NUREG/CR-5399

Survey of State and Tribal Emergency Response Capabilities for Radiological Transportation Incidents

Prepared by Frank J. Vilardo, Eric L. Mitter, James A. Palmer, Henry C. Briggs, and Julie Fesenmaier

Transportation Research Center
School of Public and Environmental Affairs
Indiana University

Prepared for
U.S. Nuclear Regulatory Commission

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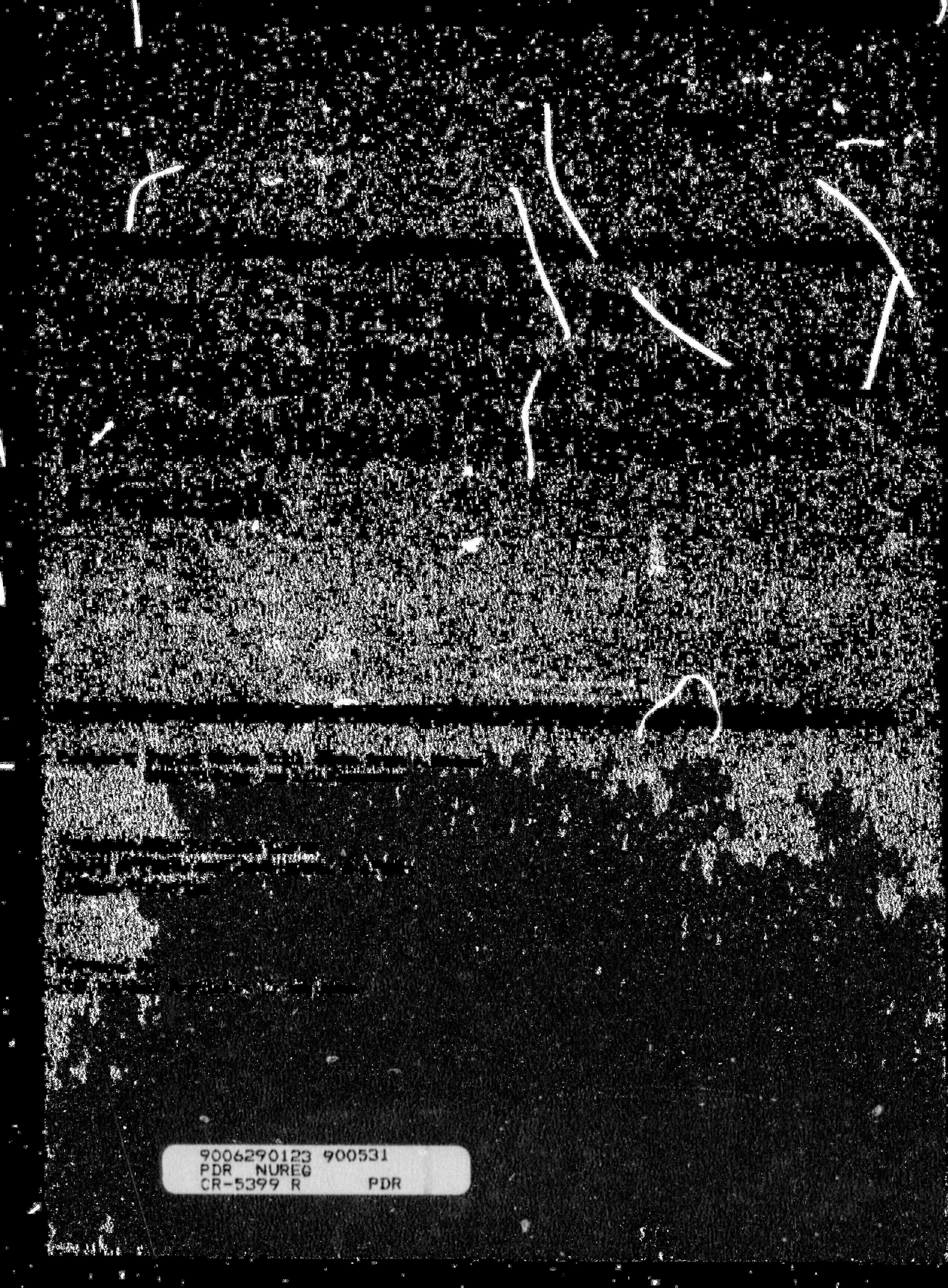

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Manuscript Completed: February 1990
Date Published: May 1990

Prepared by
Frank J. Vilardo, Eric L. Mitter, James A. Palmer,
Henry C. Briggs, and Julie Fesenmaier

Transportation Research Center
School of Public and Environmental Affairs
Indiana University
Bloomington, IN 47505

Prepared for
Division of Safeguards and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555
NRC FIN D1054

ABSTRACT

This publication is the final report of a project to survey the fifty states, the District of Columbia, Puerto Rico, and selected Indian tribal jurisdictions to ascertain their emergency-preparedness planning and capabilities for responding to transportation incidents involving radioactive materials. The survey was conducted to provide the Nuclear Regulatory Commission and other federal agencies with information concerning the current level of emergency-response preparedness of the states and selected tribes and an assessment of the changes that have occurred since 1980 (when a similar survey was performed [NUREG/CR-1620]). There have been no major changes in the states' emergency-response planning strategies and field tactics. The changes noted included an increased availability of dedicated emergency-response vehicles, wider availability of specialized radiation-detection instruments, and higher proportions of police and fire personnel with training in the handling of suspected radiation threats. Most Indian tribes have no capability to evaluate suspected radiation threats and have no formal relations with emergency-response personnel in adjacent states. For the nation as a whole, the incidence of suspected radiation threats declined substantially from 1980 to 1988.

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ACKNOWLEDGMENT

The project staff wish to acknowledge the support of the U.S. Nuclear Regulatory Commission, which recognized the value of a study to determine the current status of state and tribal capabilities to respond appropriately and promptly to any incident involving the transportation of radioactive materials and possible radiation threats to the general public. We are grateful to have been chosen to conduct this timely and important survey.

Mr. Leonard Gordon, the NRC project officer, was especially helpful and supportive during the course of the project, as were the NRC personnel who participated in the review of the project plan, draft survey interview guides, and draft final report. A project advisory panel organized by the NRC provided meaningful and constructive advice, suggestions, and recommendations.

The National Congress of American Indians, especially Ms. Gail Chehak of the NCAI, provided generous support and advice and urged the tribes selected for participation in the survey to cooperate with the Indiana University research team. Nearly all of the targeted tribes agreed to participate, and this high level of cooperation can be attributed in large measure to NCAI's endorsement of the project.

No survey would be successful without the "surveyees," the individuals willing to take the time and make the effort to provide the research team with responses to the 59-item interview guide/questionnaire. Knowledgeable staff from the radiological health program office and sometimes the emergency management agency in each state were fruitful sources of information about a state's readiness to respond to transportation-related radiation incidents. Even though tribal jurisdictions as a rule have much less capability and resources for emergency response of any kind, tribal governmental officials and public safety personnel were very willing to discuss what they do and don't do and perhaps more important, what they need in order to develop an effective emergency-response capability. We thank all of the survey respondents who answered our sometimes unanswerable questions.

We also are indebted to our friends. The project staff acknowledge the yeowomanlike effort of the project typist, Jill Deckard of the Transportation Research Center, who worked diligently and perservered in a difficult and oftentimes frustrating endeavor. Messrs. Donald Brice and Daniel Fox of TRC also contributed to the project cause, and Mr. Edward Feigenbaum and Dr. Robert Piercy, consultants for the project, reviewed our draft products and offered constructive advice and direction.

Frank J. Vilardo
Eric L. Mitter
James A. Palmer
Henry C. Briggs
Julie Fesenmaier

1.0 INTRODUCTION

1.1 About This Report

This volume is the final report of a project conducted by the Indiana University Transportation Research Center (TRC) for the U. S. Nuclear Regulatory Commission (NRC) entitled "Review of State and Indian Tribe Capabilities to Respond to Radiological Transportation Incidents." The contract was let in the Autumn of 1987 and data collection was performed throughout the Summer and Autumn of 1988.

The project was undertaken for three main reasons. First, it was designed to provide a descriptive report on the status of emergency preparedness planning and capability among the fifty states, the District of Columbia and the Commonwealth of Puerto Rico (hereinafter referred to as fifty-two "states") with respect to their ability to respond to transportation incidents involving radioactive materials. In this connection, the project was designed to provide an update to the 1980 status report, "Survey of Current State Radiological Emergency Response Capabilities for Transportation Related Incidents" (NUREG/CR-1620). The second objective was to provide a comparison between the status in 1980 versus 1988, with attention to changes that had occurred, in terms of emergency-response preparedness and the actual management of transportation incidents.

The third objective was to provide a descriptive report on the status of emergency-preparedness planning and capability among a sample of Indian tribal jurisdictions with respect to transportation incidents involving radioactive materials. Pursuant to the laws and policies outlined in the President's 1983 "Statement by the President: Indian Policy," and other policy statements and legislation such, as the "EPA Policy for the Administration of Environmental Programs on Indian Reservations" (November, 1984) and the Nuclear Waste Policy Act of 1982, Indian tribes exercise autonomous sovereignty within their jurisdictions. Indian tribal jurisdictions ("reservations") are not considered to be political subdivisions of the states that surround their borders and, therefore, tribal officials cannot rely on state or local authorities to consider Indian needs in emergency preparedness planning (see "The U.S. Nuclear Regulatory Commission Program With State and Local Governments and Indian Tribes" [NUREG-1309, 1988]. Nevertheless, designated radioactive waste shipping routes transit Indian tribal lands, and ordinary commerce in radioactive materials may include transport across Indian tribal jurisdictions. As a result, there is a need to cultivate preparedness among Indian tribes to properly recognize and manage transportation incidents. The twelve Indian tribal jurisdictions who participated in this project were selected because they all have designated routes within or adjacent to their jurisdictions.

The purpose of this project was to collect, organize and present information from a variety of sources. Some general conclusions and commentary about the usefulness of this information are presented in Chapter 5. N.B.: <u>These remarks are the opinions of the authors and should not be construed as an official position of the U.S. Nuclear Regulatory Commission</u>.

The remainder of this report is structured as follows:

- Section 1.3, "Project Description," provides a discussion of the conduct of the project, the methods of data collection, verification, reduction and analysis, and mentions qualifications on the completeness of the information presented.

- Section 2.0, presents a summary overview of the findings of the study with respect to the U.S. as a whole.

- Section 3.0, presents the survey data for the fifty-two states, with analytic commentary.

- Section 4.0, presents the survey data for the fourteen Indian tribal jurisdictions, with analytic commentary.

- Section 5.0, presents the authors' comments and interpretations.

It is the authors' hope that readers will find this report informative and useful. Every attempt has been made to assure the accuracy and completeness of the information presented; however, it was not always possible to obtain responses that reflect the terms in which the questions were asked. In some states, the questions could be answered in a straightforward manner, while in other states, the respondents were forced to interpret the meaning of some questions in the context of their state's organization. The necessarily terse entries in the data tables represent the authors' abstraction of complex material synthesized from several sources. The narrative that accompanies the tables provides information on the degree of precision that is appropriate for interpreting the tables.

1.2 Project Coordination

The preparation for this project and document was coordinated by NRC staff with the members of the Federal Radiological Committee Co-chaired by the U.S. Department of Transportation and the Federal Emergency Management Agency.

1.3 Project Description

The method used to collect data was a replication of the approach applied in the 1980 study (Mitter et al., 1980). An elite telephone interview with officials in each of the fifty states, the District of Columbia, and Puerto Rico was conducted to inventory the states' radiological emergency-response capabilities for transportation-related incidents. In addition to the states, the following Indian tribes were identified by the NRC and the National Congress of American Indians for inclusion in the study.

- Acoma Pueblo (New Mexico)
- Confederated Tribes and Bands of the Yakima Indian Nation (Washington)
- Confederated Tribes of the Umtilla Indian Reservation (Oregon)
- Laguna Pueblo (New Mexico)
- Navajo Nation (Arizona)
- Nez Perce Tribe (Idaho)
- Onondaga Nation (New York)
- Pyramid Lake Paiute Tribe (Nevada)

- o San Felipe Pueblo (New Mexico)
- o Sandia Pueblo (New Mexico)
- o Santo Domingo Tribe (New Mexico)
- o Seneca Nation (New York)
- o Shoshone-Bannock Tribes of the Fort Hall Indian Reservation (Idaho)
- o Te-Moak Tribe of Western Shoshone Indians (Nevada)

Two interview guides were developed, one for the states and one for the Indian tribes, using the 1980 instrument as a model. Questions asked in 1980 that were of continued interest to the NRC in 1988 were duplicated. New questions were added; many were drawn from the NRC's "list of typical concerns that need to be addressed" for the 1988 study, and additional questions were proposed by the study team. The draft instruments were reviewed by the NRC project advisory committee, changes and revisions were made by the project staff, and the final 59-question interview guides were approved by the NRC. The same basic questions were included in both the state and tribe survey instruments. A copy of each instrument is provided in the appendices. Certain definitions were included on the last page of the questionnaire, to assist the states and tribes in preparing their responses.

A letter of explanation from the NRC and the TRC project director (and for the Indian tribes from the National Congress of American Indians), along with a copy of the interview guide, were sent to the director of each state radiation control program or the chairman/chief of each Indian tribe. The letter explained the nature of the project and informed the official that a representative of the Transportation Research Center would call to schedule a telephone interview.

A member of the study team followed up this letter with an initial telephone contact. In some cases the researcher was referred to another person in the agency or tribe who would be more knowledgeable about the emergency-response program. An interview date and time was then scheduled, and at the appointed time the assigned researcher called and conducted the interview. The interviews ranged from 1.5 hours to 3 hours. In some cases the state or tribe preferred to submit written responses to the interview guide and mail them to the TRC. Most of those who did so had clear, complete answers; seldom was it necessary to call the state and or tribe for clarification of the written response.

When all interviews were completed and the data summarized and recorded, each state and tribal respondent was sent a completed survey form and asked to verify the information as documented. The data summaries then were updated, and the final text of the report prepared.

2.0 Nationwide Overview

This chapter presents a nationwide overview of the major topics covered in the survey of state and tribal emergency-responce cababilities. For each topic, summary remarks provide a description of the current status of emergency preparedness for transportation incidents involving radioactive materials among the states. Following each status report is a discussion of changes that have occurred among the states in the past decade. Following the discussion of the state changes is a summary of the current status of emergency preparedness among the Indian Tribes surveyed. Detailed presentations of the question-by-question responses for the states are presented in Section 3; a similarly detailed discussion of the Indian tribe responses is presented in Chapter 4.

This section is organized into the following subsections and subheadings:

- o Administration and Planning
  - Organization and Responsibility
  - Planning
  - Relations Between the States and Indian Tribes
  - Legal Authority/Issues
- o Maintaining Preparedness
  - Personnel
  - Equipment
  - Communications
  - Training
- o Field Emergency Response Operations
  - Transportation
  - Incident Assessment
  - On-Site Operations
  - Actual Experience
- o Funding and Assistance
  - Funding
  - Federal Assistance
- o Program Progress and Plans

As was noted in the Section 1.0, Introduction, the information presented here is drawn from a variety of sources. The data are accurately reported as they were provided by the respondents, but in some instances, the differences in the respondents' frame of reference and perspective and their interpretation of the meaning of the questions are grounds for caution in making comparisons of the responses among the states and tribes. These differences have been reconciled where possible, and areas where a reconciliation was not possible are noted in the text. Additionally, some anecdotal information is presented. During the interviews with some state and tribal respondents, the issues raised in the questionnaire provided the occasion for conversation and elaboration, offering rich detail about the day-to-day experiences of the people who perform this work. These subjective impressions are beyond the scope of the interview protocol, but they provide a human perspective that is essential to understanding the workings of this complex system.

2.1 Administration and Planning

Organization and Responsibility

All the states except one have unequivocally designated responsibility for technical leadership in the case of a transportation incident involving radioactive materials. Designation of lead agency responsibility is found in the statutory authority for an agency's mission, the provisions of the emergency responce plan, or by executive order. The one exception has a strong basis in precedent and that state reported that, while there is no explicit designation, there is no question as to which agency would take the lead if an incident occurred. In most states, this authority is delegated to the radiological control agency, which is usually a division of the public health department or an environmental protection department. In almost all states, the personnel who respond to an incident to evaluate whether a radiation threat is present are the same people who perform various aspects of the routine business associated with the regulation of commerce in radioactive materials, including industrial hygiene. Exceptions to this general pattern include states where environmental or conservation agencies are charged to attend to any event that threatens the environment, and where emergency response is managed through public safety or emergency preparedness agencies.

In some states, the leadership function is reserved for the state emergency management agency, which calls out the chain of command as necessary. Several of these states have explicitly adopted a two-tier response strategy. Under this approach, a generic hazmat response team, housed in emergency management, environmental protection or the state police, makes an initial assessment to determine whether the expert knowledge of the radiation control agency is truly necessary.

In the great majority of the states, the roles of support agencies are clearly delineated in emergency planning documents, and such expertise as may be required can be obtained through formal channels. However, many states emphasized the informal personal contacts among individuals whose work is concerned with radioactive materials. This may include employees of private firms that use such materials, colleges or universities, electric utilities, hospitals, federal installations, or local jurisdictions. None of the state respondents expressed any concern that needed expertise could not be accessed, for either emergency response or a protracted incident.

Over half of the states indicated that some or all local jurisdictions have the authority to respond to transportation incidents involving radioactive materials. In most of these states, the state constitution was cited as the source of such authority; in some states, major municipalities are granted independent authority. Most states stressed, however, that although such authority may exist, in practice local authorities rely on the state capability to handle most incidents. The state radiological control agency has informal knowledge of which jurisdictions have any meaningful capability to respond, and the state's response is adjusted accordingly. A few states have adopted a strategy under which local jurisdictions (usually counties) that have a sufficiently well-developed radiation safety program formally assume responsibility for the regulation of radioactive materials, including emergency response, within their jurisdiction, in a manner similar to the NRC's "agreement state" strategy. Such local jurisdictions are referred to as "contract" or "agreement" jurisdictions.

In summary, all the states have a formally organized system for responding to transportation incidents involving radioactive materials. The degree of formality and the specific details varies substantially according to the structure of state government and the historical experience. There does not appear to have been many substantial changes in the states' approach to organizing and delegating responsibility, beyond incremental improvements and refinements. However, two developments are worthy of note.

First, several states have formally instituted a two-tier response strategy by developing a generic hazmat response corps that makes an initial assessment. Through this strategy, the highly trained experts in the radiological control agency are not called to the scene expect in cases where the hazmat corps determines that such expertise is truly needed.

Second, state radiological control personnel indicated that a larger proportion of local jurisdictions have sufficient technical expertise to be relied upon to make proper assessments, or at least to provide an accurate description and thereby relieve state personnel of the need to travel to scenes where no threat is present. This is in marked contrast to the 1980 responres, where state officials expressed deep reservations about the ability of local personnel to properly evaluate radiological incidents.

With respect to Indian tribal organization for response to transportation incidents involving radioactive materials, most of the tribes surveyed reported that they do not have a lead agency designated nor any provisions for support agencies. Most of the tribes indicated that tribal police, Bureau of Indian Affairs authorities, or Indian Health Service authorities would be informed. These authorities presumably would notify other officials, such as local or state public safety authorities from the adjacent state. One tribe reported that it has organized a tribal Emergency Response Commission to manage all civil emergencies. For this same tribe, a tribal Environmental Protection Administration does have some radiation-detection equipment and trained personnel, and would take the lead to assess the radiation hazard. Three tribes stated that they do not have any capability for responding to such incidents and had made no provisions at all. One tribe mentioned that it was in the process of developing a generic hazmat response plan.

Planning

Less than half of the states have a separate planning document that specifically addresses transportation incidents involving radioactive materials. In most states, planning for such incidents has been undertaken in terms of hazardous materials more generally, or within a generic radiation incident plan. Among states with major fixed-facilities, several have a fixed-facility plan and another separate plan for all radiation incidents not occurring at a fixed-facility, which includes transportation incidents but is not transportation-specific. Among those states where planning does not explicitly address transportation incidents, the radiation control agency invokes its own internal standard operating procedures, adjusting its response to the circumstances of the incident.

The states were queried about the relationship between planning for fixed-facility versus transportation incidents. In states with major fixed-facilities, the existence of emergency planning zones and the accompanying

highly developed planning and response capabilities has lead to a broader scope of awareness about radiation issues. Larger staffs are maintained for both planning and response, more training is available to larger numbers of personnel at all levels, and a generally higher degree of capability is sought. In most such states, planning for fixed-facility versus transportation incidents was reported as being linked indirectly: the plans are separate, but the capabilities that have been developed are available for both types of incident. The same staff does the planning, and many of the same personnel respond to the scene, using much of the same equipment.

With respect to whether federal guidelines, such as FEMA-REP-5, "Guidelines for Developing State and Local Radiological Emergency-Response Plans and Preparedness for Transportation Accidents," had been used during the planning process, most of the states expressed a general familiarity with such guidelines but indicated that their planning documents did not contain any specific references. The typical response was that such guidelines had been consulted and contributed to the planning process, but very few states indicated that they had made extensive use of federal guidelines in developing their plans. A substantial fraction of the states indicated that their planning predated the issuance of certain specific guideline documents, and these had not been incorporated at all.

Over half of the states indicated that no direct federal technical or financial assistance had been used during the development of their plans. Among states indicating some form of federal support or assistance had been provided, the most frequently reported type of assistance was FEMA funding in support of planning staff. Other types of support reported included technical guidance on specific components of the plan, and review of planning documents by federal officials.

With respect to whether local government capabilities are considered in state planning, most of the states indicated that such consideration is limited to basic public safety functions at the scene, with the expectation that timely notification would be forwarded to proper authorities. In some states, certain localities have been explicitly recognized as having appropriate capabilities, and in a few other states, particular jurisdictions are known to have strong capabilities and are recognized informally.

Almost all of the state respondents indicated that there are certain geographic areas within their states that are not covered by their emergency planning authority. All such areas were characterized as being under federal jurisdiction, the majority being military facilities with a few states indicating other federal-agency installations. Most of the states indicated that, in the event of an incident at such a facility, their authority was limited to persons and property outside the perimeter. Most states also indicated that they would enter such a facility to assist if invited. The particular circumstances regarding Indian tribal lands is discussed further below.

Nearly all of the states indicated that they have an awareness of major routes and facilities where incidents may be more likely, but most of the states use this knowledge in an informal manner; that is, they do not make any special efforts to incorporate this knowledge into their planning strategy. In a few states, however, "high likelihood corridors" have been formally identified, and special efforts to be prepared along these corridors have been undertaken.

In summary, the process of planning by the states for transportation incidents involving radioactive materials has evolved in a manner that reflects the particular circumstances in each state. In slightly more than half of the states, planning for such incidents is undertaken in terms of radiation emergencies in general, with transportation incidents not being singled out for specific consideration in a separate plan. In about a third of the states, radiation hazards are grouped with hazardous materials for planning purposes. Although only a few states indicated that federal guidelines had been specifically incorporated into their planning strategy, there is a widespread familiarity with such guidelines and a sense that these materials contribute importantly, if indirectly, to the formulation of state plans. There does not appear to have been any substantial change in planning strategies beyond incremental improvements or refinements. The major exception is that a greater number of local jurisdictions have developed a significant capability to handle radiation incidents, with state authorities recognizing and incorporating these capabilities into their general approach for managing such incidents.

With respect to planning by Indian tribes, two tribes reported that a draft plan was in the process of development, another tribe reported that such a plan was under discussion, and the remaining tribes reported that no tribal plan exists. One tribe mentioned that they rely on planning by the Indian Health Service, but they were not acquainted with the details of that planning. Various tribes reported on varying degrees of cooperation with state and/or local officials from the area bordering tribal lands, federal installations close to the reservation, or industrial concerns operating within the tribal jurisdiction, but none of these cooperative efforts have the status of a formal plan. In one tribe where the development of a plan is under discussion, the tribal environmental protection administration has a radiation-detection capability oriented around environmental hazards associated with uranium mining, and has managed several incidents involving uranium ore.

State Relations with Indian Tribes

For the great majority of states, the problems related to emergency response on Indian tribal lands are not an issue: they either have no tribal lands, or only very small and isolated enclaves where the probability of a radiation incident is nil. Among states where sizable Indian tribal lands are present, nearly all state respondents indicated that they would treat radiation emergencies on tribal lands the same as for federal enclaves; that is, they would enter tribal lands upon request of tribal authorities. However, most of these states also indicated that, where highways cross tribal lands, the right-of-way is owned by the state and falls under state authority. With respect to the relationship between the state and Indian tribal authorities regarding emergency preparedness, only two states indicated any degree of formal contact, the remainder reporting no contact or only informal arrangements. Nearly all the states indicated that these questions are not an issue and had never been considered.

Among the Indian tribal jurisdictions surveyed, most indicated that, in the event of a transportation incident involving radioactive materials, they would contact federal agencies, including the Bureau of Indian Affairs or the Environmental Protection Agency, or would notify officials from local jurisdictions adjacent to tribal lands. One tribe indicated that it has a representative who sits on various state committees, but the remaining tribes re-

ported that they do not have much of a formal relationship with state authorities and prefer to deal with federal agencies. A few of the tribes mentioned that reservation lands extend across several states and that they confront the necessity to forge contingency arrangements with several states depending on where on the reservation an incident occurred.

Legal Authority/Issues

Nearly two-thirds of the states reported that public employees or volunteers acting under orders from public officials are protected from personal liability. Among the remaining states, several reported that the issue is currently under study, two reported that such protection is extended only if an emergency is declared, and five indicated that such protection does not exist.

The situation among the states with respect to assignment of costs associated with emergency response varies greatly around the country. One-fourth of the states indicated that such costs are clearly assigned, and one-fourth of the states reported that there are no provisions for cost assignment or recovery; the remaining states provided responses indicating an equivocal status. Various states reported that cost assignment is clearly defined for fixed-facility incidents but unclear for transportation incidents; is clearly defined in terms of hazardous materials spills, but radioactive materials are not specifically named; costs of cleanup are assigned, but other aspects of emergency response are not covered; and cost recovery requires litigation on a case-by-case basis.

No states reported that a formal memorandum of understanding for mutual assistance exists. However, nearly half of the states are members of regional associations that include mutual assistance as a component of membership. Among the remaining states, several reported working informally with adjacent states or cited a history of cooperation; additionally, a few states indicated that they had memoranda of understanding that covered fixed-facilities, but no formal arrangements for transportation incidents.

In summary, the number of states reporting that protection from liability is extended to cover emergency response personnel has gone up from 1980 to 1988, and this issue does not seem to be a problem, except in a few states. The matter of cost assignment and recovery remains an area where most of the states have no legislation or regulations that provide unequivocal coverage of this issue. The comparison of responses between 1980 and 1988 indicates that fewer states reported cost recovery provisions in 1988 than 1980. This apparent decline is probably the result of experience demonstrating that cost recovery is difficult, rather than any change in the laws or regulations.

Among the Indian tribes, most of the tribal respondents did not know whether emergency response personnel were protected from personal liability, although one tribe did indicate that tribal employees are protected, and another reported that a "Good Samaritan" law was on the books. None of the tribes reported any efforts to assign costs or provide a mechanism for cost recovery. One tribe reported that it has a general agreement with adjacent state authorities for reciprocal assistance, and two other tribes reported that they have made contact with state and/or local authorities, but have no formal agreements. One tribe reported that they are pursuing agreements with the several states adjacent to their jurisdiction and with various federal

agencies, including DOE, DOT and FEMA, in connection with the Waste Isolation Pilot Project. Another tribe reported that they had been involved in extensive discussions with several states and federal agencies under the aegis of the Nuclear Waste Study Program and had made important progress toward establishing formal agreements, but when this program was terminated, the framework for this cooperation was lost.

2.2 Maintaining Preparedness

Personnel

Access to personnel who can contribute their expertise in the event of a transportation incident involving radioactive materials varies greatly among the states. All of the states have designated individuals who are on call for emergency response. All of the states except one have at least one health physicist employed by the state, and most of the states have ready access to all other relevant specialties. Many states were not able to provide the exact number of individuals with specific professional expertise because they are distributed among various state agencies; additionally, several states routinely rely on personnel employed by local jurisdictions, federal agencies, or in the private sector.

In general, the number of specialists employed by the state, or specifically designated individuals in other employment, is a function of the amount of commerce in radioactive materials. Heavily industrialized states and states with nuclear-powered generating stations have highly developed programs with very many trained specialists at numerous locations. Predominantly rural states have less-well-developed programs; three states characterized their radiological health program as being a "one-man shop." This pattern of development has been driven by the states' historical experience.

Although most states have access to numerous individuals representing a variety of technical specialities, most states emphasized that only a few individuals are usually involved in emergency response. The typical response team consists of two or three health physicists or health physicists and health-physics technicians or radiation monitors; other specialties are assessed on an as-needed basis. Support personnel, such as communications specialists or public relations officers, are usually not activated unless the incident is of sufficient magnitude to warrant a full-scale response.

There appears not to have been much change in the past decade in the manner in which the states organize their personnel and deploy experts to the field. Such changes as have occurred are best characterized as incremental improvements, reflecting larger numbers of trained personnel and, especially, more personnel at certain local jurisdictions who are able to properly evaluate radiation incidents.

With regard to the Indian tribal jurisdictions, three tribes reported that they have personnel trained as radiation monitors; one of these tribes also reported that health-physics technicians are available. No other tribes have any personnel with any training that would be relevant to the radiation aspect of a transportation incident involving radioactive materials. These same three tribes also reported some limited access to personnel who would have support roles at such an incident.

Equipment

The states were requested to report on the availability of portable equipment in terms of the number of locations where such equipment is maintained in a ready-to-go status. With respect to radiation detection instruments, beta-gamma detectors of low-, medium- and high-range sensitivity are widely available at many locations in all states. Other, more specialized detection equipment is less widely available but is, in general, accessible without delay. A few states indicated that it would be necessary to borrow some kinds of instruments, such as alpha-particle or neutron detectors, from universities or other sources outside of the state agency; a few states also indicated that they did not have access to portable gamma-ray spectroscopy. The single item most frequently reported as being unavailable was tritium detectors.

Access to instrumentation other than beta-gamma detectors has been an area of substantial change over the past decade, with many more states reporting in-house availability for specialized detectors. Although many states expressed the desire to update their inventory of detection instruments with state-of-the-art equipment, none of the states felt that their detection capabilities were seriously deficient in 1988. This is in contrast to 1980 reporting, when several states indicated that they were forced to get along with antiquated instrumentation.

Over half of the states indicated that dedicated vehicles are available and equipped, or can be equipped without delay. This is in marked contrast to 1980 reporting, where slightly less than one-third of the states reported the availability of dedicated vehicles. One state that reported the use of a dedicated vehicle in 1980 indicated that they had discontinued this practice because it was not cost-effective to have a vehicle sitting and waiting for very rare events.

All of the states except two indicated that radiation emergency kits are packed and ready to go. In most states, these kits are maintained at several locations, are kept in dedicated vehicles, or are in the possession of emergency response personnel. Several states remarked that they had previously left their kits in vehicles, but had discontinued this practice because they had had problems with vandalism and theft. The kits are now kept in the office, where they can be readily obtained. With respect to the contents of such kits, the most frequently mentioned items were protective clothing, followed by dosimetery equipment, sampling equipment, detection instruments, reference materials, and respiratory protection devices. The availability and contents of kits does not appear to have changed much in the past decade.

Among the Indian tribes surveyed, two reported that they had radiation-detection instrumentation in the possession of tribal personnel, including beta-gamma detectors and alpha particle detectors. One of these tribes also has low-energy gamma detectors, instruments to determine the concentration of radon decay products, and certified sources and proper equipment for calibration. A third tribe mentioned that two instruments are available at the local Bureau of Indian Affairs office, but these have never been out of their packing crates and so are probably not suited for immediate use. No other tribe reported any detection instruments. One tribe reported that a single dedicated vehicle is available. No tribe reported any emergency response kit other than first aid.

Communications

Virtually all of the states reported that they have ready access to communications capability permitting communication between personnel in the field and a control center or dispatcher. Many states reported multiple capabilities, but the state police radio network continues as the major system for such emergency communications. A few of the larger states indicated that some very remote areas may not be covered; a few of the smaller states indicated that they use cellular phones. Most of the states indicated, however, that their preferred communications system is ordinary commercial telephone lines.

Several states commented on an unexpected problem encountered while using police radio frequencies, where news media who monitor police radio networks misinterpreted information and announced that a radiation emergency was in progress, when in fact the event was a simple traffic mishap where no radiation threat was present. Several states also indicated that over-eager news reporters misunderstood police band broadcasting during exercises.

One respondent, who is a member of the emergency response team related that a call came to him at his home on the weekend, requiring him to respond to a transportation incident. In a very few minutes after the call, before he had time to get organized and out the door, a call came from a news agency asking for details of the incident. Apparently, the news organization had been monitoring police radio when the first-on-the-scene officer made his notification and had knowledge of the call list for emergency responders.

Several states indicated that they preferred to use telephone to communicate from the field because of this problem. A few states indicated that their radio system included a scrambler to permit secure communications over the airwaves; other states reported that they have been forced to adopt the practice of announcing, "This is a test," before and after all broadcasts during exercises, to avoid such misunderstandings.

Half of the tribes reported that communications concerning any radiation incident could be channeled over a police or fire radio network. The remaining tribes reported no communications capabilities, although presumably commercial telephones would be somehow available, even if at a distance.

Training

The issues associated with training for transportation incidents involving radioactive materials comprise a cluster of administrative and technical problems that have presented substantial challenges to federal, state and local officials. In discussing these issues with the survey respondents, it became apparent that there are, functionally, three major groups of personnel affected: radiation emergency response personnel, state police, and local public safety personnel (including local police and fire departments and local emergency management personnel in some states). Each of these groups presents unique problems in terms of the type of training that is appropriate and, in particular, the administrative arrangements necessary to deliver this training.

For example, state and local police are traditionally thought of as being part of a single group of potential "first-on-the-scene" respondents, for whom

a single "first responder" training curriculum may be appropriate. But whereas state police comprise a relatively small and fairly stable group of personnel under a single administrative authority, local police comprise a large group of personnel, with a higher turnover rate, employed by a large number of separate administrative entities. The task of delivering radiation emergency preparedness training to local police (and other local officials) is a much greater challenge, presenting a very different set of problems, than training state police and other personnel employed by the state.

Radiation Emergency Response Personnel. With regard to technically qualified personnel who are expected to render an authoritative decision concerning the radiation threat at the scene of a transportation incident, most of the states rely exclusively on professional staff from the radiation control agency. The primary source of training for these personnel is their academic background in health physics and on-the-job training and experience in the regulation of commerce in radioactive materials. In virtually all of the states, a sizable proportion of the radiation control agency professional staff have had supplemental training in emergency management, especially the FEMA-sponsored "Radiological Emergency Response Operations" (RERO)course, as well as numerous other federally sponsored training programs.

A sizable minority of states have made arrangements to provide RERO training to personnel outside of the radiation control agency. Several states have instituted generic hazmat response teams within state police or the emergency services agency, and have sent some of these personnel to RERO. Several other states have adopted a policy under which at least one state police officer at each post or district headquarters must have RERO training. Various other states reported that personnel from "contract" or "agreement" counties or municipalities or from local jurisdictions within the emergency planning zone for nuclear-powered generating stations have received RERO training. Additionally, a few states indicated that known individuals in private employment are RERO-trained and are available if needed. With regard to the geographic distribution, half of the states reported that RERO-trained personnel are at one location (the state capital), and half reported that these trained personnel are at more than one location.

State Police. Among likely first-on-the-scene respondents at transportation incidents involving radioactive materials, the state police have, by a wide margin, the highest proportion of personnel trained to recognize and initiate technical notification concerning the potential threat of radiation hazard. This was also true in 1980, and although the proportions of local personnel with training have increased at a faster rate over the past decade (see below), the nation's state police forces continue as a major source of basic knowledge for first-response field operations.

In most states, such training is presented to state police cadets as part of entry-level training at the state's service academy. The hazards of radiation usually are discussed in connection with hazardous materials in general, with emphasis on recognition and notification of proper authorities. Opportunities for more advanced training are also provided, and many states reported sending state police officers to training programs presented by federal agencies. Several states reported that they organize in-house programs for training in greater depth.

Local Police, Fire and Road Maintenance Personnel. The proportion of local police who have received at least basic training in recognizing potential radiation hazards at transportation incidents has more than doubled in the past decade, but is still quite low compared to state police. Entry-level training appears to be the main source for such training, but it is presented to a smaller proportion of cadets, and opportunities for further training are less common than for state police. There are numerous exceptions to this general pattern: major municipal police forces tend to be better trained in this respect, and local police in emergency planning zones for fixed nuclear facilities usually have some training that is considered germane. Additionally, local personnel from corridors along designated routes for the Department of Energy's Waste Isolation Project have received "WIPP" training.

State radiation control and/or emergency services personnel often were not willing to offer estimates for proportions of local police with such training, except to note that it was probably quite low. Many states have programs that offer in-service training for local public safety personnel, but small class-size and the fact of having to travel (usually to the state capital) has limited the numbers of local police who have received such training. Several respondents offered the opinion that the necessity for local police to be excused from duty for several days and to cover travel costs was a serious barrier to higher levels of training among these personnel. In a few states, radiation control personnel reported that state-sponsored training delivered at local agencies was organized on an occasional basis.

Local fire departments are traditionally included in the group of potential first-on-the-scene respondents, and in some local jurisdictions are considered to be the primary source for knowledge concerning appropriate actions at any hazardous materials incident. The proportion of fire personnel with at least basic training is higher than local police, and has increased substantially since 1980, but is not as high as the state police. Several of the states offered the observation that full-time, professional firefighters are generally well trained. However, the large volume of firefighters who are volunteers serve to dilute the proportion of trained personnel.

Road-maintenance personnel are also included in the group of likely first-on-the-scene respondents, because of their frequent travel along the roadways. However, training in the recognition of radiation hazards is quite limited among this group, most states reported that few or very few of these personnel have received such training. In some states, foremen or district managers may have some training, but in general, these personnel have not been trained.

With regard to the contents of training, the states expressed confidence that their emergency response personnel were well versed in all aspects of radiation hazards. For first-on-the-scene respondents, most states indicated that training is focused primarily on recognition, proper notification, scene security and personal protective actions. In most states, training for radiation hazards is presented in the context of hazardous materials more generally. This strategy is seen as providing information about the variety of hazardous materials that may be encountered on the roadways. This approach also provides the opportunity to compare chemical and radiation hazards, and is seen as an important contribution to allaying the irrational fear of radioactivity. The emphasis is to present transportation incidents as situations that can be managed through adherence to proper procedures.

With regard to exercises as a component of training, over half of the states indicated that they have never had any exercise or that exercises are undertaken only occasionally and there had been none recently. A sizable minority of the states, however, do have exercises, either on an occasional basis but at least annually or on a regular schedule. Most states do not specifically exercise for transportation incidents involving radioactive materials, but do undertake exercises that they believe contribute to their readiness for such incidents, including fixed nuclear facility incident exercises or hazmat transport incident exercises. Several states indicated that such exercises are conducted by county officials, with state involvement in an observer or advisory capacity. A few states indicated that they stage transportation incidents in cycles involving a variety of hazards, with radiation hazards coming up in sequence.

In summary, the states reported increases in the proportions of personnel who have at least minimal training in recognizing potential radiation hazards at the scene of transportation incidents for all groups of likely first-on-the-scene respondents. Over half of the states reported that at least two-thirds of their state troopers have received such training; about one-fourth of the states reported a comparable figure for local police, with about one-third of the states reporting a similar proportion for firefighters. Although a few states do train their road maintenance personnel, training among this group is negligible for the nation as a whole. The rate of increase over the past decade has been highest for local police.

With regard to personnel who are technically qualified to properly assay the scene of an incident and render a decision as to the threat of a radiation hazard, the major change over the past decade has been an increase in the proportion of personnel who have attended federally sponsored training in emergency management of radiation incidents. However, this is regarded as supplemental, and virtually all the states rely on the academic background of the radiation control agency professional staff for definitive knowledge in this area. Many of these personnel are the instructors who lecture the training sessions attended by first-on-the-scene respondents. They stressed that these courses emphasize recognition, proper notification, and personal protective actions, rather than substantive knowledge about the phenomenon of radioactivity.

Perhaps the most notable change over the past decade is reflected in the sense of confidence expressed by state radiation control personnel that proper and timely notification is the normal course of events when a radiation incident does occur. In 1980, health-physics professionals expressed concern that dramatic over-response prior to notification by uninformed local personnel was a serious threat to the proper management of transportation incidents. Although this matter was not raised explicitly during the 1988 survey, there was no hint of any such concern.

With regard to training among Indian tribal jurisdictions, only one of the tribes surveyed indicated that they had any personnel with training in health physics; none of the tribes had any personnel with RERO training. One tribe reported that an individual on temporary assignment through the Indian Health Service was RERO-trained. Three tribes indicated that at least some of their tribal police or other tribal authorities had attended some form of hazardous materials incident training. Sources for this training included the

U.S. Departments of Transportation and Energy, the Indian Health Service, the state adjacent to the tribal jurisdiction, and a local campus of a state university. The number of individuals trained is quite small. No tribe reported having ever conducted a practice exercise.

2.3 Field Operations

Transportation

All of the states indicated that they rely on ordinary road cars or vans as the primary means for getting response teams to the field. Depending on the details of the state organization and planning strategies, the vehicles may be dedicated emergency response vehicles, agency general-use vehicles, vehicles requisitioned from the state motor pool, or the personal vehicles of response team members. However, all of the states also indicated that in the event of a serious or protracted incident, they can gain access to any mode of transportation.

The states were asked about the length of time it would take to get a team to the scene of an incident: the responses generally were consistent with the size of the state, ranging from less than half an hour to ten hours. Several states noted that in the event of an incident involving a railroad train, travel time might be substantially greater because of the remoteness of some rail routes.

There appear not to have been any changes in the transportation of emergency response teams, except as noted above with respect to dedicated emergency response vehicles in the "Equipment" section.

Incident Assessment

All of the states have the expectation that first-on-the-scene respondents will perform certain actions if it is suspected that a radiation threat is present at the scene of a transportation incident. In over half of the states, the U.S. DOT handbook Emergency Response Guidelines (ERG) is available to all or most of the likely first responders; in the remaining states, this book is not so universally available but is nonetheless widely distributed.

Most states were enthusiastic in their praise for the utility of the ERG, in terms of assisting in the recognition of potential hazards and outlining appropriate first responder actions for various commodities. Other comments included the opinion that some local personnel are not well enough informed to know how to use the book, and the observation that instructions in the ERG to call CHEMTREC has lead to wrongly handled notification, resulting in delay of notice to the proper authorities. In general, however, recognition and prompt notification do not appear to be problems for first responders.

In most of the states, first responders are not expected to undertake any efforts to ascertain the specific nature or potential seriousness of the suspected threat beyond recognition and notification; that is, the scope of first responder actions is limited to basic public safety functions (scene security, fire suppression, emergency medical services) and notification of the appropriate authorities.

Over half of the states indicated that no guidelines for first responders are issued beyond the basic procedures that are covered in hazmat training. However, about one-third of the states have produced and distributed a standard operating procedures document, which first-responders are expected to follow if a radiation threat is suspected. This may be a pocket guide, pamphlet, handbook, or the relevant sections of the state or local plan. Additionally, a few states indicated that they have distributed publications developed by federal agencies (DOT or FEMA) to give guidance to first responders.

For states which do have such procedural guides, actions expected of first responders prior to the arrival of emergency response officials may include: personal protective actions, establishment of a perimeter and controlled access, inspection of shipping papers, detention of involved parties, and initiation of measures to control cross-contamination. Some states indicated that first-on-the-scene personnel may be requested to take additional actions after notification and telephone or radio consultation with technical authorities. For example, if after hearing a description of the scene circumstances, the radiation control agency determines that a genuine threat may be present, a roadblock and detour or a substantially expanded safety perimeter may be ordered.

The major change in the past decade in incident assessment procedures for first-on-the-scene respondents is the removal of radiological impact assessment from the catalog of expected or required actions for such personnel. In 1980, nearly half of the states indicated that all or most state police officers and many local public safety personnel carried or had ready access to detection instruments and were expected to attempt a preliminary survey of the incident scene. In 1988, radiation surveys or other efforts to evaluate the radiological threat at the scene of an incident were reserved for designated personnel who have had proper training.

Among the Indian tribes surveyed, only four of the tribes indicated that likely first-on-the-scene responders had any standing orders or standard operating procedures for dealing with suspected radiation hazards at the scene of a transportation incident. Further, most tribes surveyed were not aware of any training for first responders in recognizing and managing potential radiation hazards. Two tribes indicated that the ERG was available to at least some of their first responders, but most of the tribes did not know about the guidebook or its availability. None of the tribal respondents offered any opinion as to whether the ERG was useful.

In summary, there is very little training among tribal first responders that would enable them to recognize or assess a potential radiation hazard at the scene of a transportation incident and very little guidance or training as to how to proceed if such a threat is suspected.

On-Scene Operations

With regard to the types of personnel who are deployed to the scene of a transportation incident to make a formal evaluation of the suspected radiation hazard, over half of the states routinely send at least two respondents, usually a health physicist and a trained assistant, such as a health-physics technician or radiation monitor. Most of the states have developed strategies that enable them to avoid mobilizing their full radiation control response team. Many of the states reported that they are normally able to make some

determination as to the potential seriousness of an incident during the notification phase and adjust the composition of their response team accordingly.

Some of the states indicated that some of their local jurisdictions, such as "contract" or "agreement" counties or major municipalities, have sufficiently well-trained personnel to permit local handling of most incidents; additionally, some other states have developed generic hazmat response teams who are well enough trained to recognize whether an incident requires the expertise of the radiation emergency team. In both of these scenarios, the radiation control agency's involvement may be limited to remote monitoring of the incident. However, many of the states do routinely send two or three qualified technical personnel to the scene in response to every notification of a transportation incident involving radioactive materials.

Over two-thirds of the states indicated that an on-scene coordinator is predesignated. In about half of the states, the predesignated coordinator is a member of the radiation control agency staff; in the remaining states where such a coordinator is designated, that person is a public safety official from the affected local jurisdiction (e.g., sheriff, local police, local fire, local disaster services).

Almost all of the states have access to the various specialists that might be needed in the case of a transportation incident. These individuals may be within the radiation control agency, they may be accessed through formal designation of support staff, or they may be known through informal knowledge of trained individuals around the state. Most of the states indicated that personnel other than health physicists, health-physics technicians or radiation monitors rarely go to the scene; rather, these personnel remain at their home agency and contribute their expertise, if needed, on an on-call basis.

With regard to actions performed at the scene by the radiation emergency response team, nearly all the states indicated they rely entirely on the professional judgment of qualified technicians. A few states do have detailed standard operating procedures for various scenarios or contingencies. In most states, the emergency response team identifies the material in question, surveys the scene, and proceeds as indicated. In nearly all the states, the response teams carry health-physics reference materials, copies of the plan or other procedural guidelines, or both. These documents are often packed as part of the emergency response field kit and are routinely available for use in the field if necessary.

Most of the states have no experience with actual leakage and a genuine radiation threat. However, various states offered elaborations about what their procedures would be if such a hazard were indeed present. These include: attending to scene security; notifying all concerned parties, including the shipper, carrier, consignee, other state agencies, local agencies and public relations officers; evaluating the status of shipping containers; overseeing of hazard mitigation and protective actions; overseeing of repackaging and reloading; overseeing of cleanup operations; and certifying the release of the site to unrestricted use. Other actions in the event of a protracted or serious incident include taking samples and evaluating the extent of environmental damage, which may include bringing a mobile laboratory to the scene or arranging for samples to be taken to an appropriately equipped laboratory.

There does not appear to have been much change between 1980 and 1988 in the manner in which the states designate emergency response teams nor in the manner in which technical specialists are accessed. Almost all of the states have immediate access to most of the indicated professional specialties, or have a system in place through which individuals with specific knowledge and skills can be accessed for field duty or consultation without delay.

Based on the remarks of the respondents in 1988, it appears that more of the states have adopted a strategy, either formally or informally, whereby they do not necessarily send a radiological emergency response team to the field in response to all notifications. The two-tier response, based on a generic hazmat team, is one such strategy; the recognition of "contract" or "agreement" counties or municipalities is another. Additionally, several states have explicitly sought to ensure that one or more individuals (usually state police officers) with first-tier training are strategically positioned around the state (usually at state police posts).

Beyond these formal organizational efforts, several states remarked that certain classes of personnel (usually state police or fire officials) or certain known individuals in particular jurisdictions (usually major municipalities) can be relied upon to provide an accurate description of the circumstances at the scene, thereby permitting a judgment by radiation control personnel as to the level of response required. These personnel, in effect, are able to screen out the trivial incidents, and the highly trained specialists are called to the scene only when their expert knowledge is truly needed.

None of the tribes surveyed have any emergency response teams with radiological expertise. On-site operations would be limited to scene security by tribal public safety officers.

Actual Experience

The states and tribes were asked to report on their recent experience concerning the number of transportation incidents involving radioactive materials in terms of a recent annual average and for calendar year 1987. Several questions were asked concerning the number of formal responses to such incidents, the number of queries or other requests for assistance or advice from local jurisdictions, and the number of calls to federal authorities for assistance. There were no meaningful differences between the recent annual average and calendar year 1987; subsequent discussion is presented in terms of the recent annual average.

Due to noncomparability in reporting among the states, the number of "formal responses to incidents" is presented as the number of times a radiation emergency response team, either generic hazmat response or radiation emergency response, was deployed to the scene of a transportation incident where a radiation threat was possible. The enumerations do not reflect the number of notifications or suspected incidents; similarly, instances where the response was limited to remote consultation by technical authorities, which may be regarded as a "formal" response, are not included.

Some of the responses included in the tally may not meet the strict definition of a transportation incident. For example, several states discussed a persistent problem requiring field-team activation: a soil density gauge set out along the roadside is run over and destroyed by a vehicle, requiring a

scene survey to ensure that radiation source materials are properly recovered. One state estimated that seventy-five percent of their emergency team deployments were in response to such incidents.

The total number of field responses reported was 141, for a national average of 2.7 activations annually per state in recent years (the late 1980's). Reporting on the same basis in 1980 revealed a national average of 4.1 activations annually per state in the late 1970's.

With respect to the number of calls for assistance or advice received by state authorities from local jurisdictions regarding transportation incidents involving radioactive materials, most of the states were forced to make a "soft" estimate because they do not maintain a tally that enables a ready discrimination of calls according to subject matter when the result does not include a field response.

The total number of calls for assistance or advice was 181, for a national average 3.5 calls annually per state in recent years (the late 1980's). Reporting on the same basis in 1980 indicated a national average of 5.6 such calls annually per state in the late 1970's.

The states were also asked to report on the frequency with which they call federal officials for assistance in responding to a transportation incident involving radioactive materials. For a recent annual average, all of the states reported that they have not found it necessary to call for federal assistance. A few states rely on the expertise available at federal installations (e.g., DOE laboratories) within their borders for routine assistance in field response (i.e. federal personnel are closest to the scene); this kind of contact with federal installations was not included. Most of the states stressed that they would have no hesitation to call for guidance or assistance, and many indicated that reliance on federal capabilities would be a central component of incident management if a serious event occurred. Most states indicated, however, that nearly all transportation incidents to which they respond turn out to be non-events in terms of any radiation threat.

It can be seen that in terms of both field emergency response and calls for assistance or advice, the recent average experience is substantially lower than a decade ago. With regard to field deployments, the reduction in the number of actual responses may be a reflection of the previously noted strategy whereby the states are able to avoid activating their radiation emergency teams. The development of such strategies has been fostered by the proliferation of personnel at the local and regional levels with at least primary training. Radiation control agency officials are able to receive what they consider to be an accurate and reliable description of the incident circumstances, which enables them to determine whether a field response is really necessary. It may also be true that enhanced training for first responders has reduced the number of false alarms, which were spoken of as a problem in the 1980 survey. In 1980, several states related anecdotes about local panics caused by uninformed personnel making incorrect announcements about radiation threats. In the 1988 survey, none of the respondents mentioned any such problems.

With regard to calls for assistance or advice, it seems apparent that local jurisdictions find it necessary to call less frequently than they did ten years ago. These differences may be attributable to fewer potential inci-

dents, or to local personnel feeling confident to act without advice. Regarding calls for federal assistance, the responses for 1980 and 1988 were the same: states find it necessary to call for federal assistance so rarely that averaging or trend analysis is not reasonable.

It should be noted that transportation incidents involving radioactive materials are exceedingly rare as compared to incidents involving other hazardous substances in transport. One state, where a generic hazmat response team has been organized within the state police force, reported that for 1987, there were 1,180 calls concerning some sort of hazardous materials problem (not necessarily a transport problem); two of these were concerned with radioactive materials, and none involved radioactive materials in transport. Beyond this very infrequent rate of occurrence, most states further indicated that there is almost never any threat of radiation contamination or leakage, and the actions taken at the scene consist of certifying no threat.

With regard to Indian tribal experience, all of the tribes reported zero incidents as the recent annual average, although one tribe reported two incidents for 1987 (involving spills of raw uranium ore). None of the tribes reported contacting officials in the states adjacent to tribal lands nor did they call federal officials for assistance.

2.4 Funding and Assistance

The states were queried about various aspects of funding and assistance as concerned with maintaining and improving their preparedness for managing transportation incidents involving radioactive materials. In nearly all the states, the system in place includes components from several different agencies. Most states indicated that it was not feasible for them to separate and report the sources and uses of monies without substantial research in basic budget documents; such a level of effort was beyond the scope of this survey. Further, various activities associated with preparedness for transportation incidents involving radioactive materials -- keeping plan documents up to date, organizing training programs, and conducting exercises -- are applicable across many dimensions of emergency preparedness more generally. Any attempt to separate costs associated with one functional area would be highly arbitrary in most of the states.

Funding

In most states, salary and equipment costs for the radiation control program are funded exclusively through the agency's internal budget, which consists of appropriations from the state's general fund and, in some states, license fees or other agency-specific revenue sources, such as user fees. With regard to planning and training, most of the states indicated that other agencies are also involved and that some assistance beyond state resources is available. FEMA monies were the most frequently named supplemental source, but DOE and NRC were also mentioned. In addition, several states indicated that electric utilities that operate nuclear-powered generating stations provide funding or contribute some form of assistance for planning and training.

The states were asked whether any studies had been conducted to determine their current resource allocations, capabilities, and future needs for improvement in their programs for maintaining preparedness. Almost two-thirds of the states reported that no such systematic research had been undertaken;

however, several of these states indicated that annual reporting to their legislature or interagency meetings provided adequate information for program planning and budgeting. Several other states reported that such a study was in process or planned for the near future. Among the few states where such a study had been performed, several mentioned the FEMA-sponsored "Hazard Identification Capability Assessment/Multiyear Development Program" (HICA/MYDP). One state mentioned three separate studies had been conducted in recent years, including the HICA/MYDP, a study sponsored by the governor's office concerned with the level of capabilities among local jurisdictions along designated shipping routes, and a statewide assessment of management capability for all hazmat incidents.

The states were asked about additional resources they need to upgrade their program of emergency preparedness for transportation incidents involving radioactive materials. There was substantial variation in the responses, reflecting a divergence of opinion as to what comprises an adequate level of preparedness. Some states apparently feel compelled to be prepared for any contingency, from first response through clean-up, while other states explicitly stated that if they ever confront a genuine radiation emergency, they plan to request immediate and extended federal assistance. One state indicated that if it is expected to maintain a comprehensive capability to manage radiation emergencies, a complete revision of the existing state program would be required, including several new personnel slots for which they are currently not authorized.

Some states conveyed a sense of frustration and resentment that, according to their view, DOE has placed the burden of preparedness on states with designated shipping routes. These states indicated that there are substantial expenses, well beyond the state's resources, associated with only minimal preparedness: they cannot use their historical experience to plan because the entire problem area will be transformed; they need equipment that is dedicated to emergency response at numerous strategic locations around the state; and they need a substantial training program for all personnel involved in emergency response but especially for local officials. Other states with designated routes are under the impression that before large-volume shipping commences, federal funding and technical assistance will be available to upgrade state and local capabilities.

With probing and some discussion, it was possible to extract a sense of genuine need in current programs, as opposed to concern for an unclear future or the desire to improve an already adequate program. About one-third of the states reported that their program is basically adequate and that they have no pressing needs. Among resources desired by these states are such items as cellular telephones or other field communications equipment, state-of-the-art field and laboratory equipment, protective clothing (including fully incapsulated suits, a.k.a. "moon suits"), respiratory protective devices (including self-contained breathing apparatus) and dedicated vehicles. One state indicated that they would like to have portable computers so they could run dose projection models in the field.

About one-fourth of the states indicated that their program is more-or-less adequate, but felt that they do have current needs for additional resources. Among the most frequently named resources needed were laboratory and field equipment upgrades, more training for radiation technicians and first-responders, support to conduct field exercises, and support for emergency

planning. Several states emphasized that they have a particular need for funding support to cover travel costs for their personnel to attend training programs.

About one-fifth of the states reported that, in the opinion of radiological health personnel, their program of emergency preparedness for transportation incidents involving radioactive materials is deficient and is in current need of substantial resources to attain a status deemed adequate. Among resources named as being needed by these states were basic laboratory and field equipment, studies to determine the scope of their need, planning support, and training for both radiation technicians and first responders. Several states indicated that they need more personnel slots to attain and maintain minimal preparedness, but they could not justify such requests on the basis of their history or day-to-day workload.

A few states declined to offer an opinion as to whether their program is adequate and what resources might be necessary or desirable. One state indicated that it was a matter of debate as to whether the state should attempt to develop a capability to respond to radiation emergencies. This state has a major federal nuclear research facility within its borders and has historically relied on this resource to respond on behalf of the state when an incident occurs.

None of the Indian tribes surveyed reported that any study of emergency preparedness resource allocation, or even a proper needs assessment, had ever been conducted. Several tribes reported that they are beginning to organize for emergency preparedness and that such a study would be highly useful; one of these tribes had submitted several proposals for such studies to various federal agencies, but these had been denied. Most tribes have no organized program of emergency preparedness.

Most of the tribes surveyed did not offer any estimates as to the amount of funding needed, saying simply that they need everything and further do not really understand the full scope of their needs. Among tribes that did work up a set of estimates for needed funding, all of these included support for a full-time position to coordinate the work of emergency preparedness planning and capabilities development. None of the tribes reported that had received any funding beyond internal tribal resources to support emergency preparedness for transportation incidents involving radioactive materials.

Federal Assistance

A cluster of questions was asked concerning the states' knowledge, perceptions, and opinions about federal programs available to state and local governments for assistance in developing and maintaining emergency preparedness for transportation incidents involving radioactive materials. A few states were very scrupulous to observe the distinction between transportation incidents and other types of radiation emergencies, but most states consider any assistance available for any radiation-related issue as potentially applicable to emergency preparedness for transportation incidents.

With respect to the types of assistance that are available through federal agencies, most states mentioned training, technical advice, and field support, including both emergency response and protracted on-scene assistance. Many states also mentioned funding support, especially pass-through monies for

local jurisdictions and partial support for planning staff positions. The federal agencies named as being sources of support were FEMA, NRC, DOE, EPA, and DOT. Most states expressed the opinion that they are well informed about available support in the event of an emergency. However, many states also expressed a sense of being overwhelmed by what is perceived as a myriad of training opportunities or funding support for certain discrete activities available from various federal agencies, each with its own set of requirements for participation.

With respect to how the states learn about available federal assistance, most states mentioned newsletters, federal agency publications, training course announcements, and other periodic mailings. Other frequently mentioned sources for information about assistance included professional journals and meetings, personal contacts with federal regional officials and personnel in other states, and information supplied by regional associations. Many states conveyed a sense that they had some knowledge about programs of assistance with which they had some experience, but were not acquainted with the full range of offerings that might be of interest to them. Several states suggested that a coordination or clearinghouse function needs to be established so that information can be disseminated in a comprehensive and timely manner.

Virtually all of the states indicated that they use federally-sponsored training, and most indicated that funding support is an elemental component of their program of emergency preparedness. Other types of assistance mentioned included technical support and advice and the use of laboratory facilities at federal installations.

Nearly all the states remarked that federally sponsored training is of very high quality, and many states remarked that such training is absolutely vital to their emergency preparedness program. Similar remarks were also received concerning the responsiveness of federal regional authorities with respect to requests for technical assistance. Many states also indicated that federal financial assistance, especially FEMA grants, were essential to their program. The most commonly received remark indicating dissatisfaction or inadequacy was that there is not enough assistance.

With regard to the types of federal assistance that states need to improve their emergency preparedness programs, the most frequently named need was for more slots in the training courses, more frequent course offerings, and funding assistance to cover travel costs. Another aspect of training needs was presented in terms of additional funding that would permit state agencies to extend training opportunities to local agencies. Various other topics mentioned included financial support for planning, a greater emphasis on transportation-related issues in training, and better coordination among the federal agencies that sponsor training in the areas of emergency preparedness and radiation-related issues. Several states offered the opinion that the production and distribution of video-cassette training modules appropriate for first-responder agencies would be the single most useful thing that could be done.

The various programs of federal assistance to the states for maintaining and improving their emergency response planning and capabilities for transportation incidents involving radioactive materials are perceived by the states as a series of separate but overlapping opportunities. The assistance is perceived as being general in scope, and its applicability to the specific prob-

lem of transportation incidents is accommodated by the focussing of resources acquired through federal assistance to the particular requirements of each state's planning strategy and emergency preparedness organization.

Among the Indian tribes surveyed, most indicated that they were not aware of any federal assistance for Indian tribes in this subject area. One tribe mentioned some special training through the Waste Isolation Pilot Project and FEMA first-responder training. None of the tribes indicated that any system was in place for channeling information about such assistance; sources named for information about federal assistance varied widely, including the Bureau of Indian Affairs, the Federal Register, the Catalog of Federal Domestic Assistance, the governor's office of Indian affairs in the adjacent state, and direct inquiries by interested tribal officials to individual agencies.

With respect to federal assistance that is used, no tribes reported any direct assistance for radiological emergency preparedness. A few tribes reported various forms of assistance that were loosely construed as being related, such as law enforcement training. Most tribes indicated that they had little or no experience with such assistance, and so could not comment on its usefulness. With regard to what federal assistance they need, the overwhelming response among tribal respondents was that they need any and all assistance, beginning with needs assessments and including all aspects of planning, personnel development, equipment acquisition and establishing cooperation with adjacent jurisdictions.

2.5 Program Progress and Plans

When queried about notable changes in their program of emergency preparedness for transportation incidents involving radioactive materials, most of the states commented on incremental improvements in the quality of their program. Many states remarked on a generally higher level of awareness among local authorities concerning radioactive materials and hazardous materials in general, the recognition of the need to be prepared for incidents involving such materials, and better awareness of where to turn for assistance. With respect to planning, most states spoke in terms of updating and refining their plans rather than any substantial rewriting of their emergency preparedness strategy. Several states commented on an increase in the amount of radioactive materials in transit, but no states reported an increase in the number of incidents, and one state remarked that there are fewer incidents now than ten years ago. Specific changes noted included wider distribution of plans and related documents, better training for first responders, a perceived shift in FEMA training to more emphasis on peacetime hazards, and an infusion of funding provided by electric utilities to assist in planning and training.

When queried about any major accomplishments in the past ten years, most states emphasized incremental improvements in the emergency response capability, especially with regard to the level of awareness among first-responders and the state's ability to get qualified personnel to the scene of an incident promptly. Several states explicitly declined to name any specific accomplishment, except to note that they had maintained control over this area and had otherwise fulfilled their mission.

Most states indicated that there had not been any major disappointments, but their remarks reflected a more generalized feeling that they had not been able to accomplish as much as they would have liked. One-fourth of the states

reported that they had not experienced anything that they would characterize as a disappointment. The most frequently named disappointments were related to insufficient staff and lack of resources to support training for local personnel. In connection with the problem of insufficient staff, several states remarked that authorized salaries are insufficient to attract and retain qualified health physics professionals. State radiological health programs were characterized as "up-and-out" training grounds, where new graduates come in to entry-level positions, gain a few year's experience, and then leave for higher-paying positions in the private sector. Several respondents remarked that there had formerly been federally-sponsored scholarship programs for health physics students, but these programs had been discontinued and there is now an insufficient pool of new graduates. Some states reported that they had lost personnel through attrition and had not been able to fill the vacant positions. Other specific disappointments included: the discontinuance of a DOT program that provided funding through the Highway Safety Program for a transportation planning position; too much attention to fixed-facility incident planning and lack of support other types of radiological incident planning; difficulty in recovering the costs associated with emergency response; and the perceived absence of coordination and cooperation among federal agencies.

When asked about what was needed to ensure that emergency preparedness programs could continue to fulfill their mission for the next ten years, nearly all of the states indicated that incremental improvements were indicated for the immediate future. In most of the states, this was framed in terms of: maintaining and improving technical staff; attention to developing more refined plans, especially with respect to non-fixed-facility incident planning; more training for first-responders; and maintaining and improving equipment inventories, including dedicated emergency response vehicles. A few states reported highly specific issues, such as the need to revise (as opposed to merely refine) their planning to clarify lines of authority and interagency relationships, or to consolidate radiation-related functions within state government. Several states expressed concern that the radiological health mission would be substantially revised when a high-level waste repository is designated and spent fuel shipments commence, or by other decisions such as the location of a regional low-level waste repository. Several states also remarked that state commitment to emergency preparedness for radiological incidents had not been consistent. The Three Mile Island incident had lead to increased attention and an infusion of resources for a few years, but interest has been fading and some radiological health professionals are concerned that their programs will deteriorate until another major incident brings the issue back into public awareness.

Among the Indian tribes surveyed, most of the tribes highlighted their emerging awareness of the problems associated with hazardous materials in general as the major change in the past ten years. For a few tribes, this included some first steps in getting an emergency preparedness program organized. Central to this effort is the development of an effective tribal police force and forging a day-to-day working relationship with public safety authorities from adjacent local jurisdictions in the surrounding states. Two tribes highlighted the creation of an effective tribal police force, with the accompanying involvement in training and equipment acquisition, as the major accomplishment. A third tribe emphasized the recent creation of a tribal Emergency Response Commission, and the beginnings of formalized planning for civil emergencies in general, including radiation emergencies.

Among the disappointments named were: inability to obtain assistance, too many restrictions on federal grants, lack of interest and support from the adjacent states, tribal politics leading to lack of internal cooperation an no action, and an over-arching lack of resources to pursue such matters. Several tribes highlighted the apparent refusal to acknowledge tribal sovereignty and an absence of good-faith efforts to cooperate on the part of federal, state and local officials. One tribe mentioned that the health department in an adjacent country continually insists on complete control over environmental health issues, with the result that no cooperation is possible. Another tribe mentioned that the Bureau of Indian Affairs has refused to engage in negotiations for funding and other assistance, citing litigation on treaty questions.

When queried as to what is needed for the next ten years, all the tribes stressed the need to establish organizational arrangements and move forward with planning, training and equipment acquisition. Most tribes emphasized that, for their programs to move forward, the states and federal government must recognize the sovereignty of the tribes and honor their trust responsibilities. Several tribes remarked on the impediments to their development following from institutionalized racism and the lack of any interest in or sympathy for Indian concerns. They expressed their belief that cooperation and assistance would not be forthcoming through negotiation with federal, state and local government officials, and perceive that it will be necessary to aggressively pursue their rights of self determination through litigation and other means. A few tribes expressed their hope that the United Nations would be an avenue through which such matters could be addressed.

3.0 SURVEY OF STATE CAPABILITIES: SUMMARY OF RESULTS

3.1 Organization and Responsibility

Question 1: Which state agency has the lead for responding with personnel and equipment to assess the radiological impact of transportation incidents involving radioactive materials?

The distribution of lead agencies among the states according to the main function of the agency is presented in the summary table below (Table 3-1). It can be see that in the great majority of states expert knowledge and formal authority concerning radiation emergencies resides in the state department of public health.

The 1980 survey did not include this question, so a direct comparison is not possible, but it appears there has not much change in the past decade concerning which agency of state government has the lead authority in these matters. Numerous states reported on the development of various strategies that have resulted in the lead agency not necessarily assuming direct control of every incident. These include the formal recognition of "contract" or "agreement" counties or municipalities, two-tier response strategies, and the informal recognition of local jurisdictions that have response capabilities. Nevertheless, in most states the final authority has remained unchanged.

Table 3-1: Lead Agency for Assessment of Radiological Impact (1988)

Public Health	33
Environmental Management	3
Natural Resources/Conservation	2
Radiation or Nuclear Safety	2
Human Resources	3
Emergency Services	4
Shared Resonsibility	5

Question 2: What documentation is available that identifies the lead agency?

Twenty-two states reported that the lead agency was identified in a planning document, fifteen states indicated that such authority was delineated in state statutes, and ten states reported both planning documents and statutes. In the remaining states, a memorandum of understanding has been executed or there is an executive order. One state is unreported.

Question 3: What documentation is available that identifies support agencies, if any?

The overwhelming majority of jurisdictions (36) mentioned that support agencies are identified in one of the planning documents. Two jurisdictions said that no support agencies are mentioned in any documents. Unlike the lead agency, support agencies are named by statute in only five jurisdictions (two of these use both state law and a state plan to name support agencies). It

appears that the support agencies are identified in legal or planning sources or documents in most jurisdictions.

Question 4: What local jurisdictions, if any, within the state borders exercise their own authority to respond to the radiological aspects of transportation emergencies? Is their jurisdiction based upon any recognized authority?

Eighteen states reported that all local jurisdictions have autonomous authority, twenty-three states reported that no local jurisdictions have such authority, and seven states reported that some of their local jurisdictions have such authority. One state reported that this question is unclear, and one state is unreported. Among the states reporting that all jurisidictions have such authority, most indicated that the state consitution was the source of this authority. However, most of these states emphasized that local authorities willingly cooperate with the state when a transportation incident involving radioactive materials is involved. Among states reporting some local jurisdictions with such authority, most indicated that this was the result of a negotiated agreement or some special status pertaining to certain major cities.

Many of the states emphasized that various localities are informally recognized as having sufficient capability to manage most transportation incidents involving radioactive materials and are well enough trained to recognize when their competence has been exceeded. This is a major change from what was reported in 1980. The findings of this study indicate that there is now a greater delegation of responsibility to local jurisdictions than a decade ago. Although two or three states have adopted formal strategies through which local jurisdictions assume responsibility, the more prevalent practice is an informal recognition that the requisite knowledge and skills are available at certain localities. This, in turn, follows from the personal relationships among workers in this field: state personnel know where there are individuals whom they can trust to make an accurate assesment.

3.2 Planning

Question 5: Does the state have a written emergency-response plan for transportation incidents involving radioactive materials?

Twenty-one states reported that they have a plan that specifically addresses transportation incidents involving radioactive materials, three states indicated that they do not have any such plan, and twenty-eight states said that they have a radiological emergency plan that does not distinguish between types of radiological incidents. In states where the types of incidents are not specifically addressed, the lead agency invokes its own standard operating procedures.

Question 6: Is this plan part of a hazardous-material transportation plan or does the state have a separate plan specifically for radioactive materials?

Thirty states reported that planning for transportation incidents involving radioactive materials is specific to radiation, and eighteen states indicated that such planning is subsumed under a larger strategy of more general planning for hazardous materials. With the exception of the several states that have developed generic hazmat response teams, the personnel who respond

Table 3-2: Organization and Responsibility
(Questions 1 to 3)

State	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Documentation Identifying Lead Agency	Question 3: Documentation Identifying Support Agencies
Alabama	Dept. of Public Health, Div. of Rad Health	Statute and hazmat plan	Emergency Mgmt. Agency coordinates support
Alaska	Dept. of Health and Social Services, Rad Health Program	Memo of understanding	Memo of understanding
Arizona	Arizona Radiation Regulatory Agency	Statute and hazmat plan	Hazmat plan and Rad Reg. Agency SOP
Arkansas	Dept. of Health, Div. of Rad Control; Office of Emergency Services	Statute and Emergency Ops. Plan	Annex to Emergency Ops. Plan
California	State Dept. of Health Services, Rad Health Branch	Rad health Plan	Rad health plan
Colorado	Dept. of Health, Rad Control Division	Statute and Emergency Ops. Plan	Emergency Operations Plan
Connecticut	Dept. of Environmental Protection	Statute	Fixed facilities plan
Delaware	Div. of Public Health, Office of Rad Control; State Emergency Response Team	Statute	State Emergency Response Team Plan
District of Columbia	D C. Fire Department, Hazmat Unit	Emergency Operations Plan	Emergency Operations Plan
Florida	Dept. of Health & Rehab. Services; Dept. of Emergency Management	Statute	Emergency Management Plan
Georgia	Dept. of Natural Resources, Env. Protection Division	Natural Disaster Operations Plan and executive order	Natural Disaster Operations Plan
Hawaii	Civil Defense; Dept. of Health, Environ. Protect. and Health Services, Noise and Radiation Branch	Radiation Incident Plan	Radiation Incident Plan
Idaho	Dept. of Health and Welfare	Statute and Rad Emergency Response Plan	Rad Emergency Response Plan
Illinois	Dept. of Nuclear Safety	Illinois Plan for Rad Accidents (IPRA)	Illinois Plan for Rad Accidents (IPRA)
Indiana	Board of Health, Rad Health Section	Statute	Civil Defense coordinates support
Iowa	Dept. of Public Health, Bureau of Rad Health	State Emergency Response Plan	Emergency Response Plan
Kansas	Dept. of Health and Environment, Bureau of Air Quality & Rad Control	State Emergency Operations Plan	Emergency Operations Plan

Table 3-2: Organization and Responsibility
(Questions 1 to 3)

State	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Documentation Identifying Lead Agency	Question 3: Documentation Identifying Support Agencies
Kentucky	Dept of Health Services, Rad Control Branch	Statute and Emergency Response Plan	Emergency Response Plan
Louisiana	Dept. of Environ. Quality, Office of Air Energy	Statute and Peacetime Rad Response Plan	Planning documents
Maine	Dept of Human Services, Div. of Health, Engineering; Emergency Management Agency	Executive order	Statute and executive order
Maryland	Dept. of Env., Center for Rad health	Hazmat Plan	Hazmat Plan
Massachusetts	Dept. of Public Health, Rad Control Program	Nuclear Incident Advisory Team Handbook	Nuclear Advisory Handbook
Michigan	Dept. of Public Health, Bureau of Env. & Occ. Health, Div. of Rad Health	Statute and Emergency Prep. Plan	Emergency Prep. Plan
Minnesota	Dept. of Health, Env. Health Div., Rad Control Section	Statute and executive order	Executive order
Mississippi	Dept. of Health, Div. of Rad Health	Statute	Statute and executive order
Missouri	Bureau of Rad Health	Statute	Statute
Montana	Dept. of Health and Environ. Sciences, Environ. Sciences Div.	Disaster and Emergency Plan, Hazmat Response Plan	Plan documents
Nebraska	Dept. of Health	Statute	Rad Emergency Response Plan
Nevada	Dept. of Human Resources, Health Div., Rad Health Section	Statute	Emergency Response Plan
New Hampshire	Division of Public Health Services; Office of Emergency Management	Statute	Rad Incident Control Plan
New Jersey	Bureau of Emergency Response; Bureau of Environ. Rad	Emergency Response Plan	Emergency Response Plan
New Mexico	Dept. of Health and Environ., Radiation Section	Statute	Statute and Emergency Response Plan
New York	Dept. of Health, Bureau of Environ. Rad	Emergency Response Plan, Rad Response Plan	Emergency Response Plan, Rad Response Plan
North Carolina	Dept. of Human Resources, Rad Protect. Section	Statute and Emergency Mgmt. Plan	Statute and Emergency Mgmt. Plan

Table 3-2: Organization and Responsibility
(Questions 1 to 3)

State	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Documentation Identifying Lead Agency	Question 3: Documentation Identifying Support Agencies
North Dakota	Dept. of Health & Consolidated Labs	State Emergency Operations Plan	State Emergency Operations Plan
Ohio	Ohio Emergency Mgmt. Agency	Emergency Rad Response Plan	Emergency Rad Response Plan
Oklahoma	Dept. of Health, Rad and Special Hazards Services	Statute and Emergency Ops. Plan	State plans
Oregon	Dept. of Human Resources, Health Div., Rad Control Section; Dept. of Energy	Statute	Statute
Pennsylvania	Dept. of Emergency Response; Dept. of Environ. Resources, Bureau of Rad Protection	Statute and Emergency Mgmt. Plan	Emergency Mgmt. Plan
Puerto Rico	P.R. Office of Civil Defense	(Not reported)	(Not reported)
Rhode Island	R.I. Emergency Mgmt. Agency	State Emergency Operating Plan	State Emergency Operating Plan
South Carolina	Dept. of Health and Environ. Control, Bureau of Rad Health	Statute	None
South Dakota	Dept. of Water & Natural Res.; Division of Emergency and Disaster Services	Hazmat Plan, Emergency Operations Plan	Hazmat Plan, Emergency Operations Plan
Tennessee	Dept. of Health and Environ., Div. of Rad Health; Emergency Management Agency	Emergency Mgmt. Plan	Emergency Mgmt. Plan
Texas	Dept. of Health, Bureau of Rad Control	Statute and Emergency Mgmt. Plan	Emergency Mgmt. Plan
Utah	Dept. of Health, Bureau of Radiation Control	Statute and Rad Emergency Plan	Rad Emergency Plan
Vermont	Dept. of Health, Div. of Occ. and Rad Health	Rad Incident Plan	Rad Incident Plan
Virginia	Dept. of Health, Bureau of Rad Health	Emergency Operations Plan, Rad Emergency Response Plan	Rad Emergency Response Plan
Washington	Dept. of Social & Health Services, Office of Rad Protection	Implied in statute	Statute
West Virginia	Health Dept., Industrial Hygiene Division	Hazmat plan	Hazmat plan
Wisconsin	Dept. of Health & Social Services, Rad Protection Section	Statute	Rad Emergency Response Plan

Table 3-2: Organization and Responsibility
(Questions 1 to 3)

State	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Documentation Identifying Lead Agency	Question 3: Documentation Identifying Support Agencies
Wyoming	Dept. of Health and Social Services, Rad Health Services	Executive order	None

Table 3-3: Organization and Responsibility (Question 4)

State	Question 4a: Local jurisdictions Exercising Own Emergency-Response Authority	Question 4b: Basis for Authority
Alabama	All counties	State constitution
Alaska	None	Not applicable
Arizona	None	Not applicable
Arkansas	All counties	State constitution
California	3 counties	Formal agreement (called "contract counties")
Colorado	All counties; some home rule cities	State constitution
Connecticut	None	Not applicable
Delaware	None	Not applicable
District of Columbia	Not applicable	Not applicable
Florida	All counties	State constitution
Georgia	None	Not applicable
Hawaii	None	Not applicable
Idaho	None	Not applicable
Illinois	All local jurisdictions	State constitution
Indiana	None	Not applicable
Iowa	All local jurisdictions	State constitution
Kansas	All counties	State constitution
Kentucky	None	Not applicable
Louisiana	All counties	State constitution
Maine	None	Not applicable
Maryland	Counties	(Not reported)
Massachusetts	None	Not applicable
Michigan	All local jurisdictions	State constitution
Minnesota	None	Not applicable
Mississippi	None	Not applicable
Missouri	St. Louis City & County	Special jurisdictions
Montana	All local jurisdictions	State constitution
Nebraska	None	Not applicable
Nevada	Clark & Washoe Counties	Local ordinance
New Hampshire	All local jurisdictions	Statute

Table 3-3: Organization and Responsibility (Question 4)

State	Question 4a: Local jurisdictions Exercising Own Emergency-Response Authority	Question 4b: Basis for Authority
New Jersey	None	Not applicable
New Mexico	None	Not applicable
New York	New York City	Home rule
North Carolina	All cities & counties	Statute
North Dakota	None	Not applicable
Ohio	None	Not applicable
Oklahoma	Large cities	Special agreement
Oregon	All counties	State constitution
Pennsylvania	None	Not applicable
Puerto Rico	Local municipalities	Civil Defense plans
Rhode Island	All	Local emergency operating plans
South Carolina	All local jurisdictions	Statute
South Dakota	None	Not applicable
Tennessee	None	None
Texas	None	Not applicable
Utah	Salt Lake City	City charter
Vermont	None	Not applicable
Virginia	All local jurisdictions	Statute
Washington	None	Not applicable
West Virginia	None	Not applicable
Wisconsin	Four city/county health departments	Negotiated
Wyoming	Unclear	Unclear

to radiation incidents are the same regardless of the type of incident, while hazardous chemical spills are handled by other divisions of government.

Question 7: To what extent is planning for transportation incidents involving radioactive materials linked to fixed-facility emergency-response planning?

Twenty-seven states indicated that planning for the two types of incidents was linked in some manner. In fifteen of these states, plans for fixed-facility and transportation incidents were components of a larger plan, including states where the plan was general in scope and did not address any distinctions. In twelve of these states, the linkage was characterized as indirect, where plans shared common elements but were not formally integrated. Eighteen other states reported that the plans are separate; many of these states indicated that planning for transportation incidents had preceded fixed facility planning. Seven states indicated that the question was not applicable or did not respond.

Question 8a: To what extent was the state emergency-response plan for responding to transportation incidents involving radioactive materials developed by using FEMA-REP-5, Guidelines for Developing State and Local Radiological Emergency Response Plans and Preparedness for Transportation Accidents (March 1983)?

Twenty-one states reported that they had not used FEMA-REP-5 during plan development; this includes nine states where planning for transportation radiation incidents predated the issuance of these guidelines. Nineteen states indicated that some aspects of the FEMA-REP-5 guidelines were incorporated into their planning. Typical responses indicating partial use included "reviewed it and considered the concepts" and "used it as a reference or resource." Five states reported that they specifically based their planning around the guidelines presented in FEMA-REP-5. Seven states are not reported.

Question 8b: Other federal guidelines?

Fifteen states explictly stated that no federal guidelines were used, while eleven states did report the specific inclusion of material presented in federal guidelines, such as protective action guidelines or packaging regulations. Seven states reported that a general awareness of such guidelines did contribute to plan development. Two states indicated that they had consulted other documentation, such as other state plans or regional association documents. Nineteen states did not report whether or not they used other federal guideline documents in emergency-response planning.

It should be noted that the influence of federal agencies in promulgating research findings, guidelines, and regulations concerning radiation has been pervasive; anyone who has a professional involvement with commerce in radioactive materials in the United States cannot avoid referring to some aspects of this large body of literature. Numerous respondents indicated that, while they could not cite any specific references, their entire understanding of this area (beyond their academic training in the basic physical phenomena of radioactivity) was framed around material contained in the publications of federal agencies.

Table 3-4: Planning (Questions 5 to 7)

State	Question 5: Written Emergency Response Plan	Question 6: Part of Hazmat Plan or Separate Plan	Question 7: Linkage to Fixed-Facility Planning
Alabama	Yes, but quite old	Rad Health uses own procedures	None
Alaska	Not specific to transportation	Addresses all radiation	Not at all
Arizona	Not specific to transportation	Not radiation specific	Concurrent, separate classes not distinguished
Arkansas	Single annex covers all rad not at fixed facility	Annex to master plan	Fixed facility is separate
California	Yes	Rad is separate	None
Colorado	Not specifically but Rad Control has own SOP	Part of general hazmat	Not at all
Connecticut	No, fixed facility only	Not applicable; no separate plan	Indirect
Delaware	One plan covers all	Not separate	Indirect
District of Columbia	Plan covers fixed and transportation	Rad is subset of hazmat	Both in same annex
Florida	Plan is generic; have transportation-specific SOP	Part of hazmat annex	Some common elements
Georgia	Yes, annex to master plan	Part of state plan	Are components of base plan
Hawaii	Plan covers all rad	Plan is specific to radiation	Rad plan is general
Idaho	Rad Emergency Response Plan includes transportation	Rad plan is annex to hazmat plan	None
Illinois	Separate volume	Separate, complements hazmat plan	Not specifically
Indiana	No, but in process	Not applicable	Common elements in both
Iowa	Not specific to transportation	Rad is separate	Linked in terms of notification
Kansas	Not specific to transportation	Rad is separate	Transportation preceded fixed facility
Kentucky	Not specific to transportation	Rad is separate	No fixed facility; no large-scale planning
Louisiana	Yes, section of main plan	Rad is separate	Predated fixed facilities

Table 3-4: Planning (Questions 5 to 7)

State	Question 5: Written Emergency Response Plan	Question 6: Part of Hazmat Plan or Separate Plan	Question 7: Linkage to Fixed-Facility Planning
Maine	Not specific to transportation	Rad is separate	Planning for fixed/transportation not differentiated
Maryland	Not specific to transportation	Part of hazmat	Same personnel and equipment
Massachusetts	Yes	Rad is separate	Two are independent
Michigan	Not specifically	Plan treats all	Not linked
Minnesota	Yes	Rad is seperate	None, but parallel
Mississippi	Not specific to transportation	Part of larger plan	Share some resources
Missouri	No written plan for rad transportation incidents	Not transportation specific	No direct link, indirect influence
Montana	Not specific to radiation	Part of hazmat plan	Not applicable
Nebraska	Yes	Separate plan for rad transportation	Only for transportation of spent fuel
Nevada	Plan covers all rad incidents	Part of radmat plan	Not applicable
New Hampshire	Yes	Appendix to hazmat plan	Use same personnel and equipment
New Jersey	Yes, Emergency Response Plan	Separate	Not related
New Mexico	Yes	Separate; Rad Section has internal plan	Not related
New York	Yes, Rad Response Plan	Annex to hazmat plan	Notification required
North Carolina	Not explicit, under development	Part of comprehensive emergency mgmt. plan	Not related
North Dakota	Not specific to radiation	Part of hazmat plan	Not applicable
Ohio	Yes	Separate	Follows same format
Oklahoma	Yes	Separate	Follows same format
Oregon	Yes	Part of hazmat plan	Same department responsible for both
Pennsylvania	Yes, in Emergency Management Plan	Separate	Use same personnel and equipment
Puerto Rico	No	No	None
Rhode Island	Yes	Separate	Same plan for both

Table 3-4: Planning (Questions 5 to 7)

State	Question 5: Written Emergency Response Plan	Question 6: Part of Hazmat Plan or Separate Plan	Question 7: Linkage to Fixed-Facility Planning
South Carolina	No written transportation plan	Not applicable	Linked
South Dakota	Yes	Part of hazmat plan	Not applicable
Tennessee	Yes	Separate annex to main plan	(Not reported)
Texas	Annex to Emergency Mgmt. Plan covers all rad incidents	Plan is comprehensive; no separate documents	Same planning and response staff for both
Utah	Rad Emergency Plan includes transportation	Separate plan for rad incidents	Not related
Vermont	Rad Incident Plan covers all	Separate plan for rad incidents	No direct link; some personnel and equipment
Virginia	Rad Emergency Plan covers all	Rad plan is separate	Emergency plan is comprehensive
Washington	Covered in Emergency Management Plan	Appendix to hazmat plan	Separate plan for fixed
West Virginia	Response assumed under hazmat plan	Part of hazmat plan	Hazmat covers both fixed and transportation
Wisconsin	Plan covers all rad incidents	Rad is separate plan	Rad plan is comprehensive
Wyoming	Part of hazmat	Part of hazmat	Transportation is separate

Question 9: To what extent was the state plan developed with federal technical and/or financial assistance?

The overwhelming response to this question was "none": twenty-seven of the jurisdictions indicated the no federal assistance was used. Of the federal assistance used, the most common (twelve states) was federal funding, either as the sole source or as a partial source of funding for plan development. FEMA was most often mentioned as the federal agency providing the funding. General assistance in the form of advice, consultation, or technical assistance was mentioned as being used in nine of the jurisdictions. Four states did not provide an answer to this question.

Question 10: What arrangements has the state made for establishing a state-office control center for coordinating the response to major transportation incidents involving radioactive materials?

All the states (except three) indicated that an emergency command and control center has been established that could serve this function. Most of the states stressed that the use of these services would not be invoked unless a genuine disaster was in the process, requiring extended involvement by several agencies.

Question 11: Has the state developed inventories or other listings of federal and other capabilities (e.g., military, universities, etc.) for responding to transportation incidents involving radioactive materials? Where are such listings maintained?

An overall majority of jurisdictions (thirty-six) maintain at least some minimal listing of personnel and/or resources. Nine of the jurisdictions indicated that an inventory or list is not maintained, while another four states indicated that the resources are known through personal and informal contact. In those states maintaining such listings, the resources documents are usually kept in the lead agency or included in the appropriate planning document.

In 1980, twenty-eight states reported that a directory or other list of private-sector radiation experts was maintained. The "resource-list availability" question asked in 1980 is not the same as the one used in 1988 survey; however, the results are comparable. There appears to have been an increase in the number of states reporting that resource lists are available (thirty-six in 1988 and twenty-eight in 1980). Fewer states reported in 1988 than in 1980 that no listing is maintained but resources are informally known. It appears that some states have "formalized" their inventory listings.

Question 12: To what extent are local-government emergency-response capabilities considered in the development of the state plan for emergency response to transportation incidents involving radioactive materials?

Twenty-one states indicated that their inclusion of local government capabilities in planning for transportation incidents involving radioactive materials is limited to basic public safety functions at the scene. Eleven states reported that local government capabilities are explicitly integrated into the state's planning strategy, and six states indicated that such capabilities are acknowledged for those jurisdictions known to have sufficiently

Table 3-5: Planning (Questions 8 and 9)

State	Question 8a: Use of FEMA-REP-5	Question 8b: Use of Other Federal Guidelines	Question 9: Use of Federal Technical/Financial Assistance
Alabama	None	No specific references	None
Alaska	FEMA-REP-5 did contribute	General awareness	None
Arizona	Plan predated FEMA-REP-5	SOP included some FEMA-REP-5 information	None
Arkansas	Plan predated FEMA-REP-5	Followed standard practice	Assistance for fixed facility planning only
California	Plan predated FEMA-REP-5	(Not reported)	Federal regional officials review and assist with revisions
Colorado	Plan predated FEMA-REP-5	Used many; no specific attribution	Broad-based support, indirect assistance
Connecticut	Not specifically, but used concepts	General awareness	Indirect guidance
Delaware	(Not reported)	(Not reported)	(Not reported)
District of Columbia	In general, guidelines followed	General awareness	Technical and financial assistance
Florida	Plan predated FEMA-REP-5	No specific references	FEMA funds used to develop plan
Georgia	Not used	None except protective action guidelines	None except PAGs
Hawaii	None	(Not reported)	Federal funding used to write plan
Idaho	Not referenced	Not referenced	None, except RERO training
Illinois	Illinois has resources far beyond those envisioned by FEMA-REP-5	Illinois has resources far beyond those envisioned by FEMA-REP-5	Not used
Indiana	Incorporated into current planning	No specific references	Technical assistance
Iowa	Totally, 100%	Not applicable	None
Kansas	Yes, completely incorporated	(Not reported)	No financial assistance, some guidance
Kentucky	Unknown if specifically incorporated	General awareness	No financial, technical in general sense
Louisiana	Not in current plan, included in revision	DOT packaging regulations	Not aware of any
Maine	Minimal	(Not reported)	None
Maryland	(Not reported)	(Not reported)	(Not reported)
Massachusetts	Explicity referenced	No specific references	None

Table 3-5: Planning (Questions 8 and 9)

State	Question 8a: Use of FEMA-REP-5	Question 8b: Use of Other Federal Guidelines	Question 9: Use of Federal Technical/Financial Assistance
Michigan	Plan predated FEMA-REP-5	No specific references	Some planning staff supported by FEMA
Minnesota	Not used	Not used	None
Mississippi	Not used	No specific references	Planning staff partially supported by FEMA
Missouri	Not used	None	No federal funds used, some technical guidance
Montana	Reviewed and considered	Considered FEMA-REP-10	Some FEMA funding for planning staff
Nebraska	As much as possible	DOE, DOT, EPA, and FDA	None
Nevada	(Not reported)	No specific references	None for rad health section planning
New Hampshire	Not directly	Reviewed other state plans	NRC reviewed and commented
New Jersey	Not used	(Not reported)	None
New Mexico	Not used	49 CFR requirements	None
New York	Plan predated FEMA-REP-5	None	None
North Carolina	Yes, guidelines now being used	NUREG 654 for fixed facilities	Cooperative agreement with FEMA provided some funds
North Dakota	Used as a resource	(Not reported)	50% FEMA funded
Ohio	Completely	None	None
Oklahoma	Not applicable	No specific references	None for agency rad plan, some for state master plan
Oregon	Referred to in development of procedures	Consulted with FEMA and used federal guidelines	FEMA funded 1 person on state committee
Pennsylvania	None	Other state guides and NRC regs	None
Puerto Rico	(Not reported)	(Not reported)	100% FEMA funded
Rhode Island	Plan predates FEMA-REP-5	(Not reported)	None
South Carolina	None	(Not reported)	None
South Dakota	Limited	(Not reported)	FEMA funded RADEF Program
Tennessee	(Not reported)	(Not reported)	50% of planner salaries
Texas	FEMA-REP-5 was reviewed and used as appropriate	Other references were reviewed and incorporated	None
Utah	Follows key elements	None	None
Vermont	Some use of FEMA-REP-5	New England Compact model plan	None

Table 3-5: Planning (Questions 8 and 9)

State	Question 8a: Use of FEMA-REP-5	Question 8b: Use of Other Federal Guidelines	Question 9: Use of Federal Technical/Financial Assistance
Virginia	Used FEMA-REP-5 to update plan	None	None
Washington	(Not reported)	(Not reported)	(Not reported)
West Virginia	Used relevant sections	(Not reported)	Used federal guidelines
Wisconsin	Some aspects incorporated	(Not reported)	No financial, some technical
Wyoming	Very heavily	Extensive	Some FEMA money

Table 3-6: Planning (Questions 10 to 11)

State	Question 10: State-Office Control Center	Question 11a: Listings of Non-State Capabilities	Question 11b: Location of Listings
Alabama	Div. of Rad Health	Yes	Div. of Rad Health
Alaska	Rad Health program	Rad emergency plan; informal knowledge	Rad Health program office
Arizona	Rad Reg. Agency	No inventory per se, phone list	Rad Reg. Agency
Arkansas	Dept. of Health and Office of Emergency Services	No; but strong informal knowledge	Not applicable
California	Office of Emergency Services' facilities	Yes	Office of Emergency Services
Colorado	State Emergency Operations Center	Yes, formal and informal networks	Part of Emergency Ops. Plan
Connecticut	Emergency Operations Center	Yes; also strong informal knowledge	New England Compact documents
Delaware	Division of Emergency Plan. and Ops.	Yes	In fixed-facility plan
District of Columbia	Office of Emergency Preparedness	No, but strong informal component	Not applicable
Florida	Emergency Mgmt. headquarters	Formal linkage for fixed-facility emergency response; also strong informal	In Emergency Mgmt. Plan
Georgia	Emergency Management Agency	No, but informal knowledge	Not applicable
Hawaii	Civil Defense	No, but informal knowledge	Not applicable
Idaho	Emergency Medical Services command and control center	No, but informal knowledge	Not applicable
Illinois	Rad Emergency Assessment Center	Yes	Rad Emergency Assessment Center
Indiana	Emergency Ops. Center	Yes, Ind. Area Emergency Response Committee	Plan
Iowa	Emergency Ops. Center	Yes	Disaster Services office
Kansas	Emergency Response Ops. Center	Yes	In the plan
Kentucky	Emergency Ops. Center	Informal only	Not applicable
Louisiana	Depends on scope of incidents	Call list	Rad Response Plan
Maine	State Emergency Operations Center	No	Not applicable

Table 3-6: Planning (Questions 10 to 11)

State	Question 10: State-Office Control Center	Question 11a: Listings of Non-State Capabilities	Question 11b: Location of Listings
Maryland	No plan, verbal understanding	No	Not applicable
Massachusetts	Office of Public Health	Yes	Nuclear Incident Advisory Team Handbook
Michigan	State Emergency Ops. Center	Some, informal	Emergency Prep. Plan
Minnesota	Department of Public Safety	None	Not applicable
Mississippi	Emergency Ops. Center	Yes	Rad Emergency Plan and Division of Rad Health
Missouri	None	Yes	In plan for fixed facilities
Montana	Disaster and Emergency Services Control Centers	No	Not applicable
Nebraska	Emergency Ops. Center	Yes	By the responsible state agency
Nevada	Division of Emergency Mgmt. coordinator	Some	In planning documents
New Hampshire	Emergency Ops. Center	Yes	Hazmat plan
New Jersey	Central and regional dispatch centers	Partial listing	Central office
New Mexico	State Police	Yes	In state plan
New York	State Emergency Operations Center	Yes	Department of Health
North Carolina	Emergency Ops. Center	Yes	Rad Protection Office
North Dakota	Emergency Ops. Center	Yes	Emergency Operations Plan
Ohio	Emergency Ops. Center	Yes	Transportation Plan
Oklahoma	Emergency Ops. Center	Yes	State office, home of director
Oregon	Use plan to coordinate	Yes	Health Division and Emergency Ops. Center
Pennsylvania	Emergency Ops. Center or regional offices	Yes	State capitol and regional offices
Puerto Rico	9 command posts on island	Yes	Office of Civil Defense
Rhode Island	State Emergency Operating Center	Yes	State Plan
South Carolina	Emergency Ops. Center	Yes	Duty officer manuals
South Dakota	State Emergency Operations Plan	Yes	State plan
Tennessee	Emergency Ops. Center	No	Not applicable

Table 3-6: Planning (Questions 10 to 11)

State	Question 10: State-Office Control Center	Question 11a: Listings of Non-State Capabilities	Question 11b: Location of Listings
Texas	Emergency Ops. Center	Yes	In state plan
Utah	Emergency Ops. Center	Yes	Rad Emergency Plan
Vermont	No special arrangements	Minimal	Plan
Virginia	Emergency Ops. Center and State Police	Yes	State and local plans, Bureau of Rad Protection
Washington	Mobile on-site command center	(Not reported)	(Not reported)
West Virginia	Office of Emergency Services	In the Hazmat Plan	Office of Emergency Services and Health Dept.
Wisconsin	Emergency Ops. Center	Yes	In state plan
Wyoming	Emergency Mgmt. Agency and State Patrol	In process	Emergency Operations Plan

well-developed capabilities to be of assistance. Nine states reported that local government capabilities are not considered, and the remaining states are not reported.

Question 13: Identify any geographic areas within the state borders that are not included in the state emergency-response plan for responding to transportation incidents involving radioactive materials (e.g., military bases, federal enclaves, tribal lands, and municipalities).

Twenty-seven states mentioned military bases as being outside their jurisdiction. Indian tribal lands were mentioned by ten states as areas excluded from state jurisdiction. Some states with known Indian reservations did not mention Indian lands as being outside of their jurisdiction. In the case of both military bases and tribal lands, many states said that they would respond upon request. Others said that if the incident occurred on the right-of-way of a state highway passing through Indian land, the state would assume responsibility and respond with or without tribal permission.

Other federal facilities, such as laboratories and DOE facilities, were mentioned eight times as being outside the authority of the state, while nuclear power plants were named twice.

It appears from the interviews with the state respondents that while fortunately there have not been any incidents on Indian lands, the states probably would respond to a serious incident on tribal property and worry about their authority later. Most consider state highway rights-of-way across tribal lands to be state domain; the response to any incident occurring at such locations would be a state responsibility.

Question 14: Are routes and facilities for a possible large number of shipments of radioactive materials considered, formally or informally, in establishing emergency-response plans?

The majority of the jurisdictions (thirty-five) consider routes and facilities in the planning process. Of these jurisdictions, twenty-three indicated that such information is formally considered. Most of these jurisdictions make such consideration on the basis their knowledge of the routing process and use routing and facility information in emergency-response planning and for identifying special routes and corridors.

Eleven states said that such information is not considered in the planning process, and another five indicated that the question was not applicable in their state or they did not know if such factors were or were not considered.

3.3 State Relationship With Indian Tribes

Question 15: Has the state assumed responsibility for emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders? If not, why (e.g., technical, political, jurisdictional, or financial reason)?

Twenty-two jurisdictions indicated that the question was not applicable since they did not have Indian lands or reservations within the state borders.

Table 3-7: Planning (Questions 12 to 14)

State	Question 12: Consideration of Local Government Capabilities	Question 13: Areas Not Included in Response Plan	Question 14: Consideration of Routes and Facilities for Large Number of Shipments
Alabama	Police functions and notification	None, except military	Informal awareness
Alaska	Not at all	Military base	No
Arizona	Local for crowd control, scene security	Federal and tribal lands by invitation only	General awareness, no specific plans
Arkansas	Security and crowd control	Military bases	Yes, informally
California	None, except in contract counties	Military bases	Multi-agency committee has designated high-likelihood corridors
Colorado	Police functions and notification	Military and federal, by invitation only	Current planning seeks to designate corridors
Connecticut	Basic police services only	Military by invitation only	No special efforts
Delaware	Recognition, protective actions, notification	Federal, military by invitation only	Yes
District of Columbia	Not applicable protective actions	Military, White House, foreign embassies	No history of large shipments
Florida	Not considered except police functions	None except military and NASA	Route control for classes of cargo
Georgia	Police and public works functions	Military bases	Informal consideration for training
Hawaii	First response functions only	Military	Not applicable
Idaho	No local capability	Indian reservations, INEL, military	Yes, for Waste Isolation Project routes
Illinois	Police, fire, rescue, notification	None	Informally consider known routes
Indiana	None, unless resident expert	Only federal facilities	No
Iowa	Police functions	None	Informal
Kansas	Extensively, especially larger cities	Military bases	Preferred routes designated
Kentucky	Basic police functions only	Military and DOE facility	Escorts large shipments; otherwise, none
Louisiana	County-level capabilities are included	Federal enclaves, power stations if invited	Do have knowledge, but no special planning efforts
Maine	None	Military bases, tribal lands by invitation only	No
Maryland	None	Verbal agreement with military	No

Table 3-7: Planning (Questions 12 to 14)

State	Question 12: Consideration of Local Government Capabilities	Question 13: Areas Not Included in Response Plan	Question 14: Consideration of Routes and Facilities for Large Number of Shipments
Massachusetts	Very little	Military bases	Yes
Michigan	Police and first responders only	Some federal facilities	Approval needed for large shipments
Minnesota	Only first response	Military	No
Mississippi	Integral component of planning strategy	Military and some federal land	Special routes established
Missouri	Police function only	Military bases	No
Montana	Local personnel give support and assistance	Military bases and Indian reservation	Yes, interstate corridors
Nebraska	State plan integrates capabilities	None	Yes
Nevada	Currently under study	Federal lands	Yes
New Hampshire	Training covers rad and hazmat response	None	In process
New Jersey	Does not depend on locals	Military bases	Yes
New Mexico	First response role only	Federal facilities, tribal lands	Preferred routes designated
New York	Used as first responders	[illegible] areas excluded	Routes are considered as DOT guidelines
[illegible]h Carolina	Some local agencies have good capabilities	Military, power plants, Indian reservation	No
Nor[illegible]h Dakota	Basic police functions only	None (tribal and military by request)	No, informally considered
Ohio	Local used first, state as backup	Active military reservations	Yes
Oklahoma	First responders are the backbone of the system	None	Yes
Oregon	Integral part	All included, tribal by invitation	Yes, identified key routes for shipments
Pennsylvania	First response only	Military	Yes, informally
Puerto Rico	(Not reported)	(Not reported)	(Not reported)
Rhode Island	Both state and local develop plans	None	No
South Carolina	Police functions only	DOE, military bases	Yes
South Dakota	Trained personnel at local level	Military	Informally
Tennessee	None	Oak Ridge, military	No
Texas	Basic police functions only	Federal and tribal lands	Yes, informally

Table 3-7: Planning (Questions 12 to 14)

State	Question 12: Consideration of Local Government Capabilities	Question 13: Areas Not Included in Response Plan	Question 14: Consideration of Routes and Facilities for Large Number of Shipments
Utah	Basic public safety functions only	None	Yes, informally
Vermont	Not referenced in the plan	None	Informally
Virginia	Very important, integral part	None	Yes
Washington	(Not reported)	(Not reported)	(Not reported)
West Virginia	Have been incorporated	None	Yes
Wisconsin	Some localities have capabilities	None	Yes, in terms of routing
Wyoming	None	Tribal lands	(Not reported)

Of the thirty jurisdictions to which the question was applicable, ten reported that the state would respond; however, three of these qualified their answer by indicating that the state has responsibility only if the incident occurs on a state highway right-of-way. One state responded that the state would work through the DOE. Five jurisdictions indicated that the state would respond upon request of the tribal authorities. Another eight jurisdictions indicated that the state would not respond, while three jurisdictions indicated that the issue was never considered or that there is no documentation or agreement as to what would be done in such a situation.

When asked why the state would not respond in such cases, the vast majority of the states indicated that the question was not applicable in their state. Three states gave a reason why they would respond: "state of emergency declared," "highway right-of-way," and "never told not to respond." Only three states mentioned jurisdictional issues as a reason for not responding.

Question 16: Does the state have a formal program or plan to respond to transportation incidents involving radioactive materials that occur on tribal lands within the state borders?

Twenty-five states indicated that the question was not applicable, usually because there are no tribal lands within the state borders. Seventeen states said there was no formal plan; two indicated that there were formal arrangements only for incidents occurring on a state highway right-of-way crossing tribal property. Two states stated that incidents on tribal lands would be treated the same as incidents elsewhere in the state; one state would respond pursuant to its general emergency-response plan. Another state indicated that there was an informal arrangement. Two states did not know the status of programming for responses on tribal lands.

Question 17: Does the governor's designated representative in the state who receives Part 71/73 notifications of spent fuel or radioactive-material shipments have any working arrangements with tribal officials to share this information?

Only three states said that they knew of such a relationship. Most responded that this issue was not applicable, while others said that shipments of spent fuel do not pass through tribal lands.

Question 18: Describe the relationship of the state with Indian tribes with respect to emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders.

No state reported a formal relationship between the state lead agency and tribes located within the state borders. A few of the states reported that they would treat the relationship with the tribes the same as with any other community. Others reiterated their response to Question 15 to the effect that they would respond upon request. There appears to be very little formal or informal relationship between the state lead agency and tribal authorities.

Table 3-[illegible] State Relationship With Indian Tribes
(Questions 15 and 16)

State	Question 15a: State Responsibility for Response on Tribal Lands	Question 15b: Reasons for No Responsibility	Question 16: Formal Program or Plan for Response on Tribal Lands
Alabama	Unclear; presume Indians would request help	Never considered	Not applicable
Alaska	Would respond if asked	Never considered; assume within scope	No
Arizona	If requested by tribe	Not applicable	No
Arkansas	No tribal lands	Not applicable	Not applicable
California	No routes transit tribal lands	Never considered	Not applicable
Colorado	Assume normal response would be deployed	Highway right-of-way is owned by state	No
Connecticut	On invitation, same as military	None	None
Delaware	Not applicable	Not applicable	Not applicable
District of Columbia	Not applicable	Not applicable	Not applicable
Florida	Never been issue; assume state would respond	Not applicable	No, very small areas, scattered and remote
Georgia	Not applicable	Not applicable	Not applicable
Hawaii	Not applicable	Not applicable	Not applicable
Idaho	No state role; DOE has independent relationship with tribes	Not applicable	No
Illinois	Not applicable	Not applicable	Not applicable
Indiana	Not applicable	Not applicable	Not applicable
Iowa	Not an issue	Not applicable	Not applicable
Kansas	Yes, state would respond	Not applicable	No specific plans
Kentucky	Not applicable	Not applicable	Not applicable
Louisiana	No agreements	Not an issue	None
Maine	Yes	Not applicable	Tribal lands considered same as other localities
Maryland	Not applicable	Not applicable	Not applicable
Massachusetts	Not applicable	Not applicable	Not applicable
Michigan	No formal documentation	Not applicable	Not considered, not an an issue
Minnesota	Unknown	Unknown	Unknown

Table 3-8: State Relationship With Indian Tribes
(Questions 15 and 16)

State	Question 15a: State Responsibility for Response on Tribal Lands	Question 15b: Reasons for No Responsibility	Question 16: Formal Program or Plan for Response on Tribal Lands
Mississippi	Yes	State owns right-of-way	Yes, same as other localities
Missouri	Not applicable	Not applicable	Not applicable
Montana	Not on tribal lands, but state owns roadways	Incidents would occur on highway right-of-way	No
Nebraska	No	Autonomous authority	No
Nevada	No	Has not been addressed	No
New Hampshire	No tribal lands	Not applicable	Not applicable
New Jersey	Not applicable	Not applicable	Not applicable
New Mexico	Only on state highway	Jurisdictional	Informal
New York	Yes	Not applicable	Yes
North Carolina	No, but will respond on request	Jurisdictional	No, except on state right-of-way
North Dakota	No, but would respond upon request	Jurisdictional	No, except on state right-of-way
Ohio	Not applicable	Not applicable	Not applicable
Oklahoma	Not applicable, no tribal lands	Not applicable	Not applicable
Oregon	Yes, but only by invitation	Jurisdictional	Not yet
Pennsylvania	No tribal lands	Not applicable	Not applicable
Puerto Rico	Not applicable	Not applicable	Not applicable
Rhode Island	Not applicable	Not applicable	Not applicable
South Carolina	No tribal lands	Not applicable	Not applicable
South Dakota	No	Jurisdictional	No
Tennessee	Not applicable	Not applicable	Not applicable
Texas	Yes if on public road	Not applicable	Same procedure as for any federal lands
Utah	No arrangement	Would respond until told to stop	No, use general plan
Vermont	Not applicable	Not applicable	Not applicable
Virginia	Yes	One area with tribal lands	Yes
Washington	Invitation only	FEMA instructions	Not aware of any
West Virginia	No Indian lands	Not applicable	Not applicable

Table 3-8: State Relationship With Indian Tribes
(Questions 15 and 16)

State	Question 15a: State Responsibility for Response on Tribal Lands	Question 15b: Reasons for No Responsibility	Question 16: Formal Program or Plan for Response on Tribal Lands
Wisconsin	Never consider; would respond if on public road	(Not reported)	No program
Wyoming	Not on tribal lands, but state owns roadways	(Not reported)	No

Table 3-9: State Relationship With Indian Tribes
(Questions 17 and 18)

State	Question 17: Arrangements for Sharing Part 71/73 Notification with Tribes	Question 18: State Relationship with Indian Tribes
Alabama	Not applicable	Not applicable
Alaska	Not an issue	Not applicable
Arizona	No	Information exchange, response by invitation
Arkansas	Not applicable	Not applicable
California	Not applicable	Not applicable
Colorado	No formal linkage	Invoke plan, notify Indian Division in Governor's Office
Connecticut	No	No
Delaware	Not applicable	Not applicable
District of Columbia	Not applicable	Not applicable
Florida	No	Not applicable
Georgia	Not applicable	Not applicable
Hawaii	Not applicable	Not applicable
Idaho	No	Work through DOE
Illinois	Not applicable	Not applicable
Indiana	Not applicable	Not applicable
Iowa	Not applicable	Just like any other part of the state
Kansas	Unknown	Unknown
Kentucky	Not applicable	Not applicable
Louisiana	None	None
Maine	No	By invitation
Maryland	Not applicable	Not applicable
Massachusetts	Not applicable	Not applicable
Michigan	No route goes near tribal lands	Treat as any other community
Minnesota	Unknown	Unknown
Mississippi	Yes, shares information	Same as other jurisdictions
Missouri	Not applicable	Not applicable
Montana	Governor's Office of Indian Affairs has not considered this issue	Tribe would call in the state agencies
Nebraska	Unknown	In state of emergency, support is available

Table 3-9: State Relationship With Indian Tribes
(Questions 17 and 18)

State	Question 17: Arrangements for Sharing Part 71/73 Notification with Tribes	Question 18: State Relationship with Indian Tribes
Nevada	No, being considered	None, but recent contact by nuclear waste office
New Hampshire	Not applicable	Not applicable
New Jersey	Not applicable	Not applicable
New Mexico	Probably not notified	Little relationship, no agreements
New York	Interstates not through tribal lands	Varies with the tribe
North Carolina	Not applicable, no routes	Will respond upon request
North Dakota	No shipment through, none anticipated	No formal relationship, respond on request
Ohio	Not applicable	Not applicable
Oklahoma	Not applicable	Not applicable
Oregon	Yes	Informal memorandum negotiated
Pennsylvania	Not applicable	Not applicable
Puerto Rico	Not applicable	Not applicable
Rhode Island	Not applicable	Not applicable
South Carolina	Not applicable	Not applicable
South Dakota	State planning involves tribal personnel	If requested
Tennessee	Not applicable	Not applicable
Texas	No	No formal agreement
Utah	No shipments go near tribal lands	No formal or informal arrangement
Vermont	Not applicable	Not applicable
Virginia	No	Treat as other citizens in state
Washington	Not aware of any	No formal relationship
West Virginia	Not applicable	Not applicable
Wisconsin	Not aware of any	Assumes state would respond
Wyoming	No	No formal arrangements

3.4 Legal Authority/Issues

Question 19: Are individuals from both the public and private sectors who assist in emergency response protected from personal liability (e.g., by an insurance program, statutory indemnity provisions, or statutory immunity from liability)?

In 1988, public- and private-sector emergency-response personnel were protected against personal legal liability in twenty-seven jurisdictions (compared to twenty-four jurisdictions in 1980). Nine jurisdictions reported that only state employees are protected, although some mentioned that private individuals who are deputized or otherwise acting as an agent of the state would be covered. These data concerning liability protection are presented in Table 3-10.

Table 3-10: Protection From Personal Liability (1980 vs. 1988)

Protected Personnel	1988	1980
Both Public and Private	27	24
Public only	9	4
No coverage	5	3
Other Response	11	20

Question 20: Do state statutes or other legal documents assign responsibility for costs incurred during emergencies, such as loss of property or evacuation costs?

Fourteen states indicated that the assignment of costs associated with transportation incidents involving radioactive materials was unequivocally covered, while thirteen states indicated that cost assignment provisions did not exist. This is in marked contrast to 1980, when more states said "yes" and fewer said "no." It does not seem reasonable to suggest that the states have acted to remove cost assignment provisions. Rather, it seems likely that experience has shown that cost recovery can be difficult. Sixteen states provided a response that could not be classified as "yes" or "no." This includes circumstances where fixed-facility incidents are clearly addressed but transportation incidents are not explicitly covered, where "spills" of hazardous materials in transport are addressed but the status of radioactive materials is unclear, or the practice where carriers and/or shippers are required to have insurance. Again, the responses in 1988 suggest that a more sophisticated appreciation of the potential complexity of these issues has arisen since 1980. The data for these questions are summarized in Table 3-12.

Table 3-11: Legal Authority/Issues (Question 19)

State	Question 19: Protection From Personal Liability (1988)	Question 19: Protection From Personal Liability (1980)
Alabama	Sovereign immunity	For state employees
Alaska	State employees covered, private not	(Not reported)
Arizona	Yes	Yes
Arkansas	Law protects public employees and volunteers	Yes
California	Currently bill in legislature	Yes
Colorado	Self-insured state, assume immunity	Yes
Connecticut	Yes	Yes
Delaware	Yes	Yes
District of Columbia	Public employees, yes; private sector, no	(Not reported)
Florida	Yes	Unclear
Georgia	Yes	Yes
Hawaii	Yes	Yes
Idaho	No	Unclear
Illinois	Yes, statute for employees; good samaritan law	Yes
Indiana	No; under study	Unclear
Iowa	State employees or state agents covered; good samaritan unclear	Unclear
Kansas	Yes, state employees	Only Div. of Emergency Preparedness
Kentucky	Not covered at all; state will defend employee who acted properly if suit arises	(Not reported)
Louisiana	Not clear, has good samaritan law	Unclear
Maine	Yes	Yes
Maryland	No	Unclear
Massachusetts	Yes	Yes
Michigan	Yes	If disaster is declared
Minnesota	Local volunteers and state employees are covered	Yes
Mississippi	Protected under state code	No

Table 3-11: Legal Authority/Issues (Question 19)

State	Question 19: Protection From Personal Liability (1988)	Question 19: Protection From Personal Liability (1980)
Missouri	All responders, under tort claims act	Yes
Montana	Public employees are covered	Only if deputized
Nebraska	Yes, if state of emergency declared	(Not reported)
Nevada	(Not reported)	Yes
New Hampshire	Yes	No
New Jersey	Yes, state regulation	No
New Mexico	Yes for public employees	Yes
New York	State employees protected, volunteers unclear	(Not reported)
North Carolina	Yes	Yes
North Dakota	Under review	Unclear
Ohio	Yes	(Not reported)
Oklahoma	Yes	Yes
Oregon	Yes	(Not reported)
Pennsylvania	Yes, law for state employees and good samaritan law	Yes
Puerto Rico	90% of teams are employees	Yes
Rhode Island	Yes	(Not reported)
South Carolina	(Not reported)	(Not reported)
South Dakota	Yes, by state law and insurance	No
Tennessee	Yes, if acting under orders in emergency	(Not reported)
Texas	Statutory immunity and good samaritan laws	Yes
Utah	Private good samaritan law, state immunity	Unclear
Vermont	(Not reported)	Yes
Virginia	Yes, statute grants immunity	No
Washington	(Not reported)	Yes
West Virginia	No	Yes
Wisconsin	Under declared state of emergency	Yes
Wyoming	No	Yes

Table 3-12: Assignment of Responsibility for Clean-Up Costs (1980 vs. 1988)

Response	1988	1980
Yes	14	18
No	13	11
Other Response	16	5
Not reported	9	17

Question 21: What formal memoranda of understanding and/or reciprocal agreements does the state have with adjacent states to cover transportation incidents involving radioactive materials that occur close to common borders?

Twenty-two of the states indicated that they have an arrangement of cooperation with bordering states. The most common form of cooperation is a regional mutual-aid compact or agreement, such as the Southern Mutual Radiological Assistance Pact. Three states indicated that while a formal agreement was not in place, there was general agreement with a border state for mutual assistance. One state limits mutual assistance to fixed facilities. Twenty-three states indicated that no form of mutual agreement with neighboring states was in effect.

Table 3-14 identifies the number of states, grouped by Bureau of the Census geographic region, that have mutual-aid pacts with neighboring states. States with mutual-assistance arrangements tend to be in the southern part of the country (South Atlantic, East South Central, and West South Central), as well as in the New England area. The eleven states in the upper-midwest area (East North Central and West North Central) have no mutual-assistance agreements.

3.5 Personnel

Question 22: What kinds of professional specialists are available to contribute their expertise in response to a transportation incident involving radioactive materials?

Health Physicists. All of the states (except two) reported that at least one health physicist is employed by the state. Among states reporting at least one, the number of health physicists ranged from one to sixty-five. Eight states reported that these personnel are available, but the number was not specified.

Health-Physics Technicians. Thirty-four states reported that health-physics technicians are available; the number of these personnel ranged from one to twenty-five. Two states indicated that they did not use this job title

Table 3-13: Legal Authority/Issues
(Questions 20 and 21)

State	Question 20: Assignment of Responsibility for Costs (1988)	Question 20: Assignment of Responsibility for Costs (1980)	Question 21: Arrangements with Adjacent States
Alabama	Costs of cleanup and damage to shipper	Applicable to fixed facilities only	Southern Mutual Rad Assistance Plan
Alaska	Not for radiation emergencies	(Not reported)	None, but do work with Canada
Arizona	Probably requires litigation	Yes	Nothing formal, work with California
Arkansas	No	Yes	None, but member of Central States Compact and Southern Energy Board
California	Case-by-case litigation	No law but regulated procedure	General agreements with border states
Colorado	Emergency Response Act--shipper responsible	Yes	Member of Western Compact
Connecticut	Fixed facilities are covered; transportation probably requires litigation	Unclear	Member of New England Compact
Delaware	Yes	Unclear	Yes for fixed, history of cooperation in other matters
District of Columbia	Probably requires litigation	(Not reported)	Mutual aid with Maryland and Virginia
Florida	Nuclear power plants covered; transportation probably requires litigation	Unclear	Southern Mutual Rad Assistance Plan
Georgia	No, probably requires litigation	Yes	Southern Mutual Rad Assistance Plan
Hawaii	No law, but try to identify those responsible	Yes	Not applicable
Idaho	No	No	None; under consideration
Illinois	No; legislation being considered	No	None for transportation incidents
Indiana	No	Unclear	No
Iowa	Person with control is liable for costs	Unclear	Informal, day-to-day relationship
Kansas	No, none at state level	Cleanup only	No specific
Kentucky	Not at present; requires litigation	(Not reported)	Southern Mutual Rad Assistance Plan
Louisiana	No statutes; probably requires litigation	Unclear	Southern Mutual Rad Assistance Plan

Table 3-13: Legal Authority/Issues
(Questions 20 and 21)

State	Question 20: Assignment of Responsibility for Costs (1988)	Question 20: Assignment of Responsibility for Costs (1980)	Question 21: Arrangements with Adjacent States
Maine	Fixed facility covered; transportation unclear	Cleanup is responsibility of owner	New England Rad Health Committee
Maryland	(Not reported)	No	(Not reported)
Massachusetts	Yes	Yes	New England Rad Health Compact
Michigan	No, must go to litigation	(Not reported)	None for transportation incidents
Minnesota	In state of emergency or if environment harmed	Yes	None
Mississippi	No	No	Southern Mutual Rad Assistance Plan
Missouri	Not addressed	Yes	None
Montana	No, legislation is currently proposed	No	Western Interstate Nuclear Compact
Nebraska	No	(Not reported)	(Not reported)
Nevada	(Not reported)	Yes	Western Interstate Energy Board
New Hampshire	No	No	New England Compact
New Jersey	Yes, 49 CFR Part 387 if spill	Unclear	No formal, but history of cooperation
New Mexico	Yes, state statute	No	None
New York	Law requires liability insurance	(Not reported)	None
North Carolina	Yes	Yes	Southern Mutual Rad Assistance Plan
North Dakota	In certain instances	Yes	Not aware of any
Ohio	(Not reported)	(Not reported)	None
Oklahoma	Rad not specified, but law requires cleanup of hazmat spill by owner	Policy to avoid burdening taxpayers	Southern States Emergency Board
Oregon	No	(Not reported)	None, but Pacific States Agreements Committee is in process
Pennsylvania	(Not reported)	No	None for transportation
Puerto Rico	(Not reported)	No	Not applicable
Rhode Island	No	(Not reported)	None

Table 3-13: Legal Authority/Issues
(Questions 20 and 21)

State	Question 20: Assignment of Responsibility for Costs (1988)	Question 20: Assignment of Responsibility for Costs (1980)	Question 21: Arrangements with Adjacent States
South Carolina	(Not reported)	(Not reported)	Southern Mutual Rad Assistance Plan
South Dakota	Yes	No	None
Tennessee	No	Unclear	Southern Mutual Rad Assistance Plan
Texas	Cleanup covered; other costs require litigation	No	None
Utah	Assigned to carrier	Unclear	Western Interstate Nuclear Pact
Vermont	No	Yes	New England Rad Health Compact
Virginia	Yes, "responsible party" pays	Yes	None, but history of cooperation
Washington	Yes	Unclear	Agreement with Oregon
West Virginia	No	New legislation sought	Southern States Energy Board
Wisconsin	Believes so	Yes	Only for fixed facilities
Wyoming	None	Yes	Working on memorandum of understanding with Idaho

Table 3-14: States with Mutual-Assistance Agreements (by Region)

Region	Number of States in Region	Number With Mutual Aid Agreements
New England	6	5
Mid-Atlantic	3	0
East North Central	5	0
West North Central	6	0
South Atlantic	9	7
East South Central	4	4
West South Central	4	3
Mountain	11	4
Pacific*	3	0

* Excluding Alaska and Hawaii

to define an occupational category, fifteen states reported that they had no health-physics technicians, and one state is unreported.

Radiation Monitors. With regard to radiation monitors, a few states reported that there were personnel with this training who might be involved in emergency response through the state response system, ranging from a few individuals to several dozen. Eight states indicated that they do not consider that these personnel are part of the emergency-response system. The remainder of the states reported statewide estimates for the number of personnel with this training, ranging from 100 to over 2,000.

Radiochemists. Seven states reported that they did not have access to personnel with training in radiochemistry. The remaining states indicated that they did have access to such expertise, either personnel within state government or known individuals working in the state. In some cases, personnel reported as health physicists were also counted as radiochemists.

Radiobiologists. Twenty-four states reported that they did not have access to radiobiologists, and five states are unreported. The remaining states indicated that they did have access to this expertise, either personnel within state government or known individuals working in the state. In some cases, personnel reported as health physicists were also counted as radiobiologists.

Hazardous Materials Specialists. Five states reported that they did not have access to hazardous materials specialists, and five states are unreported. The remainder of the states reported that such personnel were available, but most states indicated that these personnel are not ordinarily involved in a response to radiation incidents.

Other Specialists. For the remaining professional specialties enumerated in the questionnaire (transportation specialists, electronic technicians, communications specialists, site coordinators, and public relations/news coordinators), most of the states indicated that these personnel are usually not involved unless the incident is a genuine disaster and simply stated that they were available, if needed, through the chain of command.

The survey data for the radiation-related professional specialties and for hazardous materials specialists are presented in Table 3-15; the data for the other professional specialties are not reported because nearly all the states indicated that they were available but the number was not specified.

3.6 Equipment

Question 23: Indicate the number of locations throughout the state where serviced and calibrated portable radiation-detection instruments available for use during an emergency response are normally kept. (Do not include civil-defense shelter kits in this enumeration.)

Question 24: Of these locations, how many have the following portable radiation detectors available on a 24-hour basis?

(The responses to Questions 23 and 24 have been combined for reporting purposes.)

The states reported the number of locations where each type of instrument is available for use through normal channels by emergency-response personnel. In most states, this reporting was confined to the radiological control agency's main office and branch offices. In some states, instruments in the possession of universities, industries, nuclear-powered generating stations, federal facilities within the state, and some local jurisdictions are included. In no case should this reporting be interpreted to represent the complete inventory of instrumentation available within the respective states.

Beta-Gamma Detectors. Virtually all of the states reported ready access to beta-gamma detectors of low-, medium- and high-range sensitivity. It is not possible to make a comparison between 1988 and 1980 reporting because 1980 reporting included all instrumentation, whereas 1988 reporting was confined to instruments in the possession of emergency-response personnel. The wide distribution of beta-gamma detectors by FEMA and its predecessor agencies in civil-defense "shelter kits" led to the reporting of hundreds and even thousands of instruments in 1980.

Low-Energy Gamma Detectors. Five states reported that they did not have access to low-energy gamma detectors, and six states are unreported. Among the remainder, two states indicated that they would have to borrow these instruments, and all others had such instruments at at least one location.

Table 3-15: Personnel (Question 22)

Question 22:
Professional Specialists Available to Contribute Their Expertise for Emergency Response
(Numbers in parentheses refer to footnotes at the end of the table)

State	Health Physicists	Radiation Monitors	Hazmat Specialists	Radio-Chemists	Radio-Biologists	Health-Physics Technicians
Alabama	7	6	6	2	1	10-12
Alaska	1	Many	0	0	1	5
Arizona	20	40	15	3-5	3	N/A
Arkansas	12	2022 (1)	376 (2)	2	0	0
California (3)	30	60	30	4	1	25
Colorado	7	Many (4)	7 (5)	3	A	3
Connecticut	5	10	30	4	2	4
Delaware	1	30-40	A	A	0	2
District of Columbia	1	Many	4	0	0	0
Florida	65	N/A	Many	8	0	0
Georgia	12	12	A	2	0	3
Hawaii (6)	0	Many	A	0	0	4
Idaho (7)	3	12	3	0	0	0
Illinois	25	0	75	3	4	29
Indiana (8)	28	Many	A	2	0	6
Iowa	15-20	50	A	1	A	Many
Kansas	3	Many	A	4	0	13
Kentucky	3	5	A	2	0	2
Louisiana	20	Many	50	3	12	N/A
Maine	4	0	6	3	0	8
Maryland	4	3	6	2	2	0
Massachusetts (9)	3	3	0	2	0	4
Michigan	13	Many	Many	5	0	0
Minnesota	7	15-20	0	1	0	0
Mississippi	A	A	A	A	0	0
Missouri	A	A	A	0	0	A
Montana	2	Many	5	0	0	0
Nebraska	A	A	A	A	A	A

Table 3-15: Personnel (Question 22)

State	Health Physicists	Radiation Monitors	Hazmat Specialists	Radio-Chemists	Radio-Biologists	Health-Physics Technicians
Nevada	5	*	*	*	*	1
New Hampshire	12	Many	Many	8	8	25
New Jersey	8	22	14	3	4	12
New Mexico	5	*	10	3	0	0
New York (10)	A	A	A	A	A	A
North Carolina	19	Many	Many	3	4	10
North Dakota	3-5	Many	10	2	0	3-5
Ohio	10	15	0	3	0	0
Oklahoma	3	5	25	2	4	0
Oregon	4	Many	24	3	0	14
Pennsylvania	25	0	A	2	4	12
Puerto Rico	5	Many	5	2	*	5
Rhode Island	15-20	Many	2	2	0	10
South Carolina	A	N/A	A	A	0	A
South Dakota	0	Many	Many	A	A	0
Tennessee	27	*	*	1	0	0
Texas (11)	A	A	A	A	A	A
Utah	8	*	*	*	*	3
Vermont	3	Many	Many	3	1	1
Virginia	9	0	8	1	0	2
Washington	A	N/A	*	A	*	0
West Virginia	1	*	*	*	*	*
Wisconsin	A	A	0	1	2	A
Wyoming	1	0	A	0	A	0

* = Not reported
N/A = Not applicable
A = Available, number not specified

(1) County personnel included.
(2) All agencies of state.
(3) Access to technical expertise through universities and the private sector is virtually unlimited.
(4) Personnel available include: State police, Civil Defense, uranium mining experts, generating station personnel, and weapons manufacturing personnel.
(5) Related specialities available include: industrial hygienists, environmental toxicologists, and consumer protection experts.
(6) Extensive expertise available through Pearl Harbor Navy Base.
(7) Extensive expertise available through Idaho National Engineering Labs and Hanford, Washington.

Table 3-15: Personnel (Question 22)

(8) The recent creation of a state Department of Environmental Management has led to a broad reevaluation of the state's approach to all hazmat emergencies; reorganization is impending.
(9) A call list of approximately 40 private sector volunteer consultants is available with many specialties.
(10) Specialists are readily accessible through various state agencies.
(11) Many individuals, representing all relevant specialties, are designated for emergency response at various geographic and institutional locations.

Alpha-Particle Detectors. One state reported that it did not have access to alpha-particle detectors, and five states are unreported. Among the remainder, three states indicated that they would have to borrow these instruments, and all others had such instruments at at least one location.

Neutron Detectors. Eleven states reported that they did not have access to neutron detectors, and six states are unreported. Among the remainder, two states indicated that they would have to borrow these instruments, and all the rest had such instruments at at least one location.

Gamma-Ray Spectrometers. Eight states reported that they did not have access to gamma-ray spectroscopy, and six states are unreported. Among the remainder, six indicated that they would have to borrow such equipment, five reported that they had laboratory instruments only, and two states reported that they had a laboratory instrument installed in a mobile laboratory vehicle. The remaining states had portable gamma-ray spectroscopy instrumentation at at least one location.

Tritium Dectectors. Sixteen states reported that they did not have access to tritium detectors, and six states are unreported. Among the remainder, three indicated that they would have to borrow such equipment, six reported that they had laboratory equipment only, and all others had such instrumentation at at least one location.

Question 25: How many emergency-response vehicles that are specially equipped or can be specially equipped without delay for response to transportation incidents involving radioactive materials (or other hazardous-material incidents) are available?

Thirty-six states reported that they have emergency-response vehicles that are specially equipped or can be equipped without delay for response. For states reporting at least one such vehicle, the number of vehicles ranged from twenty-five to one. Excluding the zero responses, the mean number of vehicles per state with vehicles is eight.

The use of special vehicles represents a dramatic change over the period between the two surveys. In 1980, only seventeen states indicted that they maintained dedicated hazardous-materials response vehicles, while in 1988, thirty-six so indicated. Some of the states with specially equipped vehicles stated that they were part of the lead agency's fleet, all of which was equipped with response equipment, and therefore they were not "dedicated" as such to emergency response. Since the question was phrased in a similar manner in 1980 and 1988, it can be concluded that the number of specially equipped emergency-response vehicles has increased over the time between the two surveys.

Question 26: Are emergency kits available for use by persons responding to transportation and other incidents involving radioactive materials? At how many locations around the state are such kits available? Describe the usual contents of such kits.

Availability of Emergency Kits an Locations. In 1988, forty-six jurisdictions reported that kits are available, which is comparable to the forty-seven jurisdictions reporting the availability of kits in 1980. In terms of

Table 3-16: Equipment (Questions 23 and 24)

Questions 23 and 24:
Number of Locations With Portable Radiation-Detection Instruments (by Type of Instrument)

Legend:
- Numeral = Number of locations
- A = Available within agency, number of locations not specified
- B = Available, must borrow
- N = Not available through normal channels
- * = Not reported
- (Number in parentheses) = footnote

State	Low-Range Beta-Gamma	Med-Range Beta-Gamma	High-Range Beta-Gamma	Low-Energy Gamma	Alpha Particle	Neutron Detector	Gamma-Ray Spectro-Meter	Tritium Detector
Alabama	3	3	1	1	1	1	1	1
Alaska	5	5	2	2	2	N	B	1
Arizona	12	12	1	1	1	1	(1)	1
Arkansas	1	1	1	1	1	1	1	N
California	Many	10	10	6	6	2	3	N
Colorado	1	1	1	1	B	1	1	(1)
Connecticut	6	4	2	1	2	N	(1)	(1)
Delaware	15	15	4	A	B	B	A	B
District of Columbia	40	40	40	N	1	N	N	N
Florida	10	10	10	N	3	3	(2)	N
Georgia	1	1	1	1	1	2	2	1
Hawaii	1	1	1	B	1	N	B	N
Idaho	7	7	1	1	1	1	B	B
Illinois	79	79	6	2	2	2	2	1
Indiana	1	1	N	1	1	N	1	N
Iowa	7	7	7	7	7	7	2	2
Kansas	5	5	5	3	5	3	(1)	3
Kentucky	1	1	1	1	1	1	(1)	(1)
Louisiana	10-15	6	3-4	2	3-5	3	B	N
Maine	1	2	2	2	1	N	N	N
Maryland	8	8	6	6	4	1	N	2
Massachusetts	4	4	4	4	4	1	1	N
Michigan	3	3	3	3	3	1	1	1
Minnesota	16	12	*	10	2	2	(1)	(1)

Table 3-16: Equipment (Questions 23 and 24)

State	Low-Range Beta-Gamma	Med-Range Beta-Gamma	High-Range Beta-Gamma	Low-Energy Gamma	Alpha Particle	Neutron Detector	Gamma-Ray Spectrometer	Tritium Detector
Mississippi	A	*	A	*	*	*	*	*
Missouri	3	3	3	*	1	1	*	*
Montana	56	56	1	1	1	1	N	1
Nebraska	A	A	A	*	*	*	*	*
Nevada	3	3	3	N	2	2	N	N
New Hampshire	Many	Many	Many	20	A, B	1	A, B	A, B
New Jersey	4	4	1	B	4	N	1	(1)
New Mexico	3	3	1	1	3	1	1	N
New York	Many	Many	Many	Many	Many	A	A	A
North Carolina	6	5	5	N	5	1	3	1
North Dakota	10	5	2	3	2	1	1	2
Ohio	Many	5	3	10	11	1	A	1
Oklahoma	4	4	3	1	4	1	A	1
Oregon	Many	*	Many	8	8	1	4	1
Pennsylvania	4	4	4	4	4	N	3	A
Puerto Rico	Many	1	Many	*	2	*	*	*
Rhode Island	Many	*	A	N	N	N	N	N
South Carolina	A	A	A	*	*	*	(1),(2)	(1)
South Dakota	1	1	2	1	2	N	N	N
Tennessee	4	4	4	4	4	1	1	1
Texas	Many	15	Many	14	14	1	12	N
Utah	2	2	1	1	1	1	1	N
Vermont	1	N	1	1	1	N	N	N
Virgina	5	5	5	2	3	B	B	B
Washington	3	N	3	3	3	1	1	1
West Virginia	*	*	*	*	*	*	*	*
Wisconsin	7	7	1	1	2	1	2	1
Wyoming	*	*	*	*	*	*	*	*

(1) Laboratory instrument only, not portable
(2) Laboratory instrument installed in mobile lab, not a portable instrument

the number of locations of the kits, the mean number of locations per jurisdiction in 1988 was forty-three compared to thirteen in 1980. Excluding jurisdictions with no locations, the 1988 mean number of locations was fifty-one, while the comparable mean in 1980 was sixteen. Thus, it appears that while the number of jurisdictions reporting emergency kits available has not changed from 1980 to 1988, the number of locations at which kits are available in jurisdictions with one or more locations has increased substantially due in part to the number of states with more than two hundred locations. Table 3-17 identifies the number of emergency-kit locations in 1980 and 1988.

Table 3-17: Number of Locations of Emergency Kits (By Number of States, 1988 vs. 1980)

Number of Locations	1988	1980
No kits maintained	4	2
1 Location only	12	19
2-10 Locations	26	19
More than 10 locations	8	8
Not reported	2	3

Contents of Kits. The contents of emergency kits vary widely. Table 3-18 lists the most frequently mentioned items included in emergency kits.

Table 3-18: Common Items in Emergency Kits (1988)

Item	States
Protective Clothing	28
Dosimeters (including chargers)	18
Beta-Gamma Detectors	11
Alpha-Particle Detectors	3
Other Instruments	18
Sampling Equipment	12
Respirators	7
Decontamination Supplies	3
Detection Equipment	2
Tools (ropes, signs, etc.)	11
Reference manuals/plan	4

The most common item mentioned was some form of anti-contamination clothing, including gloves and boots. Instruments for measuring and monitoring and a variety of tools and supplies, such as ropes, signs, report forms, and general supplies, were mentioned frequently.

3.7 Communications

Question 27: What communication network, if any, has the state established to provide two-way communication between the state-office control center and the scene of a transportation incident involving radioactive materials?

Virtually all of the states reported having access to a radio communications network enabling ready communication between the field and a command center; most states reported having access to multiple dedicated frequencies. However, many states reported that they typically rely on regular commercial telephone service direct to the radiation control office because most transportation incidents turn out to be non-events and "official" communications channelled through a command center are not indicated. A few of the large states reported that some remote locations may not be accessible through established radio networks.

3.8 Training

Question 28: How many trained radiological emergency-response teams does the state have?

Thirteen states reported that they have a single group of individuals who are designated to respond that they consider to comprise one team, although all members of the "team" are not necessarily involved in every response. Eleven states reported that they have between two and five teams; six states reported that they have between six and ten teams. For these states, some have predesignated teams at various locations around the state. Others do not use a system of predesignated teams per se, but consider that they have a large enough pool of qualified personnel to deploy several "teams" to the scenes of several incidents simultaneously.

Six additional states reported that they have more than ten teams. All of these include personnel who are not members of the cognizant state agencies, but rather include personnel from local government (especially local governments within the emergency planning zone for nuclear-generating stations), generating-station personnel, or qualified individuals from universities or the private sector. Fifteen states reported that they do not use a team structure per se. One state did not respond to the question.

Question 29: How many members of the state radiological health department are trained in radiological emergency-response procedures (i.e, have completed the "Radiological Emergency Response Operation" course at Mercury, Nevada, or equivalent training)?

Twelve states reported that they have from one to five RERO-trained personnel; two of these reported only one, but both are very sparsely populated states. Eighteen states reported that they have from six to ten, and ten states reported between eleven and twenty RERO-trained personnel. Eight states reported more than twenty RERO-trained personnel. All of these are heavily populated and industrialized states. Four states did not respond.

Table 3-19: Equipment and Communications
(Questions 25 to 27)

State	Question 25: Dedicated Emergency Response Vehicles	Question 26: Emergency Field Kits	Question 27: Communications Network
Alabama	3 vehicles at one location	3 locations	Multi-channel radio
Alaska	No dedicated vehicles	1 location	Full spectrum of capabilities
Arizona	14 vehicles at 3 agencies	1 location	Public safety radio net
Arkansas	7 vehicles at 1 location	2 locations	2 radio networks
California	1 vehicle	33 locations	Multi-channel radio
Colorado	No dedicated vehicles	Team members keep kits plus main and branch office	Communications vehicle, full capability
Connecticut	8 vehicles assigned to team members	In each vehicle with team members	Multi-channel radio, commercial phones
Delaware	3 vehicles, assigned to team leaders	In each vehicle, with team leader	Dedicated frequency, cellular phones
District of Columbia	2 vehicles at 2 agencies	40 locations	Communications vehicles, cellular phones
Florida	20 vehicles at 10 locations	10 locations	Several radio nets, cellular phones
Georgia	4 vehicles	In 3 vehicles	Communications vehicles, multiple capabilities
Hawaii	No dedicated vehicles	1 at Rad Health plus other islands	Civil Defense net, commercial phones
Idaho	No dedicated vehicles	7 locations	Dedicated frequency, patch into State Police
Illinois	Nuclear Safety, 8 vehicles; hazmat officers, 72 vehicles	15 kits at 5 locations plus each hazmat police vehicle	Multiple dedicated frequencies
Indiana	No dedicated vehicles	1 kit at Rad Health plus volunteer experts	Several radio nets, commercial phone
Iowa	1 vehicle	No kits, but all equipment readily available	Communications vehicle, state police net, commercial phone
Kansas	1 vehicle	4 locations	Several radio nets, commercial phone
Kentucky	No dedicated vehicles	No kits, but all equipment readily available	State police net
Louisiana	7 dedicated vehicles plus others available	3 kits at 1 location	State police net, Civil Defense net
Maine	1 vehicle	3 locations	State police net, portable radios

Table 3-19: Equipment and Communications
(Questions 25 to 27)

State	Question 25: Dedicated Emergency Response Vehicles	Question 26: Emergency Field Kits	Question 27: Communications Network
Maryland	2 vehicles	No kits	(Not reported)
Massachusetts	10 vehicles	4 locations	Radios in vehicles link to Civil Defense net
Michigan	2 vehicles	3 locations	Police network
Minnesota	Up to 10 vehicles available	1 location	Highway patrol net
Mississippi	6 vehicles	4 kits at 1 location	Several radio nets
Missouri	1 vehicle	2 kits	Commercial phones
Montana	No dedicated vehicles	1 location	Highway patrol net
Nebraska	1 vehicle	(Not reported)	Mobile communications capability
Nevada	No dedicated vehicles	3 locations	Highway patrol net, commercial phones
New Hampshire	6 vehicles	1 location	Radio net
New Jersey	22 vehicles at 3 locations	14 kits at 2 locations	Emergency Preparedness net
New Mexico	No dedicated vehicles	1 location	State Police net
New York	No dedicated vehicles	10 locations	Several radio nets, communications vehicles
North Carolina	1 mobile lab plus 2 other vehicles	3 kits at 1 location	Several dedicated frequencies, multi-channel net
North Dakota	1 vehicle	2 locations	Portable sets link to state net plus communications vehicle
Ohio	7 vehicles	5 locations	Communications vehicle, radio and telephone
Oklahoma	1 vehicle	4 kits at 1 location	Radio and commercial phone
Oregon	5 vehicles	Many	Statewide radio net, radio telephones
Pennsylvania	18 vehicles at 4 locations	5 locations	Several statewide nets
Puerto Rico	25 vehicles	Many	Island-wide net, commercial phones
Rhode Island	3 vehicles	Many	State police radio, radio telephone
South Carolina	1 mobile lab plus 9 other vehicles	1 kit in vehicle plus 4 other kits	Radio net, mobile telephone

Table 3-19: Equipment and Communications
(Questions 25 to 27)

State	Question 25: Dedicated Emergency Response Vehicles	Question 26: Emergency Field Kits	Question 27: Communications Network
South Dakota	No dedicated vehicles	No kits packed	State radio net
Tennessee	4 vehicles at 4 locations	4 locations	Emergency radio net
Texas	2 Rad Control vehicles plus others	13 locations	State and local law enforcement radio nets
Utah	1 vehicle	4 kits at 2 locations	Police and fire radio net
Vermont	2 vehicles	1 location	Emergency Mgmt. radio net
Virginia	1 mobile lab plus 4 other vehicles	5 locations	State Police radio net, State Emergency radio net, cellular phones
Washington	11 vehicles at 3 locations	3 locations	Multi-channel radio
West Virginia	(Not reported)	(Not reported)	(Not reported)
Wisconsin	1 vehicle	7 locations	State Police radio net
Wyoming	1 vehicle	1 location	Highway Patrol radio net

Question 30: Are the trained members all at one location? How many are at each location in the state? Specify the number by location.

Twenty-six states reported that all RERO-trained personnel are at one location, while twenty-four states reported that RERO-trained personnel are at more than one location. Four states did not respond to the question.

Among the twenty-four states with RERO-trained personnel at more than one location, six reported that they are distributed at three or more locations. Many states reported that personnel from a variety of state agencies and other affiliations had been to RERO training.

Among states reporting RERO-trained personnel at more than one location, most of these trained individuals were at the state capital in the radiation control agency offices, with fewer personnel at dispersed locations. Several states reported that at least one RERO-trained state police officer was assigned to each state police post. Seven states reported that they have divided their state into regions and have RERO-trained personnel at the regional offices. One state reported that it has adopted a system of "agreement counties" (patterned after the NRC's national strategy of "agreement states") and that RERO-trained personnel are present in agreement counties. Other states have branch or satellite offices (distinguished from regional offices) with RERO-trained personnel, usually in close proximity to a nuclear-power generating station or other major producer or user of radioactive materials. A few states mentioned that some personnel from local government agencies had been RERO-trained, especially from jurisdictions that are included in the emergency planning zone for nuclear-power generating stations. Some states also indicated that known individuals in private industry were RERO-trained and available to be called upon for their expertise, if needed.

For thirty-three states, the distribution of RERO-trained personnel is essentially unchanged from 1980 to 1988. For ten states, the reporting indicated that the distribution of RERO-trained personnel had changed; however, there is no basis for a 1980-1988 comparison for nine states (missing data for 1980, 1988, or both years). Among the ten states for which a change was noted, five had changed to a system where RERO-trained personnel are now more widely distributed, and five others had brought their previously distributed RERO-trained personnel into one location.

Question 31: What provision do state and local jurisdictions make for training their emergency-response personnel? Who conducts the training? Who funds the training?

First-on-the-Scene Responders. The training of first-on-the-scene personnel with respect to transportation incidents involving radioactive materials varies widely among the fifty-two jurisdictions surveyed. Although some states do make an effort to provide special training specifically focused on transportation issues involving radioactive materials, most states provide first-responder training in basic emergency management that is oriented toward hazardous materials in general, treating radioactive materials as a subset of this larger topic. In addition, most states provide introductory training about the phenomenon of radioactivity in general terms in relation to fixed-facility incidents or nuclear attack and consider some of this training transferable to transportation incidents.

Table 3-20: Training (Questions 28 to 30)

State	Question 28: Number of Trained Radiological Emergency Response Teams	Question 29: Number of Team Members Trained in Radiological Emergency Response Procedures (RERO or Equivalent)	Question 30: Location of Trained Radiological Emergency Response Team Members
Alabama	No teams designated; can put 4 groups of qualified personnel into the field simultaneously	10 rad health plus others	All at Rad Health hq. plus 2 groups at counties with nuclear generating stations
Alaska	No teams designated; can assemble requisite personnel from various locations	1 rad health plus approximately 12 others	Rad Health hq. plus other agencies at dispersed locations
Arizona	No teams designated; can put 15 groups of qualified personnel into the field simultaneously	20 rad health plus others	All at Rad Health hq. plus other agencies at dispersed locations
Arkansas	4 teams, not including generating station personnel	16 rad health	Most at Rad Health hq.; others at satellite office for nuclear generating station
California	2 teams for immediate deployment; 30 teams can be assembled overnight	4 rad health plus approximately 30 others	Widely distributed both geographically and institutionally
Colorado	In process of developing FEMA "Radiological Response Team" (RRT) concept; 1 health physicist from state agency leads local RRT	10 rad health plus approximately 60 others	Widely distributed both geographically and institutionally
Connecticut	No teams designated; rotating 24-hour call list; for transportation incident, 1 or 2 go out, supplemented as needed	3 rad health	All at Rad Health hq.
Delaware	1 designated team; can assemble more if necessary	6 rad health plus other personnel	All at Rad Health hq.; others in various state agencies
District of Columbia	1 designated team	3	All one location
Florida	30 designated teams	20 rad health	Widely distributed at branch offices and agreement counties
Georgia	All cognizant personnel are on 24-hour call; senior personnel wear beepers	25 rad health and environmental health plus others	Most at state capital; others in each of 5 regions around state
Hawaii	No teams; strategy is under revision	6 rad health plus others	Distributed among the islands
Idaho	No teams; heavy reliance on DOE/INEL; also designated state police officers with training	2 rad health; plus others in state government plus DOE/INEL	Rad Health hq. plus state police at 6 districts around state

Table 3-20: Training (Questions 28 to 30)

State	Question 28: Number of Trained Radiological Emergency Response Teams	Question 29: Number of Team Members Trained in Radiological Emergency Response Procedures (RERO or Equivalent)	Question 30: Location of Trained Radiological Emergency Response Team Members
Illinois	No teams designated; response personnel have kits in vehicles, nearest to scene respond, usually 1 hazmat state police officer and 2 rad health officials	31 rad health plus others	Widely distributed both geographically and institutionally
Indiana	26 individuals strategically located around state	7 rad health plus others	Rad Health hq. plus other locations
Iowa	4 teams at 4 locations	4 rad health	All at Rad Health hq.
Kansas	For transportation incident, use closest personnel from branch offices on case-by-case basis	14 rad health	Rad Health hq. plus 3 area offices
Kentucky	5 individuals designated; for transportation incidents, usually 2 respond	5 rad health	All at Rad Health hq.
Louisiana	5 designated teams plus strategically located individuals	14 rad health plus others	Rad Health hq.; others at nuclear generating station
Maine	2 teams	12 rad health	All at Rad Health hq.
Maryland	1 team	12 rad health	All at Rad Health hq.
Massachusetts	3 teams	10 rad health	Most at Rad Health hq. plus one other location
Michigan	8 teams	17 rad health	At 3 locations
Minnesota	7 teams	8 rad health	All at Rad Health hq.
Mississippi	5 teams	11 rad health	Most at Rad Health hq. plus one other location
Missouri	2 teams	6 rad health	Most at Rad Health hq. plus two other locations
Montana	1 team	3 rad health	All at Rad Health hq.
Nebraska	6 teams	6 rad health	All at Rad Health hq.
Nevada	Entire rad health staff is available; for transportation incident, usually 2 respond	6 rad health	Most at Rad Health hq. plus two other locations
New Hampshire	12 teams	7 rad health plus others	All at Rad Health hq.
New Jersey	12 rad health teams plus generic hazmat teams	3 rad health plus others	Most at Rad Health hq. plus other agency

Table 3-20: Training (Questions 28 to 30)

State	Question 28: Number of Trained Radiological Emergency Response Teams	Question 29: Number of Team Members Trained in Radiological Emergency Response Procedures (RERO or Equivalent)	Question 30: Location of Trained Radiological Emergency Response Team Members
New Mexico	Entire rad health staff is available; for transportation incidents, usually 2 respond	5 rad health	Most at Rad Health hq. plus two other locations
New York	No teams designated; numerous individuals are available from various agencies	25 rad health	Most at Rad Health hq. plus 4 other locations; NYC is self-contained
North Carolina	3 teams	16 rad health plus others	Most at Rad Health hq. plus other locations
North Dakota	1 team	4 rad health plus others	Rad Health hq. plus other agencies
Ohio	4 teams	6 rad health	All at Rad Health hq.
Oklahoma	1 team	7 rad health plus others	All at Rad Health hq. plus other agencies
Oregon	1 team	8 rad health	All at Rad Health hq.
Pennsylvania	6 teams	10 rad health	Most at Rad Health hq. plus regional offices
Puerto Rico	1 team	Unknown	Individuals are distributed around the island
Rhode Island	2 teams	4 rad health	All at Rad Health hq.
South Carolina	5 designated leaders plus technical support as needed	12 Duty Officers	All at Rad Health hq.
South Dakota	No designated teams; respond on case-by-case basis	4 Disaster Services staff members	All at Disaster Services hq.
Tennessee	Numerous individuals at several locations; for transportation incidents, usually 2 respond	19 rad health	Most at Rad hq. plus three other locations
Texas	Numerous individuals at several locations, designated to cover 12-hour shifts; for transportation incidents, usually 1 or 2 respond	59 rad health plus others	Widely distributed both geographically and institutionally
Utah	2 teams	6 rad health	All at Rad Health hq.
Vermont	3 teams	3 rad health plus others	All at state capital
Virginia	8 teams	8 rad health	Most at Rad Health hq. plus 3 regional offices
Washington	6 teams	Approximately 40 rad health	Most at Rad Health hq. plus other locations

Table 3-20: Training (Questions 28 to 30)

State	Question 28: Number of Trained Radiological Emergency Response Teams	Question 29: Number of Team Members Trained in Radiological Emergency Response Procedures (RERO or Equivalent)	Question 30: Location of Trained Radiological Emergency Response Team Members
West Virginia	1 team	5 rad health	All at Rad Health hq.
Wisconsin	7 teams at 7 locations	12 rad health	At 7 locations
Wyoming	No team designated	1 rad health	Rad Health hq.

Eight states reported that there is no organized training concerning radioactivity for first-on-the-scene personnel, except for those few local jurisdictions that are within the emergency planning zone for a fixed nuclear facility. Five states reported that such training is provided entirely on the initiative of local jurisdictions and is highly variable according to locale. Six states reported that training with regard to hazardous materials in general is a basic component of the curriculum at the police and fire service academies. Ten states reported that their service academy curriculum includes a section specifically devoted to radiation and transportation issues and that qualified personnel from the radiation control agency are the lecturers for these sections.

Twenty-one states reported that training in this subject area is provided in the context of civil preparedness for the management of emergencies in general, without any detailed attention to the transport of radioactive cargo. Two states reported that the level of training among first-on-the-scene personnel is unknown.

The above enumeration provides an overview summary with regard to the training that is presented to all first-on-the-scene responders as an element of basic, entry-level job skills. Many jurisdictions reported other training opportunities for local personnel that exceed this basic training. Eleven states reported that they send some personnel from local jurisdictions or state employees on local assignment to national training programs, such as RERO. At least two of these states have a policy that one officer from each state police regional post must have RERO training. Another state indicated that sanitarians from public health districts receive some specialized training. Two states reported that the state radiation control agency sponsors a train-the-trainer program, where certain local officials receive special training and then return to their jurisdictions to train other local personnel. Two states reported that a regular program of workshops for civil defense volunteers is ongoing, two states reported that training opportunities are presented through community colleges or university extension services, and one state reported that continuing education is a requirement for all local public safety personnel and that training sessions in radiation issues are presented on an occasional basis. Two states reported that fire department personnel are the primary audience for training in radiation issues related to transportation incidents. A few states mentioned that local jurisdictions along designated shipping routes had received training through the Waste Isolation Project ("WIP training").

With regard to the question of who pays for the training, most states indicated that training in radiation and emergency response in general is underwritten in part by FEMA monies. In general, federal agencies underwrite the cost for almost all access to national training (e.g., RERO) by local personnel. With regard to state-conducted training beyond entry-level training at service academies, it appears that the states cover the cost of instruction, while the local jurisdictions bear the cost of sending their personnel. However, a few states did report that they had a program where state personnel occasionally made presentations at local jurisdictions. Among states where local personnel receive training because they are within an emergency planning zone for a fixed nuclear facility, the cost of training is borne, in part, by the company that owns the facility.

A few states expressed confidence that first-response personnel are competent to properly evaluate whether a radiation threat is present at the scene of a transportation incident. However, most health-physics professionals in the radiation control agencies are of the opinion that the training of first-on-the-scene personnel is insufficient to permit their judgment to be relied on as to whether a threat exists. Nearly all respondents told stories of improperly calibrated instruments, mistaken readings, or detectors applied inappropriately by uninformed personnel. However, many states did indicate that for certain classes of personnel (e.g., state police officers) or for certain jurisdictions (usually major cities), first responders could be relied upon to accurately describe the incident in adequate detail and have had sufficient training in appropriate actions to permit remote management of minor incidents.

Radiological Emergency Response Teams. With respect to the training of emergency response teams, whether formally designated as such or otherwise, all the states rely primarily on the academic background of their health-physics professional staff. All participation in technical training concerned with incident assessment and radiation emergency management is predicated upon sufficiently advanced primary training. A few states mentioned the prior military training of some of their personnel. In all but a few states, personnel who respond to the scene to make a formal assessment of the incident are employees of the state radiation control agency.

Fifteen states indicated that the academic training of their health-physics professionals is the major source of training; that is, they do not seek out or provide further training as a regular component of their radiation emergency preparedness. Twenty-six states reported that they regularly send their emergency-response radiation technicians to nationally organized training programs. Six states indicated that they have special training organized by the state for radiation emergency-response team members. Five states did not provide information concerning training for radiation emergency-response personnel.

Various states offered elaborations concerning training opportunities for their radiation emergency response technicians. Several states indicated that the duties of radiation control agency personnel require that they keep abreast of developments in the field and that reading journals and attending professional meetings are normal job tasks and comprise an important component of training. A few states indicated that the necessity to serve as lecturers in training sessions provides the occasion to maintain currency of knowledge. Three states reported that training opportunities are occasionally available through the initiatives of regional associations. Nine states mentioned that electric utilities that operate nuclear generating stations provide training opportunities. Most states stressed that the ongoing work of the radiation control agency serves to keep their personnel well acquainted with the technologies and practices that predominate in the industry.

With respect to the funding of training for emergency-response teams, all the states indicated that, for training programs organized by federal agencies, there was some form of cost-sharing whereby the state contributed only a portion of the expense. The monies supplied by FEMA are the primary source. Nine states reported that an electric utility makes a contribution toward training expenses. The cost of other training opportunities is borne by the

employing agency. Most states offer paid time off to attend professional meetings, but only a few extend the offer to include travel allowances. Such allowances become more liberal with higher rank within the agency.

In general, the states have developed systems to provide training that are consistent with their historical experience and perceived need for specially trained personnel. Heavily industrialized states with many licensees and well-developed radiation control programs are more active, in terms of both sending their personnel to national training programs and providing in-house training.

Question 32: What training courses are attended by state and local emergency-response personnel? Who conducts the training? Who funds the training?

First-on-the-Scene Responders. An enumeration of the courses attended by first-on-the-scene personnel is not possible. Most of the training supplied to these personnel is very basic and is presented as part of their entry-level training. However, various states indicated that at least some of their first-on-the-scene personnel do attend national training programs. Among the courses named were "Radiological Emergency Response Operations" (RERO), "Emergency Management Basics Workshop," "Emergency Management," and "Analysis of Hazmat Emergencies." Other courses named included an eight-hour radiological monitor course, a forty-hour emergency preparedness course, and training provided by electric utilities concerning fixed-facility incidents and response. Among other specific activities mentioned were drills and exercises, either statewide, at the county level, or in association with fixed facilities.

Several states mentioned aspects of training for first responders that are worthy of note. One state indicated that its approach is to focus on concepts, the logic of the emergency-response plan, and protocols for notification. This approach was the result of a decision not to attempt to provide technical training to first responders. Another state mentioned that whenever radiation issues are discussed with non-technical personnel, comparisons with hazardous chemicals and other potential hazards are always included to help allay "radiation paranoia."

Radiological Emergency Response Teams. Training for technical personnel who already possess academic training in health physics is performed primarily through nationally organized programs sponsored by federal agencies. Among the agencies named as sponsoring training programs of interest were DOT, DOE, NRC, and FEMA. Among the course titles named as being of interest were "Radiological Emergency Response Operations" (RERO), "Radiological Assessment," "Emergency Management," "Radiation Monitoring," "Radiological Officer," "Radiological Monitor Instructor Course," "RAM Transportation Workshop," "Radiological Defense" (RADEF), and "Radiography Techniques and Transportation Issues." Training institutions mentioned included the Reynolds Electric facility at Mercury, Nevada, and the Nevada Test Site; the FEMA facility at Emmitsburg, Maryland; the Department of Transportation Safety Institute at Oklahoma City, Oklahoma; the Oak Ridge Associated Universities; and the National Fire Training Academy. Other training opportunities for technical personnel are related primarily to job experience and on-the-job training, including day-to-day familiarity with the commerce in and regulation of radioactive materials, handling instruments, participating in the planning process, exercising protocols, and participating in drills.

Question 33: How many state and local emergency-response personnel on the average are trained each calendar year?

First-on-the-Scene Responders. With regard to the number of individual first responders who receive training each year, the great variation in the level of training (discussed in the preceding questions) was interpreted to include any training that would enable a first-on-the-scene respondent to recognize that a radiation threat might be present at the scene of a transportation incident.

Four states reported that twenty or fewer first responders received training annually. In these jurisdictions selected individuals from local jurisdictions or state personnel on local assignment are sent to national training programs; no first responders other than the few selected for strategic assignment receive training. Nine states reported that between twenty and one hundred first responders received some training; twenty-two states reported that over one hundred first responders received training. Three states reported facts that could not be meaningfully aggregated for inclusion with the other states' responses. These include the observation that the annual number of trainees varies greatly with the cycle of update or refresher training programs and the practice where first responders from jurisdictions within the emergency planning zone for a fixed facility receive special training. Fourteen states reported that the number of first responders receiving training is unknown.

Many states included the cautionary remark that while they could provide the number of persons who went through training programs, as a result of attrition, this should not be interpreted or extrapolated to measure the number of people in the field who have such training.

Radiological Emergency Response Teams. With regard to technical personnel who are expected to investigate the scene of a transportation incident involving radioactive materials and to make an official determination as to whether a radiation threat exists, training was interpreted to mean any opportunity that builds on their health-physics education or that enhances their knowledge of appropriate emergency-response procedures. Such training almost always refers to national training programs.

Six states reported that the question was not applicable to their jurisdiction because the professional education and on-the-job experience of their health-physics staff was sufficient to meet the perceived need for expertise. Seven states reported that five or fewer individuals are trained, eight states reported that between five and twenty individuals are trained, and eleven states reported that more than twenty are trained each year. Eight states reported that the number varies substantially from year to year depending on their needs and the availability of openings in the training programs. Three states reported that special training for emergency-response teams located within the emergency planning zones of fixed facilities is provided. Nine states reported that the number of emergency-response personnel trained each year is unknown.

Question 34: Do the training courses train emergency-response personnel in the following aspects of emergency response to transportation incidents involving radioactive materials?

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Alabama	Basic training at police and fire academies; Rad Health lectures rad sections. Emergency Mgmt. Agency has program of update training on general civil preparedness and traditional civil defense, including field exercises at the county level; funding not reported. Utilities provide special training for localities within EPZ.	Rely primarily on academic/professional training on entry. Send individuals to national training programs through FEMA and NRC, depending on who has been and course availability.	FOS: Many RER: Not applicable
Alaska	11 police and fire personnel have been to RERO; approx. 150 others have had some less rigorous training. Emergency Svcs. has on-going program of training in civil preparedness, which includes some rad-related discussion. Funding is by FEMA pass-through monies.	Not applicable; 1-man office.	FOS: 50 RER: Not applicable
Arizona	Two courses presented by state for local personnel, 8-hr. rad monitor and 40-hr. emerg. prep. Funded by FEMA pass-through. Some opportunities at community colleges.	Rely primarily on academic/professional training on entry; send individuals to national training through FEMA and NRC as appropriate. Federal agencies provide courses, sometimes cover fraction of travel. Occasional OJT opportunities.	FOS: 8-hr.: 70 40-hr.: Many RER: Not applicable
Arkansas	Basic training at police and fire academies; Rad Control Div. lectures rad sections. Also, workshops for local volunteers. Funded by FEMA pass-through. Special training for localities within EPZ.	Rely primarily on academic/professional training on entry. Attended RERO as appropriate.	FOS: Not reported (Note: approx. 800 trainees at EPZ localities, mostly volunteer firemen) RER: (Not reported)
California	Emergency Svcs. has outreach program for localities; general h[illegible] rad section. Some training for localities within EPZ through utilities.	Designated team members trained by Rad Health and Environ. Mgmt. Such training is part of agency's mandate, no separate cost accounting.	FOS: 20-25 RER: 20 teams

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Colorado	State Public Safety Training Academy working to foster general hazmat capability. Locals must cover cost; small communities have problems. Some training through Disaster Svcs. Agency via FEMA pass-through monies.	State personnel have access to full range of national training programs and some training through state agencies.	FOS: Cannot enumerate RER: Cannot enumerate
Connecticut	General emergency response training through Office of Civil Preparedness; Rad Control and Environ. Health lecture rad sections. Some localities have their own training programs.	In-house, in-service training and drills, mostly oriented toward fixed-facility, but some is transferable to transportation incidents. Also, some training through New England Compact.	FOS: 200-300 RER: As available
Delaware	State fire academy provides hazmat general training. Div. of Emergency Plan. and Ops. provides in-service training covering rad response.	Rely on academic/ professional education on entry; attend state courses as in-service; also national training programs.	FOS: 20-30 RER: 9-10
District of Columbia	Fire dept. in-house training.	National training programs as appropriate.	FOS: 20 RER: 0 (for 5 years)
Florida	Service academies present hazmat section; occasional special sessions.	Rely on academic/ professional training on entry; RERO, with FEMA contribution; and in-house, sponsored by state. "Generally well informed as a result of professional duties."	FOS: 50 RER: 20
Georgia	FEMA rad monitor curriculum presented locally, funded by local jurisdiction. Also, fixed-facility training and drills, partially transferable to transportation incidents. Some locals go to RERO.	Rely heavily on professional training and any experience; informal in-house update and refresher; and RERO, with FEMA monies. Also participate in fixed-facility exercises.	FOS: 100 RER: 2 RERO slots each year
Hawaii	Civil defense rad monitor training through state Civil Defense Agency. A few locals have been to RERO.	Academic and professional training; fed. agency training opportunities.	FOS: (Not reported) RER: "Not often"

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Idaho	Do not focus on counties or municipalities; some training for health district staff. Some state police go to RERO. Some localities have had WIP training.	Professional education and RERO.	FOS: 0 RER: 1 or 2 plus WIP training
Illinois	State Fire Institute offers hazmat transportation incident training; most local personnel attend, partially funded by FEMA grants. Emergency Svcs. Agency provides regional civil defense rad monitor course, paid by FEMA. Dept. of Nuclear Safety gives classes for power plant emergencies; state reimburses local costs. Many local personnel have attended RERO, paid by FEMA.	State Police "Hazmat Officer Course," paid by state; RERO, paid by FEMA; U.S. DOT Transportation Safety Institute; Oak Ridge Univ. "Health Physics in Radiation Accidents," partially funded by U.S. DOE; U.S. OSHA "Basic Health Physics," partially funded by OSHA; and U.S. DOE "RAM Transportation Workshop," partially funded by DOE.	FOS: Unknown RER: Approximately 100
Indiana	Hazmat section in police academy curriculum.	Professional education, occasionally send to RERO.	FOS: (Not reported) RER: Not applicable
Iowa	Service academy basic training. Disaster Svcs. and Rad Health send instructors to local jurisdictions to give civil defense training; concerned to make it easy for locals to attend.	Rad Health relies on academic training of personnel on entry, also NRC courses and RERO. Other state agencies use FEMA courses, with assistance from utilities.	FOS: 100 RER: 25
Kansas	Rad Health and Emergency Preparedness Agencies present course covering rad emergencies for police, fire, EMT, nurses; state has continuing education requirement for such personnel. Rad training is on a 3-year cycle; paid by localities	In-house training; fixed-facility training by utilities; RERO.	FOS: Many RER: 16
Kentucky	Basic training at service academies; occasional special topic sessions, including rad. Oriented toward Disaster and Emergency Svcs. personnel in regional offices who are "second line" first responders. State provides course, home agency covers travel cost.	"Take advantage of any training opportunities that are appropriate for personnel who already have extensive formal education in health physics," including FEMA, NRC, DOE, and Oak Ridge Univ., all partially underwritten by federal agencies.	FOS: 120 RER: 22 regional Emergency Services personnel

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Louisiana	Special training provided for localities within EPZ, with FEMA contribution. Each state police post has rad officer who provides some in-service training for his troop. No regular training for those outside EPZ.	In-house, in-service training, paid by state; FEMA training, RERO, partially paid by fed. agencies; and power plants provide opportunity to drill.	FOS: 6 RER: 12-15
Maine	FEMA courses; state arranges, FEMA pays.	RERO and FEMA courses; state arranges, FEMA pays.	FOS: 2 RER: 2
Maryland	FEMA courses.	FEMA courses.	FOS: 3 RER: 3
Massachusetts	For localities within EPZ, extensive training through State Civil Defense; trainers go to local communities, cost covered by Civil Defense. For those outside EPZ, little training.	FEMA and RERO; in-house OJT and seminars, and slide and video shows.	FOS: Many in EPZs, few statewide RER: Continuous and on-going
Michigan	State organizes train-the-trainer program, partially underwritten by FEMA. Locals get their training from state-trained personnel.	In-house training, use some fed. training. Funded by state, with contributions from utilities.	FOS: 250 RER: 16-20
Minnesota	Training provided through Div. of Emergency Management.	RERO.	FOS: 300 RER: Ongoing
Mississippi	State trainers go to local jurisdictions upon request; funding contributed by FEMA, state, and utility assessments.	In-house training, fed. training programs.	FOS: Many RER: 11
Missouri	(Not reported)	Federal agency offerings.	FOS: (Not reported) RER: (Not reported)
Montana	Disaster Emergency Services conducts 3-day hazmat training, including some rad.	RERO.	FOS: Many RER: 1
Nebraska	Varies greatly with locality.	In-house training; state civil defense training; and FEMA, RERO, and U.S. DOT.	FOS: (Not reported) RER: 6
Nevada	Div. of Emergency Management provides 1- and 2-day courses for police and fire, partially funded by FEMA.	On-the-job training; RERO, funded by DOE.	FOS: 80 RER: 0

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
New Hampshire	Regular training program presented by Office of Emergency Management, funded by state, federal agencies, and utilities.	In-house training; FEMA, NRC, EPA, and DOT.	FOS: Many RER: 12
New Jersey	Office of Emergency Management trains police and fire.	Regular in-house training sessions and OJT; RERO.	FOS: (Not reported) RER: (Not reported)
New Mexico	General training at service academies; training needs currently under study.	FEMA, NRC, and DOE; also, Conference of Radiation Control Program Directors regional training topic sessions.	FOS: Many RER: Intermittent, as available
New York	Some counties have own program. Some use FEMA training; courses provided, home agency pays travel cost.	(Not reported)	FOS: (Not reported) RER: (Not reported)
North Carolina	Highway patrol basic training. Div. of Emergency Management provides local on-site rad monitor training. FEMA rad instructor training.	RERO, NRC, Oak Ridge, and FEMA.	FOS: Many RER: 1-2
North Dakota	State Fire Marshal provides 3-day "Response to Hazmat Incidents" course for local police and fire. Div. of Emergency Management provides rad monitor and rad response courses.	RERO, U.S. DOT hazmat workshop, and NRC courses.	FOS: Many RER: 12-15
Ohio	State Fire Marshal, Emergency Management Agency, and State Dept. of Health provide training for locals upon request.	In-house and federal training programs.	FOS: Varies with requests RER: (Not reported)
Oklahoma	2-hour section in cadet training.	RERO, NRC, Conference of Radiation Control Program Directors, and OJT.	FOS: (Not reported) RER: Varies
Oregon	One-week course at state university, conducted by State Fire Marshal and Health Div., funded by FEMA and state.	Same course as for locals.	FOS: 50-60 RER: 10-20
Pennsylvania	(Not reported)	RERO, FEMA, U.S. DOT, Oak Ridge, and NRC.	FOS: (Not reported) RER: 5

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Puerto Rico	Courses provided by Training and Radiological Programs and State Civil Defense Agency, funded by federal government.	Same as for local personnel.	FOS: (Not reported) RER: 300
Rhode Island	Provided through state Emergency Management Agency.	National training programs.	FOS: Many RER: 40
South Carolina	Provided by state Emergency Preparedness Div., supported by FEMA; some locals go to RERO.	Oak Ridge, RERO.	FOS: (Not reported) RER: 30 (fixed-facility only, not specific to transportation)
South Dakota	State Civil Defense and Fire Academy courses; FEMA courses.	National training programs.	FOS: Many RER: 20-30
Tennessee	State Emergency Management Agency provides three levels of training, includes rad monitor, supported by TVA and Div. of Rad Health.	New-hire health physicists get same as locals; also Oak Ridge, FEMA, and RERO.	FOS: Many RER: 27
Texas	Full range of national training programs by federal agencies. Many programs through state agencies; special training through Texas A&M Engineering Extension Service. Funded by cost-sharing with sponsor and/or reimbursement by home jurisdiction.	FEMA, RERO, DOE, and DOT; in-house training: Drills and exercises conducted by state Emergency Response Program, funding through utility contributions and license fees.	FOS: Many RER: Many
Utah	All peace officers receive standard training in radmat transportation issues.	In-house training and OJT; NRC, RERO, and FEMA.	FOS: 75 RER: 0 (teams already trained)
Vermont	NRC, FEMA, and DOT.	NRC, FEMA, and DOT.	FOS: (Not reported) RER: (Not reported)
Virginia	Dept. of Emergency Services conducts and funds 1-day course and refresher courses per FEMA rad monitor curriculum.	On-the-job training; RERO and other courses.	FOS: Many RER: 2
Washington	(Not reported)	(Not reported)	FOS: (Not reported) RER: (Not reported)
West Virginia	(Not reported)	(Not reported)	FOS: (Not reported) RER: (Not reported)

Table 3-21: Training (Questions 31 to 33)

State	Questions 31 and 32: Training for First-on-Scene Personnel	Questions 31 and 32: Training for Radiological Emergency Response Personnel	Question 33: First-on-Scene (FOS) and Radiological Emergency Response (RER) Trainees Annually
Wisconsin	State has own training program for first responders and health service providers along spent fuel routes.	Annual state training for team members.	FOS: Many RER: 35
Wyoming	State Emergency Management Agency provides civil defense training. Emergency medical technicians have some rad training for certification.	Not applicable.	FOS: (Not reported) RER: Not applicable

Most states offered the observation that they do not have access to training that is specific to transportation incidents involving radioactive materials. However, most states consider the training available concerning radiation emergencies in general to be transferable to transportation incidents.

Radiation Hazards That Might Be Encountered. With respect to the radiation hazards that might be encountered, forty-six states reported that the training does cover these issues. One state said it does not, and two states reported that the contents of training in this regard were unknown. Three other states reported that their training was limited in scope (e.g., fixed-facility training only) and were unsure as to whether their personnel were thoroughly trained in terms of the variety of hazards that might be encountered.

Surveys of Incident Scenes. With respect to surveys of incident scenes, forty-three states indicated that training does cover this issue, three states said it does not, and two states reported that they did not know whether training covered survey techniques. Four states indicated that their personnel had some knowledge of survey techniques, but were unsure as to whether all their personnel were prepared to undertake surveys at the scene of a transportation incident.

Protection Against Hazards. With respect to protection against hazards, forty-six states reported that training does cover these issues, two said it does not, and two reported that they did not know whether training addresses protection. Two states reported that they are unsure as to whether their personnel are adequately trained for transportation incidents with regard to protection.

Federal and State Regulations. With respect to federal and state regulations governing radioactive materials, thirty-one states reported that training does cover these issues, six said it does not, and three reported that they did not know whether regulations are covered. Twelve states reported that some aspects of regulation are covered, but they were unsure as to whether their personnel are thoroughly trained with respect to the regulations governing the transport of radioactive materials. Several states remarked that training in state regulations is covered, but training in federal regulations is not.

Question 35: What hazards, other than the radioactive hazard, are covered in the training courses?

With respect to hazards other than radiation for which their emergency-response technical personnel receive training, the states named many specific and general topics. Two states indicated that their radiation emergency-response personnel are very thoroughly trained in all aspects of expected hazards in transportation incidents. Fourteen states indicated that their radiological emergency-response teams receive training in radiation only; other topics are not covered. This was the most frequent response. Three states reported that their personnel had some training as to hazards other than radiation. Ten states mentioned general hazmat training, eight states mentioned flammable and/or explosive materials, five states mentioned chemical hazards, and four states mentioned general disaster training. Other specific

topics named include war, natural disasters, biological hazards, decontamination procedures, materials identification, the handling of victims with contaminated wounds, and training in protocols and procedures as indicated in the state plan.

Question 36: How often are practice exercises conducted to test the effectiveness and operation of the State Radiological Emergency Response Plan for responding to transportation incidents involving radioactive materials? Do the exercises focus on radioactive-material incidents or are they part of a general hazardous-material test? When was the last exercise carried out?

Frequency of Exercises. Regarding the frequency of practice exercises to test the state plan, any exercises or drills that could be construed to involve radiation emergency-response procedures in any connection were tallied. Fifteen states indicated that they have never had any exercise or drill; a few of these reported that they were planning to undertake an exercise in the near future or to start a program of regular exercises. Fourteen states reported that they have had exercises, but only rarely or occasionally and not as part of regular program. Four states indicated that they have a schedule under which they exercise their plan, but that exercises are less than annual in frequency. Six states reported that they have practice exercises at least once each year, and ten states reported that exercises are performed more than once each year.

Among states with a regular schedule of exercises, five reported that these are in relation to fixed facilities only. Six states indicated that their exercises are limited in some other respect; that is, they do not have exercises solely for transportation incidents involving radioactive materials. One state reported that they work with military authorities during exercises concerned with nuclear weapons incidents. Eighteen states indicated that transportation issues are a component of their exercises. Five states indicated that exercises are carried out at the local level only and that statewide exercises are not conducted, while twenty-three states reported that they do conduct exercises statewide.

Specific vs. General Exercise. Sixteen states reported that they do not have exercises or that they rely on actual incidents to exercise their plan. Fourteen states reported that they have exercises that are exclusively focused on radiation transportation incidents, twelve states reported that exercises are general in nature and include radiation issues, and two states reported that they have hazmat exercises that do not include radiation issues. Two states reported that they have fixed-facility exercises only. Information on this issue was not reported for six states.

Most Recent Exercise. Fifteen states reported that they have never had an exercise. Fourteen states reported that exercises are occasional and that there had been no exercise more recently than three years ago. Four states reported that they had an exercise more recently than three years but longer than one year ago. Sixteen states reported that they had an exercise within the previous year. Several states reported that local, small-scale exercises are frequent; one state claimed that in almost every calender month there was an exercise that included a hazardous-materials transportation incident, often staged as a radiation hazard, somewhere in the state.

Table 3-22: Training (Questions 34 to 36)

State	Question 34: Radmat Emergency Response Issues Covered in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practice Exercises to Test Radiological Emergency Response Plan
Alabama	Main focus of training is to secure scene and notify	Hazardous chemicals and accident/disaster preparedness in general	No state wide drills for several years; county-level field exercises are conducted frequently through the Emergency Mgmt. Agency, as part of generic civil preparedness. Some exercises in the past have had an explicit radiation emergency focus.
Alaska	(No comment)	Hazmat general and natural disasters	There has never been a drill focused on transportation incidents involving rad materials; there was a statewide exercise of the Emergency Operations Plan, with strong Civil Defense component, 2 years ago.
Arizona	Emphasis is on recognition	Toxic chemicals, biological; command and control	Several exercises concerned with hazmat emergencies are conducted each year; a radiation-specific drill was conducted several years ago.
Arkansas	(No comment)	(Not reported)	No statewide drills for transportation emergencies, but fairly often for fixed-facility. Local jurisdictions required to exercise at least every 3 years; Div. of Rad Control works to develop transportation scenario for some local drills and sends observers.
California	State regulations covered, not federal	All hazards	Have never had a drill focused on rad transportation emergency.
Colorado	Focus is on concepts and logic of notification and response; do not teach technique	Intent is to have broadly informed personnel who know how to activate technical authorities	No drills for rad transportation emergency, but exercise frequently for fixed-facility. Also exercise frequently for generic hazmat; reflects generalist approach to planning and training.
Connecticut	Intent is to determine need for protection of personnel	Hazmat, emergencies in general	Fixed-facility drills are routine; occasionally, a rad transport component is included in such drills. Most recent, Oct. 1987.

Table 3-22: Training (Questions 34 to 36)

State	Question 34: Radmat Emergency Response Issues Covered in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practice Exercises to Test Radiological Emergency Response Plan
Delaware	(No comment)	Hazmat in general; chlorine gas, pyrophoric metals	Ongoing program of full-scale, statewide exercises in which the specific transportation hazards covered rotate year-by-year; also, smaller-scale drills quarterly. Fixed-facility exercises annually.
District of Columbia	(No comment)	Chemical spills, toxic gas and smoke, flammables, explosives	Annual exercises for hazmat, with topic rotated; rad is covered every 3 years.
Florida	(No comment)	Rad training is rad specific; other topics in other training	Office of Rad Control exercises twice each year.
Georgia	Train for logic of response, not technique	Special focus on personal protection and awareness that many chemicals are much worse than radiation	Fixed-facility exercises conducted fairly often. Few exercises that are specific to rad transport; most recent, 1982.
Hawaii	(No comment)	(Not reported)	Never exercised for rad transportation; do participate with military on nuclear weapons incident exercises.
Idaho	RERO and WIP only for rad	Hazmat training is separate	State does not conduct exercises for rad transportation; DOE has program of exercises, but state involvement is minimal.
Illinois	Various classes of personnel have different levels of training	Never assume that radiation is the only hazard; be aware of other hazmat and other dangers at incident scene	Have conducted exercises for transportation emergencies; most recent, 1986. Live response fairly common; do not need practice.
Indiana	Includes placarding and how to read cargo manifest	Hazmat general	No exercises in recent past; planning now for a program of scheduled exercises.
Iowa	Rad training is rad specific, other hazards in other courses	Compare rad to chemical hazards to allay fear of radiation	Fixed-facility exercises only, but are planning for program of off-site exercises.
Kansas	Varies by audience	Rad training in rad specific, other hazards covered in other training	Rad-specific exercises, approximately 1 every 3 years, depending on resources.
Kentucky	Placard recognition; time-distance-shield triad emphasized	Hazmat general	Hazmat transportation exercises periodically; most recent, April, 1988

Table 3-22: Training (Questions 34 to 36)

State	Question 34: Radmat Emergency Response Issues Covered in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practice Exercises to Test Radiological Emergency Response Plan
Louisiana	Details not known, but thorough	Extensive discussion of all manner of hazards	Never exercised for transportation incident, but drill frequently with nuclear power.
Maine	(No comment)	Fire hazards at rad incidents	Have not had full-scale exercises. Hospitals and state cooperate on exercises concerned with handling rad contamination victims from transport incidents; most recent, Aug., 1987.
Maryland	(No comment)	Rad training is rad specific, other hazards not covered	Never exercised for rad transportation incident.
Massachusetts	For those in EPZ only	Non-rad is completely separate	Never exercise for rad transportation; do have fixed-facility exercises. Some skills are transferable.
Michigan	Oriented toward fixed-facility, transportation not specifically addressed	Some chemical hazards	Frequent fixed-facility exercises; most recent rad transportation exercise, 1980.
Minnesota	(No comment)	Some hazmat general	Some form of exercise or drill 10 times per year.
Mississippi	(No comment)	Rad training is rad specific	Fixed-facility exercises 2 times each year; never exercise for transportation incidents.
Missouri	(No comment)	Rad training is rad specific	No program of exercises.
Montana	(No comment)	All hazmat	General disaster preparedness.
Nebraska	(No comment)	(Not reported)	State participates in exercises 2 or 3 times each year.
Nevada	(No comment)	Rad training is rad specific	Most recent exercise, 1982.
New Hampshire	(No comment)	Tactics, command and control; emergency medical; decontamination; fixed facility	Exercises have been conducted annually since 1986.
New Jersey	New training program being designed, will cover these issues	(Not reported)	No exercises because live incident experience is fairly common.
New Mexico	(No comment)	All hazards; corrosives, neurologic agents	Most recent exercise was 1987, covering chemical and rad hazards.

Table 3-22: Training (Questions 34 to 36)

State	Question 34: Radmat Emergency Response Issues Covered in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practice Exercises to Test Radiological Emergency Response Plan
New York	(No comment)	Hazmat general, weapons fallout	Exercises are conducted on a 5-year schedule; most recent was 1987.
North Carolina	(No comment)	Seperate courses for other hazmat	No statewide, transportation-specific exercises; local jurisdictions do conduct exercises. Fixed-facility exercises are conducted.
North Dakota	Depth of training varies at different courses	General hazmat and how to identify chemicals	No planned exercises; numerous live incidents used for training.
Ohio	Topics and depth of discussion vary greatly	Depends on audience	None
Oklahoma	Specific topics covered as appropriate for different classes of personnel, through OJT	Full range of all hazmat; emphasize incidents; 1984 protection	Do not exercise often because of frequent live incident responses.
Oregon	(No comment)	Brief description of other hazards	Training exercises are conducted twice each year.
Pennsylvania	(No comment)	Fire and explosion; heat exhaustion; toxics	Do not exercise for transportation incidents; do participate in fixed-facility exercises.
Puerto Rico	(No comment)	Contaminated wounds, care of victims	Exercises performed on annual schedule at municipalities.
Rhode Island	(No comment)	All types of chemicals	Exercises covering hazmat in general, including rad, are conducted once each year.
South Carolina	Fed courses cover all aspects; no in-house training for transportation issues	(Not reported)	No planned exercises for rad transportation.
South Dakota	(No comment)	Hazmat general	Exercise for hazmat in general; most recent, 1987.
Tennessee	(No comment)	Rad training is rad specific	Exercise on a 6-year schedule.
Texas	Courses vary greatly in content and scope; simple response would be misleading	"Other hazards" are covered in many courses	Local jurisdictions exercise at least annually. State has never exercised for rad transportation, but is planning for an exercise.

Table 3-22: Training (Questions 34 to 36)

State	Question 34: Radmat Emergency Response Issues Covered in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practice Exercises to Test Radiological Emergency Response Plan
Utah	Various courses cover all topics	Police basic covers hazmat general; other courses are rad specific	Exercise frequently, including focus on rad transportation.
Vermont	(No comment)	Transportation hazards in general	Seldom exercise for rad transportation; usually done in connection with hazmat general. Most recent, 1983.
Virginia	(No comment)	Mixed hazards	Exercises for rad transportation are infrequent; most recent, 1987. Fixed-facility exercises 4 times each year.
Washington	(No comment)	(Not reported)	(Not reported)
West Virginia	(No comment)	(Not reported)	(Not reported)
Wisconsin	(No comment)	Rad training is rad specific	Occasional exercises; most recent, 1984.
Wyoming	(No comment)	(Not reported)	Sporadic; not scheduled.

3.9 Transportation

Question 37: In the case of a land-vehicle-related transportation incident involving radioactive materials, how long on the average will it take radiological emergency-response teams and support crews to reach from their usual location the most remote site where an incident could likely occur?

Seven states reported that they can get qualified radiation technicians to the scene of a transportation incident involving radioactive materials in less than one hour, eighteen states reported between one and three hours, seventeen states reported between three and five hours, and six states reported that it would take more than five hours. Three states reported that the amount of time was highly variable, and no response was provided for one state.

All the states except a very few indicated that they rely on land vehicles, usually cars or vans, for transportation of their emergency-response teams. These states did indicate, however, that in the case of a serious or protracted incident, they can gain access to virtually any mode of transport.

3.10 Incident Assessment

Question 38: The first-on-the-scene respondents (i.e., policemen, firemen, and road-maintenance personnel) at a transportation incident involving radioactive materials are expected to take certain protective actions. Is there a standard operating procedure or action sequence such personnel are expected to observe? Please discuss.

All the states have the expectation that first responders will perform certain actions if it is suspected that there may be a possible radiation threat at the scene of a transportation incident. In most states, the scope of appropriate action for first responders is limited to basic police, fire, and emergency medical functions and notification of the cognizant technical authorities.

Sixteen states reported that they have produced and distributed a standard operating procedures document that first responders are expected to consult when they encounter a suspected radiation threat at a transportation incident. This may be a pocket guide, a pamphlet, a handbook, or the relevant sections of the state or local plan. Five states reported that they rely on national publications supplied by DOT or FEMA to give guidance to their first responders as to appropriate actions. Twenty-eight states indicated that standard operating procedures are covered in basic hazmat or radmat training and that there are no published guidelines distributed. Three states are unreported.

Various states offered elaborations on the specific actions expected to be performed by first-on-the-scene personnel. Beyond the basic public-safety functions of scene security, crowd control, emergency medical actions, and fire control, if necessary, some states expect further action directed to the radiation component of the incident. These include personal protective actions by public-safety personnel, the establishment of a scene perimeter and controlled access, the inspection of shipping papers, the detention of involved parties, and the initiation of measures to control cross-contamination.

Table 3-23: Transportation (Question 37)

State	Question 37: Response Time (Hours) to Most Remote Site*	State	Question 37: Response Time (Hours) to Most Remote Site*
Alabama	5	Montana	12
Alaska	10	Nebraska	(Not reported)
Arizona	3	Nevada	3
Arkansas	5	New Hampshire	2
California	2	New Jersey	2
Colorado	2	New Mexico	4
Connecticut	2	New York	4
Delaware	1	North Carolina	6
District of Columbia	0	North Dakota	5
Florida	2	Ohio	4
Georgia	4	Oklahoma	7
Hawaii	4	Oregon	2
Idaho	3	Pennsylvania	3
Illinois	1	Puerto Rico	(Not reported)
Indiana	1	Rhode Island	0
Iowa	2	South Carolina	3
Kansas	6	South Dakota	4
Kentucky	4	Tennessee	1
Louisiana	1	Texas	3
Maine	2	Utah	3
Maryland	3	Vermont	3
Massachusetts	2	Virginia	3
Michigan	4	Washington	5
Minnesota	2	West Virginia	4
Mississippi	4	Wisconsin	3
Missouri	4	Wyoming	9

* = Hours rounded to nearest whole hour

Some states also indicated that first-on-the-scene personnel may be required to take additional actions after notification and telephone or radio consultation with technical personnel. For example, if the radiation control agency concludes that a radiation threat may be present after hearing a description of the scene circumstances from the responding officer, a roadblock and detour or a substantially expanded safety perimeter may be ordered.

Question 39: Since policemen, firemen, and road-maintenance personnel are the most likely first-on-the-scene respondents at a transportation incident involving radioactive materials, what percent of each of these groups has received at least minimal training in handling radiological emergencies?

While many states were able to offer percentage estimates of the extent of training among the several classes of potential first-on-the-scene respondents, many others were able to offer only informed, subjective impressions. The responses were collapsed into ordinal categories as follows:

"All" or "most"	=	95% - 100%
"Many"	=	67% - 95%
"Some"	=	33% - 67%
"Few"	=	5% - 33%
"Very few"	=	1% - 5%
"None"	=	0

For a few states, reporting for some of the categories of personnel was judged to be "not applicable." These were combined with "unknown" for reporting purposes. For example, three of the jurisdictions surveyed do not have a state police force. Several states reported that training for local police is highly variable and to offer a statewide summary would be misleading.

State Police. Seventeen states reported that all or most of their state police officers have at least minimal training in the recognition and handling of transportation incidents involving radioactive materials. Ten states reported that many of their state police officers have such training, three states reported some, seven states reported few, and three states reported very few. In twelve states the question was inapplicable or the answer was not known.

Local Police. Six states reported that all or most of their local police have at least minimal training. Seven states reported many, six states reported some, fourteen states reported few, five states reported very few, and two states reported none. In twelve states the question was inapplicable or the answer was not known.

Firefighters. Six states reported that all or most of their fire emergency-response personnel have at least minimal training. Eleven states reported many, fifteen states reported some, three states reported few, three states reported very few, and three states reported none. The answer was not known or the question was inapplicable in eleven states.

Road-Maintenance Personnel. Two states reported that all or most of their road-maintenance personnel have at least minimal training. Six states reported many, one state reported some, fourteen states reported few, eight states reported very few, and seven states reported none. In fourteen states the answer was not known or the question was inapplicable.

Table 3-24: Incident Assessment (Question 38)

State	Question 38: Standard Operating Procedure for First Responders
Alabama	Training focus is on recognition and notification
Alaska	Rad Health has procedure sheet available
Arizona	SOP is in hazmat courses; pocket guide issued
Arkansas	Secure scene; call for help
California	Secure scene; control crowd; attend to injured; call for help
Colorado	Emergency responders handbook
Connecticut	Secure scene; attend injured; take protective action; call for help; crowd control
Delaware	Attend injured; secure scene
District of Columbia	Isolate area; attend injured; call for help
Florida	Perimeter security; cross-contamination control; protective actions; attend injured
Georgia	Secure area; perform life saving; detain involved; call technical experts
Hawaii	(Not reported)
Idaho	Plan is widely distributed, includes specific instructions for police, fire, ambulance, hospital
Illinois	Follow DOT Emergency Response Guidelines
Indiana	Attend injured; secure scene; call for help
Iowa	Follow DOT Emergency Response Guidelines
Kansas	Approach upwind; protective clothing; all the basics
Kentucky	Life saving; crowd control; assess problem; call for help (detailed in emergency Operations Plan)
Louisiana	Statewide Emergency Response Plan includes SOP
Maine	Keep public away; contact rad health
Maryland	Nothing in writing, use FEMA guidelines
Massachusetts	No specific instructions
Michigan	Contained in Emergency Operations Plan
Minnesota	No standard process
Mississippi	Render life saving; secure area; call Dept. of Rad Health
Missouri	Follow DOT guider
Montana	Personal protection; scene security; notify proper authorities
Nebraska	Procedures in plan
Nevada	Detailed in plan

Table 3-24: Incident Assessment (Question 38)

State	Question 38: Standard Operating Procedure for First Responders
New Hampshire	DOT protocol
New Jersey	(Not reported)
New Mexico	Assess situation; personal protective action; call for help
New York	Details contained in plan
North Carolina	Assess, evaluate, contact Division of Emergency Management
North Dakota	Assess situation; contact appropriate authorities; basic police activities
Ohio	Each locality uses own SOP
Oklahoma	Assess situation; scene security, notify authorities
Oregon	First aid; notify; restrict access; stop fire
Pennsylvania	Isolate area; notify Bureau of Rad Protection; check bill of lading
Puerto Rico	Contained in brochures for police, fire, rescue
Rhode Island	Details in state plan
South Carolina	[illegible] jured; call assistance; keep people away
South Dakota	[illegible]d in local emergency plan
Tennessee	Protect people; secure area; call Tennessee Emergency Management Agency
Texas	Standard local plan provides instruction for police, fire, and ambulance
Utah	Restrict entry; life saving; fight fire; minimize contact; contact authorities
Vermont	Detailed in rad plan
Virginia	Control access; treat injuries; other tasks as needed
Washington	(Not reported)
West Virginia	(Not reported)
Wisconsin	Isolate area; tend to injured; notify emergency response team
Wyoming	(Not reported)

Summary of First-Responder Training. Over half of the states (52%) indicated that "all," "most," or "many" of their state police officers have at least minimal training in the recognition and handling of potential radiation threats at the scene of a transportation incident. With respect to local police, only 25% of the states indicated a comparable proportion of trained personnel. For firefighters the comparable figure is 33% and for road-maintenance personnel 15%. These proportional findings are generally consistent with the expectations for these classes of personnel. In general, state police are more highly trained than local police. The figure for fire personnel, however, requires some elaboration. Many states indicated that full-time, professional firefighters are generally well trained, but that volunteer firemen tend to be less well trained and have a much higher turnover rate. The high proportion of firefighters who are volunteers serves to dilute the absolute number of trained fire fighters.

Among states reporting "few" or "very few" first-response personnel with training, some included the remark that a few selected individuals in local jurisdictions or at state police posts have some training and that these individuals are relied upon to offer guidance when a potential radiation incident is encountered. Several states indicated that a commanding officer at a fire station or a district supervisor at a road-maintenance office will have some training, while general service personnel do not.

First-Responder Training: 1988 vs. 1980. To facilitate the comparison of the proportion of trained first-on-the-scene personnel in 1988 versus 1980, cross-tables have been constructed for each of the four groups of first-response personnel. In all of the tables, the columns (vertical) display the status in 1988 and the rows (horizontal) display 1980. The table entries give the number of states that fall into each cell. For example, in Table 3-26, five states reported that "all" state police officers were trained in 1980 and in 1988, while two states reported "many" in 1980 and "all" in 1988. The column totals summarize reporting for 1988, while the row totals summarize 1980.

One perspective on these tables is to visualize the major diagonal, which runs from the upper-left to the lower-right of such a square table. States that fall in the cells on the major diagonal reported the same status in 1988 and 1980. Disregarding the "unknown/inapplicable" column and row, states that fall in cells above the major diagonal indicated some decline since 1980 in the proportion of trained personnel, while states that fall below the major diagonal reported an increase.

State Police (1988 vs. 1980). The comparison of the level of radiological-emergency training for state police in 1980 and 1988 is presented in Table 3-26. Twelve states (23%) are on the major diagonal, indicating no change from 1980 to 1988. Eleven states (21%) are below the diagonal, indicating an increase in the proportion of trained personnel, and 12 states (23%) are above, indicating a decline. A total of 17 states (33%) are unknown or inapplicable, in 1980, 1988, or both years.

This table should be interpreted with caution. The more extreme changes toward lower proportions, suggesting serious erosion in 1988--for example, one state reported "all" in 1980 and "few" in 1988--may represent a change in the state's understanding of what "minimal training" means. The same may

also be true of a change in the other direction. In general, however, the states are clustered around the major diagonal; if we tally states on the diagonal plus states that are immediately adjacent to the diagonal, twenty-three states (44%) are found to be essentially unchanged. Among states that are further from the diagonal, eight (15%) indicated substantially increased training, while four (8%) reported major decreases. If any trend can be inferred from these data, it would appear to be that the proportion of state police officers with at least minimal training is essentially unchanged, but does appear to be moving upward a little. In 1980, 42% of the states reported that "all," "most," or "many" of their state police had training; for 1988, this proportion is 52%.

Local Police (1988 vs. 1980). The comparison of the level of training for local police is presented in Table 3-27. Using the same approach to this table as was described above for state police, we find nine states (17%) on the major diagonal, indicating no change; twelve states (23%) above the diagonal, indicating a decrease; and ten states (19%) below the diagonal, indicating an increase. Twenty-one states (40%) are inapplicable or unknown in 1980, 1988, or both years. The high rate of unreported data reflects the lack of knowledge of state radiation control personnel as to local personnel training in many states.

When we consider those states on or adjacent to the major diagonal, we find that twenty (38%) are essentially unchanged, while eight (15%) indicated substantial increases and two (4%) reported substantial decreases. As with the state police, to the extent that these data can support any inferences about trends, there is cause for cautious optimism concerning the proportion of local police officers who have at least minimal training that would be of value for a transportation incident involving radioactive materials. In 1980, 12% of the states reported that "all," "most," or "many" of their local police had training; for 1988, the proportion is 25%.

Firefighters (1988 vs. 1980). The 1980-1988 training comparison for firefighters is presented in Table 3-28. Three states (6%) are on the major diagonal, indicating no change; twelve (23%) are above, indicating a decrease; and seventeen (33%) are below, indicating an increase. Twenty states (38%) are unreported or inapplicable in 1980, 1988 or both years. As with local police, this high rate of "unknown" responses reflects the lack of awareness by state radiation control personnel concerning local affairs in some states, but also may result from the inability to make any meaningful estimate in light of the large numbers of volunteer firefighters.

When we tally the states that are on or adjacent to the major diagonal, we find eighteen (35%) essentially unchanged. Nine states (17%) indicated a substantial increase, while four (8%) reported substantial decreases. Here again, we find cause for cautious optimism with respect to the proportion of firefighters who have at least minimal training in handling radiation incidents. In 1980, 15% of the states reported that "all," "most," or "many" of their firefighters had training; for 1988, the proportion is 33%.

Road-Maintenance Personnel (1988 vs. 1980). The 1980-1988 training comparison for road-maintenance personnel is presented in Table 3-29. The table for road-maintenance personnel is much the same as the others. Nine states (17%) are on the major diagonal, indicating no change; thirteen states (25%)

are above, indicating a decrease; and eleven states (21%) are below. Nineteen states (36%) are unreported or inapplicable in 1980, 1988 or both years.

When we tally states that are on or adjacent to the major diagonal, we find eighteen (35%) essentially unchanged, nine (17%) reporting substantial increases, and four (8%) reporting substantial decreases. We see again that there seems to be a tendency to have more personnel trained, but only marginally so. In 1980, 9% of the states reported that "all," "most" or "many" of their road-maintenance personnel had training; for 1988, the proportion is 15%.

Question 40: What percentage of the first-on-the-scene respondents possess the information designated in the DOT Emergency Response Guide (ERG)?

The DOT Emergency Response Guidebook (DOT P5800.4) has been widely circulated and is possessed or available to many first responders. "All" or "most" of the first-responder groups have access to the ERG as follows: state police--twenty-nine jurisdictions (56%); local police--twenty-six jurisdictions (50%); firefighters--twenty-eight jurisdictions (54%); and road-maintenance personnel--fifteen jurisdictions (29%). About one-third of the states did not know who possessed the ERG or did not consider the ERG applicable to one or more first-responder groups. The data concerning the proportion of the various groups of personnel who have access to the DOT Emergency Response Guidebook are summarized in Table 3-31.

Several of the states that were tallied as unknown offered elaborations. Two states indicated that the book is widely distributed but declined to estimate any proportions. One state indicated that 80% of civil-defense personnel have access to the book. One state reported that there is one copy at every police agency, fire company, and road-maintenance district office throughout the state. Another state reported that there is a copy of the book on board every emergency vehicle in the state, including ambulances, at all times.

The states were asked to indicate the perceived usefulness and adequacy of the DOT Emergency Response Guidebook by the various groups of first-response personnel. Eighteen states reported that they were not familiar with the book or otherwise had no comment. Twenty states reported that they found the book to be a useful and convenient source for basic information, but offered no detailed comments. The comments received included: the book is adequate for first responders, especially for identifying cargo, but does not supply enough information to be of use in hazard mitigation; instructions in the book to call CHEMTREC have led to wrongly handled notification resulting in delay of notice to the proper authorities; and local personnel don't understand the book because they don't have enough background.

3.11 On-Site Operations

Question 41: Does the state have predesignated on-scene coordinators for emergency response to transportation incidents involving radioactive materials?

Table 3-25: Incident Assessment (Question 39)

Question 39:
First Responders With Minimum Training
for Handling Radiological Emergencies

State	State Police (1988)	State Police (1980)	Local Police (1988)	Local Police (1980)	Firemen (1988)	Firemen (1980)	Road Maintenance (1988)	Road Maintenance (1980)
Alabama	100%	30%	100%	10%	100%	1%	Few	1%
Alaska	Few	Few	5%	15%	15%	Few	Few	Few
Arizona	Many	100%	Many	66%	Many	65%	0%	45%
Arkansas	100%	Few	99%	Few	80%	Few	98%	Few
California	100%	25%	30%	10%	60%	40%	20%	75%
Colorado	100%	Many	75%	Many	65%	Many	35%	Many
Connecticut	*	10%	*	<5%	*	10%	*	30%
Delaware	100%	35%	100%	5%	100%	15%	Many	0%
District of Columbia	N/A	N/A	10%	*	50%	*	1%	*
Florida	*	100%	*	10%	*	20%	*	0%
Georgia	90+%	90%	5%	10%	5%	15%	Few	10%
Hawaii	N/A	N/A	Few	60%	Few	100%	Few	0%
Idaho	10%	30%	Few	<10%	Few	<20%	Few	20%
Illinois	100%	100%	75%	50%	75%	50%	10%	50%
Indiana	Few	2%	Few	1%	Few	15%	Few	10%
Iowa	90%	14%	90%	*	90%	*	Many	10%
Kansas	Many	100%	Many	10%	Many	20%	Many	100%
Kentucky	0%	*	8%	*	75%	*	5%	*
Louisiana	Many	60%	*	*	*	*	*	*
Maine	90%	100%	75%	100%	90%	100%	0%	Few
Maryland	100%	*	70%	*	100%	*	10%	*
Massachusetts	Most	100%	Some	100%	Some	60%	0%	Few
Michigan	25%	Teams	2%	*	5%	Few	<1%	*
Minnesota	90%	100%	25%	85%	50%	85%	10%	50%
Mississippi	90%	80%	Few	<1%	Few	5%	Few	<1%
Missouri	*	Most	*	Most	*	Most	*	Few
Montana	100%	Some	15%	Many	50%	Many	5%	Many
Nebraska	100%	All	*	0%	*	0%	*	0%
Nevada	75%	100%	75%	0%	75%	0%	5%	0%

Table 3-25: Incident Assessment (Question 39)

Question 39:
First Responders With Minimum Training
for Handling Radiological Emergencies

State	State Police (1988)	State Police (1980)	Local Police (1988)	Local Police (1980)	Firemen (1988)	Firemen (1980)	Road Maintenance (1988)	Road Maintenance (1980)
New Hampshire	60%	90%	10%	25%	60%	25%	10%	<1%
New Jersey	*	20%	*	20%	*	10%	*	5%
New Mexico	10%	15%	1%	5%	60%	5%	15%	0%
New York	20%	100%	5%	15%	5%	25%	1%	0%
North Carolina	63%	100%	20%	*	25%	*	Few	0%
North Dakota	100%	100%	30%	50%	30%	50%	5%	50%
Ohio	*	*	*	*	*	*	*	*
Oklahoma	100%	All	*	Some	*	50%	100%	Some
Oregon	30%	*	10%	*	70%	*	10%	*
Pennsylvania	*	Few	*	Few	*	Few	*	Few
Puerto Rico	*	50%	30%	0%	60%	25%	*	0%
Rhode Island	25%	>95%	40%	35%	75%	>75%	20%	20%
South Carolina	*	*	*	*	*	*	*	*
South Dakota	80%	98%	30%	*	50%	*	90%	100%
Tennessee	10%	100%	10%	50%	25%	90%	40%	50%
Texas	100%	100%	*	100%	*	100%	*	*
Utah	100%	5%	100%	5%	90%	5%	10%	0%
Vermont	100%	*	0%	*	0%	*	0%	*
Virginia	High	*	Low	*	Mid	*	High	*
Washington	10%	33%	10%	25%	10%	50%	10%	15%
West Virginia	*	100%	*	20%	*	20%	*	20%
Wisconsin	Most	100%	50%	Some	70%	Some	*	0%
Wyoming	*	30%	*	10%	*	20%	*	0%

* = Not reported
N/A = Not applicable

Table 3-26: State Police with Minimal Training
(Proportion Trained by Number of States,
1980 vs. 1988)

	1988 Training Status for State Police							
1980 Training Status for State Police	All	Many	Some	Few	Very Few	None	Unknown/ Unapplicable	Total
All	5	5	1	1			2	14
Many	2	2	1	2			1	8
Some	2	1	1	1			1	6
Few	4	1		2	1		4	12
Very Few	1				2			3
None								
Unknown/Inapplicable	3	1		1			4	9
Total	7	10	3	7	3		12	52

Table 3-27: Local Police with Minimal Training
(Proportion Trained by Number of States,
1980 and 1988)

	1988 Training Status for Local Police							
1980 Training Status for Local Police	All	Many	Some	Few	Very Few	None	Unknown/ Inapplicable	Total
All		1		1			1	3
Many		1		1			1	3
Some		1	4	5			1	11
Few	2	1		2	3		5	13
Very Few	3			1	1	1	1	8
None		1	1				1	3
Unknown/Inapplicable	1	2	1	4		1	2	11
Total	6	7	6	14	5	2	12	52

Table 3-28: Firefighters with Minimal Training (Proportion Trained by Number of States, 1980 vs. 1988)

	1988 Training Status for Firefighters							
1980 Training Status for Firefighters	All	Many	Some	Few	Very Few	None	Unknown/ Inapplicable	Total
All		1		1			1	3
Many			3	1			1	5
Some		4	3	1			2	10
Few	1	2	4		3	2	4	16
Very Few	2	1	2					5
None		1					1	2
Unknown/Inapplicable	3	2	3			1	2	11
Total	6	11	15	3	3	3	11	52

Table 3-29: Road-Maintenance Personnel with Minimal Training (Proportion Trained by Number of States, 1980 vs. 1988)

	1988 Training Status for Road Maintenance							
1980 Training Status for Road Maintenance	All	Many	Some	Few	Very Few	None	Unknown/ Inapplicable	Total
All		2						2
Many				3			1	3
Some	1		1	2		2	2	8
Few	1	1		2	2	2	2	10
Very Few		1		1	4		1	7
None		1		4	1	2	5	13
Unknown/Inapplicable		1		2	1	1	4	9
Total	2	6	1	14	8	7	14	52

Table 3-30: Incident Assessment (Question 40)

State	Question 40: Percentage of First Responders Possessing DOT Emergency Response Guidebook			
	State Police	Local Police	Firemen	Road Maintenance
Alabama	<90%	<90%	<90%	0%
Alaska	100%	100%	100%	100%
Arizona	Many	Many	Many	0%
Arkansas	100%	99%	80%	98%
California	0%	0%	0%	0%
Colorado	100%	75%	65%	35%
Connecticut	Many	Many	Many	Many
Delaware	Many	Many	Many	Many
District of Columbia	N/A	5%	100%	2%
Florida	80%	80%	Most	Few
Georgia	90+%	5%	5%	0%
Hawaii	•	•	•	•
Idaho	Few	Few	Few	Few
Illinois	100%	75%	75%	10%
Indiana	•	•	•	•
Iowa	100%	100%	100%	100%
Kansas	Many	Many	Many	Many
Kentucky	20%	20%	100%	20%
Louisiana	99%	90%	90%	90%
Maine	•	•	•	•
Maryland	•	•	•	•
Massachusetts	100%	100%	100%	10%
Michigan	100%	100%	100%	5%
Minnesota	100%	100%	100%	100%
Mississippi	100%	100%	100%	100%
Missouri	•	•	•	•
Montana	100%	80%	100%	60%
Nebraska	100%	•	•	•
Nevada	75%	75%	75%	5%

Table 3-30: Incident Assessment (Question 40)

State	Question 40: Percentage of First Responders Possessing DOT Emergency Response Guidebook			
	State Police	Local Police	Firemen	Road Maintenance
New Hampshire	100%	85%	90%	90%
New Jersey	*	*	*	*
New Mexico	10%	10%	90%	10%
New York	100%	80%	80%	80%
North Carolina	100%	100%	100%	100%
North Dakota	100%	50%	100%	10%
Ohio	*	*	*	*
Oklahoma	100%	100%	100%	100%
Oregon	100%	90%	90%	20%
Pennsylvania	*	*	*	*
Puerto Rico	*	*	40%	*
Rhode Island	100%	100%	100%	100%
South Carolina	*	*	*	*
South Dakota	80%	80%	80%	0%
Tennessee	75%	50%	75%	50%
Texas	90%	90%	90%	90%
Utah	95%	95%	95%	Each district
Vermont	50%	*	75%	0%
Virginia	*	*	*	*
Washington	10%	10%	10%	10%
West Virginia	*	*	*	*
Wisconsin	100%	Most	Most	*
Wyoming	*	*	*	*

* = Not reported
N/A = Not applicable

Table 3-31: First Responders with Access to the DOT Emergency Response Guidebook (Proportion with ERG by Number of States, 1988)

	State Police		Local Police		Firefighters		Road Maintenance	
Response	No.	%	No.	%	No.	%	No.	%
All	23	44	13	25	13	25	10	19
Most	6	11	13	25	15	28	5	10
Some	2	4	2	4	3	6	3	6
Few	3	6	3	6	3	6	9	16
Very Few	0	0	2	4	0	0	2	4
None	1	2	1	2	1	2	5	10
Unknown/ Inapplicable	17	33	18	35	17	33	18	35

Fourteen states reported that they do not have predesignated on-scene coordinators. Twenty-four states reported that the predesignated on-scene coordinator is a member of the radiation control agency staff. Fourteen states reported that they do have a predesignated on-scene coordinator, but it is someone other than a member of the radiation control agency staff. Among these states, four indicated that the predesignated on-scene coordinator is a senior official with the fire department, three reported that this person is the local disaster coordinator, two reported that it is the county sheriff, and four indicated that it is the senior police officer at the scene.

Question 42: What is the general makeup of emergency-response teams dispatched to transportation incidents involving radioactive materials (other than police, firemen, and ambulance personnel)?

Seven states reported that for almost all reported incidents, the "team" that responds consists of one person, a health physicist from the radiation control agency. Twenty-eight states reported that when the state deploys a team, there are always at least two respondents, usually a health physicist plus other personnel, such as health-physics technicians or radiation monitors; however, several states indicated they routinely send two or more health physicists. Seventeen states indicated that they normally are able to make some determination concerning the potential seriousness of a reported incident during the initial notification phase and then send the number and types of personnel that appear appropriate. All states indicated that they make some effort to ascertain the nature of the incident during the notification phase, and most indicated that the level of their response is determined by the perceived threat. Many states, however, routinely send two or three qualified technical personnel to all calls for assistance at transportation incidents.

From 1980 to 1988, there does not appear to have been much change in the manner in which the states activate their teams or the types of personnel that are dispatched to the scene of a transportation incident involving radioactive materials. Almost all the states have access to most of the professional specialties indicated and have a system in place whereby individuals with specific [illegible] and skills can be accessed for field duty or consultation without delay. Based on the remarks of the respondents in 1988, it appears that more states have adopted a strategy whereby they do not necessarily send a radiological emergency-response team to the field in response to all notifications. Several states have arrangements that can be characterized as [illegible] response. A cadre with intermediate general training in hazardous [illegible] which may be a hazmat corps of state police officers or a hazmat [illegible] in the division of emergency services, is the first technical [illegible] Other states do not have an organized corps of personnel but do have designated individuals stationed strategically (for example, one officer with special training at each of the state police posts). These personnel, in effect, are able to screen out the trivial incidents, and the highly trained specialists are called out only when their expert knowledge is truly needed.

Question 43: What reference guides are carried by emergency personnel to outline specific actions to be taken in the event of a transportation incident involving radioactive materials?

First-on-the-Scene Responders. Thirty states reported that the DOT Emergency Response Guidebook is the main or only reference or guide available to first responders. Seven states reported that first responders routinely carry the relevant portions of the state plan or a prepared standard operating procedures guide. Three states reported that first responders carry a state-produced pamphlet or other short guide that provides an outline of appropriate actions. Six states reported that first responders do not carry any information or guidebooks, and six states are unreported.

At least fifteen states indicated that multiple guides or references are routinely available to first responders. The most frequent combination was the DOT Emergency Response Guidebook plus state or local planning documents or standard operating procedure guides. Other documentation mentioned included the National Fire Protection Association Guidelines and the FEMA "Handbook for Radiation Monitors." One state indicated that all first responders have access to a [illegible] radio through which they can request guidance.

Radiological Emergency Response Teams. Twenty-five states reported that their emergency-response technical personnel carried health-physics technical references with them into the field. In many states, such reference material is packed as part of the field kit and may include several volumes. Twenty-seven states reported that their personnel carry the state plan or agency procedure guides; often these documents are also included in the field kit. For most of these states, their personnel carry both types of references, and the preceding enumeration may include many instances of double counting. Seven states reported that their personnel carry only the DOT Emergency Response Guidebook, four states reported that no references are normally taken to the field, and four states are unreported.

3.12 Actual Experience

Question 44: How many transportation incidents involving radioactive materials do state and local authorities formally respond to each year?

The states' response to this question must be regarded as the number of times they deployed an emergency-response team to the scene of a transportation incident. Some states routinely respond to almost all incidents, while others make an effort to avoid activating the team for completely trivial events. Thus, this enumeration does not reflect the number of events that might be conceived of as transportation incidents, but only the number of activations. The states were requested to provide data for a "recent annual average" and for calendar year 1987.

For the recent annual average, ten states reported zero activations. Fifteen states were recorded as reporting one, but about one-half of these indicated that in fact the average is probably less than one. The remaining states reported more than one, the highest being twelve. The total responses for all jurisdictions is 141, an annual national average of 2.7 activations per state in recent years.

For calendar year 1987, thirteen states reported zero and eleven reported one; the remainder reported more than one, the highest being ten. The total is 136, which is somewhat lower than the "recent annual average" esti-

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
Alabama	No	2 health physicists and 1 health-physics technician go to the scene; other specialties on call	Should have DOT ERG	Division of Rad Health SOP, with call list
Alaska	Yes	1 health physicist, who can also function as radiobiologist, goes to scene; other specialties on call	DOT ERG, and SOP wallet card	(Not reported)
Arizona	Yes	2 health physicists go to scene; other specialties on call	Pocket guide, DOT ERG and National Fire Protection Association Guidelines	Agency SOP and HP references
Arkansas	Yes, if emergency is declared	Do not use team structure; 2-3 health physicists and 3-4 hazmat specialists are available for dispatch	DOT ERG	DOT ERG, and rules and regulations
California	Yes, health physicist from Rad Health	1 senior health physicist takes charge, assembles additional expertise as necessary	Pocket guide and SOP with call list	(Not reported)
Colorado	Yes	Do not use predesignated teams; 1 health physicist always present, other specialties as necessary; have protocol	DOT ERG, state Emergency Responders Handbook, checklists, and planning documents	Standard references and planning documents
Connecticut	Senior fire official	5 health physicists, each with dedicated vehicle, are first line responders; other expertise available as needed	State-issued cards	HP references
Delaware	Yes	1 health physicist and 1 radiation monitor is norm; if genuine emergency, can get any and all expertise	DOT ERG	DOT ERG and HP references

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
District of Columbia	Yes, senior fireman	1 health physicist and 3 hazmat specialists are available for immediate dispatch; others as needed	FEMA Handbook and DOT ERG	Supplemental HP references
Florida	Department of Emergency Mgmt. assumes control if genuine emergency	No less than 2 health physicist for first wave; call out chain of command as necessary	DOT ERG	Department SOP
Georgia	Yes	Primary team of 2-3 health physicists, transportation/hazmat specialist, and site coordinator plus others if needed; minimum 3-4, possibly 7	DOT ERG	State plan and HP refernece s
Hawaii	Yes	3 or 4 health-physics technicians is typical	(Not reported)	(Not reported)
Idaho	No	State has 3 health physicists; also use INEL and Hanford, Washington; closest group responds	State plan	State plan and HP references
Illinois	If large enough to call team	Typical state response includes 1 health physicist, 1 hazmat specialist, and 1 transportation specialist	DOT ERG	HP references
Indiana	No	1 health physicist and 1 radiation monitor; if genuine emergency, would call Argonne Labs	None	HP references
Iowa	Yes	1 health physicist and 1 health-physics technician usually dispatched; others as needed	DOT ERG	Plan and HP references
Kansas	Yes for genuine emergencies	1 or 2 health physicists are dispatched; others as needed	DOT ERG and pocket guide	HP references and call list
Kentucky	Senior Rad Control officer	Routinely send 1 health physicist and 1 health-physics technician	DOT ERG and phone numbers	HP references

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
Louisiana	Sheriff has authority, but defers to technical authorities	2 health physicists respond; others as needed	DOT ERG, other hazmat references, and hazmat SOP	Rad Health SOP and HP references
Maine	Yes	1 health physicist, 1 radiation monitor, 1 hazmat specialist, and 1 health-physics technician are avsilable for dispatch	None; pamphlet being produced	HP references
Maryland	No	1 health physicist responds to scene; other expertise as needed	None	(Not reported)
Massachusetts	No	1 health physicist and 1 health-physics technician comprise first crew; others as needed	DOT ERG	Plan and HP references
Michigan	Yes	1 health physicist and a police officer are dispatched; others as needed	DOT ERG	Plan and HP references
Minnesota	Emergency Response Team assumes control	2 health physicists respond to scene; call for others as needed	(Not reported)	(Not reported)
Mississippi	Yes, the Div. of Rad Health	Health physicists, radiation monitors, hazmat specialists, communications specialists, and site coordinators are available for immediate dispatch	DOT ERG and state procedures	HP references
Missouri	Bureau of Rad Health personnel assume control	4 health physicists and 2 health-physics technicians are available for immediate dispatch	DOT ERG and call list	(Not reported)
Montana	Yes, local disaster coordinator	2 health physicists, 2 radiation monitors, and 1 site coordinator are available; usually 3 of these are dispatched	DOT ERG	HP references

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
Nebraska	Yes	Full range of expertise available; field deployment is situation-dependent	(Not reported)	Plan and Rad Health SOP
Nevada	Senior law officer on site	At least 2 health physicists are deployed to the scene	Section of plan	DOT ERG, plan, and call list
New Hampshire	Yes	Full range of expertise is available; field deployment is situation-dependent	DOT ERG	Agency SOP, resource list, and HP references
New Jersey	Bureau of Emergency Response	2 or 3 radiation monitors are first wave; others as necessary	DOT ERG	HP references, and state regulations
New Mexico	Yes	1 health physicist and one site coordinator would respond; others as needed	(Not reported)	DOT ERG, plan, and HP references
New York	No	No teams designated; health physicists, radiation monitors, and hazmat specialists are available for immediate dispatch; others as needed	DOT guides	(Not reported)
North Carolina	Yes, Div. of Emergency Management area coordinator	2 health physicists are usually deployed	DOT ERG and local SOPs	DOT ERG and agency SOP
North Dakota	Yes, state fire marshal's office	Health physicists, radiation monitors, hazmat specialists, and health-physics technicians are available; usually, 2 or 3 persons from above list are deployed	DOT ERG and hazmat SOP	HP references
Ohio	Tentatively, per memorandum of understanding	2 radiation monitors and 1 site coordinator are deployed	(Not reported)	HP references
Oklahoma	Senior highway patrol on scene	2 health physicists are deployed	DOT ERG	HP references

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
Oregon	Yes, State Health Division	2 or 3 health physicists and radiation monitors are usually deployed; other available as needed	DOT ERG	HP references
Pennsylvania	Yes, area health physicists	Local area health physicist responds to assess hazard; calls out chain of command as necessary	(Not reported)	DOT ERG and HP references, and call list
Puerto Rico	Yes	Radiation monitors, hazmat specialist, radiochemist, etc. are available	(Not reported)	(Not reported)
Rhode Island	No	Hazmat specialist, radiation monitor, and radiological officer are deployed to the scene	Local SOP	Agency SOP
South Carolina	Senior rad health person	Health physicists from Radioactive Materials Division are first wave; others as needed	DOT ERG	State regulations governing radioactive materials
South Dakota	No	Response depends entirely on the situation	DOT ERG	Supplemental technical information, as needed
Tennessee	Div. of Rad Health assumes control at rad incidents	1 health physicist is primary responder; call for help as indicated	DOT ERG	Agency SOP and HP references
Texas	Yes	Have had no events involving release, never activated team; for such incidents as have occurred, response has been to send 1 or 2 incident investigators; full range of expertise is available if needed	Carry SOP and DOT ERG	DOT ERG and agency procedures manual
Utah	Yes	1 or 2 health physicists and 1 or 2 health-physics technicians plus site coordinators are typically deployed	DOT ERG	HP references

Table 3-32: On-Site Operations (Questions 41 to 43)

State	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43a: Reference Guides Carried by First Responders	Question 43b: Reference Guides Carried by Emergency Response Teams
Vermont	Local fire chief is in charge at emergencies	1 health physicist, 2 radiation monitors, 2 hazmat specialists, 1 health-physics technician, and 2 transportation specialists are available for dispatch	(Not reported)	State plan and manuals from training sessions
Virginia	No, local fire chief is coordinator	Typically dispatch 1 health physicist and 1 health-physics technician; others available as needed	Have own SOPs	State plan and agency SOP
Washington	Yes	1 health physicist is deployed; calls out others as needed	DOT ERG and local SOP	Agency SOP
West Virginia	Senior fire personnel	1 health physicist and 1 health-physics technician are deployed	(Not reported)	(Not reported)
Wisconsin	No	State teams consist of 2 health physicists; county teams consist of 2 radiation monitors; university teams have 1 health physicist and 1 health-physics technician	DOT ERG	HP references
Wyoming	No, rely on Highway Patrol	(Not reported)	None	(Not reported)

ERG = Emergency Response Guidebook (DOT P5800.4)
HP = Health physics

mate; however, given the "soft" nature of the estimates, there is no basis to suggest that there is any meaningful difference.

The number of team activations reported in 1980 is higher than the number of deployments to the field in 1988. The estimated total for a recent annual average in 1980 was 202, indicating an annual national average of 4.1 activations per state. The recent experience is substantially lower, which may be a reflection of the previously noted strategy whereby the states do not necessarily send a team to the field in response to all notices. It may also reflect increased training among first-on-the-scene personnel or the effects of a two-tier response strategy. Radiation control technicians are able to receive an accurate description of the incident circumstances, which enables a judgment as to whether a field response is really necessary. It may also be true that enhanced training for first responders has reduced the number of false alarms, which were spoken of as a problem by many of the states in the 1980 survey. In 1980, several states related anecdotes about local panics caused by uninformed personnel making incorrect announcements about radiation threats. In 1988, none of the respondents mentioned any such problems. Nevertheless, incidents that are ultimately found to be trivial continue as a major reason for activating the teams.

Question 45: Describe the usual actions taken by emergency-response personnel in transportation incidents involving radioactive materials.

Forty-three states reported that professional judgment by qualified personnel is the main factor that determines what is actually done in response to the notice that a transportation incident involving radioactive materials has occurred. In most states, radiation control personnel make follow-up telephone calls to learn greater detail about the incident before deploying a team to the field. Thirty-seven states indicated that when they get to the scene, they identify the material in question, survey the site, and proceed as indicated. Three states stated that a detailed SOP protocol exists for various contingencies, two states reported that they have never had a transportation incident and so could not describe what is usually done, and three states are not reported.

Many states offered elaborations about what the procedures would be if a genuine threat is present. In most instances these included attending to scene security; notifying all the relevant parties (shipper, carrier, consignee, other state agencies, local agencies, and public relations specialists); evaluating the status of shipping containers; overseeing of repackaging; overseeing of hazard mitigation and protective actions; overseeing of cleanup operations; and certifying release of the site to unrestricted use. Other actions in the event of a protracted or serious incident include taking samples and evaluating the extent of environmental damage, which may include bringing a mobile laboratory to the scene, arranging for samples to be taken to an appropriately equipped laboratory, or calling for assistance from federal authorities.

Few states have much experience with transportation incidents where a genuine threat is present. One state reported that 75% of reported incidents involve soil density gauges set out on the roadside that get run over. Other states mentioned that many incidents involved alleged or suspected leakage at truck stops or weigh stations. One state mentioned that they have received several hoax notifications from well-informed but misguided callers.

Question 46: How many times each year is the state contacted by local agencies for on-scene radiological assistance or for advice by telephone concerning transportation incidents involving radioactive materials?

The states were requested to supply data concerning a "recent annual average" and calendar year 1987.

Ten states reported that their recent annual average was zero and twelve reported one. The remainder reported more than one, the highest being twelve. The total for 1988 is 181, which indicates a recent annual average of 3.6 calls for assistance or advice per state.

With respect to calendar year 1987, fifteen states reported zero, seven states reported one, six reported that the number is not known, and the remainder reported more than one, the highest being twelve. The total for calendar year 1987 is 146, an average of 3.2 calls for assistance or advice per state.

In 1980, the states provided estimates for a recent annual average that totaled 275 calls for assistance or advice, an annual average of 5.6 calls per state. This is substantially higher than in 1988, suggesting that local jurisdictions find it necessary to call less frequently in recent years. Whether this difference is attributable to fewer potential incidents, to local personnel feeling competent to act without advice, or to a difference in reporting criteria is unknown.

Question 47: How many times each year does the state request federal assistance in responding to a transportation incident involving radioactive materials?

The states were requested to estimate the number of calls for federal assistance in responding to transportation accidents involving radioactive materials. The frequency of federal-assistance requests was sought for two time periods: calendar year 1987 and a "recent annual average." With two exceptions, all the states indicated that they never call for federal assistance, meaning a federally supported response team coming out to the scene of a transportation incident. Instances where a few states rely on federal installations within their borders for routine assistance are not included. All the states indicated that they would have no hesitation to call, and many reported that they do call occasionally for advice or to report on an incident.

The answers to this question for 1980 and 1988 are virtually the same, indicating that the states almost never call for assistance in the field from federal officials.

3.13 Funding

Three questions raised issues concerned with the funding of agencies that are involved in emergency preparedness planning and operations for transportation accidents involving radioactive materials. In most states, this includes the radiological regulatory agency and the emergency services agency. In many states the emergency services agency administers programs that provide pass-through monies to local jurisdictions for the support of

Table 3-33: Actual Experience (Question 44 and 46)

State	Question 44: Responses to Transportation-Related Radmat Incidents			Question 46: Local Agency Requests for State Assistance/Advice	
	Annual Avg. (1988)	Annual Avg. (1980)	CY 1987	Annual Avg. (1988)	CY 1987
Alabama	1	0	1	2	2
Alaska	0	0	0	0	0
Arizona	1	3	1	1	0
Arkansas	1	1	1	1	1
California	3	8	3	3	3
Colorado	3	6	3	3	3
Connecticut	6	5	6	12	12
Delaware	1	1	1	1	1
District of Columbia	7	*	0	*	*
Florida	10	2	10	7	*
Georgia	2	2	2	2	2
Hawaii	0	0	0	0	0
Idaho	1	3	0	7	5
Illinois	3	12	7	1	0
Indiana	1	1	1	1	1
Iowa	1	2	0	0	0
Kansas	1	4	0	3	3
Kentucky	9	6	10	9	10
Louisiana	0	2	0	0	0
Maine	0	0	0	0	0
Maryland	10	6	6	6	6
Massachusetts	1	8	1	12	12
Michigan	4	6	4	4	4
Minnesota	12	5	8	12	8
Mississippi	1	2	0	12	12
Missouri	6	0	5	0	0
Montana	1	4	1	1	1

* = Not reported

Table 3-33: Actual Experience (Question 44 and 46)

State	Question 44: Responses to Transportation-Related Radnat Incidents			Question 46: Local Agency Requests for State Assistance/Advice	
	Annual Avg. (1988)	Annual Avg. (1980)	CY 1987	Annual Avg. (1988)	CY 1987
Nebraska	0	5	0	0	0
Nevada	1	3	1	2	2
New Hampshire	0	0	0	2	1
New Jersey	8	12	8	7	7
New Mexico	1	1	2	1	3
New York	4	3	*	12	*
North Carolina	10	5	10	11	13
North Dakota	2	2	0	2	0
Ohio	10	*	10	6	4
Oklahoma	5	7	3	5	3
Oregon	8	0	7	8	7
Pennsylvania	3	12	3	1	0
Puerto Rico	1	1	*	2	0
Rhode Island	1	0	1	1	1
South Carolina	1	*	*	2	0
South Dakota	0	1	0	0	0
Tennessee	10	20	10	10	10
Texas	5	13	4	5	3
Utah	2	3	2	2	4
Vermont	0	1	0	0	0
Virginia	1	1	1	1	1
Washington	2	25	1	1	1
West Virginia	1	3	1	1	0
Wisconsin	1	1	0	1	0
Wyoming	1	5	2	0	2

* = Not reported

emergency-response activities. In some states, other state agencies also may be involved, including the state police, an environmental protection agency, or a transportation agency.

Question 48: Have any statewide studies been conducted to determine what resources and funding are allocated each year to upgrade the statewide emergency response for hazardous-material or radioactive-material incidents?

Thirty-one states reported that no statewide study of any sort has been conducted. This group of states includes three states reporting that a single agency is the sole authority, that all the requisite knowledge is in-house, and that such a study is not needed and three additional states reporting that regular interagency meetings are an ongoing component of the state's efforts in this area and that all participants are well informed about the status of the state's program. Two states reported that a commission to evaluate these questions had recently been formed and that such a study would be performed in the near future. One state reported that the recent creation of a new environmental protection agency would certainly lead to such a study.

Seven states reported that a study that explicitly included transportation incidents involving radioactive materials had been performed. One of these states indicated that three such studies had been conducted in recent years, including the FEMA-sponsored "Hazard Identification and Capability Assessment/Multiyear Development Program" (HICA/MYDP), a study by the governor's office concerned with the capability of local jurisdictions along a shipping corridor, and a statewide assessment of management capability for all hazmat incidents. Another of these states also mentioned the FEMA HICA/MYDP.

Three states reported that such a study was in process, and two states reported that a study of emergency preparedness for hazmat incidents in general had been conducted, but that transportation of radioactive materials had not been specifically addressed. Three states indicated that an annual reporting requirement answers this need, and one state indicated that there is an informal awareness of the status of the state's program. Five states reported that it was not known if such a study had been conducted.

Question 49: What additional resources are needed to upgrade the statewide emergency response to a level deemed adequate for most situations? Estimate the costs of the needed resources.

Additional Resources Needed. One of the states remarked that "there is never enough," and this comment reflects the attitude among most of the states. Another state remarked that DOE has placed the burden of preparedness on the states through which designated shipping routes run, they cannot use their historical experience to plan because the entire problem area will be transformed, they need equipment that is dedicated to emergency response at numerous strategic locations around the state, they need a substantial training program for local personnel, and there is a very large expense far beyond the state's resources associated with only minimal preparedness. However, another state remarked that it was their understanding that when large-volume shipping commenced, federal funding to upgrade the state and local capability would be available.

With probing and some discussion it was possible to extract a sense of genuine need in current programs, as opposed to concern for an unclear future or the desire to improve on an already adequate program. Seventeen states reported that their program was basically adequate and they have no pressing needs. Among the resources desired by these states are such items as cellular telephones or other field communications equipment, state-of-the-art field and laboratory equipment, protective clothing (including "moon suits"), respiratory protection devices (including self-contained breathing apparatus), low-range dosimetry equipment, increased training for both radiation technicians and first-response personnel, and dedicated emergency vehicles. One state indicated it had recently acquired a vehicle and could easily spend $100,000 outfitting it as a mobile laboratory and communications center. Another state indicated that they would like to have portable computers so that they could run dose projection models in the field.

Fourteen states indicated that their program is more or less adequate, but that they did have current needs for additional resources. Among the most frequently named resources needed were laboratory and field equipment, more training for radiation technicians and first-response personnel, support to conduct field exercises, and support for emergency planning. One state reported they need to increase the salaries for radiological health staff in order to attract and retain qualified personnel; this state further observed, however, that this is a state issue and they do not expect federal assistance in this matter. Several states indicated that they need funding support to cover out-of-state travel for training.

Ten states indicated that, in the opinion of radiological health personnel, their program of emergency preparedness for transportation incidents involving radioactive materials is deficient and is in current need of substantial resources to attain a status deemed adequate. Among the resources named as being needed by these states were basic laboratory and field equipment, planning support, and training for both radiation technicians and first responders. Several states indicated that they required studies to determine the scope of their need. Several states indicated that they need more personnel slots to attain and maintain preparedness, but they could not justify such requests on the basis of their history or day-to-day workload. One state offered the observation that the radiological health program is adequate, but that the emergency services agency is in need of substantial improvement.

One state reported that the question of whether the state should attempt to develop an emergency-response capability for transportation incidents involving radioactive materials is a matter of debate. This state has a major federal nuclear research and engineering facility within its borders and has historically relied on this resource to respond when an incident occurs.

Ten states declined to offer an opinion as to whether their program was adequate or what resources might be necessary or desirable.

Cost of Needed Resources. The states were requested to estimate the costs of needed resources. Nineteen states declined to make any estimate. Thirteen states reported that they had no particular need for increased funding and indicated zero dollars. Twenty states did provide estimates, either for the resource categories indicated or a global total. The greatest dollar

amounts were associated with capital equipment, and the second largest amounts were for training, including field exercises. The largest estimate for total funding needs was $2 million, which included expenses in support of local jurisdictions. The smallest was $2,000 to send four individuals to RERO training.

It seems apparent that the wide disparity in the states' self-perceived needs reflects differing interpretations of what comprises an adequate program. Some states apparently feel that they need to be prepared for any contingency, from first response through clean-up, while other states explicitly indicated that if they ever have a genuine radiation emergency, they have planned to request immediate and extended federal assistance.

Question 50: From whom are state and local authorities presently receiving funds to support emergency response for transportation incidents involving radioactive materials?

The states were asked to indicate current sources of funding for various aspects of emergency preparedness for transportation accidents involving radioactive materials. Most states indicated that it is not feasible to separate sources and uses of monies without a detailed study of basic budget documents; for most states the various functions are spread across several agencies, thereby compounding the accounting problem. In addition, almost all states indicated that it is not feasible to separate emergency preparedness activities for transportation accidents from other aspects of agency duties because much of the training and planning has multiple applications. As a result, most of the responses were highly general in nature.

Almost all the states indicated that personnel and equipment costs are funded exclusively through the agency budget, which consists of state appropriations but may also include license fees or other special taxes. A few states did indicate that some FEMA assistance is applied to these categories. With respect to planning and training, most of the states indicated that some assistance beyond state resources is available in these categories. FEMA monies were the most frequently mentioned source, but DOE and NRC were also mentioned. In addition, several states indicated that utilities that operate nuclear-powered generating stations contribute financial support for planning and training. Such assistance is usually associated with fixed-facility emergency planning and preparedness, but most states regard these efforts as being at least partially applicable to transportation incidents as well. Beyond the funding assistance provided by an electric utility, several states mentioned that the utility's personnel and equipment are available for use during an emergency response, if necessary, and one state mentioned that a utility contributes computer time to run dose projection models.

3.14 Federal Assistance

The following questions were intended to gather information on the states' perceptions of federal assistance available to support emergency preparedness for transportation incidents involving radioactive materials. A few states were very scrupulous to observe the distinction between transportation incidents and other types of radiation emergencies. However, most states consider any assistance available for any radiation-related issue as potentially applicable to transportation incidents, and they view nearly all assistance as being germane to the needs of emergency preparedness.

Table 3-34: Funding (Questions 48 and 49)

State	Question 48: Statewide Studies to Determine Needs	Question 49: Additional Resources Needed
Alabama	Study of general hazmat capability, not specific to radiation incidents	No major shortcomings
Alaska	Never	Adequate
Arizona	In process	Some field and lab equipment, planning support, training beyond introductory
Arkansas	No	Equipment and plan reviews
California	Informal reviews	Training and exercises, planning manpower, modest improvements in equipment
Colorado	FEMA "HICAMDP," rad capability assessment along transportation corridors, statewide assessment of general hazmat capability	Need federal assistance for system-wide upgrade to be prepared for spent fuel shipments
Connecticut	No	Basically adequate; need more planning to develop SOP
Delaware	Ongoing	Basically adequate
District of Columbia	Not issue	Basically adequate
Florida	"HICAMDP"	Presently adequate
Georgia	No; long-range planning is institutionalized	Communications and detection equipment; training for local personnel
Hawaii	No	Field and lab equipment, training, calibration facility for rad health
Idaho	No	If state decides to develop emergency response capability, need full range of assistance
Illinois	(Not reported)	(Not reported)
Indiana	None, but will soon	Equipment
Iowa	No	Field equipment, expanded training for local personnel
Kansas	No	Basically adequate
Kentucky	No	Basically adequate; need some field equipment and training for local personnel
Louisiana	No	Basically adequate; need more RERO and other hazmat training
Maine	None	Radios, vehicles, and needs study
Maryland	None	Equipment and training
Massachusetts	No, not needed	4-wheel-drive vehicles; otherwise adequate

Table 3-34: Funding (Questions 48 and 49)

State	Question 48: Statewide Studies to Determine Needs	Question 49: Additional Resources Needed
Michigan	No	Nothing in particular
Minnesota	Yearly	Equipment and training
Mississippi	No	Equipment and training
Missouri	No	(Not reported)
Montana	No	Field and lab equipment, additional training, more personnel (3.5 FTE estimate)
Nebraska	No	Basically adequate
Nevada	Yes	Field equipment, assistance for out-of-state travel for training
New Hampshire	Under study	Under study
New Jersey	No	Training courses
New Mexico	Annually	RERO-type training, support for Rad Section to conduct training, field equipment
New York	No	(Not reported)
North Carolina	No	Training and equipment for local personnel
North Dakota	No formal studies	Adequate for most situations
Ohio	(Not reported)	Equipment, training
Oklahoma	Yes	Training, additional personnel
Oregon	No	(Not reported)
Pennsylvania	(Not reported)	Basically adequate
Puerto Rico	Yes	Equipment, training
Rhode Island	No	(Not reported)
South Carolina	No	Some equipment and training
South Dakota	None	Basically adequate
Tennessee	(Not reported)	Field equipment, some training
Texas	Yes	Field and lab equipment; basic, advanced, and refresher training; field-exercise scenario development; plan development and distribution
Vermont	Only for hazmat, rad not included	(Not reported)
Virginia	Yes	More fire department supplies
Washington	Two studies	(Not reported)
West Virginia	(Not reported)	(Not reported)

Table 3-34: Fundir.g (Questions 48 and 49)

State	Question 48: Statewide Studies to Determine Needs	Question 49: Additional Resources Needed
Wisconsin	No	Field and lab equipment, additional personnel, more access to RERO, calibration capability
Wyoming	One is in process	Equipment, training

Question 51: What types of assistance (such as training, funding, technical advice, and on-scene support) are available from federal agencies (including DOE) to support state and local authorities?

This question was designed to elicit commentary by the states as to their awareness of federal programs to offer assistance to states and local jurisdictions. The responses received varied greatly. One state remarked that "virtually anything seems to be available except money." Most states mentioned training, technical advice, and field support, including emergency-response and protracted on-scene assistance. Many states mentioned funding support, especially pass-through monies for local jurisdictions and partial support for planning staff time. The federal agencies named as being sources of support were FEMA, NRC, DOE, EPA, and DOT. Most states appear to be well informed about available support in the event of an emergency. However, many states expressed a sense of being overwhelmed by what is perceived as a myriad of opportunities for training and for funding support of discrete activities; one state suggested that a coordination or clearinghouse function needs to be established so that the states can be informed about opportunities in a comprehensive and timely manner.

Question 52: How does the state learn about the available federal assistance?

This question was designed to elicit commentary by the states as to the channels of communication through which the states learn of opportunities for support from federal agencies. Most states mentioned newsletters, federal agency publications, training course announcements, and other periodic mailings. Other frequently mentioned sources for such information included professional journals and meetings, personal contacts with federal regional officials and personnel in other states, and information supplied by regional associations. the responses reflected a sense of "catch-as-catch-can," and there was no evidence of any central authority or single source for such information.

Question 53: What federal assistance is used by state and local authorities?

Nearly all the states indicated that they use federally sponsored training, and many states indicated that funding support was an elemental component of their program. Other types of assistance mentioned included technical support and advice and the use of laboratory facilities at federal installations.

Question 54: How useful is the federal assistance provided?

Nearly all the states indicated that the federally sponsored training was excellent, and many states remarked that such training was absolutely vital to their emergency-preparedness program. Similar remarks were received with respect to other types of assistance, but less frequently. The most commonly received indication of dissatisfaction or inadequacy was that there is not enough of it. With respect to training, many states indicated that there are not enough slots available and there are long waiting lists; other remarks included the lateness of course announcements and the lack of funding to cover travel costs. Similarly, various states complained that funding is available to support some aspects of emergency preparedness, but they need

Table 3-35: Funding (Question 50)

State	Question 50: Sources of Funds to Support State and Local Emergency Response: Planning, Training, Personnel, and Equipment
Alabama	No grants or funds from any agencies; much of planning and training comes through power utilities in connection with fixed-facilities; cannot separate transportation preparedness from larger mission
Alaska	No formal assistance
Arizona	Rad Regulatory Agency gets no support beyond its appropriation from the general fund; Division of Emergency Services gets approximately half of its budget from FEMA; not feasible to separate expenditures into categories
Arkansas	No formal assistance
California	Rad Health program gets its appropriation from the general fund, plus license fees; Office of Emergency Services is also active in this area; funding cannot be separated by task
Colorado	Some FEMA funding is available to support planning and training; all other activities supported by general appropriations only
Connecticut	No specific funding mechanisms for transportation preparedness; FEMA support for RERO
Delaware	Mainly state appropriations, plus some federal assistance
District of Columbia	FEMA assistance is used for some aspects of planning and training; personnel costs are covered by the general fund; no assistance for equipment
Florida	Office of Rad Control budget is based mostly on license fees; the Department of Emergency Management receives FEMA matching funds for some activities; no funding assistance for equipment
Georgia	Some FEMA funding is available to support training; other activities supported by state and local funding only
Hawaii	All activities associated with preparedness for transportation incidents are supported by the state general fund
Idaho	Emergency preparedness and response (not restricted to transportation) comprise about half of the agency's workload; this is intermingled with other job duties and is not separable
Illinois	(Not reported)
Indiana	Power utilities contribute person-hours to planning; other activities supported by agency appropriations and fee receipts
Iowa	FEMA funding contributes to some aspects of planning, training, and personnel costs; utilities contribute to planning and training and provide computing facilities; NRC contributes to training; the agency budget is also used for all these functions
Kansas	Rad health program is funded entirely from state appropriations; Emergency Preparedness Agency has some FEMA assistance and pass-through funds
Kentucky	FEMA funding supports planning and training through Disaster and Emergency Services; other functions supported by Rad Control appropriations and fee receipts
Louisiana	Planning, training, and equipment costs are supported by FEMA funding; power utilities contribute funding that is applied to all functions; additionally, utilities maintain staff who are available to assist
Maine	All functions are supported by a mix of FEMA and state monies

Table 3-35: Funding (Question 50)

State	Question 50: Sources of Funds to Support State and Local Emergency Response: Planning, Training, Personnel, and Equipment
Maryland	No funding assistance in support of preparedness for transportation emergencies is received
Massachusetts	Activities associated with preparedness for transportation emergencies are supported by state appropriations only
Michigan	No external funding in support of preparedness for transportation emergencies
Minnesota	Program funding comes from an assessment on power utilities and a fee for each high-level shipment
Mississippi	Funding for emergency preparedness comes from the state appropriation and a power utility assessment
Missouri	Funding for emergency preparedness comes strictly from state appropriations
Montana	FEMA funding through Disaster and Emergency Services supports all aspects of preparedness
Nebraska	(Not reported)
Nevada	Some aspects of planning and training are supported by FEMA and DOE; all other functions supported by state and local funds
New Hampshire	All aspects of emergency preparedness are supported, in part, by FEMA funding and power utility contributions
New Jersey	(Not reported)
New Mexico	All aspects of emergency preparedness are funded by state appropriations; federal agencies provide training opportunities
New York	Some FEMA funding is available for some aspects of emergency preparedness
North Carolina	One-third to one-half of the Division of Emergency Management's budget is supported through FEMA
North Dakota	Some FEMA and DOE funding is available to support training; other activities supported by state funds
Ohio	FEMA funding is available in support of all emergency preparedness activities
Oklahoma	All emergency preparedness activities are supported by state funds
Oregon	Planning and training are supported, in part, by federal funding; equipment purchases are supported, in part, by fee receipts
Pennsylvania	Some aspects of training are supported by FEMA and DOE; equipment acquisitions are supported, in part, by fees charges to nuclear facilities
Puerto Rico	All activities associated with emergency preparedness are supported by FEMA
Rhode Island	No funding beyond state appropriations are available to support preparedness for transportation emergencies
South Carolina	Some support for training through federal agencies; some funding to local agencies from nuclear facilities in their jurisdiction; no other funding assistance for transportation emergency preparedness
South Dakota	FEMA funding contributes in all areas of preparedness, details not reported

Table 3-35: Funding (Question 50)

State	Question 50: Sources of Funds to Support State and Local Emergency Response: Planning, Training, Personnel, and Equipment
Tennessee	Tennessee Valley Authority provides partial support for all aspects of emergency preparedness
Texas	State receives some support for training from FEMA, DOE, and DOT; other aspects of state preparedness are supported by state appropriations and license fees. Local governments receive FEMA support for planning and FEMA, DOE, and DOT support for training; other aspects of local preparedness supported by local revenues
Utah	FEMA funding supports training; all other aspects of transportation emergency preparedness supported by state funds
Vermont	(Not reported)
Virginia	FEMA funding supports planning and training; other aspects of emergency preparedness supported by state and local funds
Washington	(Not reported)
West Virginia	(Not reported)
Wisconsin	All aspects of emergency preparedness are supported by a nuclear power plant assessment; some aspects of equipment acquisitions are supported by other fees
Wyoming	Rad health program receives no external assistance

Table 3-36: Federal Assistance (Questions 51 to 53)

State	Question 51: Types of Federal Assistance Available	Question 52: Sources of Information About Federal Assistance	Question 53: Federal Assistance Used
Alabama	NRC, FEMA, other national training programs	Course announcements	Primarily training; aware of other federal initiatives, but have never used
Alaska	General awareness of assistance, but has never used	DOE site-visit team; FEMA, NRC mailings	Have not used any
Arizona	Technical advice, training, funding through FEMA; also, on-scene assistance if needed	Professional conferences and meetings, mailings	Questions and answers, clarification of technical questions
Arkansas	FEMA, DOE training	FEMA regional representatives, training announcements	Training
California	Federal assistance is apparently available to cover all aspects of radiation issues except funding	Mailings and visits from FEMA, NRC regional officials	(Not reported)
Colorado	Seems like almost anything is available except money	Agency publications, newsletters, seminars, professional meetings, professional association newsletters; also, federal regional officials	FEMA pass-though monies for planning and local development; any and all training
Connecticut	General guidance, training opportunities, technical support, on-scene support	Through New England Compact, professional meetings, publications, and newsletters	General guidance, training opportunities, technical support, on-scene support
Delaware	FEMA, EPA, DOE, and NRC	Federal regional representatives, mailings	Any training that is available
District of Columbia	SARA Title 3	FEMA newsletters	FEMA
Florida	Training through various agencies, funding through FEMA	Through FEMA	Training and some funding, occasional technical advice
Georgia	RERO and Rad Monitor training, on-scene assistance	Federal regional officials, direct contacts with federal agencies, professional meetings, newsletters	DOT guidebook
Hawaii	NRC, FDA, FEMA, DOE, and EPA	Professional meetings, personal contacts with federal agencies, mailings, newsletters	NRC and FDA
Idaho	Available assistance covers all aspects of the field, except purely state functions	Professional networking, conferences, study groups, Western Interstate Energy Board	Technical advice, on-scene support, loan of instruments, some training

Table 3-36: Federal Assistance (Questions 51 to 53)

State	Question 51: Types of Federal Assistance Available	Question 52: Sources of Information About Federal Assistance	Question 53: Federal Assistance Used
Illinois	Training and financial support; DOE facilities for technical assistance and advice	Through long history of involvement because of many reactors and other nuclear facilities, Illinois knows about most of the assistance that is available; the sources and terms under which federal financial assistance is available appears to be a big secret	Extensive use of training and financial support; also, extensive use of DOE facilities for technical assistance and advice
Indiana	Unlimited technical assistance and advice	Professional meetings	Technical assistance and advice from Argonne Labs
Iowa	FEMA and NRC funding assistance; training and technical advice	Newsletters, announcements, bulletins, direct contact with federal agencies, "the grapevine"	FEMA and NRC training
Kansas	Training, DOE for monitoring assistance and other support, NRC and EPA assistance	Newsletters, conferences, exercises with federal agencies, especially DOD/FEMA "Busyforce I" (got to meet and talk with all sorts of people)	Training
Kentucky	Training opportunities; "We are confident that federal authorities could supply any type of technical and field assistance we would ask for in any emergency situation"	Newsletters, professional meetings, informal contacts	Training, FEMA monies
Louisiana	Mainly training	Newsletters, professional journals	Training; have used DOE regional emergency response team
Maine	NRC, FEMA, and Brookhaven National Labs	Contacts with regional offices	Training, on-site support
Maryland	Technical assistance as needed	(Not reported)	(Not reported)
Massachusetts	Training, technical assistance	Mailings, contacts with federal regional officials, excellent personal relationships, frequent face-to-face meetings, New England Compact	Confident that if they felt a need, a mutually satisfactory arrangement would be worked out
Michigan	Federal agencies could supply virtually anything that might be needed	Mailings, direct contacts with federal officials	Training
Minnesota	FEMA and NRC; U.S. Coast Guard conducts seminars	Contacts with other states	Training, technical assistance over the telephone

Table 3-36: Federal Assistance (Questions 51 to 53)

State	Question 51: Types of Federal Assistance Available	Question 52: Sources of Information About Federal Assistance	Question 53: Federal Assistance Used
Mississippi	FEMA: training, some funding	DOE for on-scene support, EPA for technical advice, and NRC for technical advice, some training	Direct contact with federal agencies, through Governor's Office of Federal/State State Programs
Missouri	Training, technical assistance	Direct contact with federal agencies	Training and technical advice
Montana	Training and technical assistance	Direct contact with federal agencies	Training; used DOE emergency response team once
Nebraska	Training	Situation dependent	Situation dependent
Nevada	Training and technical assistance through FEMA, DOE, and NRC	Direct contact with federal officials	Training and technical assistance through FEMA, DOE, and NRC
New Hampshire	EPA, NRC, DOT, and FEMA	Meetings, word of mouth; mailings are frequently too late to be of use	Training, planning
New Jersey	Training, on-scene assistance	FEMA digest of training	NRC
New Mexico	DOE, NRC, and FEMA	Direct contact with federal regional officials, mailouts	Training only
New York	(Not reported)	Through federal agencies	Whatever is offered
North Carolina	Training and funding	Federal Register, agency mailings	Training and funding
North Dakota	Training and on-scene support	Mailings	Training, technical assistance and advice
Ohio	No comment	No comment	No comment
Oklahoma	Training, technical advice and support	Personal contacts, attendance at meetings, through federal regional officials	Training, written information
Oregon	Training and funding support for training	Liaison with FEMA and DOE	Training
Pennsylvania	Training, on-scene support, technical advice	Federal Register, personal contact with federal regional officials, notification	Training, technical assistance and advice
Puerto Rico	On-scene support through FEMA	(Not reported)	(Not reported)
Rhode Island	Training, funding, technical advice, on-scene support	Correspondence with regional offices	Training, funding, technical advice, on-scene support
South Carolina	Training and general assistance	Federal plans for assistance to states	Emergency assistance

Table 3-36: Federal Assistance (Questions 51 to 53)

State	Question 51: Types of Federal Assistance Available	Question 52: Sources of Information About Federal Assistance	Question 53: Federal Assistance Used
South Dakota	Training, funding, advice, support through federal agencies	Primarily FEMA	Very useful
Tennessee	Training, funding assistance	Historical knowledge of opportunities, FEMA listing of courses	Training through FEMA, DOE, and NRC; TVA financial assistance
Texas	Training (especially RERO), funding and technical advice for some specific areas	Workshops and seminars, federal agency announcements	Training
Utah	Training, on-scene assistance, consultation	Letter announcements	Training and assistance
Vermont	Unknown; no clearing house to coordinate federal agencies involved	Accidentally (see Question 51 response)	Any that is available
Virginia	Training, technical advice, on-scene support	Conference of Radiation Control Program Directors, course announcements	Training, technical advice, on-scene support
Washington	On-scene support, technical assistance, some funding	Through federal regional offices	Most of the assistance received has been in-kind, such as computer programs; would like to see funding
West Virginia	No comment	No comment	No comment
Wisconsin	Training and technical advice	Through federal regional officials	Training and technical advice
Wyoming	FEMA	Personal contacts	None

additional support in other areas. Several states indicated that there is a lack of coordination among federal agencies.

Question 55: What types of additional federal assistance do state and local authorities need to improve their capability to respond to transportation incidents involving radioactive materials?

The most frequently mentioned need for increased federal assistance was more slots in training courses and more frequent course offerings as well as federal funding that would permit state agencies to extend training opportunities to local jurisdictions. Many states also expressed a need to acquire additional equipment and manpower. One state reported that if it is expected to maintain a comprehensive and self-contained emergency-response capability, it would need four more FTE health physicists. Various other topics mentioned included financial support for planning, a greater emphasis on transportation issues in training, and better coordination among federal agencies. Several states specifically mentioned that the production and distribution of video-cassette training modules appropriate for first-responder agencies would be the single most useful thing that could be done.

3.15 Program Progress and Plans

Question 56: In the past ten years, what have been the most notable changes that have occurred in the statewide program for emergency response to transportation incidents involving radioactive materials?

Most of the states commented on incremental change in the size and quality of their program, including more personnel, more training opportunities, more and better equipment, and more comprehensive planning. Several states indicated that there had been no changes worthy of note and that the basic approach to this problem area, including planning concepts and organizational arrangements, had been long established and was continuing without revision. Several states commented on an increase in the amount of radioactive materials in transit, but no states mentioned an increase in the number of incidents. In fact, one state observed that there are fewer incidents now than ten years ago. Many states remarked on a generally higher level of awareness about radioactive materials, the recognition of the need to be prepared, and better awareness of where to turn for assistance. Specific changes noted included the updating of emergency-preparedness plans, wider distribution of plans and related documents, better training for first responders, a shift in FEMA training to more emphasis on peacetime hazards, and the infusion of funding provided by electric utilities to assist in planning and training.

Question 57: What have been the major accomplishments for the statewide program during this period?

Most states emphasized incremental improvements in their planning and emergency-response capability, especially with regard to the level of awareness among first responders and their ability to get qualified personnel to the scene of an incident. Several states indicated that they did not feel there had been any major accomplishments, except that they had maintained control over this problem area or otherwise fulfilled their mission. Very few states mentioned any substantial changes in planning strategies or organization arrangements, although some states did indicate that there had been improvements in planning.

Table 3-37: Federal Assistance (Questions 54 and 55)

State	Question 54: Usefulness of Federal Assistance	Question 55: Type of Federal Assistance Needed
Alabama	National training programs are excellent	Modern metering capabilities at local level
Alaska	Not applicable	None
Arizona	No experience in transportation-related issues; in other areas, quite useful	More advanced training, i.e., appropriate for health-physics professional; more frequent training
Arkansas	Training is good to excellent; funding is poor; never used technical and on-scene assistance	More training opportunities, more funding to support training
California	California state authorities take advantage of assistance that will be useful to them within their larger planning goals; assistance they have accessed has been quite useful and federal authorities have been very helpful	NRC and/or DOT collect license fees from firms that engage in interstate transport of radioactive materials; should create mechanism to transfer some of these monies to the states to reimburse for emergency preparedness activities
Colorado	Difficult to actually get a project going; FEMA and NRC seem not to have much coordination with each other; no money to underwrite compliance with, e.g., power plant exercises	Funding support; better coordination between various federal agency programs
Connecticut	Well satisfied with what they have received	More emphasis on transportation issues, make it a priority equivalent to fixed facilities; more attention to providing states and localities with resources to plan and develop capabilities for transportation incidents
Delaware	This is the primary source for training, and it is of good quality	More slots in training courses (turnover and attrition is a problem)
District of Columbia	Adequate for planning assistance; inadequate for operational considerations	Grants for equipment and training
Florida	Funding is critical for training, a major component of state and local programs	Information about where and when shipments will occur within the state; counties would say "more money"
Georgia	DOT guidebook is excellent; training assistance is very useful	Assistance in delivering training to local agencies; subsidize training expenses, especially travel and per diem
Hawaii	A great help	Funding for training, travel costs are especially difficult
Idaho	Absolutely indispensable	Closer interface with states in terms of sharing information about what is available

Table 3-37: Federal Assistance (Questions 54 and 55)

State	Question 54: Usefulness of Federal Assistance	Question 55: Types of Federal Assistance Needed
Illinois	DOT and DOE assistance is quite useful; NRC generally not useful because state has significant experience; NRC has more questions for the state than the state has for NRC	See addendum at end of table
Indiana	Everything ever asked for has been highest quality and very useful	If state is expected to maintain self-contained emergency response all the way through mitigation and cleanup, need 4 FTE health physicists
Iowa	Very good; without federal assistance, could not afford training, absolutely vital to the state program	Funding assistance for equipment
Kansas	RERO is highest quality, presume other assistance/guidance would be of similar quality, but never used	Additional training, especially RERO follow up or refresher; provide announcements more effectively
Kentucky	Without federal assistance, there would be only a very modest program; especially training and funding assistance for training	Training materials, especially video cassettes; maintain and expand production of training materials; much of training materials are now out of date, not receiving any update materials
Louisiana	Very good quality	More slots in training programs, more frequent course offerings
Maine	Never had an incident, do not know	Refresher training
Maryland	(Not reported)	Refresher training
Massachusetts	Everything they have used is first rate; state versus federal role is sometimes confusing; need more training opportunities, more frequent course offerings	More frequent training offerings (schedule conflicts and short notice are problems)
Michigan	Assistance that would be of direct help, such as funding for personnel slots, is not available	Funding, especially for first responder training and to support a planning position
Minnesota	In general, very good	Money for equipment; training on special situations especially spent fuel
Mississippi	Absolutely necessary	Additional training funds, especially to cover travel costs
Missouri	Training is excellent	More funds to support attendance at training
Montana	Very useful, but limited in availability	More training slots, funding support for personnel and equipment
Nebraska	Varies with circumstances	Unknown, under assessment
Nevada	In general, very useful	Funding for equipment; work out jurisdictional issues concerning federal enclaves
New Hampshire	Useful once acquired	Sustained funding for planning, equipment maintenance, and field exercises

Table 3-37: Federal Assistance (Questions 54 and 55)

State	Question 54: Usefulness of Federal Assistance	Question 55: Types of Federal Assistance Needed
New Jersey	Very good	Training, on-scene support; carriers should be made aware of their responsibilities
New Mexico	Very good	Hands-on training for radioactive materials handling
New York	Training is very important	Money for full-time instructors
North Carolina	Training is excellent; funding is very useful	More funding
North Dakota	Invaluable	Nothing in particular; are very comfortable with current arrangements
Ohio	No comment	Federal assistance is provided through standard channels; out-of-state training opportunities are inaccessible unless funding is provided; need is for better distribution of available information to appropriate state and local authorities
Oklahoma	Very useful	Conferences where state and federal people get together
Oregon	Very useful; could not provide training at state level; good relationship with federal authorities	(Not reported)
Pennsylvania	Training is excellent; federal agencies are very cooperative	More training for local personnel; more funding would be helpful but not necessary
Puerto Rico	(Not reported)	(Not reported)
Rhode Island	Excellent	Addition matching funds
South Carolina	Federal assistance for extended emergencies would be very beneficial	More training
South Dakota	Very useful	None at this time
Tennessee	Very good and helpful	More funding support for local training, refresher and update training for RERO graduates
Texas	RERO is very good; other forms of assistance are of marginal benefit for transportation emergency preparedness	Realistic risk assessment for various types of transportation incidents; funding to support training of local personnel; Instrument Maintenance and Calibration Program needs to be funded to permit calibration more often than every four years; refresher or follow-up training for RERO graduates
Utah	Training is very helpful	Monitoring equipment for transuranic wastes, training assistance
Vermont	No comment	Need more funding and training
Virginia	Very useful	Keep up the good work; happy to see transportation issues on training schedule

Table 3-37: Federal Assistance (Questions 54 and 55)

State	Question 54: Usefulness of Federal Assistance	Question 55: Types of Federal Assistance Needed
Washington	Very helpful	Funding for training of local personnel and equipment purchases; be more open about shipments entering the state, especially military
West Virginia	No comment	Need laboratory capability for testing of materials for radioactive contents
Wisconsin	RERO is good; FEMA approach not relevant to state efforts, NRC useful, EPA useful but not timely	Upgrade program to focus on transportation issues
Wyoming	FEMA emphasis on war-related emergencies is not helpful	FEMA should provide more training and assistance for peacetime emergencies; federal authorities should give greater consideration to corridor states and give them the same level of assistance provided to host states

Addendum:
State of Illinois Response to Question 55

Assistance	Type	Source	When Needed
1. Medical	a. Medical effects of isotopes	USDOE, REAC/TS	During accident
	b. Removal of isotopes in humans	USDOE, REAC/TS	During accident
	c. HP, medical, and emergency accident training	USDOE, REAC/TS	Training for key emergency responder
2. Analysis & Detection	a. Find contamination	USDOE/USNRC	During cleanup stage
	b. Measure contamination	USDOE/USNRC	During cleanup stage
	c. Long-term effects	USDOE/USNRC	During cleanup stage
3. Technical Advice	a. Packaging	USDOT/USNRC	Training for key responders and during accident
	b. Decontamination methods	USDOE	During/after accident
	c. Cleanup standards	USDOE/USNRC	After accident
	d. Safety of shipping	USNRC/USDOE	After accident
	e. Regulations	USNRC/USDOT/USDOE	Training for key responders
4. Technical Assistance	a. Finding lost sources	USDOE/USNRC/USEPA	After accident
	b. Preparation of technical reports on accident	USDOE/USNRC	After accident
	c. Recovery of material with high radiation levels (robotics, etc.)	USDOE	During accident
5. Training	a. Accident response	USDOT, FEMA, USNRC, USDOE	Training for key responders

Question 58: What have been the major disappointments in the development and operation of the statewide program during this period?

Although the states were generally positive about their progress and accomplishments in the past ten years, the disappointments they reported were mostly related to not having been able to do as much as they would have liked. The most frequently named disappointments were related to insufficient staff, insufficient equipment, and lack of funding, especially for the training of first responders. Several states mentioned that salaries for health-physics professionals are insufficient to attract and retain qualified personnel; state radiological health programs were characterized as "up and out" training grounds where new graduates come in to entry-level positions, gain a few years' experience, and then go on to higher-paying jobs in the private sector. Several respondents commented that there had been scholarship programs for health-physics students in the early 1970's, but that these programs had been discontinued and there is now an insufficient pool of new talent. Some states reported that they have lost personnel through attrition and are unable to fill the vacant positions. Other specific disappointments named included: the discontinuance of a DOT program that provided funding through the federal highway safety program for a transportation planning position, too much attention to fixed-facility planning and lack of support for transportation planning, difficulty in recovering the costs associated with emergency response, and a lack of cooperation among federal agencies. It should be noted that about one-fourth of the states reported that there had been no disappointments.

Question 59: What needs to be done to ensure that the statewide program fulfills its mission during the next ten years?

Nearly all the states indicated that incremental improvements are indicated for the immediate future. For most states, this was framed in terms of maintaining and improving technical staff, attention to developing more refined plans, especially with respect to non-fixed-facility incident planning, more training for first responders, and maintaining and upgrading equipment inventories, including dedicated emergency-response vehicles. Various states reported highly specific issues, such as the need to revise (as opposed to merely refine) their plan, to clarify lines of authority and interagency relationships, or to consolidate radiation-related functions within state government. Several states expressed concern that the radiological health mission would be substantially revised when a high-level repository is established and shipments commence or by other decisions such as the location of a regional low-level nuclear waste repository. Several states also remarked that state commitment to emergency preparedness has not been consistent; the Three Mile Island incident had led to increased concern and an infusion of resources for a few years, but interest is now fading and radiological health professionals are concerned that their program will deteriorate until another major incident brings the issue back into public awareness.

The following tables, 3-38 and 3-39, are presented differently from the others. To ensure that the states were open and forthright in their responses to somewhat sensitive issues the states were assured that their responses to these questions would be anonymous, thus states are not identified in these tables. The order in which responses are listed is random. There is consistency across the four questions.

Table 3-38: Program Progress and Plans
(Questions 56 and 57)

Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
Development of a network of regional emergency response coordinators and tripling of size of rad protection technical staff	Increase in rad protection staff and staff training, development of a definitive emergency response plan for nuclear incidents, development of the environmental protection communications network, acquisition of rad health monitoring equipment, and enactment of rad control act, which authorizes the assessment of fees to pay the cost of regulation and inspection
Formation of radiological response teams	Additional audiovisual equipment for training
Communications	Training of local police and fire personnel
Increase in hazmat response requirements has resulted in greater emphasis on transportation incidents	Increase in training available from federal agencies
Development of a plan to deal with transportation incidents	Training of personnel
Change in emphasis by emergency management in training of first responders to peacetime emergencies (including radiation-specific response) and establishment of a training section with planners within rad health division	Availability of special trainers within rad health division to provide emergency response training for first responders
Establishment of the bureau of rad control as a individual bureau in the state health department and concurrent increase in the staffing level for the rad control program	Development of the basic rad emergency response plan, development of a rad emergency response team in bureau of rad control, development of state rad assn. standard guide for handling rad-contaminated victims by emergency room personnel, designation by statute of primary state on-scene coordinators, and initiation of training for first responders to radiation transportation accidents
Adoption of formal emergency response plan, acquisition of agreement state status and subsequent increase in staff, and relocation of large quantity of uranium mill tailings	Development of emergency response van
Procurement of state vehicles with emergency management radios	Better preparation for response
Establishment of state hazmat program and regional hazmat response teams	None
(Not reported)	(Not reported)
None	(Not reported)

Table 3-38: Program Progress and Plans
(Questions 56 and 57)

Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
More manpower, better educated personnel at entry level, and better training opportunities	Have fulfilled mission
Increased awareness of how to recognize rad material and where to go for help	Dissemination of appropriate information
Creation of an emergency response program in the Rad Regulatory Agency, wider dispersion of information about the Rad Regulatory Agency, and improvements in training for local officials	Administrative accomplishments (see Question 56); also, formalization of the response effort and creation of written documents, including an SOP and input for the state hazmat plan
Better equipment, better training, and more personnel	Trained, competent staff and better planning
Sheer volume of radioactive materials in transit	Have not had any significant incidents
Increased planning	Participation in Western Interstate Energy Board, improved understanding, greater awareness and better networking, and inauguration of an incident command system
More resources (better communications capabilities, additional personnel slots and equipment, and more vehicles in more locations) and ability to obtain supplemental assistance from the oil and chemical spill section of the Div. of Environmental Protection	Ability to provide more timely response and increased staff
Updating of IRAP, implementation of Rad Emergency Plan, and statewide planning (including definition of an SOP)	State emegency response team and solution of problem of "who's in charge"
Acquisition and equipping of hazmat-dedicated vehicle	Completion of Emergency Operations Plan with radmat/hazmat annex
More training, especially hands-on, in the last 3 years with increased emphasis on transportation incidents	Upgrading of training (and thereby improving capability) and development of a state SOP for incidents other than fixed facility
No significant individual changes but rather a steady evolution; Three Mile Island resulted in greater awareness and the channeling of additional resources to rad emergency planning and capability	Nothing in particular, but is notable that there have been no incidents involving any measurable release
Changes in personnel	Nothing in particular
Development of a plan	Development of a plan and keeping the radmat transportation area under control with assistance of DOE

Table 3-38: Program Progress and Plans
(Questions 56 and 57)

Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
Elevation of responsible agency from division level to separate, cabinet-level department with 200 employees, including 6 dedicated transportation inspectors, a statewide communications system, mobile labs, command center vehicles, and dedicated response vehicles; increase in hazmat officers in State Police and ICC from 0 to 75 plus hazmat equipment; and development of radmat and hazmat accident plans	Responsible agency became a separate cabinet-level department, participation in U.S. DOT radmat transportation studies in early '80s, development of inspection and escort programs for spent nuclear fuel shipments, development and implementation of emergency response plans for transportation accidents, and finding by U.S. DOT that state inspection and fees program is consistent with HMTA and could be a model for other states
None	None, but no real radmat problems
Plan for non-power-plant incidents and becoming an NRC agreement state	Better preparedness of response teams and first responders through training
Emergency planning and preparedness for fixed-facility incidents	Better preparedness across the board because of fixed-facility planning and the resulting increase in capabilities and equipment
No major changes, although have maintained the program (including upgrading of equipment)	None, but a program of escorting large shipments was instituted and state has the ability to respond acceptably to incidents with limited staff and other resources
Nothing in particular	More knowledgeable personnel in first-responder roles, more training, and the exercises with fixed facilities
In-depth experience of program personnel (through improved training and the number of personnel who have been trained) and increased public awareness of radmat	Becoming an NRC agreement state and improvements in the state emergency management agency, including communications and status boards
FEMA	Purchase and operation of 2 emergency vans
Upgrading of equipment and communications, greater availability and use of training, and increase in staffing	Drafting of NIAT handbook and the stability of the staff
FEMA-sponsored training (train-the-trainer program for local personnel)	Many additional trained personnel (especially at local level) and new replacement equipment
Improvement in ability to handle situations, better equipment, development of power plant plans, and evolution of plans	Rewriting of plans, more competent staff, well-defined communications network, and full-time duty officer
Equipment and personnel provided by utility funds, development of guidance for transportation incidents, and FEMA funds for training	Experience gained from responding to real incidents, development of guidance for transportation incidents, and equipment and personnel provided with utility funds
Availability of additional personnel and training	Availability of additional personnel and training

Table 3-38: Program Progress and Plans
(Questions 56 and 57)

Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
Greater awareness of the issue and more coordinated effort in response planning	Development of a response plan and involvement of the highway patrol in the process (all have emergency response kits and have been trained)
Preparation and distribution of state plan	Assistance provided to 5 counties in specific emergency planning for spent fuel shipments and development of integrated management teams (state and local government personnel) to prepare for radiological hazards
Increase in rad health staff and management recognition of the need for the rad health program	Awareness by the public and other agencies that the rad health agency should be contacted for assistance in a radmat emergency and management support and awareness
Increase in awareness, funding, training, and equipment and formalization of the rad incident control plan	Development and implementation of the rad incident control plan, increased staff, local-level training, and laboratory training
Creation of the Bureau of Emergency Response	Creation of the Bureau of Emergency Response
Development of a statewide coordinated plan and creation of the waste isolation pilot project	Development of a statewide plan and coordinated state and local activities
No real changes except having a plan	Development of a plan
Rad protection: doubling of staff, better equipment, and better staff training; emergency management: increase in control office and area office staff, change in focus of planning to hazmat and nuclear disaster, and training for local responders	Legislation enabling emergency management to direct the state response, development of the state emergency response team (SERT) coordination concept, and increase in trained personnel statewide
Expansion of scope of state emergency operations plan to include peacetime response to hazmat incidents and hazmat training	First-responder training and acquisition of mobile vans: communications mobile van and hazmat response mobile van
Development of a plan	Development and implementation of a memorandum of understanding among state agencies
Decrease in the number of radmat transportation incidents and availability of specialized second-response (HERO) truck	Response to and handling of all incidents in a proper manner
Development of planning and training	Development of statewide emergency response plan and training for implementation of the plan

Table 3-38: Program Progress and Plans
(Questions 56 and 57)

Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
Shift of emphasis to spent fuel shipments	Training of first responders and hospital personnel
Occurrence of spent fuel shipments through the state and the establishment of criteria for such shipments	Rad health evaluation of the transportation plans and establishment of a high-level waste advisory committee

Table 3-39: Program Progress and Plans
(Questions 58 and 59)

Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
Lack of federal support for training	More support from federal agencies by providing additional funds to train response personnel and development of technical expertise within federal agencies (e.g., DOT) in order to provide proper assistance to the state
No response	Continuation of training and hiring of additional personnel
Lack of updating of equipment, insufficiency of training for first responders, and inability to repair or replace gamma-ray spectrometers	More training, upgrading of first-responder equipment, more frequent exercises, and additional personnel
None	Under assessment
Misperception by the public that DOE is able to handle any radsat problem and should be contacted first in a radsat emergency	State rad health agency participation in training of first responders and continuing to address resource needs (additional personnel and equipment) realistically
Lack of adequate funding	Increased funding
None	Consistent state and federal funding and more training for Bureau of Emergency Response
Lack of resources to carry out emergency management act	Acquisition of additional resources (training and equipment) as outlined in the emergency management act
Training	Hiring of full-time instructors to promote and conduct training
Lack of adequate funding for local emergency management programs	Upgrading of monitoring equipment and more and better training
Lack of cooperation among state agencies in maintaining hazmat emergency response plan, insufficient staff for developing plan and procedures, and turnover of federal progress to the state without supplementing state funding	Increased cooperation among state agencies in developing hazmat plan and procedures, increase in resources and staff to address emergency response, and federal assistance in funding staff and equipment
Insufficient interagency and intergovernmental cooperation	Overcoming the difficulty in fielding highly specialized response teams given that the state has strong local governments that view the state's role as coordination only
Lack of better communications equipment when it was needed, 2-way radio equipment, and a specialized second-response (HERO) system	Resources for providing and attending training for new personnel and additional 2-way radio communications systems
Federal emphasis on wartime activities as a condition of funding as well as in training events	Continuation of receipt of federal funds and training, upgrading of training courses, and increased funding to keep pace with inflation

Table 3-39: Program Progress and Plans
(Questions 58 and 59)

Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
Nothing in particular	Acquisition of new vehicles, keeping training up to date, and resolution of staff turnover problem (mid-range salaries are not competitive)
No direct notification about one non-transportation incident (apparently a failure to disseminate information about correct notification procedures)	Dissemination of proper information so that appropriate authorities will be notified about radmat incidents
Inadequacy of training for first responders and lack of training for hospital staff on how to attend to radiation-contaminated victims	Enhanced field communications capabilities, more frequent training, more indepth training, better training for local officials, more field exercises, better understanding of organizational roles in order to overcome turf battles, and greater emphasis on radiation safety in state planning
Lack of funding for professional staff (not enough positions and insufficient salaries to attract and retain qualified personnel)	More and better training and better funding for personnel and for equipment and maintenance
Absence of federal commitment to help states improve their capability	Commitment to the rad health mission
Inability to attract and retain qualified personnel and increased workload without additional staff	Better partnership with federal agencies, additional help (more personnel and other resources), more frequent basic and refresher training opportunities, and updating of the plan
Additional staff increases have been denied, high-quality training is scarce and expensive, and some training that has been offered is too elementary or inadequate	Additional high-quality training, more instrumentation, and additional staff because of increased activity
Difficulty in recovering money from parties responsible for incidents where no certifiable contamination	Amendment of plans to address shortcomings, continuation and expansion of training, and upgrading of equipment as necessary
Lack of funds for new detection and protection equipment, no ordinance that addresses the regulation of hazmat, and lack of funding for continued inservice training	Addressing the areas that have been major disappointments
None	Continuation of training and funding for training and an increase in the presently inadequate salaries
Lack of management support in some agencies and unwillingness to spend any money, no support for upgrading, and complacent attitude because there have been no problems	At a minimum, maintenance of the program at its current, adequate level, greater emphasis on rad health in responsible agencies, and integration of the rad function in a single agency

Table 3-39: Program Progress and Plans
(Questions 58 and 59)

Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
None	Maintenance of current level of expertise and development of a Bureau of Rad Protection emergency response plan for radmat transportation accidents
Lack of a proper vehicle for the state staff	Acquisition of additional vehicles and personnel equipment
Insufficient number of paid local directors and volunteers from fire departments	Additional funds for training and equipment
Turnover in manpower resulting in continual training requirements that are difficult to maintain	Upgrading of training of personnel
None	Provision of additional training and equipment and maintenance of plan updates
Possibility of a delay in response because of an IRS ruling concerning take-home vehicles (if state vehicle is taken home, value of use is additional "income"; as a result, vehicles are left at work) and turnover of personnel	Reversal of IRS ruling on take-home vehicles and continuation of present activities (maintain training, keep turnover down, and retain staffing slots)
Removal of instrument maintenance and calibration program from bureau of rad control, state rad officer is not a health physicist and not part of bureau of rad control, state personnel providing local training in rad monitoring and rad accident response are not health physicists or employees of the bureau of rad control, reduction in staff due to budget cuts, and redundancies of federal planning guidance	Conduct of realistic risk assessment for types of radmat transportation accidents, development of response guidelines based on risk assessment, statewide distribution of assessment and guidelines, development and testing of bureau of rad control response plan, retention of rad control functions in one agency, restoration of staff cuts in bureau of rad control, continuation of training for response team, exercise of bureau of rad control plans, and development of response plans and training of first responders by additional local jurisdictions
None	Continuation of training for first responders and response teams, development of a better mechanism to reach remotely located accident scenes, and continuation of involvement of DOE in establishing preferred routes for transit of high-level waste and funding training and additional equipment
Funding	Funding and training
None	Continuation of training of large numbers of first responders each year and redevelopment of training courses to make more interesting and encourage participation

Table 3-39: Program Progress and Plans
(Questions 58 and 59)

Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
Personnel losses without replacement	Recruitment of personnel, better and and more frequent training, and more coordination with other agencies involved
Lack of state appropriations for personnel (one position lost)	Drawing more on DOE for training (especially for potential first responders in outlying districts), continued support from federal agencies, revision and upgrading of plan, and bringing training up to date
None	Expansion of state emergency response programs to comply with SARA Title III (currently being implemented)
Inability to obtain firm clarification of liability questions and status of state area emergency response committee	Maintenance of rad health program and upgrading of funding to ensure adequacy of the program
None	Continued progress (through better equipment and training) and an increase in personnel
Because of concentration on power plants, insufficient time spent on other types of accidents	Keeping current as to the technology and working on non-fixed-facility planning
Resource limitations: limited staff, no emergency response vehicles, and no radios or communications devices	Ensuring that staff is fully trained and obtaining emergency response vehicle and radio communications
Nothing in particular, although the time taken to revise the planning for a non-fixed-facility response was too long	Retention of qualified personnel in the program and continued commitment by the state
Insufficient attention to the area because of small staff, excessive workload, and lack of legislative mandate	Establishment of a 10-year plan (with legislative mandate for milestone reporting) and federal aid for capital equipment and training
Lack of personnel and adequate funding	More federal funding
Nothing major, although there were some problems in channeling notification of incidents	Expansion of staff, upgrading of equipment, and expansion of training opportunities for local personnel beyond the EPZ communities
Discontinuance of DOT support for a transportation planning specialist	Maintenance of the level of the state program and adjustment of the program mission if the state becomes a regional low-level repository
Vagueness of the advice given (need more specific advice)	More equipment, more training, more funds to travel to training points, change in federal attitudes by recognizing state capabilities and being less paternalistic, and direct contact with the governor by NRC (bypassing the lead agency)

Table 3-39: Program Progress and Plans
(Questions 58 and 59)

Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
(Not reported)	(Not reported)
(Not reported)	(Not reported)
None	Allocation of more dedicated time to the problem (one full-time person)
Lack of federal recognition as a corridor state, failure of federal government to provide necessary resources, and failure of state legislature to appropriate sufficient funds	Provision of adequate support by the state to carry out the mandated responsibilities, establishment of clear lines of authority, enactment of necessary legislation, and funding at an acceptable level

4.0 SURVEY OF TRIBAL CAPABILITIES: SUMMARY OF RESULTS

Pursuant to the laws and policies outlined in the 1983 "Statement by the President: Indian Policy," Indian tribes exercise autonomous sovereignty within their jurisidictions. Indian tribal jurisdictions are not considered to be political subdivisions of the states that surround their borders; as a result, state and local public services, including emergency-preparedness planning and response, do not include Indian lands unless specific arrangements among all cognizant authorities have been negotiated. The President's Indian policy statement indicates that relations between Indian tribes and the United States and its political subdivisions are to be conducted on a "government-to-government" basis. This policy has been enunciated repeatedly in subsequent actions by the federal government. For example, the U.S. Environmental Protection Agency, in its official statement "EPA Policy for the Administration of Environmental Programs on Indian Reservations" (November 8, 1984), states:

1. The agency stands ready to work directly with Indian tribal governments on a one-to-one basis (the "government-to-government" relationship), rather than as subdivisions of other governments.

2. The agency will recognize tribal governments as the primary parties for setting standards, making environmental policy decisions and managing programs for reservations, consistent with agency standards and regulations.

Another example is the Nuclear Waste Policy Act of 1982, which explicitly provides that affected tribal jurisdictions have a right to extensive consultation, funding for independent investigations, and a final right to object to the establishment of a site within their boundaries. Indian tribal jurisdictions have the authority and responsibility to make plans and to develop the capability to protect the health and safety of their citizens. Any study of emergency-preparedness planning would be incomplete without a consideration of Indian tribal jurisdictions and their progress in this area.

The Nuclear Regulatory Commission identified fifteen Indian tribal jurisdictions that are transitted by or adjacent to designated spent-fuel shipping routes. These tribes have an obvious and immediate interest in the possibility of a transportation incident involving radioactive materials. With the assistance of the National Congress of American Indians, fifteen of these tribal jurisdictions were chosen for inclusion in this survey. All were contacted by project staff, and twelve agreed to participate. The tribes that provided responses to the survey questionnaire for tribal jurisdictions (Appendix B) were:

1. Acoma Pueblo (New Mexico)
2. Navajo Nation (Arizona, New Mexico, and Utah)
3. Nez Perce Tribe (Idaho)
4. Onondaga Nation (New York)
5. Pyramid Lake Paiute Tribe (Nevada)
6. San Felipe Pueblo (New Mexico)
7. Sandia Pueblo (New Mexico)
8. Seneca Nation (New York)

9. Shoshone-Bannock Tribes, Fort Hall Indian Reservation (Idaho)
10. Te-Moak Tribe of Western Shoshone Indians (Nevada)
11. Umatilla Indian Reservation, Confederated Tribes of (Oregon)
12. Yakima Indian Nation (Oregon)

These Indian tribal jurisdictions vary substantially in geographic size and population. The pueblos are quite small, being approximately analogous to small municipal jurisdictions. The Navajo Nation is the largest Indian jurisdiction in the United States, in both size (nearly as large as the state of West Virginia) and population (approximately 105,000, comprising nearly ten percent of the total U.S. Indian population).

The responses of the tribes reflected varying degrees of development in their governmental organization and capability to provide public services. Three of the tribal jurisdictions appear to be well developed in terms of modern police and fire services and have an administrative apparatus in place through which they could undertake emergency-preparedness planning. These same three also have begun the task of establishing cooperative agreements with adjacent state and local governments. The remaining tribes are largely dependent on agencies of the federal government, especially the Bureau of Indian Affairs and the Indian Health Service, for assistance in these matters. It was universally reported that such assistance has been spotty at best. Most of the tribes surveyed have very little capability to protect their own citizens in the event of a disaster or emergency of any type, nor have they negotiated formal cooperative agreements though which they could obtain assistance from adjacent state or local jurisdictions. For several of the relatively underdeveloped tribes, the responses indicated that they have an informal working relationship with local jurisdictions immediately adjacent to the tribal lands for assistance in an emergency.

The following sections present the question-by-question summary for the tribal responses to the survey questionnaire. Following the discussion of each section, the tribal responses to each question are listed in a tabular format.

4.1 Organization and Responsibility

Question 1: Which tribal agency has the lead for responding with personnel and equipment to assess the radiological impact of transportation incidents involving radioactive materials?

None of the tribes have a formally designated lead agency for evaluating the radiation threat at the scene of a transportation incident. One tribe does have a tribal agency with health-physics expertise that would assume this role, but has not yet developed a plan or other document that formally assigns responsibility. Two other tribes have public health or public safety agencies that would be involved if such an incident occurred. Four tribes indicated that Bureau of Indian Affairs or Indian Health Service personnel would be involved, two tribes indicated that the tribal police force would be involved, and three tribes indicated that there are no arrangements. For all tribes except one, the response capability of tribal personnel is limited to first-on-the-scene functions.

Question 2: What documentation is available that identifies the lead agency?

No tribe said that there was a document or plan that identified the lead agency. Two tribes said that they were in the process of developing a hazmat plan. Another tribe referenced the state disaster protocol as documenting the lead agency, but this is the state agency, not a tribal agency.

Question 3: What documentation is available that identifies support agencies, if any?

One tribe is participating with adjacent local jurisdictions to develop a regional umbrella plan; this plan will identify support agencies. One tribe is in the process of seeking cooperative agreements with adjacent state authorities and local jurisdictions and is intending to incorporate such agreements into a comprehensive tribal emergency plan. Another tribe has access to the emergency call list provided to the adjacent county authorities. No other tribes have any arrangements for identifying support agencies. One tribe reported that it had received a grant through Title III of SARA for the training of tribal personnel and that knowledge of support agencies would be developed in the course of this training.

Question 4: What local jurisdictions, if any, within the borders of tribal lands exercise their own authority to respond to the radiological aspects of transportation emergencies? Is their jurisdiction based upon any recognized authority?

One tribe reported that a private firm operating within the tribal jurisdiction has its own emergency-response personnel. One tribe reported that, while there are no autonomous jurisdictions within the reservation, the tribe has some authority over a Possessory and Usage Rights Area, where jurisdictional issues are unclear. One tribe indicated that there are pockets of private land within tribal boundaries are not under tribal jurisdiction. One tribe indicated that the Indian Health Service (which is not a part of tribal governemnt) might get involved. No other tribe mentioned any independant jurisdictions, except to note that highway rights-of-way are under the jurisdiction of the state.

Summary. None of the tribes have a formal planning document to assign tribal responsibility for responding to transportation incidents involving radioactive materials nor do any tribes have a formal cooperative agreement with adjacent state authorities for assistance in such matters. Two tribes are actively involved in drafting such plans and a third is beginning to discuss these issues. In practice, all of the tribes except one must rely on external assistance in such matters, primarily through informal contacts with civil authorities in the adjacent states or federal agencies. In general, tribal officials would notify state or local police or fire authorities. A few of the tribes indicated that they have some knowledge of state emergency planning practices and could request radiation emergency services directly; a few tribes reported that they prefer to deal with federal rather than state authorities.

Table 4-1: Organization and Responsibility
(Questions 1 to 4)

Tribe	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Document Identifying Lead Agency	Question 3: Document Identifying Support Agencies	Question 4: Local Jurisdictions Exercising Own Emergency Response Authority
Acoma Pueblo	Rely entirely on New Mexico state and county public safety authorities	New Mexico disaster protocol	County Call List	None
Navajo Nation	Navajo Nation Emergency Response Commission and Navajo Environmental Protection Administration	In process of development	No documentation; cooperative agreements being sought with state and local jurisdictions in Arizona, New Mexico, and Utah	Highway rights-of-way in affected state
Nez Perce Tribe	None	None	None	None
Onondaga Nation	None	None	None	None
Pyramid Lake Paiute Tribe	Bureau of Indian Affairs police	Nevada DOT calls appropriate state agency	None	None
San Felipe Pueblo	Bureau of Indian Affairs police, county fire dept.	Informal agreement, tribal authorities call state and local police	None	None
Sandia Pueblo	Bureau of Indian Affairs, Indian Health Service, and volunteer fire department	None	None	Some pockets of private land
Seneca Nation	None assigned, most likely Health Department of the Seneca	No documentation	Received SARA Title III grant for training; will include several tribal agencies	None
Shoshone-Bannock Tribes	Tribal police	Plan in process; participating with 8 local jurisdictions under SARA Title III to create regional umbrella plan	SARA hazmat plan will be appendix to Tribal Basic Emergency Plan also in process	No autonomous jurisdictions within reservation, but private industrial operation has its own personnel; concurrent jurisdiction with state on highway rights-of-way
Te-Moak Tribe	Bureau of Indian Affairs Police	None	None	None
Umatilla Indian Reservation	No designated agency, but have public health and safety agencies that would be involved	None	None	No autonomous jurisdictions within reservation, but Possessory and Usage Rights Area extends into 4 states; situation unclear

Table 4-1: Organization and Responsibility
(Questions 1 to 4)

Tribe	Question 1: Lead Agency for Radiological Assessment at the Scene	Question 2: Document Identifying Lead Agency	Question 3: Document Identifying Support Agencies	Question 4: Local Jurisdictions Exercising Own Emergency Response Authority
Yakima Indian Nation	Tribal police	No official document	No	Indian Health Service (1 staff member)

4.2 Planning

Question 5: Do the tribal authorities have a written emergency-response plan for transportation incidents involving radioactive materials?

None of the tribes indicated that they had a written emergency-response plan for the subject incidents. Two tribes mentioned that one was in the process of being developed, and another tribe said that it used the Indian Health Service's plan.

Question 6: Is this plan part of a hazardous-material transportation plan or does the tribe have a separate plan specifically for radioactive materials?

Since none of the tribes reported having a written emergency-response plan, this question is not applicable.

Question 7: To what extent is planning for transportation incidents involving radioactive materials linked to fixed-facility emergency-response planning?

The question was not applicable to any of the tribes. One tribe indicated that whatever resources it had would be available for any emergency situation; another tribe responded in terms of its awareness of state planning for emergencies.

Question 8: To what extent was the tribal emergency-response plan for responding to transportation incidents involving radioactive materials developed by using FEMA-REP-5, Guidelines for Developing State and Local Radiological Emergency Response Plans and Preparedness for Transportation Accidents (March 1983)? Other federal guidelines?

This question was not applicable to most of the tribes. One tribe indicated that it had consulted the National Response Team's "Hazardous Materials Planning Guide," and another indicated that it intended to consult all relevant guidelines as it worked through the business of developing a comprehensive emergency plan.

Question 9: To what extent was the tribal plan developed with federal technical and/or financial assistance?

The two tribes reporting that a plan is being developed indicated that only tribal resources are being used for plan development. Neither indicated that any federal technical or financial assistance was being used. One tribe reported that it had begun the planning process through federal sponsorship of a nuclear waste study program, but the program was scheduled to end.

Question 10: What arrangements have the tribal authorities made for establishing a single control center for coordinating the response to major transportation incidents involving radioactive materials?

Most of the tribes have no arrangements for a tribal control center. One tribe would use the tribal police headquarters; another would use the tribal governor's office. One tribe is drafting a plan that will include attention to this matter. One tribe indicated that state autorities would assume control.

Question 11: Have the tribal authorities developed inventories or other listings of federal and other capabilities (e.g., military, universities, etc.) for responding to transportation incidents involving radioactive materials?

Only one tribe reported that such a list is available. Another tribe is in the process of preparing one.

Question 12: To what extent are emergency-response capabilities of state and local jurisdictions outside the borders of tribal lands considered in the development of the tribal plan for emergency response to transportation incidents involving radioactive materials?

Four of the tribes indicated that they would rely upon a state or county agency for assistance in responding. Two tribes said that they are not aware of the state's capabilities and thus did not consider such capability. Another tribe indicated that it would like to contract with the adjacent state for such services.

Question 13: Identify any geographic areas within the borders of tribal lands that are not included in the tribal emergency-response plan for responding to transportation incidents involving radioactive materials.

Three tribes indicated some area that is not included in their perceived area of response. In one case there is a pocket of private land, in another a federal right-of-way is not considered, and the third listed a Possessory and Usage Rights Area of the tribe that extends across four states. The other tribes stated that the question was not applicable or did not respond.

Question 14: Are routes and facilities for a possible large number of shipments of radioactive materials considered, formally or informally, in establishing emergency-response plans?

Four tribes responded with a "yes" to this question. In two instances an interstate route across tribal lands is formally considered. One tribe is considering a resolution to disallow the transportation of hazmat or radioactive materials. The other tribes stated that the question was not applicable or did not respond.

Summary. None of the tribes have a documented plan in place. In two tribes, the process of planning is well under way, with various aspects of the organizational arrangements and technical capabilities in various stages of development. A few other tribes have an informal awareness of the manner in which their neighboring state would handle such an incident. In general, the tribes would contact the police authorities of adjacent state or local government and rely on these agencies to call out the chain of command in that state. With one exception, such planning as has taken place has been undertaken with tribal resources only. There are some jurisdictional complications for a few of these tribes. Several of the tribes indicated that they are well aware of the major transportation routes where an incident is likely.

Table 4-2: Planning (Questions 5 to 7)

Tribe	Question 5: Written Emergency Response Plan	Question 6: Part of Hazmat Plan or Separate Plan	Question 7: Linkage to Fixed-Facility Planning
Acoma Pueblo	No	Not applicable	Not applicable
Navajo Nation	In process	Have quasi-plan for incidents involving raw uranium ore	Not applicable
Nez Perce Tribe	No	Not applicable	Not applicable
Onondaga Nation	No	Not applicable	Not applicable
Pyramid Lake Paiute Tribe	No	Not applicable	Not applicable
San Felipe Pueblo	No, one in discussion	No applicable	Not applicable
Sandia Pueblo	No	Not applicable	Not applicable
Seneca Nation	No plan	Not applicable	Not applicable
Shoshone-Bannock Tribes	Draft plan in process	No separate plan	Share personnel, equipment, and training
To-Hoek Tribe	No	Not applicable	Not applicable
Umatilla Indian Reservation	No, use Indian Health Service Plan	No separate plan	State of Oregon's call list
Yakima Indian Nation	No	Not applicable	Not applicable

Table 4-3: Planning (Questions 8 to 11)

Tribe	Question 8: Use of Federal Guidelines (Including FEMA-REP-5)	Question 9: Use of Federal Technical/Financial Assistance	Question 10: Single Control Center	Question 11: Listing of Non-Tribal Capabilities
Acoma Pueblo	Not applicable	Not applicable	Not applicable	No
Navajo Nation	Planning process will include reference to federal guidelines; also, adjacent state planning documents will be referenced	Tribal resources only	Part of current planning	(Not reported)
Nez Perce Tribe	Not applicable	Not applicable	None	No
Onondaga Nation	Not applicable	Not applicable	None	No
Pyramid Lake Paiute Tribe	Not applicable	Not applicable	Bureau of Indian Affairs would contact state authorities, who would assume control	No
San Felipe Pueblo	Not applicable	Not applicable	None	No
Sandia Pueblo	Not applicable	Not applicable	Tribal Governor's Office	No
Seneca Nation	Not applicable	Not applicable	None	List of state and county authorities
Shoshone-Bannock Tribes	"National Response Team's Hazardous Materials Planning Guide"	With own resources	Tribal police headquarters; would cede authority to state if incident on state highway right-of-way	In draft plan
Te-Moak Tribe	Not applicable	Not applicable	No plans, tribal representative sits on state planning group	No
Umatilla Indian Reservation	None	Planning is incomplete; as much as has been done was through sponsorship of federal Nuclear Waste Study Program	None	None
Yakima Indian Nation	Not applicable	Not applicable	None	No

Table 4-4: Planning (Questions 12 to 14)

Tribe	Question 12: Consideration of State and Local Government Capabilities	Question 13: Areas Not Included in Response Plan	Question 14: Consideration of Routes and Facilities for Large Number of Shipments
Acoma Pueblo	Depend totally on state and county assistance	Not applicable	Not applicable
Navajo Nation	(Not reported)	(Not reported)	(Not reported)
Nez Perce Tribe	Not aware of state's activities	Not applicable	Not applicable
Onondaga Nation	Not applicable	Not applicable	Not applicable
Pyramid Lake Paiute Tribe	Rely almost entirely on state capabilities	None	No
San Felipe Pueblo	Not applicable	Not applicable	No plan, but have agreed to redirect highway shipments from Los Angeles; no control over rail routes
Sandia Pueblo	Not applicable	Some pockets of private land	One major highway
Seneca Nation	Not considered, would use federal agencies	Highway rights-of-way	One major highway
Shoshone-Bannock Tribes	Heavy reliance on outside capability, especially INEL and State Patrol	None	Yes; 2 major highways and rail route
Te-Moak Tribe	Desire to contract with state for such assistance	Not applicable	No, but this will be an important concern when a plan is developed
Umatilla Indian Reservation	Rely on state capabilities	Possessory and Usage Rights Area	State and counties are working on this, tribe has some involvement
Yakima Indian Nation	No plan, would be decided by tribal legal counsel	Not applicable	Resolution not to allow

4.3 Tribal Relationships with State and Local Government

Question 15: Have the tribal authorities assumed responsibility for emergency response to transportation incidents involving radioactive materials that occur outside the borders of tribal lands?

None of the tribes said that they have assumed such a responsibility. In one case the tribe would decide on a case-by-case basis, and in another the tribe would assist if called. One tribe mentioned that the reservation boundaries are in dispute; an incident on disputed land would cause difficulty.

Question 16: Do the tribal authorities have a formal program or plan to respond to transportation incidents involving radioactive materials that occur outside the borders of tribal lands?

None of the tribes indicated that they have any such program or plan.

Question 17: Does the governor's designated representative in the state who receives Part 71/73 notifications of spent fuel or radioactive-material shipments have any working arrangements with tribal officials to share this information?

None of the tribes indicated that any such arrangement existed. One tribe mentioned being "justifiably upset" over the fact that the state governor's designated representative shares notification information with all other law enforcement agencies in the state except the tribe even though it had requested such information.

Question 18: Describe the relationship of the tribal authorities with the state with respect to emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders.

Most of the tribes have an informal working relationship with state or local authorities and desire to cooperate with the state in the event of a radiation emergency. A few tribes asserted that they have no relationship with state authorities.

Summary. There is a lack of formal working relationships between the state and the tribes. Recall from the discussion of this issue in Section 3.3 that most of the state personnel indicated that a formal arrangement was not needed since any incident would most likely occur on the state right-of-way and the state could and would respond.

4.4 Legal Authority/Issues

Question 19: Are individuals from both the public and private sectors who assist in emergency response on tribal lands protected from personal liability (e.g., by an insurance program, statutory indemnity provisions, or statutory immunity from liability)?

Four of the tribes did not know if such personnel would be protected from personal liability or not; one tribe was unsure. Four others indicated some type of protection. One tribal jurisdiction limited protection to full-time employees, another tribe, like most of the states, thought that a "Good Samaritan" law would cover personnel, and another reported that the Bureau of

Table 4-5: Tribal Relationship with State and Local Government (Questions 15 to 18)

Tribe	Question 15: Tribal Responsibility for Response Off Tribal Lands	Question 16: Formal Program or Plan for Response Off Tribal Lands	Question 17: Arrangements for Sharing Part 71/73 Notification with Tribes	Question 18: Tribal Relationship with State
Acoma Pueblo	Don't know; tribal authorities would decide	No	Don't know	Local police call state police, who call appropriate authorities
Navajo Nation	(Not reported)	(Not reported)	(Not reported)	(Not reported)
Nez Perce Tribe	No	No	No	None
Onondaga Nation	No	No	No	None
Pyramid Lake Paiute Tribe	No	No	No	Tribe relies on state capabilities for expertise
San Felipe Pueblo	No	No	No	Cooperate with state
Sandia Pueblo	Bureau of Indian Affairs would call federal agencies	No	No	Would deal with Bureau of Indian Affairs rather than with state
Seneca Nation	No, do not have resources; rely on federal authorities	No	No	Depends on an agency; good relationship with state DOT, poor relationship with health authorities
Shoshone-Bannock Tribes	No, but would assist if called	No formal plan	No; tribe has interest, but state does not inform	Tribe relies on state and federal capabilities for expertise
Te-Moak Tribe	Tribe claims responsibility for treaty lands that extend beyond reservation boundaries; disputed by state; emergency on treaty lands would lead to jurisdictional challenges	No	No	State does not recognize tribal authorities; litigation concerning treaty lands in process; after this is settled, would like to contract with state for such services
Umatilla Indian Reservation	No	No	No	Sit on state committees
Yakima Indian Nation	No	No	No	No direct involvement

Indian Affairs' coverage would be applied to tribal personnel. The fourth tribe reported an unqualified "yes." One tribe did not consider the question to be applicable; another was unreported.

Question 20: Do tribal laws, federal statutes or regulations, or other legal documents assign responsibility for costs incurred during emergencies, such as loss of property or evacuation costs?

No tribe reported that any provisions exist to assign responsibility for cost recovery.

Question 21: What formal memoranda of understanding and/or reciprocal agreements do the tribal authorities have with adjacent state or local jurisdictions to cover transportation incidents involving radioactive materials that occur close to common borders?

None of the tribes reported any formal agreement with the states bordering tribal lands. One tribe mentioned that it has an informal oral agreement with the state. Two tribes indicated that they meet with and attend planning meetings with the state officials, but there are no formal agreements. One tribe reported that a mutual-aid agreement between police agencies exists, but this agreement is not restricted to or specific to radiation emergencies.

Only one tribe went into detail in its response. The tribe has requested from the Department of Energy various types of assistance to enable it to prepare for such emergencies. The tribe insisted on better communications with the DOE which it feels might lead to a formal memorandum of understanding between the tribe and neighboring states. Other than this one case, there does not appear to be any activity toward the development of mutual-aid pacts or agreements.

Summary. Legal issues and issues concerning emergency-response authority seem unresolved. There appears to be a need for the development of cooperative agreements between the tribes and bordering states to clarify the authority and responsibility for responding to transportation incidents involving radioactive materials.

4.5 Personnel

Question 22: What kinds of professional specialists are available to contribute their expertise in response to a transportation incident involving radioactive materials?

Most of the tribes reported that they have no personnel who are trained to assist at the scene of a radiation emergency. One tribe has a tribal agency that includes two health-physics technicians and a radiation monitor on its staff, and another tribe has two individuals trained as radiation monitors. One other tribe reported that a public health sanitarian on temporary assignment with the Indian Health Service is trained as a radiation monitor. In addition, two tribes stated that they have individuals who could serve as support personnel in the role of communication specialist or site coordinator.

Table 4-6: Legal Authority/Issues (Questions 19 to 21)

Tribe	Question 19: Personal Protection From Liability	Question 20: Assignment of Responsibility for Costs	Question 21: Arrangements With Adjacent Jurisdictions
Acoma Pueblo	Don't know	Don't know	Don't know
Navajo Nation	(Not reported)	(Not reported)	Agreements are being pursued with U.S. DOT, U.S. DOE, and 3 adjacent states
Nez Perce Tribe	Not applicable	No	None
Onondaga Nation	Never discussed, don't know	Never addressed	None
Pyramid Lake Paiute Tribe	Yes, Good Samaritan Law	No	None
San Felipe Pueblo	Don't know	Don't know	Met with state, but no formal agreement
Sandia Pueblo	Yes	Not at this time	No
Seneca Nation	Don't know	Don't know	No formal relations with state; would turn to federal authorities for assistance
Shoshone-Bannock Tribes	Only full-time employees	None	Only oral understanding
Te-Moak Tribe	Bureau of Indian Affairs coverage	None	No formal agreement
Umatilla Indian Reservation	Not sure	No, except as provided under Price-Anderson	General agreements between police programs
Yakima Indian Nation	Don't know	No	No

4.6 Equipment

Question 23: Indicate the number of locations throughout the tribal lands where serviced and calibrated portable radiation-detection instruments available for use during an emergency response are normally kept. (Do not include civil-defense shelter kits in this enumeration.)

Question 24: Of these locations, how many have portable radiation detectors available on a 24-hour basis?

Four tribes reported that portable radiation-detection instruments are available on the reservation. For one of these tribes, it was indicated that no tribal personnel know how to use the instruments. For another tribe, these instruments were issued to the Bureau of Indian Affairs and have never been taken out of their boxes; it is believed that these instruments have not been calibrated and probably are not suitable for use. One tribe has a well-developed radiological health division, with a variety of instrumentation plus certified sources and equipment for calibration. One other tribe has some instruments acquired through the Department of Energy, but these are in storage awaiting DOE permission to be transferred to tribal health authorities. No other tribe has any detection instruments.

Question 25: How many emergency-response vehicles that are specially equipped or can be specially equipped without delay for response to transportation incidents involving radioactive materials (or other hazardous-material incidents) are available?

One tribe reported the possible availability of one vehicle, but the vehicle may not be properly equipped to respond to such incidents.

Question 26: Are emergency kits available for use by persons responding to transportation and other incidents involving radioactive materials? At how many locations within the tribal lands are such kits available? Describe the usual contents of such kits.

None of the tribes have such emergency kits available. The only kits reported were some first-aid-type kits usually carried in fire or police vehicles.

Summary. With one exception, the tribes reported very little in the way of professionally trained personnel or equipment. Given the limited number of personnel or equipment, it does not appear that the tribes could adequately respond to a transportation incident involving radioactive materials.

4.7 Communications

Question 27: What communication network, if any, have the tribal authorities established to provide two-way communication between the single control center and the scene of a transportation incident involving radioactive materials?

The only communication networks reported are public safety radio systems. In four tribal jurisdictions, the communication network is the tribal police and/or fire department system. Four additional tribes reported some capability to contact or link into other communication networks, and the re-

Table 4-7: Personnel and Equipment
(Questions 22 to 24)

Tribe	Question 22: Professional Specialists Available to Contribute Their Expertise for Emergency Response	Question 23 and 24: Portable Radiation-Detection Equipment (Type and Location)
Acoma Pueblo	No trained personnel	2 or 3 devices received 2 years ago; no one knows how to use them
Navajo Nation	2 health-physics technicians and 1 radiation monitor	All equipment at one location: 1 each low-, medium-, and high-range beta-gamma instrument 3 low-energy gamma detectors 6 alpha-particle detectors 3 instruments that determine concentration of radon decay products Also, certified sources and equipment for calibration
Nez Perce Tribe	No trained personnel	No detection instruments
Onondaga Nation	No trained personnel	No detection instruments
Pyramid Lake Paiute Tribe	No trained personnel	No detection instruments
San Felipe Pueblo	1 communications specialist and 1 site coordinator	No detection instruments
Sandia Pueblo	No trained personnel	No detection instruments
Seneca Nation	No trained personnel	No detection instruments
Shoshone-Bannock Tribes	2 radiation monitors and 2 communication specialists	Bureau of Indian Affairs has 2 portable instruments, but these have never been taken out of their boxes
Te-Moak Tribe	No trained personnel	No detection instruments
Umatilla Indian Reservation	Sanitarian on temporary assignment to Indian Health Service is trained as radiation monitor	Beta-gamma detectors and alpha-particle detectors are available at one location
Yakima Indian Nation	No trained personnel	No detection instruments

Table 4-8: Equipment and Communications
(Questions 25 to 27)

Tribe	Question 25: Dedicated Emergency Response Vehicles	Question 26: Emergency Field Kits	Question 27: Communications Network
Acoma Pueblo	None	None	Telephone/radio with State Police
Navajo Nation	None	None	Tribal public safety
Nez Perce Tribe	None	None	None
Onondaga Nation	None	None	None
Pyramid Lake Paiute Tribe	None	None	Radio from Bureau of Indian Affairs police to county dispatch
San Felipe Pueblo	None	None	Radio contact with state authorities
Sandia Pueblo	None	None	Fire and police radio link to Bureau of Indian Affairs
Seneca Nation	None	First aid only	Tribal police and fire radio
Shoshone-Bannock Tribes	None	First aid only	Tribal police base station and portable units; access to state net
Te-Moak Tribe	None	None	None
Umatilla Indian Reservation	None	Not tribe's	None
Yakima Indian Nation	None	None	Tribal police radio

maining four tribes reported that no communications network was available to them.

4.8 Training

Question 28: How many trained radiological emergency-response teams does the tribe have?

No tribe reported the availability of a trained radiological emergency-response team.

Question 29: How many members of the radiological emergency-response teams are trained in radiological emergency-response procedures (i.e., have completed the "Radiological Emergency Response Operation" course at Mercury, Nevada, or equivalent training)?

Question 30: Are the trained members all at one location? How may are at each location? Specify the number by location.

Since no tribe has a trained radiological emergency-response team, Questions 29 and 30 do not apply.

Question 31: What provision do the tribal authorities make for training their emergency-response personnel? Who conducts the training? Who funds the training?

Seven of the tribes provided training for first responders, usually law enforcement and fire safety personnel. Three of these tribes clearly indicated that this training is offered on the reservation using tribal resources. The other four tribes apparently take advantage of off-reservation training opportunities for first responders, including training provided and funded by the U.S. Department of Transportation (mentioned twice) and U.S. Department of Energy (mentioned once). Five tribes make no provision for emergency- response personnel training at present.

Question 32: What training courses are attended by tribal emergency-response personnel? Who conducts the training? Who funds the training?

Seven tribes reported that first-responder training courses are attended by tribal emergency-response personnel; one other tribe noted that a training grant is pending. The first-responder training is provided by a variety of agencies. Federal-agency training courses were mentioned (Department of Transportation once, Department of Energy once, and Indian Health Service twice), state and adjacent county training courses were named once each, and state-university training was cited twice. External sources of funding for training seldom were mentioned, although a few tribes did indicate federal or other financial assistance.

Question 33: How many tribal emergency-response personnel on the average are trained each calendar year?

Only one of the seven tribes whose emergency-response personnel have received some form of first-responder training was able to specify the number of first responders trained annually (25).

Question 34: Do the training courses train emergency-response personnel in the following aspects of emergency response to transportation incidents involving radioactive materials:

(a) Radiation hazards that might be encountered?
(b) Surveys of incident scenes?
(c) Protection against hazards?
(d) Federal and state regulations?

Of the seven tribes whose emergency-response personnel have received first responder training, only two indicated that the training covered radioactive-material incidents. One tribe reported that the training had some discussion of radiation hazards; the other tribe reported that all four of the topics listed in Question 34 were included in the training.

Question 35: What hazards, other than the radioactive hazard, are covered in the training courses?

Three tribes mentioned that hazardous materials in general are covered in training attended by tribal first responders.

Question 36: How often are practice exercises conducted to test the effectiveness and operation of the tribal emergency-response plan for responding to transportation incidents involving radioactive materials? Do the exercises focus on radioactive-material incidents or are they part of a general hazardous-material test? When was the last exercise carried out?

No tribe reported having conducted or participating in any exercises to test a tribal emergency-response plan, although one tribe acknowledged the need to do so.

Summary. As is the case with personnel and equipment, emergency-response training is very limited in the tribes studied. With one or two exceptions, the training that is conducted is primarily law-enforcement-related training that is limited to first-response capabilities and does not specifically address radiation incidents. Only a few tribal personnel are trained annually as first responders; no tribe has a trained radiological emergency-response team.

4.9 Transportation and Incident Assessment

Question 37: In the case of a land-vehicle-related transportation incident involving radioactive materials, how long on the average will it take radiological emergency-response teams and support crews to reach from their usual location the most remote site where an incident could likely occur.

Reporting on response times varied greatly, ranging from "a few minutes" to eight hours. For the less-well-developed tribes, the estimate was for the time it would take state or local officials to reach the scene; these officials then would call for radiological emergency assistance through normal channels. For other tribes with a more-well-developed appreciation for the problems involved at a radiation incident, the time estimate reported was the time needed for a radiological emergency-response team to arrive at the incident scene.

Table 4-9: Training (Questions 28 to 30)

Tribe	Question 28: Number of Trained Radiological Emergency Response Teams	Question 29: Number of Team Members Trained in Radiological Emergency Response Procedures (RERO or Equivalent)	Question 30: Location of Trained Radiological Emergency Response Team Members
Acoma Pueblo	0	0	Not applicable
Navajo Nation	0	0	Not applicable
Nez Perce Tribe	0	0	Not applicable
Onondaga Nation	0	0	Not applicable
Pyramid Lake Paiute Tribe	0	0	Not applicable
San Felipe Pueblo	0	0	Not applicable
Sandia Pueblo	0	0	Not applicable
Seneca Nation	0	0	Not applicable
Shoshone-Bannock Tribes	0	0	Not applicable
Te-Moak Tribe	0	0	Not applicable
Umatilla Indian Reservation	0	1 (an employee of the Indian Health Service on temporary assignment)	Only one trained person
Yakima Indian Nation	0	0	Not applicable

Table 4-10: Training (Questions 31 to 33)

Tribe	Question 31: Training Provided for Emergency Response Personnel	Question 32: Training Courses Attended by Emergency Response Personnel	Question 33: First-on-Scene and Radiological Emergency Response Trainees Annually
Acoma Pueblo	None	None	0
Navajo Nation	In-house and U.S. DOT workshops	U.S. DOT first responders course; U.S. DOT radmat emergency course	Try to send some staff to some training each year
Nez Perce Tribe	None	None	0
Onondaga Nation	None	None	0
Pyramid Lake Paiute Tribe	None	None	0
San Felipe Pueblo	Tribal resources only	University of New Mexico; some training with adjacent county law enforcement	0
Sandia Pueblo	Chief of volunteer fire dept. has some first-responder training	Through Indian Health Service	Volunteer firemen have training in fire suppression and first aid
Seneca Nation	None currently	SARA Title III grant will enable basic training to be provided	Hope to send up to 20 individuals
Shoshone-Bannock Tribes	Law enforcement training only	Through state agencies	0
Te-Moak Tribe	First-on-scene trained through adjacent county	Trained at local university, funded by county	25 first-on-scene
Umatilla Indian Reservation	Have received some training through U.S. DOT and DOE; also, some training for tribal police and fire	Training conducted at reservation with tribal resources; formerly, did receive federal assistance	Occasional, as available
Yakima Indian Nation	Tribal police have some hazmat training	Conducted by Indian Health Service	One-time only

Table 4-11: Training (Questions 34 to 36)

Tribe	Question 34: Radmat Emergency Response Issues in Training Courses	Question 35: Other Hazards Covered in Training Courses	Question 36: Practical Exercises to Test Radiological Emergency Response Plan
Acoma Pueblo	None	None	None
Navajo Nation	Navajo Environmental Protection Administration personnel are trained in radiation hazards, scene surveys, personal protective actions, and regulations	Hazardous materials in general, especially petroleum products	No radiation-specific exercises
Nez Perce Tribe	None	None	None
Onondaga Nation	None	None	None
Pyramid Lake Paiute Tribe	None	None	None
San Felipe Pueblo	None	None	None
Sandia Pueblo	None	None	No radiation-specific exercises
Seneca Nation	None	None	None
Shoshone-Bannock Tribes	Some discussion of radiation hazards	Identification of materials; safety perimeters	No radiation-specific exercises
Te-Moak Tribe	None	None	None
Umatilla Indian Reservation	None	None	None
Yakima Indian Nation	None	Hazardous materials, not including radioactive	None

Question 38: The first-on-the-scene respondents (i.e., policemen, firemen, and road-maintenance personnel) at a transportation incident involving radioactive materials are expected to take certain protective actions. Is there a standard operating procedure or action sequence such personnel are expected to observe? Please discuss.

Standardized procedures for first responders exist in only four of the tribal jurisdictions studied. These procedures range from notification of the BIA police and the state department of transportation to securing the area and attending to the injured. Again, because of the limited professional staff and training of tribal personnel in dealing with such emergencies, there is little that the first responders can do.

Question 39: Since policemen, firemen, and road-maintenance personnel are the most likely first-on-the-scene respondents at a transportation incident involving radioactive materials, what percent of each of these groups has received at least minimal training in handling radiological emergencies?

Only one tribe reported that any of its police, fire, or road-maintenance personnel had received minimal first-response training for handling radiological emergencies. This tribe estimated that 5% of tribal police and fire personnel were minimally trained. The other eleven tribes either had no minimally trained personnel (eight tribes), did not know the percentage of minimally trained personnel (one tribe), or did not report the percentage (two tribes).

Question 40: What percentage of the first-on-the-scene respondents possess the information designated in the DOT Emergency Response Guide (ERG)? Do they consider the information in the ERG to be adequate?

Only two tribes were able to give an estimate of the percentage of first responders possessing the DOT "Emergency Response Guidebook" (DOT P5800.4). One tribe reported that 100% of the police and fire personnel have the information; the other tribe reported that the guidebook is available at the police and fire department headquarters.

Summary. There is a very limited tribal capability to assess incidents and an absence of standard operating procedures for first responders. Very few tribal police and fire personnel have even minimal training in radioactive-material emergencies or even possess the information in the DOT "Emergency Response Guidebook."

4.10 On-Site Operations

Question 41: Do the tribal authorities have predesignated on-scene coordinators for emergency response to transportation incidents involving radioactive materials?

Four tribes indicated that a tribal first-response agency had an individual who would function as an on-scene coordinator. In one tribe, the coordinator is the fire chief; in three tribes, the tribal police would serve as coordinators.

Table 4-12: Transportation and Incident Assessment
(Questions 37 to 40)

Tribe	Question 37: Response Time to Most Remote Site	Question 38: Standard Operating Procedure for First Responders	Question 39: First Responders With Minimum Training for Handling Radiological Emergencies	Question 40: Percentage of First Responders Possessing DOT Emergency Response Guidebook
Acoma Pueblo	4-8 hours	None	None	Unknown
Navajo Nation	3-4 hours	None	None	Availability not reported, but intend to include as planning progresses
Nez Perce Tribe	State police would respond, time unknown	State police would be responders	(Not reported)	(Not reported)
Onondaga Nation	Not known	None	None	None
Pyramid Lake Paiute Tribe	2 hours	State officials would be responders	None	None
San Felipe Pueblo	20 minutes	Bureau of Indian Affairs and state police would be responders	Not known	Not known
Sandia Pueblo	A few minutes	Bureau of Indian Affairs and state officials would be responders	(Not reported)	(Not reported)
Seneca Nation	Unsure, several hours	Not known	None	None
Shoshone-Bannock Tribes	Tribal Police, 10-15 minutes; INEL team, 1 hour minimum	No protocol, but in general: identify material, perform lifesaving, call authorities	None	Every police and fire unit
To-Nook Tribe	1 hour minimum	Scene security and first aid	None	None
Umatilla Indian Reservation	2-1/2 to 4 hours	No protocol for tribal police	5% of police and fire	Have book at department headquarters
Yakima Indian Nation	2 hours	Scene security and first aid	None	None

Question 42: What is the general makeup of emergency-response teams dispatched to transportation incidents involving radioactive materials (other than police, firemen, and ambulance personnel)?

Since no tribe has a radiological emergency-response team, this question is not applicable.

Question 43: What reference guides are carried by emergency personnel to outline specific actions to be taken in the event of a transportation incident involving radioactive materials?

The DOT "Emergency Response Guidebook" is the reference guide carried by first responders for one tribe; the first responders of another tribe have "whatever state officials carry." For the remaining ten tribes, reference guides are not carried by first responders (seven tribes) or the tribe did not report what guides, if any, are carried (three tribes).

Summary. With regard to on-site operations, the tribes have very little capability other than basic first-responder assistance. First responders are not equipped with reference guides that specify what actions should be taken in the event of the occurrence of a transportation incident involving radioactive materials. The emergency-response team concept is not used by any of the tribes studied.

4.11 Actual Experience

Question 44: How many transportation incidents involving radioactive materials do tribal authorities formally respond to each year?

All the tribes reported a recent annual average of no incidents. One tribe reported that two incidents occurred in 1987.

Question 45: Describe the usual actions taken by emergency-response personnel in transportation incidents involving radioactive materials.

Only one tribe listed any procedures; the other eleven tribes stated that they never had any incidents to which they had to respond. The single tribe listing usual actions said that the tribal agency would assess the scene, prevent further contamination, survey for radiation, supervise cleanup, and conduct a post-cleanup survey.

Question 46: How many times each year do the tribal authorities contact state or local agencies for on-scene radiological assistance or for advice by telephone concerning transportation incidents involving radioactive materials?

All but one tribe reported that no requests for state or local assistance had been made. The single tribe that had requested assistance characterized the frequency of such requests as "very rare."

Question 47: How may times each year do the tribal authorities request federal assistance in responding to a transportation incident involving radioactive materials?

Only one of the tribes had requested federal assistance, and that tribe sought assistance only once.

Table 4-13: On-Site Operations (Questions 41 to 43)

Tribe	Question 41: Predesignated On-Site Coordinators	Question 42: Makeup of Emergency Response Teams	Question 43: Reference Guides Carried by Emergency Response Personnel
Acoma Pueblo	State police officers would take control of the same	No team	Whatever state officials carry
Navajo Nation	Tribal Police, but not designated	No team	None
Nez Perce Tribe	(Not reported)	No team	(Not reported)
Onondaga Nation	No	No team	None
Pyramid Lake Paiute Tribe	No	No team	None
San Felipe Pueblo	No	No team	(Not reported)
Sandia Pueblo	Fire chief	No team	(Not reported)
Seneca Nation	No	No team	None
Shoshone-Bannock Tribes	Tribal police chief	No team	DOT ERG
Te-Moak Tribe	No	No team	None
Umatilla Indian Reservation	Tribal police, but not designated	No team	None
Yakima Indian Nation	No	No team	None

Table 4-14: Actual Experience (Questions 44 to 47)

Tribe	Question 44: Responses to Transportation-Related Radmat Incidents	Question 45: Usual Actions Taken Taken by Emergency Response Personnel	Question 46: Tribal Requests for State or Local Agency Assistance/Advice	Question 47: Frequency of Tribal Requests for Federal Assistance
Acoma Pueblo	None	No incidents	Never	Never
Navajo Nation	2 spills of raw uranium ore in 1987	Navajo Environmental Protection Administration surveys scene, prevents spread of contamination, monitors cleanup, and conducts post-cleanup survey	Very rare	One time
Nez Perce Tribe	None	No incidents	Never	Never
Onondaga Nation	None	No incidents	Never	Never
Pyramid Lake Paiute Tribe	None	No incidents	Never	Never
San Felipe Pueblo	None	No incidents	Never	Never
Sandia Pueblo	None	No incidents	Never	Never
Seneca Nation	None	No incidents	Never	Never
Shoshone-Bannock Tribes	None	No incidents	Never	Never
Te-Moak Tribe	None	No incidents	Never	Never
Umatilla Indian Reservation	None	State would respond	Never	Never
Yakima Indian Nation	None	No incidents	Never	Never

Summary. Radioactive incidents on tribal lands are very rare events. No tribe reported any such events (except for calendar year 1987). Consequently, the tribes have had no need to contact state, local, or federal agencies for assistance.

4.12 Funding

Question 48: Have any studies been conducted to determine what resources and funding are allocated each year to upgrade the tribal emergency response for hazardous-material or radioactive-material incidents"?

No tribe reported any such studies having been conducted.

Question 49: What additional resources are needed to upgrade the tribal emergency response to a level deemed adequate for most situations? Estimate the costs of the needed resources.

Ten tribes claimed to need "everything" in order to upgrade their emergency-response capabilities; the other two tribes had not yet determined their needs. Six tribes mentioned equipment as a major need; three tribes cited additional training and staff as major requirements.

Question 50: From whom are tribal authorities presently receiving funds to support emergency response for transportation incidents involving radioactive materials?

Nine tribes said they received no external funding to support tribal emergency response. Two tribes reported that they had received some external funding, but this was not specific to radiological transportation emergencies. One tribe reported that it was expecting to receive a grant for some training of tribal personnel in hazardous materials incident management.

Summary. The tribes reported receiving very little external funding. While no studies of precise resource needs had been conducted, the tribes identified a need for "everything," including equipment, staff, and training.

4.13 Federal Assistance

Question 51: What types of assistance (such as training, funding, technical advice, and on-scene support) are available from federal agencies (including DOE) to support tribal authorities?

Seven tribes responded that there was no federal assistance available; two tribes were unaware of the availability of federal support. All three tribes indicating an awareness of federal assistance mentioned training, especially training provided by the Department of Energy. The Department of Transportation and Federal Emergency Management Agency were identified by one tribe as federal-agency sources for training assistance.

Question 52: How do the tribal authorities learn about the available federal assistance?

A variety of sources for learning about federal assistance programs was cited by the tribes. Communications from the Bureau of Indian Affairs were mentioned by three tribes; two tribes indicated that the Federal Register was

Table 4-15: Funding (Questions 48 to 50)

Tribe	Question 48: Studies to Determine Needs	Question 49: Additional Resources Needed	Question 50: Sources of Funds to Support Tribal Emergency Response
Acoma Pueblo	No	Need everything	No external funding
Navajo Nation	No	Not yet determined	No external funding
Nez Perce Tribe	No	Need everything	Have received some funding, but not for radiological transportation emergencies
Onondaga Nation	No	Not determined	No external funding
Pyramid Lake Paiute Tribe	No	Need everything	No external funding
San Felipe Pueblo	No	Need everything	No external funding
Sandia Pueblo	No	Need everything	Some federal funding received, but not for radiological transportation emergencies
Seneca Nation	No	Need everything; also need better cooperation with state and federal government	Grant through SARA Title III for hazmat training, but does not include radioactive materials
Shoshone-Bannock Tribes	No	Need everything; especially, need FTE staff position for Emergency Response Coordinator	No external funding
Te-Moak Tribe	No	Need everything; need assistance with litigation to settle jurisdictional disputes	No external funding
Umatilla Indian Reservation	No	Need everything; especially, need FTE Emergency Response Planner and Coordinator and associated support services	No external funding
Yakima Indian Nation	No	Need everything	No external funding

a primary information source. Personal contacts, mailed announcements from federal and state agencies, and subscription publications are other sources identified by at least one tribe.

Question 53: What federal assistance is used by tribal authorities?

Six tribes claimed they have not used any federal assistance. Three tribes mentioned assistance received from the Bureau of Indian Affairs, and two tribes cited assistance provided by the Indian Health Service.

Question 54: How useful is the federal assistance provided?

Two of the six tribes that have been provided federal assistance considered it to be useful, two tribes thought the federal assistance was of limited usefulness, one characterized the assistance as inadequate, and one tribe tribe did not know whether or not the assistance was useful.

Question 55: What types of additional federal assistance do tribal authorities need to improve their capability to respond to transportation incidents involving radioactive materials?

The most common need listed was training, which was mentioned by five tribes. Additional equipment and staff, needs-assessment and planning assistance, and funding were mentioned by at least two tribes as federal assistance desired.

The response from one tribe was especially instructive as to the types of federal assistance needed by the tribes:

> Either the DOE or DOT or EPA or FEMA need to loosen their restrictive grip on hazardous material dollars so tribes can develop programs relating to emergency response, protect the health and welfare of Indian people and reservation residents, maintain and enhance their tribal sovereignty, regulate transportation through their reservations, and develop cooperative agreements with federal, state, and local governments to protect treaty rights off and on the reservations, as well as protect the environment and the non-Indians living in tribal Possessory and Usage Rights Areas. Traditionally, tribes have been left out of the transportation issues. . . . Tribes have the responsibility to their people to regulate the transportation of hazardous materials through the reservation and provide the emergency response capability required. There are no good mechanisms established for this approach.

Summary. Very little federal assistance in this area is being received by the tribes. The tribes need training, personnel, equipment, and planning assistance.

Table 4-16: Federal Assistance (Questions 51 to 53)

Tribe	Question 51: Types of Federal Assistance Available	Question 52: Sources of Information About Federal Assistance	Question 53: Federal Assistance Used
Acoma Pueblo	Do not know availability	Federal Register and state announcements	Indian Health Service and Bureau of Indian Affairs
Navajo Nation	DOE WIPP training, DOT first responder training, and some FEMA training via state pass-through programs; no funding assistance	EPA and subscribed literature	None currently used
Nez Perce Tribe	None	Nuclear Waste Policy Act and related literature	DOE funds for reclamation
Onondaga Nation	None	None	None
Pyramid Lake Paiute Tribe	None to their knowledge	Bureau of Indian Affairs announcements and Catalog of Domestic Assistance	None
San Felipe Pueblo	None	Bureau of Indian Affairs agent	Bureau of Indian Affairs and state
Sandia Pueblo	DOE provides some training; state may provide some training with DOE, but none offered yet	Bureau of Indian Affairs notifies Tribal Governor	None
Seneca Nation	Do not know what is available	Individual contacts	Public Health Service provides health care assistance
Shoshone-Bannock Tribes	Heard promises about retraining, but no action; sending 1 staff to DOE computer course	Federal Register, mailings, and alerts from National Congress of American Indians	Police use federal law enforcement training
Te-Moak Tribe	None	Direct inquires to agencies	Do not accept federal funds
Umatilla Indian Reservation	None	Personal contacts	In order of magnitude of funding: Bureau of Indian Affairs, Housing and Urban Development, Bonneville Power Authority, and Army Corps of Engineers
Yakima Indian Nation	None	Direct inquiries to NRC and DOE	None

Table 4-1 : Federal Assistance (Questions 54 and 55)

Tribe	Question 54: Usefulness of Federal Assistance	Question 55: Types of Federal Assistance Needed
Acoma Pueblo	Useful	Need resources to establish the emergency response teams
Navajo Nation	Not applicable	Training and equipment for radiological transportation issues
Nez Perce Tribe	Limited	All training and equipment assistance
Onondaga Nation	Not applicable	Not known
Pyramid Lake Paiute Tribe	Not applicable	The tribe requires full support from the state since no federal assistance is available to it
San Felipe Pueblo	Bureau of Indian Affairs is limited and does not address the issues	Need to develop comprehensive planning
Sandia Pueblo	Not applicable	Training for tribes along shipment routes, on-site assistance, and needs assessment
Seneca Nation	Do not know	Assistance for full-time staff and equipment
Shoshone-Bannock Tribes	Inadequate; tribes are prepared to move in this area, but receive no assistance	Need training, equipment, and staff. Also need to be notified of spent fuel shipments. Bureau of Indian Affairs needs to fulfill their trust responsibility.
Te-Moak Tribe	Not applicable	Not applicable
Umatilla Indian Reservation	Mostly useful, some strings are inhibiting	Funds to develop a program
Yakima Indian Nation	Not applicable	Need help to identify tribe's needs

4.14 Program Progress and Plans

Question 56: In the past ten years, what have been the most notable changes that have occurred in the tribal program for emergency response to transportation incidents involving radioactive materials?

Question 57: What have been the major accomplishments for the tribal program during this period?

The responses given to both Questions 56 and 57 are very similar. The most frequently mentioned notable change was an awareness of the issue. The development of a nuclear waste program was also reported as a significant change. Awareness of the issue and concern for nuclear waste were also two accomplishments mentioned. There were not many significant accomplishments cited, which is not surprising given the newness of the tribal emergency-response programs that do exist and the lack of any emergency-response program in many of the tribal jurisdictions.

Question 58: What have been the major disappointments in the development and operation of the tribal program during this period?

A variety of responses to this question was given. A common thread running through the responses was a lack of support for and/or recognition of the tribes by the federal government or the states. A lack of funding or too restrictive funding was another common disappointment mentioned.

Question 59: What needs to be done to ensure that the tribal program fulfills its mission during the next ten years?

External support, especially funding, by the federal and state governments was a major need mentioned by many tribes as a prerequisite for future program success. Planning and program development were also reported as major tribal needs.

Summary. As a generalization, the tribes consider the lack of federal and state funding as a serious limitation on what the tribes can accomplish in this area. They have identified a need for more training, equipment, personnel, and planning assistance. On-site assistance in responding to specific incidents is not considered necessary.

Table 4-18: Program Progress and Plans
(Questions 56 to 57)

Tribe	Question 56: Notable Changes in Past 10 Years	Question 57: Major Accomplishments in Past 10 Years
Acoma Pueblo	None	No programs
Navajo Nation	Just recently established program	Just recently established program
Nez Perce Tribe	None	Learning about nuclear waste and related dangers
Onondaga Nation	None	Not applicable
Pyramid Lake Paiute Tribe	Became aware of need to address this issue	None
San Felipe Pueblo	Awareness of issue	Increased awareness of the dangers
Sandia Pueblo	Possibility of I-25 as route to waste site and more awareness of potential hazards	None
Seneca Nation	Awareness of hazards	Protection of tribal ground water
Shoshone-Bannock Tribes	Police department and its programs	In law enforcement area
Te-Moak Tribe	Developing a program and greater awareness	As a result of tribal awareness, the federal government has became aware of the tribe
Umatilla Indian Reservation	Tribal police, and Nuclear Waste Study Program	Produced several reports
Yakima Indian Nation	Awareness of issues	Establishment of nuclear waste program

Table 4-19: Program Progress and Plans
(Questions 58 to 59)

Tribe	Question 58: Major Disappointments in Past 10 Years	Question 59: Needs During Next 10 Years
Acoma Pueblo	No programs	Establish a program
Navajo Nation	Failure to obtain the various federal assistance	Obtain federal assistance and establish emergency response team
Nez Perce Tribe	DOE imposes too many restrictions on grants; little communication and training	Funding, better cooperation and coordination from federal agencies, and allowance by federal government to do independent study of needs
Onondaga Nation	Not applicable	Don't know
Pyramid Lake Paiute Tribe	None, since no plan exists	Sources of funding and resources need to be investigated and a plan must be developed
San Felipe Pueblo	Lack of communications within the tribe has led to no involvement and no organization	More tribal involvement for planning, development of a training program for first responders, and need to be alerted to hazmat shipments through reservation
Sandia Pueblo	The burden is on the tribe to plan; small size precludes major development	More technical assistance for planning
Seneca Nation	Lack of support by state; wants total control	Funding for staff, training, and equipment
Shoshone-Bannock Tribes	Cannot get law enforcement training needed	Adequate funding, access to training, and recognition
Te-Moak Tribe	Federal government impedes development of a program, focuses on litigation concerning treaty lands	U.S. must respect sovereignty of tribe; U.N. should recognize Indian nations
Umatilla Indian Reservation	Elimination of funding to review transportation issues and lack of understanding by federal and state government of Indian culture and the Indian's role in decisions affecting the Indians' lands and way of life	Intertribal unity on radwaste transportation issues, training and employment opportunities for Indians, and increased training for Bureau of Indian Affairs and Indian Health Service staff
Yakima Indian Nation	Lack of a plan or program and termination of the nuclear waste program	Help in developing a program

5.0 GENERAL COMMENTS AND CONCLUSIONS

5.1 Changes From 1980 to 1988

Although there have been several specific changes that will be discussed below, it is the authors' impression that there has been a general change in the overall climate in which the work of maintaining preparedness for transportation incidents involving radioactive materials is performed. In the 1980 survey, numerous state respondents expressed their concern that such incidents might not be properly handled during the early stages of recognition and notification. The major concern was that a dramatic and inappropriate over-response would occur as a consequence of an uninformed and irrational fear of radiation. In 1988, there was very little concern among radiological-health and emergency-services personnel that this would be a problem. It now appears that transportation incidents involving radioactive materials are perceived as mishaps that can be effectively managed through proper notification and appropriate response.

A more balanced perspective on transportation-related radiation incidents appears to have been realized in the past decade. This is, at least in part, a result of the efforts to provide information and training to local public health and safety personnel. But there has also been a growing recognition among the populace and public officials across the United States that there are numerous hazards in an industrial society, in the transportation of people and products, and in the environment generally and that problems involving hazardous materials can be handled effectively if the response is managed appropriately. Transportation incidents involving radioactive materials appear to have assumed their proper place in the larger catalog of hazards in general.

With respect to specific changes that have been identified through this survey, it should be noted that there have been no major changes or substantial revisions in the states' approaches to managing this problem area during the period from 1980 to 1988. Such changes as have occurred are best characterized as incremental, reflecting the ongoing work of maintaining and improving preparedness. Various changes have been noted throughout this report; following is a discussion of several specific changes that appear to be worthy of note.

Organization and Responsibility. A trend was identified that appears to be a continuation of strategies that were nascent in 1980, whereby several of the states have systems in place that enable the management of transportation incidents involving radioactive materials without necessarily activating the state radiation emergency-response team. One strategy is the adoption of a two-tier response structure, where personnel from state police or emergency services are organized into a primary hazmat response cadre. These personnel have general training and equipment covering a wide spectrum of environmental hazards that enables them to evaluate hazmat incidents to determine whether the specialized talents of the emergency-response team are truly necessary.

The other strategy is the recognition, either formally or informally, that certain local jurisdictions have personnel who are qualified to make an intitial assessment to determine whether a threat is present. Both of these strategies serve to screen trivial incidents, permitting the state to manage

such incidents through remote monitoring and thereby saving the expense of a state response.

Maintaining Preparedness. Two aspects of preparedness for incidents in the field are worthy of note. First, there is a greater availability of portable specialized radiation-detection instruments. In 1980, items such as neutron detectors and gamma-ray spectrometers were not commonly available within state agencies; in 1988, instrumentation was generally more available in-house for emergency response.

Second, for the nation as a whole, the proportions of first-on-the-scene personnel with at least basic training in recognizing and handling radiation incidents appear to have improved. The percentage of state police with such training showed some modest improvement, and these personnel are still the best-trained group of first responders by a wide margin. The proportion of firefighters with such training also improved, but is much lower than for the state police. Several states offered the opinion that full-time professional firefighters are very well trained, but the large numbers of volunteer firefighters and the high turnover among such volunteers dilute the proportion. The proportion of local police with such training showed the highest increase, more than doubling over the past decade, but this proportion is lower than the proportion for firefighters, and local police appear to be the least-trained group among public safety officials.

Radiological health and emergency services personnel expressed confidence that proper recognition and prompt notification of the appropriate authorities is the normal course of events when such incidents occur. It is the authors' impression that, although training is far from universal and only modest improvements have been achieved in the past decade, training for first responders generally has been channelled to the jurisdictions where it is most appropriate.

Field Operations. In 1980, nearly half of the states indicated that first-on-the-scene personnel were expected to perform a radiation survey of the incident scene. Radiological health personnel expressed grave reservations about this practice and further expressed their concern that descriptions of the incident by first responders often were unreliable. In 1988, no state indicated that a radiation survey was a component of first-on-the-scene duties. Further, survey respondents expressed confidence that the description of the incident by the first responder who was reporting the incident would be accurate and reliable.

An additional aspect of field operations is the reduction in the number of emergency-response team activations. In 1980, the national average for field team activations was calculated to be 4.1 activations per state per year in the late 1970's; based on reporting for this survey, the national average declined to 2.7 activations per state per year in the late 1980's.

Similarly, calls for general assistance or information to state authorities from local officials also declined, from 5.6 calls per state per year in the late 1970's to 3.5 calls per state per year in the late 1980's. Specific factors contributing to this decline could not be identified through this survey. Several states observed that they now receive fewer false alarms.

5.2 Indian Tribal Jurisdictions

The situation among Indian tribal jurisdictions with respect to their preparedness to manage transportation incidents involving radioactive materials cannot be separated from the more general concerns to foster genuine independent sovereignty among tribal governments in accordance with national Indian policy.

Among the tribes surveyed, only a few had an administrative apparatus in place through which training could be organized and presented. Most of the tribes indicated that it is their desire and intention to assume responsibility for first response on tribal lands and further stated that they would like to establish memoranda of understanding with adjacent states for technical assistance if a hazmat threat is suspected. However, several of the tribes confront major problems, including jurisdictional disputes over reservation boundaries and the necessity to forge relationships with several states (because some Indian land boundaries cross state boundaries). Several tribes reported a persistent intransigence among state and local officials with regard to recognizing tribal sovereignty. All of the tribes expressed deep concern to have these matters settled, but most tribes are hampered by limited resources and the absence of any consistent guidance and assistance as to how best to proceed. It seems apparent that the task of developing an appropriate level of preparedness among tribal jurisdictions must be viewed as a multidimensional, long-term process that must be integrated with the larger policy goal to bring Indian people into full and independent participation in our nation's affairs.

5.3 Concluding Remarks

As was concluded in the 1980 report, transportation incidents involving radioactive materials are rare, the instances where radiation leakage occurs as a result of the incident are rarer still, and the instances where public exposure to radiation occurs as a result of a transportation incident are virtually non-existant. Although the potential for a major incident is always present, in actual experience this threat to public health and safety has not been a serious problem. To the extent that efforts to be prepared for transportation incidents involving radioactive materials affect public exposure to radiation, that effect cannot be separated from the effect of proper packaging and careful handling throughout the chain of commerce in radioactive materials.

State programs of emergency preparedness for transportation incidents involving radioactive materials consist of several state agencies and the systems of relationships among these several agencies and with local jurisdictions, other states, and the federal government. The states have adopted a variety of approaches for structuring and managing these programs, reflecting the circumstances each state must confront. It is not possible to support an assertion that one or another approach is superior or that the presence of any specific component leads to more effective performance. Any attempt to draw conclusions and develop recommendations must be approached with caution.

With the above remarks in mind, we will proceed cautiously to identify a few areas in which actions by federal agencies could contribute to improving the level of preparedness among the states.

Federally Sponsored Training Programs. The states were universally enthusiastic in their assesments of the quality and usefulness of training programs sponsored by federal agencies. However, many states reported a variety of problems in availing themselves of these opportunities. The most commonly received remark concerned a perceived apparent lack of coordination and cooperation among the various federal agencies that offer training relevant to the regulation of radioactive materials. Several states urged that a central clearinghouse function be established to ensure comprehensive and timely notification of training opportunities. Second, many states expressed their desire that more training slots and more frequent course offerings be made available.

Training for Local Personnel. The traditional separation of radioactive materials from other hazardous materials for regulatory purposes has led to the creation of separate groups of expert personnel in most states. One result of this practice is the existence of separate training programs for hazardous chemicals and radioactive materials. Such a distinction is appropriate for personnel who provide expert services in hazard mitigation, but it is not appropriate for first-on-the scene respondents whose primary function is early recognition and prompt notification. Although many states provide training for first responders that is oriented toward all hazards, a number of states apparently present radiation-hazard training separately or not at all.

The extreme rareness of transportation incidents involving radioactive materials suggests that separate training in radiation hazards for first responders probably is not cost effective, with the possible exception of local jurisdictions near major facilities or along designated shipping routes. An integrated curriculum covering hazardous materials in general, including radioactive, that emphasizes recognition, notification, and generally applicable safety precautions seems desirable for most first responders. To the extent that federal-agency activities influence the type of training that is available to local personnel, those agencies should work to develop, promote and deliver training programs that present appropriate information and procedural guidance.

APPENDIX A

INTERVIEW GUIDE:
SURVEY OF STATE CAPABILITIES FOR EMERGENCY RESPONSE TO TRANSPORTATION INCIDENTS INVOLVING RADIOACTIVE MATERIALS

SURVEY OF STATE CAPABILITIES FOR EMERGENCY RESPONSE TO TRANSPORTATION INCIDENTS INVOLVING RADIOACTIVE MATERIALS

I. ADMINISTRATION AND PLANNING

A. ORGANIZATION AND RESPONSIBILITY

1. Which state agency has the lead for responding with personnel and equipment to assess the radiological impact of transportation incidents involving radioactive materials.

2. What documentation is available that identifies the lead agency?

3. What documentation is available that identifies support agencies, if any?

4. What local jurisdictions, if any, within the state borders exercise their own authority to respond to the radiological aspects of transportation emergencies? Is their jurisdiction based upon any recognized authority?

B. PLANNING

5. Does the state have a written emergency-response plan for transportation incidents involving radioactive materials?

6. Is this plan part of a hazardous-material transportation plan or does the state have a separate plan specifically for radioactive materials?

7. To what extent is planning for transportation incidents involving radioactive materials linked to fixed-facility emergency-response planning?

8. To what extent was the state emergency-response plan for responding to transportation incidents involving radioactive materials developed by using FEMA-REP-5, Guidelines for Developing State and Local Radiological Emergency Response Plans and Preparedness for Transportation Accidents (March 1983)? Other federal guidelines?

9. To what extent was the state plan developed with federal technical and/or financial assistance?

10. What arrangements has the state made for establishing a state-office control center for coordinating the response to major transportation incidents involving radioactive materials?

11. Has the state developed inventories or other listings of federal and other capabilities (e.g., military, universities, etc.) for responding to transportation incidents involving radioactive materials? Where are such listings maintained?

12. To what extent are local-government emergency-response capabilities considered in the development of the state plan for emergency response to transportation incidents involving radioactive materials?

13. Identify any geographic areas within the state borders that are not included in the state emergency-response plan for responding to transportation incidents involving radioactive materials (e.g., military bases, federal enclaves, tribal lands, and municipalities).

14. Are routes and facilities for a possible large number of shipments of radioactive materials considered, formally or informally, in establishing emergency-response plans?

C. STATE RELATIONSHIP WITH INDIAN TRIBES

15. Has the state assumed responsibility for emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders? If not, why (e.g., technical, political, jurisdictional, or financial reason)?

16. Does the state have a formal program or plan to respond to transportation incidents involving radioactive materials that occur on tribal lands within the state borders?

17. Does the governor's designated representative in the state who receives Part 71/73 notifications of spent fuel or radioactive-material shipments have any working arrangements with tribal officials to share this information?

18. Describe the relationship of the state with Indian tribes with respect to emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders.

D. LEGAL AUTHORITY/ISSUES

19. Are individuals from both the public and private sectors who assist in emergency response protected from personal liability (e.g., by an insurance program, statutory indemnity provisions, or statutory immunity from liability)?

20. Do state statutes or other legal documents assign responsibility for costs incurred during emergencies, such as loss of property or evacuation costs?

21. What formal memoranda of understanding and/or reciprocal agreements does the state have with adjacent states to cover transportation incidents involving radioactive materials that occur close to common borders?

II. MAINTAINING PREPAREDNESS

A. PERSONNEL

22. What kinds of professional specialists are available to contribute their expertise in response to a transportation incident involving radioactive materials? (See "Definitions" (Page 10) for a definition of each specialist category.) Specify the number of:

(a) Health physicists _____
(b) Radiation monitors _____
(c) Hazardous materials specialists _____
(d) Radiochemists _____
(e) Radiobiologists _____
(f) Health-physics technicians _____
(g) Electronic technicians _____
(h) Communications specialists _____
(i) Transportation specialists _____
(j) Site coordinators _____
(k) Public relations/news coordinators _____
(l) Others (please specify):

_____ _____
_____ _____
_____ _____

B. EQUIPMENT

23. Indicate the number of locations throughout the state where serviced and calibrated portable radiation-detection instruments available for use during an emergency response are normally kept. (Do not include civil-defense shelter kits in this enumeration.)

24. Of these locations, how many have the following portable radiation detectors available on a 24-hour basis:

(a) Low-range beta-gamma detectors (e.g., 0-50 mR/hr) _____
(b) Medium-range beta-gamma detectors (e.g., 0-1000 mR/hr) _____
(c) High-range beta-gamma detectors (e.g., 0-1000 R/hr) _____
(d) Low-energy gamma detectors (e.g., Pu-239 probe) _____
(e) Alpha-particle detectors _____
(f) Neutron detectors _____
(g) Gamma-ray spectrometers _____
(h) Tritium detectors
(i) Others (please specify):

_____ _____
_____ _____
_____ _____

25. How many emergency-response vehicles that are specially equipped or can be specially equipped without delay for response to transportation incidents involving radioactive materials (or other hazardous-material incidents) are available? _____

26. Are emergency kits available for use by persons responding to transportation and other incidents involving radioactive materials? At how many locations around the state are such kits available? _____ Describe the usual contents of such kits:

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

C. COMMUNICATIONS

27. What communication network, if any, has the state established to provide two-way communication between the state-office control center and the scene of a transportation incident involving radioactive materials?

D. TRAINING

28. How many trained radiological emergency-response teams does the state have? _____ (See "Definitions" (Page 10) for the definition of "trained radiological emergency-response team.")

29. How many members of the state radiological health department are trained in radiological emergency-response procedures (i.e., have completed the "Radiological Emergency Response Operation" course at Mercury, Nevada, or equivalent training)? _____

30. Are the trained members all at one location? How many are at each location in the state? Specify the number by location:

(a) _____ _____
(b) _____ _____
(c) _____ _____

31. What provision do state and local jurisdictions make for training their emergency-response personnel? Who conducts the training? Who funds the training?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

32. What training courses are attended by state and local emergency-response personnel? Who conducts the training? Who funds the training?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

33. How many state and local emergency-response personnel on the average are trained each calendar year?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

34. Do the training courses train emergency-response personnel in the following aspects of emergency response to transportation incidents involving radioactive materials:

(a) Radiation hazards that might be encountered? _____
(b) Surveys of incident scenes? _____
(c) Protection against hazards? _____
(d) Federal and state regulations? _____

35. What hazards, other than the radioactive hazard, are covered in the training courses:

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

36. How often are practice exercises conducted to test the effectiveness and operation of the State Radiological Emergency Response Plan for responding to transportation incidents involving radioactive materials? Do the exercises focus on radioactive-material incidents or are they part of a general hazardous-material test? When was the last exercise carried out? _____ (date)

III. FIELD EMERGENCY-RESPONSE OPERATIONS

A. TRANSPORTATION

37. In the case of a land-vehicle-related transportation incident involving radioactive materials, how long on the average will it take radiological emergency-response teams and support crews to reach from their usual location the most remote site where an incident could likely occur? _____

B. INCIDENT ASSESSMENT

38. The first-on-the-scene respondents (i.e., policemen, firemen, and road-maintenance personnel) at a transportation incident involving radioactive materials are expected to take certain protective actions. Is there a standard operating procedure or action sequence such personnel are expected to observe? Please discuss.

39. Since policemen, firemen, and road-maintenance personnel are the most likely first-on-the-scene respondents at a transportation incident involving radioactive materials, what percent of each of these groups has received at least minimal training in handling radiological emergencies?

(a) State police ____%
(b) Local police ____%
(c) Firemen ____%
(d) Road-maintenance men ____%

40. What percentage of the first-on-the-scene respondents possess the information designated in the DOT Emergency Response Guide (ERG)?

(a) State police ____%
(b) Local police ____%
(c) Firemen ____%
(d) Road-maintenance men ____%

Do they consider the information in the ERG to be adequate?

C. ON-SITE OPERATIONS

41. Does the state have predesignated on-scene coordinators for emergency response to transportation incidents involving radioactive materials?

42. What is the general makeup of emergency-response teams dispatched to transportation incidents involving radioactive materials (other than police, firemen, and ambulance personnel)? (See "Definitions" (Page 10) for a definition of each specialist category.) Specify the number of:

(a) Health physicists _____
(b) Radiation monitors _____
(c) Hazardous materials specialists _____
(d) Radiochemists _____
(e) Radiobiologists _____
(f) Health-physics technicians _____
(g) Electronic technicians _____
(h) Communications specialists _____
(i) Transportation specialists _____
(j) Site coordinators _____
(k) Public relations/news coordinators _____
(l) Others (please specify):

_____ _____
_____ _____
_____ _____

43. What reference guides are carried by emergency personnel to outline specific actions to be taken in the event of a transportation incident involving radioactive materials?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

D. ACTUAL EXPERIENCE

44. How many transportation incidents involving radioactive materials do state and local authorities formally respond to each year?

(a) Recent annual average _____
(b) Calendar year 1987 _____

45. Describe the usual actions taken by emergency-response personnel in transportation incidents involving radioactive materials.

46. How many times each year is the state contacted by local agencies for on-scene radiological assistance or for advice by telephone concerning transportation incidents involving radioactive materials?

(a) Recent annual average _____
(b) Calendar year 1987 _____

47. How may times each year does the state request federal assistance in responding to a transportation incident involving radioactive materials?

(a) Recent annual average _____
(b) Calendar year 1987 _____

V. FUNDING AND ASSISTANCE

A. FUNDING

48. Have any statewide studies been conducted to determine what resources and funding are allocated each year to upgrade the statewide emergency response for hazardous-material or radioactive-material incidents?

49. What additional resources are needed to upgrade the statewide emergency response to a level deemed adequate for most situations? Estimate the costs of the needed resources.

(a) Additional capital equipment $_____
(b) Additional training $_____
(c) Additional maintenance and testing $_____
(d) Additional other resources (please specify):
_____ $_____
_____ $_____
_____ $_____

50. From whom are state and local authorities presently receiving funds to support emergency response for transportation incidents involving radioactive materials?

(a) Planning _____
(b) Training _____
(c) Personnel _____
(d) Equipment _____

B. FEDERAL ASSISTANCE

51. What types of assistance (such as training, funding, technical advice, and on-scene support) are available from federal agencies (including DOE) to support state and local authorities?

52. How does the state learn about the available federal assistance?

53. What federal assistance is used by state and local authorities?

54. How useful is the federal assistance provided?

55. What types of additional federal assistance do state and local authorities need to improve their capability to respond to transportation incidents involving radioactive materials?

VI. PROGRAM PROGRESS AND PLANS

56. In the past ten years, what have been the most notable changes that have occurred in the statewide program for emergency response to transportation incidents involving radioactive materials?

57. What have been the major accomplishments for the statewide program during this period?

58. What have been the major disappointments in the development and operation of the statewide program during this period?

59. What needs to be done to ensure that the statewide program fulfills its mission during the next ten years?

Hazardous materials specialist. A person who is trained in the assessment and handling of hazardous chemicals.

Health physicist. A person who has (1) a degree in health physics or radiation protection or a science degree and two years of radiation-protection experience or six years of radiation-protection experience (including radionuclides) and (2) the capability to perform dosimetry calculations and to provide emergency advice.

Health-physics technician. A person who has training and experience in radiation measurement and assessment beyond that of a radiation monitor. Typically works under and reports to a health physicist. Could include a person who routinely surveys X-ray machines if the person also has training to work in contaminated areas.

Radiation monitor. A person who has completed a civil-defense radiation-monitoring course or its equivalent.

Radiobiologist. A person who has special training in the effects of radiation on humans (usually has an advanced degree).

Radiochemist. A person who is qualified to operate laboratory detection instruments and to conduct chemical analyses (e.g., analysis for Strontium-90).

Trained radiological emergency-response team. A response team consisting of at least three persons: (1) a health physicist, (2) a health-physics technician, and (3) a person trained in contamination control on the "clean" side of a line demarcating a contaminated area.

APPENDIX B

INTERVIEW GUIDE:
SURVEY OF TRIBAL CAPABILITIES FOR EMERGENCY RESPONSE TO TRANSPORTATION INCIDENTS INVOLVING RADIOACTIVE MATERIALS

SURVEY OF TRIBAL CAPABILITIES FOR EMERGENCY RESPONSE TO TRANSPORTATION INCIDENTS INVOLVING RADIOACTIVE MATERIALS

I. ADMINISTRATION AND PLANNING

A. ORGANIZATION AND RESPONSIBILITY

1. Which tribal agency has the lead for responding with personnel and equipment to assess the radiological impact of transportation incidents involving radioactive materials that occur on tribal lands.

2. What documentation is available that identifies the lead agency?

3. What documentation is available that identifies support agencies, if any?

4. What local jurisdictions, if any, within the borders of tribal lands exercise their own authority to respond to the radiological aspects of transportation emergencies? Is their jurisdiction based upon any recognized authority?

B. PLANNING

5. Do the tribal authorities have a written emergency-response plan for transportation incidents involving radioactive materials?

6. Is this plan part of a hazardous-material transportation plan or does the tribe have a separate plan specifically for radioactive materials?

7. To what extent is planning for transportation incidents involving radioactive materials linked to fixed-facility emergency-response planning?

8. To what extent was the tribal emergency plan for responding to transportation incidents involving radioactive materials developed by using FEMA-REP-5, Guidelines for Developing State and Local Radiological Emergency Response Plans and Preparedness for Transportation Accidents (March 1983)? Other federal guidelines?

9. To what extent was the tribal plan developed with federal technical and/or financial assistance?

10. What arrangements have the tribal authorities made for establishing a single control center for coordinating the response to major transportation incidents involving radioactive materials?

11. Have the tribal authorities developed inventories or other listings of federal and other capabilities (e.g., military, universities, etc.) for responding to transportation incidents involving radioactive materials? Where are such listings maintained?

12. To what extent are emergency-response capabilities of state and local jurisdictions outside the borders of tribal lands considered in the development of the tribal plan for emergency response to transportation incidents involving radioactive materials?

13. Identify any geographic areas within the borders of tribal lands that are not included in the tribal emergency-response plan for responding to transportation incidents involving radioactive materials.

14. Are routes and facilities for a possible large number of shipments of radioactive materials considered, formally or informally, in establishing emergency-response plans?

C. TRIBAL RELATIONSHIP WITH STATE AND LOCAL GOVERNMENT

15. Have the tribal authorities assumed responsibility for emergency response to transportation incidents involving radioactive materials that occur outside the borders of tribal lands?

16. Do the tribal authorities have a formal program or plan to respond to transportation incidents involving radioactive materials that occur outside the borders of tribal lands?

17. Does the governor's designated representative in the state who receives Part 71/73 notifications of spent fuel or radioactive-material shipments have any working arrangements with tribal officials to share this information?

18. Describe the relationship of the tribal authorities with the state with respect to emergency response to transportation incidents involving radioactive materials that occur on tribal lands within the state borders.

D. LEGAL AUTHORITY/ISSUES

19. Are individuals from both the public and private sectors who assist in emergency response on tribal lands protected from personal liability (e.g., by an insurance program, statutory indemnity provisions, or statutory immunity from liability)?

20. Do tribal laws, federal statutes or regulations, or other legal documents assign responsibility for costs incurred during emergencies, such as loss of property or evacuation costs?

21. What formal memoranda of understanding and/or reciprocal agreements do the tribal authorities have with adjacent state or local jurisdictions to cover transportation incidents involving radioactive materials that occur close to common borders?

II. MAINTAINING PREPAREDNESS

A. PERSONNEL

22. What kinds of professional specialists are available to contribute their expertise in response to a transportation incident involving radioactive materials? (See "Definitions" (Page 10) for a definition of each specialist category.) Specify the number of:

(a) Health physicists _____
(b) Radiation monitors _____
(c) Hazardous materials specialists _____
(d) Radiochemists _____
(e) Radiobiologists _____
(f) Health-physics technicians _____
(g) Electronic technicians _____
(h) Communications specialists _____
(i) Transportation specialists _____
(j) Site coordinators _____
(k) Public relations/news coordinators _____
(l) Others (please specify):

_____ _____ _____
_____ _____ _____
_____ _____

B. EQUIPMENT

23. Indicate the number of locations throughout the tribal lands where serviced and calibrated portable radiation-detection instruments available for use during an emergency response are normally kept. (Do not include civil-defense shelter kits in this enumeration.)

24. Of these locations, how many have the following portable radiation detectors available on a 24-hour basis:

(a) Low-range beta-gamma detectors (e.g., 0-50 mR/hr) _____
(b) Medium-range beta-gamma detectors (e.g., 0-1000 mR/hr) _____
(c) High-range beta-gamma detectors (e.g., 0-1000 R/hr) _____
(d) Low-energy gamma detectors (e.g., Pu-239 probe) _____
(e) Alpha-particle detectors _____
(f) Neutron detectors _____
(g) Gamma-ray spectrometers _____
(h) Tritium detectors
(i) Others (please specify):

_____ _____
_____ _____
_____ _____

25. How many emergency-response vehicles that are specially equipped or can be specially equipped without delay for response to transportation incidents involving radioactive materials (or other hazardous-material incidents) are available? _____

26. Are emergency kits available for use by persons responding to transportation and other incidents involving radioactive materials? At how many locations within the tribal lands are such kits available? _____ Describe the usual contents of such kits:

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

C. <u>COMMUNICATIONS</u>

27. What communication network, if any, have the tribal authorities established to provide two-way communication between the single control center and the scene of a transportation incident involving radioactive materials?

D. <u>TRAINING</u>

28. How many <u>trained</u> radiological emergency-response teams does the tribe have? _____ (See "Definitions" (Page 10) for the definition of "trained radiological emergency-response team.")

29. How many members of the radiological emergency-response teams are trained in radiological emergency-response procedures (i.e., have completed the "Radiological Emergency Response Operation" course at Mercury, Nevada, or equivalent training)? _____

30. Are the trained members all at one location? How many are at each location? Specify the number by location:

(a) _____ _____
(b) _____ _____
(c) _____ _____

31. What provision do the tribal authorities make for training their emergency-response personnel? Who conducts the training? Who funds the training?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

32. What training courses are attended by tribal emergency-response personnel? Who conducts the training? Who funds the training?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

33. How many tribal emergency-response personnel on the average are trained each calendar year?

(a) First-on-the-scene responders _____
(b) Radiological emergency-response teams _____

34. Do the training courses train emergency-response personnel in the following aspects of emergency response to transportation incidents involving radioactive materials:

(a) Radiation hazards that might be encountered? _____
(b) Surveys of incident scenes? _____
(c) Protection against hazards? _____
(d) Federal and state regulations? _____

35. What hazards, other than the radioactive hazard, are covered in the training courses:

(a) _____
(b) _____
(c) _____
(d) _____
(e) _____

36. How often are practice exercises conducted to test the effectiveness and operation of the tribal emergency-response plan for responding to transportation incidents involving radioactive materials? Do the exercises focus on radioactive-material incidents or are they part of a general hazardous-material test? When was the last exercise carried out? _____ (date)

III. FIELD EMERGENCY-RESPONSE OPERATIONS

A. TRANSPORTATION

37. In the case of a land-vehicle-related transportation incident involving radioactive materials, how long on the average will it take radiological emergency-response teams and support crews to reach from their usual location the most remote site where an incident could likely occur? _____

B. INCIDENT ASSESSMENT

38. The first-on-the-scene respondents (i.e., policemen, firemen, and road-maintenance personnel) at a transportation incident involving radioactive materials are expected to take certain protective actions. Is there a standard operating procedure or action sequence such personnel are expected to observe? Please discuss.

39. Since policemen, firemen, and road-maintenance personnel are the most likely first-on-the-scene respondents at a transportation incident involving radioactive materials, what percent of each of these groups has received at least minimal training in handling radiological emergencies?

    (a) Police ____%
    (b) Firemen ____%
    (c) Road-maintenance men ____%

40. What percentage of the first-on-the-scene respondents possess the information designated in the DOT Emergency Response Guide (ERG)?

    (a) Police ____%
    (b) Firemen ____%
    (c) Road-maintenance men ____%

    Do they consider the information in the ERG to be adequate?

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48. Have any studies been conducted to determine what resources and funding are allocated each year to upgrade the tribal emergency response for hazardous-material or radioactive-material incidents?

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(b) Additional training $_____
(c) Additional maintenance and testing $_____
(d) Additional other resources (please specify):
_____ $_____
_____ $_____
_____ $_____

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(a) Planning _____
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(c) Personnel _____
(d) Equipment _____

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51. What types of assistance (such as training, funding, technical advice, and on-scene support) are available from federal agencies (including DOE) to support tribal authorities?

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53. What federal assistance is used by tribal authorities?

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57. What have been the major accomplishments for the tribal program during this period?

58. What have been the major disappointments in the development and operation of the tribal program during this period?

59. What needs to be done to ensure that the tribal program fulfills its mission during the next ten years?

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NRC FORM 335 (2-89) NRCM 1102 3201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER (Assigned by NRC, Add Vol., Supp., Rev., and Addendum Numbers, if any.)
NUREG/CR-5399

2. TITLE AND SUBTITLE
Survey of State and Tribal Emergency Response Capabilities for Radiological Transportation Incidents

3. DATE REPORT PUBLISHED
MONTH: May
YEAR: 1990

4. FIN OR GRANT NUMBER
NRC-02-87-001

5. AUTHOR(S)
Frank J. Vilardo, Eric L. Mitter, James A. Palmer, Henry C. Briggs, and Julie Fesenmaier

6. TYPE OF REPORT
Technical

7. PERIOD COVERED (Inclusive Dates)
September, 1987, to September, 1989

8. PERFORMING ORGANIZATION - NAME AND ADDRESS (If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)
Transportation Research Center
School of Public and Environmental Affairs
Indiana University
Bloomington, Indiana 47405

9. SPONSORING ORGANIZATION - NAME AND ADDRESS (If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission and mailing address.)
Division of Safeguards and Transportation
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This publication is the final report of a project to survey the fifty states, the District of Columbia, Puerto Rico, and selected Indian tribal jurisdictions to ascertain their emergency-preparedness planning and capabilities for responding to transportation incidents involving radioactive materials. The survey was conducted to provide the Nuclear Regulatory Commission and other federal agencies with information concerning the current level of emergency-response preparedness of the states and selected tribes and an assessment of the changes that have occurred since 1980 (when a similar survey was performed [NUREG/CR-1620]).

There have been no major changes in the states' emergency-response planning strategies and field tactics. The changes noted included an increased availability of dedicated emergency-response vehicles, wider availability of specialized radiation-detection instruments, and higher proportions of police and fire personnel with training in the handling of suspected radiation threats. Most Indian tribes have no capability to evaluate suspected radiation threats and have no formal relations with emergency-response personnel in adjacent states. For the nation as a whole, the incidence of suspected radiation threats declined substantially from 1980 to 1988.

12. KEY WORDS/DESCRIPTORS (List words or phrases that will assist researchers in locating the report.)
State Capibilities, Capability, Transportation

Transportation-emergency response, Transportation-incidents

Transportation-incidents assessment

Transportation-emergency training

13. AVAILABILITY STATEMENT
Unlimited

14. SECURITY CLASSIFICATION
(This Page) unclassified
(This Report) unclassified

15. NUMBER OF PAGES

16. PRICE

NRC FORM 335 (2-89)