IMPLEMENTATION OF A FEDERAL PLANNING REQUIREMENT: EMERGENCY MEDICAL SERVICES

by

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I. INTRODUCTION

This paper will examine and discuss the problems associated with the implementation of a federal program related to planning for response to an accident at a commercial nuclear power plant in Michigan. More specifically, the paper will address the issue of plans and procedures needed for the care of injured and potentially radiologically contaminated individuals as a result of such an accident. This is currently a controversial issue in the field of radiological emergency response planning (RERP).

While the area of RERP is not one normally associated with the planning practice, it is an area that does engage the services of planning professionals both in Michigan and in other states at the local, state, and federal levels. Solving the problems encountered in this area requires techniques and skills that would be found in any more traditional planning office. A brief background will be presented on the RERP field, followed by a discussion of the structure of RERP at the federal and state levels, the regulations involved with the program, and a discussion of the implementation of the federal planning document titled MS-1. Finally, the paper will discuss the problems encountered in the implementation of MS-1 and suggest solutions.

II. PROBLEM STATEMENT\BACKGROUND

Problem Statement:

As part of the licensing requirements for the operation of a commercial nuclear power plant in the United States, the owner of the plant (the utility) and affected state and local governments must develop plans for a wide spectrum of conditions. These conditions include potential emergencies arising from accidents at the plant which might release radiological material into the environment. Plans developed by the Utility address areas within the plant boundary (on-site), while those developed by state and local governments address areas beyond that boundary (off-site). The federal planning requirements are codified in various federal regulations (discussed below). This paper will address one specific area of these requirements - those requiring plans for the provision of emergency medical services for injured, contaminated individuals. This planning requirement is a controversial issue among emergency planners for a number of reasons.

Federal requirements for this area of emergency planning fall under the general title of Radiological Emergency Response Planning (RERP). While the field of RERP is relatively new, emergency planning has been required by the federal government for the licensing of commercial nuclear power plants since 1957. Since 1980, however, these requirements have been greatly expanded (see Section IV below) and the resulting plans are more voluminous and detailed. Implementation of the planning requirements requires close cooperation by the Utilities, states, and local government. Plans which are developed at all three levels must address a spectrum of emergency conditions, while remaining flexible to cover unforeseen difficulties.

The issues related to the implementation of the federal regulations regarding medical services for injured, contaminated individuals offers an opportunity to discuss the difficulties inherit in the RERP Program.

Specifically, the federal planning requirements call for plans that provide for the provision of emergency medical treatment for injured, contaminated individuals resulting from the release of radiological material from a commercial nuclear power plant. This includes individuals from both on-site and off-site. Such plans must address the federal planning standards set forth in various documents and be reviewed and approved by the federal agencies charged with their implementation.

The requirements consist of three levels of planning activities; 1) the development of specific plans (with attended procedures), 2) training of personnel, and 3) demonstration, via drills, of capabilities outlined in the plans, and of the facilities and personnel involved in emergency response. The planning program is actually a cycle of activities, sequentially consisting of planning,training, demonstration, evaluation/critique by federal evaluators and feed-back to state and utility personnel for correction of weaknesses in the next planning cycle. Plans are reviewed initially by the federal agencies and training and demonstrations are conducted based on those approved plans. Evaluators can require corrective actions in any of the three levels.

The problems that have arose in the implementation of the federal requirements can be framed in a broad heading with three sub-levels. Generally, the concern is that the basic regulations identify a problem which must be addressed through the planning process (i.e.: medical services), but

that the planning standards developed to implement the regulations are flawed in their definition (or lack thereof) of the basic premises that stem from that problem.

Simply put, are the plans, procedures, training, and demonstrations that have been developed and implemented aimed at complying with federal regulations which are not based on realistic accident scenarios? The issue of realism will be discussed in Sections VI and VII below.

The three sub-levels to this problem are:

1. Lack of basic, realistic, defined program expectations
2. Lack of consistency in program implementation
3. Changes in program interpretation over time

These issues will be discussed in Section VI below.

Background Information: This section will provide a basic background on the RERP Program. Generally speaking, the RERP Program seeks to protect public health and safety in the event of an accident at a commercial nuclear power plant. It is important to note that the RERP Program does not address certain sources or users of radiological materials. These include; federally owned and operated facilities, military sources, private or university research reactors, medical facilities, industrial users, or transportation accidents. These sources are regulated under other federal regulations, but generally do not require the detailed planning, training, or demonstrations, nor public scrutiny placed upon the commercial nuclear power plants. It might be noted here that actual accidents and resulting radiological exposures and contamination in these areas have far exceeded any in the nuclear power industry over the past 30 years. (Mettler, et al; p. 20). It is not within the scope of this paper to discuss the exclusion of

these sources from the planning requirements, but it is worthwhile to note that the plans prepared for commercial nuclear power plant accidents have been used on an ad hoc basis for these other sources, as well as for more conventional accidents.

The RERP Program existed prior to the accident at the Three Mile Island nuclear power plant (TMI) in Pennsylvania on March 28, 1979. Emergency planning was limited to an area defined as a Low-Population Zone (LPZ) around each plant. The LPZ was defined based on population density, certain maximum radiation doses, design-basis accidents, and other factors. It extended, generally, about three (3) miles from the plant in all directions. Off-site plans (those developed by state and local government) were also limited in their scope. Basic emergency response functions were included in off-site plans, but specialized needs, such as medical care were addressed primarily by utility planners. Hospitals and medical care personnel were trained under utility sponsorship and drills were conducted to meet requirements of the Nuclear Regulatory Commission (NRC). The NRC is charged with the regulation of nuclear power in the U.S. and deals directly with the utility operating the plant. Prior to TMI, it also dealt with off-site authorities (state and local government) as needed.

The accident at TMI, and the publication of federal regulations in 10CFR50 and 44CFR350 changed the planning requirements imposed on the utilities, state and local governments. The RERP Program was greatly expanded in scope and detail, especially in regards to off-site plans. The planning requirements of 10CFR50 and 44CFR350 were codified in NUREG 0654/FEMA REP 1 (called NUREG 0654, hereafter) titled "Criteria for the Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in

Support of Nuclear Power Plants" (October, 1980). The purpose of NUREG 0654 was "to provide a common reference and guidance source"... for the development and review of state, local, and utility RERP. (NUREG 0654 pg. 1). While 10CFR50 and 44CFR350 are regulatory in nature, NUREG 0654 was presented as "guidance". This presupposed that while NUREG 0654 elaborated on the CFR's in establishing 16 planning standards, the states, local government and the utilities would be able to develop plans to address these standards as they saw fit. Once the plans were completed, the NRC and, after TMI, the Federal Emergency Management Agency (FEMA), would review the plans and approve or disapprove them. Plan approval was necessary for the issuance of a license to operate, or continue to operate the nuclear power plant.

It was not assumed that planning standards presented as guidance would become the only acceptable route to plan approval. Guidance implies that it is but one way to achieve a specified end result. This has not been the case.

Because RERP is a complex field, questions raised in the planning process, and in the review and implementation of plans, are addressed in additional federal documents called Guidance Memorandums (GMs). These GM's are issued over time and seek to clarify the planning standards set forth in NUREG 0654. They can include both general policy statements and specific planning requirements.

The construction of the RERP Program is generally as follows:

1. Detailed studies and analysis of possible accident scenarios and risk to the public.
2. 10CFR50 and 44CFR350 Regulation.
3. NUREG 0654 Guidance on Planning Standards.

4. Guidance Memorandums.

5. Additional letters from NRC/FEMA relating to policy and planning issues.

Phase 1 is an on-going process of research and analysis, as well as experience gained from the operation of nuclear power plants. It was anticipated that such studies would be used to modify planning requirements over time. For example, the TMI accident provided real-world data on the types and amounts of radiological materials that might be released from a nuclear reactor in an accident. This information sets the basic parameters for emergency planning by defining the possible extent of the emergency. What TMI showed was that the project source-term used to establish planning parameters was not necessarily an accurate reflection of real-world events.

Existing plans were extremely conservative in estimating off-site effects and could be modified without affecting public health and safety. Other studies and experience indicated similar results. Other considerations did not permit the changes in the RERP Program that would be expected from this data. This disconnection with reality cascaded throughout the RERP Program, impacting all aspects of the program.

III. STRUCTURE OF THE REP PROGRAM

Generally, in the RERP Program, the NRC and FEMA promulgate regulations which are translated into standards and guidance for implementation by the state and local governments and the utility. Planning documents are developed based on these standards and guidance and submitted to FEMA and NRC for review and approval. Both federal agencies depend, to varying degrees, on outside experts for technical advice and

assistance. NRC, being a technical agency, has more in-house expertise than FEMA does. Also, FEMA's in-house staff has less training and experience than the NRC in the area of RERP; or emergency response planning in general. The result is that in plan review, FEMA personnel are heavily dependent on the guidance documents developed by the National Office or in conjunction with other agencies. Little leeway is given to planners to develop any plan that is not in keeping with the guidance format and content. Differences in state and local legal structures, organizations, capabilities and other factors have created major difficulties in the review and approval of plans. The general trend in the past ten years has been the effort by FEMA to standardize plans regardless of basic organizational and structural differences. This has negatively impacted the efforts in the areas of medical services also, as will be discussed below.

Based on the federal requirements, and the legal authorization the resulting RERP structure in Michigan has created both horizontal and vertical links. Horizontally between state agencies and local agencies, and vertically from local to state to federal. A single point of contact is maintained at each level to coordinate planning activities. Contact from the utility is maintained primarily at the state level. All off-site documents are submitted by the state to FEMA for review and approval. In Michigan, the state has taken the lead in program development and coordination, which has simplified the planning effort and resulted in better coordination of planning activities. This is not true of other states, where enabling legislation is different.

Organizationally, Michigan RERP is shown in Table 1. The organization has worked well since 1980 with Michigan being the first

state to complete the planning process required under NUREG-0654. The coordination between the state and local government units, and the utilities has provided for effective planning and use of resources, especially in areas where technical expertise is required. It has also reduced duplication of effort. Map 1 shows the location of nuclear power plants in Michigan.

IV. REGULATIONS AFFECTING THE RERP PROGRAM

As noted above, 10CFR50 and 44CFR350 provide the basic federal regulatory framework for the RERP Program. 10CFR50 is NRC regulation directed at both the utility and the off-site authorities' interaction with the utility. It requires planning in various areas, along with facilities, equipment, training, personnel, and drills/exercise. All plans, state, local, and utility, must be updated at least annually and changes submitted to the NRC and FEMA for review and approval. NUREG 0654 takes the requirements of 10CFR50 and sets 16 specific planning standards with evaluation criteria. These standards are further elaborated upon by the Guidance Memorandums, letters, and other FEMA/NRC documents.

This flow of planning requirements from the CFRs to the GM's does not necessarily clarify planning activities. A case in point being the evaluation of medical drills. Prior to MS-1, NRC was the sole evaluator of the medical drills conducted by the utility. The state planning requirements were met if the utility developed appropriate plans and successfully demonstrated them for the NRC evaluators. Under the RERP Program, FEMA must certify to the NRC that off-site plans are adequate. With the issuance of MS-1, FEMA would not accept the NRC evaluation of the medical drill as a demonstration of medical capabilities. FEMA insisted on placing their own

evaluator in the drills to observe the drill, so that it could issue its own report to the NRC on adequacy. The experience and expertise of the evaluator was not a consideration in the critique of the drill.

The difficulties encountered in the planning effort relate as much to the basic regulations as they do to the implementation of these regulations. This section will discuss the progression of planning requirements from the original 10CFR50 to the latest letters clarifying the planning standards in NUREG 0654.

10CFR50.47(b)(12) requires that "arrangements are made for medical services for contaminated, injured individuals". It further requires, in Appendix E of that CFR, "1) arrangements for the services of physicians and other medical personnel qualified to handle radiation emergencies on-site, 2) arrangements for (the) transportation of contaminated, injured individuals from the site to specifically identified treatment facilities outside of the site boundary, and 3) arrangements for treatment of individuals in support of licensed activities on the site and at treatment facilities outside the site boundary." Appendix F of 10 CFR 50 also requires initial and periodic training of medical support personnel.

NUREG 0654 takes this basic requirement and provides in Planning Standard L (Medical and Public Health Support) the following relevant items:

> L1: Each organization shall arrange for local and back up hospital and medical services having the capability for evaluation of radiation exposure and uptake, including assurances that persons providing these services are adequately prepared to handle contaminated individuals.

L3: Each state shall develop lists indicating the location of public, private, and military hospitals and other emergency medical services facilities within the state or contiguous state considered capable of providing medical support for any contaminated injured individual. The listing shall include the name, location, type of facility, and capability and any special radiological capabilities. These emergency medical services should be able to radiologically monitor contaminated personnel, and have facilities and trained personnel able to care for contaminated injured persons.

L4: Each organization shall arrange for transporting victims of radiological accidents to medical facilities.

In September of 1986, as a result of a court case involving the San Onofre Nuclear Power Plant, the NRC expanded the 10CFR50.47(b)(123) requirement to include members of the public who might be exposed to radiation off-site in the event of an accident. The phrase "injured contaminated individuals" now applied to off-site as well as on-site personnel. In their Federal Register notice (Vol.51, No.180, p.32901) the NRC noted that "the (NRC) believes that 10CFR50.47(b)(12) requires pre-accident arrangements for medical services for individuals who might be severely exposed to dangerous levels of off-site radiation following an accident at a nuclear power plant." Minimum arrangements included; 1) A list of local or regional medical treatment facilities and transportation providers appropriately annotated to show their capabilities, special capabilities or other unique characteristics, 2) A good faith reasonable effort by licensees (the

Utilities) or local or state governments to facilitate or obtain written agreements with the listed medical facilities and transportation and hospitalization providers, 3) Provisions for making available necessary training for emergency response personnel to identify, transport, and provide emergency first aid to severely exposed individuals, and 4) A good faith reasonable effort by licensees or state or local governments to see that appropriate drills and exercises are conducted which include simulated severely exposed individuals." (FR Vol.51, No.180, p.32905). The NRC and FEMA were to issue appropriate detailed guidance by November 17, 1986.

On November 13, 1986, the Deputy Associate Director of FEMA issued to the Regional Director, Guidance Memorandum MS-1; Medical Services. MS-1 consists of 5 and 1/2 pages of "interpretation and clarification" of the NRC rule for planning standards now applied to state and local plans. A deadline of nine months from November 13, 1986 was set as the date all plans were to be updated to reflect the new guidance, with demonstration of capabilities in the first exercise year from November 13, 1986.

Upon its issuance, questions were raised as to meaning and interpretation of MS-1. Clarifications were made in memorandums from the FEMA national office to various regional FEMA offices on February 9, 1988, September 9, 1988, September 19, 1988, and September 30, 1988, among others. Undocumented question to and responses from regional and national FEMA personnel also were raised. MS-1 became a major topic at regional and national RERP meetings and conferences.

FEMA also issued a further document titled "Exercise Evaluation Methodology (EEM)" (1990) which lists specific evaluation points and criteria for plans and exercises. The EEM lists specific facilities,

equipment, plan and procedures which should be present for a determination of adequacy. These specific points go far beyond the original emergency medical requirements.

The train of regulations that runs 10CFR50.47(b)(12) through the EEM's were implemented by the Utilities, States, and local governments. Implementation of the program in Michigan is discussed in the next section.

V. IMPLEMENTATION OF THE MS-1 REQUIREMENTS

This portion of the paper will discuss the implementation of the emergency medical requirements in Michigan, both before and after the issuance of Guidance Memorandum MS-1. The original 10CFR50 and NUREG 0654 requirements were discussed above. To comply with these planning requirements the four nuclear power plants in Michigan developed plans and procedures which addressed the issues through:

A. Written agreements with a primary and secondary hospital near each plant.

B. On-site plans, procedures and personnel training, and appropriate equipment.

C. Off-site plans, procedures, and personnel training, with appropriate equipment located at each hospital and with each transportation provider. (Ambulance services)

These steps successfully met the NRC's requirements, through the review and approval process of the plans and in the evaluated drills. State involvement was minimal at this stage, as it was assumed that the hospitals, equipment, and personnel included in the utility plans would be available to injured, contaminated personnel who originated off-site. This was

incorporated into the state plans and approved by FEMA. No major or recurring problems were identified in the NRC critiques of the drills. As hospitals usually have emergency plans and procedures, the RERP were incorporated into them without difficulties. If there were weaknesses, the power plants provided specialized equipment and materials as needed, along with consultants for training hospital and ambulance personnel. The focus of the plants efforts was the additional information or equipment needed to deal with contaminated personnel. The medical treatment aspects was not an area of concern due to existing capabilities at the hospitals, especially under the accreditation from the Joint Commission on Accreditation of Hospitals (JCAH) which "suffice(s) for assuring their (the hospitals) capabilities for handling contaminated individuals" (FEMA, GM-MS-1, p.4).

This straight forward program approach successfully addressed the planning issues raised in 10CFR50 and NUREG 0654. Equally important, the plants were allowed to develop plans which, while addressing the issues, had a degree of latitude to allow for local conditions.

The issuance of GM-MS-1 changed the program requirements as they related to the state. The NRC policy statement following the San Onofre finding essentially reiterated the 10CFR50 and NUREG 0654 medical requirements, but extended then to off-site personnel. The basic requirements remained the same; 1) A list of medical facilities and transportation providers, 2) Written agreements with the providers, 3) training, 4) appropriate drills and exercises (F.R. Vol. 51, No. 180, p.32,905). FEMA and the NRC issued MS-1 as guidance to implement this policy.

In its implementation of MS-1, the State of Michigan essentially formalized its piggy-backing on the utility prepared plans, procedures,

facilities and equipment. Since the utilities had already addressed the MS-1 issues as they relate to on-site personnel, and no change had been made to these requirements, the State could readily utilize these existing arrangements. The only additional planning required was to incorporate appropriate procedures in the State, hospital and Utility plans to allow for off-site victims. This was done through revisions in the hospital and utility plans indicating that victims might not originate solely from on-site, and revising notification procedures.

Basically, MS-1 was not viewed as requiring any major changes in the emergency medical system. Local and state personnel received training in implementing the revised procedures and plans were revised to indicate how off-site personnel suspected of being contaminated and injured were to be managed.

One aspect of MS-1 did require an additional change off-site. Annual drills demonstrating capability would have to originate at an off-site facility, and the drill would have to involve the primary hospital. These drills were conducted beginning with the exercises conducted in 1988. At this point, the difficulties in implementing MS-1 began to arise.

VI. PROBLEMS ASSOCIATED WITH MS-1

Problems associated with the implementation of MS-1 can be grouped into 10 areas. Each will be discussed below. Section VII will then suggest possible solutions to these problems.

1. Target Population/Realism in Requirements: None of the federal planning requirements make any mention of the number of potential victims that may result form an accident, either on-site or off-site. Without some basic

parameters, it is difficult to gage if plans are adequate. If the assumption is made that the potential target population is limited to on-site personnel only, the numbers range in the low hundreds at most. If the off-site population in the primary EPZ is counted, the total population ranges (in Michigan) from about 5,000 (at Big Rock Point) to over 100,000 (at Fermi 2). However, even under worst case accident scenarios, neither of the assumptions are valid. Indeed, under actual experiences in the U.S., neither case is valid.

Commercial Nuclear Power Plants in the U.S. are built with multiple safety systems (design-in-depth) and are constructed to contain a design-basis accident and its potential releases. The accident at TMI, which essentially resulted in the destruction of the reactor core, released minimal radioactive materials from the containment structure and off-site. The estimated average radiation dose to the general public was less than 2 milli-REM's (equivalent to the dose a person would receive flying from New York to Los Angeles) (Mettler, et al, p. 275). The EPA has set 1000 to 5000 mrem (whole body dose) as the projected dose levels where protective actions should be initiated. In addition, the material released from TMI was primarily noble gases which do not contaminate, but only provide an exposure to individuals. A medical facility would not be able to identify a person who had received such a dose, whether the person was injured or not.
(It should be noted that there is no comparison possible between U.S. and Soviet reactor designs, such as the one at Chernobyl). Emergency Response personnel and other workers on-site at TMI were not exposed beyond Federal limits, not were any workers injured/contaminated. There have been accidents at nuclear power plants where workers on-site have been injured and

contaminated, and the plans in place prior to MS-1 were successfully used in response. No major problems were encountered in those cases. In those accidents, the number of victims was low (usually one or two). In preparation for an accident at a nuclear power plant, off-site authorities in Michigan have developed plans that seek to minimize potential doses to the general public, the added target population of MS-1. This is done through accident assessment and the implementation of protective actions prior to a release of material from the plant. Under these conditions, it would be difficult to create a creditable scenario that would result in contaminated members of the public. Even in a worse case scenario, contaminate levels would be far below the trigger point for concern from a medical point, or from a point of concern for the spread of contamination.

Neither FEMA nor the NRC has sought to quantify the potential number of affected persons, especially off-site, which leaves planning in a vacuum regarding the extensiveness of preparation. Historic data and experience support the preparation of plans which would address low numbers of victims (less than 10). The lack of any guidance by FEMA or NRC leaves the point subject to regulatory interpretation.

Finally, scenarios that produce injured, contaminated individuals off-site are not based on the reality of reactor design, safety systems or approved off-site planning. As discussed below, this has negative results.

2. Consistency in Federal Implementation and Interpretation of Regulations: Upon the issuance of MS-1, the state, the utilities and Regional FEMA offices began to interpret and implement MS-1 in varying manners. This ranged from some states/utilities continuing with only utility actions

relating to MS-1, to other state duplicating all previous utility actions/plans. Some FEMA Regional offices held strict or objective interpretation of MS-1, while others held loose, or subjective interpretations. Within regions, FEMA held differing views, as to how the states and utilities should implement MS-1. Some drills were conducted only by the utilities, some by both the state and utility, some by only the states. The frequency of drills also varied from state to state and Region to Region. The inconsistency has presented additional problems to planners.

3. Funding: No funding is provided by FEMA or NRC for any area of RERP. The requirements were placed on state/local government regardless of the availability of funds to implement them. When requests are made for consideration due to funding problems, FEMA has replied that such considerations are not appropriate. There are alternatives available which address that MS-1 issues, some of which require less expenditures than others. FEMA has usually tended towards more expensive alternatives.

4. Responsibilities: Even when the State/local governments and the utilities have reached agreements on the assignment of responsibilities in response to an accident, FEMA has indicated such arrangements may be inadequate under MS-1. A case in point being the agreement by a utility to provide radiation health physicists to a hospital to provide support even if the victim originates off-site. FEMA has ruled that state/local or other sources of that support would be more appropriate. MS-1 does not address this issue, but regulatory personnel have made such an interpretation.

5. Location of Facilities: Medical facilities are generally located based on population densities. FEMA has interpreted MS-1 as requiring that medical facilities are subject to the NUREG 0654 requirement applying to

relocation centers; that they be at least 5 miles beyond the primary EPZ, and preferably 10 miles beyond. In some areas, this criteria would be unattainable without traveling long distances, which in the event of severe medical injury, would place the victims life in jeopardy. On this point, the guidance (and accepted medical protocols) indicates that medical treatment should take precedent over contamination control, yet FEMA's interpretation runs counter to that. The result being that hospitals that are used by the Utility, which are equipped, have trained personnel, and have practiced in drills for 10 years, are not satisfactory to FEMA if they are not outside the 15 mile area. Other hospitals must be located, and all plans, procedures, equipments and training duplicated.

6. Plans/Procedures: As indicated above, all plans are submitted to FEMA and NRC for review and approval. Based on those plans and procedures, training and drills are conducted. FEMA evaluators, in their critique, have indicated that approved plans are inadequate. If this is the case, what is the purpose of plan review? Similarly, accepted procedures have been rated inadequate in drills based on personal preference of the evaluators. (This will be discussed more in #10 below).

7. Training: There is no FEMA or NRC criteria for the training of personnel, or for what constitutes adequate training. Some utilities have followed accepted medical protocol in their training programs, only to have evaluators rate them as unacceptable. Again MS-1 references accreditation of the hospital and personnel, then runs counter to it in reviews.

8. Drills: No guidance or advice has been provided on the construction of a realistic scenario to drive the medical drills. Nor does

MS-1 address drill requirements beyond requiring that they involve a simulated contaminated individual (how contaminated?) originating from off-site. Given that MS-1's basic assumptions regarding off-site contamination is flawed, realistic scenarios are not possible. The drills are therefore unrealistic and involve negative training of personnel. They are trained, via the drills, to believe that an accident will always result in injured, contaminated personnel. They will therefore always respond within the prescribed limits whether they are appropriate or not. This has become a serious problem in the entire RERP field.

9. Equipment: MS-1 does not prescribe what equipment must be available at the hospital or on the ambulance. Yet critiques and evaluators have specified what equipment is adequate or inadequate. Again, no references are made to the source of that determination.

10. Evaluators: Most of the problems listed above can be traced to inexperience, lack of training, or lack of any oversight of the FEMA evaluators. Almost without exception the FEMA evaluators do not have experience in the medical treatment of injured, contaminated individuals, in radiation or contamination control, in developing plans, or in emergency response in general. Critiques are written based on broad interpretations of MS-1 and often go beyond evaluating the basic MS-1 requirements. Recent critiques of drills in Michigan have included comments on use of instruments to monitor victims for contamination, contamination control procedures, content of communications via radio, and even medical procedures. These comments are included in critiques, become part of the public record and require response by the appropriate authorities. Even if the state or utility

disagree with the critique and are able to have it changed, damage to the program is done if the critique in its original form is released.

VII. POSSIBLE SOLUTION TO THE IMPLEMENTATION PROBLEMS

As implemented, the Emergency Medical Planning Requirement presents major difficulties to planners. Possible solutions include:

A. Rewrite MS-1 to address realistic accident scenarios, especially the potential for injured contaminated individuals off-site. Define the parameters of expectations in this area; e.g. levels of contamination, number of victims, etc., based on published, agreed upon accident assessments.

B. Clarify the interpretation of the regulations with allowance for local conditions and different enabling legislation. The current MS-1 document makes no allowances for variances in state legislation or the responsibilities of state and local government. The document should recognize these differences and allow states to develop plans within their legislature parameters. This might best be done through a permissive structure to MS-1 rather than a restrictive one as now interpreted by FEMA.

C. Allow states and utilities to assign responsibilities for plan implementation based on ability and best use of resources. Successful demonstration of the plan should be the criteria for approval, not an arbitrary decision made without regard to the realities of local conditions.

D. Allow state and utilities to select the location of facilities based on best facilities available, closest to needed, and other local factors. The regulations should seek the use of the same facilities for the on-site and off-site response rather than different ones. This would reduce duplication of effort and better utilize resources, personnel and equipment.

E. Plans and procedures should be approved after review by knowledgeable personnel with an experience base in emergency planning, contamination control, medical facilities, and other associated areas. The plans should not be faulted in the drill critiques. Rather, the critiques should address whether the personnel followed accepted plans and procedures. Problems identified in the plans should be addressed separately in a plan review process.

F. FEMA comments on training should be based on a framework of accepted, professionally reviewed protocols and standards, not evaluator whim. Hospital and ambulance personnel are professionals who are trained and certified to certain standards. The medical treatment of injured contaminated individuals is not within the preview of MS-1 or any other Federal regulations associated with the RERP Program. Comments by the evaluators concerning medical care is outside of their evaluation charge and has a negative impact on State/utility efforts to implement regulations.

G. Guidance on drill scenarios need to be provided by FEMA, or a standard library of scenarios developed by competent professionals should be endorsed by them. One power company (Duquesne Light Company, 1989) has developed such a library of 25 scenarios for use in their medical drills on-site. Much of the data is applicable to off-site drills with modification of the cause of injury and contamination levels. Comments on drills need to provide positive reinforcement to participants. The critiques are, however, universally negative in nature. Participants should be given a balanced view of their activities, both good and bad. Drills should be structured around the possible conditions following an accident, and not an unrealistic scenario or a worst case scenario. Participants in drills should be able to practice a broad spectrum of response functions, and not be limited to one or two which would not occur in an accident.

H. There is a variety of equipment available to monitor individuals who may be contaminated, as well as to indicate individual exposure to radiation. FEMA needs to let the medical facility select which equipment best suits its needs within a broad framework. Requiring specific equipment does not permit use of newer, better equipment as it becomes available.

I. FEMA needs to assure that evaluators are trained in the areas that they evaluate during drills, or when they

evaluate plans. Lack of adequately trained professionals results in poor evaluations and no assurance that emergency plans will be implemented properly in an emergency. It also reflects negatively on the federal government to have evaluators who are unfamiliar with the very basics of the program who critique people who have worked in the field for a decade or more, or professionally trained individuals who have been involved in real situations. This results in people taking actions in drills to satisfy the evaluator rather than those that would be used in a real emergency.

These solutions can be implemented at both the national and state level. Most would require a recognition of the basic problems with MS-1 by the regulators who constructed the document. This recognition is apparent to some, but not to the key personnel. MS-1 and its problems has been a topic of discussion at numerous National, Regional, and industry conferences since its issuance. Part of the difficulty encountered is with individuals who do not realize that they are not experts in the field. This situation can be addressed by a better oversight of FEMA in the entire RERP Program, and especially in technical areas beyond their expertise. Some independent review process is needed on a regular basis to evaluate how the program is being conducted. Since the issuance of NUREG 0654, no such formalized review at the management level has been conducted. An assessment of program strengths and weaknesses at the federal level would be the first step in ensuring a competent radiological emergency response planning program.

VIII. SUMMARY

This paper has attempted to identify the problems associated with the implementation of the federal planning requirements associated with emergency medical services for nuclear power plants. As discussed, the problems begin with the planning criteria formulated by FEMA based on 10CFR50 and codified in NUREG 0654. Following the court case involving the San Onofre Nuclear Power Plant, the NRC and FEMA promulgated GM-MS-1 to provide additional guidance to state government and the utilities. MS-1's basic assumptions appear to be flawed regarding the parameters of medical services and does not provide the definition of the program that are needed to provide implementors with a basis for planning. The results have been confusion in the development of emergency medical plans for on-site and off-site personnel, duplication of effort and inadequate and capricious reviews and comments on plans, procedures, training and drills. It is questionable whether a system constructed to solely meet the federal criteria would respond adequately in a real emergency. Fortunately, the state and utility planners in Michigan have developed plans and procedures based on a more realistic assumption of needs and have worked towards that goal. This has lead to conflict with the federal evaluators. The solutions proposed in this paper would go a long way towards addressing the basic and extended problems associated with MS-1. Implementation of these solutions would involve not only a coordinated state/utility effort, but recognition by the federal agencies of the problems associated with MS-1.

IX. CONCLUSION

The aim of this paper was to examine a federally required planning activity and to recommend solutions to the problems identified in that program. While the RERP field is not an area common to most planners, the techniques associated with planning are used in addressing problems in that field. The lessons learned from the RERP Program are similar to those gained in other, more traditional planning activities. Likewise, the traditional planning field provides insights to persons involved in RERP on how to address planning problems.

The difficulties encountered in the RERP Program, and especially in the area of emergency medical services, can be viewed as a challenge to overcome. With the objective of protecting public health and safety, a successful program needs to be achieved not only at the state level, but also at the federal.

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MAP 1: LOCATION OF NUCLEAR POWER PLANTS IN MICHIGAN

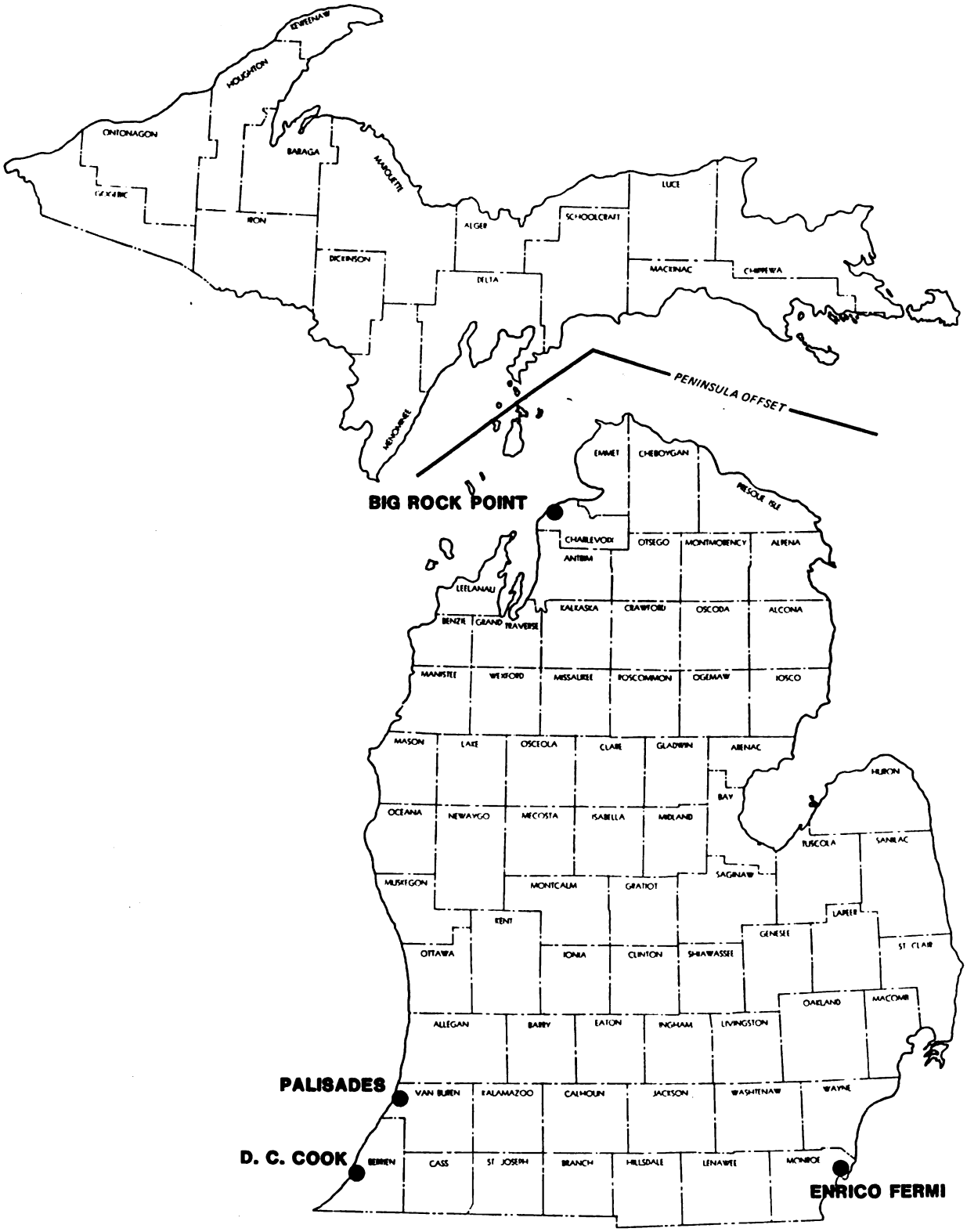

TABLE 1: NUCLEAR POWER PLANT ACCIDENT RESPONSE ORGANIZATION

NUCLEAR ACCIDENT RESPONSE ORGANIZATION

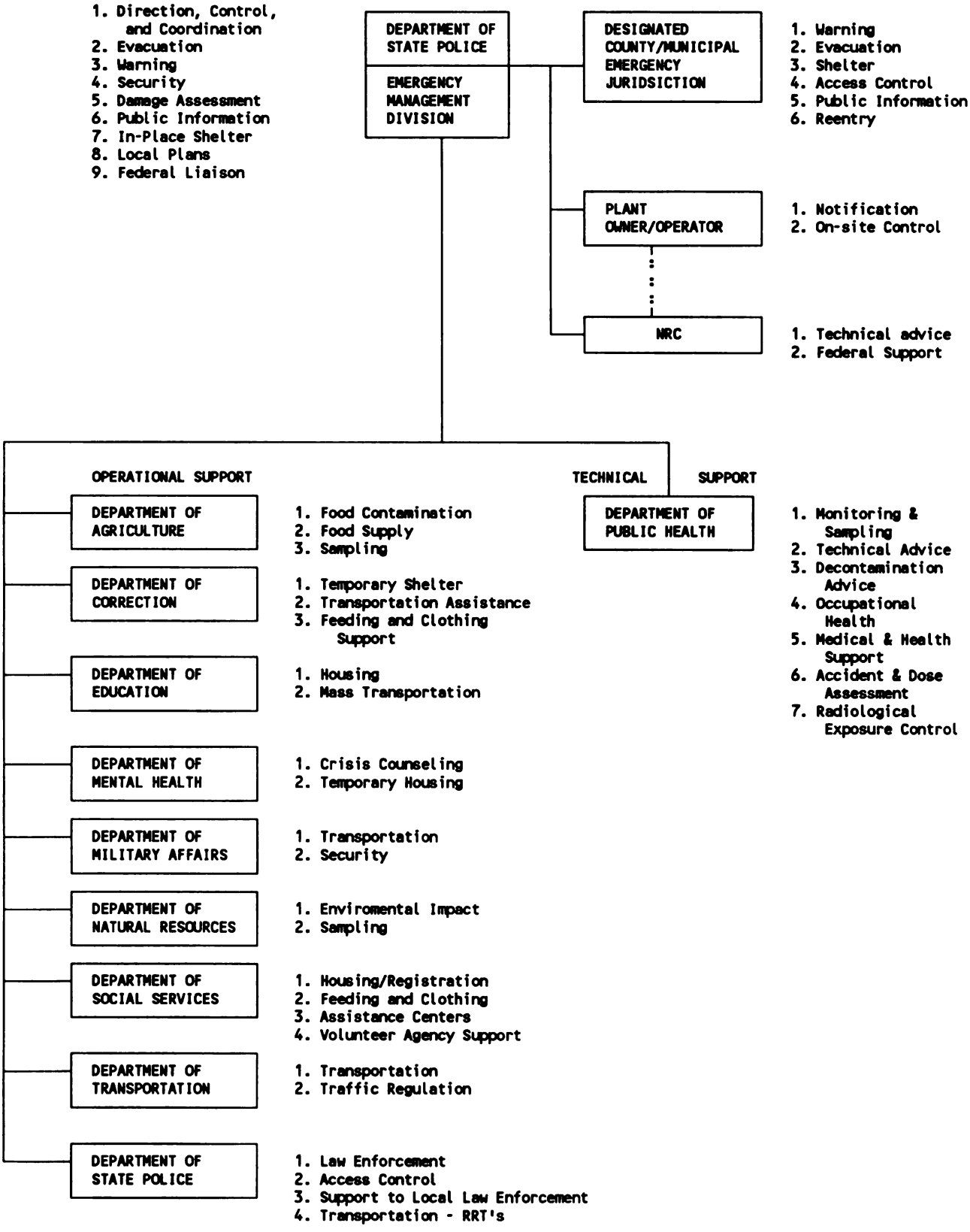

TABLE 2: EMERGENCY OPERATIONS CENTER INTERRELATIONSHIP

BIG ROCK POINT POWER PLANT
EMERGENCY OPERATIONS CENTER
INTERRELATIONSHIPS