

**Structured Meeting Techniques that Identify  
Emergency Management Issues  
Practitioners Really Want to See Addressed\***

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*This paper introduces three structured meeting techniques that can be used to determine emergency management (EM) issues practitioners really want to see addressed. The secondary purpose is to list the benefits of using these techniques and provide recommendations for research based on three applications of the techniques.*

**Introduction**

Emergency Management (EM) researchers need a proactive and systematic approach for obtaining research topics practitioners really want to see addressed. Because of the interdisciplinary nature of EM, traditional research has not provided practitioners with the information and management tools they can readily use. Furthermore, because EM practitioners are not academically oriented, they have not been inclined to make use of the research provided. We feel this situation is changing. For example, the National Coordinating Council on Emergency Management's project to develop professional standards for emergency managers. The education and

• The ideas presented in this paper represent the cumulative work of hundreds of people over twelve years at Virginia Tech's Management Systems Laboratories. Professional managers from business and industry along with faculty, graduate students, and undergraduates from a wide variety of engineering and other disciplines have participated in the research and development of these tools and techniques. The authors thank them for their good work.

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training of emergency managers is central to the certification of emergency managers. Our method adds another link to the connection between research and practice to better meet the needs of emergency managers.

#### Approach

We used three group techniques for generating initiatives for EM research: a modified Nominal Group Technique (NGT), role playing combined with a modified NGT, and a table top exercise combined with role playing. In the sub-section for each technique, we first describe the standard or traditional methodology and present empirical background information for the technique used (Background). Second, we present a brief overview of the meeting where the technique was applied and explain why the technique was appropriate for the application. We briefly describe the circumstances under which the technique was used, noting any modifications made to the original technique and explaining why these changes were more appropriate for the EM application (EM Application). Finally, we give a brief list and description of selected outputs from the technique we feel are applicable to research (Outputs).

#### A Modification of NGT

##### Background

NGT is one of the most widely used group techniques. NGT has four primary steps (Delbecq et al. 1975). First, each group member silently generates ideas in writing. Second, group members voice their ideas in a round-robin fashion. The facilitator of the group records each idea in a terse phrase, usually on a flip chart. Third, a discussion is held for the clarification and evaluation of each recorded idea. Finally, group members individually rank and vote on priority ideas. The group decision is mathematically derived through rank-ordering or rating of the individual votes.

NGT is an effective technique for generating multiple alternatives (Delbecq et al. 1975; Fox 1987; Mahler 1987). Other reasons why NGT has been effective include its high focus on the task, its equality of group membership, and its structured steps usually leading to a high sense of closure (Van de Ven et al. 1974).

##### EM Application

EM practitioners representing many different types of national organizations (industry trade groups, public interest groups, and Federal, State,

and local governments). Representative of many different fields related to emergency preparedness (e.g., fire fighting, law enforcement, medical services, etc.) attended a workshop in September 1990 to develop a list of initiatives for the newly formed National Task Force on Hazardous Materials Emergency Preparedness. The two purposes of the National Task Force include (1) enhancing the nation's capabilities to protect life, health, property, and the environment during hazardous materials emergencies, and (2) improving the management of the response to hazardous materials emergencies.

We divided workshop participants evenly into four groups: Training and Education, Emergency Planning, Prevention and Enforcement, and Response and Recovery. Each group worked independently using a modified version of NGT. NGT was chosen because it has proven itself as an excellent technique for generating ideas, and the purpose of the meeting was to generate initiatives.

The modified NGT used in the workshop differed from standard NGT in three ways. First, the clarification step was expanded to include a broader range of discussion. This allowed participants to better understand each initiative and why it was offered. Second, the workshop technique did not use NGT's step of formal (mathematical) ranking and voting on priority ideas. The workshop technique used a quick, more subjective ranking instead. The designers of the workshop felt it was more important to spend the time on detailed development of the priority ideas than on formal voting and ranking. Finally, a step was added to standard NGT to develop programmatic ideas for the top-rated initiatives. This allowed group members to develop a rough outline of what the initiative needed to accomplish and who needed to take part in its implementation.

### Outputs

The four groups attending the workshop came up with a list of over eighty EM-related initiatives, some of which were developed in greater detail (e.g., by further describing proposed outcomes and significant milestones). The following initiatives are examples of those applicable to research.

#### *Training & Education*

- Compare, analyze, and evaluate existing certification programs and develop model programs including a core curriculum and training standards and competencies.

- Develop improved delivery systems and quality assurance mechanisms for training programs.
- Evaluate the instructional methodology in existing emergency preparedness courses.
- Evaluate public awareness methods.

#### *Emergency Planning*

- Improve hazard analysis methodologies (e.g., for hazardous materials transportation).
- Improve decision support models and tools for public officials.
- Improve needs assessment methodologies.

#### *Prevention and Enforcement*

- Develop engineering solutions to address the causes of accidents.
- Identify economic incentives to industry for prevention actions.

#### *Response & Recovery*

- Establish standards for a uniform Incident Command System.

### **Role Playing with Another Modification of NGT**

#### **Background**

The technique of role playing involves people interacting in imaginary situations. Role playing forces a participants to put themselves in another person's place, to feel and behave as the other would. A successful role play increases one's understanding of others involved in the situation. Using role playing for communication can help improve attitudes and desired behavior (Shaw et al. 1980). For example, role playing can help experts and the public to communicate more effectively. For example, doctors communicate better with patients, salespeople communicate better with customers, or scientists communicate better with government administrators who lack technical expertise.

#### **EM Application**

U.S. Department of Energy (DOE) representatives attended a workshop with over twenty local government officials from around the nation in April 1989. The DOE representatives and the local government officials were primarily senior and mid-level managers with an interest in hazardous materials transportation and emergency management. The purpose of the

workshop was to address issues of mutual concern and to identify areas of productive action for DOE.

The workshop participants used role playing with a modified version of NGT to develop their programs. The programs targeted hazardous and nuclear materials transportation and emergency preparedness related to incidents involving the shipments of those materials. The workshop used role playing to promote a constructive atmosphere for identifying the action items. The designers of the workshop felt that by asking local officials to play the roles of DOE employees, the workshop would focus discussion on improvements rather than deteriorating into a gripe session. NGT was combined with role playing because idea generation was a major goal of the workshop.

Participants at the workshop were told to play the role of a DOE staff member. Their DOE division was responsible for the transportation of hazardous (including radioactive) materials and emergency preparedness related to incidents involving those materials. Participants were divided into three teams. Each team was given a mock report of planning assumptions and issues local government identified as concerns for them. Teams were asked to develop a program plan to address as many local government concerns as possible.

The workshop technique differed from standard NGT in four ways. First, each team was assigned both a leader and a facilitator. A local government team leader was chosen for each group because the designers felt that would help reduce possible feelings of manipulation of the group's outputs. The leaders of each group were the moderators and also reported the group's results to the other groups. The facilitator played a different role than a standard NGT facilitator, recording ideas and making sure the groups followed the steps of the technique. The second difference involved an informal ranking of initiatives, instead of using NGT's standard mathematical approach, because the workshop designers felt it would be more useful to work on developing content given the time available. The third difference was an additional step of asking the teams to develop more detailed programmatic descriptions of the top-ranked initiatives. The fourth difference involved merging initiatives by team leaders and facilitators after the round-robin listing. The merged initiatives were reviewed with the other team members to make sure they agreed with them.

Several steps used in the workshop technique, in addition to the standard NGT steps, were used to build a composite program plan for the hypothetical DOE office. After teams ranked their top five initiatives, they used scoping forms to guide them through the process of developing an initial

implementation plan for each initiative. Team leaders presented their team's work to the other workshop teams. Finally, a composite plan was developed by all the workshop participants using the various initiatives developed by the three teams.

### **Outputs**

The three teams initially came up with over fifty action items. They selected the following nine as the most important and developed detailed program suggestions involving statements of work, milestones, resources, and costs. Many of these top items relate to research needs. These items include (1) developing a central database of radioactive materials transportation information with electronic access by local governments, (2) expanding the existing public information program, (3) facilitating the development of national standards of operation and training for emergency responders, (4) establishing a Nuclear Transportation Advisory Committee made up of interested Federal agencies, States, and local governments, (5) developing a cooperative Federal training program for local first responders and managers, (6) supporting general public education on transportation and repository programs to rebuild credibility with targeted audiences, (7) developing an integrated training program to certify first responders for radioactive materials transport accidents, (8) providing policy guidelines and procedures for local governments to incorporate into their overall emergency plans, and (9) requiring states to notify local jurisdictions about some radioactive material shipments through Federal legislation or regulations.

### **Tabletop Exercises**

#### **Background**

Tabletop exercises provide a way to practice, develop, improve and test skills in EM operational procedures or systems (Federal Emergency Management Agency 1984; U.S. Environmental Protection Agency 1988). We provided the assembled participants with a "what if" incident or scenario. The scenario is usually broken down into several phases. Each phase includes information inputs, which may be warning messages, hazard impact reports, damage assessments, assistance requests, or other intelligence about the effects of a hazard and the need for protection of life and property. Participants make decisions about the inputs at each phase to determine appropriate actions for minimizing the effects of the hazard. Participants must consider the decisions and actions they have made at

previous phases. Outputs are decisions or actions participants describe verbally to the whole group. These may include resource allocations, action directives, and other messages.

Participants are selected so they will be consistent with the exercise's goals and objectives. A moderator and recorder are assigned. Evaluators and observers are optional. The moderator controls the play of the scenario. A recorder, evaluators and observers are optional. A recorder notes problems requiring attention and documents agreements or suggestions. An evaluator uses appropriate tools, such as time lines and checklists, to evaluate the exercise and participant responses. Observers simply watch the play of participants but may participate in the critique. Finally, the design should consider all the details of implementing the scenario exercise (e.g., time, place, and duration).

Tabletop exercises complement traditional development and maintenance programs which rely on individual review or major field exercises. Drawbacks of individual review include no individual or group perception of the system as a whole (i.e., no observation of the entire response), incomplete data collection, and minimal mental stimulation.

Tabletop exercises offer a group perception of the whole system and allow participant observation of the entire response. They generate more complete and better quality data than individual review because the groups discover gaps, overlaps, and inconsistencies. They pinpoint needs for upgrades in training, equipment, and the system itself.

The major drawbacks of field exercises include their cost. Some can run over hundreds of thousands of dollars. Furthermore, field exercises are highly visible. Testing a poorly developed system can result in low morale or bad publicity. Tabletop exercises are relatively inexpensive. Direct participation by all system elements is not required. This saves the expense of facilities, equipment and people. It also eliminates any safety and liability concerns. Tabletop exercises can be done with less media attention while gaining a preliminary confidence in the system.

#### EM Application

Federal and local government representatives from around the country attended a workshop in May 1989 to design and develop tabletop exercises they could take back home and implement. The participants worked in teams to develop exercise scenarios and used role playing to gain insights into the EM systems in their communities and how a tabletop exercise program would fit in.

Facilitators aided workshop participants in following a structured procedure for designing and developing their tabletop scenarios. Participants were specifically asked to draw on their existing knowledge of their own communities. Design involved defining the goals and objectives of the exercise and selecting exercise players based on these goals. For example, a goal developed by an exercise design team at the workshop was to "improve City response, and assistance from State and Federal agencies." Similarly, an objective was to ensure that the "roles and responsibilities [of the City's Emergency Operating Center personnel] effectively interface and support those of the Command Post."

Development of the exercise also involved selecting leadership and participants, choosing a credible scenario, phasing the scenario, and converting each phase into details necessary to stimulate play. To choose a credible scenario, participants needed to ensure it was factual and it supported their goals and objectives. This involved analyzing hazard technical data, facility status, jurisdictional involvement, possible weather conditions, and historical information. Phasing the scenario involved breaking it down into phases based on critical features. Converting each phase into details involved determining all messages the participants would receive, determining moderator questions, and determining expected participant responses.

After developing the scenarios, the teams broke up into role-playing groups to act out a sample of their materials to the other teams. Before the teams ran through their scenarios, team moderators presented reports to the rest of the participants, describing their scenario implementation exercise.

Based on the scenario design portion of the workshop, the teams identified the following major issues and concerns. Again, several of these issues relate to potential research agendas.

- Interface between the Emergency Operations Center and the Field Command Post, especially coordination among different levels of government;
- Effectiveness of emergency public information systems;
- Mobilization during off-hours;
- Coordination of information flow.

### Conclusions

We have described three structured meeting techniques that can be used to determine EM issues practitioners really want to see addressed. These techniques were used in workshops with emergency management practi-



tioners. The workshop techniques are based on proven group techniques. The modifications made them more applicable to the purposes of the workshops.

We believe the meeting techniques as used in our workshops successfully meet the objective of identifying research ideas because (1) we designed structured approaches which clearly spelled out the steps the participants needed to take, (2) we used techniques which gave people time to generate and list ideas before they were discussed and elaborated on, and (3) we used techniques which encouraged participation and team-building and even made it fun. These techniques have broad application for both researchers and practitioners because they systematically identify the needs of a diverse EM community, focus on idea generation using adaptations of proven group techniques, put researchers in direct contact with practitioners, lay the foundation for program evaluation and improvement, establish a collegial atmosphere which emphasizes team effort, and generate many initiatives applicable to research.

The workshop techniques produced numerous initiatives the EM practitioners wanted to see addressed. For example, an initiative from modified NGT suggests research in comparing, analyzing, and evaluating existing certification programs. This would help practitioners develop a model training program for emergency managers. An initiative from the tabletop exercises suggests developing a method for testing the effectiveness of emergency public information systems. These techniques do not replace other research but are a good first step in linking research and practice to better meet the needs of emergency managers.

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