

INTERIM REPORT

ACCESSION NO. \_\_\_\_\_  
ORNL/HASRD-90 \_\_\_\_\_

Contract Program or Project Title:	Safeguards Analysis for Byproduct Materials and Small Quantities of SNM
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Author(s), Affiliation and Address:	R. O. Chester, M. L. Randolph, and M. T. Ryan Health and Safety Research Division*
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NRC Individual and NRC Office or Division to Whom Inquiries Should be Addressed:	Mr. George H. Gardes Office of Nuclear Material Safety and Safeguards

This document was prepared primarily for preliminary or internal use. It has not received full review and approval. Since there may be substantive changes, this document should not be considered final.

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\*Oak Ridge National Laboratory  
Oak Ridge, Tennessee  
operated by  
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for the  
U. S. Department of Energy

INTERIM REPORT

NRC Research and Technical  
Assistance Report

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MONTHLY PROGRESS REPORT  
FOR JULY 1980

SAFEGUARDS ANALYSIS FOR BYPRODUCT MATERIALS  
AND SMALL QUANTITIES OF SNM

Health and Safety Research Division  
Oak Ridge National Laboratory

PRINCIPAL SCIENTIST: R. O. Chester

OBJECTIVE:

The principal objective of this analysis is to examine the question of whether the risk and consequences of theft or sabotage of facilities or vehicles containing small quantities of special nuclear materials (SNM), and byproduct materials are such that licensees should be required to adopt further measures to safeguard them. Phase 1 of this study was an initial screening of these materials. From this screening, candidates for further consideration were identified. In the course of Phase 2, a detailed examination will be made of the conditions of possession, use, and shipment of the materials identified in Phase 1. The characterization of the conditions of possession, use, or shipment will identify any current conditions of the referenced materials that contribute significantly to either the protection from or vulnerability to potential attempts at theft, diversion, or sabotage.

TECHNICAL PROGRESS:

Subtask 1.a(1) Description of various possible delivery methods. This subtask has been completed.

Subtask 1.a(2) Description of adversary capabilities and resources. Work on this subtask is scheduled to start in November 1980.

Subtask 1.a(3) Analysis and description of the material conditions and processing operations necessary. This subtask has been completed. Review at ORNL of formal documentation (ORNL/NUREG-69) on this topic is nearing completion.

Subtask 1.a(4) Analysis and description of the impact of meteorology. This subtask has been completed.

Subtask 1.b Perform a literature review of the acceptable/unacceptable threshold level of consequences. This subtask has been completed. Related to this subtask is a current analysis of lifetime excess of cancer mortality from low levels of gamma radiation.

Subtask 1.c. Project status reports, monthly, interim, and final. This series of reports is up-to-date.

Subtask 2.a. Update the material screening list of Phase 1 using the results of Task 1. This subtask is complete with ORNL review of formal documentation (ORNL/NUREG-69) nearing completion. This month a more complete summary section has been added to the documentation.

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Subtask 2.b. Develop a plan to obtain the necessary information for characterizing the conditions of possession and shipment of potentially hazardous radionuclides. This subtask has been completed, and is partially described in a summary report (now in draft form) covering subtasks 2.b. and 2.c.

Subtask 2.c. Upon NRC approval or modification of the plan developed in subtask 2.b., gather the needed data from the docket files. A summary report covering the docket file survey is now in ORNL review. On the basis of potential availability (i.e., license limit) alone, more radionuclides that should be considered closely for possible safeguarding are identified by the docket file study than have previously been considered using transportation data. (Also see subtask 2.f.)

Subtask 2.d. Prepare a list of industry contacts for formal survey and specify information to be collected. Discussion on this topic has been started with NRC Project Officer, G. H. Gardes. Planning for this work is to be a major goal of the August meeting with NRC staff members (J. Yardumian and G. H. Gardes) at Oak Ridge.

Subtask 2.e. Upon NRC approval of contracts, obtain the information indicated in subtask 2.d. This subtask can proceed only on completion of subtask 2.d.

Subtask 2.f. Analyze results of information gathering effort and produce an updated list of hazardous radionuclides. A draft report on the Docket File study (subtask 2.c.) is in ORNL review. This report identifies, on the basis of potential (licensed) availability, radionuclides not previously included in our hazard analyses. Preparation of a similar report based on PNL Report 2930 on DOE radioisotope customers has been initiated. Relative hazards of radionuclides identified in these two ways are to be added to those previously identified from transportation records and all are to be ranked for relative hazards using scenarios given in ORNL/NUREG-69.

Subtasks 2.g. and 2.h. These subtasks are not scheduled to start until August 1980.

Subtasks 3.a. and 3.b. These subtasks are not scheduled to start until later.

#### Meeting

A meeting with NRC staff members, J. Yardumian and G. H. Gardes, is scheduled for August 6 at Oak Ridge. The purposes of this meeting are informal review of past progress, planning for next Milestones, and discussion of the relation of Sandia NUREG on transportation of radionuclides in urban areas to this project.

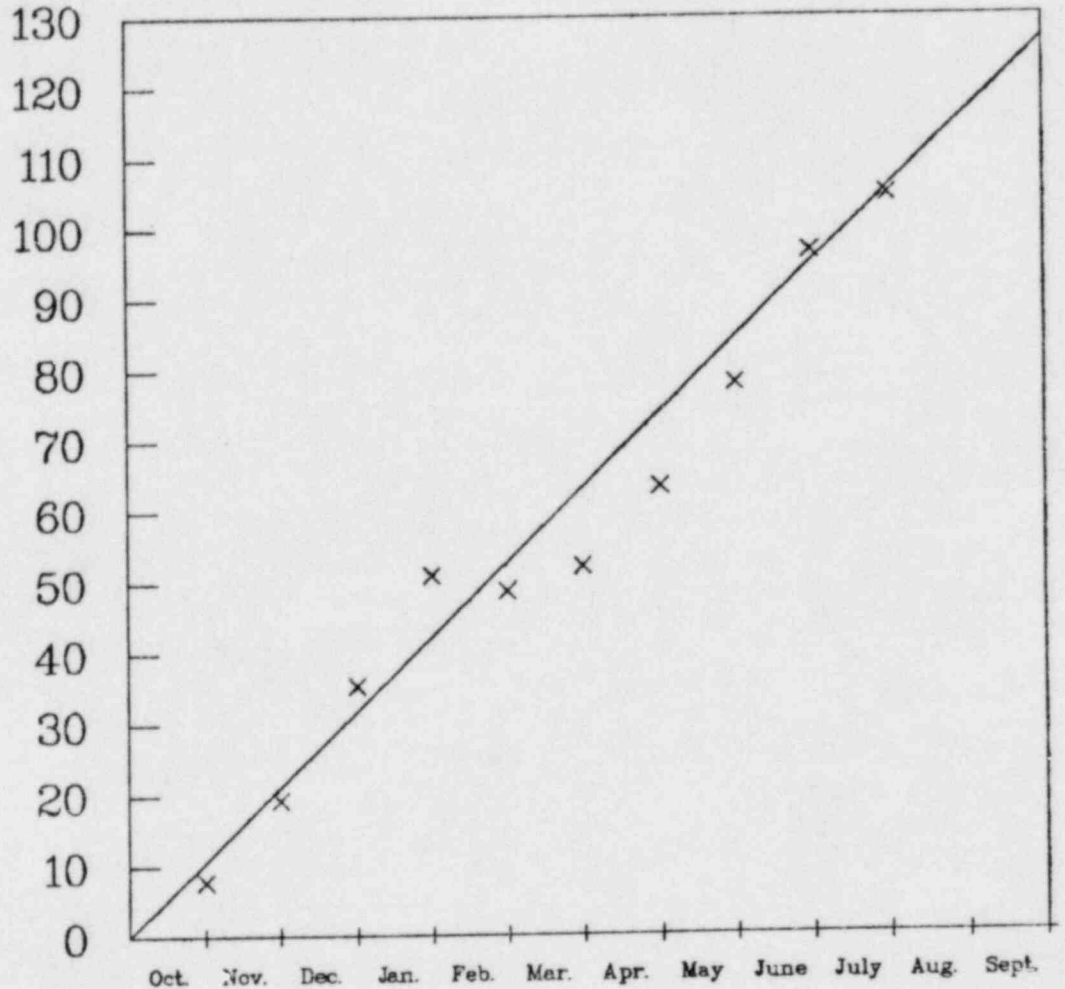
BUDGET AND TECHNICAL MANPOWER EXPENDITURES (FY 1980)

<u>Reporting Period</u>	<u>Project Costs, \$</u>	<u>Technical Support, Man-months</u>
July 1980	7,691	1.0
Total to Date	106,633	12.7
Estimated Cost to Completion	19,993	5.8

MONTHLY EXPENDITURES FY 1980 (\$1,000)

	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
Monthly Projected:	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6
Monthly Actual:	11	11	16	15	-2*	3	11	14	19	8		

Total Expenditures\*\*  
(thousands of dollars)



1979

1980

Months FY 1980

\*Inadvertent overcharges were corrected with a credit in February.

\*\*Solid line represents projected costs; x marks represent actual costs.

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