

## **Surveying the Transportation of Radioactive Material (STORM) in the U.S.A.\***

*J. D. McClure<sup>1</sup> and Donald Hopkins<sup>2</sup>*

<sup>1</sup>Sandia National Laboratories\*\*, Albuquerque, New Mexico, United States of America

<sup>2</sup>U.S. Nuclear Regulatory Commission, Washington, D.C., United States of America

### **BACKGROUND**

A program, Surveying the Transportation of Radioactive Material (STORM), has been initiated to update previous studies of the magnitude and characteristics of radioactive material (RAM) transport in the U.S.A. The STORM project is jointly funded by the U.S. Department of Energy (DOE), the U.S. Nuclear Regulatory Commission (NRC), the U.S. Department of Transportation (DOT), and the Federal Emergency Management Agency (FEMA).

STORM is composed of two phases, Phase 1 and Phase 2. Phase 1 deals with program definition, overall program planning, the development of industry contacts, definition of data requirements, the development of survey forms, and the development of a detailed RAM shipment survey plan to be implemented in Phase 2. Upon completion of Phase 1, which is scheduled to occur in October 1992, a decision point will be reached. The decision to proceed to Phase 2 will depend on the results of a detailed review by the project sponsors of the results achieved in Phase 1.

The results of Phase 1 and alternatives for Phase 2 will be presented in the Phase 1 report. The follow-on phase, Phase 2, provides for the actual acquisition of RAM shipment data on a national (U.S.A.) basis.

### **OBJECTIVE OF STORM PROJECT**

The objective of the STORM project is to develop and implement a plan for periodically updating presently available information on the numbers and characteristics of unclassified shipments of RAM in the United States. The plan must be detailed enough so that, with technical oversight, a surveying organization with limited knowledge of RAM transport could follow the plan and update the RAM shipment data base. The plan will include a survey of licensees as well as a summary of other sources of RAM shipment data for updating the data base (e.g., data at waste burial grounds). Another reason for acquiring RAM shipment data is the announced intention of the International Atomic Energy Agency (IAEA) to collect radioactive material shipment data from Member States at intervals of approximately five years, at the beginning and mid-point of each decade.

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## SUMMARY OF PRIOR EFFORTS

Two previous surveys, one in 1975 (Simmons et al., 1976) and another in 1981-1983 (Javitz et al., 1985), collected data on the quantity and characteristics of unclassified RAM shipments in the U.S.A.

## TYPES OF LICENSES

A basic assumption in the STORM program is that NRC licensees, Agreement State licensees, and DOE shippers form the set of all shippers of radioactive material in the U.S. Perhaps, the only exception to this is the shippers of natural and accelerator produced RAM. In the U.S., there are two categories of licenses for the possession and use of radioactive materials. First, there are NRC licenses, and these are subject to NRC regulations. Second, there are Agreement State licenses. Agreement States enter into an "agreement" with the NRC to regulate RAM shipments in their respective states using NRC and DOT packaging and transport regulations. At present, there are 28 Agreement States. Table 1 shows the number of NRC and Agreement State licensees.

The Phase 1 planning tasks for the STORM project are as follows:

1. Confirm the program plan, deliverables, and schedules with NRC, DOE, DOT, and FEMA.
2. Identify the data needs of STORM end users.
3. Initiate a consultation agreement with ORNL for peer review services.
4. Acquire a list of NRC and Agreement State license holders. Perform licensee status inquiry to identify shippers of RAM.
5. Develop ways to minimize the impacts of the data acquisition process on licensees.
6. Develop RAM transport industry contacts and data sources.
7. Review prior surveys and data applications.
8. Develop a sampling technique which allows shipment data to be collected from identified shippers.
9. Develop a Licensee Data Base of NRC licensees and Agreement State licensees, which will become available on the TRANSNET computer system.
10. Develop a detailed survey plan which includes survey forms.
11. Determine the character of the licensees in each license stratum (category).
12. Transmit initial data and transport information to DOT for input to IAEA.
13. Prepare a Phase 1 report and distribute to project sponsors.

## PROPOSED PHASE 2 TASKS

Phase 2 tasks will be determined after a review of the Phase 1 action alternatives by the STORM project sponsors. Some tentative remarks can be made at this time about possible Phase 2 tasks that may be proposed. These tasks are as follows:

### Phase 2 Data Acquisition Plan (tentative)

1. Evaluate shipments in one of two ways for NRC and Agreement State licensees:
  - a. Deterministically, that is, one-for-one counting of the shipments for the survey period from each licensee, or
  - b. By statistical sampling of the shipments of licensees in each license stratum (category).
2. Develop a DOE shipment model for the DOE Transportation Risk Study (DOETRS) from the DOE Shipment Mobility/Accountability Collection (SMAC) data base.
3. Plan for the protection of any proprietary shipment information that may be collected.
4. Acquire data on shipments to waste burial grounds and shipments to and from nuclear power reactors.
5. Prepare final national shipment estimate.
6. Review data acquisition plan for ways to make improvements in the data acquisition process.

## CONCLUDING REMARKS

The objective of the STORM project is to produce a defensible estimate of the number and characteristics of unclassified RAM shipments in the United States. Phase 1 of STORM is to produce a plan for the acquisition of this RAM shipment information. Phase 2 of STORM is to actually implement the Phase 1 plan in order to make a national RAM shipment estimate. There are many reasons for conducting a RAM shipment survey: to develop an up-to-date shipment model that can be used to assess the environmental effects of such shipments, to assess the adequacy of the packaging regulations which support such shipments, to provide public information about the magnitude of RAM shipments, and to assist state and local governments in planning and responding to transportation emergencies.

TABLE 1

## NRC AND AGREEMENT STATE LICENSES

	<u>Agreement States</u>	<u>No. of Licenses (Approximate)</u>
1.	Alabama . . . . .	450
2.	Arizona . . . . .	296
3.	Arkansas . . . . .	262
4.	California . . . . .	2500
5.	Colorado . . . . .	450
6.	Florida . . . . .	1072
7.	Georgia . . . . .	499
8.	Illinois . . . . .	976
9.	Iowa . . . . .	216
10.	Kansas . . . . .	342
11.	Kentucky . . . . .	382
12.	Louisiana . . . . .	550
13.	Maryland . . . . .	520
14.	Mississippi . . . . .	345
15.	Nebraska . . . . .	170
16.	Nevada . . . . .	146
17.	New Hampshire . . . . .	110
18.	New Mexico . . . . .	270
19.	New York . . . . .	5000
20.	North Carolina . . . . .	500
21.	North Dakota . . . . .	100
22.	Oregon . . . . .	300
23.	Rhode Island . . . . .	60
24.	South Carolina . . . . .	350
25.	Tennessee . . . . .	560
26.	Texas . . . . .	1800
27.	Utah . . . . .	230
28.	Washington . . . . .	380
	Subtotal . . . . .	18836
	NRC licensees . . . . .	8100
	Total NRC and Agreement State licenses . . . . .	26936

**REFERENCES**

Javitz, H. S., et al., *Transport of Radioactive Material in the United States: Results of a Survey to Determine the Magnitude and Characteristics of Domestic, Unclassified Shipments of Radioactive Materials*, Contractor report to Sandia National Laboratories, SRI-International, Menlo Park, CA, April 1985.

Simmons, J. L., et al., *Survey of Radioactive Material Shipments in the United States*, Battelle Pacific Northwest Laboratory, BNWL-1972, April 1976.

TABLE 1

State	Shipments
Alabama	1
Arizona	2
California	3
Colorado	4
Florida	5
Georgia	6
Illinois	7
Indiana	8
Iowa	9
Kansas	10
Kentucky	11
Louisiana	12
Maine	13
Massachusetts	14
Michigan	15
Minnesota	16
Missouri	17
Montana	18
Nebraska	19
Nevada	20
New Hampshire	21
New Jersey	22
New York	23
North Carolina	24
North Dakota	25
Oregon	26
Rhode Island	27
South Carolina	28
Tennessee	29
Texas	30
Utah	31
Washington	32
Wisconsin	33
Wyoming	34
Total	18832
DC	3108
Total	21940