports. Specific European locations can be reached by connecting airlines, ground transport or both within Europe. Someone who had to get a PAT package from the U.S. to Europe could develop appropriate routing; prior planning would minimize if not eliminate delays, and result in essentially the same transit time for under-belly stowage.

4. Other problems significantly effecting PAT shipments would not be reduced by allowing under-belly stowage including: (1) airline captains can and often do, refuse any cargo, and (2) local laws and agencies (i.e., NY Port Authority) may impose restrictions.

[6] DOT HM-152, FR 20097, Publ. March 27, 1980.
[7] SANDIA Draft Report, SAND 81-0001, par. 2.8.12, pp 2-57 to 2-60.
[8] Those people contacted between June 29, 1981 and July 6, 1981 are listed in Appendix A.

5. The DOE Safety Evaluation Report (SAR)[9], prepared by SANDIA, points to difficulties in using PAT-1 but no details are reported. I have contacted a SANDIA representative to find that no inquiries were made of airlines to determine the actual cause or to verify the extent of the problem[10]; however, they did an extensive study of shipper problems through a shipper survey[11]. This investigation identified the problems, looked for causes of problems, and extent of problems.

[9] SANDIA Draft Report, SAND 81-0001.
[10] J. A. Anderson, telecon, July 2, 1981.
[11] SANDIA memo, J. A. Anderson to Distribution, Subj: Problems With Plutonium Air Shipments, May 21, 1979.

Appendix A
List of Contacts for Study

Encl to memo dtd JUL 13 1981

Name/Title	Affiliation	Phone No.
Mary K. Lambert	Flying Tigers, Inc.	[redacted]
Person/Airfreight	TWA, Dulles	[redacted]
Brady Williamson/Mgr. Cargo Svc. Programs	TWA, NYC	[redacted]
Wayne Ferrar Cargo Mgr.	Pan-Am, Dulles	[redacted]
Kenneth Snow/Mgr Hazardous Matl's	Flying Tigers, Inc.	[redacted]
David Kuettler/Mgr Cargo Tariffs	Northwest Orient AL	[redacted]
John Andersen	Sandia Laboratory	[redacted]
Dave Lund/formerly Mgr. Sale Pgm.	NBL, IL (now DOE, AL00)	[redacted]