

Deliverable Report D.3.2

## **Technology User Needs and User Feedback Compilation Document**

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May 2011

CLASSIFICATION LEVEL: Consortium Restricted



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## **Summary**

This deliverable was intended to collect practical experiences of first responders and user-needs connected to the use of CBRNE detection devices under real operational conditions. To reach this aim, a questionnaire was designed and sent out together with technical instructions to app. 100 people, which had been identified by themselves to be endusers or addresses collected from national consortium contacts. After some time email reminders have been sent out.

At the Creatif certification workshop (Oct. 2010), the consortium made an additional attempt to receive more feedback: the questionnaire was presented during the workshop and end-user participants were invited to fill out printed-out questionnaire-forms, which were distributed among the audience. Again, the return of filled out forms was marginal.

In total, there were 10 responses. It was determined that with such a small number of responses, it would impossible to make any valid conclusions.

This report is to simply indicate that we attempted to receive the requested information but were unable to get enough responses. So the report focusses to the description on methodology, but it lacks a „conclusion“ chapter.

Some possible reasons for the low response rates are discussed in chapter 3.

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# **1 Introduction**

Deliverable D.3.2 was intended to provide some statistical information on the CBRNE detection sector from the perspective of the end-users. The CREATIF team was to gather data from the end-users, draw conclusions concerning needs and preferences and then present them.

Sadly, this goal has not been met at this time. In the end, no more than 10 end-user responses were recorded. Of these most were not completed fully. Consequently, it was determined that with such a small number of responses that it would be impossible to make any valid conclusions.

Therefore, this report is now simply an indication of what was done by the CREATIF team in the attempt to get participation from the CBRNE end-user community.

In section 2 we will present the methodology we used. Following that the questionnaire is presented in section 4. The two sections after the questionnaire are those items to aid in the completion of the questionnaire: namely, the introduction email (chapter 5) and the instructions for completing the questionnaire (chapter 6). In the the last chapter (7) the MS Excel spreadsheet is illustrated, which has been used to conduct the numerical/statistical analysis.

## **2 Methodology**

The next few lines will describe the methodology that was employed in this WP3 task to collect information on end-user needs and feedback.

### **1. Creation of the CREATIF network (WP1, WP2)**

The first two work packages identified the target audience.

### **2. Identify all those that are end-user**

From this audience we were to select the end-users for the questionnaire. The principle persons were those that self identified as end-users. In order to extend the number of addressed persons, national contacts from consortium members and a few relevant organisations identified from the internet were contacted.

### **3. Identify all those that are in the secondary group for CBRNE detection equipment**

These persons had oversight, maintenance, or purchasing of CBRNE detectors and may have had hands on experience.

### **4. Create a questionnaire**

The main way that the data was going to be gathered was through the use of a questionnaire. The questionnaire was developed by the work package 3 team members. Basic considerations for the content of the questionnaire were developed during a WP3 meeting in Geneva in January 2010. Care was given to be inclusive and specific enough for the data to be useful. The first several questions were to determine if the responding person had sufficient experience to answer the questionnaire. Next there were questions as to what specific experience the responding expert had C, B, RN, or E expertise, and to what group of end-users they belonged such as first responder. The bulk of the questions were focused on issues faced by end-users such as: in what environment the device is used, what personal protective equipment (PPE) is used, and what characteristics are most important such as: cost, shelf life, and battery life. There were numerous questions that had available space for the respondent to make comment. Unfortunately, very few responses did make use of this space to express their opinion and answer the open questions.

Of course, the questions were created to be balanced. They were balanced such that the data wouldn't be skewed one way or the other and the questions weren't leading to some foregone conclusion. The questionnaire was created in MS WORD and used macro text. The original questionnaire can be found in Chapter 4, p. 7.

### **5. Create an introduction email**

For contacting the persons of interest, we decided to create a standard email. The email simply introduced the CREATIF project, the questionnaire, and asked for their help.

### **6. Create an instructions document**

The instructions were created to help ensure that the respondent would not have any trouble in completing the questionnaire. Two main issues were addressed. First, was the

setting of the macro security level such that MS WORD can use the macros in the form. Second, was the way in which we intended to have files named and saved. This document can be found in Chapter 6, p. 16

## **7. Contact the two groups mentioned**

The letter, instructions, and questionnaire illustrated below were sent to everyone in the CREATIF network that was identified as an end-user or decision maker with respect to the purchase of CBRNE detection equipment.

- Send email
- instructions and
- questionnaire
- follow-up phone call: Follow-up phone calls were to be used once we had a sufficient number of responses and to clarify points on the questionnaire

## **8. Create database for responses**

This was realized in MS Excel to manage all of the responses in one place.

## **9. Use Microsoft Excel to conduct the analysis of the data**

The only downside of this tool is that each response had to be entered by hand into the spreadsheet. We hadn't figured out a clever way to automatically parse the data from the questionnaire. There were three basic operations:

- Data entry
- Statistical analysis
- Creation of charts and graphs

## **10. Draw conclusions based on the information in the statistics**

We were going to make basic conclusions. Most of the conclusions would be on the order of "50% of the end-users would like standard rating schemes for detectors." There was hope that we could make conclusions about each question asked and conclusions about the sector as a whole.

## **11. Last chance attempt at gathering data**

At the CREATIF certification workshop (Oct. 2010), the consortium made an additional attempt to receive more feedback: the questionnaire was presented during the workshop and end-user participants were invited to fill out printed-out questionnaire-forms, which were distributed among the audience. Again, the return of filled out forms was marginal.

### **3 Why the response rate was so low?**

Although the WP3 team made quite some effort to collect filled questionnaires, the total number of usable responses was only 10. Some possible reasons for the low response rates could be:

1. The number of people in the target audience was very small by its nature.  
From the approximately 300 contacts in the CREATIF stakeholder database, about 30% = 90 have been selected and contacted. A response rate of 10 % is not too bad for electronic mailing questionnaires. On the other hand, an increase of the sample size by sending out mails to unknown end-users was not seen as a very promising strategy, therefore the decision was made to contact mainly the stakeholders from the CREATIF list.
2. The questionnaire was too complicated.  
The time needed to fill out all the questions was estimated to take about 15 minutes. Not all the questions are equally relevant for each end-user group. Therefore, some of the contacted persons may have decided to be not competent enough to fill all the questions. The use of macros might have put some of the less computer savvy people off, causing them to not complete it.
3. The people were not interested in completing the form as they are very busy and it is not a priority. Many of the typical end-users (like fire brigade, Red Cross) work on a voluntary basis, which means in their spare time. Especially those end-users have to select very carefully, what can be done in the limited time-budget available for their work. Filling out questionnaires is not a favourite occupation for people who are used to work in rescue operations rather than at writing desks.
4. The people, regardless that they were listed as an end-user, don't have much or any experience actually using the detection devices. This may be one of the more significant conclusions of the project.  
This was one of the conclusions from the two CREATIF workshops that end-users have a demand for more training exercises, where they can make hands-on experiences with detection devices. The lack of experience is one of the big hurdles to correctly define user needs.

## 4 The Questionnaire

Below the original questionnaire is illustrated, as it has been sent out as MS Word document attached to an email to the addressed experts.

**For the end-users of CBRNE detection equipment**



1. Do you or have you personally use CBRNE (Chemical, Biological, Radiological, Nuclear, and Explosive) detection equipment?

YES     NO

2. If you answered “NO” to question 2, do you know someone else in your organization that does?

YES     NO

3. If you answered “YES” to question 3, could you either pass this onto your colleague or email us (peter.myers@cotecna.ch) with their details?

If you answered “NO” to both questions 2 and 3, feel free to answer any questions or stop here.

4. What types of equipment have you used and/or have familiarity with? (*multiple selections possible*)

C     B     R/N     E

Briefly describe the system(s) you are using or are familiar with.

5. CBRNE detection equipment is often tested before use. However, standardisation of test procedures is mostly lacking. What is the need for standardisation of test procedures for your organisation?

- Necessary  Convenient  Not needed  No opinion

Please explain your answer.

6. As an operator (end-user), rate the importance of the following characteristics of a detector (1 = most important, 11= least important, or 12 = least important with the "Other" option).

Cost of consumables  BIST (Built In Self Test)  Sensitivity

Easy result interpretation  Maintenance cost

Speed/Throughput

Procurement cost  Ruggedized device

Transportability

False alarm rate  Ease of use

Other

7. Did you receive a user's manual for the detection device?

- YES  NO

If you answered "YES" to question 8, how would you rate the users manual?

- Extremely poor  Poor  Acceptable  Good  Excellent

Briefly explain your answer.

8. Did you receive operational training on the device?

- YES       NO

If you answered "YES" to question 8, how would you rate the training?

- Extremely poor     Poor     Acceptable     Good     Excellent

Briefly explain your answer.

9. Are tests conducted on the device before buying it?

- YES       NO       Dont know

10. If you answered "YES" to question 10, what are the type(s) of tests conducted? *(multiple selections possible)*

- |   |   |
|---|---|
| <input type="checkbox"/> FAT (factory acceptance test)  | <input type="checkbox"/> OSAT (On Site Acceptance Test) |
| <input type="checkbox"/> Operational tests (field test) | <input type="checkbox"/> Other                          |

Briefly describe your testing.

11. If you answered "YES" to question 10, who conducts the testing? *(multiple selections possible)*

- manufacturer     own organization     3rd party     Dont know

12. If testing is conducted, where were the test procedures developed? *(multiple selections possible)*

- manufacturer     own organization     3rd party     Dont know

13. If testing has been conducted, have the results of the test been made available to you?

- YES     NO     Don't know

14. How closely do the manufacturer's specifications match your experience?

- Extremely poor     Poor     Acceptable     Good     Excellent

What specification matches the most, matches the least?

15. When operating your CBRNE detection equipment, do you wear personal protection equipment (PPE)?

- No, Never     YES, Sometimes     YES, Often     YES, Always

If you answered "YES," to question 16, what types of PPE do you use? *(multiple selections possible)*

- Gloves     breathing protection (Respirator, gas mask)     Overgarments     Boots  
 Other

Briefly describe any special items used, or elaborate on your PPE.

16. Does wearing the PPE affect the usability of the detection device?

- YES  NO

If "YES", briefly describe how it affects the usability.

17. In what environment do you typically use your detection equipment? *(multiple selections possible)*

- Indoors  Outdoors
- Daytime  Nighttime
- Bad weather  Good weather
- We are expected to work in all types of environments any time of day

18. When comparing detectors, do you think it is important to have a standard way of describing device characteristics?

- YES  NO  No opinion

19. Do you think it's important to have a standard minimum set of characteristics to be included on all detector data sheets?

- YES  NO  No opinion

20. Do you think it would be useful to have a central location (website for example) for detector comparisons?

- YES  NO  No opinion

21. Do you believe it is necessary to establish a standard rating scheme for the characteristics of CBRNE detectors?

- YES  NO  No opinion

If you answered "YES" to question 22, which system would be more useful?

- System 1: extremely poor, poor, acceptable, good, excellent
- System 2: red, yellow, green
- System 3: (1 -10 scale); 1 = extremely poor, 10 = excellent
- Other: please specify

22. CREATIF (WP3) has been tasked with making the first step towards a standardized operational testing framework (SOTF). (*critical for our development*)

Please discuss the elements or issues that you feel are critical for a complete SOTF.

23. In your experience, what are the most common materials/methods (Interferents) that negatively affect detection (e.g.: diesel fumes for a detector that uses fluorescence).

Chemical

Biological

Radiological/Nuclear

Explosives

24. Are you part of the procurement process for new CBRNE detection devices?


YES  NO

25. If "YES", rate (1 = most important, 11= least important, or 12 = least important with the "Other" option) the importance of the following characteristics in your procurement choice.

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Cost of consumables        | <input type="checkbox"/> BIST (Built In Self Test) | <input type="checkbox"/> Sensitivity      |
| <input type="checkbox"/> Easy result interpretation | <input type="checkbox"/> Maintenance cost          | <input type="checkbox"/> Speed/Throughput |
| <input type="checkbox"/> Procurement cost           | <input type="checkbox"/> Ruggedized device         | <input type="checkbox"/> Transportability |
| <input type="checkbox"/> False alarm rate           | <input type="checkbox"/> Ease of use               |   |

Other

26. Please use the following space to explain any other issues you may have with detection equipment or the test procedures for detection equipment.

A large, empty rectangular box with a thin black border, intended for the user to provide additional information or feedback regarding detection equipment or test procedures.

\*\*If you have any questions or issues regarding the questionnaire, feel free to contact me at [peter.myers@cotecna.ch](mailto:peter.myers@cotecna.ch)

**THANK YOU FOR YOUR TIME AND INPUT!**

## **5 The Introduction Email**

Dear CREATIF network member or other end-user of detection equipment,

CREATIF is a European Commission project that is focused on CBRNE related testing and certification facilities. Work package 3 of the CREATIF project in particular is focused on the operational testing and human factors. Our deliverables are an Operational Testing Framework (OTF) and a User Feedback Compilation Document.

Both of these deliverables are focused on the user/operator of the CBRNE detection equipment. This is the reason we are contacting you. As an identified user/operator of the CBRNE detection equipment your opinions, needs, experiences, and issues surrounding this issue are of the utmost importance to us.

Enclosed in this email is our “end-user questionnaire”. This is our primary source of information for the work package. As such, it is critical to have as many, complete responses from your community as possible. Could you please take a few minutes to fill it out and to send it back to us? The questionnaire may take 15-20 minutes to fill in completely.

The questionnaire is written in MS WORD but with some macro details included. The details about the use of the questionnaire are given below.

If you have any troubles with the questionnaire or any questions in general, don't hesitate to contact one of the work package 3 team members.

[Martien.broekhuijsen@tno.nl](mailto:Martien.broekhuijsen@tno.nl), [par.wasterby@foi.se](mailto:par.wasterby@foi.se), [peter.myers@cotecna.ch](mailto:peter.myers@cotecna.ch)

THANK YOU FOR YOUR TIME AND INPUT!

Regards,

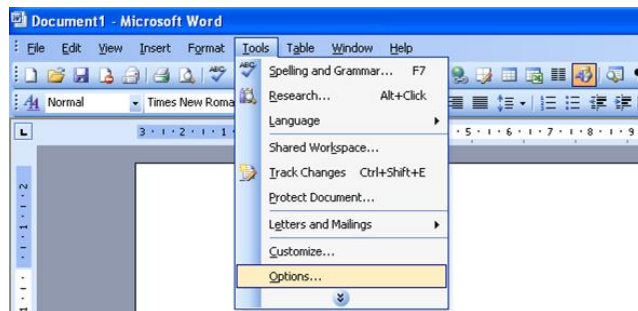
CREATIF WP3 team

## 6 Instructions for Completing the Questionnaire

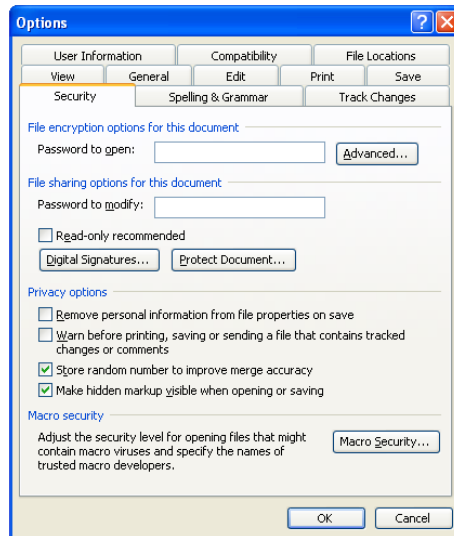
Before you attempt to use the form ensure that you have the following in place. **Make sure your security setting in MS WORD for the macros is set to “MEDIUM” and that when prompted you enable macros.**

Below is a description on how to do this. It looks long and complicated but should only take a few seconds in practice to accomplish.

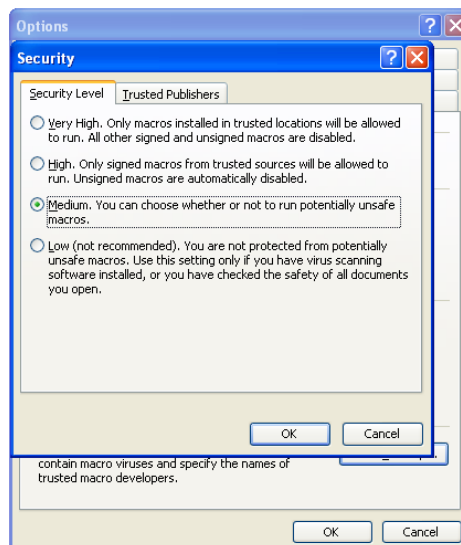
1. Open a blank MS WORD Document
2. Click on the “Tools” pull down from the menu.
3. Within the “Tools” menu, select “Options”.



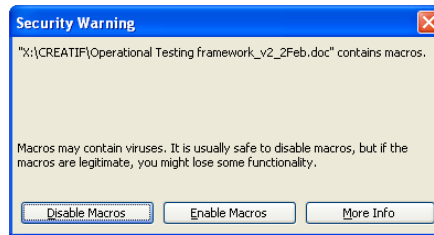
4. Within the “Options” “window, select the “Security” tab.



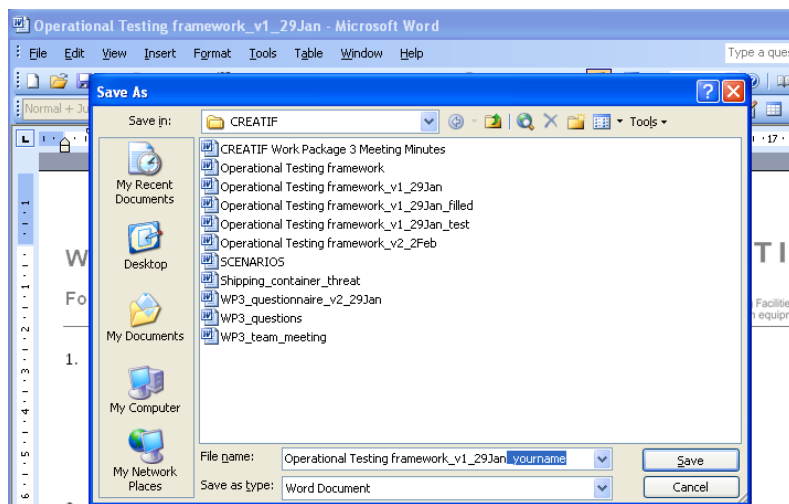
5. Click on the “Macro Security” button. You should see the following. Ensure that your security level is set to Medium and then click on OK, and OK a second time. Note: If the security setting is “High” or “very High”, this will not allow you to run the macros that are needed for the questionnaire and will not warn you of this.



6. Next, open the questionnaire. Click on “Enable macros” pushbutton. This will allow you to fill in the form fields in the document.



7. When you finish the questionnaire, click "Save As" and add your name at the end of the filename. The click "Save" to actually save the file. Email the questionnaire to [peter.myers@cotecna.ch](mailto:peter.myers@cotecna.ch) as an attachment with a subject such as "CREATIF questionnaire".



## 7 Data analysis of questionnaire responses

Below the MS Excel spreadsheet for data analysis is illustrated. Unfortunately, most respondents did not answer all the questions in the questionnaire, therefore, often the number of observations for each of the questions is below 10. It should be noted that due to the small number of returned data, the figures below are only for illustration purposes and cannot be interpreted in a statistically valid way.

No	Question			
1	<b>What type of organization do you belong to?</b>	<b>Sum</b>	<b>%</b>	
	Local police	0	0%	
	Fire brigade	2	33%	
	Medical FR	0	0%	
	National police	0	0%	
	Airport security	0	0%	
	Coast/border guard	1	17%	
	Customs	0	0%	
	National government	1	17%	
	Military FR	2	33%	
	Other	0	0%	
	2	<b>Do you personally use CBRNE (Chemical, Biological, Radiological, Nuclear, Explosive) detection equipment?</b>	<b>Yes</b>	<b>No</b>
Yes/No (1/0)		5	0	
5	<b>What types of equipment have you used and/or have familiarity with?</b>	<b>Sum</b>	<b>%</b>	
	C	5	42%	
	B	2	17%	
	R/N	4	33%	
	E	1	8%	
6	<b>What is the need for standardisation of test procedures for your organisation?</b>	<b>Sum</b>	<b>%</b>	
	Necessary	4	80%	
	Convenient	1	20%	
	Not needed	0	0%	
	No opinion	0	0%	
7	<b>As an operator (end-user), rate the importance of the following characteristics of a detector (1 = most important, 12 = least important).</b>	<b>Average</b>	<b>Std</b>	
	Cost of consumables	8	3.37	
	Easy result interpretation	3.25	0.96	
	Procurement cost	10.25	0.96	
	False alarm rate	6	3.74	
	BIST	5.2	2.28	
	Maintenance cost	8.25	2.22	

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	Ruggedized device	7	1.41	
	Ease of use	1.2	0.45	
	Sensitivity	5	1.73	
	Speed	4.5	2.65	
	Transportability	4.25	2.22	
	Other	#DIV/0!	#DIV/0!	
<b>8</b>	<b>Did you receive a user's manual for the detection device?</b>	<b>Yes</b>	<b>No</b>	
	Yes/No (1/0)	5	0	
		<b>Sum</b>	%	
	Extremely poor	0	0%	
	Poor	0	0%	
	Acceptable	3	75%	
	Good	1	25%	
	Excellent	0	0%	
<b>9</b>	<b>Did you receive operational training on the device?</b>	<b>Yes</b>	<b>No</b>	
	Yes/No (1/0)	3	2	
		<b>Sum</b>	%	
	Extremely poor	0	0%	
	Poor	0	0%	
	Acceptable	1	33%	
	Good	2	67%	
	Excellent	0	0%	
<b>10</b>	<b>Are tests conducted on the device before using it?</b>	<b>Yes</b>	<b>No</b>	<b>Don'tknow</b>
	Yes/No/Don't know (1/0/-)	5	0	1
<b>11</b>	<b>If you answered "YES" to question 10, what are the type(s) of tests conducted?</b>	<b>Sum</b>	%	
	FAT	3	33%	
	OT	3	33%	
	OSAT	2	22%	
	Other	1	11%	
<b>12</b>	<b>If you answered "YES" to question 10, who conducts the testing?</b>	<b>Sum</b>	%	
	manufacturer	1	20%	
	own org.	4	80%	
	3rd party	0	0%	
	Don't know	0	0%	
<b>13</b>	<b>If testing is conducted, where were the test procedures developed?</b>	<b>Sum</b>	%	
	manufacturer	2	40%	
	own org.	2	40%	
	3rd party	0	0%	
	Don't know	1	20%	

14	<b>If testing has been conducted, have the results of the test been made available?</b> Yes/No/Don't know (1/0/-)			
		3	0	1
15	<b>How closely do the manufacturer's specifications match your experience?</b> Extremely poor Poor Good Excellent	<b>Sum</b>	%	
		0	0%	
		0	0%	
		3	100%	
		0	0%	
16	<b>When operating your CBRNE detection equipment, do you wear personal protection equipment (PPE)?</b> No, never Yes, sometimes Yes, often Yes, always	<b>Sum</b>	%	
		0	0%	
		2	40%	
		1	20%	
		2	40%	
	<b>If you answered "YES," to question 16, what types of PPE do you use?</b> Gloves Breathing protection Overgarment Boots Other	<b>Sum</b>		
		4		
		4		
		3		
		3		
		1		
17	<b>Does wearing the PPE affect the usability of the detection device?</b> Yes/No (1/0)	<b>Yes</b>	<b>No</b>	
		2	3	0
18	<b>In what environment do you typically use your detection equipment?</b> Indoors Daytime Bad weather Outdoors Nighttime Good weather All	<b>Sum</b>	%	
		0	0	
		0	0	
		0	0	
		0	0	
		0	0	
		0	0	
		5	1	
19	<b>When comparing devices, do you think it is important to have a standard way of describing device characteristics?</b> Yes/No/No opinion (1/0/-)	<b>Yes</b>	<b>No</b>	<b>No opinion</b>
		5	0	0
20	<b>Do you think it's important to have a standard minimum set of characteristics to be included on all device data sheets?</b> Yes/No/No opinion (1/0/-)	<b>Yes</b>	<b>No</b>	<b>No opinion</b>
		0	0	0
21	<b>Do you think it would be useful to have a central location (website for example) for device comparisons?</b> Yes/No/No opinion (1/0/-)	<b>Yes</b>	<b>No</b>	<b>No opinion</b>
		5	0	0

22	<b>Do you believe it is necessary to establish a standard rating scheme for the characteristics of CBRNE detection devices?</b>	<b>Yes</b>	<b>No</b>	<b>No opinion</b>
	Yes/No/No opinion (1/0/-)	2	0	1
		<b>Sum</b>	%	
	System1	0	0	
	System2	1	0.25	
	System3	2	0.5	
	Other	1	0.25	
25	<b>Are you part of the procurement process for new CBRNE detection devices?</b>	<b>Yes</b>	<b>No</b>	
	Yes/No (1/0)	3	2	
		<b>Average</b>	<b>Std</b>	
	Cost of consumables	6.333333333	3.46	
	Easy result interpretation	3.5	2.83	
	Procurement cost	10	2.83	
	False alarm rate	3.333333333	1.73	
	BIST	5	1.41	
	Maintenance cost	6	2.12	
	Ruggedized device	9	2.83	
	Ease of use	2	#DIV/0!	
	Sensitivity	4	#DIV/0!	
	Speed	5.5	#DIV/0!	
	Transportability	8	#DIV/0!	
Other	#DIV/0!	#DIV/0!		