



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
January 17, 1978

MEMORANDUM FOR: L. J. Evans, Chief
Requirements Analysis Branch

FROM: C. K. Nulsen

SUBJECT: RECOMMENDATION TO CHANGE THE IN-TRANSIT PROTECTION
REQUIREMENTS OF THE PHYSICAL PROTECTION UPGRADE RULE

This memorandum sets forth a Requirements Analysis Branch recommendation to change the Physical Protection Upgrade Rule requirements of nine armed guards and two armored vehicle escorts for in-transit physical protection. The RAB recommendation is to require seven armed guards and one armored and one unarmored escort vehicle.

This recommendation is based on a Sandia Laboratories in-transit road convoy analysis and a judgment that requiring two additional guards and the second escort to be armored is too costly for the uncertain gains in improved protection. The Sandia analysis consisted of testing various combinations of guards and escort vehicles by using two simulation models (SOURCE and SABRES I) to examine the relative security provided by a spectrum of convoy options. The options ranged from testing the current system consisting of an armored transporter, an unarmed escort vehicle with a total of five guards to an option with an armored transporter and three armored escort vehicles with a total of nine guards.

A synopsis of Sandia's observations follow: The complete report is Attachment 1.

"Guard survival is far more important than enhancing their ability to inflict casualties. Tactics and equipment which lengthen the battle time result in systems which are less sensitive to the adversaries' characteristics and generally have higher probabilities of a favorable outcome than systems designed mainly to achieve high attrition rates against the adversary. The SABRES I results showed that moderate stand-off distances by one of the escort vehicles could result in significantly longer battle times. This increases the possibility of support by response forces. SOURCE simulations have shown that stand-off tactics by remote unarmored escort vehicles can achieve survival figures close to those given for the all armored stop values."

"The current system may experience very heavy losses in an ambush, and the capability of the surviving force to maintain possession of the material until response forces can arrive is highly questionable. There are many advantages in going from one to two escort vehicles. The case for three over two is not as strong. The adversary characteristics arguments that result in three vehicles being required can just as easily be extended to argue for four or more escort vehicles."

"A system of seven guards with two escort vehicles (two guards in each vehicle and a convoy commander) where the transporter and one escort are armored and within visual contact and the other may be unarmored but is removed from the convoy by distances from 1 to 10 kilometers, with proper training, communications, and coordination with response forces can provide extensive protection to the transportation link in the nuclear fuel cycle against a broad range of possible threats."

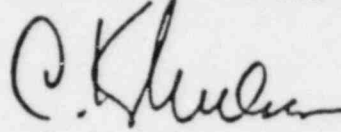
Aside from the Sandia study, military experience has shown that other factors such as tactics used, training and superior communications has as much to do with the outcome of an engagement as opposing numbers. The important element in any in-transit protection system is to have an element at a sufficient stand-off distance that it does not become engaged in the same fire fight as the transport. Thus a transport with a hardened cab and an armored escort could have a reasonable chance of surviving the initial shock of an ambush, while another escort with armed guards and reliable communications could delay further the adversary from taking over the transport while calling for a response force. This scenario can be accomplished just as effectively with seven armed guards and two escort vehicles (one armored and one unarmored) as with nine armed guards and two armored escort vehicles. The cost of two additional guards and having both escort vehicles armored does not appear necessary if the foregoing tactic is accepted.

DOE presently uses five armed guards and an escort vehicle as a minimum. DOE's Albuquerque Operations Center has recommended nine armed guards and two escort vehicles (both of which preferably would be armored). Colonel Lounsbury, Assistant Director for Safety and Facilities, Division of Military Applications, has stated that DOE cannot go to nine armed guards due to manpower limitations and that DOE does not have sufficient funds to purchase two armed vehicles for escort duty for their SSNM convoys. Realistically DOE can expect to have one escort armored and one unarmored. He also stated that, while the minimum of nine armed guards is desired; DOE will not be able to put this recommendation into practice.

A chart showing present practice and upgrade recommendations for both NRC and DOE, and RAB recommendations is Attachment 2.

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Additionally, public comments from the transportation industry have indicated that the nine armed guards and two armed escorts vehicles is more than necessary for protection and too costly for the industry to bear.

In summary, from the point of view of an effective security plan, DOE equivalency and transportation industry costs; the upgrade in-transit protection requirement of nine armed guards and two armed escorts should be adjusted to seven armed guards and one armed and one unarmed escort.



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Requirements Analysis Branch

Attachments
(as stated)