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# **GTRI Remote Monitoring System: Training and Operational Needs Assessment Analysis Report**

Prepared by:

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April 2012



**Pacific Northwest**  
NATIONAL LABORATORY

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# GTRI Remote Monitoring System: Training and Operational Needs Assessment Analysis Report

## Executive Summary

The mission of the United States Department of Energy (DOE) National Nuclear Security Administrations' (NNSA's) Global Threat Reduction Initiative (GTRI) is to identify, secure, recover and facilitate the disposition of vulnerable nuclear and high-risk radioactive materials around the world that pose a threat to the United States and the international community. The GTRI's unique mission to reduce and protect vulnerable nuclear and radiological materials located at civilian sites worldwide directly addresses recommendations of the 9/11 Commission<sup>1</sup>, and is a vital part of the President's National Security Strategy and the Global Initiative.

The Remote Monitoring System (RMS) is a tool implemented by PNNL and other labs that integrates critical facility alarms at nuclear and radiological sites and supports the GTRI mission. The RMS is a standalone security system that includes radiation and tamper alarms, and CCTV; which can be transmitted securely over the Internet to multiple on-site and off-site locations. It was designed by a third party vendor, Yamasato Fujiwara Higa & Associates, Inc. (YFH), who also provides RMS installation, training, and support services. Training is provided by YFH engineers during the initial installation visit. Advance notice is provided to sites with recommendations on which key stakeholders should attend the training. Manuals are also e-mailed to the site ahead of time. The training consists of a group demonstration of the software, usually for one to five users and stakeholders. YFH also provides quarterly troubleshooting sessions via WebEx web conferencing, which are typically attended by IT technicians and system administrators.

Through our experiences during installation of the system at 162 sites, plus feedback received from Alarm Response Training course participants, site input to project teams and analysis of trouble calls; indications were that current system training may be lacking and inconsistent. An assessment survey was undertaken to gather information from RMS users across the nation, to evaluate the current level of training and determine what, if any, improvements needed to be made. An additional survey focused on operational ease of the RMS software. Both surveys focused on day-to-day RMS software tasks, as most users are not responsible for operation and maintenance of the entire RMS system architecture. The surveys were initially sent electronically to 245 users at the PNNL GTRI partner sites with RMS installations and achieved a 37.6% return rate for the training needs survey, and a 17.1% return rate for the operational needs assessment.

Analysis of the training survey data revealed that 34.6% of the respondents had not received training or were unsure if they had, despite the fact that vendor engineers provide training at installation of the system. Some respondents commented that their training was *"minimal,"* and *"brief, not documented, and nothing in writing."* 63.7% of respondents said they were either not at all prepared or only somewhat prepared to use the RMS software required to effectively operate the system. In addition, some feedback indicated a potential training or supplementary resources need for the overall system architecture, such as: *"I feel the RMS monitoring screen and the systems being monitored are too complicated. We have had large numbers of EMS responses to our site because of misinterpretations of the alarm screens by central station operators at the police departments. Simple loss of internet connection is resulting in a full armed response by the EMS team"; "I do not feel well prepared to*

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<sup>1</sup> The 9/11 Commission Report: Final Report of the Commission on Terrorist Attacks upon the United States (New York: Norton 2004).

*troubleshoot”; and “The training covered the main alarms but did not cover the workings of the communication between the field hardware and the assessment computer”.*

As for the operational needs assessment survey, overall satisfaction for the software was in the good range (3.5 out of 5). Satisfaction for maintenance procedures and helpdesk assistance was in the fair range (2.39 and 2.95 respectively, out of 5).

As a result of this analysis, PNNL recommends a more structured and flexible training curriculum with a blended approach; designed and implemented with audience specific learning objectives and delivery options for different users (operators, responders, technicians, managers, IT, etc.). This training would be piloted at RMS sites; with initial instructor led training as a required element of RMS installation, and a blended approach of instructor led and e-learning options for refresher training and reference materials, to facilitate sustainability of operations.

As for the software itself, the operational needs survey results do not indicate a need for major changes at this time. However, as per the training survey results, we now know that many of the users do not fully understand all of the RMS functions and capabilities. A more targeted analysis of more advanced users and system administrators may be required to fully analyze operational ease and efficiency of the system, and to gather more detailed input on user needs for potential future RMS development efforts.



## Overview

The RMS is a critical element of the GTRI protection strategy to mitigate threats to existing legal radioactive materials. Off-site monitoring of the RMS can be accomplished at locations including one or more of the following: local law enforcement, a commercial monitoring center, federal law enforcement, regulatory authority, or the military. The GTRI has adjusted the program strategy for RMS development and deployment, which has resulted in some significant changes to the current RMS development process. The current RMS development and deployment strategy has consisted of as-needed development and deployment activities. This approach will be replaced with a strategy to deploy a consistent and stable RMS configuration at all GTRI partner sites. The program is conducting a comprehensive RMS needs assessment to guide any further RMS development and training activities for the new strategy. This first phase of the assessment is focused on a training needs analysis and an operational analysis.



## Goals

### *Training Needs Analysis*

The primary purpose of the training needs analysis was to determine if the instruction being provided at the installation of an RMS unit was sufficient for proper operation and response to the system alerts and alarms. In addition, the survey team sought to find out if there were performance tasks that could be improved with specific training and what those areas might be.

### *Operational Analysis*

The operational analysis was intended to gather information on the functionality of the software and seek input on how improvements might be made. User input is a critical part of the formal RMS

development process. The resulting data and input will help guide focus for another portion of the development process – a more detailed user needs analysis.



## Objectives

1. Design a survey based on the functional duties required to effectively monitor and interact with the RMS system interface.
2. Distribute the survey electronically to a wide array of end users as provided by GTRI Domestic Program Teams from PNNL and Sandia National Laboratories.
3. Retrieve survey data upon conclusion of the survey period.
4. Analyze data.
5. Present summary, conclusions, and recommendations in a written report.



## Resources/Methodology

Data analysis is the process of putting together qualitative and quantitative information to help derive answers to specific questions. Qualitative data must be analyzed for content and a determination made as to the intent of the information provided, whereas quantitative data can be provided in the form of numbers or numeric values generally on a scale from high to low, best to worst, etc. The raw data collected from analysis instruments is synthesized to form conclusions and recommendations to address the need for which the survey was first commissioned.

The first step in this training survey process was to review existing documentation on the RMS software to include the following YFH manuals:

1. GTRI Remote Monitoring System (RMS), Operator's Training Guide (V2.0 September 2010)
2. GTRI RMS Client Quick Start Training Guide (V2.10, February 2010)

A functional task list – duties performed by users through interaction with the RMS monitoring software – was developed from these materials and reviewed by members of the GTRI Domestic Materials Protection Program who are involved with site assessment and installations. The training needs survey needed to be based on task and function as opposed to job or position within the organization, as RMS users have a variety of other primary job duties. It was determined that a single training needs analysis survey would be designed and sent to the users of the RMS monitoring station computer and software. The list of users included:

- Radiation Safety Officer
- Dispatcher
- Site Operator
- Site Administrator
- Site Instructor/Trainer
- Site Responder
- Offsite Responder
- Law Enforcement
- Fire Service
- IT Specialist
- Security System Technician
- Site Security
- Security Manager/Director
- Assistant Security Manager/Director
- Other (to be specified in response)



Once the list of tasks was finalized and approved, the survey was entered into the online survey tool<sup>2</sup> for distribution. This data gathering platform was the most accessible for the majority of the proposed survey recipients, as they generally have computer access during their normal workday.

On March 19, 2012 the training survey invitation was distributed to 245 original recipients (Appendix G). The initial invitation (Appendix C) requested that each recipient *“Please forward the survey links to all staff and vendors who monitor and interact with the Remote Monitoring System.”* The survey team was copied on at least one email where the initial recipient did indeed forward the survey to additional individuals. This was intended to broaden the pool of potential survey respondents. In addition, contact information for respondents not affiliated with PNNL RMS installations was requested from YFH who currently provides initial training with installation, and Sandia National Laboratories which also has work within the RMS network.

The survey process was unique in that it contained a “piggyback” survey on the operational satisfaction with the RMS. This was noted in the invitation and at the conclusion of the survey. A separate set of questions relating to the operability of the RMS system was developed and since many of the respondents would have been the same for this survey, it was distributed in a semi-combined fashion. As a result, 20 recipients responded to both the training and the operational assessments. The results of each will be addressed separately in the section below.



## Results

### *Training Needs Assessment*

92 responses were received for the training needs assessment for a return rate of 37.6%: a successful return rate<sup>3</sup> indicative of targeting the proper audience and its desire to have feedback noted. It is significant to note that over 1/3 of the respondents stated they had no training, or didn’t know if they had been trained. At least half of the additional comments offered indicated that the training was “minimal” and that no formal training was provided.

<b>Question 14. Have you received any prior RMS software training?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Yes	65.4%	53
Not sure	3.7%	3
No	30.9%	25
Additional comments		18

Respondents who stated they did receive prior training answered follow up questions on how well prepared they felt to perform various RMS functions. These questions resulted in a mixed response,

<sup>2</sup> The tool used to disseminate and gather data was Survey Monkey®, an online survey design tool that provides 17 formats for asking questions, tracks respondents and non-respondents, sends out the survey and provides a link so that the survey can be forwarded to additional parties by the primary target audience.

<sup>3</sup> <http://www.utexas.edu/academic/ctl/assessment/iar/teaching/gather/method/survey-Response.php> Acceptable response rates vary by how the survey is administered: Mail: 50% adequate, 60% good, 70% very good, Email: 40% average, 50% good, 60% very good, Online: 30% average.

however less than 36.2% reported being well-prepared to use the RMS software and less than 50% reported to understand what the alarms meant.

<b>Question 16. Following the instruction you received, to what extent did you feel adequately prepared to:</b>					
<b>Answer Options</b>	<b>Not at all prepared</b>	<b>Somewhat prepared</b>	<b>Well prepared</b>	<b>Rating Average</b>	<b>Response Count</b>
Use the RMS software?	21.7%	42.0%	36.2%	2.14	69
Monitor RMS alarms?	14.5%	37.7%	47.8%	2.33	69
Understand what the alarms meant?	7.2%	42.0%	50.7%	2.43	69
Make proper notifications when receiving alarms?	10.1%	34.8%	55.1%	2.45	69
Additional comments					11

Comments included:

- No written manual. Prompts on screen are not adequate. More training - refresher is needed
- The instruction was conducted for a lot of people in a very busy office. There was no one-on-one training
- More training should be provided at the time of installation of the RMS software
- Software is quite complicated. Would be good to have a hands-on demo with alarm scenarios. Our training was before the system was up and running so we never got to see actual alarms.
- Training was very brief, no way to know if it was complete
- Don't fully understand some of the alerts
- Lack of understanding on the part of our dispatchers
- The training took place a few months before system was in use. Did not remember specifics covered in training.

When queried in regard to what additional training they thought might be needed, 53.3% requested a software overview, 46.7% requested training on how to use the RMS software, and 65% requested annual refresher training in some form.

<b>Question 18. What other kinds of training would have helped you work with the RMS software? Please select any/all that apply:</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
RMS Client Software Overview {product familiarization; software overview; status level setup; setting alarm conditions; tabs (alarms, general, sounds)}	53.3%	32
Using the RMS Client Software {simple view operation; live images; polled images; latest events; radiation graph; student practice}	46.7%	28
RMS Alarms and Related Activities {using the alarms screen; alarm viewer (polled images, latest event, radiation graph); acknowledge alarm actions; alarm logs; information and warning messages}	41.7%	25
One-time Refresher Training	16.7%	10
Quarterly Refresher/New Hire Training	21.7%	13
Annual Refresher Training	65.0%	39

Other (please specify)	12
------------------------	----

More significant data came from participant responses when evaluating self-proficiency for specific tasks, as respondents became aware of RMS functions that they were not previously known about. Overall for 26 separate tasks, respondents selected “I am Proficient at this Task” only 29.7% of the time and reported “I have minimal or no proficiency at this task” 20.9% of the time.

<b>Question 21. If you use OR monitor the RMS computer, please evaluate your current skill level with the following system tasks:</b>						
<b>Answer Options</b>	<b>I do not perform this task</b>	<b>I have minimal or no proficiency at this task</b>	<b>I am proficient at this task</b>	<b>I am extremely proficient at this task</b>	<b>Rating Average</b>	<b>Response Count</b>
I can locate and open the RMS software interface	33.8%	12.3%	43.1%	10.8%	1.31	65
I can locate and open the RMS Viewer window	33.8%	9.2%	44.6%	12.3%	1.35	65
I can locate and open the RMS Simple Viewer window	35.4%	9.2%	43.1%	12.3%	1.32	65
I can locate a specific RMS device within the RMS software interface	34.8%	15.2%	39.4%	10.6%	1.26	66
I understand the difference between each status indicator (good, marginal, bad)	30.8%	18.5%	40.0%	10.8%	1.31	65
I can locate and view the “Live View”	27.7%	6.2%	52.3%	13.8%	1.52	65
I can locate and view the “Latest Events”	28.8%	15.2%	43.9%	12.1%	1.39	66
I can locate and view the “Radiation Graph”	25.8%	16.7%	45.5%	12.1%	1.44	66
I can view individual graph data point values	34.4%	20.3%	32.8%	12.5%	1.23	64
I can export the Radiation Graph data	51.6%	29.7%	12.5%	6.3%	0.73	64
I can locate and view alarm data	29.2%	15.4%	44.6%	10.8%	1.37	65
I can locate and view alerts data	29.7%	20.3%	39.1%	10.9%	1.31	64
I can locate and view radiation readings data	29.2%	16.9%	41.5%	12.3%	1.37	65
I can copy data rows to paste into external programs	58.7%	25.4%	12.7%	3.2%	0.60	63
I can enlarge RMS images or image sections	43.9%	27.3%	22.7%	6.1%	0.91	66
I can check available disk storage space for the RMS	50.8%	27.7%	18.5%	3.1%	0.74	65

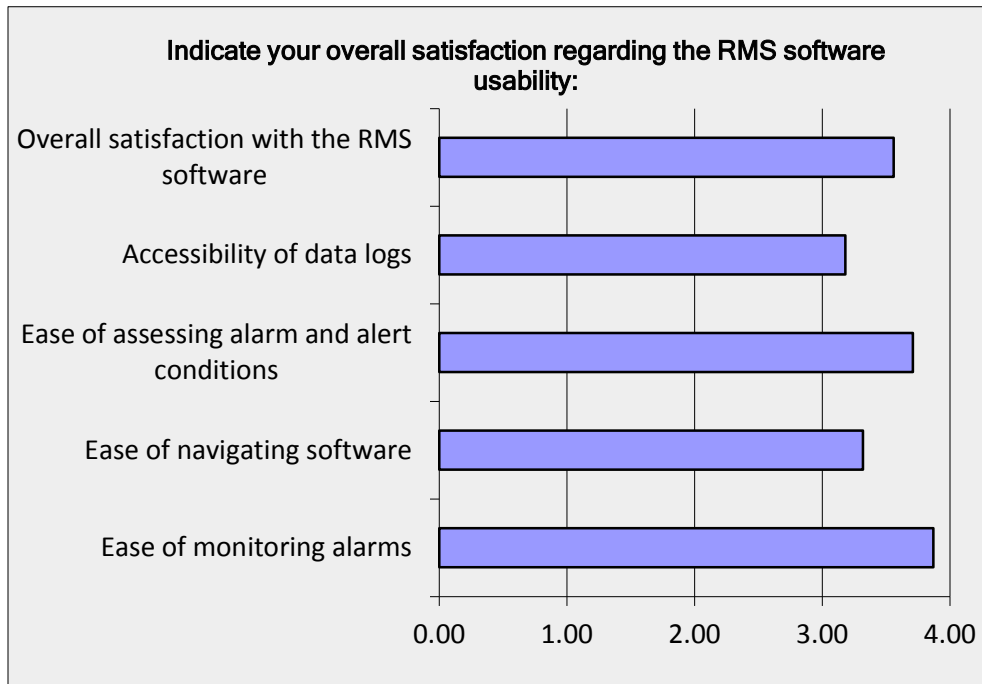
software data on the workstation							
I can check the communications status between each RMS and the workstation	50.8%	20.0%	21.5%	7.7%	0.86	65	
I can check the status of individual RMS components	47.7%	27.7%	18.5%	6.2%	0.83	65	
I can enable data and alarm filters for each RMS	60.9%	26.6%	10.9%	1.6%	0.53	64	
Additional comments						10	

These responses clearly support the need for more comprehensive and structured training, especially since respondents could also have chosen *“I do not perform this task.”* It also became evident that the survey respondents didn’t realize how much they did not know, with comments such as: *“Boy I really need some training after seeing this list”, “So when is the next class?”* and *“Sounds like we should be invited to a course.”* Another telling comment was *“The Laboratory’s security department and two police departments probably have a total of 4 individuals out of over 100 that are truly proficient in the tasks described above. That is why there are a large number of mistakes made at the monitoring sites.”*

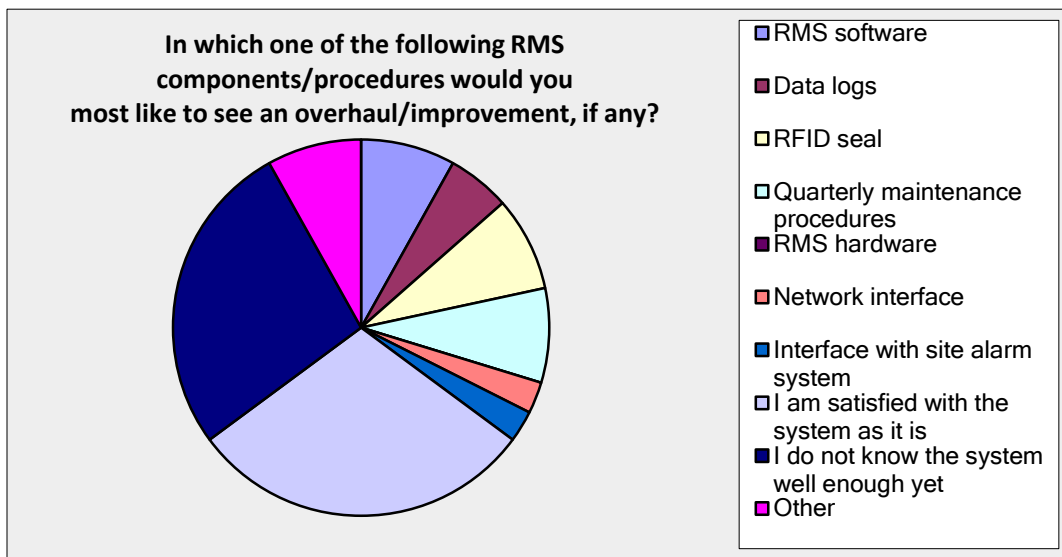
#### Operational Needs Assessment

The response rate on the operational need assessment was 17.1%. The majority of the respondents to the survey indicated only having the RMS at their facility 1-2 years (55.3%). Their overall satisfaction with the system was in the good range (3.5 out of 5), however they rated *“Ease of conducting maintenance procedures”* and *“Quality of helpdesk assistance”* in the fair range with 2.39 and 2.95 respectively – therefore these areas may be considered as specific focus areas in any additional operational needs analysis activities.

Question 6. Indicate your overall satisfaction regarding the RMS software usability:								
Answer Options	Poor	Fair	Good	Very Good	Excellent	Do Not Recall/ NA	Rating Average	Response Count
Ease of monitoring alarms	0.0%	2.6%	28.2%	35.9%	30.8%	2.6%	3.87	39
Ease of navigating software	0.0%	7.9%	34.2%	36.8%	13.2%	7.9%	3.32	38
Ease of assessing alarm and alert conditions	2.6%	0.0%	28.9%	34.2%	28.9%	5.3%	3.71	38
Accessibility of data logs	0.0%	13.2%	23.7%	42.1%	10.5%	10.5%	3.18	38
Overall satisfaction with the RMS software	0.0%	7.7%	28.2%	38.5%	20.5%	5.1%	3.56	39



When asked about which RMS component or procedures needed improvement, almost 30% of the respondents answered that they were satisfied with the system, and another 27% stated they did not know the system well enough to make a determination regarding improvements. It should be noted here that since nearly 32% of the respondents have had the system less than a year, there may not have been enough interaction with it for them to comfortably make an assessment of potential system improvements.



## Conclusions and Recommendations

The information obtained from the training analysis sought to address three basic questions:

1. Is adequate training being provided to RMS sites at installation?
2. Are all users being trained?
3. What training is needed to help reduce the number of unnecessary or excessive external responses?

The answer to questions 1 and 2 is no; current training is not perceived as being adequate, nor does it seem to be reaching the appropriate audience in all cases. There is a need to develop structured, more formal, initial training, and annual or as needed refresher training. As for question 3, the information obtained on individual tasks with which users were not even familiar can help determine the design and content of any revised training curriculum for specific RMS interface and operational duties.

The operational analysis showed that the RMS installations for most of the respondents were fairly recent (55.3% reported less than two years and 31.9% were less than one year) and so they did not have a large amount of experience with the system. Still they reported overall satisfaction with the system, as indicated by results such as: good (28.2%), very good (38.5%), and excellent (20.5%). Specific user recommendations for improvements in upcoming versions can be viewed in Appendix F.

To address the training concerns raised by the survey, the recommendation is two-fold. A formal instructor-led training course should be considered that can be delivered upon installation of the RMS unit by qualified GTRI personnel. Any training design should address the tasks and duties highlighted by this analysis. The training should make use of various training mediums and take a blended delivery approach for all users, with consideration to: thoroughness; ease of delivery; skill-based practice; and follow-up support as necessary. A training design document can outline this blended approach in more detail and will be generated using DOE-accepted instructional design principles upon approval of this recommendation.

Additionally the GTRI program may want to consider taking a broader view of training needs surrounding the entire system – users, installers, train-the-trainer for sites with training departments for continued onsite training efforts.



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# Appendix A

## Training Needs Assessment Survey Form (Reprinted from SurveyMonkey®)

PAGE 1

### **Introduction**

Welcome to the GTRI Remote Monitoring System (RMS) training needs assessment and thank you in advance for your time and feedback! As you know, the RMS is a real-time monitoring system to notify personnel of any attempted theft or sabotage of radiological or nuclear materials. The RMS monitoring software is an operator interface for the receipt and assessment of alarms via real time video, stored alarm images, alarm trigger data and radiation readings from the target area. You have been selected to participate in this brief survey because of your experiences with an RMS installation and the prior training you received as a part of that installation process. As a vital part of the global effort to combat nuclear and radiological terrorism, it is essential that you and your colleagues receive the training and tools you need to do your job – the results of this survey will help to make sure you have the tools you need.

Your candid and thoughtful feedback is anonymous and will be forwarded directly to our training developers. It will determine the content for new RMS software training and so is very important to the success of this effort. Please make sure you complete this survey – which should take you no more than 10 minutes – no later than 3/30/12. At the end of this survey, there is additional opportunity to contact us directly, so please make sure to take the survey through to its conclusion. Thank you again for your input!

\*\*\*\*\*

PAGE 2

### **Background Information**

Q1

**In what state or U.S. territory do you live?**

Q2

**In what city do you live?**

Q3

**In which site or facility do you work?**

Q4

**Position/primary role (choose all that apply):**



- |   |  |  |
|---|--|--|
| <input type="checkbox"/> Radiation Safety Officer | <input type="checkbox"/> Site Responder    | <input type="checkbox"/> Security System Technician          |
| <input type="checkbox"/> Dispatcher               | <input type="checkbox"/> Offsite Responder | <input type="checkbox"/> Site Security                       |
| <input type="checkbox"/> Site Operator            | <input type="checkbox"/> Law Enforcement   | <input type="checkbox"/> Security Manager/Director           |
| <input type="checkbox"/> Site Administrator       | <input type="checkbox"/> Fire Service      | <input type="checkbox"/> Assistant Security Manager/Director |
| <input type="checkbox"/> Site Instructor/Trainer  | <input type="checkbox"/> IT Specialist     |  |
| <input type="checkbox"/> Other (please specify)   |  |  |

Q5

**Does your organization have a separate department that handles training?**

Additional comments

Q6

**How long has the RMS been a part of your facility's security system?**

Additional comments

Q7

**How long have you been in your current position?**

Additional comments

Q8

**How many years of radiation security-related experience do you have, if any?**

Additional comments

\*\*\*\*\*

PAGE 3

**Scheduling Preference**

Q9

**Please select the most convenient day of the week for you to attend a training class:**

Additional comments

Q10

**Please select the most convenient time during the day for you to attend a training class:**

Additional comments

\*\*\*\*\*

PAGE 4

**Job Duties**

Q11

**Which of the following statements most accurately describes your responsibilities/interactions with the RMS software? Select all that apply**

- My job does not require any use or interaction with the RMS workstation.
- I think the RMS software is installed on a workstation in my area, but I minimize it and do not really understand what it is for.
- I monitor and review the RMS software data during my shift or on a daily/regular basis.
- I oversee operator use of the RMS software data.
- I review data as needed when alerted by the person monitoring the RMS.
- Other (please specify)

Q12

**How often do you review the RMS software data?**

Additional comments

Q13

**What percentage of your work day is spent monitoring the RMS software data?**

Additional comments

\*\*\*\*\*

PAGE 5

**Prior RMS Software Training**

Q14

**Have you received any prior RMS software training?**

Additional comments

Q15

**Was the training too easy or too complex?**

**Q16**

**Following the instruction you received, to what extent did you feel adequately prepared to:**

	<u>Not at all prepared</u>	<u>Somewhat prepared</u>	<u>Well prepared</u>
Use the RMS software?	<input checked="" type="radio"/> Not at all prepared	<input checked="" type="radio"/> Somewhat prepared	<input checked="" type="radio"/> Well prepared
Monitor RMS alarms?	<input checked="" type="radio"/> Not at all prepared	<input checked="" type="radio"/> Somewhat prepared	<input checked="" type="radio"/> Well prepared
Understand what the alarms meant?	<input checked="" type="radio"/> Not at all prepared	<input checked="" type="radio"/> Somewhat prepared	<input checked="" type="radio"/> Well prepared
Make proper notifications when receiving alarms?	<input checked="" type="radio"/> Not at all prepared	<input checked="" type="radio"/> Somewhat prepared	<input checked="" type="radio"/> Well prepared

Additional comments

**If you did not feel prepared to use the RMS software, please explain why not:**

**Q18**

**What other kinds of training would have helped you work with the RMS software? Please select any/all that apply:**

- RMS Client Software Overview {product familiarization; software overview; status level setup; setting alarm conditions; tabs (alarms, general, sounds)}
- Using the RMS Client Software {simple view operation; live images; polled images; latest events; radiation graph; student practice}
- RMS Alarms and Related Activities {using the alarms screen; alarm viewer (polled images, latest event, radiation graph); acknowledge alarm actions; alarm logs; information and warning messages}
- One-time Refresher Training
- Quarterly Refresher/New Hire Training
- Annual Refresher Training

Other (please specify)

**Q19**

**Please rate the quality of the following elements of the training you received:**

	<u>Poor</u>	<u>Fair</u>	<u>Good</u>	<u>Very Good</u>	<u>Excellent</u>	<u>Do not Recall/NA</u>
<b>Overall content of the training</b>	<input checked="" type="radio"/> Poor	<input checked="" type="radio"/> Fair	<input checked="" type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input checked="" type="radio"/> Excellent	<input checked="" type="radio"/> Do not Recall/NA
<b>User guide or</b>	<input checked="" type="radio"/> Poor	<input checked="" type="radio"/> Fair	<input checked="" type="radio"/> Good	<input checked="" type="radio"/> Very	<input checked="" type="radio"/>	<input checked="" type="radio"/> Do not

materials				Good	Excellent	Recall/NA
<b>Presentation of material by Instructor</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do not Recall/NA
<b>Participant/Group activities or actual practice during training with the RMS software</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do not Recall/NA
<b>Facilitation of activities by Instructor</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do not Recall/NA

Additional comments

**Q20**

Please share any other comments you have that would help us improve the next RMS software training.

\*\*\*\*\*

**PAGE 6**

**Current RMS Software Use and Software Response Skills**

**Q21**

If you use OR monitor the RMS computer, please evaluate your current skill level with the following system tasks:

	<u>I do not perform this task</u>	<u>I have minimal or no proficiency at this task</u>	<u>I am proficient at this task</u>	<u>I am extremely proficient at this task</u>
<b>I can locate and open the RMS software interface</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can locate and open the RMS Viewer window</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can locate and open the RMS Simple Viewer window</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can locate a specific RMS device</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task

<b>within the RMS software interface</b>			this task		task
<b>I understand the difference between each status indicator (good, marginal, bad)</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view the "Live View"</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view the "Latest Events"</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view the "Radiation Graph"</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can view individual graph data point values</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can export the Radiation Graph data</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view alarm data</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view alerts data</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can locate and view radiation readings data</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can copy data rows to paste into external programs</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task
<b>I can enlarge RMS images or image</b>	I do not perform this task	 I have minimal or no proficiency at this task	I am proficient at this task		I am extremely proficient at this task

sections		this task		task
<b>I can check available disk storage space for the RMS software data on the workstation</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can check the communications status between each RMS and the workstation</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can check the status of individual RMS components</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task
<b>I can enable data and alarm filters for each RMS</b>	I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	I am proficient at this task	I am extremely proficient at this task

Additional comments

## Q22

### Software Response Tasks

	<u>I do not perform this task</u>	<u>I have minimal or no proficiency at this task</u>	<u>I am proficient at this task</u>	<u>I am extremely proficient at this task</u>
<b>I know how to contact the System Administrator</b>	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
<b>I know when to contact the System Administrator</b>	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
<b>I know how to contact the GTRI RMS Help Desk</b>	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
<b>I know when to contact the GTRI RMS Help Desk</b>	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
<b>I recognize the audio alarm signal from the monitoring workstation</b>	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task

I know the appropriate response for a "Seal Left" alert	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for a "Radnet Trigger" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for a "RFID Seal" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for a "Housing" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for an "Intrusion" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for a "Duress" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task
I know the appropriate response for a "Trigger" alarm	<input type="radio"/> I do not perform this task	<input type="radio"/> I have minimal or no proficiency at this task	<input type="radio"/> I am proficient at this task	<input type="radio"/> I am extremely proficient at this task

Additional comments

\*\*\*\*\*

PAGE 7

**Contact Information (Optional)**

Q23

Name

Q24

Title

Q25

Phone Number

Q26

E-mail Address

\*\*\*\*\*

PAGE 8

### **Additional Feedback Opportunities**

Do you perform alarm maintenance or information technology functions within the RMS? If so, provide additional feedback on operational satisfaction by pasting the following link into a new browser:

[https://www.surveymonkey.com/s/RMS\\_Operational\\_Satisfaction\\_Assessment\\_Survey](https://www.surveymonkey.com/s/RMS_Operational_Satisfaction_Assessment_Survey)

Please feel free to forward this survey to other alarm maintenance or information technology individuals in your organization. If you have any questions, concerns, or additional feedback about the RMS please contact any of the below GTRI individuals.

Sorcha Fox, Instructional Designer  
Global Threat Reduction Program  
Pacific Northwest National Laboratory  
509-372-6342  
[sorcha.fox@pnnl.gov](mailto:sorcha.fox@pnnl.gov)

Debra Day, CPT, PMP, Senior Security Operations Specialist  
Global Threat Reduction Program  
Pacific Northwest National Laboratory  
509-371-6255  
[debra.day@pnnl.gov](mailto:debra.day@pnnl.gov)

Mike Henry, Remote Monitoring System Coordinator  
Office of Global Threat Reduction  
955 L'Enfant Plaza, SW  
Washington, DC 20585  
202-586-3755  
[michael.henry@nnsa.doe.gov](mailto:michael.henry@nnsa.doe.gov)



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## Appendix B

### Operational Assessment Survey Form (Reprinted from SurveyMonkey®)

PAGE 1

#### **Introduction**

Welcome to the GTRI Remote Monitoring System (RMS) operational satisfaction assessment and thank you in advance for your time and feedback! The GTRI program is currently conducting a review of the entire RMS, including: software, hardware, infrastructure, and integration with site security systems, and you have been selected to participate in this survey because of your experience with an RMS installation. Your candid, thoughtful feedback is anonymous and will help identify areas of concern and opportunities for improvement to the RMS. The survey should take no more than 10 minutes and needs to be completed by 3/30/12. If you previously completed our training needs assessment, you will recognize a few of the demographic questions. We need to ask for those responses again as the two surveys are not connected except by the active link. At the end of this survey, there is an opportunity to contact us directly, so please make sure to take the survey through to its conclusion. Thank you again for your input.

\*\*\*\*\*

PAGE 2

#### **Background Information**

Q1

In what state or U.S. territory do you live?

Q2

In what city do you live?

Q3

In which site or facility do you work?

Q4

Position/primary role (choose all that apply):

- Radiation Safety Officer
  - Dispatcher
  - Site Operator
  - Site Administrator
  - Site Instructor/Trainer
  - Other (please specify)
- 
- Site Responder
  - Offsite Responder
  - Law Enforcement
  - Fire Service
  - IT Specialist
- Alarm Maintenance Specialist
  - Security System Technician
  - Site Security
  - Security Manager/Director
  - Assistant Security Manager/Director

**Q5**  
**How long has the RMS been a part of your facility's security system?**

Additional comments

\*\*\*\*\*

PAGE 3

**RMS Satisfaction**

**Q6**  
**Indicate your overall satisfaction regarding the RMS software usability:**

	<u>Poor</u>	<u>Fair</u>	<u>Good</u>	<u>Very Good</u>	<u>Excellent</u>	<u>Do Not Recall/NA</u>
<b>Ease of monitoring alarms</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Ease of navigating software</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Ease of assessing alarm and alert conditions</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Accessibility of data logs</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Overall satisfaction with the RMS software</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA

**Q7**  
**Please provide feedback on best practices and/or potential areas for system improvement of the RMS software:**



**Q8**

**Please indicate your overall satisfaction regarding the RMS hardware and infrastructure usability:**

	<u>Poor</u>	<u>Fair</u>	<u>Good</u>	<u>Very Good</u>	<u>Excellent</u>	<u>Do Not Recall/NA</u>
<b>Acceptability of false alarm rate (frequency of incidents)</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Acceptability of nuisance alarm rate (frequency of incidents)</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Quality of video images</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Integration with house alarm system</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Reliability of RFID seal</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Reliability of network interface</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Reliability of RMS hardware</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Ease of conducting maintenance procedures</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Quality of help desk assistance</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Overall stability of the system</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA
<b>Overall satisfaction with RMS?</b>	<input type="radio"/> Poor	<input type="radio"/> Fair	<input type="radio"/> Good	<input checked="" type="radio"/> Very Good	<input type="radio"/> Excellent	<input type="radio"/> Do Not Recall/NA

Q9

In which one of the following RMS components/procedures would you most like to see an overhaul/improvement, if any?

If other, please specify:

Q10

Please provide feedback on best practices and/or potential areas for system improvement of the complete RMS:

\*\*\*\*\*

### Contact Information (Optional)

Q11

Name

Q12

Title

Q13

Phone Number

Q14

E-mail Address

\*\*\*\*\*

### Additional Feedback Opportunities

Thank you for your input! If you have any questions, concerns, or additional feedback about the RMS please contact:

Mike Henry  
Remote Monitoring System Coordinator  
Office of Global Threat Reduction  
955 L'Enfant Plaza, SW  
Washington, DC 20585  
202-586-3755  
[michael.henry@nnsa.doe.gov](mailto:michael.henry@nnsa.doe.gov)



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## Appendix C

### Survey Invitation

Attention RMS User,

You recently received an email invitation to participate in two surveys about training and operations of the Remote Monitoring System installed at your facility. We wanted to follow up and let you know just how important this survey is in deciding what future training will be made available for system users and administrators, and that we also need your input to make improvements in the operational aspects of the system. Just in case your system flagged the email as a possible problem, we are providing the links to both surveys again below:

Training Assessment Survey:

[https://www.surveymonkey.com/s.aspx?sm=Kej\\_2f6tpI4CUgV\\_2f69Inm60Q\\_3d\\_3d](https://www.surveymonkey.com/s.aspx?sm=Kej_2f6tpI4CUgV_2f69Inm60Q_3d_3d)

Operational Assessment Survey:

[https://www.surveymonkey.com/s/RMS\\_Operational\\_Satisfaction\\_Assessment\\_Survey](https://www.surveymonkey.com/s/RMS_Operational_Satisfaction_Assessment_Survey)

These will take less than 10 minutes of your time and will provide us with critical information for making the RMS better; please be sure to take both of them.

You were selected because you are a primary RMS site contact however we need input from others who interact with the system as well. **Please forward the survey links to all staff and vendors who monitor and interact with the Remote Monitoring System.** Those individuals may include:

Radiation Safety Officer	Fire Service
Dispatcher	IT Specialist
Site Operator	Security System Technician
Site Administrator	Site Security
Site Instructor/Trainer	Security Manager/Director
Site Responder	Assistant Security Manager/Director
Offsite Responder	Security Vendor or Other Provider
Law Enforcement	

We understand your time is valuable and appreciate your willingness to help in this effort. **Both surveys will close on 3/30/12.** If you have any questions, please feel free to contact your PNNL POC or any of the survey team directly:

Debra Day, PNNL Senior Security Specialist, 509-371-6255, [debra.day@pnnl.gov](mailto:debra.day@pnnl.gov)

Sorcha Fox, PNNL Instructional Designer, 509-372-6342, [sorcha.fox@pnnl.gov](mailto:sorcha.fox@pnnl.gov)

Mike Henry, Remote Monitoring System Coordinator, 202-586-3755, [michael.henry@nnsa.doe.gov](mailto:michael.henry@nnsa.doe.gov)

Sincerely,

<name>

RMS Survey Team



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## Appendix D

### Survey Reminder

Attention RMS Users,

The RMS training assessment and operational assessment surveys will *end tomorrow* – so if you haven't had a chance to complete them yet, please do so, and if you already have, thank you! These will take less than 10 minutes of your time and will provide us with critical information for making the RMS better; please be sure to take both of them. Here are the links to both surveys:

Training Assessment Survey:

[https://www.surveymonkey.com/s/RMS\\_Training\\_Needs\\_Assessment\\_Survey](https://www.surveymonkey.com/s/RMS_Training_Needs_Assessment_Survey)

Operational Assessment Survey:

[https://www.surveymonkey.com/s/RMS\\_Operational\\_Satisfaction\\_Assessment\\_Survey](https://www.surveymonkey.com/s/RMS_Operational_Satisfaction_Assessment_Survey)

Again, please forward the survey links to all staff and vendors who monitor and interact with the Remote Monitoring System. Those individuals may include:

- Radiation Safety Officer
- Dispatcher
- Site Operator
- Site Administrator
- Site Instructor/Trainer
- Site Responder
- Offsite Responder
- Fire Service
- IT Specialist
- Security System Technician
- Site Security
- Security Manager/Director
- Assistant Security Manager/Director
- Security Vendor or other provider
- Law Enforcement

We understand your time is valuable and appreciate your willingness to help in this effort. If you have any questions, please feel free to contact me or any of the survey team directly:

- Debra Day, PNNL Senior Security Specialist, 509-371-6255, [debra.day@pnnl.gov](mailto:debra.day@pnnl.gov)
- Sorcha Fox, PNNL Instructional Designer, 509-372-6342, [sorcha.fox@pnnl.gov](mailto:sorcha.fox@pnnl.gov)
- Mike Henry, Remote Monitoring System Coordinator, 202-586-3755, [michael.henry@nnsa.doe.gov](mailto:michael.henry@nnsa.doe.gov)

Sincerely,

<name>

RMS Survey Team



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## Appendix E

### Training Needs Assessment: Data Tables and Graphs

Question 1. In what state or U.S. territory do you live?		
Answer Options	Response Percent	Response Count
Connecticut	3.4%	3
District of Columbia	1.1%	1
Illinois	10.3%	9
Indiana	1.1%	1
Maryland	12.6%	11
Massachusetts	8.0%	7
Mississippi	1.1%	1
Missouri	8.0%	7
Montana	3.4%	3
New Jersey	2.3%	2
New York	25.3%	22
Ohio	2.3%	2
Pennsylvania	8.0%	7
Puerto Rico	1.1%	1
Rhode Island	3.4%	3
Texas	1.1%	1
Washington	5.7%	5
Wisconsin	1.1%	1

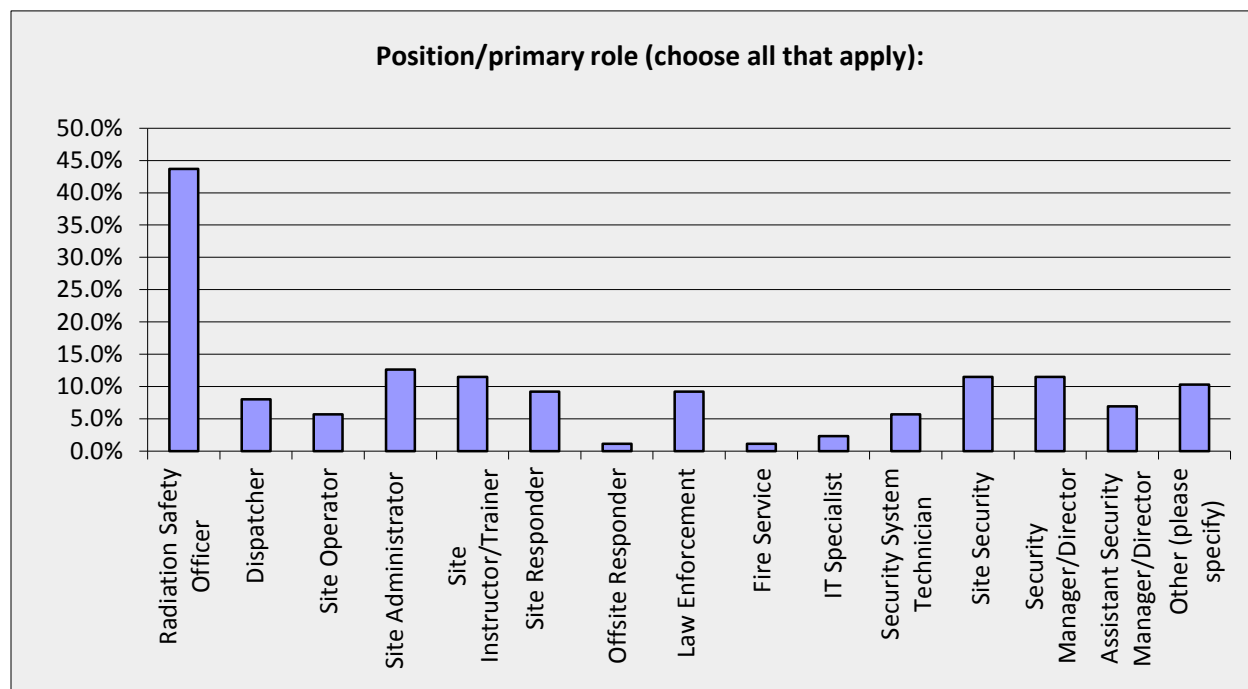
Question 2. In what city do you live?		
Response/Counts		
Baltimore	Highlands	Pleasant Prairie
Bethesda	Houston	Plymouth
Blue Bell	Kansas City (5)	Prefer Not to Answer
Boston (2)	Kensington	Providence (2)
Boyd's	Kirkland	Raymore
Chelmsford	Lee's Summit	Seattle (4)
Chicago (7)	Lowell	Southaven
Cincinnati (2)	Maywood	State College (2)
Cold Spring Harbor (2)	Millville	Rochester (2)
College Park (3)	Needham	Rockville (3)
Cortland Manor	New Britain	Schenectady
Cranston	New Hyde Park	Suburbs
Demotte	New York (12)	Tacoma
Gaithersburg	North Haven	Valhalla
Hamilton (2)	Northborough	Washington, DC
	Philadelphia (4)	Yonkers

<b>Question 3. In which site or facility do you work?</b>	
<b>Response/Count</b>	
Albany Medical Center	Penn-Jersey Region
Brown University (4)	Prefer Not to Answer for Security Reasons
Cambridge	Puget Sound Blood Center (2)
Casco Security	Rocky Mountain Laboratories (3)
Children's Hospital Boston	Rush University Medical Center, Chicago, IL
Children's Mercy Hospital (6)	Shady Grove Adventist Hospital (2)
Cold Spring Harbor Laboratory (2)	Temple University
Columbia University (4)	The Methodist Hospital Research Institute
Drexel University, Philadelphia, Pennsylvania	George Washington Medical Center
Evanston & Chicago	The Rockefeller University
Fox Chase Cancer Center	Tufts Medical Center
Harvard University PD	UIC
Hospital Lifeblood	Uniformed Services University of the Health Sciences (USUHS)
Medical Center	University of Chicago (4)
Medstar Washington Hospital Center	University of Cincinnati (2)
Merck and Co.	University of Connecticut Health Center (2)
MIT Montefiore Medical Center	University of Illinois
Mount Sinai Medical Center (4)	University of Maryland (5)
National Institutes of Health	University of Massachusetts Lowell
New York Presbyterian Hospital	University of Pennsylvania
NIST Northwest Hospital	University of Washington
NYU Langone Medical Center/ Bellevue Hospital (2)	Vaccinex
PD U of I Chicago	VACT
Penn State University (2)	Washington Alarm, Inc. Seattle, WA
	Westchester Medical Center

<b>Question 4. Position/primary role (choose all that apply):</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Radiation Safety Officer	43.7%	38
Dispatcher	8.0%	7
Site Operator	5.7%	5
Site Administrator	12.6%	11
Site Instructor/Trainer	11.5%	10
Site Responder	9.2%	8
Offsite Responder	1.1%	1
Law Enforcement	9.2%	8
Fire Service	1.1%	1
IT Specialist	2.3%	2
Security System Technician	5.7%	5



Site Security	11.5%	10
Security Manager/Director	11.5%	10
Assistant Security Manager/Director	6.9%	6
Other (please specify)	10.3%	9



<b>Question 5. Does your organization have a separate department that handles training?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Yes	24.1%	21
Not sure	4.6%	4
No	71.3%	62
Additional comments		12

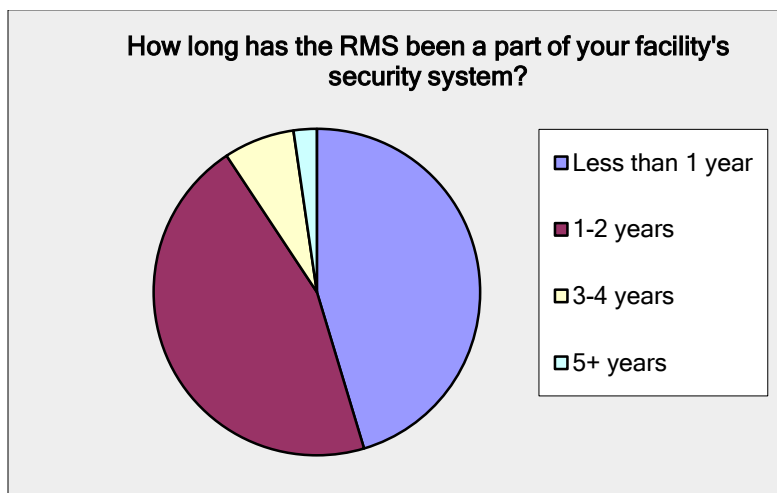
Comments:

- I am the Training Academy Director
- Radiation Safety Dept. handles radioactive materials training
- Radiation Safety Office, Department of Environmental Safety
- Radiation Safety Department
- We give training only about Radiation and Lasers
- Depends on the training
- Radiation Safety Office conducts radiation related training
- What type of training? Many departments do their own training
- I offer training often times
- Routine training done in house. Specialized is contracted.
- All Safety training is performed by us

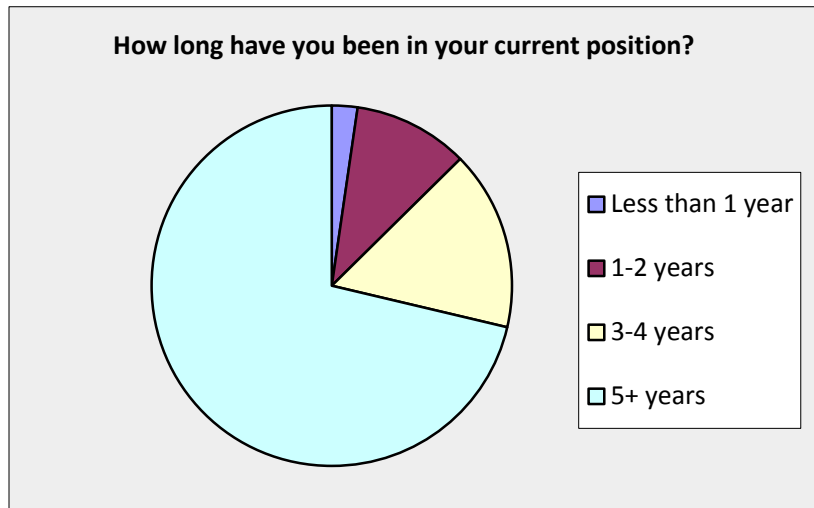
Question 6. How long has the RMS been a part of your facility's security system?		
Answer Options	Response Percent	Response Count
Less than 1 year	45.3%	39
1-2 years	45.3%	39
3-4 years	7.0%	6
5+ years	2.3%	2
Additional comments		7

Comments:

- 5 ARC site up and running on RMS, 5 more being installed
- 2-3 years
- Unsure
- We have had them for years but they have just become important
- RMS has been live less than a year
- Installed Sep 2009



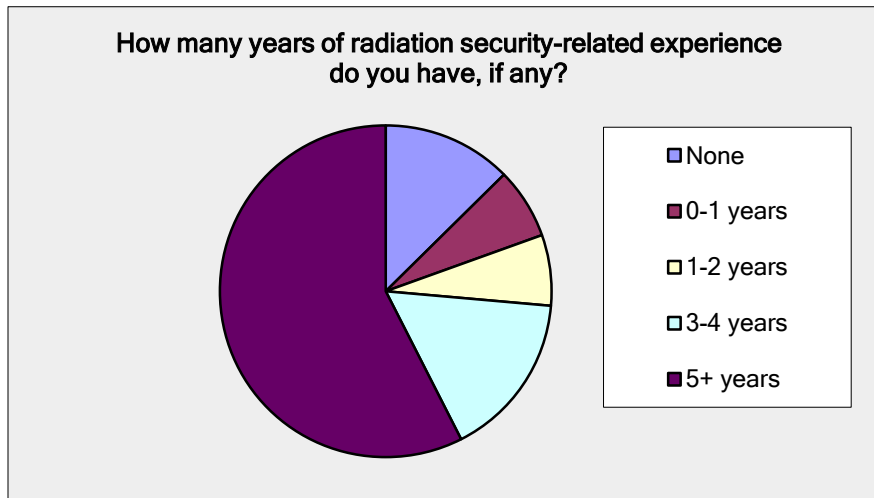
Question 7. How long have you been in your current position?		
Answer Options	Response Percent	Response Count
Less than 1 year	2.3%	2
1-2 years	10.3%	9
3-4 years	16.1%	14
5+ years	71.3%	62



<b>Question 8. How many years of radiation security-related experience do you have, if any?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
None	12.6%	11
0-1 years	6.9%	6
1-2 years	6.9%	6
3-4 years	16.1%	14
5+ years	57.5%	50

Comments:

- OJT since the NRC increased controls went into effect
- No training before we went to Tennessee
- All my radiation security-related experience is via our GTRI on-the-job deployment.
- 20 years
- This became more focused when the IC order went into effect
- Just what I have received in this position.
- Been doing this since 1980
- More than 10 years

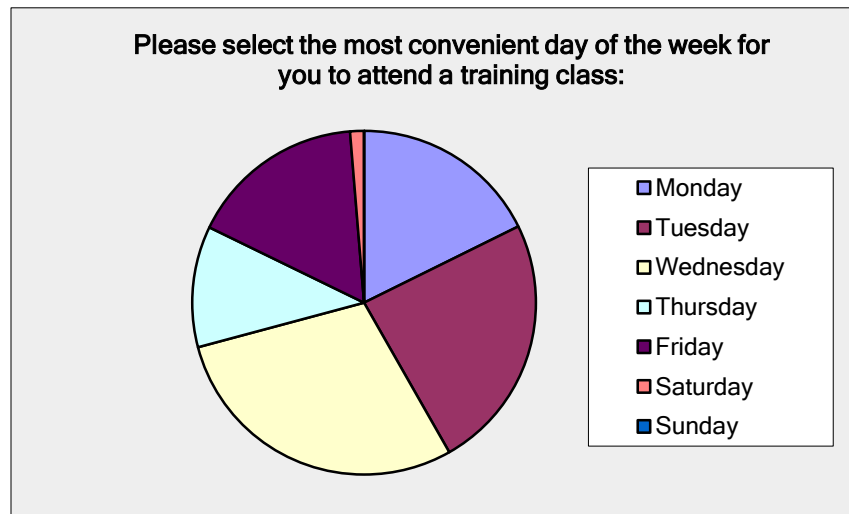


<b>Question 9. Please select the most convenient day of the week for you to attend a training class:</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Monday	17.7%	14
Tuesday	24.1%	19
Wednesday	29.1%	23
Thursday	11.4%	9
Friday	16.5%	13
Saturday	1.3%	1
Sunday	0.0%	0
Additional comments		22

Comments:

- Tuesday-Thursday
- Sunday through Saturday
- Generally Monday and Friday, but this term I will be teaching those days, so Tues. or Thurs.
- Varies according to work schedule
- My day off
- Tuesday thru Thursday
- It depends on the week
- Since I have to make sure the office is covered there is really no convenient time.
- But any day is generally fine.
- Any weekday will work
- online training is the best option for me
- Need training for RADEYE system
- Retiring in three months
- It would depend on where it is
- Any weekday is really ok - if onsite training
- Anytime but the weekends
- Most days are fine with advanced notice
- Any work day is really about the same as any other.

- Any weekday is fine
- If travel is involved, any day mid-week is best
- Any day is OK
- Flexible depending on location e.g., travel



<b>Question 10. Please select the most convenient time during the day for you to attend a training class:</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Morning	67.5%	54
Afternoon	32.5%	26
Evening	0.0%	0
Additional comments		14

Comments:

- Any time is the day is good for me
- All Three
- Afternoons or evenings
- It depends
- Please see above
- But any time is generally fine
- Or afternoon
- Retiring. No training needed.
- It would depend on where it is
- Anytime but the evening
- Anytime during normal working day, with advanced notice
- Morning or afternoon are really about the same.
- 8AM - 5 PM
- Flexible

<b>Question 11. Which of the following statements most accurately describes your responsibilities/interactions with the RMS software? Select all that apply.</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
My job does not require any use or interaction with the RMS workstation.	17.1%	14
I think the RMS software is installed on a workstation in my area, but I minimize it and do not really understand what it is for.	1.2%	1
I monitor and review the RMS software data during my shift or on a daily/regular basis.	28.0%	23
I oversee operator use of the RMS software data.	18.3%	15
I review data as needed when alerted by the person monitoring the RMS.	46.3%	38
Other (please specify)	17.1%	14

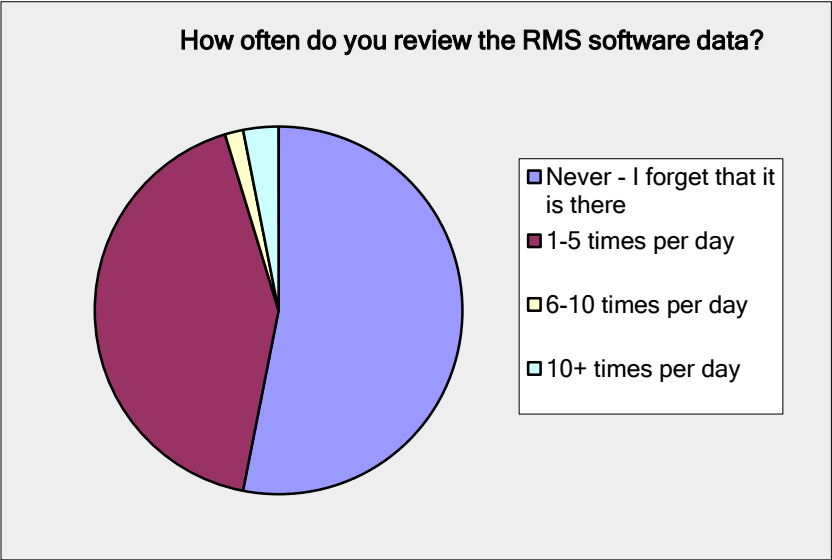
**Comments:**

- Oversee all ARC sites with RMS workstations
- I restart/ reload/ update RMS software
- MANTAIN AND INSPECT SYSTEM
- I only ensure that the system is working
- Trouble Shoot any issues with the RMS or Assessment Computer
- Security interacts with this. I am notified if there are issues.
- I understand it to a degree
- Assist with IT-related questions
- I need to understand RMS system and use of RADEYE
- As RSO I am informed of alarms from the RMS
- Manage its operability and functionality
- Supervisor of Communications where software is installed to be monitored
- The RMS software is installed on workstation in the secure area and a LLE workstation. I have very little understanding of how it works.
- I view parallel systems on my workstation, and some video feeds.

<b>Question 12. How often do you review the RMS software data?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Never - I forget that it is there	53.1%	34
1-5 times per day	42.2%	27
6-10 times per day	1.6%	1
10+ times per day	3.1%	2
Additional comments		37

Comments:

- Oversee the project not the day to day operations
- I would only review the data regarding activity alarms, otherwise security oversees all other data. If need be, I am alerted to any unusual situation.
- Have not had the opportunity to review
- I don't review it directly
- RMS software is handled by Security and IS staff members
- Once a quarter
- I only get called when there is a problem
- Primarily rely on an alarm for notification
- When the alarm goes off
- I look at the data weekly
- Not part of my normal job
- As needed, you should offer a different choice depending on the question above
- We monitor 24/7. Any data such as an alarm are handled upon activation. Any additional data monitoring is handled by a department manager ( Physical Security Manager )
- I did not forget about it
- This is good - no or very few false activations
- Occasionally
- The RMS is monitored by HUPD dispatch and I am alerted if there is an 'admin' or 'network' issue. I also use it during quarterly tests and/or for troubleshooting issues.
- Review of software data occurs only when an alarm triggers.
- Once in a while
- as above
- More like 1-2 times per month
- I don't really forget it's there, I just don't monitor it.
- I have not forgotten that it is there. Job responsibilities do not require that this is reviewed. You should reword the question so that it doesn't lead to this conclusion.
- I am rarely asked to review any of the data
- I have not reviewed RMS data system, need training.
- Quarterly performance testing
- I didn't forget, but my job doesn't have me reviewing data.
- As needed for review and QA/QC
- I review only when Security notified me with an incident
- The access is on the other side of campus
- As needed, but not very often
- Our Police Monitors RMS - we only respond
- I review the screen when I go into the communications center a few times a week.
- Only checked when there is problem or false alarm
- Just video feeds, usually left on my desktop.
- As needed
- Not applicable

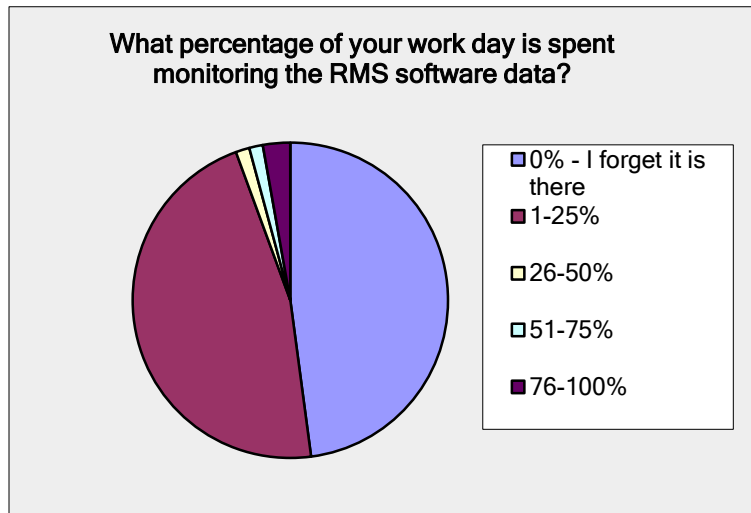


<b>Question 13. What percentage of your work day is spent monitoring the RMS software data?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
0% - I forget it is there	47.9%	34
1-25%	46.5%	33
26-50%	1.4%	1
51-75%	1.4%	1
76-100%	2.8%	2
Additional comments		21

**Comments:**

- Oversee the project not the day to day operations
- 1-2 hours / week
- I did not forget it is there, there is no need for me to review.
- I don't review it directly
- RMS software is handled by Security and IS staff members
- Once a quarter
- Minimal
- If it is running normally, only weekly for 5 min. If they are down, I am on it until it is resolved.
- Not part of my normal job
- This is good - no or very few false activations
- It is on the low end of the above number, Dispatch monitor the software 24x7
- I don't forget it's there, I just don't actually monitor it.
- Same response as above
- Looking forward to review data
- Only when there is a problem
- I didn't forget, but I get informed on alarms and don't monitor personally.
- This is not my role
- Again, just the video feed.
- As needed

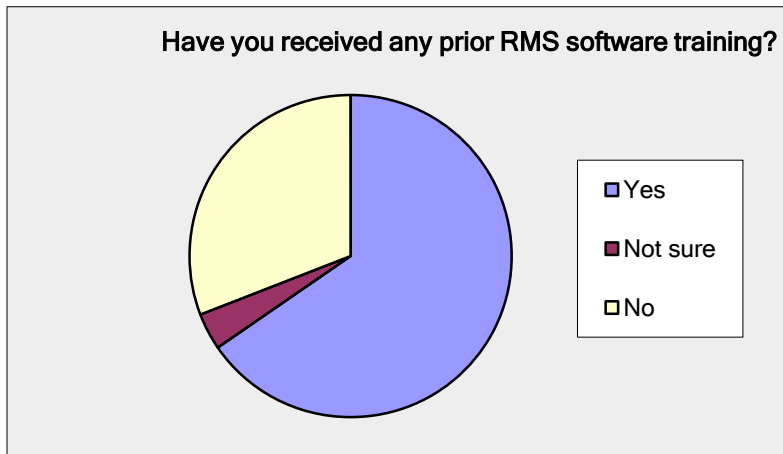




<b>Question 14. Have you received any prior RMS software training?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Yes	65.4%	53
Not sure	3.7%	3
No	30.9%	25
Additional comments		18

Comments:

- Only on site during installation but training was sufficient
- Training via installer and site visit engineers
- But it was geared towards installers.
- When initially installed and made operational
- Brief, not documented, nothing in writing - not manual
- Webinar from Aquila?
- In-service performed by installers.
- I did get an overview training when the system was initially deployed but most of my knowledge is from reading the manual and hands-on use.
- Minimal
- Alarm Response Training
- Minimal during technician's last part of install day
- I received training at the install, but not much
- Y-12
- Hands on during installation and some at Y-12
- Minimal upon installation
- Minimal
- Brief and informal during installation
- Training received when unit was installed, no classroom training provided



<b>Question 15. Was the training too easy or too complex?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Too easy	21.8%	12
Just right	69.1%	38
Too complex	9.1%	5

<b>Question 16. Following the instruction you received, to what extent did you feel adequately prepared to:</b>					
<b>Answer Options</b>	<b>Not at all prepared</b>	<b>Somewhat prepared</b>	<b>Well prepared</b>	<b>Rating Average</b>	<b>Response Count</b>
Use the RMS software?	21.7%	42.0%	36.2%	2.14	69
Monitor RMS alarms?	14.5%	37.7%	47.8%	2.33	69
Understand what the alarms meant?	7.2%	42.0%	50.7%	2.43	69
Make proper notifications when receiving alarms?	10.1%	34.8%	55.1%	2.45	69
Additional comments					11

**Comments:**

- I felt somewhat prepared, but have the impression our dispatchers are not prepared.
- A written manual is needed since multiple staff will respond to alarms. Training was brief and complex.
- These questions are dependent on the person's position and should be modified accordingly.
- I have not yet attended the online training webinar but plan to do so.
- The best training is from conducting quarterly alarm testing!
- Since I don't actually monitor alarms, I only interact with those who do monitor. However, I do not feel well prepared to troubleshoot.
- Not directly involved on a day to day basis.
- Not sure what "use the software" means. Notifications are a local event

- One quick session. No back up if you forget something.
  - I feel the RMS monitoring screen and the systems being monitored are too complicated. We have had large numbers of EMS responses to our site because of misinterpretations of the alarm screens by central station operators at the police departments. Simple loss of internet connection is resulting in a full armed response by the EMS team. It is also very cumbersome to clear events (alarms and alerts) from the screen. Some of our PD's have over 120 workers in their central stations and training them on the nuances of the system has proven difficult.
  - Have not received training, yet.
- 

**Question 17. If you did not feel prepared to use the RMS software, please explain why not:**

Comments:

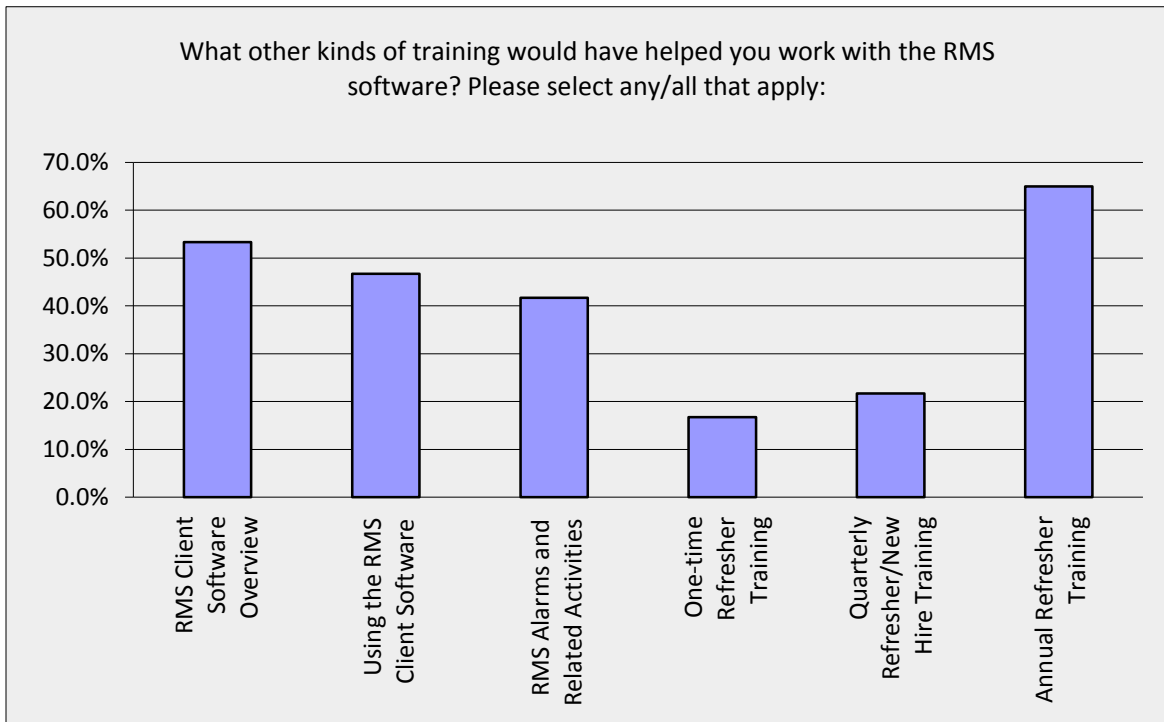
- Don't fully understand some of the alerts
  - Dispatchers monitor system
  - Lack of understanding on the part of our dispatchers.
  - Never trained
  - The training took place a few months before system was in use. Did not remember specifics covered in training.
  - No written manual. Prompts on screen are not adequate. More training - refresher is needed
  - This falls under the RSO.
  - Did not receive training
  - The instruction was conducted for a lot of people in a very busy office. There was no one-on-one training
  - More training should be provided at the time of installation of the RMS software
  - The training covered the main alarms but did not cover the workings of the communication between the field hardware and the assessment computer, or the details about log/history files (for reviewing old alarms, or for troubleshooting)
  - Had problems with false alarms and deciphering what should be alarmed at first
  - See above
  - The subscribers didn't have contact lists/procedures prepared to explain how to respond/notify on alarm conditions
  - Would have preferred all users had a sit-down class with demo.
  - No, you forget what you learned if you don't use it daily.
  - I never use it on my own
  - Software is quite complicated. Would be good to have a hands-on demo with alarm scenarios. Our training was before the system was up and running so we never got to see actual alarms.
  - The system needs a lot of in-house customization for the many different alerts and alarms and training in-house screen operators at the PD's has proven to be difficult.
  - minimal initial training and post-install use
  - Not trained, yet.
  - Training could have been more thorough
  - Training was very brief. No way to know if it was complete.
-

**Question 18. What other kinds of training would have helped you work with the RMS software?  
Please select any/all that apply:**

Answer Options	Response Percent	Response Count
RMS Client Software Overview {product familiarization; software overview; status level setup; setting alarm conditions; tabs (alarms, general, sounds)}	53.3%	32
Using the RMS Client Software {simple view operation; live images; polled images; latest events; radiation graph; student practice}	46.7%	28
RMS Alarms and Related Activities {using the alarms screen; alarm viewer (polled images, latest event, radiation graph); acknowledge alarm actions; alarm logs; information and warning messages}	41.7%	25
One-time Refresher Training	16.7%	10
Quarterly Refresher/New Hire Training	21.7%	13
Annual Refresher Training	65.0%	39
Other (please specify)		12

Comments:

- Advanced notice of refresher training and a written manual is needed
- hands on training in working environment
- N/A
- I don't deal with the system
- Having dedicated classroom training with and RMS unit and inputs etc. would have been better than the live (i.e. live system in HUPD Dispatch) training we used at the initial deployment.
- A lot was given during the initial training. The personnel who provided the training did a fine job. Since my job responsibilities do not require me to interact with this on a regular basis it is not as fresh as it could be. Refresher training would be a very good idea.
- Refreshers only because we use it once a quarter for testing.
- On-call help from Aquila is sufficient
- I agree more training and refreshers are needed and should include LLE
- Something to refer to if you forget.
- Our alarm company really needs the new hire training element
- Having another client would help.



Please rate the quality of the following elements of the training you received:								
Answer Options	Poor	Fair	Good	Very Good	Excellent	Do not Recall/NA	Rating Average	Response Count
Overall content of the training	2.9%	19.1%	33.8%	23.5%	8.8%	11.8%	2.81	68
User guide or materials	7.6%	13.6%	28.8%	18.2%	7.6%	24.2%	2.32	66
Presentation of material by Instructor	2.9%	19.1%	27.9%	26.5%	8.8%	14.7%	2.75	68
Participant/ Group activities or actual practice during training with the RMS software	10.4%	17.9%	23.9%	10.4%	9.0%	28.4%	2.04	67
Facilitation of activities by Instructor	7.5%	16.4%	26.9%	14.9%	7.5%	26.9%	2.18	67
Additional comments								17

**Comments:**

- Too involved with system to adequately determine
- There was no handout or manual provided.
- Onsite training
- Instructor did not seem very comfortable presenting to a group.

- Not the instructors fault - we were unable to focus at the time due to multiple projects occurring. A written manual is required
- It's been too long since the training.
- Did not receive any training.
- NA
- The above 'poor' rating reflects the fact that we had training on our 'live' system, not in a classroom with a static/demo RMS.
- Have not received formal training
- Training was just too short in nature. Operators just got basic training, but malfunctions/false alarms are not understood.
- Again refresher training would be a good idea.
- On install we got 5 minutes of this is what it does and that was it.
- Don't recall training be this structured and/or widely offered
- Initial training was informal
- N/A: not trained
- No formal class provided, just at installation

**Question 20. Please share any other comments you have that would help us improve the next RMS software training.**

Comments:

- Handout material may be beneficial.
- I maintain the system. So far we have not had any trouble in the field. If something went wrong with the field equipment I would be the one they would call.
- As RSO, I am a person who does not directly read or monitor the RMS, but would get information/data from those who do monitor the RMS. I wasn't aware that my participation was needed in the initial training for the system; however, I can see the value in understanding its operation and results in order to interpret the data being provided to me. My only comment is to stress (maybe you did) who in what roles, should attend the initial training.
- Refresher training with written materials is needed
- The RMS is not hard to use. How much can you do on a webinar? Most of it is self-explanatory for reasonably computer savvy people.
- Training on how to populate alarm instructions should be provided
- Train users before deployment and not on live systems. Follow-up with some refresher training on the live system during or shortly after deployment.
- More on site Admin Rights. Maybe a Web Based Course on the Software
- Our facility needed more software training with each shift and explanation of what the alarm is. Dispatchers were confused at first with the software and what our response was to each alarm. Also updated lists of people allowed into the facilities needs to be maintained and contacts for after hours
- The dispatchers in Security would be the best personnel to answer these questions. The training for the RMS needs to be more in depth, the installer set the alarm point did a brief this is what it does and that was it.
- The software training was great. The only problem was with the notification procedure materials not being in. Because they weren't there, it wasn't really possible to walk through using the software as though we were getting an actual alarm. So I couldn't practice response and encounter any possible issues.

- Please arrange RMS training.
- Show how to stop problems with change to daylight time.
- Some of the individuals who actually use the software and provide alarm information appear to find it easy to use while others seem to have some difficulties.
- Would volunteer to help establish training, review materials, or host a regional training. Use me if you need help.
- Break it up into small, easily literate and understandable modules, not computer language.
- Onsite training was minimal. More training would be a welcome addition to eliminate mistakes
- The RMS is kept on the other side of campus in our communications center. Having access to it remotely or having another client would help us use it more.
- The training is fine but in my opinion the display screen for the RMS is flawed. True alarms should appear with a distinct siren and flashing red color (radiation, intrusion, RFID seal etc.). Alerts should be displayed with a yellow color and a different siren, similar to how fire alarm conditions report.
- One day formal initial training and annual (2-3 hours) refresher training would be best.

<b>Question 21. If you use OR monitor the RMS computer, please evaluate your current skill level with the following system tasks:</b>						
<b>Answer Options</b>	<b>I do not perform this task</b>	<b>I have minimal or no proficiency at this task</b>	<b>I am proficient at this task</b>	<b>I am extremely proficient at this task</b>	<b>Rating Average</b>	<b>Response Count</b>
I can locate and open the RMS software interface	33.8%	12.3%	43.1%	10.8%	1.31	65
I can locate and open the RMS Viewer window	33.8%	9.2%	44.6%	12.3%	1.35	65
I can locate and open the RMS Simple Viewer window	35.4%	9.2%	43.1%	12.3%	1.32	65
I can locate a specific RMS device within the RMS software interface	34.8%	15.2%	39.4%	10.6%	1.26	66
I understand the difference between each status indicator (good, marginal, bad)	30.8%	18.5%	40.0%	10.8%	1.31	65
I can locate and view the "Live View"	27.7%	6.2%	52.3%	13.8%	1.52	65
I can locate and view the "Latest Events"	28.8%	15.2%	43.9%	12.1%	1.39	66
I can locate and view the "Radiation Graph"	25.8%	16.7%	45.5%	12.1%	1.44	66
I can view individual graph data point values	34.4%	20.3%	32.8%	12.5%	1.23	64
I can export the Radiation Graph data	51.6%	29.7%	12.5%	6.3%	0.73	64
I can locate and view alarm	29.2%	15.4%	44.6%	10.8%	1.37	65

data						
I can locate and view alerts data	29.7%	20.3%	39.1%	10.9%	1.31	64
I can locate and view radiation readings data	29.2%	16.9%	41.5%	12.3%	1.37	65
I can copy data rows to paste into external programs	58.7%	25.4%	12.7%	3.2%	0.60	63
I can enlarge RMS images or image sections	43.9%	27.3%	22.7%	6.1%	0.91	66
I can check available disk storage space for the RMS software data on the workstation	50.8%	27.7%	18.5%	3.1%	0.74	65
I can check the communications status between each RMS and the workstation	50.8%	20.0%	21.5%	7.7%	0.86	65
I can check the status of individual RMS components	47.7%	27.7%	18.5%	6.2%	0.83	65
I can enable data and alarm filters for each RMS	60.9%	26.6%	10.9%	1.6%	0.53	64
Additional comments						10

Comments:

- I don't operate the RMS workstation as a daily functions
- I provide oversight-details managed by local observer
- We do not have the system password so cannot perform all tasks.
- The individual who managed the installation resigned his position just prior to the system going live. I feel I did not receive adequate training on the software. Additional training would be appreciated
- Clinical engineering does this job.
- I am a little unclear on some of the above questions and so have put a lower level of comfort for those items.
- Boy I really need some training after seeing this list...
- I have been working my way through the system but do not feel 100% confident that I can identify all
- The Laboratory's security department and two police departments probably have a total of 4 individuals out of over 100 that are truly proficient in the tasks described above. That is why there are a large number of mistakes made at the monitoring sites.

<b>Question 22. Software Response Tasks</b>						
<b>Answer Options</b>	<b>I do not perform this task</b>	<b>I have minimal or no proficiency at this task</b>	<b>I am proficient at this task</b>	<b>I am extremely proficient at this task</b>	<b>Rating Average</b>	<b>Response Count</b>



I know how to contact the System Administrator	26.2%	16.9%	38.5%	18.5%	1.49	65
I know when to contact the System Administrator	26.2%	16.9%	38.5%	18.5%	1.49	65
I know how to contact the GTRI RMS Help Desk	25.0%	21.9%	37.5%	15.6%	1.44	64
I know when to contact the GTRI RMS Help Desk	27.7%	27.7%	32.3%	12.3%	1.29	65
I recognize the audio alarm signal from the monitoring workstation	27.7%	7.7%	41.5%	23.1%	1.60	65
I know the appropriate response for a "Seal Left" alert	35.4%	21.5%	27.7%	15.4%	1.23	65
I know the appropriate response for a "Radnet Trigger" alarm	33.8%	15.4%	33.8%	16.9%	1.34	65
I know the appropriate response for a "RFID Seal" alarm	32.3%	10.8%	36.9%	20.0%	1.45	65
I know the appropriate response for a "Housing" alarm	32.8%	12.5%	35.9%	18.8%	1.41	64
I know the appropriate response for an "Intrusion" alarm	32.3%	9.2%	40.0%	18.5%	1.45	65
I know the appropriate response for a "Duress" alarm	30.8%	9.2%	40.0%	20.0%	1.49	65
I know the appropriate response for a "Trigger" alarm	33.8%	15.4%	35.4%	15.4%	1.32	65
I know the appropriate response for a "Loss of AC" alarm	32.8%	18.8%	32.8%	15.6%	1.31	64
I know the appropriate response for a "Timer" alarm	33.8%	26.2%	29.2%	10.8%	1.17	65
I know the appropriate response for a "Motion" alarm	32.3%	9.2%	40.0%	18.5%	1.45	65
I can acknowledge individual alarm events that have been reviewed and acted upon	32.3%	15.4%	32.3%	20.0%	1.40	65
Additional comments						8

Comments:

- I don't operate the RMS workstation as a daily functions
- We have not finalized the protocols for responses to events
- NA
- I am a little unclear on some of the above items (trigger, timer etc.) and so have put a lower level of comfort for those items. Due to our (I think unique design) we monitor motion and general room alarms through external systems and use the GTRI for Seal, Rad., duress and tampers
- I am the system administrator
- So when is the next class?
- The Laboratory's security department performs this function.
- Sounds like we should be invited to a course.

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**Questions 23 – 26 are voluntary identifying information. 53 respondents chose to self-identify and provide contact information for further research. Feedback was provided by individuals in the following positions:**

Assist. Supervisor Security  
Assistant Manager, Technology Services Bureau, Dept. of Public Safety  
Assistant Radiation Safety Officer (3)  
Assistant VP for Safety and Environment  
Associate Director Security  
Associate Director/Radiation Safety Officer  
Associate Radiation Safety Officer  
Captain  
Central Station Operator  
Central Station Supervisor  
Communications Supervisor  
Director EH&S, RSO  
Director of Radiation Safety  
Director/RSO  
ELEC TECH III  
Electric/Electronic Manager  
Facilities Coordinator  
Facilities Director  
Facilities Manager  
Facilities Systems Specialist  
Health Physicist, LSO  
Irradiator Security Manager  
IT Security Director  
Lieutenant Public Safety  
Manager, Security Technology Systems and Infrastructure  
Police Officer  
Police Telecommunicator  
Project Manager, S&FE, BHQ  
QA Compliance Manager  
Radiation Safety Officer (14)  
Radiation Safety Specialist (2)

Reactor Director  
RPO  
Security Specialist  
Security Systems BA  
Senior Safety Officer  
Sergeant  
Training Sergeant



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## Appendix F

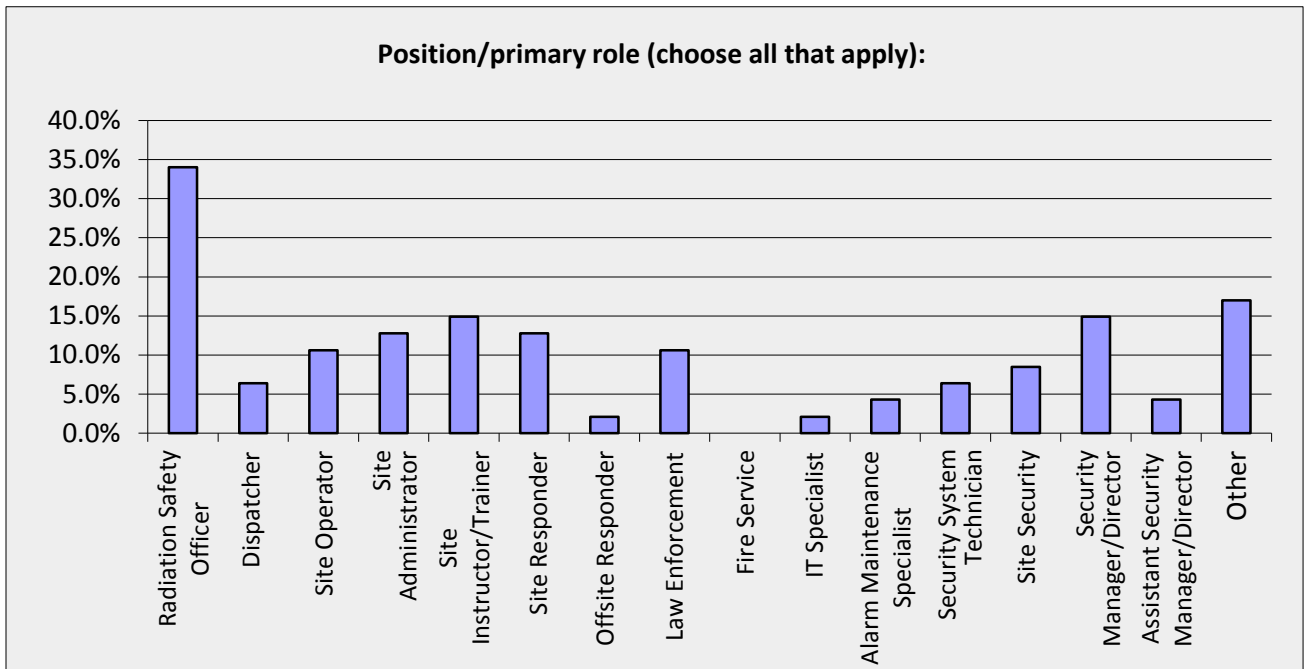
### Operational Needs Assessment: Data Tables and Graphs

Question 1. In what state or U.S. territory do you live?		
Answer Options	Response Percent	Response Count
Connecticut	2.1%	1
District of Columbia	2.1%	1
Illinois	10.4%	5
Indiana	2.1%	1
Maryland	18.8%	9
Massachusetts	10.4%	5
Mississippi	4.2%	2
Missouri	2.1%	1
New Jersey	4.2%	2
New York	16.7%	8
Pennsylvania	8.3%	4
Rhode Island	2.1%	1
Texas	4.2%	2
Virginia	2.1%	1
Washington	8.3%	4
Wisconsin	2.1%	1

Question 2. In what city do you live?		
Response/Counts		
Brookeville	Lowell	Raymore
Chicago (5)	McLean	Rochester
Cold Spring Harbor	Mountlake Terrace	Rockville (2)
College Park	Needham	Seattle (3)
Demotte	New Hyde Park	Seattle
Gaithersburg	New York (2)	Southaven
Highlands	Boston	Stony Brook
Houston (2)	Olney	Suitland
Jefferson	Philadelphia (4)	Toms River
Kansas City	Pleasant Prairie	Wakefield
	Plymouth	Washington, DC
	Providence	

<b>Question 3. In which site or facility do you work?</b>	
<b>Response/Counts</b>	
Baltimore	Northwest Hospital
Boston	NYU Langone Medical Center
Brown University	Philadelphia
BTGH	Puget Sound Blood Center (2)
Children's Hospital Boston	Rush University Medical Center, Chicago, IL
Children's Mercy Hospital (2)	Shady Grove Adventist Hospital
Childrens National Medical Center	Shrewsbury
Cold Spring Harbor Laboratory	Stony Brook University
Eatontown Police Department	Temple University
Evanston & Chicago	The Methodist Hospital Research Institute
Fox Chase Cancer Center	UIC
George Washington University Hospital	University of Chicago (4)
Harvard University PD	University of Maryland
Lifeblood - Memphis, TN	University of Massachusetts Lowell
MIT	UPENN
Mount Sinai Medical Center (2)	Vaccinex
National Institutes of Health (4)	Washington Hospital Center
NIST	

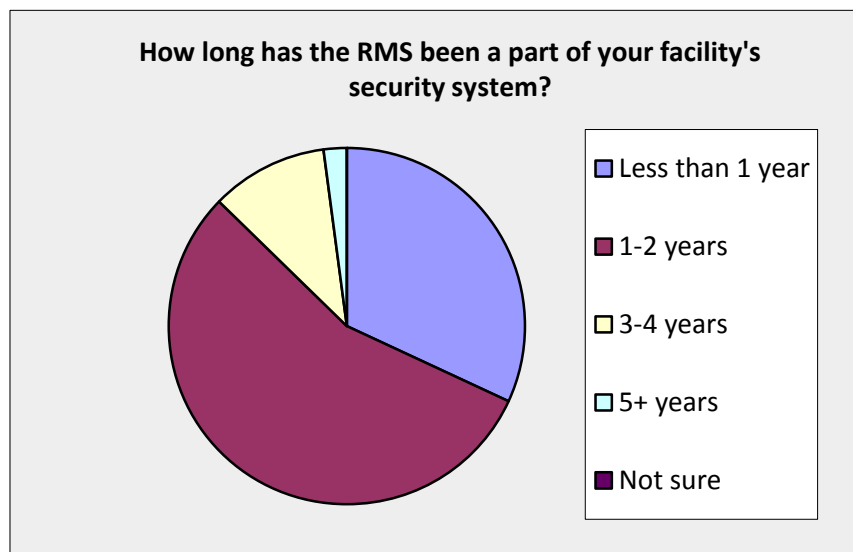
<b>Question 4. Position/primary role (choose all that apply):</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Radiation Safety Officer	34.0%	16
Dispatcher	6.4%	3
Site Operator	10.6%	5
Site Administrator	12.8%	6
Site Instructor/Trainer	14.9%	7
Site Responder	12.8%	6
Offsite Responder	2.1%	1
Law Enforcement	10.6%	5
Fire Service	0.0%	0
IT Specialist	2.1%	1
Alarm Maintenance Specialist	4.3%	2
Security System Technician	6.4%	3
Site Security	8.5%	4
Security Manager/Director	14.9%	7
Assistant Security Manager/Director	4.3%	2
Other (please specify)	17.0%	8



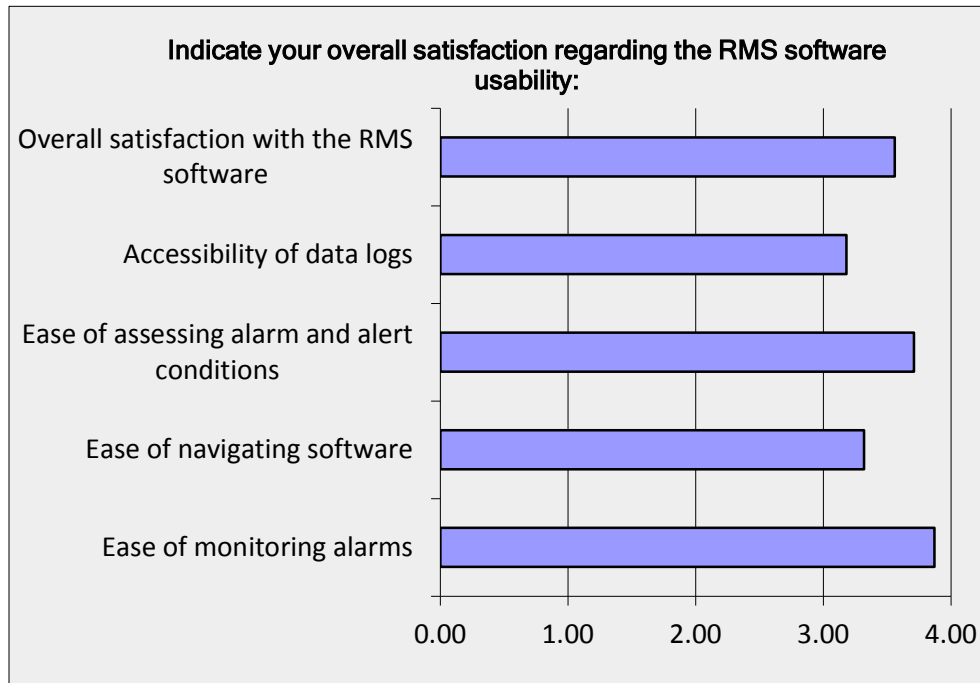
Other

**Question 5. How long has the RMS been a part of your facility's security system?**

Answer Options	Response Percent	Response Count
Less than 1 year	31.9%	15
1-2 years	55.3%	26
3-4 years	10.6%	5
5+ years	2.1%	1
Not sure	0.0%	0
Additional comments		2



Question 6. Indicate your overall satisfaction regarding the RMS software usability:								
Answer Options	Poor	Fair	Good	Very Good	Excellent	Do Not Recall/ NA	Rating Average	Response Count
Ease of monitoring alarms	0.0%	2.6%	28.2%	35.9%	30.8%	2.6%	3.87	39
Ease of navigating software	0.0%	7.9%	34.2%	36.8%	13.2%	7.9%	3.32	38
Ease of assessing alarm and alert conditions	2.6%	0.0%	28.9%	34.2%	28.9%	5.3%	3.71	38
Accessibility of data logs	0.0%	13.2%	23.7%	42.1%	10.5%	10.5%	3.18	38
Overall satisfaction with the RMS software	0.0%	7.7%	28.2%	38.5%	20.5%	5.1%	3.56	39



**Question 7. Please provide feedback on best practices and/or potential areas for system improvement of the RMS software:**

Comments:

- When an alarm occurs there is an area for comments and once comments are entered into the system we are not able to view the comments. It would help us a great deal if we were able to view all comments entered into the RMS system.

- It does not cause any problems so I gave it a reasonable review but I have never accessed any data logs or navigated any software and no clue how to assess alarm conditions. Perhaps security does.
- It would be nice if prior alarms would be cleared from the alarms received window and banked elsewhere. No reason to see the old alarms in the window. Reduces confusion if only see current alarms.
- I've not worked with it much lately but not having the ability to export data is a weak point.
- Alarms & Alerts should sound and appear differently at review station for more clarification.
- Provide a separate link for Radiation Safety personnel to be able to access the system either remotely or by a separate pc.
- Better initial and refresher training
- When there is certain alarm activation, a large number of alarms come in for one activation type. This takes a while for our desk officers to clear. A more 1:1 activation would be best.
- Would help tremendously if we had the system password; could access the data logs and dispatch comments then.
- With everything, there is always room for improvement. No feedback now on how to improvement the RMS software.
- The areas I believe need improvement are the following:
  - Real time icons for all alarm status (power, input alarm/open-loop etc.)
  - Battery status for the RFID tags
  - Ability to separate the monitoring client from the database (typical IT requirement)"
- Not a primary user of the software
- Give the Facility Owner a little more Admin Rights to repair issues on our own and ensure security on a more regular basis rather than waiting for repairs.

<b>Question 8. Please indicate your overall satisfaction regarding the RMS hardware and infrastructure usability:</b>								
<b>Answer Options</b>	<b>Poor</b>	<b>Fair</b>	<b>Good</b>	<b>Very Good</b>	<b>Excellent</b>	<b>Do Not Recall/NA</b>	<b>Rating Average</b>	<b>Response Count</b>
Acceptability of false alarm rate (frequency of incidents)	2.6%	17.9%	23.1%	28.2%	20.5%	7.7%	3.23	39
Acceptability of nuisance alarm rate (frequency of incidents)	0.0%	18.4%	15.8%	26.3%	28.9%	10.0%	3.34	38
Quality of video images	5.1%	5.1%	23.1%	38.5%	25.6%	2.6%	3.67	39
Integration with house alarm system	2.6%	2.6%	35.9%	35.9%	17.9%	5.1%	3.49	39
Reliability of RFID seal	2.6%	10.3%	23.1%	25.6%	33.3%	5.1%	3.62	39
Reliability of network interface	2.6%	10.5%	28.9%	26.3%	28.9%	2.6%	3.61	38



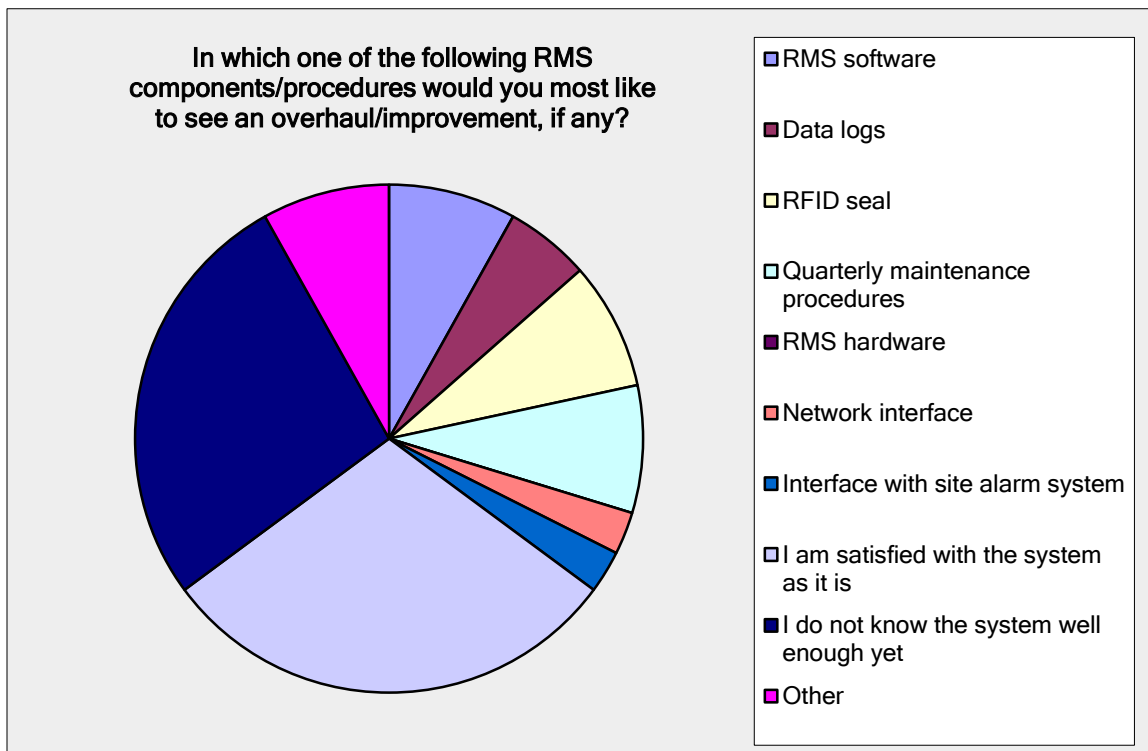
Reliability of RMS hardware	0.0%	2.7%	35.1%	32.4%	21.6%	8.1%	3.49	37
Ease of conducting maintenance procedures	0.0%	7.9%	26.3%	26.3%	7.9%	31.6%	2.39	38
Quality of help desk assistance	0.0%	2.6%	15.4%	25.6%	28.2%	28.2%	2.95	39
Overall stability of the system	2.6%	2.6%	33.3%	30.8%	28.2%	2.6%	3.72	39
Overall satisfaction with RMS?	0.0%	5.0%	40.0%	27.5%	25.0%	2.5%	3.65	40

**Question 9. In which one of the following RMS components/procedures would you most like to see an overhaul/improvement, if any?**

Answer Options	Response Percent	Response Count
RMS software	8.1%	3
Data logs	5.4%	2
RFID seal	8.1%	3
Quarterly maintenance procedures	8.1%	3
RMS hardware	0.0%	0
Network interface	2.7%	1
Interface with site alarm system	2.7%	1
I am satisfied with the system as it is	29.7%	11
I do not know the system well enough yet	27.0%	10
Other	8.1%	3
If other, please specify:		4

Comments:

- Also hardware...we did have one bad computer and one bad RFID seal
- I feel I would need more training on the RMS components/procedures to give a positive answer to the questions.
- The Seals are the primary items that need to be better but the assessment software could also be better (decouple database/logs from client monitoring, pre-defined dispatch messages)
- Integration with LLE systems



**Question 10. Please provide feedback on best practices and/or potential areas for system improvement of the complete RMS:**

Comments:

I think it is working okay or else security would have been complaining.

- We have had issues with network connection. We seem to have power glitches that cause the RMS to alarm, triggering a response by officers. I'm not sure if the RMS is the issue or the network/communication system.
- I would prefer that the cameras could more easily be located away from the panel.
- There should be a way to test the strobe/horn without a source (i.e. manual override).
- Alarm acknowledgment.
- We still get a fair amount of Data Broadcast Status Error alerts. Also 2 events when RFID seal failed, resulting in ~30 RFID alarms per incident and necessitating seal replacement. Two events of random High Radiation Alarm (from the Ludlum problem). Video image quality is okay; surveillance camera image quality is better.
- The same as the other please specify questions, thank you.
- We had a very shaky start over about the first 18 months with the system software (v.1 crashed a few times), blown power supplies (I think we went through 3), rad-modules (I think 2), but mostly Seals (we had all seals replaced 2 or 3 times along with some wires too). I would also like if we had 3-factor authentication at the reader so we could support 'duress' entry, and also a way to support escorted access.
- RFID seals need a more sound and permanent method of attachment to units. Epoxy glue is not the best method. Better if mounted inside and out of sight
- Need to find a work around for communications loss.

**Feedback was provided by individuals in the following positions:**

- Assist. Supervisor
- Assistant RSO
- Associate Director/Radiation Safety Officer
- Cad Drafter
- Captain
- Communications Supervisor
- Electric/Electronic Manager
- Facilities Coordinator
- Facilities Director
- Facilities Manager
- Health Physicist
- Irradiator Security Manager
- Manager, Security Technology Systems and Infrastructure
- Officer/Dispatcher
- Police Officer
- QA Compliance Manager
- RPO
- Radiation Safety Officer (7)
- Radiation Safety Specialist (2)
- Reactor Director
- Security Systems BA
- Supervisor Emergency Services Dispatch



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## Appendix G

### Initial Survey Recipient List By Location and Position

State	County	Site Name	Job Title	POCs
CO	Boulder	University of Colorado	Asst. Director/Radiation Safety Officer	1
CO	Boulder	University of Colorado	Chief of Police/Executive Director	1
CO	Denver	National Jewish Health	Radiation Safety Officer	1
CT	Hartford	University of Connecticut Health Center	Assistant Radiation Safety Officer	1
CT	Hartford	University of Connecticut Health Center	Radiation Safety Officer (RSO)	1
CT	Hartford	Veterans Health Administration	Radiation Safety Officer	1
CT	Hartford	Veterans Health Administration	Supervisory Police Officer	1
DC	District of Columbia	Children's National Medical Center	Radiation Safety Officer	1
DC	District of Columbia	George Washington Univ. Hospital	Head Security	1
DC	District of Columbia	George Washington University Hospital	Radiation Safety Officer	1
DC	District of Columbia	Georgetown University Hospital	Unknown	1
DC	District of Columbia	Washington Hospital Center	Director, Radiation Safety Officer	1
DC	District of Columbia	Washington Hospital Center	Unknown	1
IL	Chicago	Univ. Illinois at Chicago	Assistant Director for FM	1
IL	Chicago	Univ. Illinois at Chicago	Dispatcher	1
IL	Chicago	Univ. Illinois at Chicago	Electrician	1
IL	Chicago	Univ. Illinois at Chicago	Electrician Foreman	1
IL	Chicago	Univ. Illinois at Chicago	Foreman	2
IL	Chicago	Univ. Illinois at Chicago	Police	5
IL	Chicago	Univ. Illinois at Chicago	Project Manager	1
IL	Chicago	Univ. Illinois at Chicago	Security Supervisor	1
IL	Chicago	Univ. Illinois at Chicago	UICPD	1
IL	Cook	Hines VA	Criminal Investigator	1
IL	Cook	Hines VA	Lieutenant	1
IL	Cook	Hines VA	Lieutenant - VA Site Police Department	1
IL	Cook	Hines VA	Police	2
IL	Cook	Hines VA	Radiation Safety Officer (RSO)	1
IL	Cook	Loyola University	Sr. Systems Administrator and Assistant Manager of Security	1

State	County	Site Name	Job Title	POCs
IL	Cook	NorthShore University Healthsystem	Director and Radiation Safety Officer	1
IL	Cook	NorthShore University Healthsystem	Radiation Safety	1
IL	Cook	Northwestern University	Director of Emergency Management	1
IL	Cook	Northwestern University	Research Safety Tech NG71	1
IL	Cook	Rush University Medical Center	Electrical Manager- Rush	1
IL	Cook	Rush University Medical Center	Radiation Safety Officer - Rush	1
IL	Cook	University Of Chicago	Associate Director/Radiation Safety Officer	1
IL	Cook	University of Chicago	Communications Supervisor	1
IL	Cook	University of Chicago	Dispatcher	2
IL	Cook	University of Chicago	Health Physicist	1
IL	Cook	University of Chicago	Lieutenant	1
IL	Cook	University Of Chicago	Senior Director of Emergency Communications and Security Technology	1
IL	Cook	University Of Illinois At Chicago	Radiation Safety Officer	1
IL	Cook	University Of Illinois At Chicago	Senior Director of Police Services	1
IN		Purdue University	Director of Rad Laboratories	1
IN		Purdue University	Public Safety Systems Coordinator	1
IN		Purdue University	Technician	1
MA	Barnstable	USDA - OTIS ANGB, MA	Laboratory Director	1
MA	Barnstable	USDA - OTIS ANGB, MA	USDA Radiation Safety Officer	1
MA	Boston	Tufts Medical Center	Operation Manager	1
MA	Middlesex	Harvard University	Chief of Police	1
MA	Middlesex	Harvard University	Radiation Safety Officer (RSO)	1
MA	Middlesex	Harvard University	Security Systems Business Analyst	1
MA	Middlesex	Massachusetts Institute of Technology	EH&S Specialist	1
MA	Middlesex	Massachusetts Institute of Technology	MIT Radiation Protection Officer (RPO)	1
MA	Middlesex	Massachusetts Institute of Technology	Reactor Superintendent	1
MA	Middlesex	Massachusetts Institute of Technology	Senior Safety Officer	1
MA	Middlesex	University of Massachusetts, Lowell	Director, Reactor Operations	1
MA	Suffolk	Beth Israel Deaconess Medical Center	Medical Health Physicist	1
MA	Suffolk	Beth Israel Deaconess Medical Center	Radiation Safety Officer	1

State	County	Site Name	Job Title	POCs
MA	Suffolk	Children's Hospital Boston	CHB Radiation Safety Officer	1
MA	Suffolk	Children's Hospital Boston	Director of Security	1
MA	Suffolk	Dana-Farber Cancer Institute	Director of Security	1
MA	Suffolk	Dana-Farber Cancer Institute	Radiation Safety Officer	1
MA	Suffolk	Tufts Medical Center - Primary	Associate Radiation Safety Officer	1
MD	Baltimore	American Red Cross - Baltimore	Director, Facilities/Materials Management	1
MD	Gaithersburg	National Institute of Standards & Technology	Console Operator	1
MD	Gaithersburg	National Institute of Standards & Technology	Dispatcher	1
MD	Gaithersburg	National Institute of Standards & Technology	Lieutenant	1
MD	Gaithersburg	National Institute of Standards & Technology	NCNR Operations	1
MD	Gaithersburg	National Institute of Standards & Technology	Security Clerk	1
MD	Gaithersburg	PW NISTP-100	Chief of Police	1
MD	Gaithersburg	PW NISTP-100	Chief, Reactor Operations	1
MD	Montgomery	American Red Cross - Rockville	ARC BHO	1
MD	Montgomery	American Red Cross - Rockville	Radiation Safety Officer	1
MD	Montgomery	National Institute of Health	Chief, Division of Radiation Safety	1
MD	Montgomery	National Institute of Standards & Technology	Chief, Reactor Operations and Engineering	1
MD	Montgomery	National Institute of Standards & Technology	Radiation Safety Officer - Rad Building	1
MD	Montgomery	Shady Grove Adventist Hospital	Blood Bank Technical Manager	1
MD	Montgomery	Shady Grove Adventist Hospital	Site Contract/Procurement POC	1
MD	Montgomery	Uniformed Services University of Health Sciences	Assistant Vice President for ESH	1
MD	Montgomery	Uniformed Services University of Health Sciences	Security	1
MD	Prince George's	University of Maryland College Park	Assistant Director, Radiation Safety Officer	1
MD	Prince George's	University of Maryland College Park	Major	1
MO	Jackson	Children's Mercy Hospital	Assistant Director of Security	1
MO	Jackson	Children's Mercy Hospital	Radiation Safety Officer	1
MO	Jackson	St. Luke's Healthcare	Radiation Safety Officer - Saint Luke's Health Sys	1
MO	Kansas City	Children's Mercy Hospital	Administrative Assistant	2
MO	Kansas City	Children's Mercy Hospital	Blood Bank Supervisor	1
MO	Kansas City	Children's Mercy Hospital	Office Manager	1
MO	Kansas City	Children's Mercy Hospital	Project Manager	1
MO	Kansas City	Children's Mercy Hospital	Security	1

State	County	Site Name	Job Title	POCs
MO	Kansas City	Children's Mercy Hospital	Security Assistant Supervisor	1
MO	Kansas City	Children's Mercy Hospital	Security Supervisor	1
MO	Kansas City	Children's Mercy Hospital	Unknown	1
MT	Missoula	Providence Saint Patrick Hospital	CSO	6
MT	Missoula	Providence Saint Patrick Hospital	PBX	1
MT	Missoula	ST. PATRICK HOSPITAL	Director Safety & Emergency Preparedness	1
MT	Missoula	ST. PATRICK HOSPITAL	Radiation Safety Officer	1
MT	Ravalli	NIH Rocky Mountain Labs	Captain NIH Police	1
MT	Ravalli	NIH Rocky Mountain Labs	Engineer Technician	1
MT	Ravalli	NIH Rocky Mountain Labs	Health Physicist	1
MT	Ravalli	NIH Rocky Mountain Labs	IT Specialist	1
MT	Ravalli	NIH Rocky Mountain Labs	IT Support Analyst	1
MT	Ravalli	NIH Rocky Mountain Labs	Maintenance	1
MT	Ravalli	NIH Rocky Mountain Labs	Radiation Safety & Environmental Compliance	1
MT	Ravalli	NIH Rocky Mountain Labs	Sergeant NIH Police	1
NJ	Eatontown	Central Jersey Blood Center	IT Coordinator, EPD	1
NJ	Middlesex	St. Peter's University Hospital	Medical Physicist	1
NJ	Monmouth	Central Jersey Blood Center	Facilities Coordinator	1
NJ		Saint Peter's University Hospital	Assistant Director Safety/Security	1
NJ		Saint Peter's University Hospital	Coordinator Safety & Security	1
NJ		Saint Peter's University Hospital	Director Safety & Security	1
NJ		Saint Peter's University Hospital	Program Manager	1
NJ		Saint Peter's University Hospital	Radiation Safety Officer	1
NY	Albany	Albany Medical Center	Assistant Radiation Safety Officer	1
NY	Albany	Albany Medical Center	Radiation Safety Officer (RSO)	1
NY	Bronx	Montefiore Medical Center	Radiation Safety Officer - Montefiore	1
NY	Bronx	Montefiore Medical Center	Security Manager - Moses	1
NY	Bronx	Montefiore Medical Center	Security Manager - North	1
NY	Monroe	University of Rochester	Radiation Safety Officer	1
NY	Monroe	Vaccinex	Facility Manager	1
NY	Monroe	Vaccinex	Radiation Safety Officer and Lab Manager	1
NY	Nassau	Cold Spring Harbor Laboratory	Director Environmental Health and Safety	1
NY	Nassau	Cold Spring Harbor Laboratory	Security	1
NY	Nassau	Unknown	Project Manager	1
NY	Nassau	Unknown	Technician	2

State	County	Site Name	Job Title	POCs
NY	New York	Bellevue Hospital	Assistant Director of Hospital Police	1
NY	New York	Columbia University	Assistant Radiation Safety Officer	1
NY	New York	Columbia University	Associate Vice President	1
NY	New York	Columbia University	Radiation Safety Officer - CUMC and NY Presbyterian	1
NY	New York	Columbia University	Unknown	9
NY	New York	Lenox Hill Hospital	Director, Security Services	1
NY	New York	Mt Sinai Medical Center	Radiation Safety Officer - Mt Sinai	1
NY	New York	New York University	Radiation Safety Officer	1
NY	New York	New York University	Radiation Safety Officer	1
NY	New York	NY Presbyterian Hospital	Manager of Operations- NY Presbyterian	1
NY	New York	NY Presbyterian Hospital	Security	2
NY	New York	NY Presbyterian Hospital	Sergeant	3
NY	New York	NY Presbyterian Hospital	Unknown	1
NY	New York	Rockefeller University	Director of Security	1
NY	New York	Rockefeller University	Radiation Safety Officer	1
NY	New York City	NYU Langone Medical Center	Operation Manager	1
NY	New York City	NYU Langone Medical Center	Security Manager	1
NY	New York City	NYU Langone Medical Center	Security Supervisor	1
NY	New York City	NYU Langone Medical Center	Training Manager	1
NY	Rochester	Vaccinex	Casco Security	1
NY	Rochester	Vaccinex	Central Station	2
NY	Rochester	Vaccinex	Operation Manager	1
NY	Rochester	Vaccinex	Unknown	1
NY	Suffolk	Stony Brook University	Radiation Safety Officer	1
NY	Suffolk	Stony Brook University	Staff Assistant, University Police	1
NY	Westchester	Westchester Medical Center	Director of Security	1
NY	Westchester	Westchester Medical Center	Radiation Safety Officer	1
NY		Rockefeller University	Radiation Safety Officer	2
NY		Rockefeller University	Security	1
NY		Rockefeller University	Unknown	1
OH	Hamilton	University of Cincinnati	Assistant Radiation Safety	1
OH	Hamilton	University of Cincinnati	Radiation Safety Officer	1
PA	Centre	Penn State University	Radiation Safety Officer	1
PA	Centre	Penn State University	Reactor Director	1
PA	Centre	Penn State University	Reactor Supervisor	1
PA	Montgomery	Glaxo Smith Kline	Radiation Safety Officer (RSO) - GSK	1
PA	Montgomery	Merck	Corporate Radiation Safety Officer	1
PA	Montgomery	Merck	Health Physicist	1
PA	Montour	Geisinger Health System	Director, Security and Emergency	1



State	County	Site Name	Job Title	POCs
PA	Philadelphia	American Red Cross: Philadelphia	Real Estate and Fixed Assets Management	1
PA	Philadelphia	Drexel University	Radiation Safety Officer (RSO)	1
PA	Philadelphia	Fox Chase Cancer Center	Director of Security	1
PA	Philadelphia	Fox Chase Cancer Center	Radiation Safety Officer (RSO)	1
PA	Philadelphia	Hahnemann University Hospital	Radiation Safety Officer - Hahnemann	1
PA	Philadelphia	Hahnemann University Hospital	Security Manager	1
PA	Philadelphia	St. Christopher's Hospital	Director of Administrative and Technical Services	1
PA	Philadelphia	St. Christopher's Hospital	Director of Support Services	1
PA	Philadelphia	Temple University	Radiation Safety Officer (RSO) - Temple University	1
PA	Philadelphia	Thomas Jefferson University	Radiation Safety Officer -Thomas Jefferson University	1
PA	Philadelphia	Thomas Jefferson University	Senior Project Manager - Siemens Industry, Inc.	1
PA	Philadelphia	University Of Pennsylvania	Radiation Safety Officer - University of Pennsylvania	1
RI	Providence	Brown University	Associate Director of Facilities	1
RI	Providence	Brown University	Card Access Controller	1
RI	Providence	Brown University	Commander of Police Department	1
RI	Providence	Brown University	Communications Control Officer	1
RI	Providence	Brown University	Crime Analyst	1
RI	Providence	Brown University	Director of Facilities	1
RI	Providence	Brown University	Public Safety Officer	2
RI	Providence	Brown University	Radiation Safety Officer	1
RI	Providence	Brown University	Radiation Safety Specialist	1
RI	Providence	Brown University	Sergeant	1
TN	Shelby	Life Blood	Radiation Safety Officer	1
TN	Shelby	Methodist Healthcare University Hospital - TN	Director of Security	1
TN	Shelby	St. Jude Children's Research Hospital	Security Director	1
TX	Bexar	University of Texas Health Science Center	Radiation Safety Officer	1
TX	Harris	Baylor College of Medicine	Director, BCM Office of Environmental Safety	1
TX	Harris	Ben Taub General Hospital	Medical Physicist	1
TX	Harris	Ben Taub General Hospital	Supervisor	1
TX	Harris	Memorial Hermann Hospital	Radiation Safety Officer	1
TX	Harris	Methodist University Hospital	Call Center Coordinator	1
TX	Harris	Methodist University Hospital	Radiation Safety Officer	1
WA	King	Benaroya Research Institute at Virginia Mason	Unknown	2
WA	King	Boeing	Radiation Safety Officer	1

State	County	Site Name	Job Title	POCs
WA	King	NW HOSPITAL GAMMA KNIFE CENTER	Facilities Manager	1
WA	King	NW HOSPITAL GAMMA KNIFE CENTER	Radiation Safety Officer	1
WA	King	NW HOSPITAL GAMMA KNIFE CENTER	Unknown	1
WA	King	University of Washington	Radiation Safety Officer-UW	1
WA	Pierce	TACOMA-PIERCE COUNTY BLOOD BANK	Director of Laboratory Operations	1
WA	Pierce	TACOMA-PIERCE COUNTY BLOOD BANK	Radiation Safety Officer	1
WA	Seattle	Harborview	Security Supervisor	1
WA	Seattle	PSBC Terry Ave	Biomed	1
WA	Seattle	PSBC Terry Ave	Chief Engineer Facilities	1
WA	Seattle	PSBC Terry Ave	Director Facilities	1
WA	Seattle	PSBC Terry Ave	Facilities and Engineering Supervisor	1
WA	Seattle	PSBC Terry Ave	Facilities Systems Specialist	1
WA	Seattle	PSBC Terry Ave	Quality Coordinator	1
WA	Seattle	Univ. of WA Health Sciences Ctr.	Unknown	3
WA	Seattle	Univ. of WA Medical Center	CS Supervisor	1



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## Appendix H

### Glossary of Evaluation Analysis Terms

<b>Cleaning Data</b>	The process of excluding from analysis forms or individual responses that are substantially incomplete, or do not make sense.
<b>Coding Instruments</b>	The process of converting responses to numbers for data entry.
<b>Content Analysis</b>	The process used to organize open-ended, unstructured information (qualitative data).
<b>Data Analysis</b>	The process of putting together qualitative and/or quantitative information to derive answers to questions.
<b>Database</b>	Computer software that can be used for data entry, analysis and retrieval. Data is entered line by line, where each line contains the information for one filled instrument.
<b>Emergent Categories</b>	Categories in a content analysis determined after reading the raw data.
<b>Frequency</b>	The number of times a given response occurs.
<b>Instrument</b>	A device for recording, indicating, measuring or collecting information to measure your objective.
<b>Mean</b>	The average of numeric responses or scores. This is obtained by dividing the total of all responses to an item by the number of responses obtained.
<b>Measure</b>	(Verb) The process of counting information. (Noun) the instrument used to quantify information.
<b>Percent Distribution</b>	The proportion of respondents selecting each response.
<b>Pre/Post Test</b>	An instrument administered at two or more points in time, used to capture gains over that period of time.
<b>Predetermined Categories</b>	Categories in a content analysis determined before data is collected.
<b>Qualitative Data</b>	Data that comes from open-ended questions, in the form of words. These may be written or recorded.
<b>Quantitative Data</b>	Data which are provided in the form of numbers or can be converted to numeric form This type of data usually comes from structured instrument where respondents are required to select a response or provide a numeric response. This may also include test scores.
<b>Raw data</b>	All of the data collected from the instruments before they are analyzed.
<b>Response</b>	The individual answer selected or given to a question.
<b>Spreadsheet</b>	Computer software that allows data arranged in a grid format. Allows for fast data entry and basic analysis.



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