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CIVILIAN FIRST RESPONDER DECONTAMINATION EQUIPMENT CHARACTERISTICS SURVEY RESULTS

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14. ABSTRACT The U.S. Army Edgewood Chemical Biological Center Decision Analysis Team (DAT) was tasked by the Department of Homeland Security/National Institute of Standards and Technology (DHS/NIST) Standards Development Team to develop a survey to determine important characteristics of first responder decontamination equipment. The DAT created a survey with questions in 10 areas relating to decontamination, including time, ease of use, reliability/maintainability, operating conditions, transportability, consumable resources required, human factors, interoperability, power requirements, and operational interface. The survey was released on the Responder Knowledge Base website in the fourth quarter of FY08. Responses were received from 874 First Responders (e.g., firefighters, hazardous material team members, police officers, emergency medical technicians, nurses, etc.) across the United States. The DAT analyzed the responses to determine trends and develop general conclusions. The Standards Development Team then used this information to generate a draft American Society for Testing Materials standard for civilian first responder decontamination systems.					
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PREFACE

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CIVILIAN FIRST RESPONDER DECONTAMINATION EQUIPMENT CHARACTERISTICS SURVEY RESULTS

1. INTRODUCTION

Current users of decontamination equipment have a wide range of procurement options. In most cases, users must rely on little more than vendor claims and their professional experience to determine the best equipment for decontaminating the general public, themselves, and their own equipment. These users, called First Responders, include fire fighters, hazardous material teams, police officers, emergency medical technicians, and other professionals in charge of decontamination after an event. To better enable First Responders to choose the most effective decontamination equipment for their applications, the DHS/NIST Standards Development Team, Engineering Directorate, U.S. Army Edgewood Chemical Biological Center (ECBC), was tasked by the Department of Homeland Security (DHS), Washington, DC, and National Institute of Standards and Technology (NIST), Gaithersburg, MD, to develop equipment performance standards for the Response community. The Standards Development Team tasked the Decision Analysis Team (DAT) to determine the important characteristics of equipment used by First Responders in personnel decontamination operations. These characteristics will be used to develop recommended equipment performance standards for adoption by various Standards Development Organizations (SDOs).

2. BACKGROUND

The DHS/NIST Standards Development Team seeks to enhance public safety by developing equipment performance standards for adoption by various SDOs to ensure that minimum levels for performance, reliability, and interoperability are established. This program is being accomplished under the guidance of the DHS. Any standards developed will be disseminated to the public safety community to help them make informed equipment purchase decisions; to manufacturers and developers to guide equipment production; and to the test and evaluation community to ensure product compliance with equipment performance standards.

One way to determine appropriate and important characteristics for decontamination equipment is to elicit input from the user community, i.e., the First Responders. These professionals have intimate knowledge of the equipment based on their training and use in actual emergencies. A survey was administered to decontamination equipment users, with the assistance of the DHS-funded Responder Knowledge Base (RKB) organization, to determine important performance, quality, reliability, and interoperability characteristics. A report that documents the overall results (i.e., the responses) of the survey has already been written and is provided in Appendix A. These results are simply termed “overall results” or “results for all First Responders” herein.

Although the input from every First Responder is important, the Standards Development Team wanted to focus the survey analysis on fire fighters and hazardous material team members (herein called hazmat personnel), based on the assumption that these types of

responders would have the most first-hand experience with decontamination equipment. Sections 3-6 of this report describe how the survey was developed, and provide the results and analysis for fire fighters and hazmat personnel.

3. OBJECTIVE

The objective of the survey was to determine, using input from the First Responder community, the important characteristics of equipment used during decontamination operations. Characteristics of interest will be used in a follow-on effort to develop performance standards for decontamination equipment. This report documents the results and analysis for fire fighters and hazmat personnel. The overall study results are provided in Appendix A.

4. SURVEY DEVELOPMENT AND ANALYSIS PROCESS

4.1 Scope.

The First Responder survey focuses on the equipment used to decontaminate chemical [including agents and toxic industrial chemicals and materials (TICs/TIMs)], biological, radiological, and nuclear contaminants. This equipment includes showers, water heaters, decontamination solutions, hoses, buckets, berms, etc. The Standards Development Team needs information on First Responder preferences that relate to the performance, safety, and ease of use of the equipment. For example, it would be beneficial to know whether First Responders prefer a standardized hose connection so that equipment from several responder jurisdictions is compatible during large events. This survey also addresses the following issues:

- Commercial off-the-shelf (COTS) decontamination equipment that decontaminates First Responders. The survey does not consider military equipment unless it is available commercially.
- First Responders and the equipment they wear that allows them to get through the decontamination line (e.g., personal protective equipment (PPE) and oxygen tanks). Equipment that is removed prior to decontamination (e.g., monitoring equipment) is not part of the scope of this survey. The survey does not address other ancillary equipment (e.g., buckets, tools, and fire hoses), vehicles, buildings, or animals being decontaminated.
- Transportable decontamination systems, including vehicular mounted (can be moved from point A to point B), are discussed, whereas fixed decontamination systems are not addressed.

4.2

Participants.

The study team for the survey consisted of the Project Lead from the Standards Development Team, decision analysts from ECBC's DAT, and Subject Matter Experts (SMEs) from local fire departments and hazardous material teams. The Project Lead provided background information on standards development and guidance to develop the survey. The Project Lead tasked the DAT to develop and administer the survey and analyze the responses. The DAT has five government team members with backgrounds in operations research, industrial engineering, biology, chemistry, and economics. They conduct studies, including survey-based analyses, in support of the CB Defense community. Their role in this study was to develop a comprehensive and organized approach to collect the required information, compile and evaluate the results, and then document the process, results, and recommendations. The DAT used selected SMEs from the First Responder community to gather background information on decontamination equipment and to help develop the survey. The list of participants is provided in Table 1.

Table 1. Survey Study Team

Name	Organization	Role
Michael B. DeZearn	ECBC, Standards Development Team	Project Lead; provided guidance and leadership to complete project
John Frank	Harford County Emergency Operations Center (HCEOC), Aberdeen Proving Ground (APG) Fire Department	SME; member of HazMat Team for HCEOC, Fire Fighter at APG; provided technical expertise for decontamination equipment to help develop survey
Mary Moses	HCEOC	SME; member of HazMat Team for HCEOC; provided technical expertise for decontamination equipment to help develop survey
Dave Smith	APG Fire Department	SME; APG Assistant Fire Chief; provided technical expertise for decontamination equipment to help develop survey
Scott Kooistra	ECBC, DAT	Decision Analyst; responsibilities included survey development, administration, and analysis
Shawn Bowen	ECBC, DAT	Decision Analyst; responsibilities included survey development, administration, and analysis
John Walther	ECBC, DAT	Decision Analyst; responsibilities included survey development, administration, and analysis

4.3 Methodology.

The DAT used a three-stage process to complete this study:

1. Develop Survey
2. Administer Survey
3. Analyze Responses

The following sections describe each of these stages; this is followed by the survey results and analysis.

4.3.1 Develop Survey.

The first step in developing a survey is to determine the content, or questions, that should be asked. The DAT used input from the Project Lead and SMEs from local fire departments and a hazardous material team to develop the questions in the survey. The DAT also researched available equipment using vendor websites, results from other recently conducted studies, and standards developed by other federal agencies [e.g., DHS, Federal Emergency Management Agency (FEMA), and National Fire Protection Association (NFPA)] to identify possible characteristics that First Responders may find important.

The next important development considerations are the survey's structure and format. A self-directed questionnaire was chosen to elicit information from First Responders. This type of survey allows respondents to complete the survey when it is convenient for them, and allows for a larger number of respondents (or larger representation) than other types of surveys such as telephone interviews or focus groups. Potential drawbacks of a self-directed survey are that they must be relatively short so respondents do not lose interest before completing the survey, and it is more difficult to ask follow-up questions when respondents provide atypical answers. However, follow-up is possible if respondents are willing to provide contact information. The survey described herein did request respondents to voluntarily provide this information.

The same set of survey questions was used for each type of First Responder (e.g., fire fighters and police officers). The questions asked respondents to rank proposed characteristics by order of importance and provide preferences for different aspects of equipment. For example, one question asked which types of fuel were preferred from a given list. Another asked respondents to choose from a list the minimum preferred shelf life of decontaminants. These are examples of closed-ended questions. Respondents were also asked open-ended questions in which they could provide additional, unconstrained input or suggestions relating to a question.

The first question of the survey asked respondents to rank 10 characteristics in order of importance; these are listed and defined in Table 2. The remainder of the survey is a series of questions that relate to and are organized by each of these characteristics.

Table 2. Definitions for Decontamination Equipment Characteristics

Decontamination Equipment Characteristic	Definition
Time	- required to decontaminate civilians and First Responders (i.e., throughput rate) from point people first enter decontamination station until they exit last station - required to set up equipment from time you arrive on site to being operationally ready; includes “warm-up” time (e.g., time to heat decontamination solution)
Ease of Use	- while using/operating equipment (considers number of steps and people needed, also includes how complicated steps are and how easy equipment is to use) - while setting up equipment (includes number of steps, parts, and people needed; also includes how complicated steps are and how ergonomically well-designed equipment is)
Reliability/Maintainability	- includes the equipment’s quality, durability/robustness, ease of repair, and frequency and complication of required maintenance
Operational Conditions	- the ability of the equipment to operate in most or all environmental conditions [e.g., high winds, extreme humidity (including rain), extreme cold or heat]
Transportability	- the combination of the size/volume, weight, and packaging of equipment. Includes moving equipment from storage location to contaminated site [includes possible requirement to move equipment cross-country (e.g., across an open field)]
Consumable Resources Required	- the type of consumables (e.g., fuel, filters) and amount of consumables needed, shelf-life (under expected conditions), and storage conditions (required for reasonable shelf-life), and time consumable may be used after being first opened until it must be disposed
Human Factors	- the combination of all the factors that make the equipment satisfactory to use or perceive it as safe to use by First Responders or the public - for example: reasonable water/decontamination solution temperature, acceptable smell (e.g., of decontaminants), noise level (e.g., of power generator), and use of equipment against body (e.g., brushes)
Interoperability	- all the factors that allow and/or make it easier to use equipment from/with other decontamination teams (e.g., use same type and size connections, same type of power, fuel used)
Power Requirements	- the combination of the type of power (i.e., DC, AC, none required), source of power [e.g., gasoline, diesel, LPG, multi-fuel (e.g., kerosene)], and amount of power required (e.g., 15 AMP, 30 AMP)
Operational Interface	- the combination of displays and signals that allow for constant feedback to determine equipment (e.g., water pressure gauge) is operating properly and allows for operator(s) to determine when equipment starts malfunctioning. Also includes the controls to reset operating parameters or to make manual adjustments to ensure proper performance

Other questions asked respondents for demographic information so that results could be categorized by area of the country or type of First Responder. The survey questions as posted on the internet are provided in Appendix B.

4.3.2 Administer Survey.

The RKB, a national information resource for emergency responders funded by the DHS FEMA National Preparedness Directorate, sponsored the survey on their website. About 60,000 First Responders have registered accounts with the RKB and had access to the survey via a link from their account. The RKB posted the survey on the front page of its website using the survey tool SurveyMonkey.com, and then provided e-mail notification to registered responders about the survey. The survey link was active 20 August to 9 October 2007. Appendix B shows the survey as it was posted on RKB.

The internet was used as the sole method of eliciting input from Responders because it was the fastest way to survey a wide range of First Responders across the United States. A large number of responses were needed because there are thousands of First Responders and just as many ways to perform decontamination operations using different equipment. The Standards Development Team also wanted enough responses from each Environmental Protection Agency (EPA) Region to indicate whether First Responders in different sections of the country have different preferences. The 10 EPA Regions and the states/territories belonging to each are provided in Figure 1. The Regions are numbered starting in the northeast of the United States and moving westward. The responses for fire fighter and hazmat personnel were separated by EPA region using their telephone number area codes.

4.3.3 Analyze Responses.

As discussed in Section 2, the DAT summarized the overall results in a report titled “First Responder CBRN Decontamination Equipment Questionnaire Preliminary Results, 15 November 2007”, which is provided in Appendix A. The percentages of responses were calculated for every closed-ended question for all respondents and compiled in tabular form. For open-ended questions, the comments from all respondents were consolidated in list form.

In the following sections, the responses from fire fighters and hazmat personnel were separated from the rest of the responses because fire fighters and hazardous material team members were assumed to have the most experience with decontamination equipment. The results were tallied for this smaller subset of respondents and compared to the overall results for all First Responders that are given in Appendix A. The fire fighter and hazmat personnel subset was then organized by EPA Region, and differences in the responses between EPA regions (explained in Section 4.3.2) were highlighted.

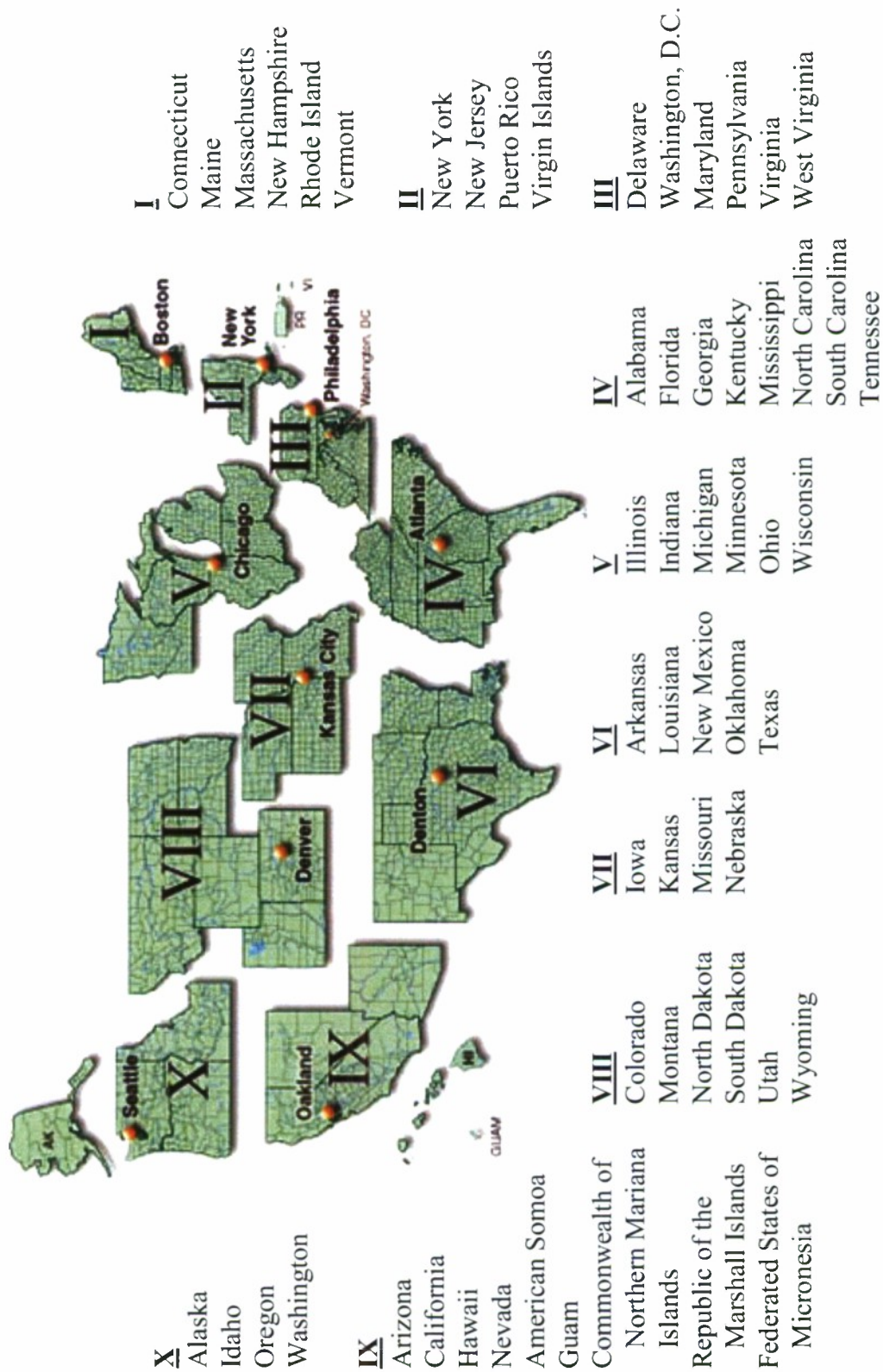


Figure 1. States and Territories in each EPA Region

5. RESULTS AND ANALYSIS

Eight hundred seventy-four respondents completed the survey. The demographic information for all respondents is presented in Section 12 of Appendix A. A summary of this information follows:

- All types of First Responders participated, including emergency room personnel, and SWAT and bomb squad team members. As expected, the highest participation rates were, in order, fire fighters, hazmat personnel, and emergency medical technicians.
- All types of jurisdictions (i.e., city, township, county, state, territory, and federal) completed the survey, with cities and counties making up about 60% of responses.
- About 60% of responses came from jurisdictions of <100,000 people to areas with over a million people, and all jurisdiction sizes participated.
- Only about 10% of respondents characterized their decontamination operation knowledge and experience level as “not very knowledgeable”; 35% assessed themselves as “very experienced” (highest level).
- Only about 13% of organizations characterize their decontamination equipment as state-of-the-art; however, almost half describe their equipment as between basic and state-of-the-art. Most of this equipment is used, for either training or an incident, one to three times within a 2 year period.

Five hundred eighty-four respondents listed themselves as fire fighters or hazmat personnel, and 402 of these personnel provided telephone area codes and were used in the EPA region analysis. Fire fighters and/or hazmat personnel responded from every state except Hawaii, Rhode Island, Vermont, and South Dakota. Of the U.S. territories, only the Commonwealth of Northern Mariana Islands was represented.

Table 3 shows the number and percentage of total responses for each region for fire fighters and hazmat personnel, as well as the percentage of the total U.S. population in each region. This table also shows the percentage of each equipment type (basic to state-of-the-art) that is used in each region. Basic equipment is multi-purpose equipment such as wading pools, garden hoses, horse brushes, and bleach decontamination solution. State-of-the-art equipment includes dedicated self-powered vehicles with on-board equipment specifically developed for decontamination operations. Several respondents selected more than one equipment type, so the percentage values across the equipment type columns do not total 100.

Table 3. Percentage of Fire Fighter and Hazmat Personnel Responding for each EPA Region

EPA Region	Total U.S. Population (%) in each EPA Region	No. Responses	Response (%) of Total Respondents	Respondents (%) with Basic Equipment	Respondents (%) with Equipment between Basic and State-of-the-Art	Respondents (%) with State-of-the-Art Equipment
I	4.8	20	5.0	35	60	20
II	10.7	34	8.4	29	59	21
III	9.6	54	13.4	44	50	13
IV	19.0	68	16.9	29	54	18
V	17.0	93	23.1	34	59	16
VI	11.9	41	10.2	44	49	10
VII	4.5	26	6.6	46	46	23
VIII	3.3	15	3.7	53	53	0
IX	15.2	28	7.0	36	46	36
X	4.0	23	5.7	39	57	4

More fire fighters and hazmat personnel from Regions III, IV, and V submitted surveys than from the other regions. The representation in each region was good overall. The only significant under-representation was in Region IX. The results provided in Sections 5.1-11 are not normalized to account for the percentage responding from each EPA region.

In general, the majority of equipment in each EPA region is between basic and state-of-the-art. Respondents from Region IX had the highest percentage of state-of-the-art equipment. In contrast, no respondents from Region VIII had state-of-the-art equipment.

Sections 5.1-11 describe the results of the survey for fire fighters and hazmat personnel, and are organized by question. The questions for each characteristic (e.g., Time, Human Factors) are grouped together. The questions are numbered this way to correspond with the format of the survey in Appendix B, and with the overall results in Appendix A. Each section contains the following information:

- The result for the 584 fire fighters and hazmat personnel using a pie chart showing percentage responding.
- A comparison of the fire fighter and hazmat personnel response to the overall results (includes all First Responders).
- The differences in responses, in most cases displayed as a table, between EPA regions for the 402 fire fighters and hazmat personnel who provided telephone numbers. Percentages have been rounded to the nearest 5% points.
- Where applicable, a summary of the open-ended comments for all First Responders.

An analysis of the open-ended comments is provided for questions where comments were requested. The analysis of open-ended comments does not separate fire fighter and hazmat personnel comments from the rest of the comments, and also does not separate the comments by EPA region. The comments have been organized by category based on the types of comments received (this was done after the survey was closed, and all of the comments could be reviewed), and discussion notes how many respondents commented for each category.

For several of the questions below, the terms “majority” and “most” have been used to describe the percentage of respondents. Majority refers to a percentage >50%. Most refers to the largest number of respondents. For example, in a question with four options, “most respondents choosing one option” could mean 40%, where the percentages for the other options are 30, 20, and 10%.

5.1 Importance of Characteristics.

Rate the 10 characteristics of decontamination systems from 1 (most important) to 10 (least important).

The percentage of each rating (i.e., 1 to 10) that each characteristic received was calculated, and the characteristic that received the highest percentage for a rating was given that rating. Similar to the results for all First Responders, fire fighters and hazmat personnel rated Ease of Use and then Time as the two most important characteristics, followed by the other characteristics shown in Table 4.

Table 4. Relative Order of Importance of Decontamination Equipment Characteristics; Fire Fighter and Hazmat Personnel Responses Only

Order	Decontamination Equipment Characteristic
1	Ease of Use
2	Time
3	Reliability/Maintainability
4	Operating Conditions
5	Transportability
6	Consumable Resources Required
7	Human Factors
8	Interoperability
9	Power Requirements
10	Operational Interface

The ratings for several EPA regions were not as straight forward, as shown in Table 5. Cells in the table that have been merged with “tied” noted indicate two characteristics that received the same percentage of response for that rating. For example, an equal number of people in EPA Region II felt that Time and Ease of Use were the most important characteristics.

In some cases, characteristics may have received a lower percentage for one rating; but, because they had a higher overall percentage for the top two, three, four, etc., ratings, they were rated higher than another characteristic. For example, in EPA Region I, the same number of people rated Reliability/Maintainability and Operating Conditions as third. Instead of calling these characteristics “tied”, the percentage of respondents that rated these characteristics as first and second was compared. Because more respondents rated Operating Conditions in the top three, it received a rating of three, and Reliability/Maintainability received a rating of four.

The respondents in Regions III, VII, VIII, and IX showed a clear preference for either Time or Ease of Use as the most important characteristic. The respondents in the other Regions rated these two characteristics very closely. Most of the differences in ratings for the characteristics occurred in the characteristics that ranked the lowest overall: Consumable Resources, Human Factors, and Interoperability. Region I rated Consumable Resources lower and Power Requirements higher than the other regions generally did. A follow-up effort could address the most noticeable differences in ratings; for example, it would be useful to determine why some respondents rated Consumable Resources ninth, whereas others rated it sixth.

Table 5. Differences in Rank Between EPA Regions; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Characteristic									
	Ease of Use	Time	Reliability/Maintainability	Operating Conditions	Transportability	Consumable Resources Required	Human Factors	Interoperability	Power Requirements	Operational Interface
I	2	1	4	3	5	9	6	8	7	10
II	1 (tied)		3	4	5	7	8	6	9	10
III	1	2	3	4	5	8	6	7	9	10
IV	2	1	3	4	5	6	7	8	9	10
V	2	1	3	4	5	6	7	8	9	10
VI	2	1	3	4	5	6	7	8	9	10
VII	2	1	3	4	5	8	6	7	9	10
VIII	2	1	3	4	5	6	7 (tied)		10	9
IX	1	2	3	4	5	6	8	7	9	10
X	1 (tied)		3	4	6	8	5	7	9	10

Respondents were given the opportunity to provide comments for this question. Twenty First Responders felt all of these characteristics were equally important but ranked them anyway. Other comments were provided, but were irrelevant to the question asked.

5.2 Time.

5.2.1 Choose the longest acceptable time to set up equipment after arriving on-site.

As shown in Figure 2, the majority of fire fighters and hazmat personnel prefer a maximum setup time of 6-20 min. The percentages of responses were the same for 6-10 min and 11-20 min. This is different from the results for all First Responders (Appendix A), where most respondents preferred a maximum setup time of 11-20 min.

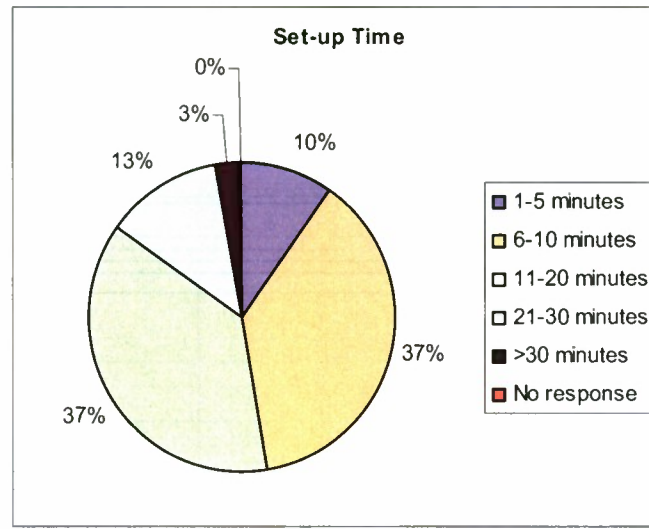


Figure 2. Longest Acceptable Setup Time; Fire Fighter and Hazmat Personnel Responses Only

The responses for the EPA regions exhibited differing preferences, which are provided in Table 6. Eastern state respondents (except those in Region II) generally prefer the shorter setup time of 6-10 min, whereas western state respondents (except Region IX) would accept the longer setup time. Region IX is represented mostly by one state, California. Firefighters and hazmat teams in this state operate with more stringent regulations (as noted during research of existing standards) and possibly more advanced systems than the other states on the western side of the United States, which may account for the shorter time preference.

5.2.2 Choose the longest acceptable time to decontaminate one ambulatory person.

Figure 3 shows that almost half of fire fighter and hazmat personnel indicated that time to decontaminate ambulatory personnel should be 5 min or less; more than 75% responded that no more than 10 min was acceptable. These results are very similar to the results for all First Responders.

Table 6. Differences in Longest Acceptable Setup Time Between EPA Regions; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 6-10 min Setup Time	Respondents (%) Choosing 11-20 min Setup Time
I	65	25
II	25	50
III	40	35
IV	45	30
V	35	40
VI	30	35
VII	35	40
VIII	25	45
IX	35	30
X	35	45

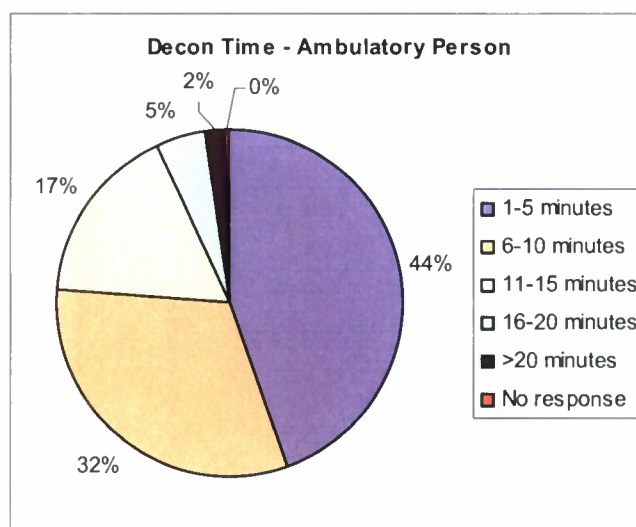


Figure 3. Longest Acceptable Time to Decontaminate One Ambulatory Person; Fire Fighter and Hazmat Personnel Responses Only

As shown in Table 7, there was one difference in preference among the EPA regions. For EPA Region V, which consists of most of the states bordering the Great Lakes, more respondents found a decontamination time of 6-10 min to be acceptable.

Table 7. Differences Between EPA Regions in Time to Decontaminate One Ambulatory Person; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 1-5 min Decontamination Time	Respondents (%) Choosing 6-10 min Decontamination Time
I	65	20
II	40	20
III	55	25
IV	45	30
V	35	45
VI	50	35
VII	40	20
VIII	45	40
IX	55	15
X	45	25

5.2.3 Chose the longest acceptable time to decontaminate 10 ambulatory people.

Fire fighters and hazmat personnel (81%) felt it was important to decontaminate 10 ambulatory people in 30 min or less, with responses between 11-15, 16-20, and 21-30 min being fairly equally distributed (Figure 4). This is similar to the results for all First Responders.

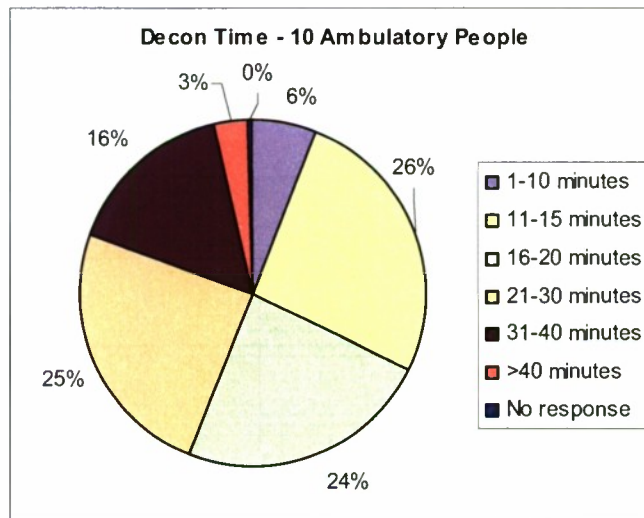


Figure 4. Longest Acceptable Time to Decontaminate 10 Ambulatory People; Fire Fighter and Hazmat Personnel Responses Only

Table 8 shows that the responses between EPA regions exhibited multiple differences. Regions II, III, IV, V, VI, XI, and X showed similar results for all fire fighters and hazmat personnel; the preferences among the three timeframes, 11-15, 16-20, and 21-30 min, are fairly equally distributed. Region I, however, showed a stronger preference for the 11-15 min timeframe, while more respondents from Regions VII and VIII found the 21-30 min timeframe acceptable. There should be follow up with respondents from the different EPA regions to determine why some timeframes were chosen over others.

Table 8. Differences Between EPA Regions in Time to Decontaminate 10 Ambulatory People; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 11-15 min Decontamination Time	Respondents (%) Choosing 16-20 min Decontamination Time	Respondents (%) Choosing 21-30 min Decontamination Time
I	55	20	20
II	20	20	25
III	30	30	20
IV	30	20	20
V	25	25	20
VI	30	20	30
VII	10	10	55
VIII	20	15	55
IX	25	25	30
X	30	20	30

5.2.4 Choose the longest acceptable time to decontaminate 100 ambulatory people.

Almost two-thirds of the fire fighter and hazmat personnel preferred (Figure 5) that 100 ambulatory people be decontaminated in <60 min, with almost half of those desiring 40 min or less. The remaining respondents were not concerned if decontaminating 100 people takes longer than 60 min. The results for all First Responders indicate a similar preference. The preferred time to decontaminate 100 people takes proportionally less time than it takes to decontaminate 10 people. A potential follow-up question for First Responders may be whether they considered the use of multiple decontamination systems or whether they want one decontamination system that can do all 100 people in the given timeframe.

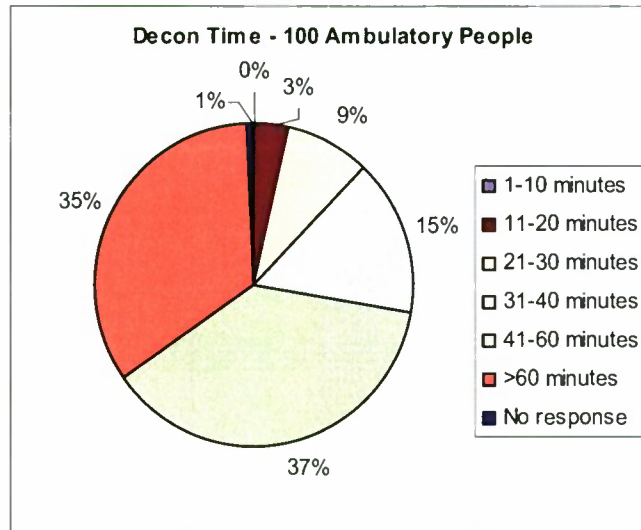


Figure 5. Longest Acceptable Time to Decontaminate 100 Ambulatory People; Fire Fighter and Hazmat Personnel Responses Only

As shown in Table 9, the majority of EPA regions exhibited similar results for this question. However, approximately half of the fire fighters and hazmat personnel from Regions VI, VII, VIII, and X were not concerned if decontamination took longer than 60 min. Another follow-up question would ask Responders to choose from options with longer timeframes to help narrow the time that they find acceptable.

Table 9. Differences Between EPA Regions in Time to Decontaminate 100 Ambulatory People; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 60 min or Less Decontamination Time
I	80
II	60
III	70
IV	65
V	60
VI	55
VII	45
VIII	45
IX	70
X	50

5.3 Ease of Use.

5.3.1 Choose the highest acceptable number of responders required to set up decontamination equipment within required time constraints.

Figure 6 shows that the majority of firefighter and hazmat personnel feel 3-4 responders is the maximum acceptable number to set up decontamination equipment, although almost one-third of respondents could accept up to 8 responders. This number is also the same as that for the overall results.

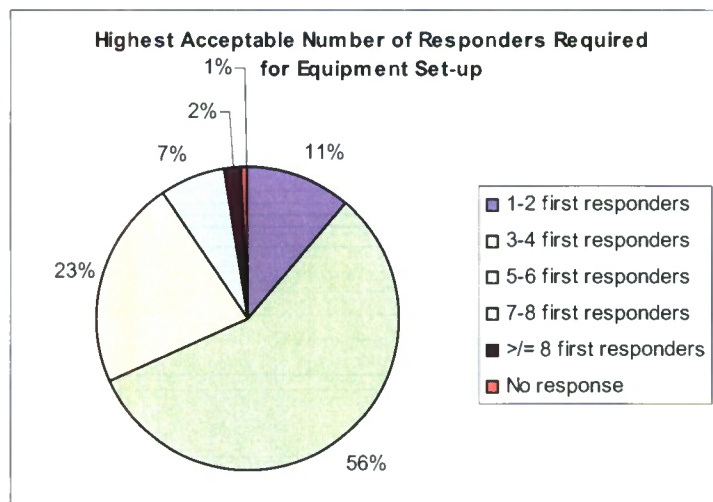


Figure 6. Highest Acceptable Number of Responders Required to Set Up Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

The majority of respondents from the different EPA regions prefer, as shown in Table 10, that decontamination equipment setup require no more than 1-2 or 3-4 responders. Region IX showed a smaller majority, indicating that more respondents in that region would accept equipment requiring a larger number of responders to set up.

Table 10. Differences Between EPA Regions in Number of Responders Required to Set Up Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 1-2 or 3-4 Responders for Setup
I	70
II	60
III	70
IV	70
V	70
VI	70
VII	60
VIII	75
IX	55
X	75

5.3.2 Choose the highest acceptable number of responders required to operate decontamination equipment.

Although half of fire fighter and hazmat personnel respondents prefer no more than 4 responders be needed to operate decontamination equipment, the other half of the fire fighters and hazmat personnel surveyed could accept >4 , as shown in Figure 7. The results for all First Responders indicate a stronger preference overall for having <4 responders, with two-thirds of all respondents selecting 1-2 or 3-4 first responders for operating the equipment.

The results for EPA Regions I, VIII, and X indicate a preference (Table 11) for a maximum of 4 operators, whereas for the rest of the regions, responses were more equally distributed between having <4 or >4 operators to operate decontamination equipment. The results for all regions show a clear preference for having <6 operators.

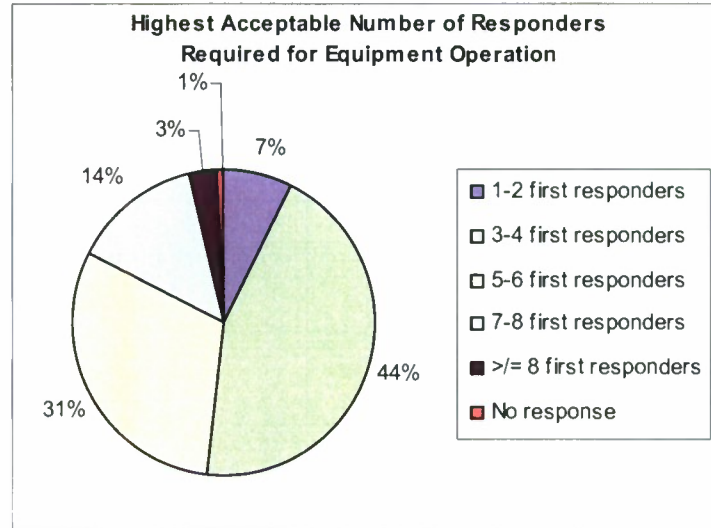


Figure 7. Highest Acceptable Number of Responders Required to Operate Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

Table 11. Differences Between EPA Regions in Number of Responders Required to Operate Equipment; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 1-2 or 3-4 Operators	Respondents (%) Choosing 1-2, 3-4, or 5-6 Operators
I	65	80
II	50	75
III	55	80
IV	55	80
V	45	80
VI	45	90
VII	40	90
VIII	60	70
IX	45	80
X	75	90

5.3.3 Choose the highest acceptable number of training hours required to certify decontamination equipment operators.

Figure 8 shows that three-fourths of fire fighters and hazmat personnel prefer <24 hr of certification training. Within the three-fourths, the responses were equally distributed between the 1-8, 9-16, and 17-24 hr options. The results for all First Responders showed a similar distribution.

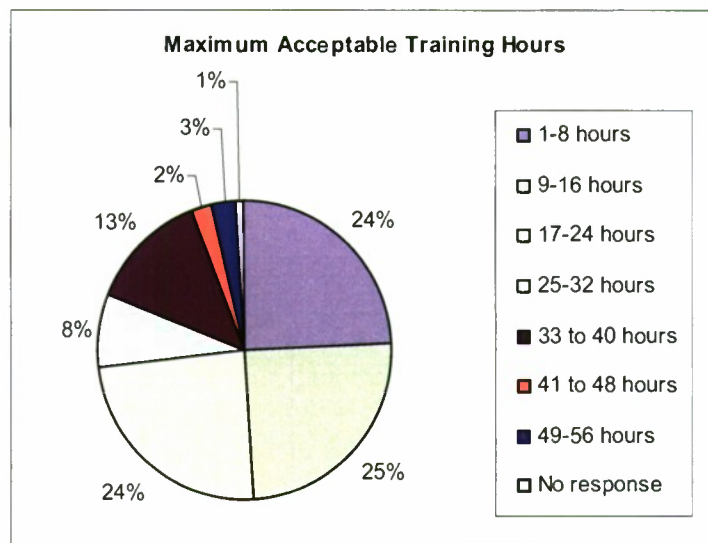


Figure 8. Maximum Training Hours Acceptable for Certifying Decontamination Equipment Operators; Fire Fighter and Hazmat Personnel Responses Only

The majority of EPA regions also preferred 24 hr or less of certification training, as shown in Table 12. More respondents from Region IV chose the 25-32 hr option; responses were fairly evenly distributed among the first four choices for this question (1-8, 9-16, 17-24, and 25-32 hr). Following up with responders from this region may be beneficial.

Table 12. Differences Between EPA Regions in Certification Hours; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Responders (%) Choosing 1-8, 9-16, or 17-24 hr of Training
I	80
II	75
III	75
IV	55
V	70
VI	70
VII	75
VIII	65
IX	80
X	90

5.3.4 Choose the highest acceptable frequency of recurrent training to maintain certification of decontamination equipment operators.

Fire fighters and hazmat personnel preferred that recurrent certification training mostly take place every other month, which is the same as the preference from the overall results. Only about one-fourth of fire fighters and hazmat personnel would accept more frequent training (e.g., monthly). Figure 9 shows the distribution of responses.

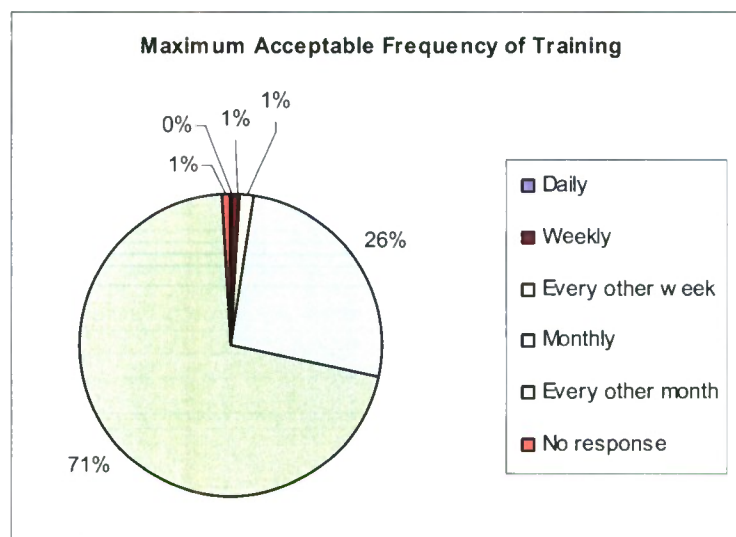


Figure 9. Maximum Acceptable Frequency of Certification Training; Fire Fighter and Hazmat Personnel Responses Only

Table 13 shows that respondents from all the EPA regions also demonstrated a fairly strong preference for having recertification training no more than every other month.

Most fire fighters and hazmat personnel preferred that the highest acceptable number of recurrent training be 4-6 hr, as shown in Figure 10. This is the same length of time as for the overall results for all First Responders. About one-third of fire fighters and hazmat personnel would accept no longer than 1-2 hr for recurrent certification training.

Table 13. Differences Between EPA Regions in Maximum Acceptable Frequency of Certification Training; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Responders (%) Choosing Recertification Training Mostly Every Other Month
I	60
II	70
III	65
IV	60
V	70
VI	70
VII	90
VIII	85
IX	80
X	85

5.3.5

Choose the longest acceptable length for each session of recurrent training to maintain certification of decontamination equipment operators.

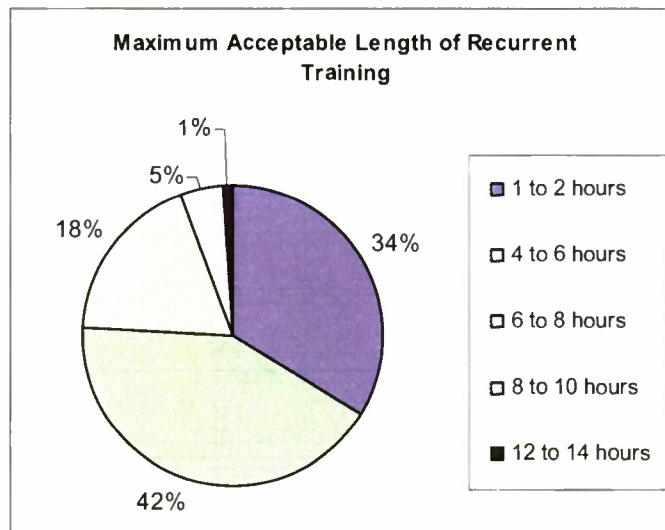


Figure 10. Maximum Number of Hours for Each Session of Recurrent Certification Training; Fire Fighter and Hazmat Personnel Responses Only

EPA Regions I, VI, and X showed (Table 14) different preferences for recurrent training time. Regions I and X showed a preference for a maximum of 1-2 hr for recurrent

training, whereas Region VI showed equal preferences for the 1-2 and 4-6 hr timeframes. Although not shown here, in Regions IV, VI, and VII, a fairly significant number of respondents (about 25% each region) chose the 6-8 hr training timeframe.

Table 14. Differences Between EPA Regions in Maximum Number of Hours per Session of Recurrent Certification Training; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Responders (%) Choosing Mostly 1-2 hr of Recurrent Certification Training	Responders (%) Choosing Mostly 4-6 hr of Recurrent Certification Training
I	50	40
II	30	45
III	30	45
IV	30	35
V	30	45
VI	30	30
VII	25	40
VIII	35	45
IX	30	35
X	45	35

5.4 Reliability/Maintainability.

5.4.1 What is the minimum number of actual decontamination operations (of at least 12 hr each) that equipment must operate as intended without any expected preventive maintenance or repairs other than routine post-incident care and cleaning?

Similar to the overall results, about one-third of fire fighters and hazmat personnel prefer that equipment operate for >4 operations before needing non-routine maintenance; while the majority of fire fighters and hazmat personnel are satisfied (Figure 11) with 1-3 decontamination operations. A follow-up question would be helpful to narrow the specific number of required operations.

All the EPA regions showed similar preferences for decontamination operations. Table 15 shows the percentage of respondents who are satisfied with 1-3 operations, and the percentage that prefer more than four operations. Respondents from Region III had the lowest preference for more than 4 operations, and the highest percentage for 3 or fewer operations.

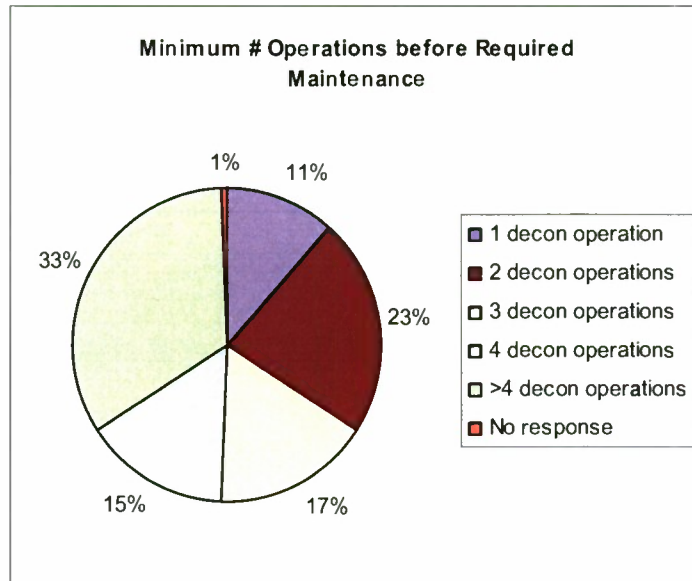


Figure 11. Lowest Acceptable Number of Operations before Non-Routine Maintenance is Required; Fire Fighter and Hazmat Personnel Responses Only

Table 15. Differences Between EPA Regions in Lowest Acceptable Number of Operations Before Maintenance is Required; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Satisfied with 3 or Fewer Operations	Respondents (%) Choosing More than 4 Operations
I	50	35
II	45	35
III	65	25
IV	45	35
V	50	35
VI	55	30
VII	60	30
VIII	35	35
IX	55	45
X	50	35

5.4.2 What is the smallest acceptable interval for recurring maintenance on decontamination equipment when the equipment is not being used for an incident or training?

Most fire fighters and hazmat personnel chose (Figure 12) that recurring equipment maintenance occur no more than every 9-12 months. Almost one-half of the

respondents were satisfied if recurring maintenance occurred more frequently (1-4 or 5-8 months). This preference is the same as that for the overall results.

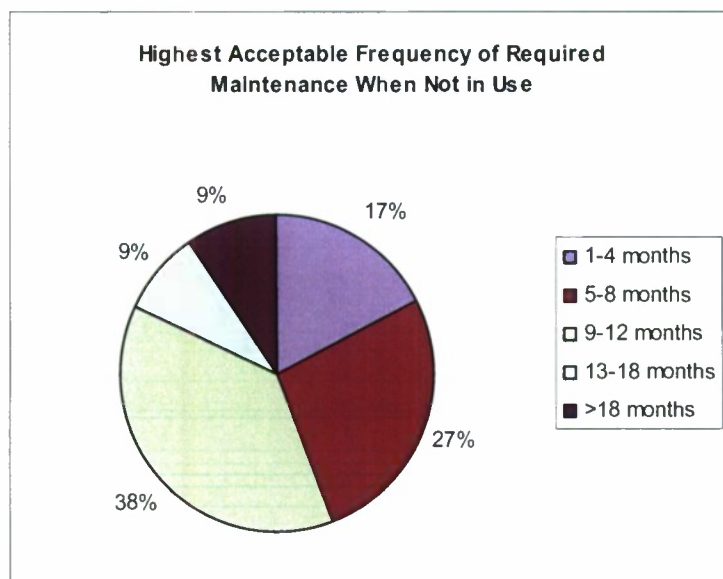


Figure 12. Highest Acceptable Frequency of Required Maintenance When Equipment is Not in Use; Fire Fighter and Hazmat Personnel Responses Only

All of the EPA Regions agreed with this preference except Region I (Table 16). Sixty percent of respondents in Region I were satisfied with maintenance recurring every 8 months or less. Regions IV and VIII showed a slightly larger number of respondents willing to accept a shorter frequency (less than every 8 months) for required maintenance.

Table 16. Differences Between EPA Regions in Highest Acceptable Frequency of Required Maintenance When Equipment is Not in Use; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing Maintenance No More Frequent than Every 9-12 Months
I	40
II	65
III	55
IV	50
V	55
VI	55
VII	60
VIII	45
IX	55
X	75

5.5 Operational Conditions.¹

5.5.1 What is the highest ambient temperature in which decontamination equipment needs to remain functional?

About two-thirds of the respondents would accept a maximum operating temperature of 110 °F for decontamination equipment (Figure 13). This distribution is similar to the result for all First Responders.

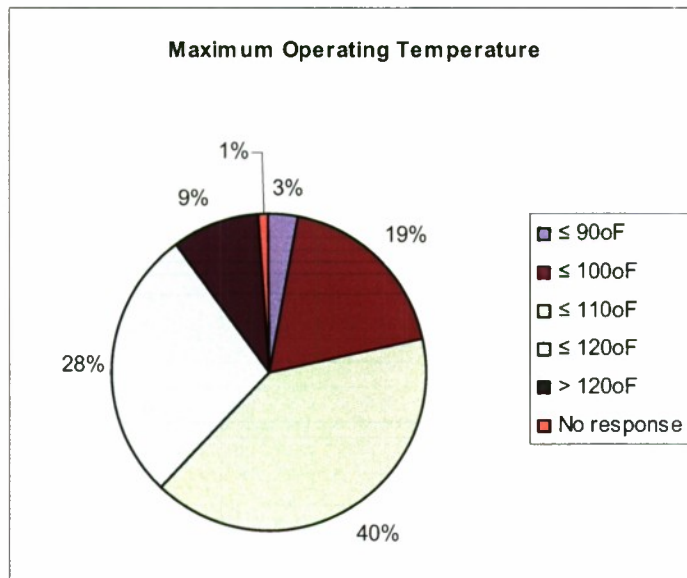


Figure 13. Maximum Acceptable Operational Temperature for Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

The majority of EPA regions showed the same preference (Table 17) for maximum operating temperature. However, most respondents in EPA Regions VI (39%) and IX (50%) prefer a maximum operating temperature of 120 °F. This preference makes sense due to the warmer climates in these areas. Additionally, Region VIII had the same percentage of responses for a maximum operating temperature of 110 or 120 °F. It may be beneficial to follow up with fire fighters and hazmat personnel in this region to determine why their preference was different from that of other regions with more moderate climates.

¹ This section was inadvertently called “Operational Considerations” in the posted survey.

Table 17. Differences Between EPA Regions in Maximum Operating Temperature; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Satisfied with Maximum Operating Temperature (°F) of:					
	90	100	110	120	>120	No response
I	10	20	45	20	5	0
II	12	26	41	15	6	0
III	2	20	43	24	9	2
IV	0	12	43	35	10	0
V	2	21	42	30	5	0
VI	5	12	29	39	12	3
VII	0	11	50	27	12	0
VIII	0	20	40	40	0	0
IX	7	0	29	50	14	0
X	5	4	61	17	13	0

5.5.2 What is the lowest ambient temperature in which decontamination equipment needs to remain functional?

The responses for fire fighters and hazmat personnel were fairly evenly distributed among the five options for this question. Over half of the fire fighters and hazmat personnel are satisfied with decontamination equipment that can remain functional to a minimum temperature of 10 °F (Figure 14). The results for all First Responders are similar.

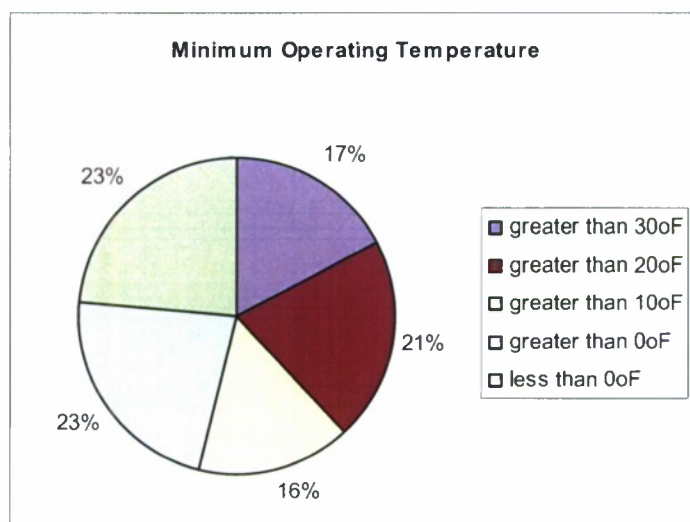


Figure 14. Minimum Required Operational Temperature; Fire Fighter and Hazmat Personnel Responses Only

Table 18 shows the percentage of respondents for each EPA region who are satisfied with decontamination equipment that can remain functional at a minimum temperature of 10 °F. Region VIII, which includes some of the colder states, showed a clear preference for minimum operating temperatures below 10 °F.

Table 18. Differences Between EPA Regions in Minimum Operating Temperature; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Satisfied with Minimum Temperature of 10 °F
I	50
II	50
III	60
IV	65
V	45
VI	75
VII	45
VIII	15
IX	55
X	55

5.5.3 What is the highest wind speed in which decontamination equipment needs to remain functional?

Similar to the overall results, most fire fighters and hazmat personnel prefer that decontamination equipment remain functional in up to 30 mph winds, although a significant percentage need functionality in wind speeds >30 mph (Figure 15).

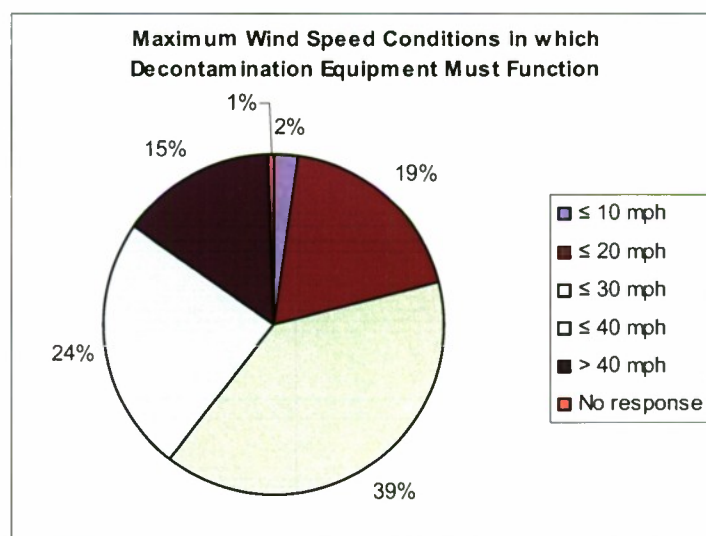


Figure 15. Maximum Wind Speed Conditions in which Decontamination Equipment Must Function; Fire Fighter and Hazmat Personnel Responses Only

EPA Region VIII exhibited a different preference (Table 19). More fire fighters and hazmat personnel in Region VIII preferred that decontamination equipment remain functional in >30 mph maximum wind speeds. Half of the respondents from Region X had the same preference. Follow-up should be done with these regions to determine respondent reasons for the different preferences.

Table 19. Differences Between EPA Regions in Maximum Acceptable Wind Speed for Decontamination Equipment to Remain Functional; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Satisfied with Decontamination Equipment Able to Function in 30 mph or less Wind Speeds
I	80
II	60
III	60
IV	55
V	70
VI	65
VII	75
VIII	40
IX	60
X	50

5.6 Transportability.

5.6.1 Choose the greatest distance decontamination equipment would need to be moved from the end of a paved road to get it to the contaminated site (e.g., across an open field).

The majority of fire fighters and hazmat personnel will not need their decontamination equipment to be movable more than 750 ft off pavement, although Figure 16 also shows a significant percentage need equipment to be moved greater distances. These results are similar to the overall results, and indicate that decontamination equipment should be fairly man-portable or be packaged on carts that can be wheeled to needed location.

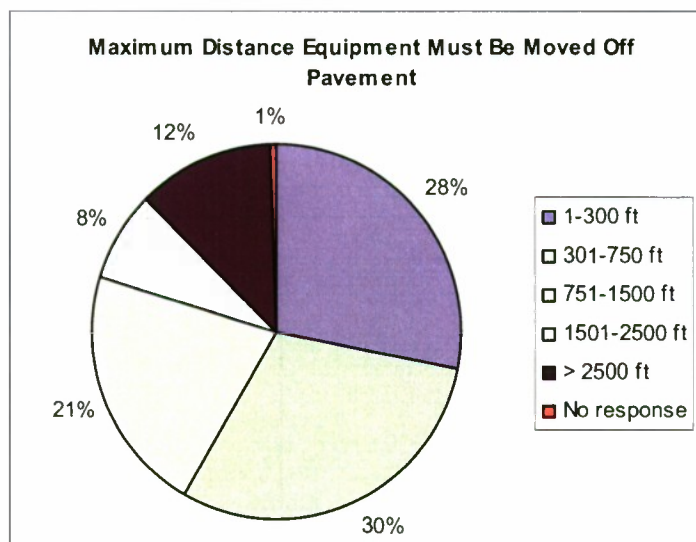


Figure 16. Maximum Distance Equipment Must Be Moved Off Pavement; Fire Fighter and Hazmat Personnel Responses Only

Table 20 shows that EPA regions predominantly chose either 1-300 or 301-750 ft, with the exception of Regions III, VI, and VIII, which have a larger number of respondents who chose 751-1500 ft. It may be beneficial to follow up with First Responders from these regions to determine why they chose a longer distance to move equipment.

Table 20. Differences Between EPA Regions in Maximum Distance Equipment Must Be Moved; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing Maximum Distance of 750 ft
I	80
II	60
III	50
IV	60
V	60
VI	55
VII	70
VIII	55
IX	70
X	75

5.6.2 Choose the maximum acceptable weight for individual transportable components of the decontamination equipment.

Fire fighters and hazmat personnel strongly preferred that the maximum weight for individual transportable components be 60 lb or less; although about one-third of respondents

were not concerned (Figure 17) if the maximum weight was more than 60 lb. A follow up question to ask those respondents would be whether respondents related this question with the “Transportability” question on the distance equipment must be moved (Section 5.6.1). For example, are individual fire fighters and hazmat personnel expected to carry equipment weighing 60 lb a distance of 750 ft?

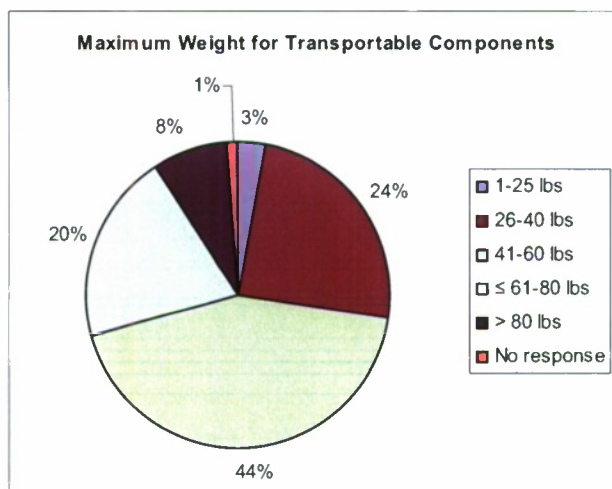


Figure 17. Maximum Weight for Transportable Components; Fire Fighter and Hazmat Personnel Responses Only

All of the EPA regions showed a similar preference for the maximum weight (Table 21) of transportable components.

Table 21. Differences Between EPA Regions in Maximum Weight for Transportable Components; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing Maximum Weight of 60 lb or Less
I	65
II	75
III	80
IV	70
V	65
VI	65
VII	65
VIII	60
IX	65
X	80

5.7 Consumable Resources.

5.7.1 What is the minimum acceptable shelf-life you would expect for the following types of consumable resources?

Figures 18, 19, and 20 show fire fighter and hazmat personnel preferences for the shelf life for fuel, active technical decontamination consumables (e.g., bleach, detergents), and supplemental decontamination items (e.g., modesty clothing, towels), respectively. Roughly 40% of fire fighters and hazmat personnel chose 1-6 months for fuel, and about the same percentage chose a minimum of 7-12 months. Longer timeframes were desired for active technical decontamination consumables, with almost half choosing a minimum of 18 months or more. For supplemental decontamination items, a large majority chose a minimum shelf life of >24 months. These results are similar to the overall results.

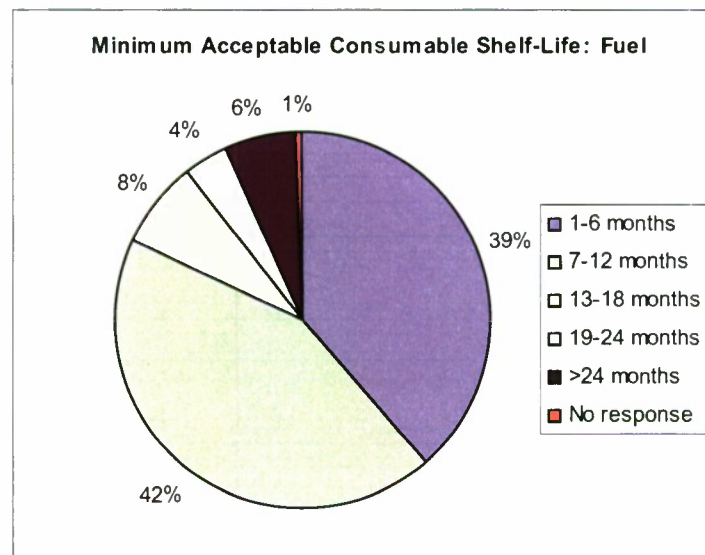


Figure 18. Minimum Acceptable Shelf-Life for Fuel; Fire Fighter and Hazmat Personnel Responses Only

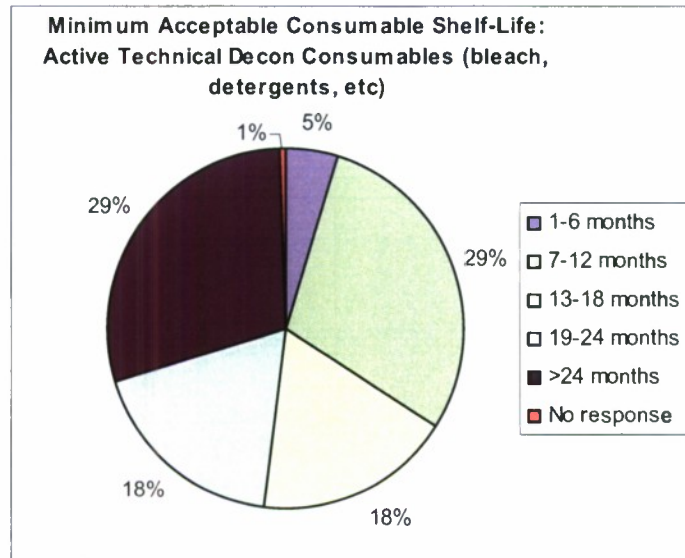


Figure 19. Minimum Acceptable Shelf-Life for Active Technical Decontamination Consumables; Fire Fighter and Hazmat Personnel Responses Only

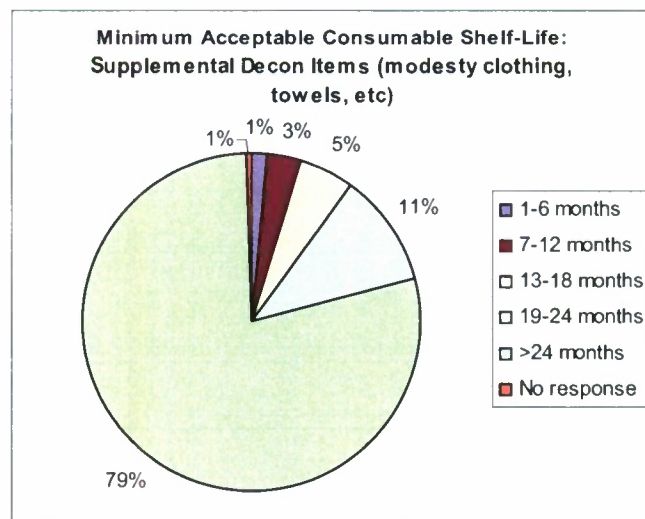


Figure 20. Minimum Acceptable Shelf-Life for Supplemental Decontamination Items; Fire Fighter and Hazmat Personnel Responses Only

Table 22 summarizes the results for shelf-life by EPA regions. For fuel, the western EPA regions (VI, VII, VIII, IX, and X) strongly prefer a shelf-life of 7-12 months over 1-6 months. The eastern regions (with the exception of Region I) either equally prefer 1-6 and 7-12 months, or show a slight preference for 1-6 months. Follow-up should be done to determine whether western regions used different fuel sources than eastern regions, which would allow the shelf-life to be longer.

For active technical decontamination solution, most respondents in each EPA region prefer a shelf-life of 18 months or more. For supplemental decontamination items, the vast majority of respondents in every EPA Region prefers a minimum shelf-life of 24 months. Both of these trends are similar to the fire fighter and hazmat personnel results.

Table 22. Differences Between EPA Regions in Minimum Acceptable Shelf-Life for Fuel and Other Items; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing Minimum Shelf-Life of 1-6 Months for Fuel	Respondents (%) Choosing Minimum Shelf-Life of 7-12 Months for Fuel	Respondents (%) Choosing Minimum Shelf-Life of 18 Months or More for Active Technical Decontamination Consumables	Respondents (%) Choosing Minimum Shelf-Life of 24 Months or More for Supplemental Decontamination Items
I	40	45	45	90
II	35	35	50	85
III	40	35	40	75
IV	45	45	45	80
V	45	35	35	70
VI	30	60	65	85
VII	25	40	50	80
VIII	15	65	55	75
IX	40	55	50	80
X	35	50	70	90

First Responders were also asked to provide other consumables that they use along with expected shelf-life for each. Most who provided additional comments suggested items covered by the supplemental decontamination items category, and recommended a shelf-life of at least 24 months. Nine respondents mentioned tarps and hoses; the shelf-life was generally <2 years, with two respondents choosing 7-12 months. Twenty-one respondents mentioned respiratory equipment (e.g., filters, masks), and most preferred a shelf-life >24 months.

5.7.2 What are the most restrictive long-term environmental storage conditions for consumables that are still acceptable?

Figures 21 and 22 show the preferences for long-term storage of active technical decontamination consumables (e.g., bleach, detergents) and supplemental decontamination items (e.g., modesty clothing, towels). The vast majority of fire fighters and hazmat personnel are willing to accept partially controlled environments for active technical decontamination consumables, while most would prefer supplemental decontamination items require no environmental controls.

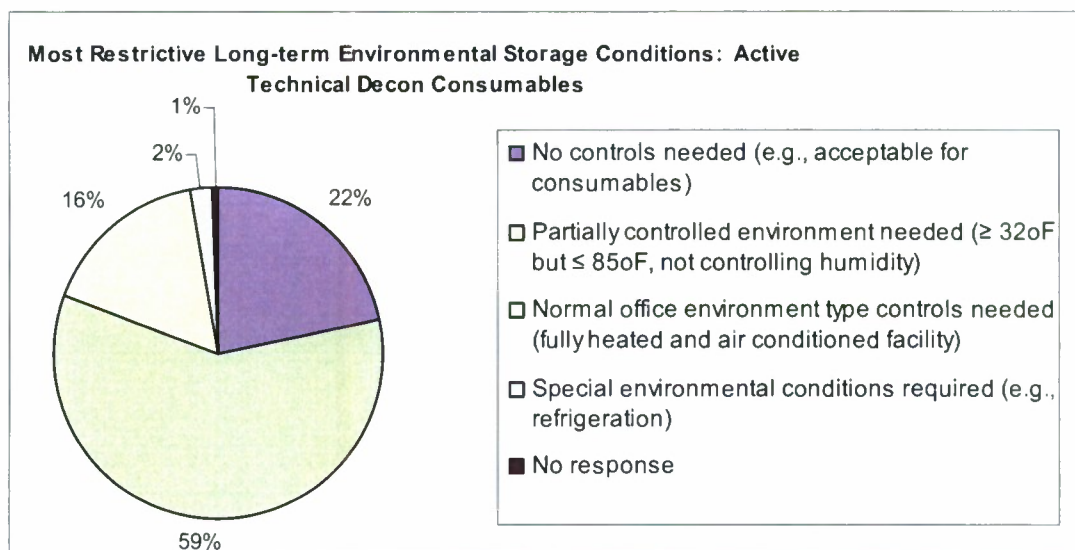


Figure 21. Most Restrictive Long-term Storage Conditions Acceptable for Active Technical Decontamination Consumables; Fire Fighter and Hazmat Personnel Responses Only

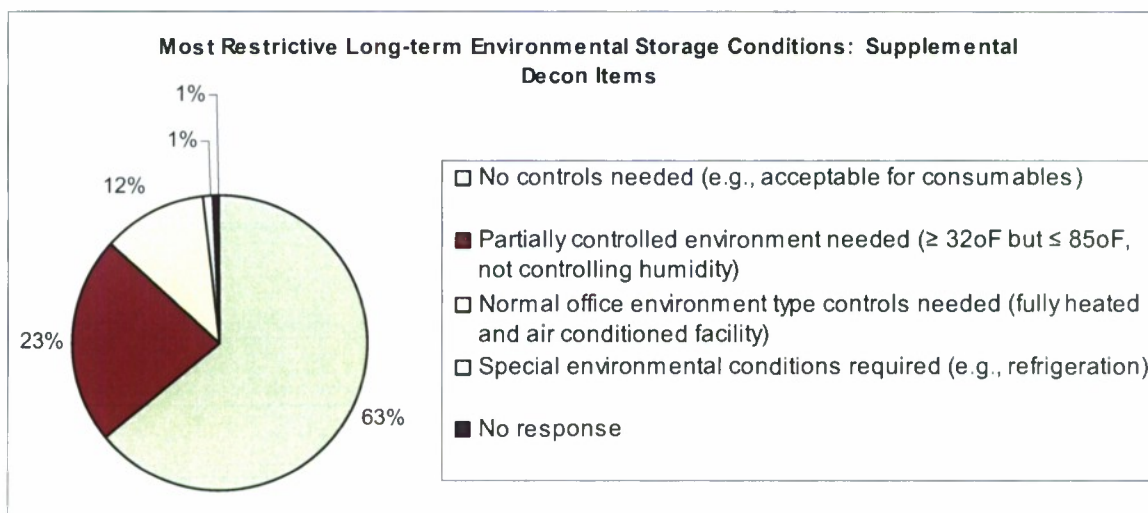


Figure 22. Most Restrictive Long-term Storage Conditions Acceptable for Supplemental Decontamination Items; Fire Fighter and Hazmat Personnel Responses Only

These results are similar across the United States, except that fire fighters and hazmat personnel in EPA Region IX prefer (Table 23) that active technical decontamination consumables require no environmental controls.

Table 23. Differences Between EPA Regions in Long-term Storage Conditions for Consumables; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing that Active Technical Decontamination Items Require only a Partially Controlled Environment	Respondents (%) Choosing that Supplemental Decontamination Items Require No Environmental Controls in Long-term Storage
I	50	75
II	65	60
III	60	60
IV	60	60
V	60	60
VI	65	60
VII	70	70
VIII	60	75
IX	30	60
X	75	80

First Responders were asked to provide other consumables and the shelf-life for each. Responders provided suggestions that fell within the two categories supplied, and recommended that no or minimal environmental storage conditions be required. Several commented that most items are stored outside in a trailer year-round.

5.8 Human Factors.

5.8.1 Choose the highest acceptable noise level within 25 ft of equipment.

Over 80% of fire fighters and hazmat personnel prefer that the noise level within 25 ft of equipment not exceed 80 db. About one-half of that group chose the more restrictive 70 db maximum option (Figure 23). None of the respondents chose the 110 or 120 db options. These preferences are the same as for the overall results.

As shown in Table 24, all of the EPA regions showed a similar preference.

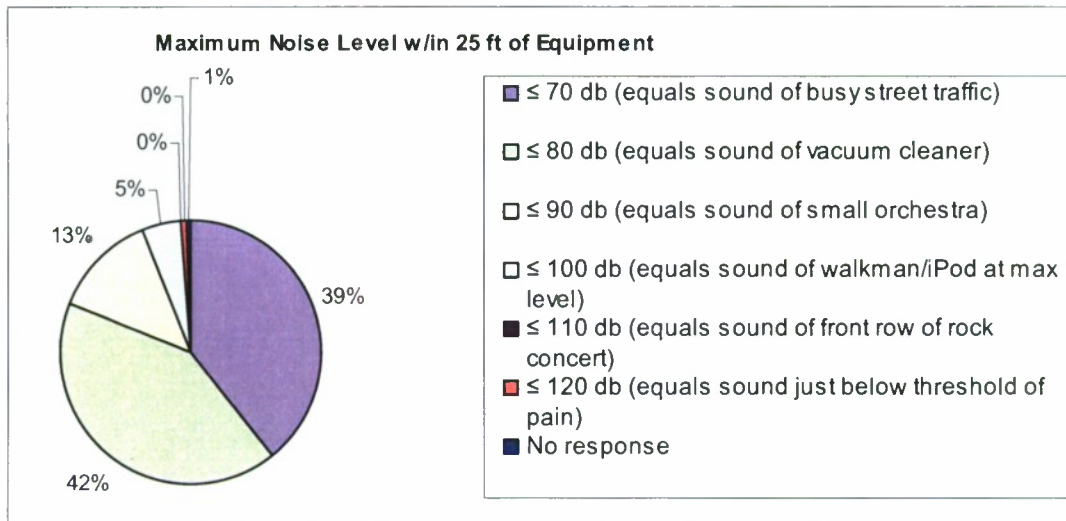


Figure 23. Maximum Noise Level within 25 ft of Equipment; Fire Fighter and Hazmat Personnel Responses Only

Table 24. Differences Between EPA Regions in Maximum Acceptable Noise Level within 25 ft of Equipment; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing that the Maximum Noise Level Be <70 or 80 db
I	90
II	80
III	90
IV	75
V	80
VI	80
VII	75
VIII	85
IX	80
X	85

5.8.2 Should manufacturers be required to supply appropriate signage (directional, pre/post decontamination, etc.) as part of their decontamination equipment?

Fire fighters and hazmat personnel strongly preferred that manufacturers provide signage with their decontamination equipment; Figure 24 shows that 88% of the respondents replied “Yes” to this question. This response is similar to the overall results.

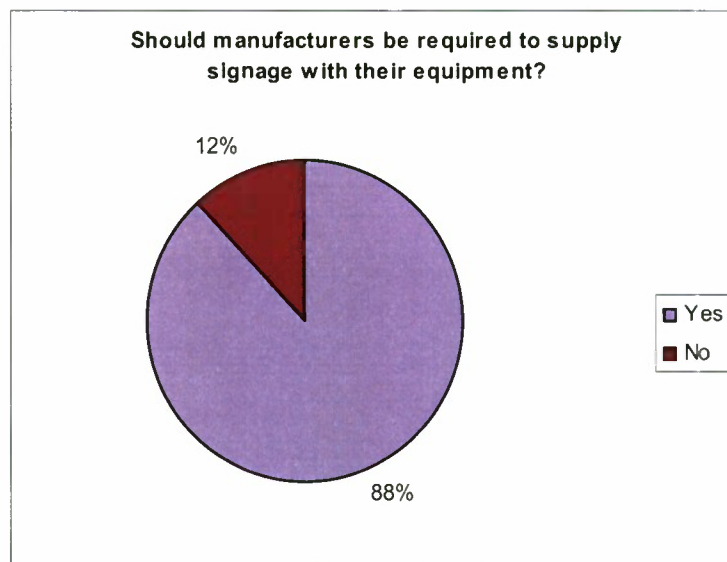


Figure 24. Desire for Requirement to have Signage from Manufacturers;
Fire Fighter and Hazmat Personnel Responses Only

As shown in Table 25, the respondents in each EPA region responded similarly, although a lower percentage of Region VIII respondents cared about having manufactured-supplied signage.

Table 25. Differences Between EPA Regions in Requirements for Signage;
Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing that Manufacturers Be Required to Provide Signage with Equipment
I	90
II	90
III	100
IV	95
V	80
VI	85
VII	90
VIII	60
IX	90
X	95

First Responders were asked to provide comments for this question. Eight respondents would prefer signage that is basic and easy to understand in any language and by children. Eight responders who answered in the negative felt that signage would have to change, depending on the situation, and thus could not be standardized, whereas another eight responders felt that manufacturers should only provide signage as an option to Responders. Five other

respondents provided additional information, indicating that they prefer standardized signage so that new personnel could easily understand how to operate the equipment.

5.8.3 Is there anything that the general public might perceive as unsafe about decontamination operation or the use of decontamination equipment?

Approximately one-half of fire fighters and hazmat personnel surveyed responded “Yes” to this question (Figure 25). The overall results are similar. The next question provides information regarding things that would be perceived as unsafe.

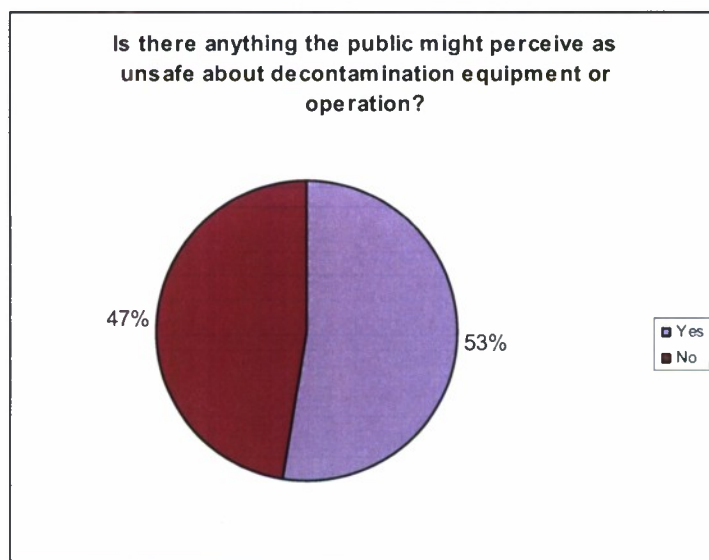


Figure 25. Perception of Public Safety Concerns for Decontamination Equipment and Operation; Responses from All First Responders

Most EPA regions responded similarly (Table 26). Fewer respondents in Region VII believed that the public might perceive something as unsafe about decontamination equipment or operation.

Table 26. Differences Between EPA Regions in Whether the Public May Perceive Decontamination Equipment/Operation as Unsafe; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Who Feel the Public Might Perceive Something as Unsafe about Decontamination Equipment or Operation
I	50
II	60
III	45
IV	65
V	50
VI	55
VII	30
VIII	55
IX	45
X	50

5.8.4 What are three things that the general public might perceive as unsafe about decontamination operation or the use of decontamination equipment?

This was an open-ended question, and First Responders provided 1,087 suggestions for things that the general public might perceive as unsafe (and in some cases, things that the public may fear) about decontamination operation or the use of decontamination equipment. Based on similarities, these suggestions were categorized into 11 groups (Figure 26). Miscellaneous items include any suggestions that were mentioned only once or twice, and include such things as claustrophobia and government conspiracy. While these concerns are not necessarily safety oriented, they are public concerns. Definitions for the other categories are provided in Table 27.

The public concerns mentioned the most were chemicals, waste, and physical injury/security. Although several respondents suggested that the appearance of decontamination personnel in suits/respirators (called Team Appearances) would be perceived as unsafe by the public, this concern was recommended far less than other types.

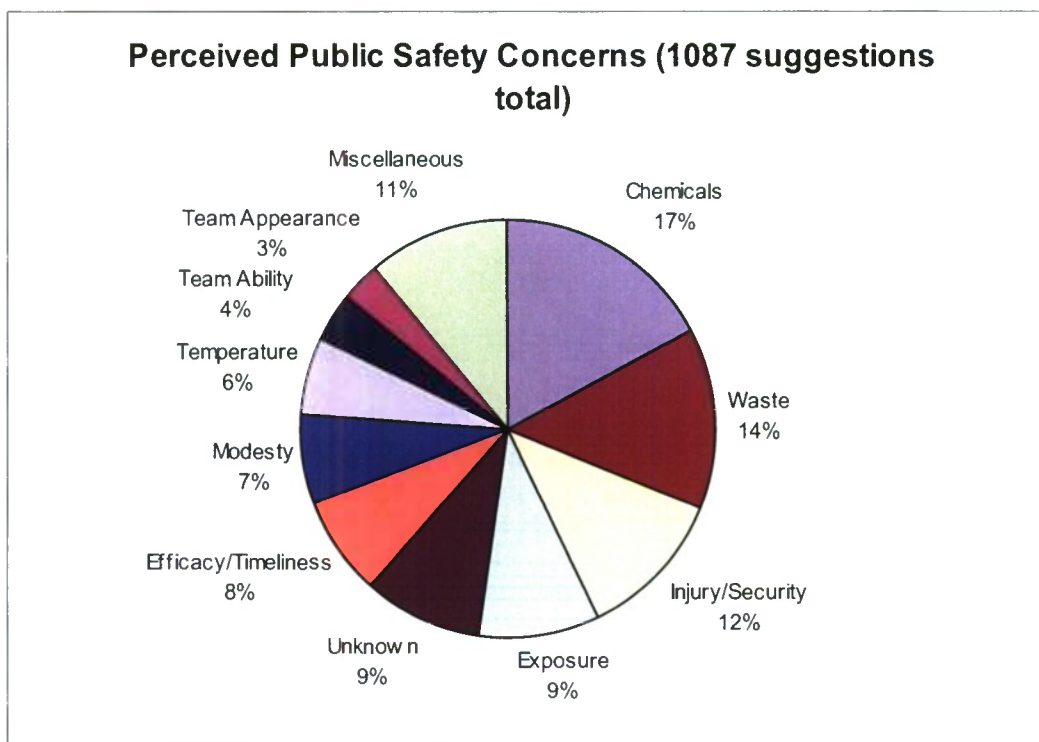


Figure 26. Perceived Public Safety Concerns about Decontamination Operation/Equipment; Responses from All First Responders

Table 27. Definitions for the Categories of Perceived Public Concerns

Category	Definition
Chemicals	Chemicals involved in the process
Waste	Proper containment and disposal of wastes (includes runoff)
Injury/ Security	Physical injury (from decontamination operation or accident) and security of decontamination site
Exposure	Fear of exposure (includes cross-contamination, standing "gray" water, etc.)
the Unknown	Fear of unknown or lack of understanding (includes literacy and language issues)
Efficacy/Timeliness	Effectiveness and efficiency of decontamination operation (includes timeliness)
Modesty	Lack of privacy, disrobing, lack of modesty
Temperature	Weather and temperature of the water, shelter, or environment
Team Ability	Ability/training of the decontamination team
Team Appearance	Appearances of decontamination personnel in suits/respirators and of the decontamination site
Miscellaneous	Miscellaneous fears, including claustrophobia, government conspiracy, etc.

5.8.5 What has been done to mitigate any or all of these items (refer to Section 5.8.4)? Describe successful and unsuccessful ideas, as well as any ideas that have not yet been implemented.

The suggestions for this open-ended question were very diverse, and respondents did not provide an indication of how well their mitigation strategies worked. The responses were categorized into nine broad categories (Figure 27), which are defined in Table 28. To address public concerns, most First Responders recommended improving communication with the public as a solution. One suggested method for improving communication is to do media days, open houses and public infomercials, and to teach school students and people at work how to respond to an event.

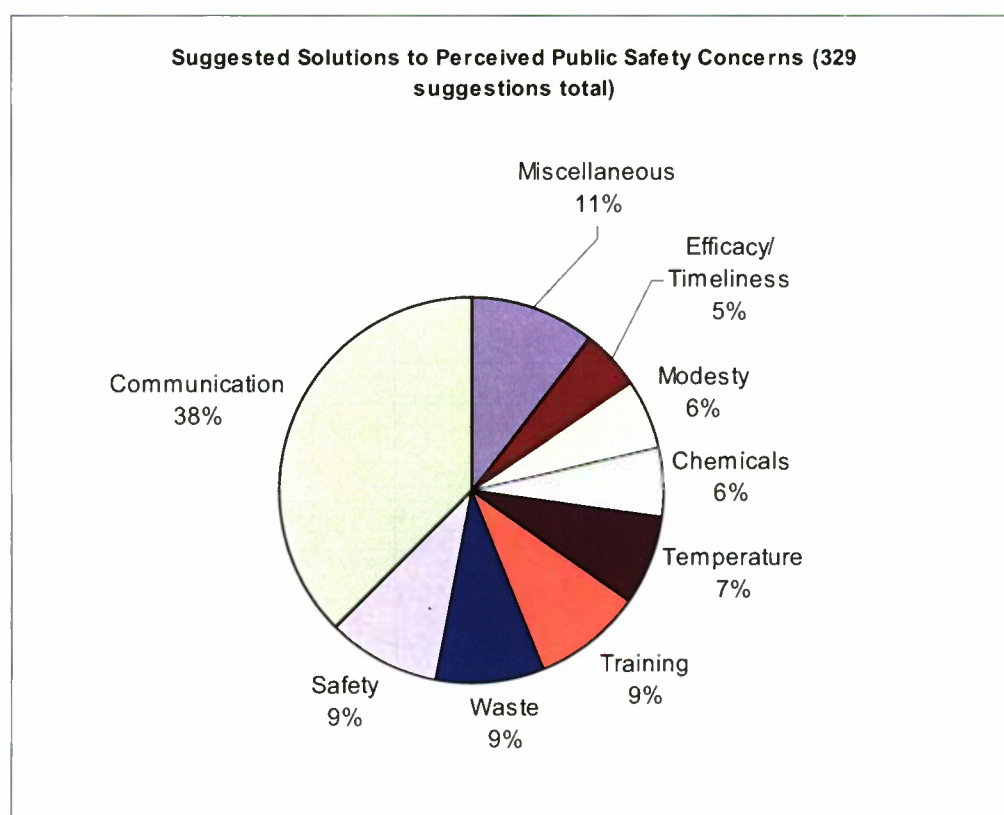


Figure 27. Suggested Solutions to Perceived Public Concerns about Decontamination Operation/Equipment; Responses from All First Responders

Table 28. Definitions for the Categories of Solutions to Public Concerns

Perceived Public Concern Categories	Suggested Solutions to Perceived Public Safety Concerns	Definitions for Solutions
Miscellaneous	Miscellaneous	Solutions that were not easily categorized, such as providing medical oversight post-decontamination or long-term environmental monitoring, and designing trailers/vehicles to mitigate specific issues
Efficacy/Timeliness	Efficacy/Timeliness	Improve effectiveness and efficiency of decontamination equipment (e.g., more reliable equipment that can be easily relocated) and/or of operation (e.g., moving people through faster)
Modesty	Modesty	Increase privacy during decontamination
Chemicals	Chemicals	Reduce harshness of decontamination solutions
Temperature	Temperature	Regulate temperature of water, tents, etc.
Team Ability	Training	Increase ability of personnel
Waste	Waste	Ensure proper waste disposal and/or containment (including used water)
Injury/Security	Safety	Increase general safety of public and property
Exposure		
Team Appearance	Communication	Communicate information about decontamination process and/or event to increase public awareness
the Unknown		

5.9 Interoperability.

5.9.1 Choose the top three sizes for necessary hose connections when working with decontamination equipment.

Fire fighters and hazmat personnel had five choices of hose connection sizes, $\frac{3}{4}$ in., 1 in., $1\frac{1}{2}$ in., $1\frac{3}{4}$ in., and $2\frac{1}{2}$ in., and were able to rank the top three. The top three choices were: $1\frac{1}{2}$ in. first, $\frac{3}{4}$ in. second, and $2\frac{1}{2}$ in. third. This was determined by comparing the percentages of respondents that ranked each hose connection size (Figure 28). The $1\frac{1}{2}$ in. size was chosen first most often. The $\frac{3}{4}$ in. size received a high percentage of first and second responses, so it was ranked second overall. Of the remaining three sizes, the $2\frac{1}{2}$ in. size received the highest percentage of responses for first, second, and third, so it was ranked third overall. This is slightly different than the overall results. The results for all First Responders show that the $1\frac{1}{2}$ in. size was ranked first, the $\frac{3}{4}$ in. was ranked second, and the 1 in. and $2\frac{1}{2}$ in. connections were both ranked third as a tie.

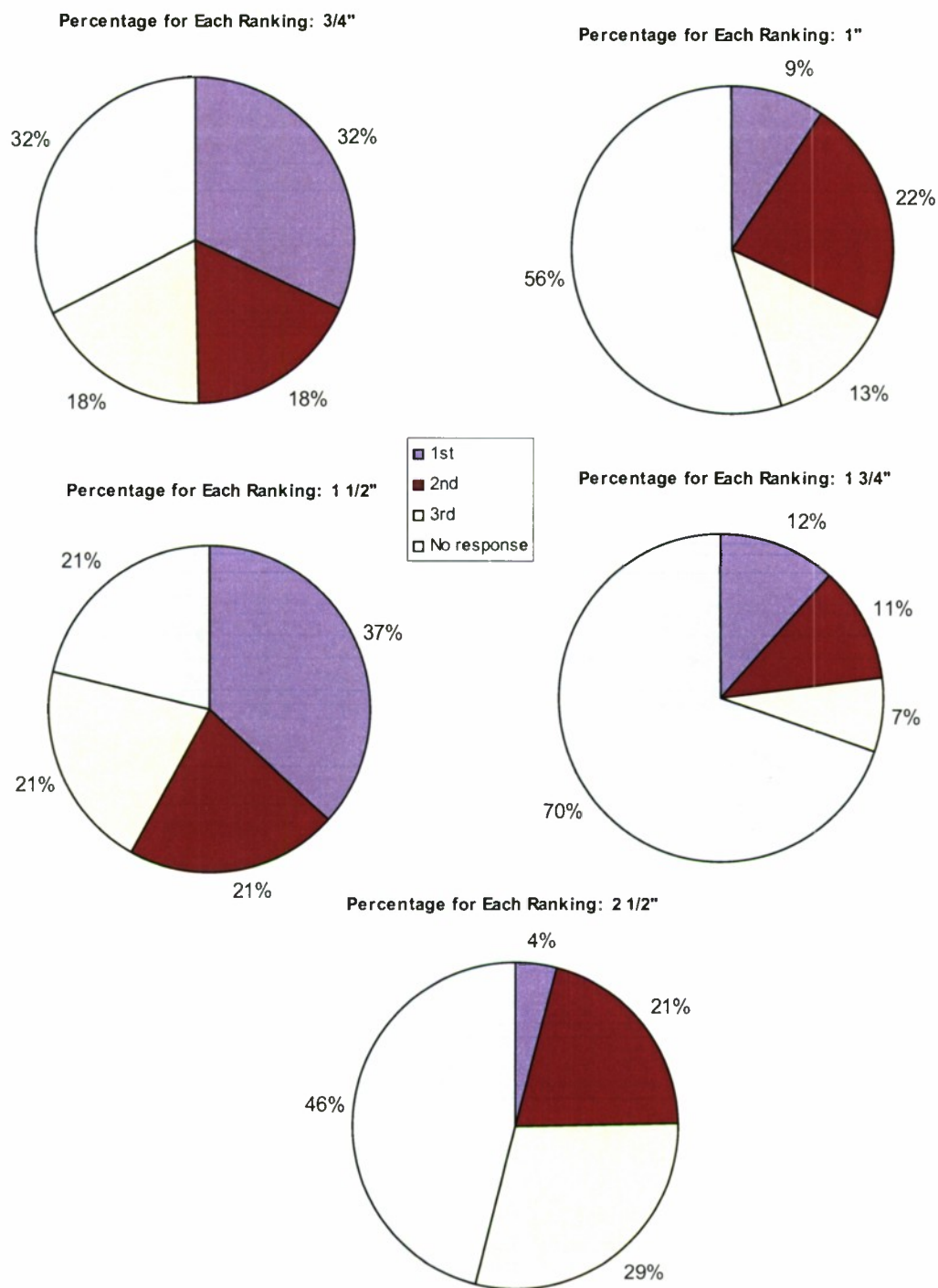


Figure 28. Percentage of Respondents Ranking Each Hose Connection Size First, Second, and Third; Fire Fighter and Hazmat Personnel Responses Only

EPA regions exhibited some variability in answers. Table 29 shows the differences. There is a lot of variability for the $\frac{3}{4}$ and $1\frac{1}{2}$ in. sizes as to whether they are preferred first, second, or third. The 1 in. size was not selected by EPA Regions I-V, and the $1\frac{3}{4}$ in. size was not selected by anyone. The eastern EPA Regions (I, II, III, IV, and V) showed a preference for $1\frac{1}{2}$ in., $2\frac{1}{2}$ in., and $\frac{3}{4}$ in. (in that order). The western EPA regions had less

agreement, but in general preferred $\frac{3}{4}$ in., $1\frac{1}{2}$ in., and 1 in. (in that order). The differences may occur due to differences in connection manufacturers and their geographic locations. A follow up with Responders from the eastern and western parts of the United States should be done to determine the reasons for the large variability.

Table 29. Differences Between EPA Regions in Hose Connection Sizes;
Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Rank of Hose Connection Size (in.)				
	$\frac{3}{4}$	1	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{2}$
I	3	--	1	--	2
II	3	--	1	--	2
III	3	--	1	--	2
IV	1	--	2	--	3
V	2	--	1	--	3
VI	1	2	3	--	--
VII	--	2	1	--	3
VIII	1	2	3	--	--
IX	1	3	2	--	--
X	--	2	1	--	3

Few First Responders provided responses on additional hose connection sizes; but, the responses received have been included in Table 30 for informational purposes. This table shows the additional sizes suggested as well as the number of respondents who suggested each.

Table 30. Additional Sizes for Hose Connections; Responses from All First Responders

Hose Connection Size (in.)	No. of Times Suggested
5	4
4	1
$4\frac{1}{2}$	1
3	3
$\frac{3}{8}$	1
$\frac{5}{8}$	2
$\frac{1}{2}$	2
$\frac{1}{4}$	1

Several First Responders provided additional information not necessarily relevant to the question. Twenty-five respondents noted that they prefer hoses that are designed for quick connect. Fifteen respondents noted that they use garden hoses, but did not specify a connection size. Eight noted that they prefer the National Standard Thread (NST) that they use for their fire hoses.

5.9.2 Should National Standard Thread (NST) be used as a standard for decontamination equipment?

Fire fighters and hazmat teams strongly prefer that NST be used as a standard for decontamination equipment, as 95% responded “Yes” to this question. This response is higher than the overall results, where 84% responded “Yes”.

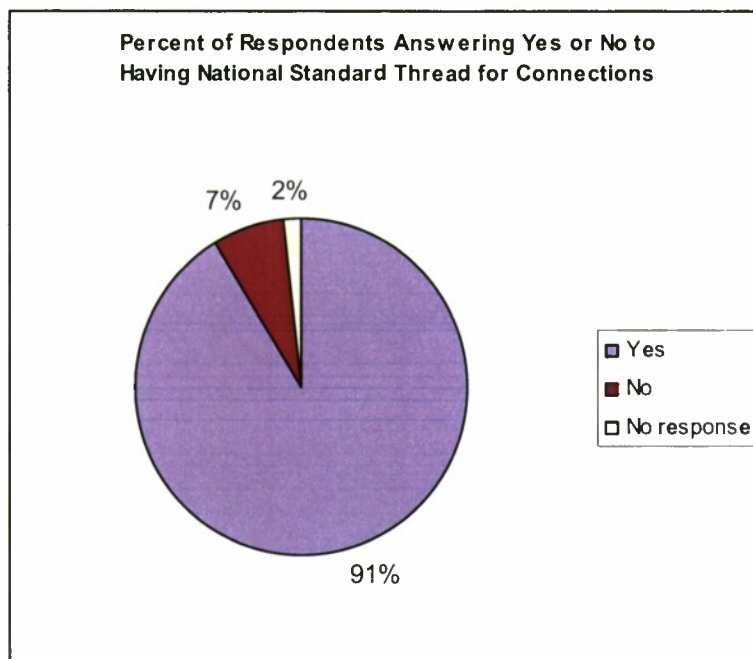


Figure 29. Percentage of Respondents Answering Yes/No to Using NST for Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

This response is similar across EPA regions, with the lowest positive response from Region X being 85% (Table 31).

Table 31. Differences Between EPA Regions in Whether the NST Should Be Used in Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Who Want NST to Be Used in Decontamination Equipment
I	95
II	95
III	90
IV	95
V	95
VI	90
VII	90
VIII	100
IX	90
X	85

First Responders had the opportunity to provide additional comments to this question. Twenty-one responders stressed the need for a common connection size, and 13 noted the need for connection adaptors. Eight noted that they wanted cam locks and quick connects.

5.9.3 Choose the top three decontamination equipment or parts of decontamination equipment that should be standardized nationally (e.g., all water in-feed hoses must be 1 ½ inches in diameter).

Overall, fire fighters and hazmat personnel clearly rated standardization of “hose connectors for the decontamination system” as their first choice. “Decontamination shelter components to allow parts of different systems to be interconnected” was rated second, and “non-ambulatory victim decontamination equipment was rated third” (Figure 30). The same comparison process described in Section 5.9.1 for hose connection sizes was used to determine this ranking preference.

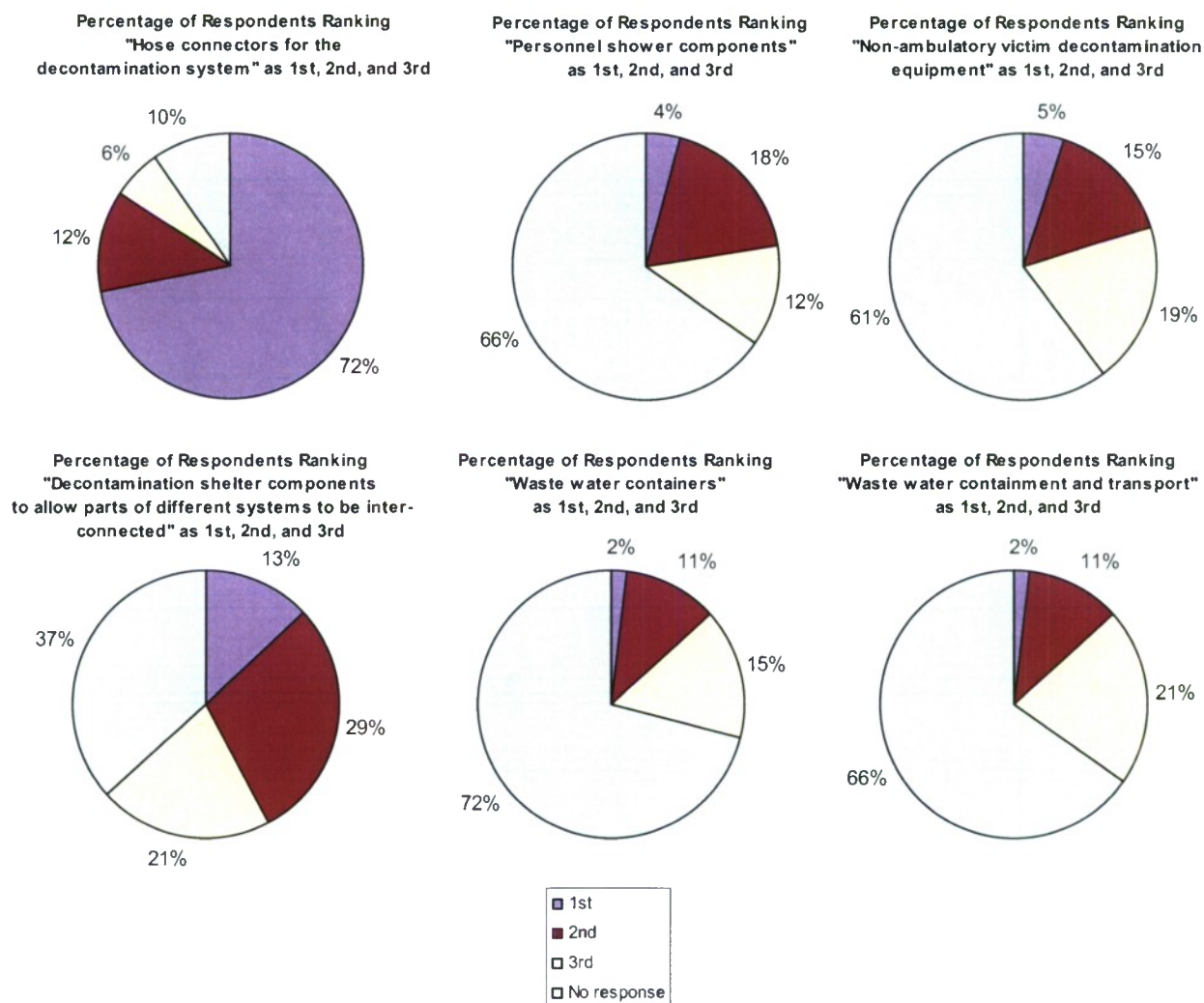


Figure 30. Percentage of Respondents Ranking Each Piece of Decontamination Equipment as First, Second, and Third; Fire Fighter and Hazmat Personnel Responses Only

Table 32 shows fire fighter and hazmat personnel preferences for each EPA region. The choices for equipment standardization that received the top three percentages of respondents are shown with 1, 2, and 3 for each region. The choices that received lower percentages for each region are shown with "--". In general, all of the EPA regions had similar preferences. Three options clearly preferred for standardization are "hose connectors for the decontamination system" and "decontamination shelter components to allow parts of different systems to be interconnected".

Table 32. Choices for Equipment Standardization; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Standardization Choices					
	Hose connectors for the decontamination system	Personnel shower components	Non-ambulatory victim decontamination equipment	Decontamination shelter components to allow parts of different systems to be inter-connected	Waste water containers	Waste water containment and transport
I	1	2	--	3	--	--
II	1	--	3	2	--	--
III	1	--	3	2	--	--
IV	1	--	--	2	--	3
V	1	--	3	2	--	--
VI	1	3	--	2	--	--
VII	1	3	--	2	--	--
VIII	1	--	3	2	--	--
IX	1	--	2	3	--	--
X	1	--	3	2	--	--

First Responders were given the opportunity to provide additional options and comments for this question. Seven First Responders noted that it will not be possible to standardize at this time. Four respondents suggested that communications (e.g., signs, language, equipment) be standardized. Additional suggestions for standardization include power connections, respiratory equipment, and detectors for post-decontamination.

5.10 Power Requirements.

5.10.1 Which types of power should be required to operate decontamination equipment?

Similar to the overall results, fire fighters and hazmat personnel prefer the use of AC and DC power, although "AC Only" and "DC or AC" also received a large number of responses. Figure 31 shows the responses for this question.

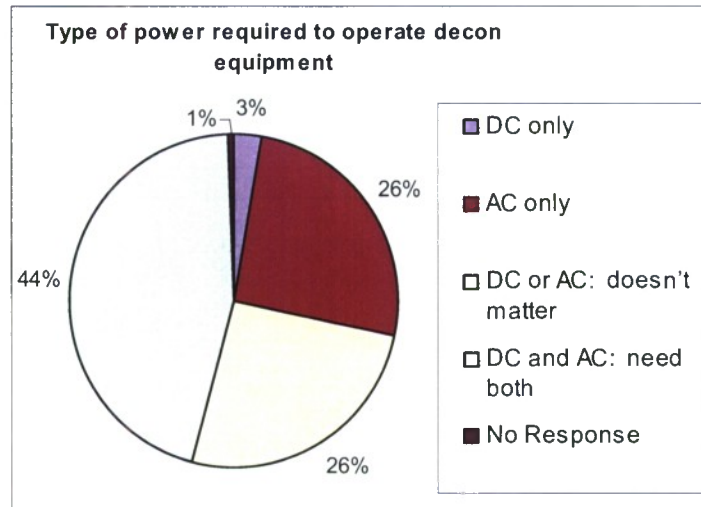


Figure 31. Percentage of Respondents Choosing Each Power Type for Operation of Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

Most of the EPA regions exhibited similar preferences (Table 33). However, an equal number of fire fighters and hazmat personnel in Region VII either preferred both or did not care whether AC or DC was used. In addition, Regions IX and X showed a higher preference for the use of AC power only. It would be beneficial to follow up with the First Responders from Regions IX and X to determine why they have this preference.

Table 33. Differences Between EPA Regions in the Power Type Required to Operate Decontamination Equipment; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing DC Power Only	Respondents (%) Choosing AC Power Only	Respondents (%) with No Preference for AC or DC Power	Respondents (%) Choosing AC and DC Power
I	0	30	20	50
II	5	25	25	45
III	0	25	30	45
IV	5	20	25	50
V	5	30	25	40
VI	0	15	25	60
VII	5	10	40	40
VIII	0	25	15	60
IX	5	40	25	25
X	5	40	25	30

5.10.2 If AC power is used, what voltage(s) should be required?

Fire fighters and hazmat personnel strongly preferred that equipment use 110-120 volts (Figure 32). This is similar to the overall results.

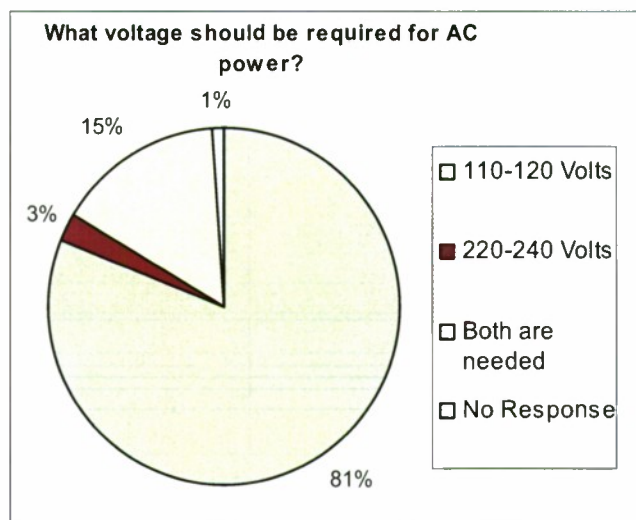


Figure 32. Percentage of Respondents Choosing Each Type of Voltage Required for AC Power; Fire Fighter and Hazmat Personnel Responses Only

Table 34 shows that the majority of respondents from all of the EPA regions have the same preference: 110-120 V. However, a slightly smaller percentage of respondents from Regions I and VIII chose the 110-120 V option.

Table 34. Differences Between EPA Regions in Voltage Requirements; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing 110-120 V
I	70
II	90
III	80
IV	85
V	75
VI	85
VII	95
VIII	65
IX	85
X	80

5.10.3 Choose the highest acceptable amperage that should be required for decontamination operation.

One-half of the responding fire fighters and hazmat personnel chose 30 as the highest acceptable amperage (Figure 33). The other one-half would be willing to have higher amperage. Overall, the majority of responses indicate that 50 amperes (AMP) or less is the highest current acceptable. This is similar to the overall results.

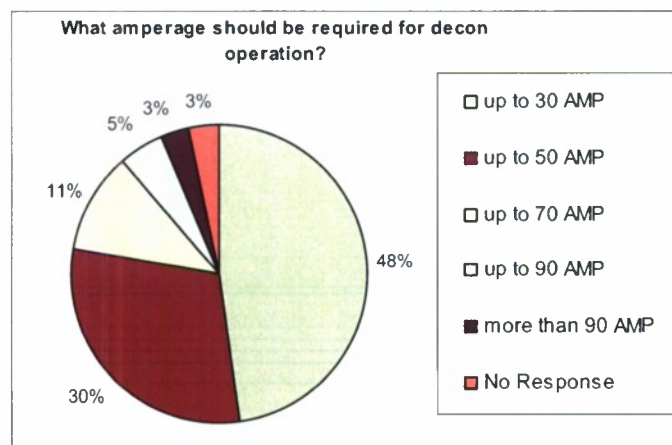


Figure 33. Percentage of Respondents Choosing Each Amperage Required for Decontamination Operation; Fire Fighter and Hazmat Personnel Responses Only

Most of the EPA regions exhibited similar preferences, as shown in Table 35. Regions VII and VIII chose the maximum 50 AMPs option over the maximum of 30 AMPs option, which is different than the results for all fire fighters, hazmat personnel, and the other regions. It may be beneficial to follow up with respondents in Regions VII and VIII to determine why they preferred the higher level of current.

Table 35. Differences Between EPA Regions in Amperage Requirements for Decontamination Operation; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Choosing a Maximum of 30 AMPs	Respondents (%) Choosing a Maximum of 30 or 50 AMPs
I	40	70
II	55	75
III	55	85
IV	50	80
V	50	80
VI	50	80
VII	35	80
VIII	35	80
IX	45	75
X	60	85

5.10.4 Should Ground Fault Interrupt (GFI) capability be required on all decontamination equipment where electrical current is utilized?

Similar to the overall results, fire fighters and hazmat personnel strongly preferred that GFI capability be used on all equipment where electrical current is used (Figure 34).

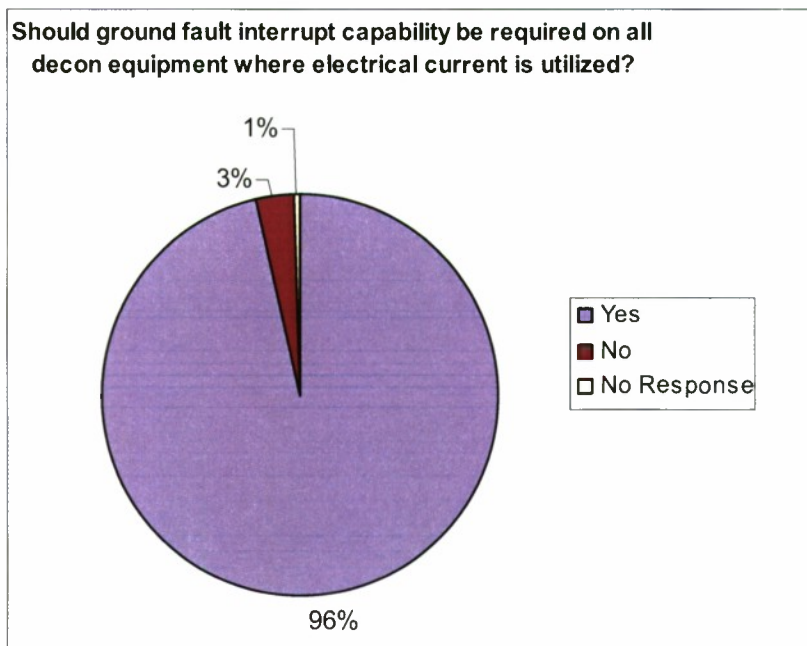


Figure 34. Percentage of Respondents Preferring GFI Capability; Fire Fighter and Hazmat Personnel Responses Only

EPA regions also strongly preferred that GFI capability be required (Table 36).

Table 36. Differences Between EPA Regions in Requirements for GFI Capability; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) Preferring that GFI Capability Be Required
I	100
II	95
III	95
IV	100
V	95
VI	100
VII	95
VIII	85
IX	95
X	95

First Responders were given the opportunity to provide comments for the question on GFI. Most comments stressed the importance of protecting users from electrical current. For those respondents who chose “No”, several noted that they already had GFI protection at their power supply.

5.10.5 Rank order the most important fuel sources for power generators, etc. to run any decontamination equipment requiring electricity.

Figure 35 shows that fire fighters and hazmat personnel preferred the fuel sources in the following order (most to least): gasoline, diesel, LPG, and multi-fuel. This order was determined using the same process used to rank hose connection sizes described in Section 5.1.9. The option, “Other Fuels”, is not shown here, and was ranked fifth. These results are similar to the overall results.

There were some differences between EPA regions (Table 37), although gasoline and diesel were unanimously preferred over LPG and multi-fuel across the United States. The table does not show that many respondents in Regions I, III, VI, and X ranked multi-fuel first (although that number was still less than those that ranked gasoline or diesel first).

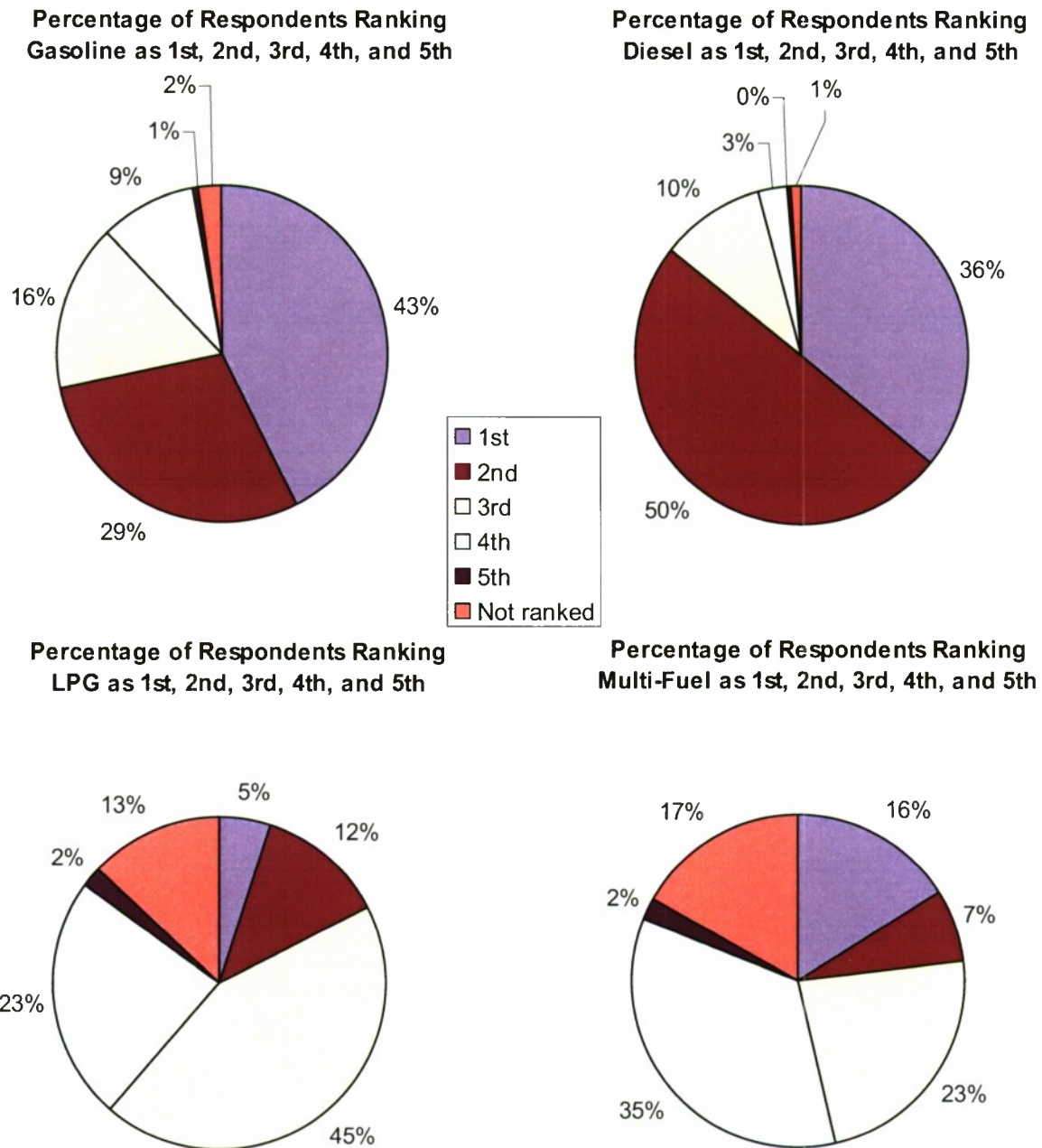


Figure 35. Fuel Rankings by Percentage of Respondents; Fire Fighter and Hazmat Personnel Responses Only

Table 37. Differences in Fuel Source Preferences Between EPA Regions;
Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Fuel Sources			
	Gasoline	Diesel	LPG	Multi-fuel
I	1	2	3	4
II	1	2	3	4
III	2	1	3	4
IV	1	2	3	4
V	1	2	3	4
VI	1	2	3	4
VII	1	2	4	3
VIII	1	2	3	4
IX	2	1	3	4
X	2	1	4	3

Respondents were given the opportunity to provide and rank additional fuel sources. Figure 36 shows the additional suggestions as well as the frequency of response for all First Responders.

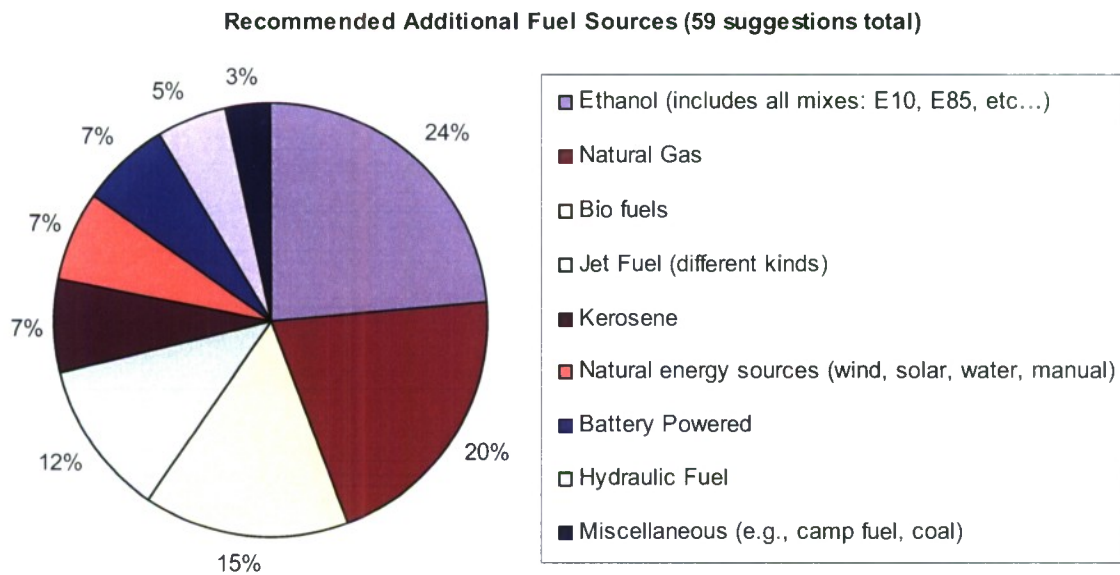


Figure 36. Additional Fuel Sources Suggested by All First Responders

Overall, most respondents ranked each of the additional fuel sources fifth. Fourteen First Responders suggested ethanol as an alternative fuel: 12 ranked ethanol fifth, and 2 ranked it fourth. Bio fuels were one of the few additional sources that was ranked first. Natural gas and natural energy sources were each ranked second.

5.11 Operational Interface.

5.11.1 Rate the importance of the following visual control displays needed when working decontamination equipment.

The displays were rated on a scale of 1 (Unimportant) to 5 (Important). Figure 37 shows the importance ratings that fire fighters and hazmat personnel chose for each type of display. Most fire fighters and hazmat personnel rated operating temperature and pressure displays as most important (5), and fuel level and decontamination solution level displays as next most important (4). These ratings match the overall results for all First Responders.

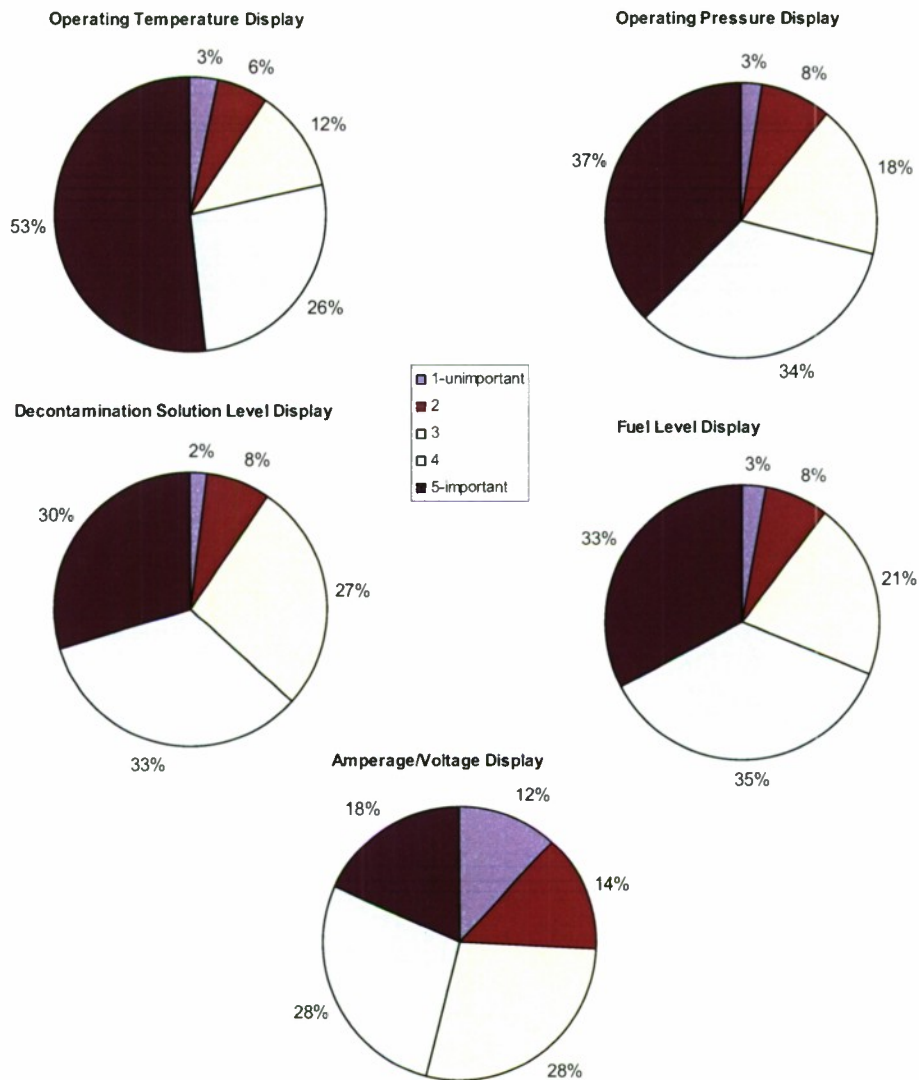


Figure 37. Ratings for Importance of Displays; Fire Fighter and Hazmat Personnel Responses Only

Table 38 provides the ratings that each EPA region assigned to the displays. These results are similar to those for fire fighters and hazmat personnel.

Table 38. Importance Ratings (I-Unimportant to 5-Important) of Displays by EPA Region; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Display Options				
	Operating Temperature	Operating Pressure	Decontamination Solution Level	Fuel Level	Amperage/Voltage
I	5	5	4	4	3
II	5	4	4	5	3
III	5	5	4	4	3
IV	5	5	5	4	4
V	5	5	5	4	4
VI	5	4	3 and 5 equally	4	3
VII	5	5	4	5	4
VIII	5	4 and 5 equally	4	4	3
IX	5	4	4	4	3
X	5	4	5	4	4

All EPA Regions agreed that operating temperature is an important visual display, whereas operating pressure, decontamination solution level, and fuel level are also fairly important. Amperage/voltage was rated less important.

First Responders were given the opportunity to provide and rate additional options for displays. Seven Responders noted that a waste level indicator is important, and six noted that low level indicators for oil, air, etc., are important. Additional displays rated as important are on/off indicators and time indicators (for billing and operating time).

5.11.2 List three examples of important audio signals/alarms needed when working with decon equipment.

The options for this question were incorrectly posted on the internet, so follow-up will be needed to determine fire fighter and hazmat personnel preferences.

5.11.3 Indicate agreement/disagreement with the following statement: The capability to pre-set equipment operating parameters and have them automatically monitored/adjusted based on those pre-set values as needed is important to successful decontamination operations.

Figure 38 shows that most fire fighters and hazmat personnel “Strongly Agree” or “Agree” with the above statement. These results are similar to the overall results.

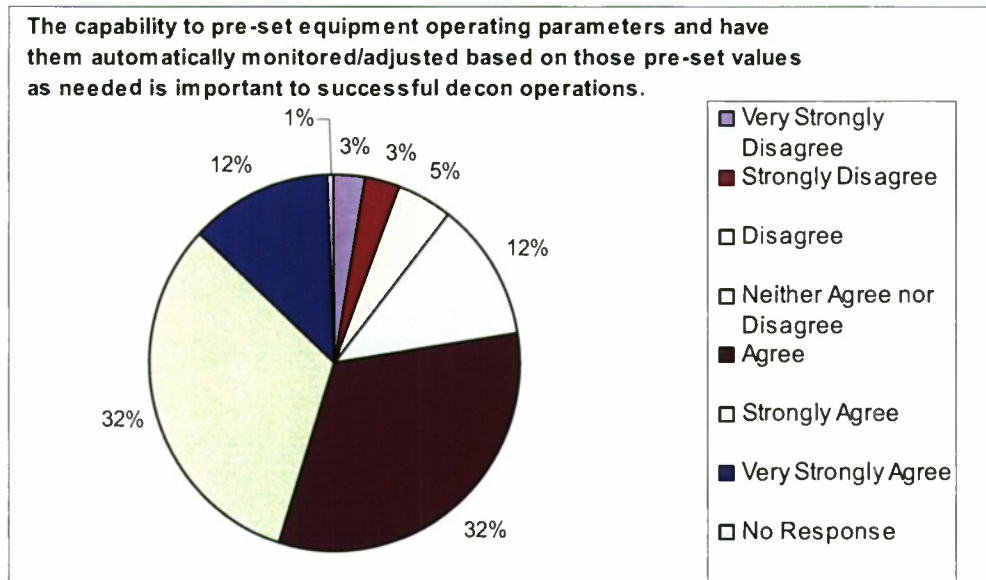


Figure 38. Percentage of Respondents Choosing Each Level of Agreement with Importance of Having Pre-set Equipment; Fire Fighter and Hazmat Personnel Responses Only

The majority of respondents (close to two-thirds) from the different EPA regions “Agree” or “Strongly Agree” that equipment operating parameters should have pre-set capability with automatic monitoring. Table 39 shows some variability in the degree to which respondents agreed with that statement.

Table 39. Differences Between EPA Regions in Agreement with Statement that Equipment Operating Parameters Should Have Pre-Set Capability with Automatic Monitoring; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) that “Agree” with the Statement	Respondents (%) that “Strongly Agree” with the Statement
I	15	50
II	20	40
III	30	35
IV	35	30
V	30	40
VI	40	25
VII	25	30
VIII	25	45
IX	30	25
X	35	25

5.11.4 How important is it to have the ability to manually adjust controls (override automatic adjustments) for key operating parameters?

The majority of fire fighters and hazmat personnel find having the ability to manually override automatic adjustments for key operating parameters “Important” or “Rather Important”. Most of the rest chose “Extremely Important” (Figure 39). This rating is the same as preferred in the overall results.

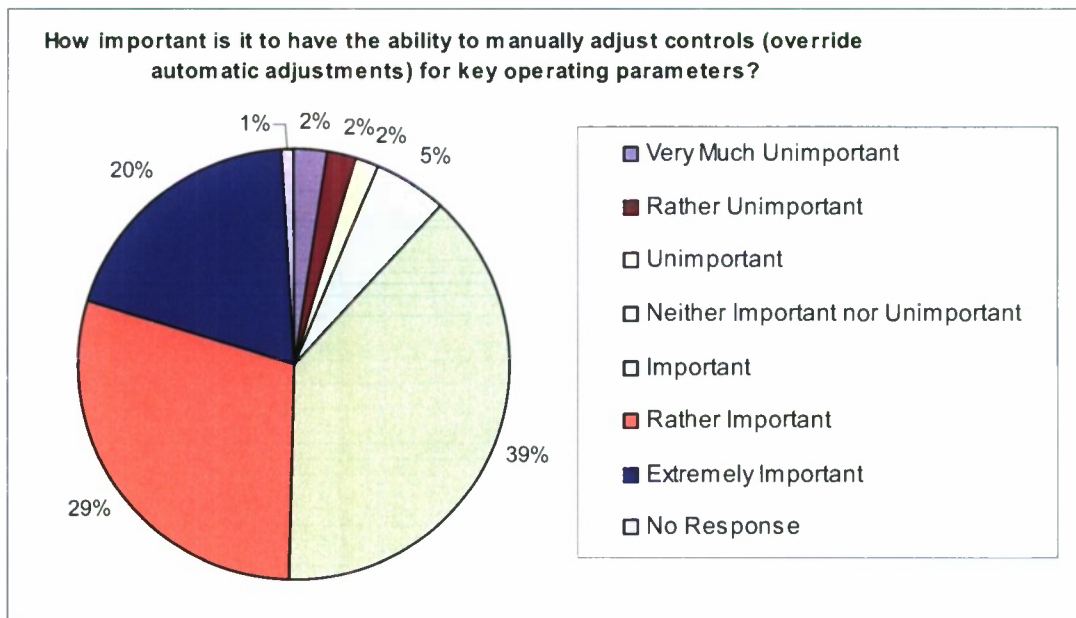


Figure 39. Importance of Being Able to Manually Override Automatic Controls; Fire Fighter and Hazmat Personnel Responses Only

The vast majority of respondents from the different EPA regions felt that being able to override automatic controls was at least “Important”. The EPA regions exhibited slightly different preferences within the top three “Important” options (Table 40). In general, the largest number of respondents from each region felt that manual override capability is “Important”.

Table 40. Differences Between EPA Regions in Agreement with Statement that Equipment Operating Parameters Should Have Pre-Set Capability with Automatic Monitoring; Fire Fighter and Hazmat Personnel Responses Only

EPA Region	Respondents (%) that Felt Manual Override is “Important”	Respondents (%) that Felt Manual Override is “Rather Important”	Respondents (%) that Felt Manual Override is “Extremely Important”
I	40	30	25
II	50	20	20
III	35	30	25
IV	35	30	30
V	40	30	20
VI	40	10	30
VII	40	45	10
VIII	35	40	15
IX	45	25	10
X	30	20	30

6. CONCLUSIONS

Overall, the survey was very successful. Eight hundred seventy-four First Responders completed the survey, and these responses included a good representation of the demographic categories of interest (i.e., types of First Responders, location, jurisdiction type, jurisdiction population size, operational knowledge and experience level, and types of equipment used and how often used).

The responses also indicated great interest in the ultimate objective of this survey (decontamination equipment standards). Seventy-five percent of respondents stated they would consider participating in a follow-on data collection effort, and they also gave permission to contact them if there were questions about their survey responses.

A significant amount of data was collected from the survey, and the quality of data was very high, as evidenced by the low non-response rates for each question and the low rate of atypical answers. There was also good representation within the sub-group of fire fighters and hazmat personnel.

Overall, the results showed some interesting trends, such as the difference in preferences for hose connection sizes and operating temperature across the United States. The trends should be useful in developing standards for decontamination equipment. A brief summary, which includes trends, of the results for fire fighters and hazmat personnel is provided below.

- Importance of Characteristics: Ease of Use and then Time are the top two ranked characteristics.

- **Time:** The longest acceptable time to set up equipment after arriving on-site is split between 6-10 min and 11-20 min. It should take 1-5 min to decontaminate one person, anywhere from 11-30 min to decontaminate 10 people, and 41-60 min to decontaminate 100 people (although many respondents were not concerned if decontamination of 100 people took longer than 60 min).

- **Ease of Use:** Many respondents felt it should take no more than 3-4 First Responders to set up and operate decontamination equipment. Respondent opinion on the number of hours required to certify personnel for decontamination equipment operation was split among 1-8, 9-16, and 17-24 hr. Recurring training to maintain certification should require no more than 4-6 hr every other month.

- **Reliability/Maintainability:** Decontamination equipment should successfully operate for more than 4 operations before needing non-routine maintenance. The largest number of respondents prefer that decontamination equipment should not require routine maintenance more than every 9-12 months when not in use (although almost one-half of respondents selected the shorter timeframes, every 1-4 or 5-8 months).

- **Operational Conditions:** The respondents were fairly equally distributed among the five minimum temperature options, although almost half would accept equipment that remains functional to >10 °F. Most respondents felt that decontamination equipment should operate in up to 110 °F conditions, and at wind speeds up to 30 mph.

- **Transportability:** Most respondents want equipment to be transportable over unpaved terrain up to 301-750 ft, and individual transportable components to not exceed 41-60 lb.

- **Consumable Resources:** Fuel should last at least 7-12 months. Active technical decontamination consumables should last at least 7-12 months (although many chose the >24 month option as well) and require at most partial environmental controls. Supplemental decontamination items should last longer than 24 months and require no environmental controls.

- **Human Factors:** Noise levels within 25 ft of equipment should not exceed 80 db (although almost 40% would not want noise levels to exceed 70 db). Manufacturers should provide signage with their equipment, and the signage should be simple and easy to understand for people of all reading levels and language backgrounds. Respondents felt that the public could perceive chemicals from the decontamination process as waste, and risk of physical injury/unsecure decontamination site as unsafe. Most respondents suggested better communication to mitigate public concerns.

- **Interoperability:** Hose connections should be 1 ½, ¾, or 2 ½ in. in diameter. Several respondents suggested the use of quick connects, and suggested different connection sizes such as 3 or 5 in. Respondents strongly felt that National Standard Thread should be used. The top three choices (in order) that respondents want standardized are: hose connections on decontamination equipment, decontamination shelter components to allow parts of different systems to be interconnected, and non-ambulatory victim decontamination equipment.

- **Power Requirements:** Decontamination equipment can require either AC or DC power at 110-120 V. Up to 30 AMPs of AC power can be required (although many respondents were satisfied with up to 50 AMPs of required AC power). Ground Fault Interrupt is an important capability to have. Gasoline and diesel were the top two (in order) recommended fuel sources. Ethanol and bio fuels were the alternative fuel sources most suggested by respondents.

- **Operational Interface:** Decontamination equipment should have operating temperature and pressure displays. Other important displays are decontamination solution levels, fuel levels, and amperage/voltage levels. Respondents suggested that waste level indicators are also important, and agreed that having automated monitors on equipment is important. Respondents also agreed that it is important to be able to override automatic controls for key operating parameters.

Self-directed surveys have some limitations (e.g., not conducive to asking follow-on questions), so there are some data gaps. Specific follow-on questions that should be asked in any additional data collection effort were noted throughout the report. For example, for the question “What is the highest wind speed in which decontamination equipment needs to remain functional?”, the answer varied among the EPA regions. Follow-up questions would help determine why 22% of regions said equipment only needed to remain functional for wind speeds of 20 mph or less, whereas 15% said equipment would need to function in wind speeds exceeding 40 mph.

Feedback on outliers would also be useful. For instance, while most respondents gave Time a high ranking (1, 2, or 3), some people gave it a 10. Follow up is needed to determine whether the outliers were mistakes, or if respondents who gave it this ranking have some other perspective that others have not considered. Further analysis, such as a focus group technique, is recommended to collect this information and similar missing data. Although more time-intensive, a focus group would allow a more in-depth discussion of the characteristics important to First Responders.

In summary, answers to fundamental questions have been quantified; and where the questions have not been completely answered, the range of possible answers has been narrowed. The survey also provides an understanding of data gaps and the additional follow-on questions that need to be asked. A strong foundation has been set for additional data collection that can support the development of decontamination equipment standards.

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APPENDIX A – OVERALL SURVEY RESULTS

First Responder CBRN Decontamination Equipment Survey Preliminary Results 15 November 2007

Overview:

The following report was provided to the Standards Development Team in November 2007 to summarize the preliminary results of the survey for all First Responders. This report's purpose was only to document a summary of the results; no analysis of the responses was done for inclusion in this report.

The main body of this preliminary report provides the percentages for responses that have been calculated for each question. The response that received the highest percentage is highlighted in green. The sub-appendices include the comments First Responders made to the open-ended questions.

The section numbers and question numbers do not match the survey as it was posted on the website. However, all of the questions and possible responses have been copied into this report, so comparison to the original, posted survey should not be necessary.

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1. IMPORTANCE OF CHARACTERISTICS

Question 1: This question asks that you rate the following characteristics of decon systems. Please rank these items from your 1st choice (most important) to 10th choice (least important) by checking the appropriate columns. Input your ratings below:

Rank	Percentage									
	Time	Ease of Use	Reliability / Maintainability	Operating Conditions	Transportability	Consumable Resources Required	Human Factors	Interoperability	Power Requirements	Operational Interface
1	31.7%	34.4%	11.8%	4.3%	3.1%	1.5%	5.7%	3.2%	2.1%	2.2%
2	22.7%	31.1%	18.0%	7.7%	4.6%	1.8%	5.0%	4.6%	2.4%	2.2%
3	12.9%	12.9%	25.4%	17.5%	8.9%	4.2%	6.5%	6.8%	2.5%	2.3%
4	8.8%	7.7%	14.1%	24.1%	15.6%	6.6%	8.8%	7.7%	3.5%	3.1%
5	7.2%	3.3%	11.7%	14.0%	23.0%	11.2%	12.2%	8.4%	3.3%	5.7%
6	4.9%	2.7%	6.4%	10.5%	14.5%	22.2%	14.3%	10.6%	6.3%	7.4%
7	3.3%	1.7%	5.1%	7.6%	10.3%	16.0%	19.2%	14.9%	10.9%	11.0%
8	3.0%	1.4%	3.9%	5.7%	7.9%	14.0%	11.2%	22.2%	17.5%	13.3%
9	2.4%	2.5%	2.7%	4.6%	6.6%	11.2%	9.7%	12.9%	29.9%	17.4%
10	3.1%	2.2%	0.9%	4.0%	5.5%	11.2%	7.2%	8.8%	21.6%	35.5%

TIME: required to decon civilians and first responders (i.e., throughput rate) from point people first enter decon station until they exit last station; required to set up equipment from point you arrive on site to being operationally ready; includes “warm-up” time, e.g., time to heat decon solution.

EASE OF USE: while using/operating equipment (takes into account number of steps and people needed, also includes how complicated steps are and how intuitive equipment is to use); while setting up equipment (includes number of steps, parts, and people needed, also includes how complicated steps are and how ergonomically well-designed equipment is).

RELIABILITY/MAINTAINABILITY: includes the equipment’s quality, durability/robustness, ease of repair, and frequency and complication of required maintenance.

OPERATING CONDITIONS: the ability of the equipment to operate in most or all environmental conditions (e.g., high winds, extreme humidity [including rain], extreme cold or heat).

TRANSPORTABILITY: the combination of the size/volume, weight, and packaging of equipment. Includes moving equipment from storage location to contaminated site, including possible requirement to move equipment cross-country (e.g., across an open field)

CONSUMABLE RESOURCES REQUIRED: the type of consumables (e.g., fuel, filters) and amount of consumables needed, shelf-life (under expected conditions), and storage conditions (required for reasonable shelf-life), and time consumable may be used after being first opened.

HUMAN FACTORS: the combination of all factors that make the equipment satisfactory to use or perceived as safe to use by first responders or the public, such as reasonable water/decon solution temperature, acceptable smell (e.g., of decontaminants), noise level (e.g., of power generator), and use of equipment against body (e.g., brushes).

INTEROPERABILITY: all the factors that allow and/or make it easier to use equipment from/with other Decon Teams (e.g., use same type and size connections, same type of power, fuel used).

POWER REQUIREMENTS: the combination of the type of power (i.e., DC, AC, none required), source of power (e.g., gasoline, diesel, LPG, multi-fuel [e.g., kerosene]), and amount of power required (e.g., 15 AMP, 30 AMP).

OPERATIONAL INTERFACE: the combination of displays and signals that allow for constant feedback to determine that equipment (e.g., water pressure gauge) is operating properly and allows for operator(s) to determine when equipment starts malfunctioning. Also includes the controls to reset operating parameters or to make manual adjustments to ensure proper performance.

Optional Comments on Ratings: See Sub-Appendix A

2. TIME

Question 1: After you have arrived on-site it is important to be able to set up equipment in not more than:

Response	Percentage
1-5 min	10.4%
6-10 min	35.4%
11-20 min	37.4%
21-30 min	12.9%
>30 min	2.5%
No response	1.4%

Question 2: It is important to be able to decon one ambulatory person within:

Response	Percentage
1-5 min	45.4%
6-10 min	30.8%
11-15 min	15.4%
16-20 min	5.1%
>20 min	1.8%
No response	1.4%

Question 3: It is important to be able to decon 10 ambulatory people within:

Response	Percentage
1-10 min	6.2%
11-15 min	25.1%
16-20 min	23.1%
21-30 min	25.4%
31-40 min	15.3%
>40 min	3.5%
No response	1.4%

Question 4: It is important to be able to decon 100 ambulatory people within:

Response	Percentage
1-10 min	0.6%
11-20 min	3.3%
21-30 min	10.9%
31-40 min	14.4%
41-60 min	33.2%
>60 min	36.0%
No response	1.6%

3. EASE OF USE

Question 1: Upon arrival on-scene, setup of all decon equipment within required time constraints should require not more than _____.

Response	Percentage
1-2 first responders	14.2%
3-4 first responders	53.5%
5-6 first responders	21.5%
7-8 first responders	5.9%
>= 8 first responders	1.7%
No response	3.1%

Question 2: Operation of all decon equipment should require not more than _____.

Response	Percentage
1-2 first responders	9.5%
3-4 first responders	43.1%
5-6 first responders	27.9%
7-8 first responders	13.2%
>= 8 first responders	3.1%
No response	3.2%

Question 3: What is the maximum acceptable level of required training for certifying decon equipment operators?

Response	Percentage
1-8 hr	23.1%
9-16 hr	25.6%
17-24 hr	20.4%
25-32 hr	8.2%
33 to 40 hr	14.1%
41 to 48 hr	2.3%
49-56 hr	2.9%
No response	3.4%

Question 4: What is the highest acceptable frequency of recurrent training to maintain certification of decon equipment operators?

Response	Percentage
Daily	0.2%
Weekly	1.1%
Every other week	1.0%
Monthly	23.5%
Every other month	70.5%
No response	3.7%

Question 5: What is the longest acceptable length for each session of recurrent training to maintain certification of decon equipment operators?

Response	Percentage
1 to 2 hr	30.7%
4 to 6 hr	40.8%
6 to 8 hr	18.4%
8 to 10 hr	5.6%
12 to 14 hr	1.5%
No response	3.0%

4. RELIABILITY/MAINTAINABILITY

Question 1: What is the minimum number of actual decon operation(s) (of at least 12 hr each) that equipment must operate as intended without any expected preventive maintenance or repairs other than routine post-incident care and cleaning?

Response	Percentage
1 decon operation	10.8%
2 decon operations	20.7%
3 decon operations	15.9%
4 decon operations	15.9%
>4 decon operations	33.0%
No response	3.8%

Question 2: How often should recurring maintenance be required on decon equipment when the equipment is not being used for an incident or training? Please choose the smallest acceptable interval.

Response	Percentage
1-4 months	18.8%
5-8 months	25.9%
9-12 months	35.0%
13-18 months	7.7%
>18 months	9.0%
No response	3.7%

5. OPERATIONAL CONDITIONS

Question 1: What is the highest ambient temperature in which the decon equipment needs to remain functional?

Response	Percentage
≤ 90°F	2.9%
≤ 100°F	17.6%
≤ 110°F	38.3%
≤ 120°F	27.3%
> 120°F	9.6%
No response	4.2%

Question 2: What is the lowest ambient temperature in which the decon equipment needs to remain functional?

Response	Percentage
≤ 30°F	17.5%
≤ 20°F	19.7%
≤ 10°F	15.0%
≤ 0°F	20.6%
> 0°F	23.5%
No response	3.8%

Question 3: What is the highest wind speed in which the decon equipment needs to remain functional?

Response	Percentage
≤ 10 mph	2.1%
≤ 20 mph	19.8%
≤ 30 mph	34.9%
≤ 40 mph	22.8%
> 40 mph	16.2%
No response	4.2%

6. TRANSPORTABILITY

Question 1: The greatest distance I would need to be able to move my decon equipment from the end of a paved road to get it to the contaminated site (e.g., across an open field) is ____.

Response	Percentage
1-300 ft	27.0%
301-750 ft	27.8%
751-1500 ft	20.4%
1501-2500 ft	7.4%
> 2500 ft	12.8%
No response	4.6%

Question 2: The maximum acceptable weight for individual transportable components of the decon of equipment is ____ lb.

Response (lb)	No. Responding (%)
1-25	3.7
26-40	23.8
41-60	41.0
≤ 61-80	19.1
> 80	7.9
No response	4.6

7. CONSUMABLE RESOURCES

Question 1: What shelf-life would you expect for the following types of consumable resources? Please choose the shortest shelf life you would find acceptable.

Response	Fuel	Active Technical Decon Consumables	Supplemental Decon Items
1-6 months	34.7%	4.7%	1.3%
7-12 months	41.2%	27.7%	3.8%
13-18 months	7.2%	16.8%	5.9%
19-24 months	4.5%	18.2%	10.6%
>24 months	6.9%	27.0%	72.8%
No response	5.6%	5.6%	5.6%

Please specify other if used: see Sub-Appendix B

Question 2: What do you believe are the most restrictive long-term environmental storage conditions for consumables that you could reasonably expect from a vendor?

Response	Active Technical Decon Consumables	Supplemental Decon Items
No controls needed (e.g., acceptable for consumables)	18.2%	58.4%
Partially controlled environment needed ($\geq 32^{\circ}\text{F}$ but $\leq 85^{\circ}\text{F}$, not controlling humidity)	55.5%	20.7%
Normal office environment type controls needed (fully heated and air conditioned facility)	18.5%	13.7%
Special environmental conditions required (e.g., refrigeration)	2.3%	1.5%
No response	5.5%	5.7%

Please specify other if used: see Sub-Appendix C

8. HUMAN FACTORS

Question 1: It is important that the noise level within 25 feet of the equipment be no higher than _____.

Response	Percentage
≤ 70 db (equals sound of busy street traffic)	35.5%
≤ 80 db (equals sound of vacuum cleaner)	41.0%
≤ 90 db (equals sound of small orchestra)	12.6%
≤ 100 db (equals sound of walkman/iPod at max level)	4.6%
≤ 110 db (equals sound of front row of rock concert)	0.1%
≤ 120 db (equals sound just below threshold of pain)	0.2%
No response	6.1%

Question 2: Should manufacturers be required to supply appropriate signage (directional, pre/post decon, etc.) as part of their decon equipment?

Response	Percentage
Yes	81.7%
No	12.5%

Yes/No Comments: see Sub-Appendix D

Question 3: Do you believe there is anything the general public might perceive as unsafe about decon operation or use of decon equipment?

Response	Percentage
Yes	51.8%
No	42.9%

Question 4: What are 3 things that the general public might perceive as unsafe about decon operation or use of decon equipment?

Comments: see Sub-Appendix E

Question 5: What have you done in an attempt to mitigate any or all of these items? Please describe successful and unsuccessful ideas, as well as ideas you have that you might not yet have tried.

Comments: see Sub-Appendix F

9. INTEROPERABILITY

Question 1: Select your top three choices for necessary hose connections when working with decon equipment.

Response	Percentage				
	¾" threaded	1" threaded	1 ½" threaded	1 ¾" threaded	2 ½" threaded
1 st	29.10%	10.30%	31.80%	9.30%	4.20%
2 nd	15.10%	23.30%	19.50%	10.20%	16.40%
3 rd	16.50%	11.30%	20.60%	8.40%	23.90%

Other Ranked 1st/2nd/3rd: see Sub-Appendix G

Question 2: Should NST (National Standard Thread) be used as a standard for decontamination equipment?

Response	Percentage
Yes	83.5%
No	6.9%

Yes/No Comments: see Sub-Appendix H

Question 3: Select your top three choices for decon equipment or parts of decon equipment that should be standardized nationally (e.g., all water in-feed hoses must be 1.5 in. in diameter).

Response	Percentage					
	Hose connectors for the decon system	Personnel shower components	Non-ambulatory victim decon equipment	Decon shelter components to allow parts of different systems to be inter-connected	Waste water containers	Waste water containment and transport
1 st	65.4%	4.1%	5.1%	11.4%	1.5%	2.4%
2 nd	10.5%	15.9%	14.1%	28.9%	10.5%	9.5%
3 rd	6.8%	12.0%	18.5%	18.0%	12.7%	19.5%

Other Types of Decon Equipment Ranked 1st/2nd/3rd: see Sub-Appendix 1

10. POWER REQUIREMENTS

Question 1: Which type(s) of power should be required to operate decon equipment?

Response	Percentage
DC only	2.3%
AC only	20.3%
DC or AC: doesn't matter	23.9%
DC and AC: need both	45.2%
No Response	8.4%

Question 2: If AC power is used, what voltage(s) should be required?

Response	Percentage
110-120 Volts	71.2%
220-240 Volts	2.7%
Both are needed	17.4%
No Response	8.7%

Question 3: What amperage should be required for decon operation? Please choose highest amperage rating that you would reasonably require.

Response	Percentage
up to 30 AMP	40.2%
up to 50 AMP	28.8%
up to 70 AMP	10.8%
up to 90 AMP	5.6%
more than 90 AMP	2.7%
No Response	11.9%

Question 4: Should Ground Fault Interrupt (GFI) capability be required on all decon equipment where electrical current is utilized?

Response	Percentage
Yes	88.3%
No	3.2%
No Response	8.5%

Yes/No Comments: see Sub-Appendix J

Question 5: Rank order the most important fuel sources for power generators, etc. to run any decon equipment requiring electricity.

Response	Percentage				
	Gasoline	Diesel	LPG	Multi-fuel	Other Fuels (Specify Below)
1 st	37.4%	31.7%	5.0%	17.0%	0.2%
2 nd	28.1%	44.1%	10.9%	7.3%	0.5%
3 rd	16.1%	12.0%	37.5%	21.4%	0.9%
4 th	7.8%	2.7%	24.4%	29.6%	2.2%
5 th	0.6%	0.2%	1.5%	1.9%	18.2%

Other Ranked 1st/2nd/3rd/4th/5th: see Sub-Appendix K

11. OPERATIONAL INTERFACE

Question 1: Rate the importance of the following visual control DISPLAYS needed when working with decon equipment:

Response	Percentage					
	Operating Temperature	Operating Pressure	Decon Solution Level	Fuel Level	Amperage/Voltage	Other (please specify)
1-Unimportant	3.4%	1.7%	1.7%	1.9%	10.9%	1.0%
2	3.8%	7.1%	4.9%	5.9%	14.4%	0.3%
3	14.9%	16.1%	19.8%	17.2%	26.2%	0.9%
4	24.0%	31.8%	32.6%	36.6%	23.5%	1.1%
5-Extremely Important	45.1%	34.4%	31.9%	29.6%	14.2%	2.1%

Other rated 5-Extremely Important/4/3/2/1-Unimportant: see Sub-Appendix L

Question 2: List 3 examples of important audio SIGNALS/ALARMS needed when working with decon equipment:

NOTE: THE POSSIBLE RESPONSES FOR THIS QUESTION WERE INCORRECTLY POSTED IN SURVEY MONKEY.

Question 3: The capability to pre-set equipment operating parameters and have them automatically monitored/adjusted based on those pre-set values as needed is important to successful decon operations.

Response	Percentage
Very Strongly Disagree	1.9%
Strongly Disagree	3.0%
Disagree	3.7%
Neither Agree nor Disagree	11.4%
Agree	30.1%
Strongly Agree	30.3%
Very Strongly Agree	11.0%
No Response	8.6%

Question 4: How important is it to have the ability to manually adjust controls (override automatic adjustments) for key operating parameters?

Response	Percentage
Very Much Unimportant	2.2%
Rather Unimportant	2.1%
Unimportant	1.6%
Neither Important nor Unimportant	6.2%
Important	36.4%
Rather Important	25.9%
Extremely Important	17.0%
No Response	8.7%

12. DEMOGRAPHICS

Question 1: Are you a: (check all that apply)

Response	Percentage
Firefighter	50.1%
Police Officer	16.1%
HazMat Team member	47.8%
SWAT Team member	4.5%
Emergency Medical Technician (EMT)	34.9%
Bomb Squad Team member	2.1%
Emergency Room Personnel	2.9%
Other	23.3%

Other professional types: see Sub-Appendix M

Question 2: Your primary job title is: see Sub-Appendix N

Question 3: Jurisdiction type:

Response	Percentage
City	33.4%
Township	10.3%
County	22.0%
State	5.3%
Territory	1.0%
Tribal	0.3%
Federal	4.7%
Other	13.5%
No Response	9.5%

Other jurisdiction types: see Sub-Appendix O

Question 4: Approximate population of your jurisdiction is:

Response	Percentage
≤ 10,000	22.8%
10,001 to 100,000	36.3%
100,001 to 250,000	10.3%
250,001 to 500,000	7.0%
500,001 to 1,000,000	4.9%
> 1,000,000	9.3%
No Response	9.5%

Question 5: Your decon operation knowledge and experience level is:

Response	Percentage
Very Experienced (participated in many actual decon events or training exercises)	34.7%
Knowledgeable (responded to actual decon event(s) or have hands-on training)	45.5%
Not Very Knowledgeable (never participated in an actual event, have limited training)	10.3%
No Response	9.5%

Question 6: Type of decon equipment your organization has: (choose all that apply)

Response	Percentage
Basic (e.g., multi-purpose equipment such as wading pools, garden hoses, horse brushes, bleach decon solution)	37.6%
Between Basic and State-of-the-Art	45.8%
State-of-the-Art (e.g., dedicated self-powered vehicle with on-board equipment specifically developed for decon operations)	13.4%

Note that 4.5% of respondents chose more than one of the above options, and 9.5% did not respond at all to this question.

Question 7: Number of times your organization has used each type of decon equipment for a hazardous materials incident or hands-on training in the last 2 years: (note number of times for each type)

Response	Percentage		
	Basic (e.g., multi-purpose equipment such as wading pools, garden hoses, horse brushes, bleach decon solution)	Between Basic and State-of-the-Art	State-of-the-Art (e.g., dedicated self-powered vehicle with on-board equipment specifically developed for decon operations)
0 times	16.6%	30.5%	65.2%
1-3 times	35.2%	30.7%	13.6%
4-10 times	23.3%	20.5%	8.1%
10-20 times	8.4%	4.9%	2.2%
>20 times	7.0%	3.9%	1.4%

Note that 9.5% of people did not respond at all to this question.

Question 8: Describe the functionality/capacity of your current decontamination equipment (include brand/model if you wish): see Sub-Appendix P

13. FOLLOWUP

Question 1: Would you consider participating in a follow-on effort to continue to determine standard-level requirements for decon equipment?

Response	Percentage
Yes	67.7%
No	20.6%
No Response	11.7%

Question 2: May we contact you if we have any questions about your responses?

Response	Percentage
Yes	65.4%
No	22.5%
No Response	12.0%

Additional Comments: see Sub-Appendix Q

Blank

Sub-Appendix A. Section 1, Question 1

Comments on the Importance of Characteristics

1. A unit I saw from "Mobile Responder" seemed to be right on the money. Worth looking into.
2. All 15 State of Oregon Hazmat team have the same equipment
3. All critical requirements. Difficult to prioritize one over the other except that the bottom line is to decon personnel. Anyone can be a show stopper and not acceptable.
4. All of these are important. A 10 for me is still very high in importance.
5. I would consider all of these categories first or second choice.
6. As many items as possible need to be easy to replace from local hardware and parts stores. Specialty items and connectors should be kept to a minimum.
7. CBRN Respiratory Protection Equipment should be compact/lightweight. Recommend C420 PAPR with Tight Fitting Facepiece for maximum protection.
8. Communications should be added to this list as this may be one of the most important factors in decon
9. Ease of use and ability for the crew to understand how to make it function - primary purchasing points
10. Ease of use, time to set up, and effectiveness of the decon system are pretty close to the same priority.
11. EFFECTIVENESS IS #1
12. Extremely low-level (ppb) measurements & readings is critical.
13. First responder and public safety first, everything else will fall into place and if we need to adapt we will
14. First, decon must be broke into to phases, emergency decon and formal decon. Arrival on the scene with decon requirements can begin with emergency decon procedures that could be set up in a matter of min for purposes of life safety for responders and the public. Then, the formal decon procedure can be established for long-term required emergencies. You did not mention monitoring the area or sampling which are also important priorities when establishing the initial perimeters for zones and long term response.
15. Hard to put an exact order of importance...a lot of #2's
16. Human factors are always #1 priority because product must be safe to use. All other priorities should be ranked based on the impact on the likelihood that the product will be used effectively when needed. I ranked interoperability last because different teams may have different needs.
17. I do not agree with the questions ranking process! Many of the questions should have a 1st or 2nd ranking. You have skewed your data by requiring 1 through 10!
18. I find all of these to be extremely important. As an acquisition officer, I cannot rate one less than another. To rate these (one more than the other) doesn't make any sense.
19. I have always considered "time" as the prime for decon ops; especially when you are in a Mass Decon scenario.
20. I have never used decon equipment so I rated this on what I know and how I feel the importance of these steps are
21. I like TVI decon systems
22. I would have liked to rank several items as similar in importance due to many outside influences can change the order at which you encounter each one aspect and need to make changes among other items to accomplish the mission. Limiting one aspect more than the other without being able to say why limits the value of this survey due to constraints of the selection and ranking process.
23. I'd rate these all a ten.
24. Impossible to rate one aspect that requires the other 9 are available and are working properly.
25. It is nearly impossible to rank these factors because they should all be within the first three considerations.
26. Items 1-5 are all #1 mostly due to short staffing & lack of funding. Solve those two issues and the rest is cake.
27. It's hard to rate because everyone could be the most important. To me they should all be the most important (1)
28. Most important is the amount of time needed to get the system operational
29. Not a good survey tool as there are several key factors - none that is more or less than the others yet this scale requires they be placed so... Invalid Tool
30. not easy.....very close
31. Several of these factors would actually have the same rating. I would suggest the ability to do that on the future
32. Smaller print so that all choices fit in the screen window making it easier to look at whole list at one time

33. Some of the choices are very close.
34. Some of these comments will depend on if there is already an interoperable component within your area.
35. Some of these items are of greater importance that the checked box indicates. Some are of equal importance.
36. Speed of set up is a huge factor.
37. The ability to have communications that allows both voice commands to be heard while wearing a PAPR and also radio use is vital to a NBC event. I would rate it fourth on the list!
38. The ability to isolate victims and first responders from the hazardous fumes or particulate during the response.
39. The degree of what the equipment can do and whether it can do it without harming people or the environment are the most important questions in decontamination.
40. The first five priorities are actually of equal need.
41. The number of people it is able to decon during a specific time versus cost should be an important factor. Decon systems need to be simple, durable and able to operate in all conditions.
42. The question is flawed by the fact that many parts of the question rank a high response, but I had to down grade my response, IE interoperability is very important but now has a low rating.
43. This is a fixed facility
44. This question is too broad. On my widescreen, I still could not see all of the ten options top to bottom and had to scroll. You should have considered breaking this down into bigger chunks. Human factors, interface and ease of use are all the same question if you back up and look at the bigger perspective.
45. This rating system is not practical as a method to determine priorities of the various characteristics. Numbers 1-3 are all high priority items and can easily be rated interchangeably depending on the rater's perception or imagined scenario. All listed characteristics are more reliably subjective rather than objective, again, depending on the raters experience, training, imagination, etc.
46. This was difficult as 1-4 are of equal importance Human factors was twofold as safety is of utmost importance but smell and water temp are of least importance.
47. This was difficult to rank them - all of these items are important.
48. Time and ease of use are critical. We can make the system work with other systems as necessary. My primary concern is getting it set up and starting to effectively process victims as quickly as possible.
49. Time saves lives
50. Unfortunately, one of the key issues is cost. It doesn't matter how good a system is if the user cannot afford it.
51. We have NO CRBNE decon equipment available at our location
52. We need a system that is easy to setup, can be used many times, and is durable. It needs to be compact and be able to handle most events
53. Zumro is the best tent.

Sub-Appendix B: Section 7, Question 1

Consumable Resources: Other Types of Consumables

1. Access to manuals on paper since electronic means are not always available
2. Antidotes & First Aid Supplies
3. Any
4. Associated responder PPE
5. Audiovisual training materials (portable personal DVD players, DVD's, etc.) for first timers (civilians-youth-etc.) or people who may replace trained personnel in event of their death or after a NBC event...aka 'end of world' scenario
6. Batteries
7. Batteries
8. Batteries for PAPR's
9. Batteries, filters, testing reagents
10. Battery life
11. Bleach should NOT be used on patients. The danger far outweighs the benefit (if any)
12. Booties, gloves
13. Brushes, contaminated clothing receptacles, etc
14. Calibration gases/sensors for CBRN detection instruments.
15. Cartridges, batteries
16. catch basins/brushes
17. Clothing such a Tyvek or other for civilians
18. communication equipment and its batteries
19. decontamination verification tests
20. everything should be at least 5 years, except fuel
21. filters
22. Filters, disposable catchment pools, etc.
23. filters, hoses
24. first aid supplies
25. General hardware
26. Gloves
27. Gloves
28. Gloves/etc
29. HEPA filters for RPAS and batteries
30. HEPA Filters, etc.
31. Hoses & tarps
32. hoses, bladders, and tents
33. Hot & cold packs for victims, comfort items etc.
34. lithium batteries/ filter cartridges
35. LPG
36. MRE's, Hydration Fluids, Disposables
37. none
38. PAPR batteries
39. PAPR Cartridges
40. PAPR filters
41. Polyatomic Oxygen generators
42. PPE
43. PPE
44. PPE
45. Propane lasts forever!
46. Putty, passive consumables
47. Rebreather, Air Tanks, test kits
48. Respirator canisters
49. respirator cartridges and batteries
50. Respiratory Protection Equipment Filter Cartridges Batteries
51. respiratory protection filters and atmospheric monitoring sensors
52. RPE PAPRs, Batteries, Face Masks, Head Coverings
53. Rubber items, Gloves, brushes, hoses, Tyvek suits,
54. sand, gravel "clean" dirt
55. sensors for detection equipment
56. Shelter
57. Specific decon solutions
58. Sturdy Stable Misc. Items Vacuum Sealed pouches
59. suits
60. Support equipment: Hose, brushes, buckets, containers, etc.
61. tarps, nozzles and adaptors, flexible tubing, etc.
62. unknown
63. unopened mask filters etc
64. WATER

Sub-Appendix C: Section 7, Question 2

Consumable Resources: Other Types of Consumables

1. Acids
2. All rubber items, Hoses, Tyvek suits.
3. As noted above.
4. Batteries for equipment
5. batteries, filters, testing reagents
6. Brushes, bags, etc can be vacuum sealed in airtight bags for better storage
7. Communications equipment and PAPRS
8. Cost effective PAPR hoods that withstand temperature variations
9. Decon equipment, i.e., tents, hoses
10. Decon trailer (self contained)
11. Decontamination suits
12. Electronics are unreliable after frequent and repetitive power fluctuation, UPS's will be needed to clean AC power and provide continued power should there be a wide spread power outage. Components of electronic equipment degrade with use and/or dirty power!
13. Filters, disposable catchment pools, etc.
14. General hardware
15. hoses, tents, bladders
16. Misc
17. Most of our items are stored in a trailer outside in extremes during most of the year.
18. PPE
19. PPE
20. PPE
21. PPE and respirator canisters
22. Reality is that everything may be stored in a trailer outside.
23. respiratory protection filters and atmospheric monitoring sensors
24. Respiratory Protection Equipment Batteries and Filter Canisters
25. Sand, gravel "clean" dirt
26. See # 1
27. Suits, Boots, Gloves
28. This is a fixed facility (hospital) environmental controls are a storage issue not a show stopper
29. Tyvek suits etc
30. verification equipment
31. WATER
32. Water heater must be drained out to prevent freeze damage
33. Worst case disaster conditions-airdrop freefall and or dumped at sea type conditions

Sub-Appendix D: Section 8, Question 2

Human Factors: Should signage be required?

“Yes” Comments:

1. A great idea; however, we must make the cost reasonable to purchase equipment.
2. Absolutely
3. Also, ear protection should be required if db's are too great.
4. As long as it is removable or directional
5. Basic international signage needs to be developed for comprehension at the lowest level- that of public civilian 6th grade level at least so that the use and survival needs of untrained personnel can be maintained. We focus on specialists only be able to operate items when they may not be present or surviving. Focus on the youth being able to function for societal survival. Get youth involved and use their insight. Adults are often too inside the box. As for sound levels, it needs to be at lowest levels due to threat environment and its possible attraction of threats, also maintain lowest IR signatures.
6. Basic signage should be supplied. More detailed / specific signage should be the responsibility of the local operator.
7. Consider young children and non-readers - clowns and balloons for kids' tents and illustrations rather than words
8. Each Manufacturer should be required to post a Standing Operational Procedure booklet with instructions that are easy to follow as part of the decon equipment.
9. Easily screen printed on materials but does add to cost
10. Enter/Exit, Men/Women, Handicap. These can be a heavy Laminated or plastic sign. The sign and the decon tent could have Velcro on them so signs could be exchanged at will
11. Have available for custom application
12. I believe that will aid new members of the decon unit to utilize equipment they have heard of or seen during training and apply them to an operation
13. I have yet to see a dedicated decon team. Many responders train however, never know who will be assigned at any particular incident.
14. I would want everything included in a package. Except for fuel and liquid decontaminating agents.
15. It always helps to have directions close by in-case there are less trained personal, volunteers, etc.
16. It is always helpful to have proper signage, saves time!
17. Language used should be based on the population served. need to have brief explanation as to the goal of decon and how it is protective of the population
18. Make it as simple as possible
19. Manufacturers know how their equipment operates and best know what type of signage and directions to uses.
20. Minimal signage with pictographs preferred to multiple language.
21. Multi Language
22. Must be bilingual and have pictures for those who cannot read.
23. Noise should be contained to one side, access and working area should be on the opposite side if possible. Noise barriers (vehicles, etc.) could be used to minimize the intrusion. Too much noise = bad communication = poor effectiveness
24. Only where this info is critical for proper use of the equipment. I prefer using generic equipment that can be setup and used at multiple stations along the decon process. Requires less spare parts, training, and familiarization.
25. Per customer request
26. Pictographs in lieu of having to utilize multiple languages
27. Pictures and multiple languages with the interpretation on back. Rolls of these such as the NBC placard that DOD uses, i.e., Bio/Chem, etc.
28. Provide generic Signage to allow for different configurations.
29. Removable signage so that configurations can be altered if need be.
30. Setting up signage separately takes extra time. Attached signs help orient equipment for set up and save several min.
31. Should be part of the package.

32. Signage would help the small departments
33. Since many purchasers/end users of decon equipment do not use the items except for training, and often have to support/be supported by other small response agencies, the signage coming with the equipment will lessen the number of pre-deployment and on site duties and checks.
34. Standardization across the board for everyone
35. Sure would be helpful and it should be deconnable
36. They are concerned about safeguarding valuables and modesty.
37. They designed the system, they should provide needed directional devices
38. This is a critical part of the problem. Direction of frightened people by other people in moon suits and face masks just adds to the confusion. Large signage and those Tensabarriers like in banks and theaters would go a long way, especially if they were ruggedized to withstand a CBRNE decon agent and quick to deploy (i.e., pop out signs).
39. This makes things much more consistent and one less thing we need to worry about making sure is in kits before/after their initial use.
40. We end up having to purchase the signs anyway. It would be helpful if they would sell the tent, equipment, and signs as a package.
41. Would create a smooth transition for the flow of the decon corridor

“No” Comments:

1. Appropriate signage should be the requirement of the agency and the type of decontamination being used.
2. Bilingual instructions should be available as an option. Required instructions may conflict with responder/agency procedures and would be difficult to make all hazards.
3. But it's a good option
4. Can be created by purchaser to fit SOPs
5. Each service component (Army, navy, Air Force) has different ideas on the best way to decon
6. Each situation is going to be so different that signage for one incident may not work for another so you would have too many signs to carry around.
7. I don't like the work required in this case. It might be a good option to have; however, it would likely limit the equipments use.
8. It would be nice. In a agricultural environment all decon scenes different
9. It would increase cost for departments that have such signage already. Include as an option.
10. Not all signage will be the same for each team using.
11. Not everyone will need the same signage. Perhaps they could supply a certain number of signs that are specific to the needs of that customer
12. Offered as an option.
13. One never knows how many and what types signs are needed. The operating agency should have an agency supply of signage.
14. Provide as an option
15. Required no, recommended yes
16. Responders should be able customize signage for regional and cultural diversity.
17. Should remain customer responsibility to maintain multi use / multi scenario capability for equipment
18. Signage needs to be available, but also field customizable to allow for command choices
19. Signage should be required only when it is critical to operation of the intended equipment. Responding agencies/organizations need to ensure that all of the equipment has been appropriately integrated into their decontamination system and that any signage deemed necessary has been fitted into the operation of the system as a whole.
20. Signage should not be a requirement due to the multi-cultural atmosphere that a team may be working in.
21. That should be left to the employing agency since their operators, unless trained from factory reps, may misinterpret directions or specifics.
22. The equipment itself would serve as the "draw".
23. The final configurations of how the equipment is set up should be left up to the agency using the equipment. Therefore the number and type of signs should be left up to the agency and part of their developed protocol.
24. These are value added accessories.

25. Too many variables for equipment. Equipment needs to remain modular and adaptable to be used at any station in the decon process.
26. Would be a great selling point
27. yes, if direction is important to proper operation

Neither Yes nor No:

1. Not required; but custom durable signage (multi language and/or pictographs) available to fit sleeves or attachment points on equipment.

Sub-Appendix E: Section 8, Question 4

Human Factors-Public Concern: 3 things the public may perceive as unsafe.

Listed 1st:

1. "What happens to the hazardous material after I am decontaminated?" I've had to explain the neutralization process many times.
2. a general fear of the unknown and what will occur in the decon process
3. Ability of the operation crew
4. agents used
5. air borne contaminants
6. Air contamination
7. Air Quality
8. AIR quality
9. Allergies
10. Allowing runoff to flow on the ground
11. Ambient Temperature
12. Ambient temperatures
13. Any electrical equipment near water source
14. Any run off
15. Anything sprayed on them.
16. Are the victims getting "clean" enough?
17. Becoming Nude
18. Being exposed to contaminated water (e.g., collection pools under showers)
19. Being treated with chemicals
20. bleach
21. By-products of DECON
22. Can it be proven that they are decontaminated?
23. chemicals used
24. Chemical exposure from decon solutions
25. chemical run off
26. Chemical Run-Off
27. chemicals
28. Chemicals
29. chemicals
30. Chemicals
31. Chemicals
32. chemicals being used
33. chemicals being used
34. Chemicals Used
35. chemicals used
36. Chemicals used
37. Chemicals used could harm public
38. Chemicals used for decon
39. Chemicals/cleaning agents used
40. cleanliness / spread of contamination from past use
41. cleanliness of the water
42. cleanliness
43. climate
44. Close contact with other patients
45. cold water
46. Cold/freezing weather usage
47. Common shelter
48. Complete Contamination
49. control of waste
50. Containment of decontamination products (water, soap, etc)
51. Containment of effluent
52. Contaminated Run-off control.
53. contaminated water
54. Contaminated run-off
55. Contamination by unknown water source.
56. Contamination caused by run off
57. Contamination Containment
58. Contamination Issues if used Incorrectly
59. contamination within the space
60. Contamination of water sources
61. Cross contamination
62. cross contamination
63. cross contamination
64. cross contamination
65. cross contamination
66. Cross contamination
67. Cross contamination
68. Cross Contamination
69. cross contamination
70. Cross contamination
71. Cross contamination
72. Cross contamination
73. Cross contamination - multiple victims being processed through one location
74. Cross contamination between exposed parties and bystanders
75. cross contamination with human, animal life, and endangered species
76. Cross contamination
77. cross-contamination from one person to the next person
78. Decon "Chemicals" may harm them
79. Decon agents
80. decon chemicals
81. Decon Chemicals
82. decon chemicals
83. decon chemicals spray
84. Decon consumables
85. Decon in a tent with other doesn't give the general public a good feeling of safety and security.
86. Decon in adverse weather

87. Decon materials used
88. Decon solutions being harmful to the skin
89. decon solution
90. decon solution toxicity
91. Decontaminants will be hazardous to their health
92. Decontaminates being used
93. Decontamination is something that they have never experienced
94. Decontamination Solution What Is It?
95. Delay in getting setup - might be better of going to nearest hospital
96. detergent – i.e., bleach or other caustic or acidic cleaners
97. detergents of chemicals being used to decon their loved ones, including children
98. Disposal of captured contaminants
99. disposal of the water
100. Disposal of waste water
101. disrobing
102. distance
103. Does it work, "Am I really Clean"
104. Does not adequately work to provide decon
105. Does the process really work?
106. Does this really work?
107. Don't understand the process
108. Due to lack of education they may believe the solution/technique is ineffective
109. Effect of decon solution. The public is concerned it may be harmful on the skin or eyes.
110. Effectiveness
111. Electricity to lights and some water heaters
112. Electrocution hazard
113. enclosed
114. enclosed tents causing claustrophobia- consider small, high windows
115. entering decon where chemicals may remain
116. Environmental conditions, especially extreme cold
117. Environmental Contamination/residuals
118. environmental damage
119. Environmental damage
120. Environmental extremes
121. EQUIPMENT MALFUNCTION
122. exhaust or escape of hazards
123. Exposure Risk
124. exposure to cold especially and decon 'chemicals'
125. Exposure to contaminants left by other decontaminated individuals
126. Exposure to decon chemicals
127. Exposure to Decon Chemicals
128. exposure/ cross contamination
129. Fear of airborne cross contamination, perception is reality
130. Fear of contaminated consumables
131. fear of contamination
132. fear of cross contamination if they enter decon equipment after someone else
133. Fear of Leakage , coming from Decon Pools
134. Fear of the unknown style or look of the equipment
135. Fear of unknown
136. fear of unknown
137. fear of unknown
138. Fear of unknown chemicals involved in incident or decon procedures
139. Fear that the material is not being removed
140. flimsy barriers delineating contaminated zone
141. fuels
142. Further contamination
143. General anxiety over the entire incident
144. General fear because they have been contaminated.
145. General misunderstanding of the entire process
146. Getting wet with unfamiliar substances
147. Going into a enclosed tent/trailer. Unknown environment.
148. Government experimentation or 'men in black' conspiracy thoughts provoke their fear of its use.
149. grey water
150. Grey Water Storage/Disposal
151. ground contamination
152. group environment
153. Harm the environment
154. Harsh Chemicals being used to decontaminate
155. Has it been tested/calibrated correctly?
156. Having to strip
157. Hazardous materials are- hazardous!
158. Hazardous Materials Exposure
159. Hazardous Waste
160. Hazardous waste entering environment by run-off
161. health
162. High volumes of water spray
163. hk
164. how waste disposed
165. How will the contaminants and "run off" be handled and properly disposed of?
166. If Chemicals are used how safe are they
167. If it really works, do you go from dirty to clean and how can you tell
168. If they need to be decontaminated then they are already afraid of anything else that "could" happen to them.
169. If they see it at all they think they are in the wrong place and therefore contaminated, FEAR of UNKNOWN
170. Improperly controlled run off

171. Inaccurate information, not knowing what is happening or why they need decon
172. In ND, outside temp/ or conditions
173. Inadequate efficacy
174. Ineffective or does not completely decon
175. Inhalation effects AFTER exposure and decon of the agent used and as well the decon agent.
176. Injuring people being decontaminated with water spray or brushes
177. Is it effective?
178. Is the agent safe to use on me?
179. Is the contaminated material being safely removed from the decontamination site
180. Is the Decon safe
181. Is the solution being used getting rid of what I have been exposed to?
182. is there a hazard
183. Is there any chemicals used in deconning and are these chemicals safe?
184. is this the real thing or just a public relations "feel good" activity?
185. Lack of general knowledge of why to use decon procedures. Fear of results.
186. Lack of modesty
187. LACK OF PRIVACY
188. Lack of proficiency of decon personnel
189. Lack of understanding
190. Lack of understanding of what decon is
191. level of exposure
192. Liquid being used as it most likely will not be marked
193. Location of Decon
194. Long lines waiting to get in and go through
195. Long term effect of the decon agent
196. Long term health risks from process
197. Loss of personal items
198. Loss or damage to valuables/property
199. male/female victims same entrance-modesty issue
200. Mass decon of large group of people.
201. Mass Decon requires the doffing of clothing and we must provide sufficient personnel to ensure that children are monitored through the process if they are not with guardians
202. Materials being used to Decon Them, are they themselves hazardous?
203. Materials Used during Decon.
204. materials used to decon other than water (except high pressure), splashes to face
205. May feel they are not clean enough
206. methods applied
207. Methods of Decon
208. Might cause harm to them
209. misconception about product being used
210. modesty
211. modesty issues
212. modesty issues
213. modesty issues/disrobing
214. na
215. Noise
216. Noise
217. noise
218. noise
219. noise and activity
220. Noise level,
221. Not being able to visualize what is going on behind the protected decon corridor. (The unknown)
222. Not being decontaminated
223. not familiar with the shower system and feel uncomfortable with the standing water
224. Not fully decontaminated
225. Not knowing what Decon is.
226. Not knowing what the solutions are
227. not understanding why and what equipment that is in operation
228. open flame in view from the decon diesel fueled water heater
229. openness of decon stations/lines
230. Operational knowledge
231. Operators in protective suits/gear.
232. People are always skeptical of what they don't understand during the decon procedure.
233. Perception of dangerous decon solutions, with special concern for children.
234. Perimeter security
235. personal injury
236. Physical injury
237. PHYSICAL SCRUBBING AND ABRASION
238. Possible recontamination from other people,
239. Possible Runoff
240. Post decon waste
241. potential water contamination from runoff from decon operations
242. PPE worn by decon personnel
243. presence of dangerous material
244. presence of harsh chemicals (bleach, detergent, etc.)
245. previous contamination
246. privacy issues
247. process
248. Process is harmful/ unsafe
249. process of decon
250. Product used to decontaminate
251. products used for decontamination
252. Proper Removal of Contaminant
253. psychological effects
254. Public being forced to undress.
255. Reaction to decon solution
256. reactions to decon solution
257. Re-circulated water
258. recontamination

259. Re-contamination from previous
260. Recovery of contaminated water
261. Removal of clothing
262. Removing clothes
263. Responders in personal protective equipment but general public not. Responders wearing respirators but respirators not issued to general public.
264. Risk of effluents getting into water supply and watersheds
265. Risk of greater contamination from other victims, water run-off, etc.
266. Risk of hypothermia/cold water
267. run off
268. run off
269. Run off
270. run off
271. Run Off
272. Run off
273. run off
274. run off
275. Run Off
276. Run off & walking thru it.
277. run off not contained properly
278. Run Off of used chemicals etc
279. Run off of wash water
280. Run off solution
281. Run off.
282. runoff
283. Runoff
284. Runoff
285. runoff
286. Runoff
287. Runoff
288. run-off
289. Runoff of chemicals
290. Runoff of material
291. safe guarding of valuables
292. Safety & security of mingling both genders in less than modest cover
293. Safety of byproducts of process (air, water, soil contamination)
294. sanitary conditions
295. Secondary Contaminates
296. secondary contamination
297. Security of property
298. Seeing someone in Level A suit
299. Skin absorption of undesirable products that are not "Green"
300. Skin or other allergic reaction to decon chemicals
301. Slip
302. slippery services
303. Slippery Surfaces
304. solution
305. Solution used
306. solution used
307. Solution(s) used
308. Solutions
309. Some may have difficulty stepping in our out of pools
310. SOUND
311. sound
312. Spread of contamination from run off
313. Standing in contaminated water or runoff from previous decontamination.
314. Sterile Conditions
315. storage of hazmat articles (fuel, chemicals) used in the decon process
316. storage of waste
317. suits
318. television perception
319. Temp.
320. That it does not work
321. That it may destroy the environment and human life.
322. That it might not kill what its supposed to
323. That some solutions might not be safe on their skin
324. That the decon operation itself is unsafe. Most will flee the site without decontamination.
325. That the use of decon equipment is ineffective
326. That we are using chemicals to do decon
327. The chemicals use to clean them
328. the decon agents
329. the decon solutions
330. the decontamination solutions
331. The exposure to the open environment
332. The fact that you have to decontaminate somebody
333. the factor of fear to the unknown
334. The noise of equipment operating.
335. The procedure
336. The process itself, cross contamination from non ambulatory
337. the sight of it
338. The sight of the set up is scary in itself
339. The site of hazmat responders in CBRNE might cause a perception of environmental dangers to them.
340. The solutions used
341. The uncertainty of use and lack of knowledge of procedures.
342. The uneducated public does not always understand what you are doing therefore wrong assumptions could be perceived as unskilled operations.
343. The unknown
344. the unknown, the thought of going into something and not know where it comes out.
345. The use of chemicals on their bodies.
346. The use of water on water reactive products

347. Their lack of understanding
348. Their personal welfare - we are asking them to become naked
349. Their safety
350. They a
351. They are not familiar with decon process
352. They may not have confidence in the results or fear spray water
353. They may question the safety of decontamination solutions and liquids used
354. their health
355. thoroughness of the decon process
356. Time for decon to begin
357. Time involved to adequately DECON.
358. Time to get the public decontaminated
359. toxicity
360. training of responders
361. Type of and level of use of decon chemicals
362. type of detergents
363. Type of Equipment Used for Mass Decon Such As Fire Hose Streams
364. Types of chemicals being used
365. types of chemicals or cleaners used
366. Unclear instructions and clearly defined entry and exit points
367. undressing,
368. unfamiliar environment
369. Unfamiliar with decon operations
370. Unfamiliar
371. unknown agent
372. unknowns
373. unsafe assembly
374. use of unknown chemicals
375. Use of bleach or other decontaminants
376. use of bleach....especially after the first couple of patients are injured by someone using it
377. Use of Chemical suits and respiratory protection
378. use of chemicals
379. use of chemicals
380. use of combustibles in area
381. use of decon chemicals
382. use of decon solutions e.g., bleach, neutralizing agents
383. Use of Toxic Chemicals possibly worse than contaminant
384. Use of unknown decontamination solutions or ones considered toxic like bleach.
385. volatility of decon solutions
386. Was equipment properly decontaminated, meaning can it be fully trusted
387. Washing in cold weather
388. waste byproducts and their disposal
389. Waste fluid
390. waste water
391. Waste Water
392. Waste water production
393. waste water seeping into sewer systems or ground
394. Water quality
395. Water Runoff
396. water run-off containment
397. water source
398. Water spray causing injury
399. Water Temperature
400. Weather
401. What are you using to decon them?
402. what chemical is in the water -- is it organic?
403. What effects the "decon" will have on the person
404. What happens to the water runoff?
405. what happens to the water that is used in decon?
406. What is being used?
407. What is it going to do to me
408. What materials are involved ie bleach, detergents
409. where does the contaminated water go
410. Where is the discharged decon fluid going?
411. will it cause me harm
412. Will it hurt?
413. will the solution used harm
414. Will these procedures work?
415. Working in extremes of temperature
416. Would YOU walk naked with 2k of your best friends through an active car wash where the only people not suited up were you?

Listed 2nd:

1. "Are the decon agents safe?"
2. adequate decontamination
3. Air borne debris
4. Air contamination
5. Air exposure
6. AIR QUALITY
7. Am I completely decontaminated?
8. They were waving car brushes at you and putting your valuables into a bag.
9. Application of chemical decon solutions
10. Are they really necessary?
11. Are you sure of what I have been exposed to?
12. Assurance that all of the product is off of them
13. Being sprayed with disinfectant for a biohazard contamination

14. Bleach
15. Can the decon equipment be
16. Capacity of equipment
17. Chemical injury
18. Chemical reactions
19. Chemical reactions
20. Chemical reactions from decontaminants
21. chemical use
22. chemicals
23. chemicals
24. Chemicals
25. Chemicals used in Decon
26. Chemicals used in sprays.
27. Chemicals Used to Decon
28. Chemicals/Decon Agent in open wounds
29. Clean up
30. clean water versus dirty
31. Cleaning /decon solutions being used
32. Climate, usually cold weather
33. Claustrophobic effects of shelters
34. Clothing problems
35. Clothing removal
36. Cold
37. Common areas for the corralling of decontaminated victims
38. common decon pools
39. competency of decon crew
40. Complete removal of all clothes.
41. Concerns about the cleanliness of water.
42. Condition
43. Contamination
44. Contaminating an ambulance by doing decon after arrival at the hospital
45. Contaminating local water sources
46. Contamination of PPE in Use by responders
47. Contamination of public facilities
48. Contamination of site following decon operation
49. Control of residual liquids
50. Cross contamination
51. Cross contamination
52. Cross contamination
53. Cross contamination
54. Cross contamination
55. Cross contamination
56. Cross contamination possibilities
57. Cross contamination through pooled water in decon area
58. Damage to property
59. Decon cleaning fluids
60. Decon fluids
61. Decon products
62. Decon run off
63. Decon solutions being harmful to the respiratory system
64. Decon solution
65. Decon solutions and their side effects.
66. Decontaminating where someone has already decontaminated i.e., secondary contamination
67. Decontaminates Used
68. Delay in being notified - might result in those leaving the scene before the First Responders arrive
69. Desire to exit the scene quickly
70. Did they get everything off of me
71. discarded items
72. Disposables
73. Disposal
74. Disposal of runoff
75. Disposition of runoff & contaminated articles (clothing, etc)
76. Do decon chemicals themselves pose a hazard?
77. Does risk increase if I am not at the head of the line?
78. Does not completely remove the hazardous material
79. Drain-off or disposal of the decon materials after usage.
80. Easy directions needed without tripping or getting lost.
81. Effects of decon solutions on skin
82. Electrical cords usage near water/ use of non-water decon solutions
83. Emergency personnel
84. English as a second language
85. Environmental exposure during decontamination
86. Equipment
87. Escape of airborne contaminants
88. Exhaust gas near the decon entrance/exit
89. Experience of personnel, lack of public being informed
90. Exposure
91. Exposure decency
92. Exposure to cleaning solutions
93. Exposure to Decon Equipment
94. Exposure to environmental conditions.
95. Exposure to other people
96. Exposure to temperature extremes.
97. Exposure/Cold/Heat
98. Exposure/Leaks
99. Fall hazards
100. Fear of airborne contamination escaping from decon equipment
101. Fear of short-term pain
102. Fear of the equipment
103. Fear of the equipment
104. Fear of the equipment
105. Fear of the unknown
106. Fear of unknown
107. Fear of unknown
108. Following the process/flow of decon

109. General fear of situation
110. General safety
111. Getting further contaminated
112. Getting naked
113. Getting shocked
114. Getting the public to doff personal clothing and personal items
115. Getting wet in the middle of winter
116. Ground spillage
117. Groundwater contamination
118. Harm or lingering effects to themselves
119. Harmful to eyes
120. Harsh decon solutions
121. Having to wait their turn for decon to occur, no "instant gratification" or "instant fix me"
122. Hazardous chemicals
123. Hazardous material familiarity
124. Hazardous waste
125. Health concerns over exposure to decon solution
126. How are the by-products of the process handled?
127. How do I know that all the contaminant has been removed?
128. How does the public know if they are safe after decon?
129. How is it maintained?
130. How the chemicals are being used?
131. How their belongings are cared for/
132. How will the decontamination tent(s) and equipment be relocated if weather, winds, or safety/security threats require relocation?
133. Human exposure
134. Hypothermia
135. Hypothermia in cold conditions
136. If gases are used, the public may conceive it to be harmful to life.
137. Immediate health effects
138. Inadequate drainage
139. Inadequate physical security around contaminated zone
140. Inefficient process
141. Injury to self while operating
142. Is it contaminated already by someone/something else?
143. Is it going to burn or sting?
144. Is this sufficient, or should I see my doctor about this?
145. Items used
146. Items used
147. Lack of communication
148. Lack of complete decontamination - will take home/spread infection to family members
149. Lack of education on how to use
150. Lack of information/explanation prior to decon as what will happen and how to proceed.
151. lack of knowledge
152. Lack of knowledge of safe zones, downwind hazards, and the purpose of the decon members being in CBRNE also might cause apprehension.
153. Lack of trust in the government.
154. Lack of understanding of the process and procedures
155. Leakage
156. Leaving family members of opposite sex
157. Lighting
158. Limited capability to maintain air temperature in the operational area.
159. Liquid Spillage
160. Location of set up
161. long term effects
162. Long term environmental impact of runoff
163. Lose all belongings
164. Loss of access to personal property, esp. ID, keys, credit cards, and other items needed for daily living
165. Loss of clothing
166. Loss of modesty
167. Loss of modesty
168. Loss of personal property and being undressed
169. Loss of valuables/personal items
170. Low environmental temperature
171. Male-female interaction
172. Mass decon using cold water from a fire truck and the probability of hypothermia
173. Mass Decon with unsanitary water conditions in the waste stream
174. Materials used in the de-contamination process
175. May cause additional injury
176. Method of decon
177. Misconceptions about chemical agents.
178. Misunderstanding the need for decon
179. Modesty
180. Modesty Considerations
181. Modesty issues
182. Modesty issues
183. Modesty issues
184. Movement of employees in uncontrolled manner
185. No description of decon for modesty etc
186. No organization causing panic
187. Noise
188. Noise
189. Noise
190. Noise
191. Noise and confusion around a decon area.
192. Noise could be a factor from heating & cooling equipment.
193. Noise could harm their hearing
194. Non removal of contamination
195. Non-climate controlled environment

196. Non-functional performance
197. Not familiar or informed as to reasons for decon
198. Not fast enough
199. Not knowing what we can offer them as far decon
200. Not removing all contamination from victims
201. Nudity
202. oihio
203. Long term effect on disposal on environment
204. Operations are unsafe and may harm them.
205. Operators in military uniforms.
206. Pain
207. Pain
208. panic
209. Patients are deconned prior to treatment (open cuts, burns, etc.)
210. Personal items security
211. Physical effects of the above
212. Physical barriers of decon corridor
213. Poorly lit areas
214. Possible injury due to equipment malfunction
215. Post DECON care in temperature extremes needs to be taken into consideration.
216. Potential contamination left behind post decon
217. Power Decon Apparatus
218. Perceived Confusion
219. Prevailing Wind Factors
220. Previous person exposing them
221. Privacy
222. Privacy
223. Privacy
224. Privacy
225. Privacy
226. Privacy Issues
227. Privacy or modesty issues such as photographs while undressed.
228. Proper disposal of contaminated materials
229. Proper Disposition of Equipment
230. Proper procedure
231. Protection of Modesty
232. Proximity of operation
233. Psychological effects of being decontaminated and possible long-term affects
234. Psychological impact on neighborhood when set up and in use
235. Public Information updates
236. Public is thinking that the suit might get a tear
237. Questions on the chemicals being used for the decon process
238. Reaction to decon solutions
239. Relinquishing personal belongings, i.e., purses, wallets
240. Responders unfit and not properly trained
241. Reuse
242. Risk of scalding
243. Run off
244. Run off and environmental concerns
245. Run off or wastewater disposal
246. Run off results in pollution issues
247. Run off that they may have to walk through at the site
248. Runoff
249. Runoff issues
250. Runoff of decon material
251. Runoff or spills
252. Safety of cleaners used in decon process
253. Safety of decontaminant
254. Safety of portable equipment vs stationary decon station.
255. Safety of the device
256. Sanitary conditions of decon process
257. Sanitary issues on dressing areas
258. Seepage of Decon materials and contaminated materials into the ground/groundwater
259. Secondary exposure
260. Security of personal items
261. Shock hazard
262. Shower
263. Signage leading to unwarranted fears
264. Skin sensitivity of decon agents
265. Slip and falls
266. Slip, trip, fall
267. Slip/fall hazards
268. Slippery surfaces
269. Slips and falls
270. Slips, trips, and falls
271. Slips, trips, and falls.
272. Solutions
273. Special needs individuals (IAW Americans with Disabilities Act)
274. Spill of fuel and decontaminants
275. Spray volume
276. Spread of contaminate after decon
277. Spread of contaminate by wind/run-off
278. Spreading contaminated debris
279. Steep inclines to access decon areas
280. Structural stability
281. Sturdiness of the system
282. System
283. Takes too long to place in operation, therefore is unsafe
284. Taking cloths off in the front of the decon tent
285. Temperatures
286. Temperature
287. Temperature at time of decon
288. Temperature extremes and the use of water
289. Temperature of solutions or water
290. Temperature
291. That chemicals used in decon is hazardous to their health
292. that it is insufficient to remove the contamination

293. That it might leave a dangerous residue that will exist after the decon
294. That the materials being decontaminated could result in further contamination.
295. That they are in a safe zone and no other harm will come to them, since they are being asked to make themselves vulnerable
296. That they will be contaminated worse than they are if they go in a shower that hasn't been cleaned
297. The decon agents being used.
298. The decontaminant
299. The detergent being used
300. The human factor "sex"
301. The modesty issues are huge and while not "Unsafe" they are viewed as a constraint to decon.
302. The possibility of getting more contaminated from people who get deconned before them
303. The procedure in general
304. The removal of clothing
305. The suits and any other disposal items
306. The uncertainty about the results
307. The use of handwritten signage, or other "hurried" items would suggest limits to the knowledge of the responders
308. The use of the same equipment on every patient leaves the public guessing if there may be cross-contamination.
309. The usual conspiracy ideas.
310. The water source
311. They may feel the possibility of cross contamination is present if the design is not fluid
312. They may not understand control zones
313. Time delays
314. Too hot/too cold
315. Toxicity
316. Trained personnel?
317. transportation of waste
318. Trip hazards
319. Trip hazards & falling
320. Type of decontamination solution used in gross decontamination and thorough decontamination.
321. Types of decon agents used
322. Unfamiliar with the processes
323. Unfamiliar with the types of decon chemicals used
324. Unknown to them if/what chemicals are being used
325. Unsure of environment
326. Unsure of response during process
327. Use in temperature extremes (particularly freezing temps)
328. Use of detergents and bleach
329. Use of chemicals
330. Use of chemicals to remove chemicals
331. Use of electric
332. Use of some decontaminates (Sodium Hydroxide, Calcium Hypochlorite etc)
333. Use of too harsh substances on skin
334. Vapors of the cleaner and CBRN Agents
335. Video game idealistic perception
336. Vivid imaginations
337. Walking in contaminated water
338. Waste water from decon
339. Water being too cold or hot
340. Water being too cold on the body
341. Water pooling more than 1/2 inch inside of washing areas
342. Water pressure too high
343. Water quality
344. Water run off
345. Water spray - too powerful / aggressive?
346. Water spray and run-off
347. Water Temp
348. Water temperature
349. Water temperature and force
350. Water Temperatures / Water Pressure / Allergic Reactions to Soaps, Bleaches and Other Decon solutions
351. Water temps
352. Water Usage
353. We are making it worse
354. We are wearing level A suits and they are next to naked
355. Weather conditions, will they be properly taken care of for the conditions
356. Weather exposure
357. What are the long time effects
358. What effects the "decon" will have on the environment
359. What is being done with the waste product, equipment, contaminated ground etc.
360. What is being sprayed on them?
361. What is its effectiveness?
362. Where are the decon byproducts going
363. Where the contaminants are going?
364. Who cleans the equipment cache?
365. Who decons the decon?
366. Will I get completely clean post contamination?
367. Will it be effective, how will I know if it isn't?
368. Will it protect me?
369. Will they get their items back, like wallets and purses. Who will track these?
370. Will this system harm the victims?
371. Windblown contaminants
372. Wind direction changes
373. Working with electrically powered sources in damp/wet environments
374. Would it be better just to throw items to be deconned away?

375. You can get more contaminated by being

around others in decon line.

Listed 3rd:

1. access to area
2. actual contamination
3. actual decon trustworthiness
4. actual safety of decontamination procedures
5. Adequate decon: length of or intensity of decon
6. After Care
7. After event clean up
8. Air-carried contamination
9. allergy concerns for products
10. Amount of time needed
11. Amount of time to enter and complete decon
12. Any incident requiring decon is reason enough
13. any other hazards that may come to their mind
14. Appearance
15. Are first responders doing the decon properly trained
16. Are my privacy concerns and valuables removed from me going to follow a "chain of custody" so I later get back what belongs to me?
17. Assurance that the product is flowing back into the Hot Zone or is being collected.
18. availability of resources
19. being clustered with contaminated people
20. being required to stay at a dangerous location
21. Breathing is contaminated air/shower mist
22. causing injury
23. chance of contracting colds or flu from being wet
24. Chemical odors
25. cleaning agent
26. cleaning agent used MSDS
27. CLIMATIC EXPOSURE
28. clothing after decon
29. Clothing being removed in a public setting
30. clothing that decontaminated victims were wearing
31. cold temperature conditions
32. common staging areas
33. Communication barriers (foreign languages/first responder terminology/knowledge of incident hierarchy)
34. communication will be a factor (what just happened or is going on?)
35. Competent training and knowledge of operators
36. Concern of what will happen to their personal items
37. Confusion
38. Contact with decon liquids with skin, property and inhalation
39. Containment of wastewater
40. Contamination of response personnel during or following decon operation
41. Control of personal belongings, ID, wallets, etc... Command and Control of decontamination site to ensure all potentially or actual contaminated personnel are decontaminated. Ability to communicate to remote family members.
42. Cross Contamination between Users
43. cross contamination
44. damage to the environment
45. Damage to their property
46. decon equipment not fully "clean" after last use
47. Decon is inadequate
48. Decon personnel not acting professional
49. Decontaminants "won't work"
50. did they get it all
51. Disposable Items left on scene
52. Disposal and location of contaminated waste and water
53. disposal of equipment
54. disposal of waste products
55. Disposition of patients
56. Do they know what they are doing?
57. Effect on Skin/Mucous membranes
58. effectiveness of decon
59. Effectiveness
60. Enclosed spaces
61. environment
62. environment
63. environmental exposure (winter time ops)
64. Environmental compatibility
65. Environmental Conditions (e.g Freezing Weather After Decon)
66. Environmental contamination due to waste material leakage
67. Environmental exposure during Decon Ops.
68. environmental factors
69. environmental factors
70. Environmental impact
71. equipment
72. equipment capabilities
73. Equipment dependability
74. equipment needing decon
75. excessive water pressure
76. Exposure to elements (cold)
77. falling
78. Falls
79. Fate of the decon water if it is not contained
80. Faulty Equipment.

81. fear of "what's inside the decon facility
82. fear of chemicals
83. fear of delaying transport to medical facility
84. Fear of entering an area, that was used for a Decon Station
85. Fear of hazardous refuse
86. fear of the operators
87. fear of the process
88. Fear of the seriousness of the situation
89. fear of unknown agent
90. fear of unknown
91. fear that they are going to be scrubbed raw while being deconned
92. Field decon
93. Finally, its a WMD. Wouldn't it take WMD - strength cleaner to remove it?
94. future issues
95. Gauging when they are de-contaminated.
96. General hysteria
97. General ignorance of decon procedures and equipment might make the public feel unsafe.
98. General panic concerns with hazmat incidents
99. general perception of hazmat techs being in level I II or III gear while they are being deconned
100. general safety issues such as cross contamination
101. General slip, trip, falls
102. general unknowns
103. general worry about HazMat as a whole
104. Generally unfamiliar
105. Gray water
106. Greater level of protection for decon members
107. Group panic due to situation.
108. has decon been fully attained
109. Having to take off their clothes in public
110. hazardous waste disposal methods
111. hazards
112. Hearing and sight impaired will require special consideration to instructions and explanations of treatment as well as physically and mentally affected individuals. Don't forget "prisoners" in jails and prisons in case decon has to be done to them as well!
113. heat
114. High noise levels give a perception of danger.
115. How clean is clean?
116. How do they know they really have been decontaminated?
117. How equipment is cleaned post-op
118. How much of the chemical is being used
119. hypersensitivity to cleaning agents
120. Hypothermia
121. Hypothermia
122. Hysteria due to lack of understanding
123. If the responder has proper training and frequent training
124. If the victims are completely clean
125. If they can see you doing it they will perceive a danger
126. improper time of use
127. Inability to understand directions
128. Incomplete decon may lead to long term effects
129. Ineffectiveness of cleaning solutions to remove product
130. Injuries from slips, falls, trips, etc.
131. Injury sustained during decon
132. Is decon really effective.
133. Is it being done correctly
134. Is it being applied properly
135. is it really effective?
136. Is the decon really doing what it is meant to for them.
137. Is the equipment being used correctly by qualified personnel?
138. Is the equipment maintained and used by properly trained personnel?
139. Is the water used safe?
140. It may hurt???
141. Lack of appropriate warning signs; or signs to relieve "anxiety" of the public.
142. Lack of confidence in responders
143. lack of knowledge of public on what decon is
144. Lack of knowledge of the system
145. Lack of Training
146. Lack of training.
147. large quantities of people being forced to disrobe
148. lies & misconceptions perpetrated by politicians
149. lightweight structures falling in on them
150. limited communication capability of responders (particularly evident in many hospital decon situations)
151. Limited experience of decon teams with equipment setup in high stress events.
152. long term exposure
153. long term exposure
154. Long term health effects
155. long term health issues from decon
156. loss of privacy
157. making sure that decon is complete
158. Mixing of incompatible chemicals and decon solutions
159. modesty
160. Modesty
161. modesty
162. modesty
163. Modesty
164. Modesty and loss of valuables
165. Modesty issues
166. modesty issues

- 167. modesty issues
- 168. Modesty issues not being taken into account.
- 169. modesty people may feel intimidated or embarrassed
- 170. movement out of the hot zones
- 171. MUTAGENESIS OF DECON AGENT.
- 172. na
- 173. nearby use of electricity
- 174. noise
- 175. noise
- 176. Non-regulated temperature of decon agents or water
- 177. Not a safe/unsafe issue, but modesty for the person being deconned is a major issue as well.
- 178. not effective
- 179. Not effective in removing - i.e., ammonia & chlorine - need to disrobe completely otherwise skin burns to moist regions
- 180. not trusting our directions
- 181. Not understanding exposure and decontamination
- 182. Obstacles in the area
- 183. Odor
- 184. Old or unkempt appearance
- 185. operators
- 186. operators in high level protection
- 187. own mind, worried they will not get it off
- 188. People using equipment
- 189. perception
- 190. Personal items being stolen.
- 191. Personnel
- 192. personnel don't know what they are doing, or are not trained to proper levels
- 193. pneumonia
- 194. Poor ability to communicate between rescuers/victims due to PPE.
- 195. Possible exposure during decon
- 196. Possible riot / Civil unrest
- 197. Post-Decon clean-up
- 198. power cords
- 199. Presence of equipment may cause concerns that an event is occurring/expected
- 200. privacy
- 201. Privacy issues.
- 202. Procedures
- 203. Proper procedures used
- 204. proper training
- 205. Proximity of decon process to "clean"/support areas.
- 206. qualifications of persons
- 207. redress
- 208. reliability to effectively decontaminate them
- 209. removal and disposal of used decon sites
- 210. replacement of contaminated supplies
- 211. Residue
- 212. respiratory
- 213. Run off and capture and treatment of such
- 214. Runoff
- 215. runoff
- 216. Runoff
- 217. runoff control and disposal
- 218. safeguarding jewelry, wallets and valuable such as iPods/phones/lap tops.
- 219. safety issues
- 220. safety of chemical usage on a person
- 221. safety of equipment near a hazardous location
- 222. Safety of the products use in decontamination process.
- 223. Sanitary Issues (More than one person using the same Equipment)
- 224. Security
- 225. Security around the site.
- 226. separation of family members
- 227. Separation from children in process
- 228. Separation of family or friends
- 229. Sexual contact
- 230. skill of operators
- 231. Slip and fall hazards.
- 232. Slip or Trip
- 233. slip trip hazards threw the decon line
- 234. Slipping
- 235. slips, falls
- 236. Smells from decon solutions.
- 237. Solid waste generated during decon
- 238. Speed to get through decon
- 239. Spread of further contamination from other contaminated persons
- 240. Status of personal belongings
- 241. strange different equipment
- 242. Stripped naked in front of everyone
- 243. Stripping off clothing
- 244. temp
- 245. Temperature
- 246. Temperature of water
- 247. temperature of water
- 248. That it might pose a risk to the surrounding areas
- 249. Only military or civil defense personnel can use it and no one else.
- 250. That the use of decon chemicals are hazardous to the environment
- 251. That they are sexually vulnerable.
- 252. That we are using solutions that could hurt them as well
- 253. The "guys in moonsuits" phenomenon, "Do they know something I don't know?"
- 254. the amount of time patients may have to wait in line before it is their turn
- 255. the deconning methods
- 256. The delay of medical attention to shower.
- 257. The equipment will spread the chemical or viruses and harm life.

258. The fear of the people wearing PPE such as PAPRs and chem suits
259. The field decon won't work. I need to go to a hospital.
260. the probability of complications in conjunction with other existence health problems
261. The removal of their clothing/ protection of their dignity
262. the requirement for decon of exposed individuals
263. The setup
264. the suits the first responders wear and they do not wear anything
265. The Unknowns of why they are going through the process
266. theft
267. they are contaminated and are going to die
268. They may not understand the time (waiting) it takes to decon if mass decon is involved.
269. Trip and fall hazards around the scene
270. type of decon
271. Type of decon solutions used if they have various allergies or sensitivities
272. types of materials that are being used
273. Use of decon equipment in a makeshift setting.
274. underage victims
275. Unfamiliar with the equipment
276. unknown decon solutions (beyond soap & water)
277. unknown devices and practices
278. unknown factors
279. Unknown long term health effects of being deconned, as well as how effective decon actually is.
280. use of gasoline
281. use of solutions, and monitoring
282. Use of stiff bristled scrub brushes and scouring pads on skin
283. use of the heaters and blowers
284. wading through runoff/gray water
285. Waste water
286. water and electricity being used together in a somewhat chaotic environment
287. water contamination
288. water pressures used in decon shelters
289. We are wasting time and money.
290. What chemicals that may be used in decon
291. What effect will the chemicals used in the process have on me?
292. What exactly is being done to me
293. What happens to decon run off
294. What happens to personal property?
295. What if "it" gets in my (eyes, mouth, nose, etc)?
296. What is left in the area after the decon team leaves?
297. What kind of cost they have to bear in taxes, how governments handle the cost in replacement of supplies.
298. What will happen to my personal belongings?
299. whether or not it was adequate - time based
300. Why Decon personnel are in PPE while they are not
301. Will either of these things hurt me?
302. Will I die from it?
303. Will it clean me?
304. Wondering if the operators know what they are doing
305. workers are in PPE, something more must be wrong
306. You can be exposed to disease by field decon

Sub-Appendix F: Section 8, Question 5

Human Factors-Public Concern: What has been done to mitigate public safety concerns?

1. #1. N/A #2. N/A #3. Awareness and open exercises
2. >Orientation prior to decon - 15-second instruction and "assurance" talk. >Plenty of blankets - personnel in cold zone meet decon patients and wrap them in blankets. >Buses, ambulances, etc. for decon patients to enter to warm up and dry off. >Also set up tents in cold zone for slightly chilly days or days when it is very hot to protect decon patients.
3. 1 - Public education. We teach CPR, why not WMD? 2 - Leverage all these reality shows. Surely someone wants to do a segment on escaping a WMD. 3 - Get important or visible people to go first. Most people are sheep. If they see George Clooney getting the scrub, they may add it as a spa item....
4. 1 ongoing decon training 2 a portable environment habitat 3 heating and cooling of said habitat
5. 1- When the question comes up, I describe the neutralization process 2- explain what the decon agents are and how they are safe 3- ensure curtains are in place & modesty clothing are in place for the persons being deconned.
6. 1) Expand outer perimeter. Designate a media location 2) PIO to give updates at regular intervals. 3) Maintain post clean-up perimeter and security
7. 1) We have a supply of painters' suits and upside down hefty bags with arm holes and heads cut out. 2) We have a small supply of zip lock bags for jewelry. 3) We have one sealable plastic tub for valuables.
8. 1. Extensive pre-decon briefing 2. Demonstrate by placing decon on my own skin to demonstrate no ill-effects
9. 1. Sump pumps in collection pools to collection bladders to keep water level minimum within pools. 2. Soft brushes with liquid soap that is not harmful (e.g., liquid Dial) 3. Unable to prevent - rapid movement through the decon corridor will help.
10. 1. Catch basins, bladder systems with pumps 2. Limited use of bleach/chemicals in solutions ... use simple soaps/water for most decon operations 3. Provide delineated corridors by gender/families. Combine with individual tents.
11. 1. Containment for runoff 2. Training in correct procedures 3. scene monitoring
12. 1. Education starting early in life. 2. Use of bleach solutions to cleanup areas. 3. Keep extra space around decon areas as off limits to the public. Decon areas tend to expand as time extends. Need for extra space for storage of equipment that needs deconning before re-use. Housekeeping tends to get lax as decon personnel get tired.
13. 1. Ensure that decon procedures are not aggressive to the public. Talk the public through the decon solution to prevent any unnecessary anxiety 2. Ensure adequate temperature control in public high exposure area. 3. Reduce elevation differences throughout the decon line. i.e pool walls, shower burns water power lines etc.
14. 1. Establishment of refuge area prior to decon to explain procedures and separation sexes, non-ambulatory and immediately life threatening victims. 2. Station trained law enforcement in staging area for crowd control 3. Establish decon in controlled environments in which undressing area and decon are enclosed and separate dressing areas for sexes 4. Think outside the box, use of empty building such as vacant gyms, prison facilities, industrial buildings, hotels ballrooms with kitchen corridors and sprinkler systems, pool facilities, barns, and large parking structures with standpipes and sprinkler facilities for decon. 4. Establishment of post- decon medical evaluation immediately after decon prior to secondary staging area for transportation to holding facility, where all but non-ambulatory are taken to reunite with other family members.
15. 1. In-depth explanation prior to entering decon corridor to put people at ease. 2. Move powered equipment a little further away from decon area. 3. Prepare people prior to entering if there is obnoxious smells that they may encounter.
16. 1. Made the equipment as foolproof as can be, by having the equipment control the process, with feedback ensuring the proper concentration levels and contact times are reached. 2. Inherent to the process 3. Public would never see high concentrations of decontaminant, disperses quickly
17. 1. Mix decon agents out of public sight. 2. Use temperature control mechanisms. 3. Placing bath mats/grip pads on walking surfaces.

18. 1. Non Skid elevated surfaces to stand and walk on. 2a,b. Test and verify that temp and pressures are adequate before using Decon showers. 2c. Very difficult to achieve 3. Soap dispensers in shower corridors, disposable sanitary washcloth.
19. 1. Nothing 2. Purchased milder decon solutions
20. 1. Procure and stock the pumping equipment and proper storage containers for mitigating contaminated water accumulated during the decon process. 2. Purchase equipment that is easily relocated without having to completely tear it down and start over at the relocation site. 3. Bar code system for people and their valuables
21. 1. We had to reassure them that the detergents and or decon solutions were safe to use, but if they had a reaction to them, we would have to wash it off anyway. 2. The public was advised that if they did not get decontaminated, there could be a greater risk of continued contamination that could be more harmful to them. 3. We had to assure them that the water being used is safe to drink and did not pose any harm. The above three questions were obtained from people that we interviewed in our response area.
22. 1. We use mild tear-free baby soap as a decon solution to prevent burning of the eyes and irritation to skin. 2. We use heating and cooling equipment in an enclosed shelter along with modesty garments to protect them from both the environment and embarrassment. 3. We use bar coded tamper evident personal item bags and provide receipts to the patients.
23. 1. Use of very mild, off the shelf soaps; dilute bleach; use clear water whenever reasonable. 2. Check water temperature between each victim. 3. Purchase decon enclosures; provide don/doff decon suits for victims after decon.
24. 1-Not an issue we've run into, we don't usually work with general public. 2-Post incident environmental monitoring (long term). 3-Same as 1.
25. added a shower mat and pump system so people don't stand in water have a separate area where people may take cloths off
26. added separation materials in decon tent checking product components
27. addressing community meetings and neighborhood watches to inform them of attempts and further training and practices being completed by first responders for the betterment of their safety
28. Adequate signs in several languages. print large enough to be read at distance. traffic signs, directional signs to parking/staging areas.
29. Allow contaminated person to package their own property and seal it in a bag. de-con one person at a time.
30. An idea that has not been tried is to pre-print pamphlets explaining the decon process and what to expect and possible side effects
31. An open shower area available with just water.
32. Argue for environmentally friendly decontaminants which leave no hazards on the ground.
33. As a responder who has been decontaminated using hydrant water the risk of hypothermia is significant. On a cold day even someone who has been decontaminated with warm water is at risk because of the rate of heat transference from a wet body. Clothing needs to be provided for more than just modesty in all climates. Options that need to be considered are hats, which will quickly allow for holding heat in, and possible warm shelter/holding areas for post decon processing.
34. Asking the above and using the working solutions for your needs could result in lawsuits if not attributed to the source guys. 1. I train all my personnel simply and in minimum time and involve them in problem/solutions. 2. I involve their family members in same. 3. I develop plans of action where all personnel and family members are part of the community solution in event of disaster. If my people know their family is safe and where they are, they will not abandon the mission like the cops did in New Orleans. 4. I involve my personnel's kids and other youth in part of the problem/solution. 5. I sponsor science fair prizes and promote active participation by youth and adults in community to be part of the solution. 6. I do not take failure as a problem but as an opportunity to find an answer. 7. I plan worst scenario and look for best solution.
35. Attempt to explain to the victims what we are doing and why and the time factor. Feel that clear directions and reasons are the answer to some of the fear
36. Attended Mass Decon training with DPETAP - General Physics from Pine Bluff at Letterkenny Army Depot. (24 hour course) WMD Mass Casualty Personnel Decontamination course.
37. Awareness of public and their participation in full scale exercises
38. basic information releases and training
39. better education, scrubs versus Tyvek (I know money is an issue)

40. Big fan of water (copious amounts) and little detergent or bleach. Allow families to be processed together.
41. Booms and retention pools
42. brief all first responders to talk to each subject and explain what is going on
43. brief general public before entry
44. Brief participants as they are awaiting their turn in the decon process. Answer questions they have.
45. Briefing victims regarding the need to remove the substance from them to lessen exposure and prevent injury
46. Cache NIOSH-certified CBRN protected respirators. CBRN APER for general public. Post medical signage that advises the general public the constituents of the decontamination solution and who to contact in case physical discomfort or symptoms develop when released from site.
47. Choose the most efficient decontaminant with the least toxicity and the best environmental compatibility.
48. CLEAR MARKING OF DIRECTIONS AND TRAINING OF DECON PERSONEL IN HANDLING THE PANICING PUBLIC
49. communicate to patients in English & Spanish about the process, we can have water flowing within 3 min of a call so we can mass decon patients initially and then provide the individual showers, if needed within 15 min of the call.
50. Communication to participants of process if time allows. 1 member of decon team walk a civilian through the corridor.
51. Community education about what the procedures are in case of contamination. What the procedures are for training of responders. What is the equipment we will be using and how does it work?
52. Community preparation: what to expect in a disaster, what are the "real" dangers of a bio/chem attack, the efficiency/inefficiency of the "usual" WMDs.
53. Concerns have been brought up in EMA meetings for discussion.
54. conduct trainings and desperately request appropriate resources from state, federal and local agencies, which is takes a while.
55. Contact DNR for assistance.
56. Containment of contaminated articles.
57. Contamination Containment: Used water bladders control run-off.
58. Contaminate Devices Natural Biodegradable Decon solutions Containers to store disposable items must be part of decon sets
59. Dam Dike Divert Prevention Precaution
60. Dawn dish soap
61. De-con with clothing as much as possible Keep water temperature as close to room temperature as possible Need to do more public awareness
62. Defined corridor to funnel victims into system
63. Developed methods to ensure acceptable decontamination. Brief public on the type & possible reactions to decon solutions. Provide bilingual first responders. The first activity has been greatly improved by the use of air monitoring equipment and ph paper. The third activity has been difficult due to the lack of bilingual personnel.
64. Development of an onsite quick explanation of the process and what is being achieved
65. Dispose or clean all items that go through decon
66. Do your best to maintain control.
67. DOD ENVIRONMENT: DISCUSS THE USE OF BLEACH AND HYPOCHLORITE SOLUTIONS AS SWIMMING POOL TYPE MATERIALS TO DISPELL MISCONCEPTIONS ABOUT DECON CHEMICALS AS THESE WERE EARLY FORMS OF DECON CHEMICALS. ACTIVATED CHARCOAL IS HARMLESS AND MAY BE PASSED OUT AS SELF AID PACKS PRIOR TO ARRIVAL AT DECON STATION IF STILL CONSIDERED USEFUL AS A DECON ITEM. AS OF 3 YEARS AGO IT WAS STILL BEING FIELDIED WITH THE JSLIST WITHIN DOD.
68. drills using other than hazmat personnel for the decon individuals
69. educate the public about the procedures, and invite them to participate in a mock exercise
70. Educate the public, handle victims in a firm manner, but understanding, Advise them these personnel are highly trained to perform Decon.
71. Educate, train, publish information, show equipment at fairs etc.
72. Educated staff about public disclosure and fostered relationships with public information officers.
73. education

74. education
75. Education
76. Education
77. Education
78. Education Drills with public participation
79. education & training both books / scenarios use of common sense tried to use chemists to reason out chemical formulas very hard to change the star status misconceptions hard to teach old dogs
80. Education and demonstration of equipment and procedures.
81. education and demonstrations
82. Education The team has attended public demonstrations and Fairs.
83. Education, listening to concerns and coaching
84. Education. Special noise reduction mufflers on power sources.
85. Education/ horse and pony shows. The problem is in our rural underserved area, our DECON equipment is limited to nonexistent and is generally fire hoses and car brushes
86. Effective Interpersonal communication, i.e., Security personal talking and providing instructions. First responders communicating to victims and each other or to Command control.
87. Ensure public understands the operation thru public information. Leave light footprints across the decon field. Capture all runoff and clean decon site before leaving.
88. Establish guidelines as to type of location of decon set up. Determine proper amount and time of decon by using reference materials.
89. Exercises with media coverage of what and why to educate the public
90. Explain the term copious amounts of water to them. Demonstrate the use of pH paper to them. Show them air monitoring techniques and show them the collection system that is in place.
91. Fire department/EMA actually responsible for this operation
92. For #2, place personal items in large zippered plastic bags. Write owner's name, phone #, and e-mail (if any) on bag. Only decon or over pack item(s) in a bag if chemical monitoring / testing indicates a need to do so, i.e., actual presence of hazardous substance on the item(s). Otherwise, return the item(s) promptly to the owner.
93. Fire Department HAZMAT has containment systems in our jurisdiction and they are responsible for those things.
94. Give people enough information that they are compliant, without wasting time. Remain calm and reassuring while keeping things organized and progressing expeditiously. Remain professional in all actions, and respect our patients.
95. good pr, public education, cross train with other agencies
96. Gray Water holding bags, Sump pumps to pump transfer contaminated runoff Individual Showers
97. Have not had a spill that required decon.
98. Have not tried yet, but would consider tarping off area to contain the decon from view of public as well as to contain run off and other byproducts
99. have open houses to educate the public
100. have started a secure collection system, purchased some military clothing thru surplus program, and provide a secure area for family and patient
101. Having a team in the warm zone to answer questions, and guide patients through the process, especially the elderly and children
102. Having one responder explain what is going on over and over again as the public enters the decon area and shelters. This has seemed to help the general public as to why they are being deconed and as to what is going on. IT has seemed to help with their fear of not knowing.
103. I don't think you can, when something like that happens they have enough to think about family, work, friends and if they will live or not and how the event will effect them.
104. I have had to explain the actual use of oxygen as a friend to all life yet at the same time show how it destroys viruses and bacteria and chemicals but never harm life. In explaining to investors that heavy oxygen is not radioactive nor is it ever harmful to life. Ozone is not harmful if the nitrogen molecule is not broken and neither is O4+ oxygen molecules. People no matter what will always perceive a danger from decon equipment either that it will work or hinder or actually increase the danger. The human mind sees danger to day everywhere and technologies have increased this 10 fold.
105. I have not done any training in any of these areas.
106. I have not had to deal with this issue yet.

107. I have taken this survey and given my opinions! Along with decon personnel you will need PAO and security, someone in charge of the decon, someone to act as a go between for decon items available from Wal-Mart but not included in the decon crate and someone to handle media muppets!
108. I would funnel personnel through a simple, fast, but effective process.
109. In training courses developed by the Arizona Department of Health Services (ADHS) the use of baby shampoo or a similar product is highly recommended. use of bleach is forbidden. I asked USAMMRID why the DOD still uses bleach and was told that it was only a last resort. The ADHS train-the-trainer PPE and Patient Decontamination course is available to all hospitals state wide. ADHS works with the Municipal Medical Response City teams to ensure patient education while in the decon line. Also PIO will be putting out information on decon over the media.
110. Increased demo's in public areas so that the public has more faith in the equipment and the personnel. Increased public presentations including talks and PPT programs
111. inform the general public that the chemicals are common household items.
112. Instruction on what to expect when deconning, material used, and effectiveness. Modesty ensured Collection and return of personal belongings capture of runoff
113. Inviting public to attend drills as patients to go through decon process - works for those who attend.
114. Involve the media in its operation and use, demonstrations
115. Issue has not arisen, I am not primarily responsible for decon in this area
116. It has been addressed in agency training
117. Just try to educate public through pre-planning
118. Keep family members together, even at the cost of inconvenience. Not much can be done to convince a member of the public that the decon solution is safe unless it is pure water with soap.
119. Keep to simple household products that everyone knows. Someone has to keep a constant monitor of water temp. and pressures. Have separate decons for male and female if possible, and male and female to operate the appropriate decons.
120. Keeping the decon stations out of the public view is an easy way to lower fear. With the public information officer's need to keep the media informed and the decon station often being the only available site with action makes it attractive for the media. Community awareness and information pieces periodically in the press and on television will make the appearances of the decon team less threatening. Currently, the public only sees this type of equipment being used in foreign war news coverage and some incidents/accidents on the national news. While some shows have been aired on Discovery/History channels, a DHS special showing how first responders and specific hazmat technicians would handle a chemical incident/accident should aid in misperceptions. Knowledge is always the best defense to fear.
121. Large Ziploc bags, Male and Female Attendants, enclosed decon
122. Law Enforcement secures all valuables removed during the decon procedure. A chain of custody form is maintained. We utilize a tagging system that identifies the valuable's bag, contaminated clothing bag, and a wristlet ID. We have privacy corridors for female, males and families. Each corridor is separated into three areas, undressing, showering, and re-dressing. Recently purchased a heater for our unit to control the water temperature.
123. Level C or greater decon station workers moving up and down the line handing out cards to those waiting to be deconned explaining the whys and wherefores of the requirement for decon
124. Limited use of uncommon, technical solutions-soap & water is easily understood.
125. Local press releases and press at decon training events.
126. Lots of communication. Try to have a valet for one on one contact
127. Maintain high professional skills and reassure those you care for.
128. Making sure the sump pump operates continuously and is kept clear of any debris
129. Maybe decon water runs into a pool and then is removed by a vacuum truck and disposed of when and where deemed safe. Have not done decon myself so I have not tried or failed at it. The county has two small decon trailers but we have not been showed them or trained on them.
130. Media exposure to mass decon drills, but not given sufficient air time to explain.
131. Minimal levels of PPE for workers to allay fears; good PIO interface to provide information; easy to follow directions & signage, including the expected outcomes of decon - safer, contamination reduction
132. modesty clothing
133. Multiple wash stations, we separate a male and a female side of our decon shelter, a large enough decon shelter.
134. My dept. has no decon equipment

135. N/A
136. N/A
137. N/A
138. n/a
139. n/a
140. Need separate sides for male/female The equipment also needs to come with signage/ soft barricades, ropes etc to assist in the victim collection/for directing victims (quickly) into and through the decon process -Decon tent equipment-needs a communication out feature to facilitate the communications of people working inside the decon tent-or on the perimeter (but in PPE) -to communicate their needs/safety issues to those not in PPE--Major Gap.
141. Need to educate the population as to what to expect in a decon situation.
142. Need to have several decon tools in the tool box, based upon incident requirements and environmental conditions.
143. Newspaper articles highlighting functions and purpose. No very effective- public isn't concerned until an event occurs
144. Newspaper articles. Public Education efforts. Identifying hazards and how we would remove them.
145. no
146. No ideal currently use a mfg system.
147. no ideas
148. No progress made to date.
149. none
150. None
151. none
152. none
153. none
154. None
155. None as of yet
156. None as we do not have any equipment other than gross decon using structural fire apparatus.
157. nothing
158. Nothing
159. nothing
160. Nothing
161. Nothing
162. Nothing at this time.
163. Nothing much, tried some newspaper articles.
164. Nothing to date we have no equipment
165. Nothing yet
166. Offer assurances, calming words.
167. Once someone start through, others will follow. We would like to start a bar code tracking system with triage tags and personal items.
168. Only water or water and "dawn" used for decon Make it easy to follow path needed
169. open house displays during fire prevention week/month
170. Open-Ended Response
171. Our agency currently has no decon unit in service.
172. Our company manufactures decon equipment and is thus equipment focused. Have yet to see any "people friendly" decon ops. Haven't tried it here yet - have tossed around the kid-tent idea yet we don't make tents.
173. Our training includes the human factor, but in the time of crisis we will be depending on site personnel and communications officers.
174. Outreach education of civilians. Answering any questions honestly. Presenting outside information, i.e., manufacturer's handouts.
175. Perceptions are difficult to plan for. Using the reasonable person theory is the best. Reasonable person probably would not find anything unsafe about decon. Some may.
176. plastic windows (high enough for modesty), shelters for decon with heating and warm water, elevated pads to stand on during decon and exit
177. Practice Practice Practice. Use what we have and make the best out of it.

178. Pre-plan disposal and make unit appear non-threatening by using softened decals and wording (sometimes no wording at all is best)
179. Pretty much all are creatures of the critter - professionalism on behalf of the Team and Responders clear up #2 and #3, whereas #1 is done by having regular training and standards for our disposal contractor
180. Procedure to secure belongings in view of person being deconned.
181. Proper set of decon to eliminate runoff. Use off an inflatable decon tent to provide privacy and protection from elements.
182. Properly train our first responders
183. Provide segregated decon facilities to separate male from female. Use of a squad/gym room like concept to improve throughput. Segregate non ambulatory from ambulatory.
184. Provided training and demonstrations of the decon process to the general public.
185. PSA announcements on going education
186. public education for other responders
187. public education
188. Public Education
189. Public Education about decon and why it is important and how we protect them, ourselves and the environment.
190. Public Education about decon I think would reduce their fears. It is the unknown that makes people afraid.
191. Public Education is #1, Citizen involvement C.E.R.T., and Volunteer Reserve Medical Corps.
192. Public Education seems to work the best. Show them what it is and what it does.
193. Public education through literature, and demonstration projects
194. Public education, instant heating of water
195. Public Information - Developed a public information office to deliver information through the media outlets showing what we do, how we do it, why we do it, and how we train for it. This has been successful in all areas of response. We also conduct drills with local companies and institutions to show them what to expect. These are very successful with some businesses but others refuse to participate.
196. Public informational brochures would be useful, as would public service announcements.
197. Public training of operations during an event or incidents involving hazmat
198. Publicly advertised hazardous materials exercises and invited the public to observe. Used Citizen Corps/CERT resources to help make the general public aware of various hazardous materials risks in our county.
199. put the heater behind a piece of apparatus
200. Quick Explanation to people who are being decontaminated. (Having a Firefighter go through decon first. Telling them the personnel are trained. Equipment is checked out and is safe.
201. Quicker line -adequate redress supplies information to decon masses through pre-recorded messages
202. Readable material explaining the potential risk or lack thereof.
203. reassure your victims with qualified people
204. Regular training with a target facility. An example would be the US Post office where we conducted three separate training decons with PO staff. They installed an anthrax BDS. This helped to alleviate employee concern.
205. Runoff is captured Divided tent for undress, plan to acquire forced air propane powered heater Local PD made an integral part of the response plan
206. run-off unsuccessful depending upon location.
207. Safety Briefings
208. Scheduled training drills with LEPC and local community, incorporated signage and tent segregation. Segregation of contaminated items, i.e., clothing, water and other decon products.
209. Separate facilities for men and women. Public education. Close contact, instructions and encouragement by rescue personnel.
210. Show the general public what we do by holding annual exercises
211. Signage Education Floor mats, Cow type interlocking
212. Signage posted in decon area explaining what decon is and what products we use and what effects they may show after
213. signage, monitored personal decon activities,
214. signs stating warm water and redress area

215. Small amount of public outreach for decon. Government agencies, State and Federal need to incorporate decon essentials to the public, take a lesson from Israel. Schools need to teach shelter in place and self decon, as well as the reasons for doing these things.
216. Still trying to find ideas to get info out to the public. It is difficult to get that much info out to such a large group
217. still trying to get rest of fire department to realize we need showers in station just for dealing with regular structure fire, vehicle fire, or EMS incidents to decontaminate
218. Storm drain plugs to prevent run off of effluent.
219. Stress that the decon solutions are household items. Stress the need to be decon. Provide demonstrations to show what goes on.
220. Talking confidently with victims explaining what is happening
221. THE MABAS DIVISION I AM AFFILIATED WITH JUST RECEIVED A MOBILE SELF-CONTAINED DECON UNIT THAT SHOULD ALLEVIATE ALL OF THE ABOVE CONCERNS
222. These are ideas that have not been practiced that would greatly increase successful and efficient operations: I. Encourage facility related training with employees, managers, and first responders maximizing general knowledge based on the limited time provided for training with the following resources: i. Audio/Visual related training. ii. Hands on practical exercises on all. iii. Provide basic operational material to the public on a limited information basis to increase awareness of needs (i.e., websites, handouts, gimmicks, & etc.). Awareness and training are basic tools of success in decon operation, however, corporate support even on a minimal level is met with stubborn resistance. We need to create a user friendly program for the corporate work place. Currently, the best program for the public we have is the Shelter-In-Place procedures, which is supported by www.ready.gov. Unfortunately, this isn't as promoted as it should be in the workplace. We need to create procedures that protect first responders from scrutiny by the general public. The general public will scrutinize the decon operations less if they know what the general standards are and if they know they are given an opportunity to know where to find those standards. Of course, we have to consider the value of information security in relation to the decon operations. Equally, first responders need advanced training in public relations during decon operations focusing on sensitivity to the general public. Every citizen is a potential complaint regarding first responder interaction with the general public.
223. Three line decon shelter Heaters for water and air in the decon line Bladders for containment of decon water
224. train responders by having them role play as victims to gain an appreciation for their situation
225. train to minimize any effluent or runoff, invite the public to watch decon operation drills, and share opportunities for participation with the public
226. training
227. Training for the operators
228. Training of CERT teams on the equipment in place and processes. HAZCOM regarding solutions
229. Training the public about Decon.
230. Training, training, training!!!!
231. Training, training, training.....Telling people involved in the decon procedure what to expect during the process.
232. Tried to procure scrub suits for use after decon Using a decon foot pool after showering Using a small temporary hand rail when entering or leaving decon shower
233. Try to educate the public and have the 'at-fault' company reimburse the cost of replacing equipment and any environmental impact.
234. Try to explain the process as they enter area but this takes time and slows the process down alot.
235. Use berms to control run-off insure appropriate gear for rescuers
236. Use commercial detergent that the public can recognize such as Johnson & Johnson No More Tears shampoo. Show pictures of detergent or logo in the decon shower or line.
237. use common terms such as disinfectant, avoid scary terms such as antidote
238. Use containment ponds and cleanup contractors
239. Use of containment ponds and waste containers. Separation of de-con from public area.
240. Use of PD Tag system for personal items
241. Use only soap and water and no bleach or other more harsh solutions. Use warm (heated) water to prevent shock from too cold of water from water supply. Use sorbent pads to walk on when plastic sheets are wet.

242. Use solutions already known to public. Personal bags for items.
243. Used high temp flex hose to direct exhaust away. Bladder containment of runoff. Encourage Hospitals to install shore power and hot/cold water connections and piped discharge at designated decon points.
244. Used tents to operate pds. Properly packaged all waste prior to removal from the pds proper and movement to the waste consolidation point. Also we used 55 gal ploy drums at the pds for waste collection.
245. Using berms and dykes. Ensure the operators are trained in the uses of all decontaminates.
246. very little at this time but ensure control of runoff and movement
247. Very little public training or outreach has been done in our area.
248. water heater- not effective for water flow required Tyvek suits for modesty. separate male/female with salvage cover
249. We are working to revise our decon program now. Have not found a suitable program as of yet
250. We concentrate on soap/water solution on people. No chemical decon is acceptable on the skin for civilians in our procedures. Consideration would be given for biological concerns as warranted. The enclosed decon shelter and tempered water provides some relief from wind and lower temperatures. Elevation of the people who have been decontaminated above the water level in floor the equipment provides drainage and they can walk with less slippage on the wet vinyl(sic).
251. We don't have occasion to do decon much. Not that familiar.
252. We had a sump installed at our permanent location.
253. We have a heated air and heated water system available for use.
254. We have added a law enforcement component to secure the borders around out decon system. There are no conceivable ways to alleviate the cross-contamination issue with the public unless we use all disposable equipment. This would become an extremely costly venture after that happens.
255. We have climate controlled areas for the suits, boots gloves, radios, Rad. detection devices, all other items (barrier tape, decon tents, direction signs, etc..) are kept in a heated garage. I am out of storage area however, I am looking at a shed type structure for added storage but the cooling and heating system may be an issue.
256. We have CRBNE mask and suits, however lack decon equipment
257. we have designed and use our own decon vehicle that provides for weather protection, modesty, heat and secondary contaminates issues
258. We have done nothing. I would like to try an open house with a live scenario so the public can witness first hand and experience it. Have the News media on hand to publicize the events and help with the summary.
259. We have tried to do media days and open houses. This didn't work well and attendance was low. What we need to do is teach everyone like we do for tornados and we did back in the 50's and 60 for Atomic Bomb scenarios. Pubic Infomercials would help. Actual induction of this subject into the schools and businesses as a taught and mandatory subject. The Russians and the A-Bomb have been replaced by the Terrorist and his terrorist weapons. People need to know what to do and what we will be doing to help them. They were successful back in the 50's and 60's we need to mimic this. My kid can tell you what to do in a tornado but has no idea what to do if a terrorist disperses a toxin. Who of us that grew up in the 50's and 60's cannot remember "Duck and Cover"?? I know it was media B/S but it was effective B/S. We have to duplicate this but eliminate the B/S concept that we can survive a thermonuclear explosion in town.
260. We have used our unit during drills so that people know what it is used for and how it operates.
261. We have used show and tell public education displays of the equipment
262. we haven't really tried anything yet
263. We put traffic standards in the pools as hand grabs to provide stability.
264. we train regularly and have outside company help
265. We train with our decon. Equipment in areas visible to the public which allows them to be familiar with this equipment.
266. We triage on the "in" side and the "out" side. In the second triage the successfulness is also rated and if necessary the patient is returned to the line. We deal with the modesty issues the same as everyone. We have separate lanes for men and women, and if necessary we have a family lane. One of the things we have found is that most families want to stay together and if we can remove some stress from an already stressful situation it works to our advantage later on. We loft as many cords as possible through

- stanchions and the others we route in a way that they are not in traffic areas for the public. We still have an issue with responders and trips and falls are our #1 injury from the decon line.
267. We use grates in the decon pools, and added more shelters to increase the distance between stations.
 268. We work with Clean Harbors for disposal of all effluents. We have several storage drums for effluents. We have absorbent material for mitigating any spill from our operations.
 269. What have you done in an attempt to mitigate any or all of these items? Please describe both successful and unsuccessful ideas, as well as ideas you have that you might not yet have tried.
 270. While in the Army (101st Chemical Company - Ft. Bragg, NC) We trained on decontamination of a civilian population, and were deployed as a platoon-level decontamination element at Ft. AP Hill, VA. The public was expected to be scared if we had to decontaminate them. Some of the problems with the public that we expected were:
 - * General fear in relation to the incident leading to the need to be decontaminated
 - * Unknown what agents are being used to decontaminate them
 - * Soldiers dressed in protective gear while performing the decontamination operation (This was expected to cause individuals being decontaminated to possibly panic - or give up on their situation, since they were not wearing any protective equipment)
 - * Generally a decontamination operation involving the public was expected to be a problem because of available resources (people) used at the decon site, and the lack of knowledge that the public had about a decon operation
 271. While we have not yet tried, an informational pamphlet to describe how & why decon is used including the cleaners used would be beneficial. These informational pamphlets would be distributed at fire safety events and fire station open houses. They could also be incorporated into fire safety education programs at the local schools.
 272. Wide publication of expected decontamination activities, processes and materials.
 273. working on it - display all equipment at local health fairs so the public at least becomes familiar with the sight of it
 274. would show that any run off is being contained have decon containers to place all items in easily displayed have community advised as much as possible

Sub-Appendix G: Section 9, Question 1

Interoperability: Other types of hose connections

Other types ranked 1st:

1. Any hoses meant to attach to public supply are essential items. Standardization and one or two from all that are found should be in every decon crate.
2. Quick connects
3. Insure
4. Garden hose
5. I suggest most easily handled while wearing max gloved protection or one handed operations. Durable male-female connections.
6. NST - Compatible with National Standard Thread - Fire Hose used by Fire Department
7. Quick connects
8. 3/4 " quick connects
9. Quick Disconnect
10. Quick connect
11. Sexless quick connections
12. Snap connections
13. Quick connect
14. Garden hose type, reducers, double female connectors with different style threads.
15. Cam Lock
16. 1/4 Inch, Remember limitation in supplies, water, etc, generation of Waste
17. Quick Connect hose connections to all parts of system.
18. Cam-Lock fittings
19. 1 1/2" Fire Thread - most interoperable with existing hose discharges
20. Quick connect cam locks. Also need to take a look at the availability in emergencies (garden type hoses are readily available most anywhere). Need to look at off loading used decon water by vac trucks, etc for disposal. Disposal companies may have a standard connection.
21. standard 5/8" Garden hose
22. Gecko
23. Quick couplers on garden hose type equipment
24. Standardized with fire departments nation wide
25. 1/2 inch hose thread
26. Cam-locks are fast, water tight, and do not cross thread
27. Quick connect
28. Garden Hose
29. Quick connect
30. Unknown. I do not have the decon stuff, I purchase it (DOJ, HSEM, IPPG grants)
31. Manifold from 2.5 reduced to 3/4
32. No recommendation
33. Common Garden Hose fitting
34. Quick connect couplers
35. Non-threaded quick disconnects

Other types ranked 2nd:

1. 1" or 1 1/2" quick lock connections
2. 5" Storz fitting
3. Decon starts with large diameter hose being lead out in to smaller hose lines with reducers, or fix vehicles piping
4. Garden hose
5. I think a standard Garden hose connection is the best and most versatile. NPT and straight pipe threads are not widely available in the field.
6. Quick connects either bayonet or quarter turn, and color coded.

Other types ranked 3rd:

1. 1/2" Garden Hose Thread
2. 1-3/4" adapted to garden hose threaded
3. 3"
4. 3" threaded
5. 4" LDH For Manifolds
6. 5"
7. garden hose acceptable

8. Garden Hose....Note* Most Fire Service 1 1/2 and 1 3/4 hose have same size 1 1/2 hose couplings
9. LDH to supply fire pump
10. Quick connect
11. Quick Coupler (similar to an air hose) for ease of operation, leak control and cold weather functioning

12. Quick Release Hoses - Sizes above
13. Sealed Quick-disconnect type.
14. Simple answer. You make a multi-port kit. They make adapters for batteries; you make one for all the crazy hose sizes.
15. Steamer Fitting 4 1/2
16. we use a 5" stortz

Other types not ranked:

1. 1 1/2 " fire hose uses same thread as 1 3/4" fire hose.
2. 3 inch
3. 3/8"
4. 5"
5. 5/8 " garden hose or wildland hose.
6. All connections National Standard Fire Hose Tread except 3/4" regular garden hose
7. All threads to be NST
8. Both national standard and iron pipe thread - depending upon location
9. Chicago or cam lock fittings are best.
10. Fire dept connections will always be your best choice, but too big a line can be too cumbersome.
11. Fire hydrant level of flow and tapered down.
12. Garden Hose
13. Garden Hose thread
14. National Fire Hose Thread or Garden hose in my third choice

15. National Standard thread
16. No knowledge in this area. Would suggest it be standardized for all decon equipment/agencies - only military decon experience - would guess the larger connector would allow for more water/fluid with less painful pressure
17. No personal knowledge of hose connection requirements
18. Quick connect
19. Quick connect couplings
20. Quick connects for 1" 3/4" & 2 1/2"
21. Quick Disconnect
22. Standard Fire Hydrant 2 1/2
23. Standard hose connections for DECON equip. with conversions to 1, 1.5, 1.75 and 2.5
24. Standard hose connections may be best
25. this is not my expertise

Sub-Appendix H: Section 9, Question 2

Interoperability: Should NST be used as a standard?

“Yes” Comments:

1. 1"theaded is one of the common threads used with the max flow
2. 3/4 hose-bib with 1.5 adaptors
3. 3/4"should be garden hose thread.
4. A National Standard should include language that requires manufacturers of equipment needing hose connections to supply any adapters needed to fit NST.
5. Acceptable standard nationwide for fire house couplings.
6. Adapters should be made available for the use of fire hose, NSH/NST
7. Additionally camlocks should be used where possible.
8. All fire departments carry it. Firescope.
9. Garden hose thread
10. As long as same as fire hydrant
11. As much as possible, we should use of-the-shelf equipment.
12. Even our fire department that does not use NST for 2-1/2" carries adaptors from our 2-1/2" thread to NST
13. Except for garden hose connections
14. except for the garden hose connections should be GHT
15. Except where garden hose is used
16. Except where standard garden hose connections are required.
17. For compatibility with other supplies
18. For connecting system to a water supply the answer is yes, but internal to the system connections should be quick connects either bayonet or lockable quarter turn connections.
19. For everything except garden hose.
20. For main supply to decon (i.e., from hydrant or apparatus to decon). All other connections for actual decon of patients should be standard "garden hose" fittings.
21. I presume that this is the NST Fire Hose Thread NOT pipe thread
22. If larger than the standard garden hose connection.
23. Include Y/N answer in CEDAP Grant Questionnaire. Develop NIMS Class on equipment standards within the jurisdiction.
24. It makes sense that everything is standardized throughout the decon process, and over jurisdictions
25. Large Decon Operations will require regional assistance. Having standardized thread will help.
26. Listed above is our present equipment. Cost will be a factor in converting present equipment
27. Make all companies use the same couplings, just in case you have to work with another department or for a mass casualty incident.
28. National standard should be used but the connection should be easily adaptable. My primary area's threading is Pittsburgh 6.
29. No knowledge in this area - would suggest it be standardized for all decon equipment/agencies - only military decon experience - would guess the larger connector would allow for more water/fluid with less painful pressure
30. Notwithstanding existing standards for thread counts on commercially available equipment.
31. NST is compatible with most fire hose. Fire department is the usual water supplier.
32. NST is good but its faster with quick connections
33. NST must be the nation-wide standard without exception.
34. On 1 1/2" and 1" hose threads garden treads on 3/4"
35. On future equipment, and that would assist mutual aid interoperability and provide a standard adapter to be acquired
36. Only if you are looking for interoperability between agencies that may respond to an incident.
37. Only on 1 1/2" couplings and larger
38. Option needed for those who don't use NST.
39. Problem will be seen in NYC which uses FDNY Thread.

40. Promotes interoperability easier to obtain parts from local plumbing supply for emergency repairs
41. Should be national standard for all fire service.
42. Standard water hose connections are also acceptable
43. Standard for field work, with standard inclusion of adapter to 3/4" garden hose fittings for use when purchaser is a hospital or when field setup is at location where residential water is available and it is desired to not tie up a pumper.
44. Standardization will reduce mutual aid issues, use of equipment by other agencies responding to assist.
45. Stortz couplings
46. The more standardization, the better! There is nothing worse than having equipment that is useless due to incompatibilities!
47. This is a must!
48. This may be a cost issue
49. Thread used must be compatible with local fire department hose threads or sufficient adaptors furnished.
50. Unless using 3/4" garden hose
51. We use Dayton Standard Threads, but have adapters for NST
52. When we initially ordered our equipment we asked for NST and received National Pipe Thread. This is not the standard in the Fire Service and well adapting is costly so we have equipment that is moth balled due to lack of funding to adapt.
53. You want to be able to add on or replace equipment with a trip to Home Depot during large scale incidents

“No” Comments:

1. 3/3" GHT thread is standard worldwide
2. 3/4 garden hose, 1.5 & 2.5 NST
3. 3/4" garden hose, 1 1/2 & 2 1/2 Hose thread
4. A standard quick connect coupling that is readily available
5. as long as adapters available and sufficient flow is achieved
6. Cam-lock or FD thread should be used
7. Chicago or cam lock fittings
8. Don't care
9. Fire Thread on the larger fittings would be more convenient
10. Garden hose thread should be the standard.
11. Garden type hose are available anywhere
12. GHT for 3/4" which is most common
13. It should be a quick detachable fitting. ALL CBRNE should be the same kind of detachable fitting. Easy to tear rubber gloves trying to unscrew garden hoses. Pop on, pop off, with a quick in-field repair kit. Air ports are different color and shape than water than decon solution than drainage than environmental air (heating / cooling). Make it a national standard, and make all the mfg's comply so I can use my old company A spray pump with the new company B shower. And, if Hazmat team A brings shower tunnel A, and team B has one made by B, they can interconnect and use each others' replacement kits. Plenty of stuff to choose from in the swimming pool and avionic industries already.
14. National hose thread
15. Needs to be inoperable with hose connections of a given region (i.e., my department uses a specific "Pittsburgh 6" thread.
16. NH or NPSH only!
17. No, most decon equipment connects to a fire hydrant. Hydrants use NFT (national Fire Thread) much courser thread than NST
18. Not all are going to operate in a large capacity hose.
19. Not sure. Is NST a standard among firefighting or medical equipment connections?
20. NPT - National Pipe Threads for all Plumbing
21. Only for feed to water heater or pump. Prefer standard garden hose for individual showers.
22. Only if NST is internationally recognized in future.
23. Prefer 1.5" NST to heater, then use of standard garden hose connections for showers. Allows multiple shower operation from single 1.5" line.

- 24. Quick connect couplings should always be used to expedite equipment readiness
- 25. Quick Connects
- 26. Quick disconnects
- 27. Regular hose bibs with NPT needs to be an option
- 28. See above - the equipment must fit the environment. Cost to change is not practical especially for regional deployment.
- 29. Should have an option of NST or same threads as garden hoses
- 30. Standardize as much as possible and make sure the product is readily available and off the shelf as much as possible
- 31. They need to be sexless ends for speed of deployment!
- 32. What should be standard is that which is found with all fire depts. or required by the national fire academy.

Neither Yes or No Comments:

- 1. Standardized quick connects speed the operation and assist with interoperability
- 2. Unknown
- 3. Unknown

Sub-Appendix I: Section 9, Question 3

Interoperability: Other decon equipment parts that should be standardized

1st Choice:

1. Standardize process/equipment nationwide
2. While maintaining the interoperability of decon operations is important I don't think it is currently practical. There are too many vendors selling different systems to gain any level of compatibility. It would be good if there was a standard on the books for future purchases but with the long shelf life of equipment it could be quite a while before we achieved the goal.
3. Air purification/isolation units

2nd Choice:

1. PAPRs and communication equipment

3rd Choice:

2. Standards should be established as in triage/MASH units. Care for ambulatory first. Non-A's expendable.
3. Respiratory Protection Equipment standard will reduce training and ease of use for responders
4. Follow new forthcoming ISEA ANSI # 113 portable hazmat decon shower standard recommendations
5. Instruments to determine "how clean is clean" post decon (ppb level detectors)
6. Power connectors
7. communication protocols
8. Electrical connections
9. Language for signage should be standardized.
10. Messages to victims should be standardized; communications equipment

Other Comments not Ranked:

1. For Radiological - need to contain runoff
2. NONE-too many systems in place to start this now
3. Not necessary to standardize nationally, as long as each system is complete.
4. Not sure I would recommend standardization of other components
5. Read my above comments. Modularity is a good thing. It makes new ideas easier to add on without having to DX all the old stuff.
6. Setup, mobility and transportability would be one, two and three.
7. This is about five years too late. many agencies have already purchased systems, retrofitting will be expensive or improbable
8. This section is not accting input correctly
9. Triage tags
10. We haven't standardized on hose threads in over 200 years; standardizing any of these is an uphill battle.

Sub-Appendix J: Section 10, Question 4

Power Requirements: Should GFI capability be required on all electronic decon equipment?

“Yes” Comments:

1. AC or DC Power should not necessarily be required for Decon Operations. GFI should be used if commercially available - however without proper grounding, GFI is not as effective. Electrical connections should meet UL standards for water resistance/marine environments.
2. Amperage could be split between two sources if needed
3. At times it can create additional hazards when it not. We had an NRC drill fro our local Nuclear Station last night. As a storm moved in, we were reminded that not all our outlets were protected by GFI!
4. Build subcomponents to work off of smaller amperage inverters to allow 12 Volt systems to supplement in the event of generator failure. The will also enhance its ability to be deployed.
5. Either the entire system needs to be GFI protected or all components need to have individual GFI.
6. Electrical Safety is a must!
7. Electrical shocks are more common when using AC in wet conditions as compared to DC
8. Electricity and water do not mix in decon. GFCI is imperative
9. Especially when AC power sources are used.
10. Explore alternative power sources such as solar and manual hand crank (remember WWII radio units and present day hand crank/shake equipment?). As well as power sources adaptable to vehicle batteries and alternators/generators or even as simple as taking off a wheel and running a power source to the turning shaft. Think low tech in a post disaster world guys.
11. GFI is a great Idea as water and power cords do not mix
12. GFI w/ UL listing
13. GFIs can be too sensitive to austere operational/field requirements
14. Have to be in place!! Bare feet, water and electricity- Bad combination!
15. I do not know much about the amperage needed, my answers are assumptions
16. I prefer no electricity in Decon
17. Mixing water and electric
18. No idea on amperage. Based on what is on the vehicle or set up in terms of power usage.
19. no option, no choice
20. Power is required in the Northeast to heat decon area and/or fluid being used. Portable generators with GFI is mandatory.
21. This is required by the National Electrical Code NFPA 70.
22. To avoid getting shocked in distress
23. To the extent possible. It would be easy to electrocute accidentally any subject when setup is conducted rapidly. Mistakes do happen, GFI can help mitigate.
24. Use of AC devices in a decon environment is very dangerous & MUST be very carefully controlled.
25. Water and electricity do not mix, responder and civilian safety must be paramount
26. Water! This is not a question but a must
27. Where more than 24v is utilized or you will get someone shocked slightly, then they will sue and we won't have any more stuff to decon with. Your current needs also don't really discuss the size of the response. For all gear, or a single shower setup?
28. You can kill folks if you don't use it. The public will see a problem with it if we do not use it.

“No” Comments:

1. Not always practical for outlying areas
2. Only at the source
3. Our power supplies are already GFI

Neither Yes or No Comments:

1. Tough one - They're great for safety, but trouble for consistent running of equipment.

Sub-Appendix K: Section 10, Question 5

Power Requirements: Other types of fuel sources for power generators.

Other types ranked 1st:

1. Reverse gravity/suction systems
2. There should be BIO-fuel.

Other types ranked 2nd:

1. Natural; hybrid
2. Solar, manual generator, etc.
3. Natural gas
4. Biofuels (biodiesel, straight vegetable oil, ethanol,

Other types ranked 3rd:

1. Bio diesel
2. Fuels made from vegetable oil, etc.
3. Jet A/JP5
4. Kerosene
5. Kerosene

Other types ranked 5th:

1. Air operated
2. Alcohol (x2)
3. Alternative including solar and electric
4. Anything other than those listed above
5. Batteries (x2)
6. Battery, Natural gas
7. Bio diesel
8. Bio fuel compatible
9. Biofuels
10. Camp fuel
11. Coal
12. E 85 (x3)
13. e-85 or biodiesel
14. Ethanol (x4)
15. Ethanol in any form may be more accessible here locally. It would change priority if generators used it perhaps.

Other types ranked 4th:

1. Bio diesel
2. bio fuel capacity
3. Biodiesel/Alcohol
4. Ethanol
5. Ethanol
6. Hydraulic or vehicle mounted
7. Kerosene
8. Kerosene, Ethanol, Red Diesel, Alcohol, Two cycle fuel
9. PTO generator
10. Water Motor Driven

16. Fuels made from corn or alcohol in states that have them.
17. Hydraulic
18. I have only used gasoline and diesel
19. Jet A
20. JP4 or JP5
21. JP-8/JP-4
22. Kerosene (x2)
23. LNG
24. Natural Gas (x2)
25. Natural recourses in remote areas
26. New Bio Fuels
27. Potentially kerosene for heat source after decon
28. Rank by order of availability
29. Renewable Energy
30. Solar (x2)
31. Stored energy (12volt battery) or biofuels

Other types not ranked:

1. LPG is no good. It ruins motors. Fuel should parallel response vehicles.
2. Must have ability to have back up resources self- generate, with capability of refueling while being used

Sub-Appendix L: Section 11, Question 1

Operational Interface: Other types of visual control displays

Other types rated 5-Extremely Important:

1. Ground Fault Indicator
2. Oil/lubrication
3. On/Off
4. Operating hours
5. Process interruption - loss of water; agent, etc.
6. Some kind of air indicator for the personnel on air or filter usage timer.
7. Tent ambient temp 2 feet off ground
8. They all work hand in hand, you need one for the other to work properly
9. Visual as in line of sight and not powered.
10. Warning Level indicators
11. Warning lights and warning sensor for warning of low fuel
12. Waste Tank(s) fullness level(s)
13. Waste Water Containment Level
14. Wastewater container/reservoir(s) level.
15. Water Temperature

Other types rated 4:

1. Contaminated run-off container level indicators.
2. Supplemental Indicators - Oil Level, End time Indicators
3. Waste containment levels
4. Waste Water Level

Other types rated 3:

1. Hour Meter - to support billing for reimbursement from FEMA/DHS
2. Waste water level

Other types rated 2: no comments provided for second rating

Other types rated 1-Unimportant:

1. Hour meter, clogged filter indicator on motor or on filtered air intake,
2. Whatever is critical for the operation

Sub-Appendix M: Section 12, Question 1

Demographics: Other professional types

Other professional types:

- | | |
|--|---|
| 1. 911 Dispatcher | 44. Emergency Management Specialist, Equipment Specialist |
| 2. Administrative | 45. Emergency Management, Medical 1st Responder, DART |
| 3. AF CBRN Decon Equipment acquisition officer | 46. Emergency Manager (x2) |
| 4. Also CBN advisor for city | 47. Emergency Management Agency WMD responder |
| 5. Asset Protection Specialist | 48. Emergency Management Decontamination Team Trainer |
| 6. Basic Emergency Care | 49. Emergency preparedness coordinator |
| 7. Campus Public Safety | 50. EMERGENCY RESPONSE TEAM |
| 8. CBRNE Operations Specialist | 51. Emergency Response Team Member |
| 9. CBRNE Specialist | 52. Emergency Services |
| 10. CERT Member, Emergency manager | 53. Emergency Manager |
| 11. CERT Team Leader | 54. EMS Coordinator |
| 12. Chief | 55. Environmental first responder |
| 13. Chief Officer / Incident Commander | 56. EOC staff |
| 14. Civil Protection | 57. Equipment manufacturer |
| 15. Civil Support Team Decon NCOIC | 58. Factory HazMat Tech on Emergency Response Team |
| 16. Civilian | 59. Federal Employee: Former US Army Chemical Officer |
| 17. Communications instructor/manufacture | 60. Fire Chief (x2) |
| 18. Consultant (2x) | 61. Fire Chief / EMA Rep. |
| 19. Consultant to first responders | 62. Fire Chief/Paramedic/decon |
| 20. County Emergency Management | 63. Fire Marshal |
| 21. Critical Care Paramedic, Tactical/ Technical Rescue | 64. Flight Nurse and PARAMEDIC |
| 22. CST Member | 65. Former 2nd CST Commander |
| 23. Decon equipment manufacturer and member of portable decon shower standards committee for ISEA ANSI # 113 | 66. Former 54B (US ARMY) |
| 24. Decon Officer | 67. Former hazmat responder |
| 25. Decon Operations Officer | 68. Hazard Mitigation |
| 26. Decon Subject Matter Expert | 69. Hazardous Materials Instructor and consultation. |
| 27. decon task force | 70. Hazardous Materials Response Officer/Coordinator |
| 28. Decontaminant Manufacturer | 71. Hazardous Materials/Forensic Chemist |
| 29. Decontamination Sales In-service/ Training | 72. Hazmat, Confined Space Instructor |
| 30. Decontamination Services provider | 73. Homeland Security |
| 31. Department of Health Preparedness | 74. Homeland Security liaison |
| 32. Director EMS and Emergency Management | 75. Hospital |
| 33. Director, Lookout OES | 76. Hospital based |
| 34. Disaster response | 77. Hospital Decon Personnel |
| 35. Dispatcher | 78. Hospital Decon Team |
| 36. DOH Nurse | 79. Hospital Decon Team member |
| 37. EMA | 80. Hospital decontamination member |
| 38. EMD | 81. Hospital Emergency Management |
| 39. Emergency Communications Supervisor - Homeland Security/Safety Coordinator | 82. Hospital Emergency Planner |
| 40. Emergency Management (x21) | 83. Hospital Emergency Preparedness Coordinator |
| 41. Emergency Management Agency | |
| 42. Emergency Management Coordinator (x2) | |
| 43. Emergency Management specialist | |

84. Hospital manager of Emergency Mgmt; in charge of HERT (Hospital Emergency Response Team)
85. I consult nationally on WMD issues.
86. Incident Management Team member
87. Industrial Hygienist
88. industry representative
89. Instructor (x2)
90. Laboratorian
91. Line Supervisor
92. Manufacture
93. Manufacture Decon Equipment and Train end users
94. Manufacturer and member of ISEA ANSI # 113 portable decon shower standards committee
95. Manufacturer of Rad. Decon Solutions
96. Medical Technologist
97. Member of a state wmd response team
98. Member of the LEPC
99. Military
100. Military/Civilian Paramedic
101. Military/Emergency management
102. Motorcoach (Buses)
103. nuclear hazmat responder
104. OEM (x2)
105. Officer in charge of HazMat response
106. ok I do not use the decon stuff all the time. someone that does might have a better idea on this. i did my best.
107. Paramedic (x4)
108. Paramedic/ Technical Rescue Specialist US&R
109. Paramedic/Illinois Lead Instructor
110. PARK RANGER
111. Police operations Supervisor
112. Polyatomic Oxygen Specialist
113. Private Industry Emergency Management Instructor
114. Private Investigator/ Code Enforcement Inspector
115. Private, Commercial Emergency Responder
116. Procurement Officer
117. Public Health (x3)
118. Public Health Coordinator
119. public health/emergency response
120. public safety officer/ decon responder
121. Radiological Assessment Team
122. Regional Response Team
123. Regional WMD Response Team
124. research
125. Respiratory Therapist
126. Response Planner
127. RETIRED
128. Retired from the above disciplines
129. rm instructor
130. Safety Equipment Manufacturer
131. Safety Equipment Sales Person
132. Safety Officer
133. Security Director
134. Sheriff's dept...ambulance
135. Soldier
136. SPECIAL OPS/TECH RESCUE
137. State Agency Deputy Director
138. State EMS
139. State Fire Trainer
140. State Instructor/responder
141. State Medical Assistance Team Member
142. Systems Designer
143. Tech Rescue-Haz Mat training
144. Technical Animal Search and Rescue
145. Technical Rescue / SAR Specialist
146. through fire department - nothing; help with emergency preparedness with local hospital
147. trainer
148. Training Officer
149. Training officer for HazMat team
150. U. S. Navy Retired
151. U.S. Army Chemical Specialist
152. us army special forces retired
153. US Treasury Police
154. US&R Task Force member
155. USAF Special Ops aircrew/disaster prep Ret, Aux police officer, mental health officer, Civil Air Patrol commander
156. UXO Technician
157. vendor
158. volunteer
159. we are a decon team manned by operation of plant staff at a major hospital
160. WMD Response Tactical Team
161. wmd tech
162. WMD Tech.

Sub-Appendix N: Section 12, Question 2

Demographics: Primary Job Titles

- | | | | |
|-----|---|-----|--|
| 1. | 1st captain | 51. | Captain over Hazmat |
| 2. | 911 Dispatcher | 52. | Captain, Training Officer, Medical Officer |
| 3. | 911 map administrator | 53. | Captain/Company Officer |
| 4. | Accountant | 54. | captain/firefighter/paramedic |
| 5. | ADHS Industrial Hygienist/Safety Officer | 55. | Captain/Grant Manager/Haz-Mat/MMRS/UASI |
| 6. | Admin/Patrol | 56. | Captain/Paramedic (x2) |
| 7. | Administration | 57. | Captain/Special Operations |
| 8. | Advanced Care Paramedic | 58. | Captain/training officer |
| 9. | Agency Liaison/IC | 59. | CAPTAIN-SPCIAL OPS |
| 10. | apparatus operator | 60. | CBRN Equipment Analyst |
| 11. | Assistant Chief (x14) | 61. | CBRN Response Specialist |
| 12. | Assistant Chief of Police | 62. | CBRNE Coordinator |
| 13. | Assistant Chief of Training | 63. | CBRNE Operations / Planning |
| 14. | ASSISTANT CHIEF/OPERATIONS | 64. | CBRNE Operations Specialist |
| 15. | Assistant Coordinator | 65. | cbrne response coordinator |
| 16. | Assistant Coordinator ESDA | 66. | cert |
| 17. | Assistant Director (x2) | 67. | CERT Team Leader |
| 18. | Assistant Fire Chief (x7) | 68. | Charge Nurse |
| 19. | Assistant Fire Chief/ HazMat Coordinator | 69. | Chemist |
| 20. | ASST OPERATIONS/TNG NCO | 70. | Chemist |
| 21. | Asst. Chief of Operations | 71. | Chief (x26) |
| 22. | Asst. Chief of Police | 72. | Chief Deputy |
| 23. | Asst. Chief of Police | 73. | Chief Deputy Director |
| 24. | Asst. Chief/Safety Officer | 74. | Chief in charge of spec ops hazmat/tech rescue/dive team |
| 25. | Asst. Eng. | 75. | Chief of Haz-Mat |
| 26. | Asst. Fire Chief and Training Officer | 76. | Chief of Homeland Security/ Haz-Mat |
| 27. | Asst. State Fire Marshal | 77. | Chief of Police (x6) |
| 28. | Attorney | 78. | Chief of Special Operations |
| 29. | Battalion Chief (x6) | 79. | Chief of Training |
| 30. | Battalion Chief / Paramedic / HM Specialist | 80. | chief officer |
| 31. | Battalion Chief -Fire - Operations | 81. | Chief Officer |
| 32. | Battalion Chief HM team Coordinator | 82. | Command |
| 33. | Battalion Chief Occupational Safety/Health | 83. | Commander (x2) |
| 34. | Battalion Chief/Training | 84. | Commander/NYS Hazmat Specialist |
| 35. | Bio-Terrorism Coordinator | 85. | Communications Specialist |
| 36. | bomb squad | 86. | Company Officer (x4) |
| 37. | Bomb Technician (x2) | 87. | Consultant (x2) |
| 38. | Bomb Technician CRBNE Technician | 88. | consultant trainer |
| 39. | Bomb/Arson Investigation | 89. | Coordinator (x2) |
| 40. | Bureau Chief - Haz Mat | 90. | Coordinator, Dallas Medical Strike Team |
| 41. | Business and instructional Manager | 91. | Corporal (x2) |
| 42. | Business Development | 92. | County emergency manager |
| 43. | Captain (x20) | 93. | county emergency manager, director |
| 44. | Captain - Hazardous Materials Team | 94. | County Hat Mat coordinator |
| 45. | Captain / Bomb Squad Commander | 95. | Crew Chief |
| 46. | Captain / Haz Mat Duty Officer | 96. | Decon Officer (x2) |
| 47. | Captain /Firefighter | 97. | Decon Team Chief |
| 48. | Captain- decon team | 98. | Decon Unit Leader |
| 49. | Captain Firefighter | | |
| 50. | Captain Hazmat Team | | |

99.	Dep Co. Fire Coord. for Spl Ops	155.	Emergency Management Planner
100.	dept. administrator	156.	Emergency Management specialist
101.	Deputy (x2)	157.	Emergency Manager (x4)
102.	Deputy Chief (x8)	158.	emergency manager/ paramedic
103.	Deputy Chief - Special Operations	159.	Emergency Manager/HazMat Coordinator
104.	Deputy Chief - Support Services	160.	Emergency Management
105.	Deputy Chief of Police	161.	emergency management coordinator
106.	Deputy Chief, firefighter	162.	Emergency Medical Services Manager
107.	Deputy Chief/Fire Marshal/Training Manager	163.	Emergency Medical Technician
108.	Deputy Chief-Logistics Division	164.	Emergency Medical Technician
109.	Deputy Commander	165.	Emergency Planner
110.	Deputy Coordinator	166.	emergency preparedness coordinator
111.	Deputy Director	167.	Emergency Preparedness Manager
112.	Deputy Director - Haz Mat Technician	168.	Emergency Response Coordinator (x3)
113.	Deputy Director-Operations	169.	Emergency Response Operations manager
114.	Deputy Fire Chief (x8)	170.	Emergency Response Program Manager
115.	Deputy Fire Chief - Operations	171.	Emergency Response Specialist
116.	Deputy Sheriff (x2)	172.	emergency response specialist
117.	Deputy Sheriff, Investigations	173.	Emergency Response Specialist
118.	Detective (x4)	174.	EMERGENCY RESPONSE TECH
119.	DHHS - ERT Member	175.	Emergency Services Coordinator -Emergency Management
120.	Director (x11)	176.	emergency services director
121.	Director OES	177.	Emergency Services Director
122.	Director of Business Development	178.	EMS / FF-Captain
123.	Director of Emergency Services	179.	EMS All Hazards Consultant
124.	Director of Public Safety	180.	EMS Coordinator
125.	Director of Public Safety	181.	EMS Coordinator
126.	Director of Safety	182.	EMS Director
127.	Director of School Health	183.	EMS Director/Paramedic
128.	Director, Emergency Management	184.	EMS Field Operations Manager
129.	Director, Environmental Emergency Response	185.	EMS Supervisor
130.	Disaster Ops consultant	186.	EMS Supervisor
131.	Disaster Preparedness Specialist	187.	EMS training officer
132.	Disaster Response Coordinator	188.	EMS/Haz-mat coordinator
133.	Disaster Team Leader	189.	EMS-RESCUE-HAZMAT CHIEF
134.	District Commander - Homeland Security	190.	EMT (x5)
135.	District Fire Chief	191.	Engine Operator
136.	Div Chief of Training	192.	Engineer
137.	Division Chief (x4)	193.	Engineer/Firefighter
138.	Division Chief Fire Department	194.	Env. Health & Safety Instructor
139.	Division Chief, hazardous Materials	195.	Environmental and Safety Coordinator
140.	Division Commander	196.	Environmental Crimes Investigator
141.	Divvision Chief-Training	197.	Environmental Engineer
142.	driver/operator-EMT-Hazmat Tech	198.	Environmental Specialist
143.	EHS III	199.	EOD
144.	EMA	200.	Equipment Development
145.	EMA	201.	ER
146.	EMA Deputy/Haz-Mat Technician	202.	Executive Officer
147.	EMC	203.	Explosive Ordnance Disposal
148.	Emergency Mgmt Specialist - Field Ops	204.	F.F/HazMat/EMT
149.	emergency responder	205.	Factory Mechanic / Asst. Chief VFD
150.	Emergency Management (x6)	206.	FF (x3)
151.	EMERGENCY MANAGEMENT	207.	FF/EMT
152.	Emergency Management Coordinator (x6)	208.	FF/EMT
153.	Emergency management Director	209.	ff/emt-p
154.	Emergency Management Manager		

210.	ff/paramedic	264.	firefighter/paramedic
211.	fire	265.	Firefighter/Paramedic
212.	Fire	266.	firefighter/Paramedic
213.	Fire Administrator	267.	Firefighter/Paramedic
214.	Fire Battalion Chief Special Ops/Homeland Security	268.	Fire medic
215.	Fire Battalion Chief, career	269.	Firer Chief
216.	Fire Captain (x15)	270.	General Manager
217.	Fire Chief (x57)	271.	General Manager
218.	Fire Chief / County Hazmat Cord	272.	Grand Pupah
219.	Fire Chief / EMA Rep.	273.	grant coordinator
220.	Fire Chief Paramedic	274.	Grant writer
221.	Fire Chief, EMC	275.	grant writer, firefighter
222.	Fire Chief/ Haz Mat Specialist	276.	Haz Mat
223.	Fire Chief/EMS Director	277.	Haz Mat Chief
224.	Fire Chief/Regional HazMat Team Leader	278.	haz mat chief
225.	Fire Company Officer/HazMat team leader	279.	Haz Mat Coordinator
226.	Fire Coordinator	280.	Haz Mat Responder
227.	Fire Department shift Commander	281.	Haz Mat Specialist
228.	Fire District Chief - Planning operations	282.	Haz Mat team Leader
229.	Fire Fighter (x5)	283.	Haz Mat Tech
230.	fire fighter first responder	284.	Haz mat technician
231.	Fire Inspector	285.	Hazardous Materials Instructor and consultation.
232.	Fire Inspector/Haz Mat Specialist/Captain	286.	Hazardous Materials Response Officer/Coordinator
233.	Fire Investigator	287.	Hazardous Materials Specialist
234.	Fire Lieutenant	288.	HazMat & Fire Training
235.	Fire Marshal	289.	Hazmat Coordinator
236.	Fire Marshal / EMC	290.	Hazmat Division Coordinator
237.	fire marshal	291.	HazMat Field Instructor
238.	Fire Officer	292.	HazMat Officer
239.	fire officer 1	293.	Hazmat Officer
240.	Fire Prevention Officer	294.	HazMat response
241.	Fire Protection Specialist	295.	Haz-Mat Specialist
242.	Fire Protection Specialist 1	296.	HazMat Specialist
243.	Fire Protection Specialist/decon team supervisor	297.	HazMat Specialist / Evidence Tech
244.	Fire Suppression	298.	HazMat Team Commander
245.	Fire Suppression	299.	HAZMAT Team Coordinator
246.	fire suppression asst. chief	300.	Hazmat Team Leader
247.	Fire Training	301.	Hazmat Team Leader
248.	Fire/HazMat Captain	302.	Hazmat Team Supervisor
249.	Fire/HazMat Captain	303.	HazMat Tech
250.	FIRE/HAZ-MAT LIEUTENANT	304.	HAZMAT Technician
251.	Firefight/Paramedic	305.	HAZMAT Technician
252.	Firefighter (x28)	306.	HazMat Technician Trainer
253.	firefighter captain	307.	HazMat/WMD Responder
254.	firefighter hazmat	308.	Health & Safety Instructor
255.	firefighter paramedic hazmat tech	309.	Homeland Security
256.	Firefighter/ HazMat Instructor	310.	Homeland Security Coordinator
257.	firefighter/captain	311.	Homeland Security Coordinator/ Staff Nurse
258.	Firefighter/EMT	312.	Homeland Security Lieutenant
259.	Firefighter/EMT	313.	IC Safety Officer
260.	firefighter/EMT	314.	In Place Patient Decon Team Chief
261.	Firefighter/EMT/Hazmat Specialist	315.	Incident Command
262.	Firefighter/EMT-B/HAZ-MAT TECH	316.	Incident Management Team staff
263.	Firefighter/Hazmat Tech	317.	Instructor

318. Instructor / Training Officer
319. instructor; fire investigator
320. Investigations and special operations
321. Investigator
322. Investigator
323. Investigator
324. K9 Officer
325. Labor
326. law enforcement
327. law enforcement
328. Law enforcement special operations commander
329. Lieutenant
330. liaison to department of fire services-hazmat division
331. Lieutenant (x13)
332. Lieutenant - Assistant Fire Marshal
333. Lieutenant / Haz Mat Coordinator
334. Lieutenant, Technical Services
335. Lieutenant/Investigator
336. Lieutenant/Paramedic
337. life safety
338. Line Training Officer
339. Local Health Dept. Emergency Coordinator
340. Logistician
341. Loss Prevention Officer
342. It
343. It hazmat tech
344. Lt,
345. Lt./Safety Officer/Health Physicist
346. LT.CD-HN (ret)
347. Major
348. Manager
349. manager
350. manager
351. marketing manager
352. Medical Services Superintendent
353. Medical Supply Specialist / All Hazards Responder
354. Medical Technologist/Clinical Laboratory Scientist
355. MMRS Coordinator
356. MMRS Program Manager
357. Narcotics Officer
358. Narcotics Supervisor
359. Navy Police Chief/ Security Officer
360. NSM
361. nuclear safety engineer
362. Officer (x4)
363. Ohio Regional Territory Representative
364. on scene coordinator
365. Operation Chief
366. Operational commander
367. Operations
368. Operations Chief
369. Operations Officer
370. Operations Section Chief
371. Operations Supervisor
372. Operations Supervisor
373. Operations support
374. OPS & TRAINING OFFICER
375. Over County Decon Team
376. Oversight of Decon Program at our hospital
377. Paramedic (x5)
378. paramedic hazmat rescue
379. Paramedic/Co-Owner
380. Paramedic/State Medical Assistance Team Leader
381. PARK RANGER / EMT
382. patrol
383. Patrol
384. Patrol Officer
385. Patrol Officer
386. Patrol Sergeant
387. Patrol Sergeant
388. Patrol Sergeant
389. Patrol Supervisor
390. Patrol Supervisor
391. patrolman
392. Physical Science Technician
393. Physical Scientist
394. Physician
395. Physiology Technician
396. PIO, Research & Planning Coord.
397. planner
398. Platoon Chief
399. police
400. police
401. Police Chief (x4)
402. police investigator / hazmat
403. Police Lieutenant
404. Police Lt.
405. Police Officer (x6)
406. Police Officer (Paid) others are Volunteer
407. Police operations Supervisor
408. Police Sergeant (x4)
409. Police Supervisor
410. Police-Sergeant
411. Preplanning Officer
412. President (x4)
413. President / Chief
414. Principal Investigator - Decontamination Research
415. product management
416. Professional firefighter
417. Professional Standards - Accreditation
418. Program Director
419. Program Management
420. Program manager
421. Program Manager
422. Program Manager, Emergency Management
423. Project Manager

424. Public Health Coordinator	464. State On-Scene Coordinator
425. Public Health Education and Training	465. Station Lt.
426. Public Health Planner	466. Structure fire and Haz-Mat Response training
427. Public Safety Dispatch Supervisor	467. Supervising Hazmat specialist
428. Public Safety Officer	468. Supervisor
429. public safety officer	469. supervisor
430. Regional Resource Center Coordinator	470. Supervisory
431. Regional Response Team Operations Chief	471. Support Services
432. Registered Nurse / EMT	472. Suppression Battalion Chief/Haz-Mat Coordinator
433. Rescue Chief	473. SWAT Supervisor
434. research	474. tactical EMS
435. Research Scientist	475. Tactical Operations Commander
436. Research Scientist	476. Team Coordinator
437. Research and Development	477. Team Leader
438. Safety	478. Team Leader
439. safety	479. technical advisor
440. Safety and Security Manager	480. Technical Assistance to HazMat
441. Safety Engineer	481. Technician
442. safety manager	482. Training and Development Coordinator
443. Safety Officer (x5)	483. Training Captain
444. Safety, Logistical Support	484. Training Officer (x9)
445. SAR	485. Training Officer (USCG LT)
446. Scene containment/control	486. Training Officer and Duty Chief
447. Senior EOD/UXO Advisor	487. Training Officers to wear PPE
448. Senior Manager System Safety	488. Training Section Supervisor
449. Sergeant (x6)	489. Training Sergeant
450. Sheriff	490. training spec/responder
451. Sheriff	491. Training Specialist
452. Shift Lt	492. Training Specialist
453. Sleeplab Coordinator/Disaster Coordinator	493. Training Supervisor / EMT Point of Contact
454. Special Operations Captain	494. training/education
455. Special Operations Chief	495. USAF Decon Equip Modernization Analyst
456. Special Operations Division Chief	496. Vice President
457. Special Operation Training Coordinator	497. Vice President for Safety and PI
458. Special Response Bureau OIC	498. Was firefighter
459. Specialist	499. WMD / HazMat Program Manager
460. Specialist	500. WMD Analyst
461. SRO	501. WMD Planning
462. Staff Nurse, EMS Coordinator	502. WMD response coordinator
463. Staff RN	

Sub-Appendix O: Section 12, Question 3

Demographics: Other jurisdiction types

- | | |
|---|---|
| 1. 2 townships, a small city | 47. Military (x4) |
| 2. 5 city fire district | 48. Military Treatment Facility |
| 3. 8 Counties | 49. Multi-jurisdictional |
| 4. Air Force | 50. municipal |
| 5. all | 51. N/A |
| 6. Area-wide Hazardous Materials Response Team | 52. nationwide for commercial, federal, state, and local entities |
| 7. Boro | 53. no jurisdiction -conduct training on RPE |
| 8. Both Federal and Municipal jurisdictions | 54. None |
| 9. City and County areas of responsibility - Combined Services as independent profession - both Fire/LE and limited Medical | 55. Non-for-Profit healthcare system |
| 10. City and federal | 56. nonprofit hospital |
| 11. City and regional Hazmat response team | 57. North America Director |
| 12. City Team that covers entire County | 58. Not-for-profit Firefighting Corporation |
| 13. City/ Multi-jurisdictional SWAT/ WMD | 59. Partial County |
| 14. College Campus Police | 60. Private |
| 15. Commercial | 61. Private chemical plant as well as Local Township |
| 16. company | 62. Private Company |
| 17. Contractor | 63. Private Industry |
| 18. Contractor | 64. Private not for Profit |
| 19. Contractor for the US EPA to prepare and instruct federal employees. | 65. Private Organization |
| 20. County Fire Department | 66. Private Property |
| 21. County fire dept, regional hazmat team covering 8 counties | 67. Private school |
| 22. county/city joint operation | 68. Private Sector |
| 23. Cover State of Ohio | 69. private third service |
| 24. Currently NYSG Emergency Response Coordinator (NYS) | 70. Provide Decontaminate to First Responder and U.S. Military |
| 25. District | 71. Public Institution |
| 26. District | 72. Regional HAZMAT |
| 27. District | 73. Regional Task Force |
| 28. does not apply | 74. Retired |
| 29. Everywhere | 75. Retired A/C Fire, Private company |
| 30. Federal and County | 76. Rural Fire District |
| 31. Fire District (x5) | 77. Rural Fire District |
| 32. Fire Protection District (x3) | 78. School district |
| 33. Fire District | 79. Sell internationally |
| 34. Global | 80. Special District (x5) |
| 35. Health Care Facility | 81. Special District Fire Dept |
| 36. Healthcare | 82. Special District Fire Protection |
| 37. Homeland Security Region | 83. Special tax district (fire protection) |
| 38. Hospital (x12) | 84. Squadron on Air Force base |
| 39. Hospital Based ambulance | 85. State Contracts for Support Services |
| 40. I am a City, Regional and State Response Team | 86. Transit Authority |
| 41. I work locally, but other capacities are national. | 87. Transit Police |
| 42. Independent Consultant (Hazmat 20+ Years) | 88. University |
| 43. Industrial | 89. University Police |
| 44. Manufacturing | 90. US Army Contractor |
| 45. Metro | 91. Vendor |
| 46. Metropolitan City/County | 92. Village (x4) |
| | 93. Worldwide |

Sub-Appendix P: Section 12, Question 8

Demographics: Functionality/capacity of current decon equipment

1. (2) Intelagard Merlin compressed air decon units with DF 200 Sandia Decon Foam, or bleach, or detergents.
2. 1 20' trailer that holds all of our equipment.
3. 100 ambulatory per hour
4. 2 line TVI corporation decon tent system with roller system for non-ambulatory victims; backup open pool system (kiddie pools & hoses) + fixed decon room for technical decon. All integrated with county HazMat team, City Fire Dept decon team and county (vol FD) decon teams. Capacity 25-50/hour self decon; 15-20 non-ambulatory.
5. 2 mass decon units - 1 100 person hour - 1 40 person/hour Technical decon stations for Haz Mat Team Engine companies carry basic equipment for emergency decon
6. 2 tents with a mfg rating of 60 people per hr, realistically about 50 per hour.
7. 2 types - both function well for what they were designed for
8. 2 Zumro Decon complete units in the County. Equipment housed in their own trailers. Can be set up together for larger incidents.
9. 200-300 ambulatory per hour
10. 2-LINE AIR TENT WITH AMBULATORY ROLLERS, AIR AND WATER HEATERS, AND MODESTY KITS: ALL CONTAINED IN A TOW BEHIND 16 FOOT TRAILER
11. 3 - Self contained decon trailers (pre-shower - undress area - showers - clean area w/ air filtering system) 1 - Field decon line trailer (2 showers, suits, collection bases) 3 - Technical decon lines complete
12. 3 pool with garden sprayers and brushes m295 dry sds decon speeds (TGSI) zumro self contained Modec trailers Modec portable pump up back pack sprayers pressurized back pack sprayers numerous items for radioactive substance decon/ removal
13. 3 shower layout x 2. One for Team one for Public. We have Two additional units identical in use that can respond for mass decon. The Basic unit can decon 40-50 persons per hour, after set-up. Set up of showers takes approx. 15 min.
14. 4 Drash Decon Tent setups, with the ability to provide 4 ambulatory lines(120 decons per hour per tent) or 2 ambulatory lines and 1 non-ambulatory line(66 decons per hour per tent).
15. 4 lane TVI system
16. 40 patients per hour. 3 lane tent supplied by State of WY. Heated air and water powered by 110V/Kerosene.
17. 50+ persons per hour
18. 92 trailer based mobile decon units statewide to protect the healthcare infrastructure and to be a resource available to local incident response based on a statewide mass decontamination plan
19. A little less than very functional
20. a variety of portable decon tents and decon trailers (used in the CSEPP (Chemical Stockpile) Program in Kentucky
21. Ability to decon Level A entry team to an unknown environment.
22. Acceptable
23. adapter for garden hose for apparatus and garden hose
24. air supported decon tents with hot water capability Advanced multi step decon lines (homemade) simple decon kits issued to all county FD's (garden hoses, brushes, sprayers, decon solutions)
25. All items have been made and built by HM team. County not funded to purchase any items. Bleach, Sprayer, pool, shower, etc donated by local business. Use FD brush truck for water.
26. All of the SWEDE Decon Equipment is designed for high volume and low pressure with a 95F temperature rise. Hot air and water is very important to prevent hypothermia. Systems are designed to prevent cross contamination and increase user safety. SWEDE Mobile Mass Decontamination Unit SWEDE MidiFlex and MiniFlex Decon Tents SWEDE Compact 4000 Air/Water Heater
27. ATC vehicles Articulating tents with portable water and air heaters TVI Western Shelter Tents
28. bare min. enough to get by
29. Base X Decon unit Bio Tech Model 111
30. Base X easy to set up and use quick set up and take down
31. basic

32. basic
33. Basic - Training of HAZWOPER Students - Response Team has more equipment than training department - our dilemma.
34. Basic air inflated module, small water heater, various basic tools. set is designed for small operations max 40 per hour.
35. BASIC EQUIP IN AN ENCLOSED TRAILER, NO REE FOR MASS DECON AS NEEDED, USING WATER SUPPLY FROM FIRE APPARATUS- HYDRANT SOURCES
36. Basic equipment, palletized for deployment.
37. Basic multi-purpose equipment. Some state of the art with other jurisdictions.
38. Basic multi-purpose equipment for technical decon of responders, in addition a 30'x40' inflatable Zumro decon tent for mass decontamination of ambulatory and non-ambulatory victims, all contained on a 28' trailer with dedicated generator
39. Basic only - no brand names applicable.
40. Basic Pools and showers, Trailer with Drash pre-piped decon shower. Water heater with decon injection, air heater, air conditioner, dewatering pump, containment berm, containment bladder, dress and redress kits.
41. Basic so firefighter can deploy system fast
42. Basic wading pools
43. Basic. Prior employment was state of the art, I don't recall the names but it was a single unit structure with hose attachments along with space heaters and water line heaters.
44. Benton County is a Chemical Stockpile Emergency Preparedness (CSEPP) community, we have: (17 ea.) - Zumro 311 decontamination shelter systems for both fire responders and hospitals. Each tent is capable of processing approximately 60 people an hour running both am and non-am patients, or 120 patients an hour running am only. (5 ea.) - Nor E Shower trailers, four of the trailers has an approximate capacity of 90 people an hour and one at approximately 180 an hour.
45. Between the resources of MMRS and Fire, our county has access to a dedicated, walk-thru decon trailer, 7 walk-thru/roller-thru tents (with all needed operating equipment) and the standard wading pool/bucket-type decon setup.
46. Biosystems custom Mass Decon Trailer w/ base-x shelters, fully functional technical decon setup.
47. BioTech Mass causality Decon Trailer.
48. Both Modular (TVI Multi Line) and Trailer mounted decon systems
49. Bulky. Laborious to setup.
50. capacity could withstand simple CBRNE agents, as for advanced CBRNE agents does not have the capability or capacity
51. Capable and functional just not practical. Too slow to assemble and requires too many personnel.
52. CBRN Decon line to decon up to 100 individuals max. Equipment consist of Two land Decon tent, water heater, tent heater, 3000 gal gray water tank, detection and monitoring devices, modesty covers, tables, and other items to be used at each station.
53. Combination of multiple brands of equipment all placed together in a transportable tote. Some of the more advanced detection equipment is pulled from a secured meter room for each response. Examples are the GX1 brand atmospheric meters as well as our radiation meters.
54. County has supplied regional groups with decon trailers; we have practiced with them
55. County wide HAZMAT Ops Team has three units. Two mobile, one based at the local hospital. The mobile units have 1 Hughs 5 line decon tents plus two individual showers. The hospital has a two line tent and a single line shower. The county also has available a three line ITTF trailer that is stored in the county. Total capacity of the entire team decontaminating ambulatory patients with 5 minute showers would be 240 per hour.
56. Current Capacity would be 1-10 people. We have two Andax Personal Showers. We also have a small propane heating unit for heated water (Pro 70).
57. Current equipment allows for decon of multiple ambulatory as well as litter patients simultaneously
58. Current procedures use only M291 and M295 decon kits. For larger items, buckets and brushes. My comments refer to Personnel and equipment decon, not HAZMAT (performed by Fire Dept.) or Patient Decon (performed by Medical).
59. current systems Technician use only-single lane non-enclosed, homemade manifold, garden hoses, brushes and 5 gal sprayers 1st rinse stand up shower homemade, scrub and rinse, inspection final rinse and equipment removal. Public - same as above
60. Current TVI 3-lane tent system. Currently building indoor mass decon facility

61. Currently using "cardboard" folding unit. Not reliable, only one decon channel, does not easily accept non-ambulatory victims. We wish to go to an inflatable 3 channel decon shelter with non-ambulatory and male/female channels.
62. Currently we have 2 TVI tents 1 small, one large. We can decon 2 ambulatory patients every 3-4 min & 1 non-ambulatory every 5-7 min. The system is well designed and very easy to use, it sets up with four experienced people in about 6-8 min per tent. We have type "C" protection with P.A.P.R. and butyl hoods, also easy to use and fits anyone. Recommendations: 1. include a generator powerful enough to drive decon system with addition power for lights and accessories & spare gerry can with tent/decon kit 2. Include at least six rechargeable P.A.P.R. batteries with chargers in original kits for training exercises. 3. Provide maintenance grants sized to cover replacement of expired filters & batteries based on original equipment allocation.
63. decon suit's
64. Decon Support Trailers containing self contained tent systems, containment systems, and water heaters/generators. Kits also contain tarps, drop buckets, rubbish containers, modesty/triage kits for all deconned. City also has three dedicated decontamination support vehicles, containing sister equipment to decon trailers and able to establish two independent decontamination systems and associated support equipment.
65. Decon tent/shower unit with water heater & furnace system. Limited ability to handle non-ambulatory patients-very manpower intensive. For major events use mutual aid regional & state technical decon teams. Main limitation is the required travel time for these teams.
66. Decon Trailer with 2 pop up tents, Gen set, water heater, catch basin w/pump. Well set up unit.
67. Decontaminate team members or several members of the public. No mass decon except fire hoses
68. Decontamination is our discipline for our area HSRT. We have a decon truck and trailer. Truck carries all of our equipment to perform a technical decon. The trailer is set up for mass decon and also has an emergency decon section.
69. Dedicated Decon Trailer w/ 2 stand alone tents. Containment systems, Multi casualty systems. 1 of only 2 in County of Glenn, CA Pop. Approx 30,000. I-5, and 2 State Highway systems in response area. Brand, TVI
70. Dedicated self-contained trailer with the capability to decon up to 300 people without re-stocking. One of four trailers that are assigned to four counties in the region that make up Tennessee Homeland Security District 5. The trailer is assigned to a fire company that responds with a separate hazmat team and is trained for all phases of decon.
71. Depending on which entity I am with, we use anything from the wading and hose to a multi-patient decontamination tent
72. DQE Standard Decon Shower with Privacy Corridor - allows patients to move through the system quickly and with privacy.
73. Employ complete decon system utilizing decon tents, water heaters, decon solutions, catch basins and rehab tents. Also employ decon trailer with areas for ambulatory and non-ambulatory patients. However the trailer is 10 years old and technology has advanced.
74. Enclosed trailer with onboard generator and water heater, has 10 interior shower positions and 4 exterior shower positions. Unit is very functional but does require refresher periodically on how all the components work and assemble. Originally had some damage to equipment because of sub zero temperatures. we have 2 units and both have to be stored outside
75. Environmental Health and Safety runs the decon process for my hazmat team, I have found no deficiencies with the current system, but don't know more specifics on the equipment either.
76. Equipment used by former employer was a combination of basic COTS and a trailer that had been set up with on-board power, HVAC, water tanks, showers, and consumable supplies.
77. excellent
78. Extremely basic, generic tools.
79. FEMA based equipment for disaster ops.
80. Field Decon trailer + Hospital decon unit. Personnel cross trained to work with both systems. Mutual aid industrial decon team. Mutual aid regional decon team. Varied suppliers. Good capabilities, but little or no interoperability.
81. fire hoses- mop buckets- dawn dish soap-soft brushes
82. Fixed hospital site ZUMRO operation, with full supporting equipment for independent operation. FD Regional decon trailer operation has exactly same equipment. Completely interoperable.

83. Four decon tents with heaters (One Reeves Drash & one Reeves Tactical air shower two unknown make) All decon equip. is in two 26' trailers, two tents and one generator each. Each trailer has supplies for 500 victims.
84. Free standing pre plumbed tent with multiple corridors, diesel powered water heater with Decon solution mixing, containment ponds.
85. FSI blow up shelter with two travel routes. Our hospitals have the same units that have the addition of a third travel route to provide for stretcher patients
86. FSI portable decon shelter.
87. FUNCTIONALLY OPERABLE BUT MOST IS IMPROVISED OR HOME MADE
88. getting older and somewhat reliable
89. good
90. Had acquired a brush truck with stainless steel piping for slip-on unit to also have dual purpose supporting decon if ever was there a need to do so.
91. Have (2) Mass decon units issued by state and maintained by fire department. Have MOA signed with hospitals in City of Lowell and train with hospital staff. Can handle ambulatory and non ambulatory patients with (2) corridors in each unit.
92. Have a Trailer mounted unit that contains water heaters, an UV unit. Ability to (advertised) decon 500 per hour. 4 shelters, (2 inflatable, 2 expandable metal frame).
93. Have equipment to perform standard decon of first responders including stand alone shower, pools, brushes, hoses, solutions; plus air inflated tent with integral showers, waste water bladders, pumps, heaters, cots for non-ambulatory patients.
94. Hazardous Material Response Team has the capability to set up Mass decontamination operations
95. HAZMAT DEQ
96. HAZMAT TEAM RELATED: Many things we have either been donated or made by team members. We are a dedicated volunteer response team. We have much room for improvement when it comes to the capacity of our decon equipment.
97. High availability no matter where we deploy in the region.
98. high pressure water
99. Home built systems from many manufacturer's, Two vehicles are set up identical for decon. We use several types of decon stations depending on type of incident, emergency personal decon, personal decon, 3 stage decon and 12 stage decon.
100. Hospital Mass decon unit
101. HRSA Grant decon equipment-3 compartment tent with 16 decons/papr suits
102. I am familiar with two local systems, one is homemade and the other is an inflatable system, both work well and serve the purpose, cost is obviously the difference.
103. I am President and founder of FSI North America. We have been designing and supplying portable, mobile, and fixed hazmat decon shower systems worldwide for over 10 years. Mark Conron www.fsinorth.com
104. I do not have specifics. We continue to build on the basics with dedicated Decon Equipment, operated by our Haz-Mat Team, for both ambulatory and non-ambulatory capabilities.
105. I have worked with/work with hospitals, HAZMAT teams, MMRS Teams, Fire Departments, and law enforcement teams, assisting them with training and patient decontamination. The systems range from a basic drench hose and tarps to state of the art decon shelters and equipment.
106. In addition to the "basic" set-up, our 4 hospitals have state-of-the-art inflatable decon tents
107. In general we depend on fire Department Teams for our mass decon. We only perform technical decon of our own responders. For long term or more specialized operations we have used the CST Teams in our state.
108. inflatable tents with shower system capacity for 100 people an hour has own power, heating, and can connect to any fire hydrant or fire engine have put together tents with shower system for backup if more is needed three self contained trailers one is a double tent trailer can be towed to any scene with gas masks and free flowing popper units also self contained breathing apparatus with spare bottles
109. Infrastructure decon, external decon of individuals wearing PPE as part of doffing via Macaw backpack and Merlin handcart. Falcon Fixed Site Decontamination Systems (FSDS) for large scale decon of buildings and runways and vehicles. SwiftCAF ATV system takes advantage of all terrain vehicles to maneuver around abandoned cars, safely maneuver through crowds, and traverse uneven terrain that regular vehicles could not handle. The Intercept is a skid unit that fits in the back of short bed pick up trucks for decon.
110. Initial mass-decontamination is conducted with fire hose streams and decon solution (manual). We also have access to a mobile mass-decon trailer with three lines for ambulatory and one line for non-ambulatory victims.

111. Intelagard, Inc manufactured Macaw Man Portable Backpack, Merlin Hand Cart and truck mounted Inticeptor. All are Compressed Air Foam Systems, capable of dispensing the Sandia Based DF-200 Decontamination solution.
112. It is enough to simply get by until help arrives
113. It is extremely basic and should the situation ever arise where we'd need to decon a large segment of our population we'd be in trouble.
114. It is functional but not fancy
115. It is functional when weather conditions are acceptable; otherwise if it is too hot or cold it can be unbearable.
116. It is functional, but not optimal
117. It works for what it does.
118. It's the Mark I Mod I available through Military Supply lines... don't know the actual data... based out of 3 Conex Cadillac containers... part of the EMEDS package
119. just have received new zomro tent and equipment
120. Latest equipment provided by the State for hazmat/WMD
121. light capacity, occupancy and very basic
122. Limited
123. limited capacity
124. limited to none
125. Little to none, unable to afford equipment, no grants available for equipment
126. Local Fire agency maintains equipment and constantly purchases/upgrades based on changing needs. Regional training exercises several times a year with at least one HAZMAT exercise every two years.
127. Local Hospital has on-site we assist staff with its operation and set up.
128. low bid item, what can be afforded
129. Maintain a personal pack, issued by the county, for responding. Other decon equipment is maintained by the local fire department and EMA.
130. makeshift shower stall; disrobing station; robing station; 1 1/2" nozzle; child's wading pool, 3 plastic barrels
131. Manual tent operations with the capacity to decon ambulatory and non-ambulatory persons.
132. Mass decon trailer capable of deconning 500 ambulatory persons per hour also enough equipment to run 2 8 station decon lines.
133. Mass engine Company Decon & basic for technical decon, i.e., wading pools, garden sprayers and brushes.
134. Mass' decon support
135. Massachusetts standard TVI system
136. Minimal basic equipment at main station. MABAS Mobile decon truck and hospital based trailers available to this jurisdiction.
137. Minimally functional. We have money budgeted this year to increase our capability.
138. Most of our equipment would come from the private sector as a loan or rental. Ours would operate as a secondary system in the event that resources from a larger agency were not available.
139. Mostly self contained shower trailer hooked to a dedicated tow vehicle with on board generator. Trailer is equipped with diesel fired boiler to heat decon water.
140. Multi-lane mass decon shower facility w/ non-ambulatory capability Basic single person decon facility
141. N/A
142. N/A
143. N/A
144. N/A
145. n/a
146. na
147. na
148. Non existent
149. None
150. none
151. none
152. None
153. non-existence
154. Non-existent.
155. Nor - e Decon Trailer. 7 lane decon

156. Nor E System - difficult to set up, multiple personnel needed (4-6), also using the MITI hoop system for personnel decon, and as a backup system the basic pools and garden hose system.
157. NorE Decon shower system with four compartments one of which is for non ambulatory utilizing a roller system.
158. Nor-E Decon Tent
159. Nor-E decon trailer with 3 line ambulatory, 1 line responder, and 1 line for non-ambulatory. DQE personal decon shower
160. NOR-E SYSTEM
161. Nor-E system, good system but takes too long to set up.(takes 5-6 people 25 min, if you really know the system well) Once set up you can run a lot of victims through the ambulatory and non-ambulatory stations quickly.
162. Not a functional unit anymore. Technology has passed us. We are trying to revise this now, but as always, money says it all
163. Not applicable
164. not used very often but maintained. we could decon 20-30 people in about 30 min
165. Only Ambulatory personal with basic equipment only
166. Our department (Petaluma) is only FRO trained. I coordinate training and also respond with the Sonoma County Haz mat team. Our equipment is basic emergency decon with pool, hoses, brushes and level B suits.
167. Our department does have a three lane Reeve's Telescoping decon tent. Most members would rather utilize a pre-connected hose from a fire apparatus. The Reeve's unit is labor intensive, not user friendly and quite frankly a pain.
168. Our dept. only has basic decon equipment. Our local hospital has state-of-the-art decon equipment and we have had some limited training with them.
169. Our equipment is functional, we could use more capacity.
170. Our equipment is state of the art with additional equipment added when it fits our system. We can perform approximately 200 definitive decons an hour
171. Our equipment is very basic. We carry just enough to provide emergency decon for our responders & a limited number of civilians. More extensive decon is available from our County Haz-Mat Team. This is set up as an automatic response to a known Haz-Mat incident.
172. Our MABAS Division has its own truck mounted mass decon unit, our Haz Mat Team operates with a Zumro pre-piped air supported decon tent for mass and team decon duties.
173. Our police department has none
174. Pools and showers and Zumro shelters with patient conveyors, etc.
175. Poor not a priority in Los Angeles. Weak leadership and just a lack of awareness from the top down.
176. Portable decon trailers established around county. Able to runs 2 lines thru
177. Possess both technical decon and general population decon expertise and equipment. A low pressure 1 1/2" hose line ALWAYS works for emergency decon of both hazmat team members and general public. Runoff is always a concern, but of lives depend on an immediate wash down at the expense of the environment, the environment loses.
178. Radiological equipment also
179. Ranges from portable technical decon provided by HMRT's, to Decon Companies using FD engine companies, to use of portable trailers (Nor Easter design)
180. Rather limited. We have VERY basic supplies and protective gear.
181. Reeves decon shelters and heaters. Blowers, wands, brushes, lights, pre and post decon kits. Agentase post decontamination detection.
182. Reeve's drash unit
183. Reeves/Drash, tent, hot water heater
184. Self constructed 32 foot self contained trailer, in final stages of completion. (2) 24' three chamber tents with all accessories. Capability of ambulatory and non ambulatory patients. Capacity of 8 people in various combinations. Emergency room has additional fixed room for 2 people.
185. Self contained decon room, additional Zumro tent and level C gear
186. Self contained ASI trailer used in New Orleans for Two weeks.
187. self-contained and reained with
188. Self-contained decon except water. No bells and whistles and no auto. controls. Adding the auto controls, gauges and lights will price the equipment beyond locals.

189. Self-contained decon trailer from ACSI, with generator, and water heaters build in. Two indoor ambulatory shower lanes, and two spray booms on each side of the trailer for mass casualty and non-ambulatory decon
190. Single and multi line for decon of trained personnel. Also now have a basic mascas system. I concur with the concept of establishing a national standard for interoperability such as supply line sizes, waste water containment systems and signage.
191. Standard multi-component, open-air decon equipment. PVC showers, pools, collection sumps.
192. State funded Decon unit
193. State gave us one and we just sent it back
194. State-purchased towable decon unit w/ external showers, tent, heating unit. Also, my office has equipped five local fire departments with full sets of technical decon equipment (pools, showers, hose, etc..) to assist with Countywide hazmat response.
195. Supposed to handle large numbers, as it is a trailer mounted unit with expandable metal frame shelters. Will not operationally handle the advertised numbers. Replaced blow up shelters with the metal frame due to time and maintenance issues
196. Technical decon specifically for Haz-Mat team members consist of Fisher Scientific gross decon self shower and two other Aramsco wash rinse stations to insure contaminate reduction plus a self contained Mass Decontamination trailer
197. The above basic pools, wands hoses for small decon such as a meth lab and 1-2 personnel. Two Zumro Decon shelters for more people and weather shelter decon. issues.
198. The County Haz-Mat Team currently has all levels of decon equipment and supervises the operation of the basic level of equipment used by the 15 fire departments in the County.
199. The equipment is for operation level only. Wading pools etc. It can de-con aproximately 15 persons an hour.
200. The MA2SI 100 series air contamination control system provides up to a FDA certifiable Class 5 (100) micro clean room for fabrication lines and related processes requiring clean environments. Σ Flexible/Multi-functional: Clean room or micro clean room configuration customizable environmental enclosures are inexpensive and easy to set up for either positive or negative pressure, or a combination. Σ Versatile: Filter head height and angle adjustments allow getting clean air to areas never before possible. Only certified HEPA or ULPA filters are used. Σ Instant: Certifiable Class 5 environments are easily established and moved from line to line as needed. Σ Portable/Easy to Use: Bring the clean room to the project, rather than take the project to the clean room. Simply roll equipment into place, plug into any 120V outlet, and turn it on. A clean work zone is available in min with no necessary special wiring or ventilation. Σ Energy Efficient: Units do not require recertification at each on/off cycle—filter seal maintains its integrity—providing substantial energy cost savings. Σ Low Noise/Low Vibration: Units provide quick, easy cleanup, quiet operation, and no unwanted vibration on the work surface. Low Cost: No excessive capital outlays; lower operational costs.
201. The Polyatomic Oxygen generators have the ability to be mobile and can eliminate by treating the air and releasing it into areas with contamination for 99.99% removal rates. We have used equipment in Poultry houses before and after grow outs. We have used the equipment after very large die outs to decontaminate the buildings and personnel that cleaned or removed the dead poultry carcasses. We have a small portable 9000 ft system and we have a 52000 sq ft system that is mobile. The large systems have the power to eliminate anthrax and sarin gases if released as standalone systems once they are setup and in place.
202. This was FEMA buy off it is not a professional built unit, they took that one away from my dept and gave this homemade put together unit that is not certified by UL in anyway shape or form
203. Three pools with showers. Less than five minute set-up. 1 Person per minute throughput for technical decon.
204. Three tents Zumro brand. one ambulatory, two lane, one non ambulatory, and one treatment/holding tent
205. Tow-behind mass decon unit capable of 150 per hour
206. Trailer contained equipment. Generator powered hot water pump. Fire hose fed PVC shower with department made decon solution injection. Containment of 110 gallons. Capable of decon for 16-25 people.
207. Tried to enter this but having trouble with moving past this question.
208. TVI 3-Lane Decon tent, TVI Diesel Water Heater, DeWalt 6000W Gasoline Generator, 3M RRPAS Respirators, 3M CPF3 Protective Suits
209. TVI 3-Line
210. TVI 3-line decon system.
211. TVI 3-line decon tent with water heater/solution induction system. Tent also has roller system for non ambulatory patients.
212. TVI CORP Decon Shelters, PAPRs, accessories
213. TVI Corporation Decon Shelters and accessories with SafetyTech International C420 PAPR Systems

214. TVI Decon Tents (2), plus all needs for Basic Decon Set Up.
215. TVI standardized hospital decon package.
216. TVI System for Ambulatory and Non-Ambulatory Patients. (Includes Tents w/attached spray shower nozzles, water heater space air heater, roller system w/ rolling back boards, catch pools, recovery pump. The complete Dry decon system using Military M-100 kits.
217. TVI tent system easy to set-up and operate
218. TVI tent systems with plumbed water heaters and dedicated air heaters. Separate ambulatory and non-ambulatory lines. Can decon individuals or be set up for mass decon operations. Plumbed Moderc trailer used primarily for storage/transport, but can be deployed as rapid system with exterior heated water booms.
219. TVI Tents with heated water and A/C
220. TVI Two lane decon system Kohler decon trailer
221. TVI, Reeves, 4 shelter with heaters
222. Two 2.5 ton trucks, one with 6,000 gal water tank, one with ex military decon apparatus.
223. Two ambulatory lanes with a third non-ambulatory. TVI Shelter
224. Two line trailer capable of decontaminating approx. 10 patients per hour
225. Two separate systems. 1. Series of 3 decon tents: doffing, decon, and donning set up in sequence for patient movement through 2 corridors. Water connections; ability to connect to Supplied Air respirators, or use of PAPRs with canisters & batteries. Utilize wading pools with sump pumps to 500 gal collection bladders (4). Electrical hook-up for tent deployment, heater, and lights. 2. 2 8'x20' Wells Cargo trailers: Unit 1 complete with storage cabinets that contain "live" suits and accessories, sized to each team member, along with PAPRs. Each member has own duffle bag with personal items. Equipment that may be needed on-site also stored (cooling vests, burn kits, SureVents, AEDs, Patient donning/doffing kits, etc). Small desk and cabinets for reference materials. Unit 2: Rhino lining and plumbing for 2 corridors for actual decon on site. (Still being completed.) Built-in drain that will connect to water collection bladder, as well as sumps into collection area inside trailer to bladders. Both units have electrical hook-ups and lights. Large vehicle to pull trailers used also by hospital to move beds, etc., has ball for connection to trailers, and lift to move tents on board. 2.
226. Typically we are a cold zone entity but have participated in operational and training for emergency decon and to aid other members of the team. Our equipment is slightly higher than basic with portable sprayers, for example, and we have used a MDOU for mass casualty training.
227. unknown
228. unknown
229. Unknown; Probably just garden hoses and towels from gymnasium.
230. Use Nor-E trailer for ambulatory/non-ambulatory decon
231. Useable, simple, little time to set up, effective for most hazards & low cost!
232. useful but getting old; not state of the art but functional
233. Utilize decon equipment under a mutual-aid agreement w/ our local fire department. Have access to two state of the art regional haz-mat response teams. Work with the local hospitals decon system
234. Varies based upon the part of the state and jurisdiction, whether law enforcement or fire.
235. Very basic equipment primarily designed for "routine" decon incidents such as fuel spills, water run-off from contaminated fires, etc.
236. Very Basic tools, wash brushes, plastic buckets, dish, laundry detergents ,Clorox, garden hoses, homemade adapters, wading pool, sump pump, plastic tarps, traffic cones, hospital gowns.
237. Very basic, seldom used.
238. Very basic: generic wading pools (kids swimming pools) garden hoses, scrub brushes and bleach. Tarps.
239. Very capable. Biggest problem is interoperability with mutual aid agencies.
240. Very functional and capacities for many ambulatory and non-ambulatory. Zumro 311-120 systems (4)
241. Very functional disposable showers, pools, etc. also have used a tractor drawn trailer with three showers, donning and doffing area, etc.
242. Very functional.
243. Very limited functionality and capacity. Minimal risk of decon event within district borders, resulting in small portion of budget attributed to decon equipment or training.
244. Very limited in experience and equipment by both police and fire
245. Very Limited.
246. Very little equipment at all owned by this department.
247. Very Low
248. We are able to accomplish all levels of decon from Gross to Technical.

249. We are interoperable with the National Guard Civil Support Team (CST) equipment and techniques. We are somewhat interoperable with surrounding communities. We are considered across our state as a premier HazMat Tech and Decon team.
250. We are lucky to have several chemical plants and fire department that can establish and run the decon stations, so we do not perform decon except as awareness of exit procedures. I'm also responder to meth lab cleanups, and there we conduct our own decon. The decon equipment is maintained by the sheriff's department we would respond with, and I'm not sure the brand names in the trailer. I only respond with my technician's bag of PPE. The department also has PPE from CEDAP which is different from my meth lab response equipment. Officers only are employed should a crime scene need processing within a contaminated area, and it needs processing before the incident is completed. The incident commander would be a non-police officer, and the police team deployed has not other incident functions. Since the police hazmat technicians will not be maintaining or employing the decon equipment, we do not know the brands used by the plants and fire department.
251. We are part of a task force with the capability of decon for 200 people per unit. There are 6 units county wide.
252. We are part of Pennsylvania Region 13. We have access and have used our decon trailers which can decon 50-100 min an hour. With adequate personnel we can go up to around 300 people per hour with mass decon.
253. we are set-up to handle low to med load of people, we would go to a Mass Decon if we had a load greater than what a technical decon can handle. We have a Reeves systems, hot/cold water decon ,we aim to keep it simple as possible, we use free standing berms ,decon flooring tarps water hoses.
254. We build mobile, elf contained devices that bring ultra-clean air to the decon location to allow isolation of victims and first responders, the ability to pressurize a room/chamber to keep toxic fumes/particulate out and the ability to collect very efficiently the toxic materials to lower the threat they impose. Mobile air Applie Science, Inc. Models E100, EIU, CF320
255. We currently carry equipment for technical decontamination of our hazardous materials team members. We also carry limited supplies for mass decon of the civilian population if necessary.
256. We currently focus of HazMat team decon and not as much on Mass public decon.
257. We currently have no such device
258. We currently have none that I am aware of
259. We do minimal decon, the fire service performs decon
260. We do not decon. We work closely with our Fire Dept.. They primarily do all of our decon.
261. We do not have any decon equipment available other than the bleach solution and garden hoses and brushes.
262. We do not have direct access to decon equipment at our department. We have to utilize the county team for equipment, if needed
263. We do not have much more then the basic setup here, we rely mostly on mutual aid. In the future we will be part of an county wide Haz_mat Team.
264. We do not have state of the art equipment. Our decon consists of basic practices and use of the fire departments.
265. We do technical Decon on a routine basis. We have had no occasion to do mass decon except in training. Our equipment has been assembled from various components purchased from a variety of Decon Equipment suppliers plus traditional hardware and Fire Service vendors. Our capacity has not been tested as we traditionally have not needed to decon more than a 6 person entry crew at any one time. Our biggest limitation is probably air supply for decon personnel followed by decon team members themselves.
266. We don't have any. We help a neighboring department operate theirs.
267. We had a "state of the art" decon trailer and junked it after three years as it was a piece of \$100,000 junk. Trailer shower unit - poor quality plumbing/construction and heating unit. So many dead spots the unit could not be drained for winter storage even with air pressure blow out. Heater unit could not adjust from low flow to high flow, low flow it would overheat and blow apart hoses and high flow it would run cold after 10 min. Frozen pipes could not be accessed for repair without total disassembly of interior. \$2000.00 to fix \$5.00 worth of pipe and install a drain.
268. We have a 3 tent combination system. one shower head, can be used inside or out. PAPRs, with hoods and full mask, Tyvek suits with cotton, rubber and Chemical cloves. Radios are GT-750 23 channel scan with head sets. Cooling vests.
269. We have a basic decon setup. Most components were constructed in house with available parts. We can decon 1 person at a time.
270. We have a dedicated trailer ready to respond within 10 min to a HAZMAT incident within a three county area. We can process three people simultaneously, 2 ambulatory and 1 non-ambulatory in our Zumro inflatable decon tent. Our processing time is approximately 1-3 min per person depending on the type of contamination

- and the season (layers of clothing). We wrote an AFG grant to purchase a non-ambulatory roller system for the tent.
271. We have a dual response for in the city and out of the city. On each response we have staged Decon tents that are pre plumbed and able to any type of decon, we also have smaller technical decon and have also trained to do EDC with all apparatus in the department. Zumro Tents they work great and very easy and fast to set up.
 272. We have a large truss tent that is designed for decon of large numbers of people. We have a smaller inflatable tent, and several mini- one person decon set ups. We also have misc. supplies that we could use with a fire engine for gross decon. Man power is our limiting factor so we mutual aid with the Parish department.
 273. We have a small inflatable Zumeru decon shelter with portable, Hot water heater as well as forced air furnace.
 274. We have a small powered unit that produces heated water at several points in a shower type system. Also wading pools, hoses, brushes etc...
 275. We have a special built WMD decon trailer for mixing of decon solution, heating water and pressurizing. Also we have the air inflated decon tents with three divided areas for undress, wash, redress. We also have the hazmat decon system for our Haz-Mat Team as well.
 276. We have a state of the art decon rig used for mass casualty decon. It is designed to handle about 250 persons. Our hazmat rig also carries a full complement of technical decontamination equipment for responder decontamination.
 277. We have a state of the art system but it is in a trailer not in a "self-powered vehicle". We had an incident with 36 farm workers who needed to be decontaminated after exposure to a chemical and used our system. Full set up in under 10 min (hot running soapy water) with all victims decon in less than 20 min.
 278. We have access and have trained with the Minnesota hazmat trailers located in our region
 279. We have Basic Set ups as well as an enclosed shower set up and three Zumro Tents with all fixtures. In that way we can set up multiple decon lines and have the ability to go from basic more advanced based on the needs.
 280. We have decon showers and water heaters, but they are time consuming to set up and not user friendly.
 281. We have equipment for technical decon, and are also capable of performing mass decon. We carry supplied air, and numerous levels of protective clothing. We have a large mass decon tent and we have pt garments. We carry generators, water heaters, lighting, and heating equipment.
 282. We have five shelters, of which two are military external frame and three are manufactured by Zumro. Two large (15'X 24') Zumros are transported in the beds of two John Deere 4 X 4 Gators. Both Gators are stored inside an enclosed trailer with ancillary equipment. These are used at large special events of greater than 50,000 attendees (Insight Bowl, Fiesta Bowl New Year's Eve Block Party, 4th of July Celebration, etc.). The third and smaller Zumro is stored on a mobile laboratory. The military external frame tents are kept in reserve due to the weight of almost 500 pounds per tent. The shelters are a supplement for the standard technical decontamination procedures of a couple portable steel showers and wading pools setup.
 283. We have no equipment dedicated to decon.
 284. We have no equipment but have access to equipment and operators through mutual aid.
 285. we have no equipment packaged or designated
 286. we have none. are in the process of obtaining decon/nbc equipment
 287. We have nothing other than organic within the community. We rely on area and regional assets at this time.
 288. We have standard industry OSHA required safety decon equipment. I based my answers on my role as a USMC Battalion NBCNCO and was honor graduate of USA Chemical Warfare School APG MD. 1975. I have kept current on my own and have friends in positions of worth regarding these decon levels.
 289. We have the basic wading pools, showers, brushes and just the things you need to get by at the basic level of operations.
 290. We have the capability to decon up to 200 people, including litter-bound victims, we have one large 3 lane decon tent, 1 medium 1 lane tent for responders and small vehicles, and 1 individual tent. we have 1 diesel/ JP-8 powered water heater, and 1 JP-8 powered steam cleaner for decon of large tactical vehicles..
 291. We have the capability to do responder and mass casualty decon. We use pools and hose for responder decon and have Zumro tents for mass casualty.
 292. We have the equipment to complete a mass decon operation. Our short coming is the manpower and training required to operate the equipment.
 293. We have the Supplied New York State equipment cache and we have purchased additional trailers and equipment to supplant
 294. We have two of the Zumbro foldout decon tents. One is a 3 line (two ambulatory and one non-ambulatory lines), and One is a 2 line (ambulatory only).

295. we have very limited decon equipment. we must make do with child blow up pools, vehicle wash brushes and fire hose for decon at this time. We need funding to purchase basic level decon equipment. If there are specific grants for this equipment we are not aware of them.
296. We have Zumro decon tent, and also pools
297. we make it and so we use it daily in demos etc.
298. We only have level B suits, SCBA, and utilize the wading pools, brushes, sprayers, and tarps for our agency's decon station.
299. We only have the very basic needs in our dept.. We have a railroad that runs 4-5 times a day, as well as a major turnpike and 3 well traveled state highways.
300. We Produce Radiation Decontamination Solutions and Kits for first responders, Emergency vehicles, Hospital Emergency rooms, and families of four people. Please visit our website at www.raddecon.com
301. We use 2 DQE shower units along with 1 portable ZUMRO air shelter. We also have HAZMAT shower and air heaters LPG driven. Our equipment is matched by type and amount of inventory with another like trailer within our county. Also the surrounding counties have purchased similar equipment to be as compatible as possible.
302. We use a gross decon setup with hookups off the fire hydrant followed by a 3 line decon shelter with water heaters and air heaters for cold weather decon. The setup has its own generators, heaters, sump pumps for waste collection and a bladder for containment of decon water.
303. We use ClorDiSys Solutions Inc equipment
304. We use mostly Zumro equipment, tents, mass casualty conveyor system, shelter heaters, water heaters, Lakeland suits, Scott scba with filter adapters, berms and pumps.
305. We use the county hazmat truck mostly for all events
306. We used to have a bio-tech trailer and FEMA took it away from our dept. and replaced it with a homemade put together piece of junk it's not even certified, this what you get when those in charge do not care as to what you should have I.E FEMA and we are suppose to get monies from the Army for the CSEPP program for our county to have the right equipment but we have to many middle men with their fingers in the pot
307. we utilize decon equipment currently owned by the local hospital -- can't remember specifics about it
308. What I have for the hospital is 2 Zumros rapid deployment decon units. 1 unit has two 3stage ambulatory shower stalls and non-ambulatory rollers. The other unit has three 3stage ambulatory stalls only. Climate control units, lightings and other accessories on hand. We use these units to prevent the spread of contamination into the hospital while doing primary or secondary decon. These units are on trailers and can be mobilized anywhere on our island if needed but our primary role is to protect the hospital. We do monthly hands on hazmat/decon training.
309. works well but all ways room to improve
310. Zumro decontamination tent with heater, modesty dividers, grey water tank, containment flooring. Also carry numerous disposable decon pools, clothing etc. Hoses, manifold, brushes, solutions, and mass decon showers.
311. Zumro 16 X 20 inflatable tent with 4 lanes. Hot water heater with decon solution canister directly/permanently plumbed into tent. Containment floor along with exterior bladder. Also have stand alone decon pop up pools with garden hoses, watering wands, decon solution sprayers, decon tarp and garden hose nozzles.
312. Zumro Decon Shower and accessories
313. Zumro Decon system tent model 1810 Landa water heater model HS-3000 Mobile air heater Hunter model MVC-125
314. Zumro inflatable decon shelter, 311 sq ft. water and air heaters, waste water collection system for mass decon Portable showers, technical decon equipment for haz mat team.
315. Zumro Rapid Deployment Decontamination Shelters from Single Stall to 4-lane systems. Everywhere I have traveled people are amazed that in a matter of min their staff can deploy and maintain these Zumro Decontamination Systems. The ease of deployment with limited staffing, benefit of pre-plumb shower lanes with curtains and dividers in place, accessories that can be readied while the shelter deploys on its own, connector panels allowing interoperability with like systems, ability to physically move or redeploy without having to take the shelter back down, these along with many other features all add up to advantages that set Zumro Shelters apart!
316. Zumro shelter with showers and heater
317. zumro tent
318. Zumro Tent x3 for 50-75 phr per tent
319. Zumro Tents with Heated water
320. Zumro tents, online computer equipment with interfaces to external sensors. State of the art meters.
321. Zumro tents, Zodi water heaters, conveyors

Sub-Appendix Q: Section 13, Additional Comments

1. A decon standard should be established for all entities. "Generally" nothing should be different when it comes down to how and with what we do decon.
2. A follow up on the grant from 2004. We got a lot of equipment we needed but also some we didn't. i would rather someone else get it if they need it that it set on my shelf. Maybe a trading program I am sure I am not the only one in that position. Keep in mind the money came fast and had to be spent fast, we did a pretty good job and have be accountable for all of it, as required and thankful for it just have some items setting.
3. A standard for "basic" first responder decon kits, deployable in minutes by those first on scene.
4. All water & power connections for decon systems should be standardized, all fittings should be able to interchanged not matter what the brand, so in an emergency parts from any system may be used in another if need.
5. Although we may be considered on the fringe of the normal decon arena, we see the need to protect the victim, the first responders and the materials they use as vital during their operations. If one can place these operations within a protective environment, then the safety threshold has been significantly improved.
6. As is always the case, one shoe does not fit the nation. Our rural county faces different local problems than the nearby urban areas, BUT, we will be called to assist the urban areas should they have a large incident. This response may be manpower or manpower and equipment. Additionally we rely on these urban areas to assist us should the incident be beyond our ability to supply adequate resources. With that said, we need to have similar financial resources as our neighbors to be able to cope with the problem, whether decon, a hazmat incident or any all hazard incident.
7. As long as you'll listen to us, you are already on the right path. Best wishes! -Shawn
8. As the Haz Mat coordinator for a cold climate city, and traveling extensively as a senior instructor for a Homeland Security Consortium Member, I would be very interested in participating in a decon standardization / overview committee.
9. as we are a small department it might help if there was some info on how to get some of these very highly needed items
10. At the present time we have no equipment
11. Based on previously military training, hot soapy water was always identified as the best de-contamination process. Is there any thought of addressing this method and then accelerating to a decontamination solution that would neutralize certain agents? Simpler is always better.
12. CEDAP is model that DHS should be using for all of its grant programs. Please let me know what we can do to support DHS in this wonderful program.
13. Community based grants should be offered by both corporate and government entities to encourage the training, use, and especially development of technologies for decon situations. I suggest that youth be more involved in future operations as well as development of decon materials. Offering grants, scholarships, and hands on experience will ensure a greater sense of community as well as R&D.
14. Decon equipment needs to be simple to use, for the benefit of everyone. There needs to be a standard for every aspect of contamination, Fire, Police, Haz-Mat, EMS. Carl Miller
15. Decon equipment should be standardized so that departments can have interchangeable equipment. Standardize the way contaminated water is moved to the contaminated storage area.
16. Decon systems consist of three principal components: people, procedures, and equipment. There are more and more choices of equipment available on the open market. There are no standards for evaluating the systems to ensure that they are effective in the goals of decontamination. These goals include: safely/cleanly extricating responders from contaminated ensembles; balancing time v. "cleanliness" for patient/victim contamination processing; ensuring containment within the CRC and during transport; and verifying the efficacy of decontamination solution application (does it really reach the surfaces where the contaminants are?). Issues like interoperability might not be that meaningful if the overall effectiveness of the decontamination system(s) isn't known to begin with. Thanks for the opportunity to respond.
17. Decontamination efficacy is the lynchpin. Universal decontamination solutions are necessary; however, type of contaminant will dictate the type of ideal decontamination solution. Air sampling and decontamination process effectiveness must be monitored and equipment or personnel that are not completely decontaminated should be re-routed to start of decontamination lane. % of contaminant removal must be pre-determined and that is the decontamination standard that must be evaluated and enforced. Contamination control lines for vapor and

liquid should be visible and known by all responders operating site. Respirator discipline must be enforced. Work-Rest cycles must be used.

18. Decontamination of equipment, supplies and environmental samples is overlooked
19. Don't forget those of us who live where it is cold.
20. Don't forget to include space for supervision of decon operation, such as when the people being decon are prisoners, and also for off - road activity, decon should be considered both fixed and mobile for it really to be used properly in emergency operations. Railroad operations are a perfect example, most don't happen in urban environments where you can easily get a trailer set up and supplied with water. You may end up trucking equipment into the area, so equipment should be marked pack -up and conveniently pre-set. Any major plan for decon should consider both types of equipment and necessary supplies for the procedures to take place. Also, if equipment is going to be used for radiological and chemical emergencies, monitoring plays an important part in making sure decon is properly taking place. This needs to be in your discussion, which I don't see.
21. Emergency decon and tactical decon equipment should be considered within this survey.
22. First page of survey was too detailed. Should reduce to fit on screen without scrolling especially since it required making comparisons between the choices.
23. five years late on this
24. Former nuclear submariner, radiation safety tech, and other radiological experience
25. From a civilian and hospital perspective, I believe that it would be beneficial to assist hospital systems to "regionalize" all of their decon training and equipment, increasing interoperability. This would assist everyone in at least attaining the minimal level of ability to respond in an event. Thank you.
26. Funding for smaller agencies to get this equipment
27. Give me a call.
28. Hi.
29. How to standardize the training plan for CBRNE inventory, to include waste disposal and storage distance requirements.
30. I am a Captain on Riverside County F.D. / Cal Fire hazmat team. I have 17 years on our hazmat team. team
31. I am very interested in other's (especially hospital's) experience performing outdoor decontamination during cold weather. Our experience is that this is not a realistic operational strategy.
32. I am very interested in the future of decon systems and procedures. I currently work with a state police team that requires a tactical response system, 3 to 5 minute "arrival to operation" requirement, light weight, high efficiency protocol. We are progressing quickly in our capabilities, but are still working out some minor bugs. I believe the data we are acquiring at this time will be helpful to many decon teams, and would like the opportunity to share knowledge with other teams in the future. Please include me in any correspondence in the future, if possible. Thank you.
33. I appreciate your efforts to develop national standards for decon equipment and would be willing to help in any way needed.
34. I believe you should score or tabulate responses from Bomb Squads with separately from these of standard hazmat Units. Our responses may be limited to matters of a criminal investigative nature or these where Improvised Devices are present. We do not generally respond to spills and industrial incidents where there is no intentional harm.
35. I enjoy opportunity to do whatever I can do to help encourage first responder research and development in the private sector.
36. I enjoyed the survey and hope to see more of them, maybe we could be allowed to upload pictures of the equipment we use if possible.
37. I feel that funds for Fire Departments should require performance criteria. Much like the hospitals departments should receive annual evaluations on their ability to set up and operate the equipment they have.
38. I feel the most overlooked and now most sought after item that mass decon and pandemic exercises need is a full understanding of mass decon communications and how it can be simplified.
39. I have a specification sheet that 17 decon systems were built and delivered by . If you would like a copy please get in touch with me. I have spent many hours writing these for the state of Michigan.
40. I like what you're doing....and it needs to be factored into all government installations as they will undoubtedly key in playing a role in any large scale decon effort.
41. I need decon equipment and training for a Chemical Terrorism fixed laboratory.
42. I think it makes sense to use National Standard Thread as the hose coupling since fire departments will be involved at some level in any situation

43. I think the main concern with decontamination equipment is the lack of ongoing training. Too many agencies have received equipment and not gone to next step with regard to training their staff. Finally someone is asking the right questions hopefully it's not to late.
44. I think the most important thing is how fast you can get your operation up and running and the contaminated individuals thru it. People won't and can't be expected to wait.
45. I'm pleased that someone is doing the research on this and hope that much good comes out of it.
46. In a world of ongoing, probable, terrorist attacks; both foreign and domestic, I feel it is necessary for me to receive some type of hazmat/first responder decon training. I'm experienced in the use of firearms and various other equipment. However, because of the increased probability of coming across something of this nature. I feel I need that training to arrest a situation from getting out of control, OR recognize the signs of such hazmat situations in order to alert the properly equipped emergency services.
47. In my opinion, for most firefighters/ paramedics a hazmat incident (requiring decon) is a rare occurrence. We focus most of our training efforts toward fire, rescue, extrication, EMS/ con ed, and confined spaces. This is why I rated the importance of "ease of operation" so high.
48. In small rural areas and smaller communities I strongly believe that there should be minimum levels of cross training, because of limited personnel to cover long term events. This would give a higher level of service and effective coverage in critical times.
49. Incorporate HAZMAT training/decon processes for all emergency communication personnel.
50. It does take well trained people to decon with good equipment to do the job
51. It would be nice to have complete affordable decon packages that could be purchased based on your current and projected capabilities. Smaller departments (like us) don't respond to Hazardous Materials Incidents that often but we still need to maintain equipment and training. The hardest thing for me is purchasing the right equipment at a reasonable price, knowing that we probably will not use it except for training. Also when you pick and choose different equipment from different vendors and make it fit together because the price is right it really complicates the training aspect.
52. Its very important to continue to encourage science and technology advances in CBRN decontamination.
53. Keep it as simple as possible. Try to design training to small blocks of time, It is difficult to get personal to all required training. Life is very busy for people now with school, church, family, and work. We are a volunteer department and training time is a problem. Training should be in blocks and build from there.
- thank you
Chief Fisher
54. Keep It Simple and Stupid
55. Keep it simple, volunteers are hard to find and keep trained.
56. Keep up the excellent work.
57. Keep up the good fight!
58. last question #6 could not answer truly, we have no equipment, we are too poor to buy anything!
59. Mass decon always looks workable during a "tabletop exercise", and even during controlled "hands-on" drills. There is a tremendous problem with protecting the modesty of citizens while assuring the best decon is performed. All of this needs to be done in a rapid manner (no more than 60 - 90 seconds per individual). Doing this in an actual situation is very different. Speed of set-up, modesty for citizens, simplicity and standardization are the most important factors we have found difficulty during operational periods.
60. Money is our problem, same as with everyone else
61. My specialty is radiological incidents.
62. National decon deployment needs to be modular (first arriving units emergency decon capabilities, next arriving units have medium capabilities, and specialized decon units arrive last with larger capabilities). Decon capabilities should be based on population/population density. Decon areas should be marked with a standard ICS symbol. (Command post are marked with a green light, maybe mass decon should be marked with a purple light). On a major scene with numerous apparatus and flood lights, responders and the public need a easy to find symbol to get to decon. In addition, responders will have to direct crowds by making announcements over a public address system. It would be much easier to announce "go towards the purple flashing light".
63. Need interoperability and multiple agency training. One agency responsible for transport, use and maintenance has been detrimental to our program. Our Decon unit is managed by one agency and there are no cross-trained personnel to manage our unit.
64. Need to look at decon set up and usage with as few people as possible. Lower cost and readily available expendables if any are trashed or the ability to decon and reuse equipment. Operating personnel should be as few as possible. Have ability to expand size for big incidents or scale back system for one to two people. We

- have used decon more for meth labs or agricultural pesticide exposures involving 1-2 people more than for the big disaster. Mobile vs. non-mobile patients also, Decon is very labor intensive at its best.
65. None
 66. None at this time
 67. None noted
 68. Not sure about some of my answers related to controls and monitoring. If contacted, I would refer inquiries to product applications expert.
 69. Nothing within the survey really addresses the need for what type of hazard detection equipment should be considered, i.e., portable GC/MS, CWA detectors, PID's, FID's etc. I would think this is critical to the overall decon process.
 70. our fire co is first due for nuclear power plant in our area and we would like more info and training on stuff so we can prepare for the worst should anything happen here. Thank you
 71. Please consider adding a waterless decontamination capability to any standards developed. This capability offers two key advantages in a decontamination process. 1. In the event that enough water is unavailable based on circumstance. 2. In the survey you had mentioned the time it would take to decontaminate 100 ambulatory victims. With a dry decon solution (when applicable, ambulatory victims can begin to self decontaminate while in line. This provides them with an effective means for decontamination and psychologically they feel as if they are being helped.
 72. Please get the bleach out of decontamination. Patients have received chemical burns by first responders in instances nation wide. Why even use bleach, according to CDC biological decon procedures for hard surfaces it must be a 1:10 solution and contact time is 20 min. It really doesn't do anything for chemical agents either versus the threat to the patient. Bleach also breaks down and defeats the skin making it easier for chemical agents to enter the skin.
 73. Please keep it simple. The more auto controls, bells and whistles, self-contained, rugged terrain capable will narrow vendors and make equipment costs beyond local capability. Decon cannot wait for a military unit to assemble, transport, setup and then decon.
 74. Please work with us at ISEA as we finalize the first portable hazmat decon shower standard - currently out for public comment. This standard is basic but a first step in professionalizing the multiple possible systems offered by dozens of manufacturers and while currently designated as ISEA # 113 will be adopted by ANSI and given an ANSI standards #.
 75. PPE is a tough sell in terms of priorities of spending. NIMS training on PPE necessities that deal not only with WMD incidents but also routine exposure are necessary. Examples include active shooter in colleges or high schools where organic solvents are present (chem labs)...every jurisdiction has these. There is a new technique where perpetrators will attempt to destroy "crack" cocaine by disposal into muriatic and other acids during warrant service. Asbestos in old buildings is a hazard. Finally, the use of PPE to protect against first responder exposure to communicable diseases on routine calls for service should be explored.
 76. Prior to Hurricane "KATRINA" we had about 3,000 folks in our area. We are supposed to have an increase to 30,000 within the next year or so. With that kind of growth we are going to have to start training for more advanced techniques & practices. A lot of things that did not seem that important before will now be common place in our everyday activities. We are morphing from a small rural all volunteer department into a more modern up to date department, having to reformulate our procedures & thinking to meet the expectations of the incoming population that were accustomed to metropolitan type departments. All of this financed by a Board of Supervisors that can't understand why we need more financial support & more sophisticated equipment.
 77. Provide questions about the available decon trailer systems and interoperability of equipment. What are the current tread types being utilized today.
 78. Question #6 says list all if you have all but will only allow you one choice.
 79. Remember, time is of the essence. IT decon setup and operation takes too long victims in perceived pain will attempt to breach to go get assistance. Now you have a site control situation and contaminants spreading. Decon must be simple and quick.
 80. research alternate ways to setup decon quicker and disposable
 81. Review your Survey Instrument for more accurate data - rating in order of importance will skew the data in that in a couple of the data sets, equally important items/criteria were forced to compete against each other and this is counter effective for the purpose of your survey
 82. Some of us have to use a regular hose pipe, 1/2", tobacco sprayers, shower curtains from the dollar store, and barrels donated from farmers. Our Pumper trucks use 1 1/2" hose's with a 1" reel. Small Counties have to make do with the items before them in a regular day to day decon. In a declared incident a HM trailer could be

- requested from the district HS home county. We do not have funding to replace equipment that would be used of the HS HM response trailers.
83. Standardization is great. But remember what works in the city may not work in the mountains. Similar events - different locations and resources.
 84. Standardization. What a novel concept!
 85. Suggest contacting TVI Corp who has considerable developmental and sales expertise. Decon is their core competency. www.tvicorp.com
 86. Thank you for the ability to incorporate my thoughts.
 87. Thank you for the opportunity to participate in this survey.
 88. Thank you, some fire fighters don't take this seriously "it can't happen here".
 89. Thanks for asking.
 90. Thanks for the survey opportunity. Chief Whalen
 91. Thanks for the survey; I would like to see the results. One of my answers to the questions concerning decon may seem misleading but while we have not had many times here at our City to use decon, I was in the National Guard and my job was a Chemical Operations NCO, so I have a lot more experience outside of the City than just the times we have a decon mission.
 92. The 1st section of this survey is very badly laid out and most respondents would not have continued on.
 93. The county I'm involved with is going through a lean period and the funding is not expected to get any better in the coming years. It seems that most of the expendable equipment is due to expire in the next couple of years and I see no plans in place to replace this equipment. If this continues over the next two or three years units will begin to go out of service. Our unit will be out of service in 2008 unless equipment is replace as it expires. Thank You.
 94. The most important parameters for decon equipment are that it: 1) Be affordable / practical for the local jurisdiction; 2) Have a long shelf life under non-climate controlled conditions; 3) Require minimal practice and continuing training to operate. Other considerations, such as interoperability, are important, but they are much less important than these factors, especially for smaller communities where much of the public safety sector is staffed by volunteers.
 95. The question that was asked about what level decon we used would not allow me to put multiple answers which is what most will answer. Also caused me to not answer what system we used because I did not want to rewrite it all over again.
 96. The questions asked as part of this questionnaire are extremely inappropriate. They miss many important aspects and most are useless, trivial or ridiculous. The person that developed them seems to have no knowledge of what is required to perform decontamination. I would rate this as a total waste of time.
 97. The system should also contain a tracking system where non ambulatory pt are found, ie GPS location to help rebuild the incident for investigation.
 98. There is not one piece of equipment or decontaminant that will satisfy all CBRN attacks by enemy combatants vs. a WMD event within CONUS. How we decontaminate aircraft will be different then roads, ramps, runways, facility exteriors/interiors, vehicles, and sensitive equipment. May end up with multiple technologies.
 99. there should be standards set for long term storage as to prevent damage from heat/cold
 100. This is a great idea. I hope a similar effort is being taken for other CBRNE equipment.
 101. This is a rather useless survey. All the answers are common sense. The questions even guide you to the logical conclusion. I'm surprised someone is wasting their time with this unless they want to sell something!
 102. This is an excellent survey. All the right questions seem to have been addressed. I do feel strongly that standard connections and directions need to be implemented.
 103. This questionnaire seems to be geared towards large decontamination equipment for CBRNE. I think that the same should be do for a basic first responder decontamination equipment, keeping it simple for agencies with not a lot of assets.
 104. Use the resources of trainers and fire chiefs. Include the cog people. Create a master list of trained people in all areas that can and will respond to emergency. Allow them to train with the first responders so each can learn the others strengths and weaknesses.
 105. We are a four man department, the county has the equipment, we set up the trailer and equipment, we have not had any formal training other than DVD's and books, were are going to end up with the trailer and equipment so we will take hands on training only to provide other jurisdictions in our region. In an emergency we will not be able to provide decon in our jurisdiction. We have an STP problem when it come to volunteers and helping out. (Same Ten People do everything.)

106. We are a regional hazmat team; all of our equipment is purchased by the State of Oregon Fire Marshall's office. We have 15 regional teams state wide.
107. We can always improve on a good idea!
108. We feel reliable, durable high volume equipment operated with well trained personnel are the key to any operation.
109. We find that a warm environment with directionally controlled air flow is the most commonly overlooked requirement for an effective decontamination facility. Decon lane size is also important, especially for assisted decon and decon teams that use SCBA.
110. We have an experienced decon-development team here in Cincinnati. I would be glad to arrange a meeting/conference call, etc.
111. We need more standardization of all haz mat equipment
112. We should be using the best equipment available
113. We use the trident system which is permanently installed in one of our parking garages. This leads to fast and ineffective mass decon. We also have showers permanently installed in our garage for individuals to use after the mass decon. This system has been used as an example for other across the state.
114. Well done survey - nice job again RKB.
115. When this organization needs decon it calls on fire department or regional decon unit
116. You must have a quick attack program to start out which any fire department can provide. Where we really need help is supplies and equipment when we are waiting for the CERFP'S to arrive. We must have enough supplies and equipment to decon people until the CERFP'S arrive and setup. Field hospitals must be deployed with the CERFP's.
117. Your questionnaire is too long.
118. Your questions did not seem to consider the availability of additional resources from outside agencies. As an example: Town A might be able to decon 10 people within 30 minutes and 100 within 2 hr but they would get assistance from Town B. The town B resources might speed up the process so that the 100 people have been deconned in a much shorter time. Standardization of some items is useful, in other cases it can stymie innovations and makes it difficult for a community to adapt to unique situations.

APPENDIX B – SURVEY AS POSTED ON WEBSITE

The following pages show the survey as it was posted on the Responder Knowledge Base Website.

CBRN Decontamination Equipment Questionnaire Page 1 of 1 Exit this survey >>	CBRN Decontamination Equipment Questionnaire Page 1 of 1 Exit this survey >>
 CBRN Decontamination Equipment Questionnaire 1. Overview Welcome! Thank you for volunteering to take the RKCB Decontamination Equipment Survey. This survey was developed with the assistance of the U.S. Army's Edgewood Chemical Biological Center. We appreciate your time and input on this critical matter. The purpose of this questionnaire is for you to rank all hazards/ CBRNE decon equipment characteristics and determine other important details related to decontamination of civilian personnel and first responders after an incident. The results of this questionnaire will be presented to the InterAgency Board for Equipment Standardization and Interoperability (IAB), and reviewed by other relevant organizations to gain insight into responder priorities and standards requirements. Please read the directions and each of the questions carefully, and answer them to the best of your ability. It will take you about 20 minutes to complete this survey. Please note that any question marked with an asterisk (*) is a mandatory question and requires an answer before moving to the next page. Next >>	 CBRN Decontamination Equipment Questionnaire 2. Some information before you start... 12% Definitions: CBRNE is the acronym for Chemical, Biological, Radiological, Nuclear, and Explosive. Decon equipment is defined as all the equipment used in an operation to decontaminate the general public and first responders. This equipment also includes decontaminants (e.g., decontamination solutions and powders). Assumptions: Some high-level characteristics such as cost, efficacy (effectiveness and efficiency of decon equipment), safety, and environmental considerations of decon operations are being evaluated separately from this questionnaire. << Prev Next >>

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CBRN Decontamination Equipment Questionnaire

3. Importance of Characteristics

18%

- * 1. This question asks that you rate the following characteristics of decon systems. Please rank these items from your 1st choice (most important) to 10th choice (least important) by checking the appropriate columns.

Input your ratings below:

1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th

TIME: required to decon civilians and first responders (i.e., throughput rate) from point people first enter decon station until they exit last station; required to set up equipment from point you arrive on site to being operationally ready; includes "warm-up" time, e.g., time to heat decon solution.

EASE OF USE: while using/operating equipment (takes into account number of steps and people needed; also includes how complicated steps are and how intuitive equipment is to use); while setting up equipment (includes number of steps, parts, and people needed; also includes how complicated steps are and how ergonomically well-designed equipment is).

RELIABILITY/MAINTAINABILITY: includes the equipment's quality, durability/robustness, ease of repair, and frequency and complication of required maintenance.

OPERATING CONDITIONS: the ability of the equipment to operate in most or all environmental conditions (e.g., high winds, extreme humidity [including rain], extreme cold or heat).

TRANSPORTABILITY: the combination of the size/volume, weight, and packaging of equipment. Includes moving equipment from storage location to contaminated site, including possible requirement to move equipment cross-country (e.g., across an open field).

CONSUMABLE RESOURCES REQUIRED: the type of consumables (e.g., fuel, filters) and amount of consumables needed, shelf-life (under expected conditions), and storage conditions (required for reasonable shelf-life), and time consumable may be used after being first opened.

HUMAN FACTORS: the combination of all factors that make the equipment satisfactory to use or perceived as safe to

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CBRN Decontamination Equipment Questionnaire

4. Time

24%

Choose the longest length of time you find acceptable in each situation below.

1. After you have arrived on-site it is important to be able to set up equipment in not more than:
- | | | | | |
|-------------|--------------|---------------|---------------|--------------|
| 1-5 minutes | 6-10 minutes | 11-20 minutes | 21-30 minutes | > 30 minutes |
|-------------|--------------|---------------|---------------|--------------|

2. It is important to be able to decon one ambulatory person within:
- | | | | | |
|-------------|--------------|---------------|---------------|--------------|
| 1-5 minutes | 6-10 minutes | 11-15 minutes | 16-20 minutes | > 20 minutes |
|-------------|--------------|---------------|---------------|--------------|

3. It is important to be able to decon 10 ambulatory people within:
- | | | | | | |
|--------------|---------------|---------------|---------------|---------------|--------------|
| 1-10 minutes | 11-15 minutes | 16-20 minutes | 21-30 minutes | 31-40 minutes | > 40 minutes |
|--------------|---------------|---------------|---------------|---------------|--------------|

4. It is important to be able to decon 100 ambulatory people within:
- | | | | | | |
|--------------|---------------|---------------|---------------|---------------|--------------|
| 1-10 minutes | 11-20 minutes | 21-30 minutes | 31-40 minutes | 41-60 minutes | > 60 minutes |
|--------------|---------------|---------------|---------------|---------------|--------------|

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CBRN Decontamination Equipment Questionnaire
6. Reliability/Maintainability

35%

1. What is the minimum number of actual decon operation(s) (of at least 12 hours each) that equipment must operate as intended without any expected preventive maintenance or repairs other than routine post-incident care and cleaning?

1 decon operation	2 decon operations	3 decon operations	4 decon operations	> 4 decon operations
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2. How often should recurring maintenance be required on decon equipment when the equipment is not being used for an incident or training? Please choose the smallest acceptable interval.

1-4 months	5-8 months	9-12 months	13-18 months	> 18 months
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CBRN Decontamination Equipment Questionnaire
7. Operational Considerations

41%

1. What is the highest ambient temperature in which the decon equipment needs to remain functional?

≤ 90°F	≤ 100°F	≤ 110°F	≤ 120°F	> 120°F
--------	---------	---------	---------	---------

2. What is the lowest ambient temperature in which the decon equipment needs to remain functional?

≥ 30°F	≥ 20°F	≥ 10°F	≥ 0°F	< 0°F
--------	--------	--------	-------	-------

3. What is the highest wind speed in which the decon equipment needs to remain functional?

≤ 10 MPH	≤ 20 MPH	≤ 30 MPH	≤ 40 MPH	> 40 MPH
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Exit this survey >>



CBRN Decontamination Equipment Questionnaire 9. Consumable Resources

53%

1. What shelf-life would you expect for the following types of consumable resources? Please choose the shortest shelf life you would find acceptable.

1-6 months	7-12 months	13-18 months	19-24 months	> 24 months

Fuel (diesel, gasoline)

Active Technical Decontamination Consumables (bleach, detergents, etc.)

Supplemental Decontamination Items (modesty clothing, towels, etc.)

Other (please specify below)

Please specify Other if used

2. What do you believe are the most restrictive long-term environmental storage conditions for consumables that you could reasonably expect from a vendor?

No controls needed (e.g., acceptable for consumables to freeze)	Partially controlled environment required (2 32°F but s 85°F, not controlling humidity)	Normal office environment type controls needed (fully heated and air conditioned facility)	Special environmental conditions required (e.g., refrigeration)

Active Technical Decontamination Consumables (bleach, detergents, etc.)
Supplemental Decontamination Items (modesty clothing, towels, etc.)
Other (please specify below)
Please specify Other if used

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CBRN Decontamination Equipment Questionnaire 10. Human Factors

59%

1. It is important that the noise level within 25 feet of the equipment be no higher than _____.

≤ 70 decibels (dB, equals sound of busy street traffic)	≤ 80 dB (equals sound of vacuum cleaner)	≤ 90 dB (equals sound of small orchestra)	≤ 100 dB (equals sound of walkman/iPod at max level)	≤ 110 dB (equals sound of front row of rock concert)	≤ 120 dB (equals sound of just below threshold of pain)

2. Should manufacturers be required to supply appropriate signage (directional, pre/post decon, etc.) as part of their decon equipment?

Yes

No

Comments

* 3. Do you believe there is anything the general public might perceive as unsafe about decon operation or use of decon equipment?

Yes

No

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CBRN Decontamination Equipment Questionnaire

12. Interoperability

71%

1. Select your top three choices for necessary hose connections when working with decon equipment.

First Second Third

3/4" threaded

1" threaded

1 1/2" threaded

1 3/4" threaded

2 1/2" threaded

Other

Specify Other here if used:

2. Should NST (National Standard Thread) be used as a standard for decontamination equipment?

Yes

No

Optional Comments

3. Select your top three choices for decon equipment or parts of decon equipment that should be standardized nationally (e.g., all water in-feed hoses must be 1.5 inches in diameter).

First Second Third

Hose connectors for the decontamination system

Personnel shower components

Non-ambulatory victim decontamination equipment
Decontamination shelter components to allow parts of different systems to be inter-connected
Waste water containers
Waste water containment and transport
Other

Specify Other here if used:

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CBRN Decontamination Equipment Questionnaire

14. Operational Interface

82%

1. Rate the importance of the following visual control DISPLAYS needed when working with decon equipment:

1 - 2 3 4 5 -
Unimportant Extremely Important

Operating Temperature
Operating Pressure
Decon Solution Level
Fuel Level
Amperage/Voltage
Other (please specify)

Please specify Other if used

2. List 3 examples of important audio SIGNALS/ALARMS needed when working with decon equipment:

1 - 2 3 4 5 -
Unimportant Extremely Important

Operating Temperature
Operating Pressure
Decon Solution Level
Fuel Level
Amperage/Voltage
Other (please specify)

Please specify Other if used

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3. The capability to pre-set equipment operating parameters and have them automatically monitored/adjusted based on those pre-set values as needed is important to successful decon operations.

Very Strongly Disagree Disagree Agree Strongly Agree
Strongly Disagree Disagree

4. How important is it to have the ability to manually adjust controls (override automatic adjustment for key operating parameters)?

Very Much Unimportant Rather Unimportant Neither Important Rather Extreme
Unimportant Unimportant nor Unimportant Important Impo

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Basic (e.g., multi-purpose equipment such as wading pools, garden hoses, horse brushes, bleach decon solution)

* 7. Number of times your organization has used each type of decon equipment for a hazardous materials incident or hands-on training in the last 2 years: (note number of times for each type)

0	1-3	4-10	10-20	>20
---	-----	------	-------	-----

Basic (e.g., multi-purpose equipment such as wading pools, garden hoses, horse brushes, bleach decon solution)

Between Basic and State-of-the-Art

State-of-the-Art (e.g., dedicated self-powered vehicle with on-board equipment specifically developed for decon operations)

8. Describe the functionality/capacity of your current decontamination equipment (include brand/model if you wish):

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CBRN Decontamination Equipment Questionnaire

16. May We Follow Up?

94%

1. Would you consider participating in a follow-on effort to continue to determine standard-level requirements for decon equipment?

Yes No

2. May we contact you if we have any questions about your responses?

Yes No

3. If you answered "Yes" to either question above, please enter your contact information here.

We will only contact you regarding which question(s) you answered "Yes" to above.

Name _____

Name

Phone _____

Number

Email

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CBRN Decontamination Equipment Questionnaire

17. *Thank you for completing this questionnaire!*

100%

Your input is very important as we develop consensus for decon equipment standards.

1. **If you have any other comments or suggestions, please include them here.**

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[Done >>](#)