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eNOTICE-2

EU Network of Training Centres for preparedness to CBRN Events

D3.1 End user requirements for SDS - additional information on scene

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Executive Summary

This deliverable examines and summarises the main end user requirements for the creation of Additional Information on Scene (AdInoS). It starts with a short explanation on the naming of the AdInoS. In the Grant Agreement, AdInoS were still called SDS, but we have noticed that this is not the ideal name.

The introduction gives a quick overview on the eNOTICE-2 project, its main objectives, the scope of the project, and the link of this deliverable to other tasks within the project. The introduction also addresses the methodological approach of this deliverable. In order to write this deliverable, focus groups were used of 29 external experts in 5 different countries (BE, UK, DE, CZ, IT). On top of that the information sources of 5 countries and the NATO were compared to gain an understanding about what sources are currently in use.

Chapter 3 gives an overview of the gaps discussed in the focus groups. these gaps address the common problems found while using information sources during CBRNe incidents. It also mentions more general gaps, such as a lack of training for CBRNe recognition. It is vital to understand these gaps, so that we know in which environment the AdInoS will be used.

Chapter 4 is an overview of the different sources currently in use in first responder organisations. It addresses the 5 countries in the consortium, as well as NATO sources. Section 4.2 searches for focal points in those sources and in the focus groups. the focal points are broken down in general, focal points for the 1st line, the 2nd line and the 3rd line. Section 4.3 examines the content that AdInoS should contain, and section 4.4 gives an overview of the possible formats that the AdInoS could have.

Chapter 5 summarises all information in the final list of end user requirements for the AdInoS. Finally, Chapter 6 gives an overview of the next steps in the process of the creation of AdInoS. This is the creation of the methodology via a peer review. Another next step is to determine the form of the AdInoS.

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Nomenclature

AdInoS	Additional Information on Scene
CBRN	Chemical, Biological, Radiological, Nuclear
CDC	Centre of Disease Control and Prevention
CPE	Collective Protective Equipment

CWA	Chemical Warfare Agents
DIM	Detection, Identification, and Monitoring
ECOSA	Emergency Coordination of Scientific Advice
EDD	Explosive Detection Devices
ENCIRCLE	European CBRN Innovation for the Market Cluster
eNOTICE	European Network of CBRN Training Centres
FDDO	Fire Department of (the City of) Dortmund
FR	First Responder
JCBRND COE	Joint CBRN Defence Centre of Excellence
METU	Middle East Technical University
PPE	Personal Protective Equipment
SDS	Safety Data Sheet
SOP	Standard Operating Procedure
TC	Training Centre
TIC	Toxic Industrial Chemical(s)
TMT	Triage, Monitoring, Treatment
UCLouvain	Université catholique de Louvain
UNITOV	University of Rome Tor Vergata
USA	United States of America
VESTA	Campus Vesta APB
WHO	World Health Organisation
WMP	West Midlands Police

1 A note on the naming of “additional information on scene”

As we were writing the Grant Agreement, it was noted that there should be a mechanism to translate scientific information into practical and usable information for first responders on scene - information that could be used in the field. We used the abbreviation “SDS” for this, or Safety Data Sheet. However, during the focus groups and review of the sources, it became clear that SDS might not be the most appropriate name for what we were trying to accomplish. Safety data sheets are very widely used, mostly in laboratories or in the chemical industry and they contain vital information about the substances that are contained within that laboratory or the chemical facility. Nonetheless, an SDS is **not specifically tailored** to first responders and contains a great deal of information that is not relevant to first responders, and that they have to filter out. On top of that, SDS are often substance bound, while WP3 considers unknown hazards as well. Thus, the name might not fit the goal. As such, “**Additional Information on Scene**” (**AdInoS**) could be a good name, and we decided to work with that name from now on.

2 Introduction

2.1 eNOTICE-2 Project scope and objective

In the past years, the threat of CBRN intentional attacks, technological accidents or natural hazards has led governments and international organisations to adopt far-reaching regulations and programmes to defend populations against the associated risks, while complementing national measures that address existing gaps and promote exchanges of information and best practices. To improve preparedness for CBRN events of deliberate, accidental or natural origin, the eNOTICE Network of Practitioners project was initiated in 2017 (finished in August 2023) which built an EU network of CBRN civilian and military training centers, testing and demonstration sites, and its goals are fully in line with the UCPM general objectives. The network comprising 53 training centers from 22 countries (17 EU Member States and 5 countries outside the EU) prioritizes multidisciplinary and multiagency training to enhance interoperability, cross-border training with a focus on standardized approach to comply with procedures and standards of neighbours, legal, administrative and organizational aspects; as well as training based on various scenarios including combined C, B, R threats of accidental or deliberate nature, hybrid threats and emerging threats, with testing and validating innovative technologies at different stages of development.

eNOTICE-2 Project consists of the members of the created network of CBRN training centers, and is supported by associated civil protection actors from the corresponding Member States and UCPM countries. eNOTICE-2 focuses on **improvement of the overall preparedness and capability** for responding quickly to major cross-border crises involving C, B or RN agents or a mixture thereof. eNOTICE-2 is building on lessons learned from eNOTICE-1 as well as on gaps identified during the 17 field exercises, table tops, simulations and serious gaming Joint Activities that were held with participation of CBRN practitioners – first responders, crisis managers, civil protection, training professionals, CBRN technology developers, policy makers, and volunteers from civilian population. eNOTICE-2 continues to bring together all the multidisciplinary stakeholders during four simulation exercises (SimEx) during the project to ensure **cooperation, coordination, compatibility and complementarity** between all the actors. The intense **knowledge sharing, comparison of operational procedures, identification of good and best practices across the actors in participating countries will strengthen knowledge partnerships between civil protection, DRM actors**, ensure cross-fertilization with the R&D sector, selecting most promising results for uptake from the scientific community, most innovative DRM tools from technology developers, and enrich the contents of the training courses.

Despite the abundance of material resources, expertise, and procedures, one of the major identified gaps occurs in CBRN decontamination, which has been consistently identified by eNOTICE-1 first responders (FR), and which is one of the UCPM rescEU CBRN priorities. eNOTICE confirms that there are currently no shared EU-MS guidelines or procedures. Furthermore, there are significant gaps in the way to conduct a decontamination that is safe for both the FR and the victims, especially when the decontamination activity involves a large number of FR and victims and lasts for several hours. And the emergence of new CBRN threats (such as Novichok, steadily emerging biological threats including toxins that necessitate regular updates to practices, procedures, guidelines, and policies) makes these gaps even deeper and more critical.

To fill this gap, the eNOTICE-2 project includes several new dimensions that will have several expected effects at institutional and individual levels. eNOTICE-2 considers CBRN decontamination in its broadest sense, including conventional and new emerging threats while considering together common healthy and vulnerable people, and focusing on a major well-known gap that is the decontamination of prosthetic and orthotics that are used by disabled people (wheelchair, hearing aids, breathing device, exoskeletal prostheses – such as hand, arm, foot, leg, finger and toe prostheses). As a result, **eNOTICE-2 substantially broadens the spectrum of organisations contributing to DRM and strengthens UCPM while remaining in line with the civil protection mandate to support EU Member States’ DRM activities.**

Direct engagement of the end-user community, the advisory group of disabled patients guiding the project findings and providing recommendations will contribute to raising **awareness of citizens and authorities on the CBRN risks**, while carefully taking their needs and concerns into consideration, and provide possibilities to reduce their vulnerability.

2.2 eNOTICE-2 Project: report’s scope, objectives, and methodology

2.2.1 Scope of this deliverable

The goal of D3.1 is to elaborate on the work which was conducted as part of Task 3.1. This is to create end user requirements and topics for AdInoS creation. This deliverable describes the results of this task, mostly collected via focus groups. This deliverable gives an overview of **gaps in CBRNe information sources and streams**. It also includes an overview of the information sources currently in use. The goal is to examine the **common denominators** and the **differences** of those information sources. Additionally, it discusses previous relevant EU projects that can be used for the creation of AdInoS. Lastly, it discusses a possible format of the AdInoS and next steps.

2.2.2 Links to other tasks

The work of this report is related to several tasks and their correlated deliverables which will be produced throughout the eNOTICE-2 project:

Task 1.1: Identification of topics to improve preparedness (M1-M6)

This task assesses and prioritises topics relevant for an improved preparedness and response to CBRN, HAZMAT events and cross-border crises. This task can thus inform the subject of the AdInoS we write.

Task 2.1: CBRN-centred digital library populating (M7-M16)

In task 2.1, content is created for the CBRN-centered digital library of open-access sources. This includes targeted information for preparedness (training) and response to incidents. The AdInoS can be included as content of the library.

Task 3.2: Common procedure for AdInoS¹ drafting (M5-M12)

In task 3.2 a methodology for AdInoS drafting (formally SDS) is created. This follows directly on the current deliverable and is informed by the contents of this deliverable.

¹ The original text in the task refers to “SDS”, see chapter 1

2.2.3 Methodological approach

In order to find out the end user requirements, a focus group methodology was used. The focus group methodology was chosen because it allowed us to consult a large group of experts in a limited time. On top of that, the discussions that arose in those groups highlighted the challenges that could arise while creating AdInoS. This would not have been possible with interviews. In total, 6 focus groups have taken place in Belgium (VESTA, 2x), Germany (FDDO), Czech Republic (JCBRND COE), Italy (UNITOV+ SAFE) and the UK (WMP). Recruitment was done by the partner in brackets. They were given the following instructions:

- 5-10 participants
- Experience with CBRN
- Experience on the terrain and knowledge about information sources and streams in the 1st, 2nd and 3rd line
- A spread between disciplines (fire brigade, medics, police, civil protection, if) if possible and ranks, if possible and mil and civ, if possible.

These instructions were not set in stone. Instead, VESTA discussed with the organising party about what was possible for their organisation. Thus, the civil organisations generally had more civil participants and the military had more military participants. Additionally, the monodisciplinary organisations had more participants of that specific discipline.

Before every focus group, information sheets were distributed. These information sheets can be found in Annex I. Most focus groups were held online, with the exception of the FDDO focus group and the VESTA focus groups. The agenda of the focus group is down below:

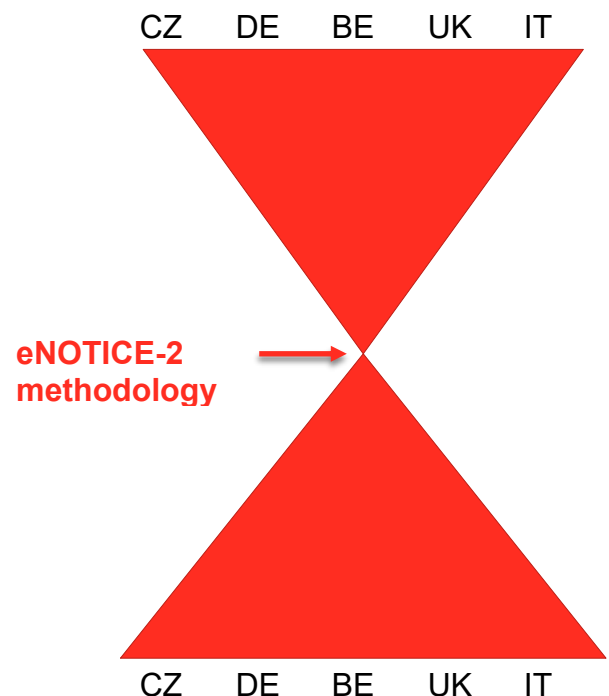


Figure 1 Hourglass figure for eNOTICE-2 methodology

Time	Title
10 min	Introduction to eNOTICE-2 and the preliminary SDS methodology
	Main question: How do we translate scientific knowledge/ case-based knowledge into practical information that can be used on the field?
20 min	Scenario description
10 min	What information sources are currently available for FRs in the field?
10 min	Who approves the information that goes into those information sources?
20 min	Are there gaps in those information sources?
20 min	What information should an SDS contain to be useful?
20 min	What topics should be prioritised?
20 min	Varia

Table 1 Agenda of the focus group

In all focus groups, the same questions were asked. In the discussion however, often the answers to these questions blurred. For example, in the first question (What information sources are currently available for FRs in the field?). While answering the question, many participants already reflected on the gaps in those information sources they mentioned. Thus, more time was spent on the 1st question, and less on the 3rd, because it was already partially answered.

Figure 1 shows the final goal of eNOTICE-2 methodology. It shows the focus groups in the 5 different countries. They have different information sources, and different SOPs. The AdInoS methodology is created from input out of all of those countries, and should be able to fit in the information sources of all of those countries.

2.3 Statistics of focus groups

In total, **29 external experts** were consulted. This excludes the consortium members that were also present. Figure 1 shows the disciplines of the experts. The majority were firefighters, followed by police and military. Then Medical experts. Finally civil protection experts and information providers. An information provider is someone that is explicitly responsible for the creation of information sources. Most experts were 2nd or 3rd line first responders. A minority was 1st line.

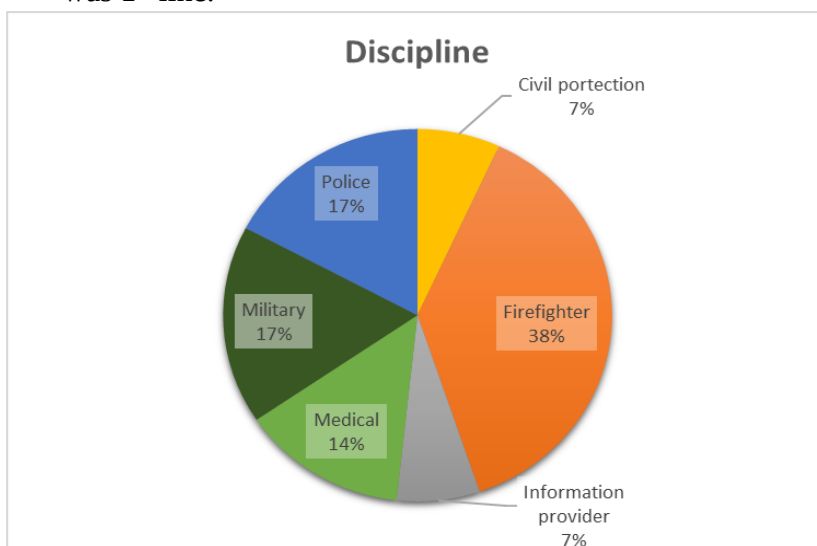


Figure 3 Pie chart discipline in the focus group

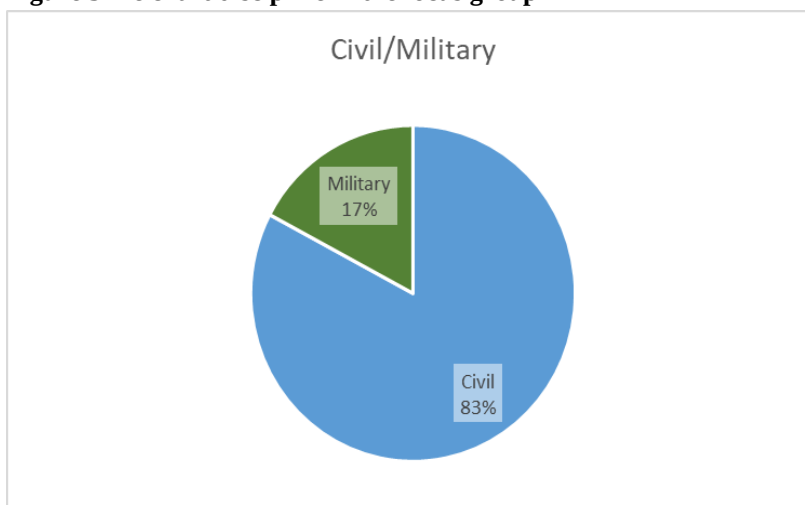


Figure 2 Pie chart civil/military division in the focus groups

3 Gaps in information sources and challenges

Please note that this is a short overview of the gaps found during focus groups. For the sake of brevity, the discussion of the gaps is kept short. Nonetheless for all of the gaps, we recommend more in-depth research. Figure 2 shows that relations between the different gaps to give a good overview.

The first common gap that was mentioned in the focus groups was recognition of the CBRNe incident. If first responders did not notice that there was a possible CBRNe incident, then they will not attempt to use the information in the designated CBRNe information sources. Thus an “unknown” CBRNe situation needs to be distinguished from a “known” CBRNe situation, for example when they react to an incident in a chemical facility. This is a challenge to address in this project as well. If we make information sources that are labelled CBRNe, they risk not being used in an unknown situation. At the same time, if we integrate all CBRNe data into non-CBRNe information sources, the information is unnecessary in many of the interventions. Worse, the extra information could cause confusion and increase the response time of the first responders. This gap is particularly linked to having little information at the beginning of an incident. Some experts in the focus groups thus underlined the importance of equipment for fast and early detection for a quicker recognition of a CBRNe incident.

The second common gap found was training. This is related to the first gap. In many countries, not enough first responders are trained to recognise a CBRNe incident. This differs per discipline and per country, yet it was a point highlighted in each focus group. Generally, civil protection and firefighters are better prepared than police and medical personnel. They have more personal protective equipment (PPE) and know how to use them. On top of that, they have more information sources and advisors. However, training is often expensive and takes time. This while many first responders mentioned that they do not have time to spend on training.

The third identified gap was discovered during a discussion about differences between C, B and RN. All focus groups mentioned that generally, they felt more prepared for a C incident, especially if it contains TICs (Toxic Industrial Chemicals). They mentioned that they could use the crisis manager of the company as a source of information. On top of that, the companies often have detailed information about the substances they use, and what possible reactions they could cause. However, this preparedness was not felt in some civil first responder organisations around CWAs (chemical warfare agents). They mentioned that even though they would be first on scene, they do not always have the knowledge to recognise that a chemical warfare agent is being used. Usually this is reserved for military. There is often reach back possibilities, but these take time. On top of that, a focus group mentioned new, engineered chemicals as a gap as well.

Additionally, Bio was a major gap discussed in all focus groups. This was partially since Bio can create a delayed reaction. Therefore, first responders do not even know they are working on a CBRNe incident until a few days later. There was a discussion in several groups was about the possibility of creating information sources around Bio, specifically a sort of leaflet highlighting “red flag” symptoms. These are symptoms that indicate that something could be a CBRNe incident, and that do not occur often outside of CBRNe incidents. An example of this was bleeding from different orifices. Nonetheless, common bio symptoms such as coughing would not be included in this list. The possibility of identifying red flag symptoms for bio should be further researched.

Another major gap discovered was to know which advice needed to be followed. One focus group used the expression of “two experts, three opinions” to discuss what an information storm could look like. How can first responders know which expert opinion is the right one? Is there perhaps a protocol that they should follow? In the UK focus group, a coordination process was mentioned: ECOSA (Emergency coordination of scientific advice). This is also of concern when creating additional information sources for first responders and the project should think carefully and critically about how to tackle this problem and how to find the right experts to consult.

The fifth gap is related to the prior gap. This is about the reliability of information. If first responders do not have their own information sources, they will look to the Internet and to WhatsApp/Telegram groups to gain information. However, these information sources are not audited on their reliability, and anyone can put information on there. This is in a situation where their own reliable sources are either not available or do not cover the incident. For example, in a CBRNe situation where there is no information source available about the substance being used. On top of that, when finding information sources such as apps, these apps are sometimes USA focussed, not EU focussed. This means that time is lost by converting units of measurement, and by checking if e.g. the thresholds are the same in the USA and in the EU country.

For the sixth gap, the experts pointed out that a big CBRNe event is often exceptional. This means that much less information and procedures are available. Or they are available but are not used much. In other words, they are not always “between the ears” of first responders. An example would be a powder letter. This happens quite often, there are procedures that are regularly being followed and most first responder organisations feel well equipped to handle an incident with a powder letter. A CBRNe terror attack however is not ordinary. Ideally, the use of the information sources should be integrated into the day-to-day use. This is in contradiction with the fact that some CBRNe incidents are not daily business at all. On top of that, the rarity of those events makes the subject of CBRNe less of a priority for some first responder organisations.

Seventh gap: In case of an incident, it is necessary to have access to fast, reliable information. This information should also be available without internet. Currently, it is often a timely process to reach experts. On top of that, who to reach, or how to reach them, is not always clear. This depends heavily in the country. In some focus groups, access to experts relied on the contacts the first responders on scene had. In others, they explained that there was a set-up system. For example, the ECOSA process (Emergency coordination of scientific advice) in the UK. This is especially important in unknown situations. Where either the substance is not identified or the substance is identified but its effects are unknown. Closely related to this is the difficulty of the information flow between different agencies. This is different per country. Some have short information lines but many do not. The procedures to reach other agencies can be complicated. Sometimes one discipline does not know the information that other disciplines do.

Civil-military cooperation represents the eighth gap. The military often have different information than civil first responders. However, that information is not always used in the home country. On top of that, it is civil first responders that are dispatched to inland incidents. Setting up this cooperation can take time. Some countries have developed close connections between civil and military organisations, others have not. This makes it difficult to share

information during crucial moments. In almost all focus groups, all participants (from both sides) mentioned that there is still work to be done to tighten and strengthen the connections further.

Another important gap, highlighted by the PROACTIVE project is that there are no, or very little, information sources surround the effect of CBRNe incidents on vulnerable people. This is a gap that the eNOTICE-2 project is trying to close, for example in decontamination (D5.1.). It is also important to include information about vulnerable people in the AdInOS that are going to be created in this project. This information should be easily accessible and equip the first responder with the necessary knowledge to work with these groups in case of a CBRNe incident. This can be in the form of vulnerability to lower doses, but also procedures on how to work with specific groups of vulnerable people.

The tenth and final gap concerns cross-border communication. It depends on a country-by-country basis what the agreements are, and if they are bilateral or multilateral. Often, first responder organisations cannot communicate with each other (on the field) and thus can miss crucial information. Other times, the formal communication are slow and an improvised communication system is set up. Even then, the first responders do not always have the same base information sources. This means that they may make different decisions based on the same circumstances.



Figure 4 Gaps identified in the focus groups

4 Overview of Sources

This section includes the different source that the countries of the focus groups make use of. Sources is used both for information databases as well as persons or organisations that can provide information.

4.1 Available information sources

4.1.1 Belgium

Belgium is currently reviewing its approach for CBRNe incidents on the federal level. The National Crisis Centre of the country is currently developing a CBRNe doctrine, that will form the framework for further organization and operation. This means moving away from regional and zonal procedures towards national SOPs. However, currently there are still many regional and zonal SOPs and information sources. The information in this deliverable is thus prone to change.

BELINTRA

BELINTRA is a collaboration between the Belgium federal government and the federation of chemical industry, plastics and life sciences. It is subsidised by the SEVESO fund.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

It is generally the 2nd line of the firefighters or civil protection that calls BELINTRA.

How and when to use information source

It can be used in different stadia of an incident. It was established for chemical transporting incidents. It is a 24/7 helpline which can include both on-the-phone support as well as support on the incident site. They have an intervention team with specific HAZMAT officers and can also provide the clean up of a scene. They sometimes have specialised knowledge and tools of specific substances in comparison with the firefighters.

Advantages and disadvantages of information source

Advantages:

The firefighters generally find it a good experience to have extra back-up knowledge and are satisfied with e.g. the clean-up that BELINTRA can provide.

Disadvantages:

It is not always clear to some officers how it is subsidised, what the response time is and if they can react to more than 1 incident.

Training for information source (needed/ not needed, how often)

No extra training needed, if there is a BELINTRA incident, there is also a trained Advisor Dangerous Goods.

Specific information about vulnerable people?

No information about specifically vulnerable people.

BIG books/Kaleidoscope/24-hour phone line²

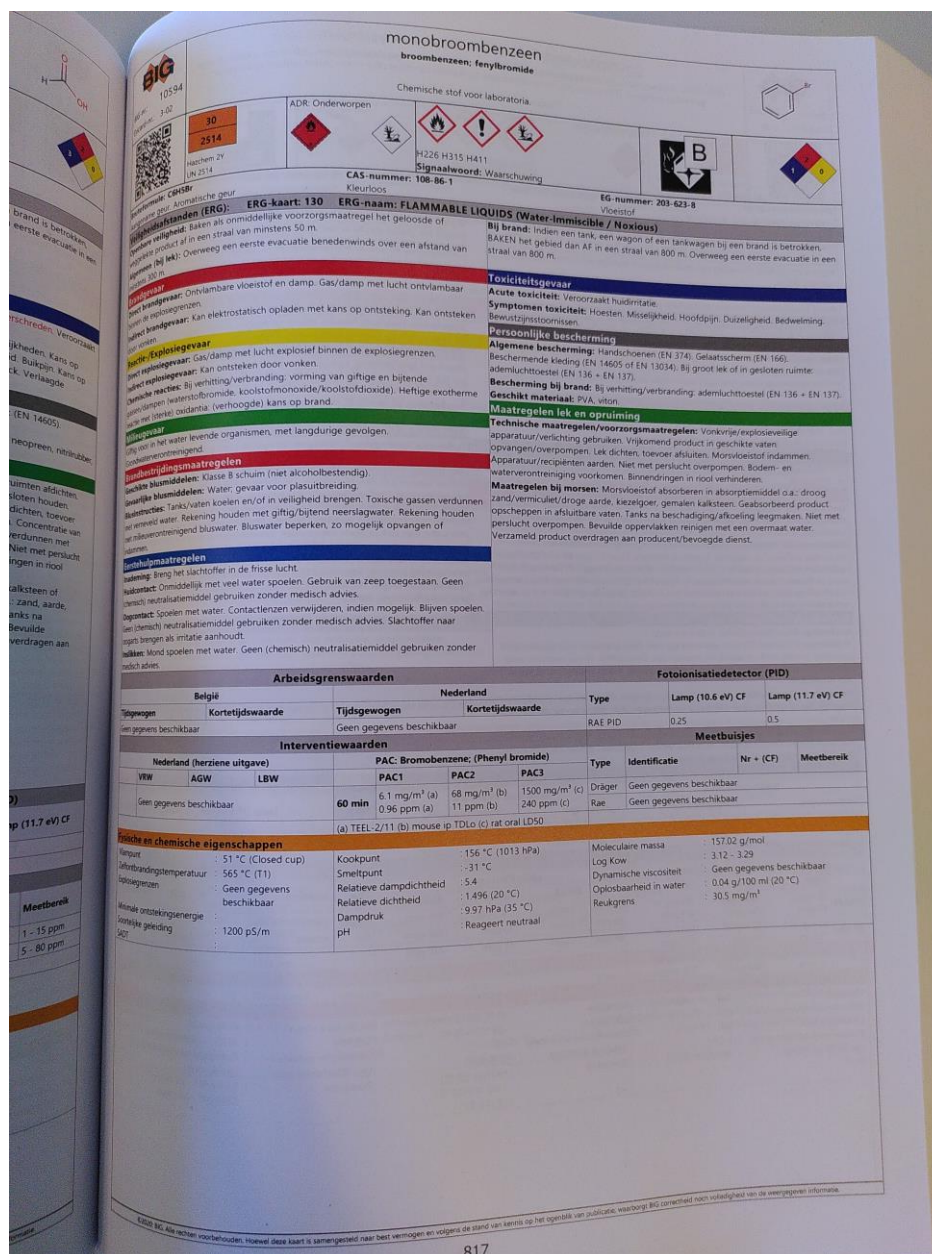


Figure 5 BIG book, edition 20-21

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The BIG books are used by Belgium firefighters and civil protection and contain information on chemicals that they can encounter. The 1st line officers and petty officers should be able to use them. On top of that, the 2nd line uses the books and the online app (Kaleidoscope), specifically the advisor dangerous goods. The online version includes chemical equations and possibilities for dispersion. If the phone line is used, it is also generally used by the 2nd line.

² The predecessor of BIG were the ERIC cards, but they are very general (https://www.ericards.net/psp/ericards.psp_search?p_lang=5)

How and when to use information source

During a chemical incident.

Training for information source (needed/ not needed, how often)

Training is needed to use the BIG books, especially online version. This is because the online version is more complex and elaborate than the paper version. To get to know the BIG books, it takes about 4 hours, and table top training with the Book.

The advisor dangerous goods can spend up to 3-4 days specifically on the use of BIG or Kaleidoscope in training. They re-train with the book every 3 years.

The most common mistakes seen during training is that the first responders look up a substance, but accidentally go to the wrong page and then they do not double check if it is the right substance. This happens particularly under stress. Once trained, the responders are less stressed, and are able to use the books as intended.

Advantages and disadvantages of information source

Advantages:

The information is put together and synthesised by experts in their field. This means that information is reliable to use for first responders. They can be consulted during any chemical incident.

The book is easy to use. However, a possible risk is that people start to falsely interpret it if they have not had training. If training was received, the book uses a clear methodology that can be used for quick interpretation.

Disadvantages:

It needs to be updated often. On top of that, the letters are often small which means that many firefighters need to use reading glasses to be able to read the book.

On top of that, it can be quite expensive, because of the needed updates. The firefighter zones need to buy both the books as well as a license to use the online platform.

Specific information about vulnerable people?

The source does focus on health risks, but not specifically vulnerable people.

Action cards/checklist

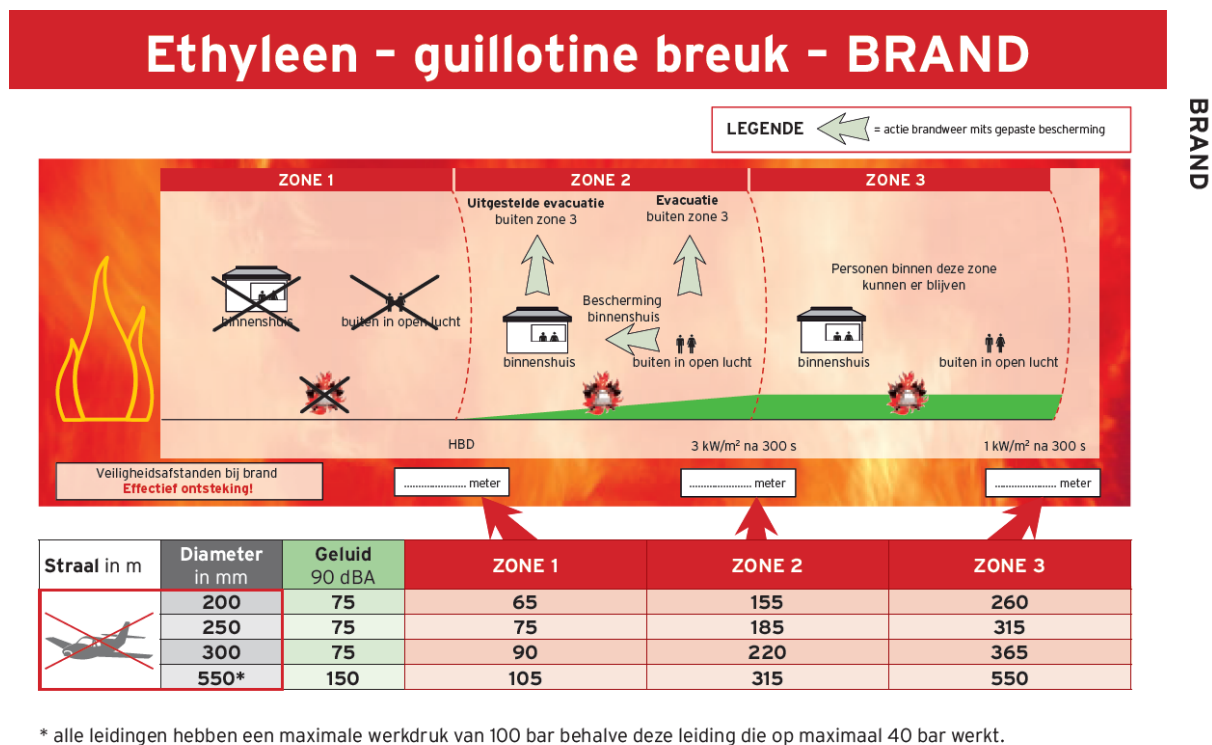


Figure 6 Action Card Ethyleen (G. Van Der Meeren, Algemene Directie Civiele Veiligheid, 2023)

These are often dependant on the unit of the fire brigade. They can generally add actions cards or checklists. On top of that, there are also some federal action cards. For example, the cards about pipelines, asbestos and ethylene.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Generally, it is used by the 1st line of firefighters and civil protection. The intent is to also share the action cards with the other medical services to make them more conscious of the possible dangers. However, this is still based on individual initiative of those on scene.

How and when to use information source

They are used during the creation of emergency plans, during interventions and exercises. They are meant to give a quick overview for a fast response during an intervention. This means that some of the information contained seems obvious.

Training for information source (needed/ not needed, how often)

Training is needed, and it needs to be repeated often. Advisors dangerous goods are trained to use these cards, as well as officers of the firefighters. Generally, the training is 1 day, first theoretical and then use of (historical) case studies.

Advantages and disadvantages of information source

Advantages:

If the creation of the action card requires a specific, rare expertise, firefighters zones are happy to use a (federal) action card that provides them with the information. this also allows for information sharing within Belgium.

D3.1 end user requirements for SDS (PU)

Disadvantages:

The firefighters in Belgium are not federally organised. This means that action cards are often written in parallel or rewritten locally. This means that there are often many different versions of action cards. This is also partially because many zones have their own material, and they tend to rewrite it based on the equipment and material that they have. Within the province of Antwerp, the materials are tested for all firefighter posts. This makes it easier to work with the same action cards.

Specific information about vulnerable people?

Generally not.

AGS'er (advisor dangerous goods)**Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?**

The advisor dangerous goods, or AGS'er, is a firefighter or member of the civil protection specifically trained to respond to CBRNe incidents. They can be called to a scene when there is a suspected or confirmed CBRNe incident. Although they are a firefighter, their information is passed on to the other disciplines as well.

How and when to use information source?

They can be called to any CBRNe incident.

Training for information source (needed/ not needed, how often)

AGS'ers have to follow a difficult and intensive training of 306 hours. This represents 34 credits. After completing this training, they are awarded with a postgraduate degree advisor danger goods. The postgraduate degree takes 1.5 years. They are trained in:

- Chemical, explosive and radioactive agents
- Toxic and biological agents
- Estimation of incidents and needed incident repression
- How to learn from past incidents
- Giving advice during incidents with dangerous goods

Advantages and disadvantages of information source**Advantages:**

They are highly trained experts and can provide reliable and useful information. They know how to interpret multiple information sources. On top of that, they can access the intervention app for firefighters, which means that they can provide advice even when not directly contacted.

Disadvantages:

Often their reach back depends on their own professional network. This means that some advisors have more access to certain knowledge than others. To counter this, there is a Telegram group with all advisors dangerous goods of the Antwerp province, and one of the entire Flemish region. There is also an (informal) network group that includes academics. They know the more theoretical side. However, it remains difficult to monitor the scientific papers on hazardous substances.

Being an advisor dangerous goods is quite time intensive in Belgium. It is something that is done additionally to the normal job. On top of that, the training is rigorous and many also do self-study to keep up to date about new developments.

Specific information about vulnerable people?

They are not specifically trained to give advice about vulnerable people in an incident.

Experts from the chemical company

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The information is used by the firefighters and civil protection. They are consulted when there is an incident involving the company. It depends on the escalation, time, and amount of the substance.

How and when to use information source

An incident on the premises of the specific company, or during transport of substances of that company. They should know how many people work in the company, the (chemical) product and the process to make it.

Training for information source (needed/ not needed, how often)

General training on information gathering is enough

Advantages and disadvantages of information source

Advantage: specialised knowledge about the product of the company, as well as knowledge on the size of the company, the dangerous parts of the company etc.

Disadvantage: It can take long before the expert arrives. Generally larger companies have emergency experts. Smaller companies do not always have an expert ready 24/7.

Specific information about vulnerable people?

-

Anti poison centre Belgium

The antigif centrum or anti-poison centre in Belgium is a phone number that can be used 24/7. It gives information to the general public and first responders about possible poisonings.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Anyone can call the anti gif centre. It is generally more used by the medical discipline.

How and when to use information source

They are specialised in toxicology, any toxicology related questions can be asked. On top of that, they manage antidotes and can make them available to hospitals and pharmacies in Belgium. They also manage a scientific database about different products that could possible cause intoxication. Lastly, they are toxicovigilant. This means that they need to research new situations that could lead to a risk for the public health.

Training for information source (needed/ not needed, how often)

D3.1 end user requirements for SDS (PU)

Anyone can call. The people in the antigif centrum are trained doctors and pharmacists.

Advantages and disadvantages of information source

Advantages: it is reliable information that is accessible for everyone

Specific information about vulnerable people?

They get many calls about children, specifically because children are often curious and that can lead to ingestions of non-edible products. This can lead to intoxication.

Leidraad ziekenhuizen CBRN³

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

This is the guideline for hospitals for a CBRN incident. It was created by the federal knowledge centre of healthcare in November 2011. It is not binding but contains recommendations for the medical discipline.

How and when to use information source?

It is a guideline and should not be used during the incident itself. Rather it is in the preparation phase that this document can be used by hospitals. It is also a suggestion about how the medical care should be arranged in Belgium in case of a large CBRNe incident.

BNIPS

BNIP is a “exceptional disaster management plan”. An example is the nuclear disaster management plan. A BNIP can describe a scenario that is specifically linked to CBRNe.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

BNIPS are created by the local government such as the province or the municipality. They can also exist on the national level. For example, the CBRNe terror incident BNIP⁴.

How and when to use information source

When the incident matches (approximately) the described scenario in the BNIP.

Training for information source (needed/ not needed, how often)

The BNIP can for example contain action cards that are trained. On top of that, every municipality needs to train at least 1x a year. However, this is not specifically for CBRNe, but in general.

Advantages and disadvantages of information source

Advantages: if it is used as it should be, it works well

Disadvantages: The BNIP needs to be kept up to date. Often, they are created because it is mandatory. This means that the knowledge is not always active knowledge.

Specific information about vulnerable people?

It can describe the vulnerable infrastructure in municipalities or provinces. These include hospitals and residential care centres.

³ <https://kce.fgov.be/nl/organisatie-van-medische-zorg-bij-cbrne-incidenten-een-leidraad>

⁴ Not available to the public due to sensitive information

FANC

FANC is the federal agency for nuclear supervision. They are responsible for the safety of employees, the general public and the environment against risks of ionising radiation. They were one of the parties involved in renewing the national nuclear disaster plan³. On top of that, they monitor the radiation in Belgium proactively.⁵

SCK CEN

The SCK CEN is the Belgian Nuclear research centre. They have organised courses in the past for first responders. They can also be used as an expert source during a CBRNe incident.⁶

Sciensano

Sciensano is a research centre that connects health, science and society. They can respond to emergencies if those emergencies are a danger to public health. This can include CBRNe scenario's such as pandemics. They can offer reference documents, carry out risk analysis, do intervention activities and can help with the communication.⁷

4.1.2 Germany

The federal states are responsible for the prevention of CBRN threats and corresponding response actions in times of peace. Each federal state defines responsibilities and authorities in its own legislation. This results in organizational differences. However, cooperation between the federal states is ensured by a uniform set of service regulations and standardized materials. The federal government supports emergency response by providing special equipment. This includes, for example, CBRN measuring vehicles and measuring devices for local authorities. Independently of this, each federal state can provide additional equipment for emergency response. The state of North Rhine-Westphalia, for example, procured its own measuring vehicles and measuring equipment (All-Purpose Radionuclide Identification Device “identiFINDER”), which correspond to those provided by the federal government and even go beyond their capabilities. The basic procedure for fire departments responding to CBRN emergencies is regulated within the Fire Service Regulation (FwDV – Feuerwehr Dienstvorschrift) 500. It can be adapted to the respective circumstances in the individual countries through country-specific additions. Essentially however, they are identical.

The federal government and the federal cooperate by defining a framework concept for CBRN protection. In addition to material, the federal government supports the federal states with training. This creates an additional benefit because the units are also deployed for civil protection in the event of defense, which is the responsibility of the federal government.

CBRN emergency response is carried out at municipal level according to a 4-stage concept. Depending on the incident and the extent of the damage, available measuring devices are used in the first stage. If the extent of the damage is greater and there is a risk to the civilian population, municipal measuring vehicles and measuring devices are deployed in the second stage to investigate the damage area. If necessary, these units can be supplemented by supra-local forces in the 3rd stage. The 4th level comprises the special unit Analytical Task Force ATF. It is equipped specifically to analyze and identify hazardous substances at the emergency location – for more details concerning the ATF see D5.1.

⁵ <https://fanc.fgov.be/nl/noodsituaties>

⁶ <https://www.sckcen.be/en/expertises/guaranteeing-radiation-protection>

⁷ <https://www.sciensano.be/nl/over-sciensano/noodsituatie-en-interventie>

Role of dispatch centre

The dispatch centers support CBRN emergency response, for example by providing weather data. Depending on the locally available incident command and support software, hazardous substance information can be transmitted by the dispatch center to end devices (tablets) of the incident command in various ways. In this way, images can be transmitted from the incident site to the dispatch center and back to the incident site.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The information is used by the fire department for the procurement of hazard information during the operation. If necessary or required by the situation (for example a terrorist attack), that information will be shared, providing assistance to police and other non-police emergency services.

How and when to use information source?

On-scene personnel stays in close contact to the dispatch center for - among other things - the following tasks:

- (E-) Accompanying documents (also electronically via dispatch center with query database),
- Calculate dispersion lobes for the spread of hazardous substances,
- Triggering the population warning,

Additional alarm when expert information is required. Available on request:

Special units:

- TUIS - Transport-Unfall-Informationen- und Hilfeleistungssystem⁸ (Transport accident information and assistance system)
- Analytische Task Force – Analytical Task Force (see before)
- Technical Advisor in dependence of the given risk / hazard / substance
- Special operations service LANUV, LIA

Passing on information to other authorities or other organizations:

- Environment Agency (local / regional – in dependence of the level)
- Health department
- Poison center
- Specialist offices of the municipalities or districts

Additional alarm when supra-local CBRN-forces are needed:

- Supra-local forces according to pre-planning of the federal state concepts (may differ in dependence of the state) – ABC-Schutzkonzept-NRW (CBRN protection concept of the state North-Rhine-Westphalia)

Training for information source (needed/ not needed, how often):

- The procedure for transmitting the data necessary for the substance search should be known.
- Available resources should be known.
- Procedure for requesting resources and notifying authorities.

⁸ <https://www.vci.de/themen/logistik-verkehr/tuis/uebersichtsseite.jsp> [12.07.2024]

- Knowledge of population warning options.

Mein Vorschlag:

Necessary knowledge and abilities:

- the exact procedure through which all data is transmitted, that is needed for the substance identification process. Training frequency: Each CBRNe-specific training session.
- what resources for the successful execution of CBRNe-related measurements are available to the personnel. Training frequency: ...
- the exact procedure through which additional resources can be requested and authorities can be notified. Training frequency: ...
- the available options for population warning and their usage. Training frequency: of each item depends on the employee's function related to CBRNe situations.

Advantages and disadvantages of information source

- Advantages: Substance information with digital data from the dispatch center up to date
- Disadvantages: Possible loss of information when transmitting information to the dispatch center

Specific information about vulnerable people?

Depending on the data maintenance of the operations control computer (information stored in the deployment plans for specific regions or buildings)

ADR list of dangerous substances/Orange book

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Fire department in higher command levels or the special CBRN units

How and when to use information source:

At stage 1 for immediate information if hazardous goods labeling or hazardous substance labeling is present. Dortmund fire department uses the Hommel (Handbook of dangerous goods).

The ADR list can be used for the following aspects:

Hazardous goods labeling (Transport labeling):

- Danger label
- HazChem Code/ hazard diamond
- Orange warning sign (Hazard Identification Number/ UN-Number)
- Flagging/Lamps for inland waterway vessels
- Color coding on rail tank car (orange circle)

Hazardous substance labeling:

- GHS-pictograms
- Color coding of pressure vessels
- Labeling Stationary systems
- Labeling pipelines
- Fire Department Plans
- Product descriptions

Training for information source (needed/ not needed, how often)

The use of the information sources must be practiced. However, the special CBRN units will be called in for any CBRN operations. Cooperation must be practiced. The non-specialized fire department units must have knowledge about the possibilities for obtaining information on hazardous substances.

Advantages and disadvantages of information source

Advantage: Clear overview of the hazards as well as clear labelling (aim: avoiding that a CBRN hazard is not recognised).

Disadvantages: Hazardous substance labeling necessary - Needs knowledge for interpretation, if the information is encoded, e.g. in a Hazard Identification Number.

Information that may be outdated if the recommended measures are changed

Specific information about vulnerable people?

No

Memplex

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Fire Department Environmental service, ATF, specialist advisor CBRN

How and when to use information source

Research on the properties of substances and limits on the use of protective equipment, dispersion calculations

Training for information source (needed/ not needed, how often)

Initial training in the ABC 1 course (basic course for fire fighters), in-depth training in ABC 2 for higher command levels (starting with team leader)

Advantages and disadvantages of information source

Accessibility in online format may be disrupted

Specific information about vulnerable people?

No

Other apps from ATF:

IGS-Fire similar to MEMPLEX,

Server platform with documents from all over Germany,

Documents from institutions that counter CBRN threats, such as the German Armed Forces

TUIS experts/ petro-chemical experts

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The support can be used by the fire departments, police, authorities or comparable forces. In addition to supporting German emergency response forces, support is also available within Europe.⁹

How and when to use information source

In the event of a transportation accident involving chemicals or storage and production accidents, TUIS can be requested for assistance. The request is divided into three stages. The decision as to whether the TUIS is requested is made by the incident commander at the scene of the accident.

For this purpose, the TUIS emergency call center is called via telephone in stage 1. The necessary information is recorded over the phone using a standardized document. This is done by the requested TUIS emergency call center or alternatively by the forwarded specialized TUIS fire department. The information is used to decide whether level 2 with additional on-site advice or level 3 with technical assistance at the scene of the accident is necessary.

If level 2 is required, a specialist advisor is deployed to the scene of the accident. In special cases, they can be brought to the scene of the accident by the SAR services of the German Armed Forces in a helicopter.¹⁰

If a consultation is not sufficient, technical assistance on site with level 3 can additionally ensure that special equipment and experienced chemical plant firefighters are called in for support. In order to meet the special requirements, the special equipment includes turbo extinguishers, universal flanges or flare systems.¹¹

Training for information source (needed/ not needed, how often)

To ensure good cooperation between the TUIS fire departments and the fire departments in the surrounding neighborhood, joint emergency exercises and presentations are held.

Further information and training activities are held at the state fire department schools or police training facilities.

The TUIS also take part in staff exercises for corresponding chemical situations.¹²

Advantages and disadvantages of information source

Advantages:

The advantage of the level system is that a consultation is held to check whether TUIS is necessary on site, which TUIS unit would be most suitable or whether telephone assistance is sufficient.

TUIS has several cooperation agreements to improve the cooperation with / between partners. This makes it possible to provide cross-sector assistance, for example by using a shared database in the event of tank farm fires.¹³

With its 130 locations, which consist of plant fire departments and specialists, the organization has good area coverage in Germany.¹⁴

⁹ (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.2 [12.07.2024]

¹⁰ (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.3 [12.07.2024]

¹¹ (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.3 [12.07.2024]

¹² (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.7 [12.07.2024]

¹³ (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.6 [12.07.2024]

¹⁴ (<https://www.vci.de/vci/downloads-vci/publikation/broschueren-und-faltblaetter/tuis-flyer-2022-doppelseiten.pdf>) – S.2 [12.07.2024]

Disadvantages:

Rapid availability varies depending on the location of the accident to the location of the appropriate TUIS unit.

Specific information about vulnerable people?

No

4.1.3 United Kingdom

Know your Chem/Chem data app

'Know your Chemicals' is an app developed for iOS and Android mobile devices, developed by the UK National Protective Security Authority (NPSA), a Governmental Authority, and is available for Emergency Services and Government Partner use.



Figure 7 'Know Your Chemicals' App Screenshot

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The app can be used by all emergency service responders to provide rapid access to scientific information about chemicals, including their appearance and different uses. Especially useful for emergency responders are the sections which enable chemical precursors (including precursors for Home-Made Explosives and chemical agents). It is an ideal resource for first responders requiring immediate access to chemical information at the scene of a CBRNe incident.

How and when to use information source

The app also includes sections on how to recognise hazards and indicators, such as those present at illicit laboratories, as well as a list of important contact details, for organisations such as the Anti-Terrorism Hotline, National CBRN Centre and Forensic Explosives Laboratory.

Training for information source (needed/ not needed, how often)

No training is needed to use the app, which is intuitive and easy to use.

D3.1 end user requirements for SDS (PU)

Advantages and disadvantages of information source

The app is regarded by the UK emergency services as a trusted source of information, as the information is produced and verified by NPSA.

Specific information about vulnerable people?

There are no specific reference sections on vulnerable people or groups within the app.

Joint Emergency Services Interoperability Programme (JESIP) Guidance and App

The Joint Emergency Services Interoperability Programme (JESIP) comprises Joint Doctrine and a series of principles for joint working, primarily aimed at emergency response agencies, although the majority of JESIP documents are available in an open-source format (some are restricted, for example, those related to some aspects of terrorism). An open-source JESIP App can be downloaded by responders, and contains several useful response models and templates around joint working.

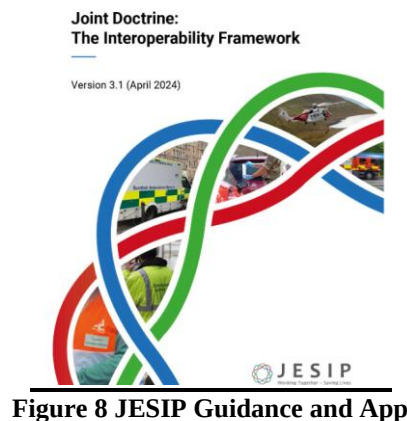


Figure 8 JESIP Guidance and App

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The guidance and its app can be used by all emergency service responders and incident commanders to provide rapid access to useful information on joint working with emergency service partners. Especially useful for emergency responders are the M/ETHANE template, which tells responders which key information to provide control rooms and partner agencies to make them aware of the developing emergency situation, the Joint Decision Model, which assists commanders to make joint decisions regarding the response, and the IIMARCH briefing model. It is an ideal resource for first responders requiring immediate access to information on responding jointly with partner agencies at any emergency, but especially those which may be classified by the emergency services as a 'major incident'.

How and when to use information source?

The app mirrors this usability and provides instant access to the most important information and models / templates on a mobile device.

The joint doctrine is used by the emergency services as the basis for several multi-agency training courses, but the guidance is not intended for on-scene use.

Training for information source (needed/ not needed, how often)

D3.1 end user requirements for SDS (PU)

The app requires no training to use and is intuitive and easy to use. The guidance and app are regarded by the UK emergency services as a trusted source of information, as both are produced and verified by JESIP, which is a nationally recognised organisation.

Specific information about vulnerable people?

The joint doctrine promotes a 'people-centred approach', but contains no specific reference sections to the needs of vulnerable people or groups.

Initial Operational Response (IOR) to incidents suspected to involve hazardous substances or CBRN materials

The Initial Operational Response (IOR) to incidents suspected to involve hazardous substances or CBRN materials is guidance published under the JESIP umbrella, and contains series of considerations and actions for first responders, primarily from emergency response agencies, who are likely to deal with such incidents, whether as a result of an accidental release of hazardous substances or CBRN materials, or a deliberate act.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)? How and when to use information source?

The IOR guidance is available in an open-source, online format and can be downloaded by anyone. As well as the publication itself, there are several downloadable leaflets and pocket-sized aide-memoires designed to be carried, and used by, first responders, some of which are outlined below.

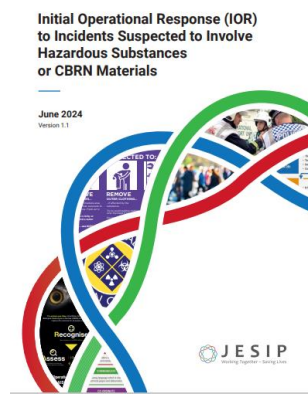


Figure 9 Initial Operational Response (IOR)

Training for information source (needed/ not needed, how often)

IOR, as an entire set of guidance, requires minimal training for first responders and is supported by a number of videos and e-learning activities for response organisations. The principles are designed to be trained to first responders during scheduled training activities, and refreshed, ideally, annually.

Advantages and disadvantages of information source

The advantage of IOR is that it is easy to understand, and apply, and requires no specialist equipment or training.

IOR contains a specific section on the considerations which responders should have when implementing IOR, related to vulnerable people and groups.

‘Remove, Remove, Remove’ Guidance¹⁵



Figure 10 Remove, Remove, Remove guidance

Remove, Remove, Remove guidance is a component of the (IOR) guidance, which was developed, supported by scientific advice, to improve the outcomes for members of the public and responders during the initial stages of an incident suspected to involve hazardous substances or CBRN materials. As with IOR, the Remove, Remove, Remove guidance is designed to be easy to understand, and apply, by both first responders and members of the public during the initial phase of the response. It requires minimal training, and no specialist equipment or knowledge.

Recognise-Assess-React (RAR) Guidance



Figure 11 Recognise- Assess- React Guidance

¹⁵ <https://www.jesip.org.uk/wp-content/uploads/2023/04/IOR-2023.pdf>

Recognise – Assess - React is another component of IOR guidance, which is designed to ensure that first responders recognise the indicators that an incident involving hazardous substances or CBRN materials is taking place, accurately assess the situation for threats and risks to the public and responders, and take appropriate action (such as Remove, Remove, Remove, and updating all responding agencies as to the nature and potential scale of the incident).

CBRN Joint Operating Principles (JOPs)

Responding to a CBRN(e) Event: Joint Operating Principles for the Emergency Services (CBRN JOPs) is a guidance publication, again under the JESIP umbrella, which focuses specifically on the response to CBRN Terrorist Attacks.

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The JOPs contain a series of Joint Operating Principles, primarily for Police, Fire & Rescue and Ambulance services, to promote the command, control and coordination of any response to a CBRN(e) Event by all three services. The CBRN JOPs are currently available online, in an open-source format and can be downloaded free of charge by anyone. The JOPs are currently under review, and may, in future, be subject to more access restrictions.

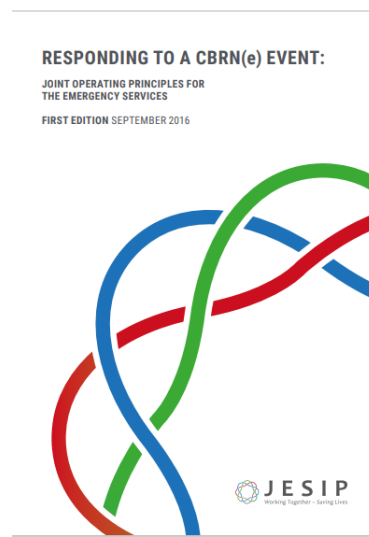


Figure 12 Responding to a CBRN(e) event

How and when to use information source

The JOPs can therefore be used by all emergency service responders and incident commanders to provide rapid access to useful information on responding in a coordinated manner, to a CBRN(e) event. It is an ideal resource for first responders and incident commanders who wish to refresh themselves on the main principles related to the response to a CBRN(e) event, however it is not designed to be used as an on-scene aide-memoire.

Training for information source (needed/ not needed, how often)

The Ops are used by the emergency services as the basis for CBRN responder and commander training, however there is no training required to use the guidance itself.

Advantages and disadvantages of information source

The guidance is regarded by the emergency services as a trusted source of information, as the information is produced and verified as a component of JESIP.

Specific information about vulnerable people?

In the current guidance, there is no specific reference to considerations around vulnerable people or groups, however, with the guidance currently under review, this approach will change.

Hotline National CBRNe centre

Figure 13 National CBRNe Centre

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The National CBRN Centre hotline is a direct-dial telephone number available to UK Police Forces, as well as other emergency services, when required, as a point of contact to access immediate CBRN tactical advice when responding to CBRN(e) events, as well as access to coordinated scientific advice for all agencies, known as the 'Emergency Coordination Of Scientific Advice' (ECOSA).

How and when to use information source

The hotline is staffed by experienced police officers from the National CBRN Centre on a 24/7 basis and is nationally recognised, by police dispatch centres, as the number to contact should a CBRN(e) event be suspected of taking place.

Training for information source (needed/ not needed, how often)

No training is needed to use the number, which is only available to the UK emergency Services.

Emergency Response Guide (Orange Book and App)



Figure 14 The ADR book/ App (Orange book)

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The 2024 Emergency Response Guide (ERG), known as the 'Orange Book' and its associated App, is available for all emergency responders to use.

How and when to use information source

They have been developed by the US Pipelines and Hazardous Materials Safety Administration (PHMSA) to provide emergency responders with fast, easily accessible information to help them manage hazardous material incidents.

Training for information source (needed/ not needed, how often)

The guidance forms a component of many training activities for emergency responders, but there is no specific training required for its use.

Advantages and disadvantages of information source

As a US Governmental organisation, PHMSA is regarded as a trusted source of information.

Specific information about vulnerable people?

The guidance does not contain any specific information about vulnerable people and groups.

IAEA TRACE App

Figure 15 IAEA TRACE app

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?
How and when to use information source?

The IAEA Tool for Radiation Alarm and Commodity Evaluation (TRACE) App is designed, primarily, to help customs officers to determine whether radiation alarms going off at border crossings are sparked by naturally occurring radioactive material in goods such as ceramics, fertilizer and soy beans, or whether the alarm could indicate smuggled material, warranting further inspection. Because of its relevance to identifying the cause of radiation alarms, the app also has applicability to emergency response organisations.

Training for information source (needed/ not needed, how often)

The app requires some limited training in its use, to ensure that users can interpret the data properly, but once trained, it is designed to be very user-friendly.

Advantages and disadvantages of information source

As an IAEA tool, the app is regarded as a trusted source of information.

Specific information about vulnerable people?

There is no specific information in the app related to vulnerable people or groups.

4.1.4 Italy

Italy has a structured approach to CBRN emergencies, with a focus on coordination between civil protection and military forces. This includes plans for detection, decontamination, and public protection. Moreover, Italy has specialized centres, including poison control and zoo-prophylactic institutes, which provide expert guidance during CBRN incidents. These centres collaborate with emergency services to offer real-time support and information. Continuous training for first responders is crucial, with regular exercises conducted to ensure preparedness. These include simulated CBRN scenarios, focusing on the identification and management of chemical, biological, radiological, and nuclear threats. Italy uses various digital tools and

databases, such as the “Orange Book,” to manage information about hazardous materials. These tools help first responders quickly identify risks and appropriate responses during an incident.¹⁶ These elements reflect Italy's CBRN response strategies and, nonetheless, Italy's integrated and multi-agency approach to managing CBRN emergencies, ensuring that first responders are well-equipped and informed during critical situations.

Orange book/ADR

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The "Orange Book" is primarily used by firefighters, police, and emergency medical personnel across different command levels. It is especially relevant for specialized CBRN units of the previously specified actors during incidents involving hazardous materials.

How and when to use information source?

The "Orange Book" is used on-site during incidents to identify hazardous substances quickly. It provides immediate access to critical data that helps in determining the necessary protective measures and response strategies.

Training for information source (needed/ not needed, how often).

Being the reference document subject to continuous revisions, regular training activities are required to ensure that all responders are familiar with how to access and interpret the information within the "Orange Book." This training often involves simulations and scenario-based exercises to practice the application of the book's contents in real-life situations.

Advantages and disadvantages of information source

Advantages: The "Orange Book" offers a comprehensive and easily accessible source of information on hazardous materials, helping first responders make informed decisions quickly.

Disadvantages: The effectiveness of the "Orange Book" relies heavily on the responders' ability to interpret the information correctly, which necessitates thorough training. Additionally, in dynamic situations, reliance on a static book might limit the response if new or unexpected hazards are encountered.

Specific information about vulnerable people?

The "Orange Book" does not specifically address vulnerable populations, but it provides general guidelines that can be adapted by responders to protect those at higher risk during a CBRN event.

Dispatch centre

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The Dispatch Centre information is used by firefighters, police, medical personnel, and civil protection agencies. It serves as a communication hub for coordinating emergency responses and disseminating critical information during CBRN incidents.

¹⁶ http://www.cbrn-italy.it/sites/default/files/Phases%20of%20the%20CBRN%20emergency%20management%20cycle_Background%20considerations.pdf

How and when to use information source.

In Italy there is a distinction between civil protection¹⁷ and civil defence¹⁸; for the first are foreseen three levels of response: national, regional and municipal. For the latter national, provincial¹⁹ and, prefectural²⁰ levels are expected. In consequence of this organization, for each level of response a dispatch centre is established. The relating Dispatch Centre is engaged immediately when a CBRN incident occurs. It provides real-time updates, manages communication between different emergency services, and helps in coordinating the deployment of resources and personnel.

Training for information source (needed/ not needed, how often).

Personnel must be trained in using the Dispatch Centre's systems, including understanding communication protocols and using the technology for managing the massive information flow during emergencies. Regular drills and scenario-based training ensure that staff can operate efficiently under pressure.

Advantages and disadvantages of information source

Advantages: The Dispatch Centre provides centralized coordination, ensuring a streamlined and efficient response across multiple agencies. It enables rapid dissemination of information and supports decision-making processes during critical incidents.

Disadvantages: The effectiveness of the Dispatch Centre can be hampered by technical failures or communication breakdowns, which could delay response times or lead to misinformation being spread among responding units.

Specific information about vulnerable people?

The Dispatch Centre can manage specific instructions regarding vulnerable populations, ensuring that information about evacuation routes, medical needs, and special assistance is communicated clearly and promptly.

Poison centre network

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The Poison Centre Network²¹ (CAV) is utilized by firefighters, police, emergency medical personnel, and civil protection agencies. It provides critical toxicological information during CBRN incidents to guide treatment and response strategies. Local CAVs refers to the National Centre for Toxicology Information of Pavia.

How and when to use information source.

The Poison Centre Network is activated when there is a suspected or confirmed exposure to hazardous substances. It offers real-time advice on the identification of toxins and recommended medical treatments during CBRN emergencies.

Training for information source (needed/ not needed, how often).

Emergency responders receive training on how to interact with the Poison Centre Network, including protocols for seeking advice and applying the guidance provided in real-time

¹⁷ <https://www.protezionecivile.it/it/approfondimento/sala-situazione-italia/>

¹⁸ <https://www.interno.gov.it/it/temi/prevenzione-e-soccorso/difesa-civile/i-nuclei-nbcr-chi-sono-cosa-fanno-come-esercitano-quando-entrano-azione>

¹⁹ https://www.prefettura.it/FILES/AllegatiPag/1189/PRESENTAZIONE_PIANO_DIFESA_CIVILE_sintesi.pdf

²⁰ <https://www.interno.gov.it/it/temi/prevenzione-e-soccorso/difesa-civile>

²¹ <https://www.iss.it/-/cnsc-cav>

scenarios. Continuous professional development ensures that responders are up-to-date with the latest toxicological information²².

Advantages and disadvantages of information source

Advantages: Provides specialized and expert advice rapidly, crucial for managing toxic exposures effectively. It ensures that responders have access to the best possible guidance during critical incidents.

Disadvantages: The effectiveness depends on the promptness of communication and the ability of responders to accurately convey incident details. Any delay or miscommunication could affect the response quality.

Specific information about vulnerable people?

The Poison Centre Network can provide tailored advice for treating vulnerable populations, such as children, the elderly, or those with pre-existing health conditions, ensuring that their specific needs are met during a CBRN incident.

Zoo-prophylactic Reference Centres

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

The Zoo-prophylactic Reference Centres are 10 distributed on the national territory and are utilized by firefighters, police, medical personnel, and civil protection agencies. They provide specialized information regarding biological and zoonotic threats during CBRN incidents.

How and when to use information source.

These Centres are consulted when there is a need to identify and manage biological hazards, especially those that are zoonotic in nature (originating from animals). They offer expertise in diagnosing and responding to these specific threats.

Training for information source (needed/ not needed, how often).

Personnel interacting with Zoo-prophylactic Reference Centres require specialized training in recognizing and handling biological and zoonotic threats. This training often includes simulations and collaborations with veterinary experts.

Advantages and disadvantages of information source.

Advantages: Provide expert analysis and advice on biological threats, particularly those involving animal vectors, ensuring that responders can act effectively in such scenarios.

Disadvantages: The reliance on specialized knowledge means there could be delays if experts are not immediately available or if the communication process is slow.

Specific information about vulnerable people?

The Zoo-prophylactic Reference Centres can offer guidance on protecting vulnerable populations from biological threats, particularly those involving zoonotic diseases. This includes tailored advice for children, the elderly, and immunocompromised individuals.

²² <https://preparatipericolosi.iss.it/>

Flash cards

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Flash cards are primarily used by first responders, including firefighters, police, and medical personnel, as a quick reference tool during CBRN incidents.

How and when to use information source.

Flash cards are employed on-site during emergencies to provide immediate guidance on recognizing hazards, using protective equipment, and executing safety protocols. They are especially useful in the initial stages of a response when quick decisions are crucial.

Training for information source (needed/ not needed, how often).

First responders undergo specific training on how to effectively use flash cards. This training ensures familiarity with the information and the ability to quickly access and apply it in high-pressure situations.

Advantages and disadvantages of information source.

Advantages: Flash cards are easy to carry, simple to use, and provide concise, critical information quickly, which is vital in emergency scenarios.

Disadvantages: While useful, flash cards may offer limited information and may not cover all complex scenarios that responders might face during a CBRN incident.

Specific information about vulnerable people?

Flash cards can include guidelines²³ for protecting vulnerable populations, such as instructions on evacuation, decontamination, and medical care for those who are most at risk, like children, the elderly, or individuals with pre-existing health conditions.

4.1.5 NATO**NATO CBRN Reachback capability**

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

NATO commanders, deployed forces, Allied nations and partners. How and when to use this information source information is provided based on request.

The reach back element is not designed for a real-time or live support, there will always be a time delay between request for information (RFI) and the RFI response.

Training for information source (needed/ not needed, how often)

training not required

Advantages and disadvantages of information source?

expert technical information, customized based on request / must be requested, available on to partners and NATO

Specific information about vulnerable people?

Is available if asked

²³ <https://www.asaps.it/downloads/files/ALLEGATI.pdf>

More information

Reachback is a capability that provides technical advice to commanders and deployed staff. Within Reachback there are experts in CBRN fields to provide comprehensive advice for laymen. Reachback has their information sources like factsheets, databases, library. Reachback has available extended network of experts through national representatives at the COE for further required information.

Guidebook for chemical incidents: Emergency Response Guidebook (ERG) | PHMSA (dot.gov)

Also available as an app

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

First responders, emergency response community

How and when to use this information source?

It provides with a manual intended for use during the initial phase of a transportation incident involving hazardous materials/dangerous goods but can be used in other situations as well. Gives clear guidance on measure needed to be taken in an emergency scenario including CBRN materials.

Training for information source (needed/ not needed, how often)

not needed

It is very comprehensive and straightforward. However, it might not be as specific, and does not include all scenarios and CBRN materials

Specific information about vulnerable people?

no

NATO Internal procedures, warning & reporting systems, modelling & simulation software

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

NATO members

How and when to use information source

In response to CBRN incident or in preparation. It depends on mission what specific procedure or software is needed.

Advantages and disadvantages of information source

The source is available to NATO partners but it may not be identical to national sources

Specific information about vulnerable people?

No

4.1.6 Czech Republic

Reach back mechanism

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

All basic organisations of Czech Integrated Rescue System (FRS, police, medical, army)

How and when to use information source

How: via Operational and Information Centre (advice on request) or independently (via mobile app in mobile phone)

When: if needed (identification of danger properties, safe disposal, medical aid etc.)

Training for information source (needed/ not needed, how often)

Needed, some advice is possible to find at website, some trainings available upon request

Advantages and disadvantages of information source

Advantages: enable access to integrated, critical CBRN information quickly and conveniently on mobile devices, such as tablets, field laptops and mobile phones, provide a wide range of information on hazardous substances / substance identification support, physical characteristics, human health information etc, some of them free of charge, working in offline mode

Disadvantages: when working in offline mode, it is not able to connect app with map

Specific information about vulnerable people?

Probably no information yet. The Czech application “Medis-Alarm” refers to legislative sources where the mention of disabled people could be included in some law

Emergency Response Guidebook (ERG, known as Orange Book) for chemical incidents

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

ERG is written in English / Spanish / French and is therefore not widely used by Czech rescuers. A lot of information from the ERG is incorporated into the Czech application Medis-Alarm, which is used by the bodies of Integrated Rescue System (fire fighters, police, medical, army), and also into the Czech application "Dangerous Substances", created especially for firefighters.

How and when to use information source

How: via Operational and Information Centre (advice on request) or independently (via mobile app in mobile phone)

When: if needed (identification of danger properties, safe disposal, medical aid etc.)

Training for information source (needed/ not needed, how often)

Needed, some advice is possible to find at website, some trainings available upon request

Advantages and disadvantages of information source “Medis-Alarm” widely used by Czech rescuers

Advantages: enable access to integrated, critical chemical information quickly and conveniently on computers, also on mobile devices, such as tablets, field laptops and mobile phones, provide a wide range of information on hazardous substances / substance identification

support, physical characteristics, human health information, transport, toxicity, Czech + EU legislation etc, working also in offline mode

Disadvantages: no

Specific information about vulnerable people?

Probably no information yet. The Czech application “Medis-Alarm” refers to legislative sources where the mention of disabled people could be included in some law

Experts from the chemical company/laboratory

Who uses the information sources (fire fighter, police, medical, 1st line, 2nd line, 3rd line)?

Chemical company / laboratory: experts responsible for safety in a specific chemical company

Fire Rescue Service of the Czech Republic (FRS CR):

- FRS CR include chemical laboratories, which serve as experts (specialised operational responders) going to the scene of the CBRN incident to identify the substance and recommend protective measures for endangered population. These people use CBRN applications.
- FRS CR include Operational and Information Centres which use mobile apps for advice on request of first responders (mainly fire fighters that means incident commanders)

How and when to use information source

How: if asked for information by responding people, mainly by incident commander

When: in case of emergency, in case of saving human lives and protecting the environment

Training for information source (needed/ not needed, how often)

Needed, some advice is possible to find at website, some training is available upon request by special company or by experts from Fire Rescue Service

Advantages and disadvantages of information source

Advantages: enable access to integrated, critical chemical information quickly and conveniently on computers, also on mobile devices, such as tablets, field laptops and mobile phones, provide a wide range of information on hazardous substances / substance identification support, physical characteristics, human health information, transport, toxicity, Czech + EU legislation etc, working also in offline mode

Disadvantages: no

Specific information about vulnerable people?

Probably no information yet. The Czech application “Medis-Alarm” refers to legislative sources where the mention of disabled people could be included in some law.

SOPs for CBRNe:

Item	Name	Author/Editor	Date	Who uses it?	Bibliographic ref. or URL
1	SOP no. 1: Dirty bomb	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2015	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
2	SOP no. 3: Threat of the usage of explosives or finding of explosives, suspicious objects, ammunition and other objects	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2014	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
3	SOP no. 5: Finding an object suspected of containing B-agents or toxins	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2006	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
4	SOP no. 9: Intervention of the Integrated Rescue System in case of emergencies with a large number of injured persons	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2016	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
5	SOP no. 11: Bird Flu	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2011	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
6	SOP no. 13: Response to a chemical attack in the subway	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2019	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
7	SOP no. 14: Attack of an active shooter	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2012	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
8	SOP no. 16A: Incident with a suspected occurrence of a highly contagious disease in a medical facility or other premises	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2018	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx

9	SOP no. 16B: Incident with a suspected occurrence of a highly contagious disease on board an aircraft landing at Prague Ruzyně Airport	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2019	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
10	SOP no. 17A: Illegal drug lab	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2022	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
11	SOP no. 17B: Illegal storage of hazardous substances and waste	Ministry of Interior - Directorate General of Fire Rescue Service of the Czech Republic	2022	Integrated Rescue System, State Administration and other organisations	https://www.hzscr.cz/clanek/dokumentace-izs-587832.aspx
12	Internal regulation: Chemical Service of the Fire Rescue Service of the Czech Republic	Directorate General of Fire Rescue Service of the Czech Republic	2017	Fire Rescue Service of the Czech Republic	https://www.hzscr.cz/clanek/predpisy-994648.aspx
13	Textbook: Chemical Service of the Fire Rescue Service of the Czech Republic	Directorate General of Fire Rescue Service of the Czech Republic	2012	Fire Rescue Service of the Czech Republic	https://www.hzscr.cz/clanek/predpisy-994648.aspx
14	Textbooks suitable for various situations: Training of Firefighters	Directorate General of Fire Rescue Service of the Czech Republic	-	Fire Rescue Service of the Czech Republic	https://www.hzscr.cz/clanek/konspekty-odborne-pripravy-i.aspx
15	Internal Regulations related to the activities of Chemical Service	Directorate General of Fire Rescue Service of the Czech Republic	2001-2020	Fire Rescue Service of the Czech Republic	https://www.hzscr.cz/clanek/predpisy-994648.aspx
16	Internal Procedures of Fire Units of the FRS CR (sheets L1 - L17, N1 - N23)	Directorate General of Fire Rescue Service of the Czech Republic	updated every two years	Fire Rescue Service of the Czech Republic	https://www.hzscr.cz/clanek/predpisy-994648.aspx

Table 2 SOPs for CBRNe in the Czech Republic

Database of dangerous substances on mobile devices

D3.1 end user requirements for SDS (PU)

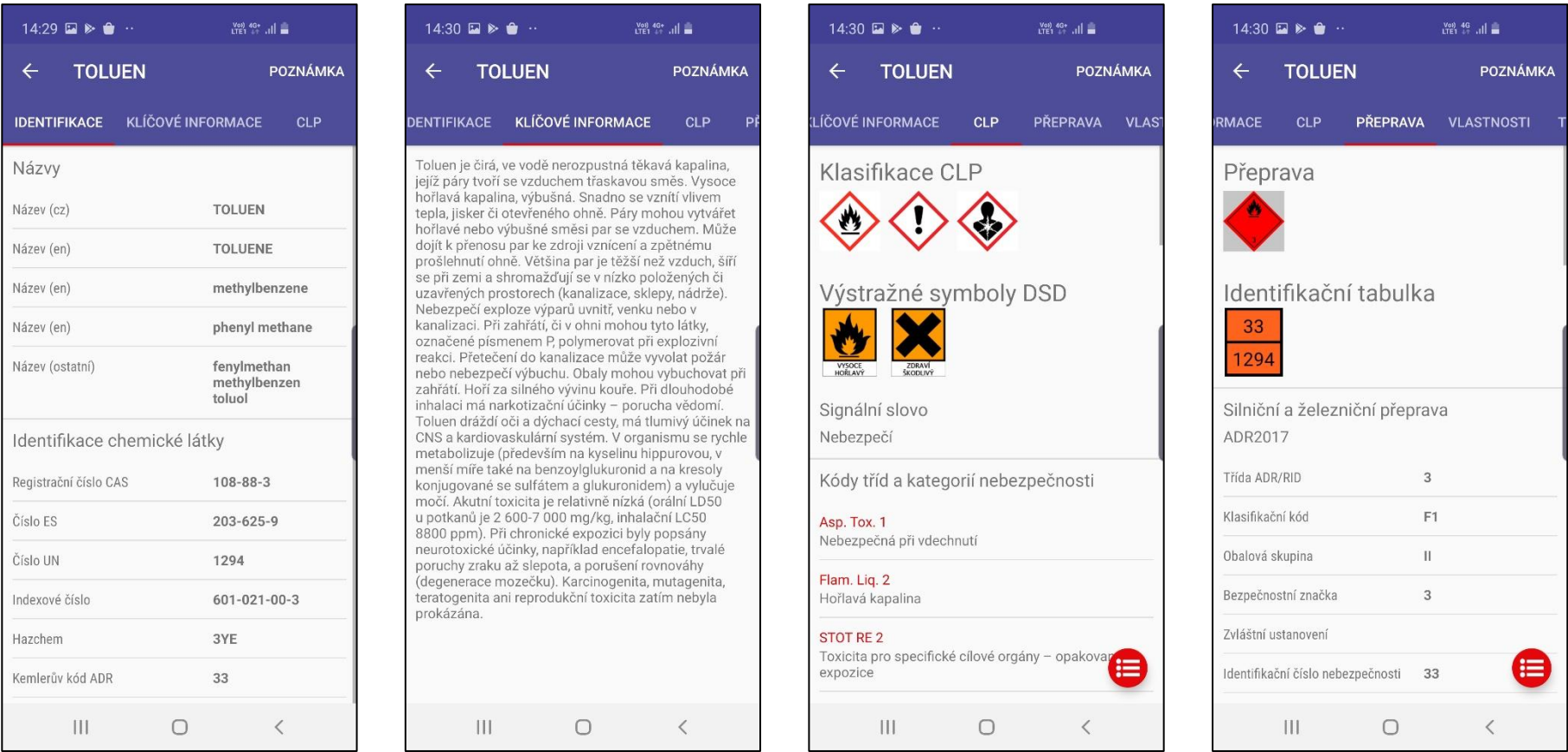


Figure 16 Chemical identification database in the Czech Republic

Identification

Key Information

CLP

Transport

14:30 4G+ LTE 17

TOLUEN POZNÁMKA

P PŘEPRAVA VLASTNOSTI TRINS ERG

Fyzikální a chemické vlastnosti

Vzhled	bezbarvá kapalina
Bod tání [°C]	-94,5
Bod varu [°C]	110,0
Hustota	0,87 g/cm³ (při 20°C)
Molární hmotnost [g/mol]	92,14
Dolní mez výbušnosti [obj.%]	1,1
Horní mez výbušnosti [obj.%]	7,1
Relativní hustota par	3,14 (1=vzduch)
Tenze par [kPa]	2,9 při 20°C
Teplota vznícení	480°C
Teplota vzplanutí	6°C
Kritická teplota [°C]	320°C
Rozpustnost [mg/l]	500,0 (ve vodě při 20°C)

III O <

Properties

14:30 4G+ LTE 17

TOLUEN POZNÁMKA

AVA VLASTNOSTI TRINS ERG ERIC

Střediska stupně pomoci 1 (telefonická porada)

1
UNIPETROL RPA, s.r.o. Litvínov
436 70 Litvínov, Záluží 1
Stupeň pomoci: 1,2,3
Tel.: [476163111](tel:476163111)*
Fax.: [476161708](tel:476161708)*
Dosažitelnost: nepřetržitě
Pozn.: * též pro kontakt se zahraničím

2
SYNTHOS Kralupy, a.s. Kralupy nad Vltavou
278 52 Kralupy nad Vltavou
Stupeň pomoci: 1,2,3
Tel.: [315727085](tel:315727085)
Fax.: [315723566](tel:315723566)
Dosažitelnost: nepřetržitě

4
SPOLANA, a.s. Neratovice
277 11 Neratovice
Stupeň pomoci: 1,2,3
Tel.: [315662555](tel:315662555)
Fax.: [315666633](tel:315666633)
Dosažitelnost: nepřetržitě

6
SYNTHESIA, a.s. Pardubice
532 17 Pardubice - Semtín

III O <

TRINS (SEVESO)

14:30 4G+ LTE 17

TOLUEN POZNÁMKA

STNOSTI TRINS ERG ERIC HAŠENÍ

KAPALINY - HOŘLAVÉ (NEPOLÁRNÍ/NEROZPUSTNÉ VE VODĚ/ŠKODLIVÉ)

MOŽNÉ NEBEZPEČÍ
POŽÁRNÍ NEBEZPEČÍ
VYSOCE HOŘLAVÁ LÁTKA. Snadno se vznítí působením vysokých teplot, jisker či otevřeného plamene.
Páry mohou tvořit výbušné směsi se vzduchem. Páry se mohou šířit směrem ke zdroji vznícení a může dojít k opakovanému vznícení.
Páry jsou většinou těžší než vzduch, šíří se při zemi a shromažďují se v níže položených a uzavřených prostorách (kanály, sklepní prostory, nádrže). Nebezpečí výbuchu par ve vnitřních i venkovních prostorách nebo v kanalizaci.
Látky označené písmenem P* mohou při zahřátí nebo při požáru polymerovat - NEBEZPEČÍ VÝBUCHU. Při úniku do kanalizace může vzniknout nebezpečí požáru a výbuchu.
Nádoby mohou při zahřátí explodovat.
Řada kapalin je lehčích než voda.

ZDRAVOTNÍ NEBEZPEČÍ
Při vdechnutí nebo absorpci kůže může mít toxické účinky.
Při vdechnutí nebo kontaktu s látkou může dojít k podráždění nebo poleptání kůže a očí.
Při požití se tvoří dráždivé, žíravé a/nebo toxické plyny.
Páry mohou způsobit závratě a dušení.
Při úniku látky nebo hasební vody z místa požáru může dojít ke znečištění prostředí.

III O <

ERG

14:30 4G+ LTE 17

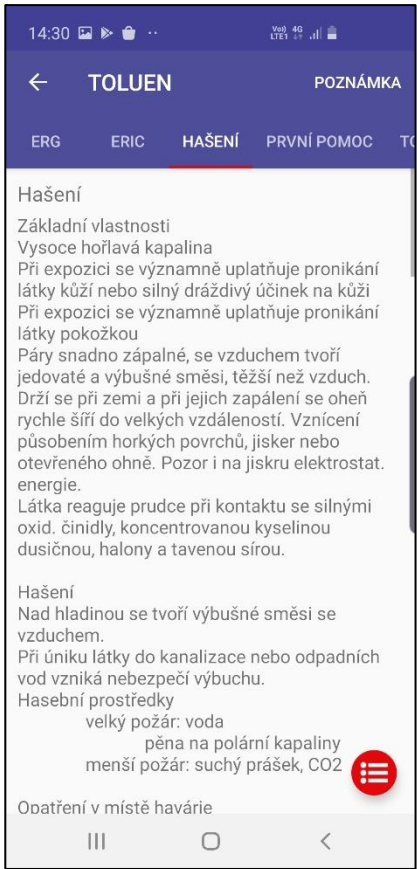
TOLUEN POZNÁMKA

TRINS ERG ERIC HAŠENÍ PRVNÍ PO

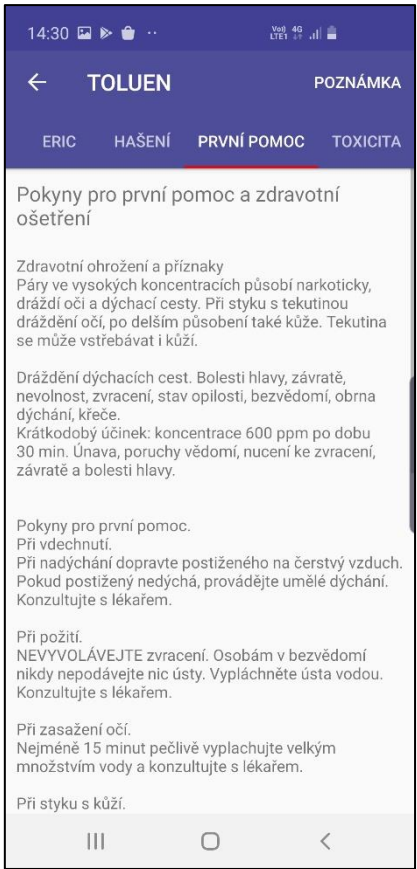
VYSOCE HOŘLAVÉ KAPALINY
Informace pro případ nehody
1. **Vlastnosti.** Látka uvolňuje nebezpečné páry. Bod vzplanutí je nižší než 23 °C. Látka je nebezpečná pro oči a dýchací cesty. Látka není mísitelná nebo je částečně mísitelná s vodou (méně než 10 %), je lehčí než voda.
2. **Nebezpečí.** Zahřátí nádrže způsobuje růst tlaku s nebezpečím prasknutí a následného výbuchu. Látka může tvořit výbušné směsi se vzduchem. Je-li látka zahřátá nebo hoří, uvolňuje toxické a dráždivé páry. Páry mohou být neviditelné a jsou těžší než vzduch. Šíří se při zemi a mohou se dostat do kanálů a sklepů. Látka může mít narkotické účinky a způsobit bezvědomí.
3. **Osobní ochrana.** Samostatný dýchací přístroj. Protichemický ochranný oblek, pokud je nebezpečí osobního kontaktu. Zvážit použití standardního zásahového oděvu pro hasiče pod ochranným oblekem.
4. **Opatření při zásahu.** 4.1 **Všeobecná opatření.** Zasahovat z návětrné strany. Okouřít, odstranit potenciální zdroje zapálení. OHROŽENÍ VĚŘEJNOSTI. Varovat osoby v blízkosti, aby zůstaly vevnitř se zavřenými dveřmi a okny. Zastavit jakékoli větrání. Zvážit evakuaci lidí v bezprostředním nebezpečí. Minimalizovat počet zasahujících osob v nebezpečné oblasti.
4.2 **Opatření při úniku látky.** Pokud možno zastavit únik látky. Zachytit uniknuvší látku všemi dostupnými prostředky. Provéřit meze výbušnosti. Používat nejiskřivější nářadí a zařízení v nevybušném provedení. Absorbovat kapalinu pískem, zeminou nebo jiným vhodným materiálem nebo ji pokrýt penou. Pokud

III O <

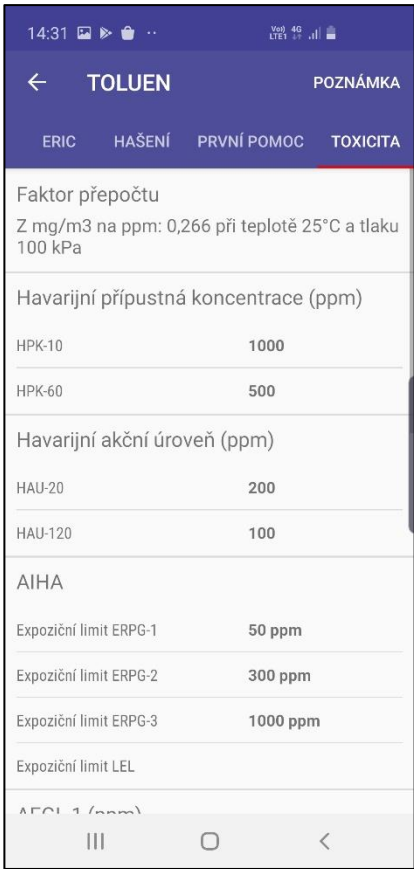
ERIC



Extinguishing



First Aid



Toxicity

4.1.7 Other (European projects and other databases)

1. **TERRIFFIC Project:** This project, funded by the European Commission's Horizon 2020 program, aims to improve the effectiveness of first responders during the critical initial hours of a radiological, nuclear, and explosive incident. It integrates advanced technologies such as drones, robots, new detectors, and decision support software to provide faster and more accurate information, thus enhancing the management of control zones and reducing risks for response teams.²⁴
2. **PRACTICE Project:** This project, part of the EU's FP7 framework, focuses on preparedness and resilience against CBRN terrorism. It developed the PRACTICE Toolbox, which includes tools and training kits for first responders, as well as information on handling human and societal effects of CBRN events. The project included live exercises across different countries to validate and integrate these tools in real-world conditions.²⁵
3. **PROACTIVE Project:** This Horizon 2020 project emphasizes a human-centric approach to CBRN preparedness and response. It aims to improve societal resilience by enhancing protocols for first responders, particularly in addressing the needs of vulnerable citizen groups. The project engaged over 100 practitioner organizations and included field training exercises to study interactions between responders and community members. It also developed the PROACTIVE Crisis Communication System to facilitate two-way communication during emergencies.²⁶
4. **ISF MELODY project:** this Internal Security Funds project created a harmonised modular course of CBRNe awareness for first responders without prior CBRNe training. This includes ambulance drivers, paramedics, general practitioners, emergency room personnel, firefighters and police. It considers both intentional and unintentional release of CBRN substances. The training modules created and the information therein could be used by the eNOTICE-2 project as well²⁷.
5. **ISF BULLSEYE project:** the goal of the ISF BULLSEYE project was to work towards harmonising procedures for chemical and biological threats. On top of that, the project created a training curriculum concerning dynamic EDD (explosive detection devices) with certification. This includes the first, second and third line responders. Both the contents of the training modules, as well as the harmonised procedures could be useful to created AdInoS.²⁸
6. **CDC Database:** The database of the American Center of Disease control is a resource that is already often used by FRs of multiple different countries. It is seen as a reliable source that is easy to google, which allows for quick access to information. They did however mention that the CDC follows USA standards, and that they need to adapt those standards to the standards of their own home country. It is mostly used based on a known substance.
7. **WHO database:** the WHO database is used by FRs in different countries for mostly biological incidents. They mention that, like the CDC, it is easy to google and it is considered a reliable resource. It is mostly used during a known biological incident.
8. **Guidelines for first responders to a CBRN incident (NATO):** these guidelines can be used by FRs. They are generally not used on-scene, but before that in the

²⁴ <https://www.terrific.eu/>

²⁵ <https://cordis.europa.eu/project/id/261728/reporting>

²⁶ <https://proactive-h2020.eu/>

²⁷ <https://melody.sckcen.be/en>

²⁸ You can find more information by contacting the coördinator, NCCS

preparedness phase. They can also be used while creating AdInoS and could contribute to better civil-military collaboration.

9. **Non-binding guidelines for enhanced civil-military cooperation to deal with the consequences of large-scale CBRN events associated with terrorist attacks (NATO):** These guidelines, like the ones above, can be used to inform the AdInoS, specifically surrounding civil- military collaboration.
10. **EURATOM TMT handbook:** the triage, monitoring, and treatment handbook for radiological accidents. The information in this handbook can be used by the AdInoS. It was created during a EURATOM project, and the WHO refers to it as an official source for the treatment of victims of ionizing radiation.²⁹

4.2 Focal points of the information sources and focus groups

4.2.1 General

At first sight, it seems that there are not many common denominators for information sources. Countries have their own sources and their own procedures. However, when we zoom out, we start to discern similarities. Firstly, the information sources exist for the 1st, 2nd and 3rd line of first responders. They also address the operational (know-how's), tactical (specific procedures) and strategical level (guidelines on multidisciplinary cooperation, laws, and regulations). Generally, each new line of first responders has their own information source, and their own information needs. This means that for the eNOTICE-2 AdInoS, we should carefully consider what level to address, and how to address each level. Rather than create one generic AdInoS sheet, the project should be focussed on creating a methodology that is flexible, modular and that can answer the demands of the three lines of first responders.

The advantages of the information sources mentioned in 3.1 include the reliability of the sources. This is mentioned for almost all sources and shows the importance that first responders give to reliability. The current view of AdInoS includes a peer review from both an academic and a practitioner. This should allow the project to guarantee reliability of the AdInoS. Another advantage that was mentioned was the speed with which the sources could be accessed. On some other sources, the slowness of the source was a disadvantage. For the creation of the AdInoS the end user requirement should be fast and reliable.

Many of the sources were created for the mobile phone or had an (online) version that could be used on the phone. This was seen as positive, because nowadays everyone has mobile phone that they can use, and many first responder organisations make use of tablets with pre-installed apps. The AdInoS of eNOTICE-2 should thus be accessible via phone and should be able to transfer important information via the smaller phone screen.

Another point that was brought up is how complicated and in-depth a source needs to be. This depends on the line in which it is used. In the focus groups it was mentioned that for the 1st line, the sources should be straightforward. As you move towards the 3rd line, the sources can contain more details and can be more complicated. However, even for the 3rd line, detailed information that is created by academics in articles is most of the time too much (although this depends on whether there is a fast-acting

²⁹ <https://www.sckcen.be/en/tmthandbook>

crisis or not). For example, the action cards and checklists used by first responders can often be quite generic, not containing enough information. However, these cards are more of a how-to guide, and are meant to sustain the first line first responders in the incident until the 2nd line arrives. In the AdInoS, this means that as the target audience moves from 1st to 3rd line, the information should be more detailed but still presented clearly.

Additionally, the first respondents mentioned that the way in which the information was presented was of importance. An advantage of the BIG books, for example, was that the book uses a clear methodology to present the information. This should be replicated in the AdInoS. This means that all disciplines should immediately see what information is meant for them. On top of that, the kind of information (e.g. health risks, environmental risk) should also be easily distinguishable.

4.2.2 1st line

The 1st line is the first “boots on the ground”. They are trained first responders that react to an alarm. They generally do not have any specific training in CBRN, but this can vary country by country.

The first important content that the 1st line first responders would need is how to keep themselves safe. Many respondents in the focus groups mentioned that this needs to be explicitly addressed and is a top priority. This includes knowing what distance to take from the incident centre. It also includes the use of PPE, and a reminder on how to use PPE. However, this can be a reminder only. Training for the PPE needs to be done earlier, in the preparedness phase. Without this training, the reminder will not work sufficiently. The own safety is important to address for all disciplines.

Secondly, they should know how to keep the public safe. This includes being able to make a first decision on shelter in place/evacuation, and what distance the public should have from the incident site. It should also include the Remove, Remove, Remove guideline³⁰. They should be able to recognise terminal symptoms such as being blue in the face. Ideally, they could also recognise some typical symptoms caused by CBRNe agents. This does not mean they have to recognise the agent itself, or diagnose the patient, just a recognition that something “unusual” is going on. This leads to the third point.

The third information piece would be the recognition of CBRNe incidents. This includes common signs that a CBRNe occurrence has taken place, such as the 123-rule (MELODY), dead animals close by and warning symptoms. This should also include the use of their senses to see what is happening, e.g. using METHANE³¹ or BADCOLDS³². Table 3 shows more in-depth the current availabilities for threat assessment for C and B. Lastly, it should include a local/national communication plan so that the first responders know who to call and how to reach them. This should also give information on what resources are available.

³⁰ <https://www.jesip.org.uk/wp-content/uploads/2023/04/IOR-2023.pdf>

³¹ Major Incident Declared / Exact location / Type of incident / Hazards / Access / Number and type of casualties / Emergency services present and required // <https://firstaidtrainingcooperative.co.uk/major-incident-management-methane/>

³² Substance Assessment. <https://www.jesip.org.uk/webapp/badcolds.html>

4.2.3 2nd line

The 2nd line can be called up because of their specialised knowledge. An example of a 2nd line first responder is a HAZMAT officer or an advisor dangerous goods. They can be expected to have specialised training in CBRNe.

The information in the 2nd line can be split up into two possible scenarios: a known agent and an unknown agent. These are flexible scenarios. It can move from unknown to known by doing measurements. At the same time, if a complicated reaction happens between multiple known agents, it could move from known to unknown (and eventually back to known). The information source should give an overview of sensor data that 2nd line first responder can use and give some information on the interpretation of that sensor data. Table 3 shows the difference between C and B with regards to possibilities of detection.

The AdInoS should also give further guidelines for known agents, and for unknown agents. In this, it is important to make a distinction. For chemical, there are already many sources (described above) such as BIG, the Chzech database on the mobile, Memplex, the Orange book/ADR etc. For radiation, the AdInoS could use sources such as the EURATOM TMT handbook, TRACE app or the course material of the ISF MELODY project. For biological, the CDC or WHO databases could be considered, as well as the publications of the different anti poison centres in the different countries. Nonetheless, the focus groups mentioned that there was a lack of sources specifically for Chemical Warfare Agents and Biological agents. This could be an important gap for the AdInoS to fill.

The information sources for the 2nd line also should include health risks, the correct antidotes and how to use those to treat patients. It should give guidelines on how to approach contaminated, possibly traumatised, victims. These guidelines would be particularly important for the first responders responsible for decontamination, and the medical discipline. On top of that, information about vulnerable people should be included.

The local/national communication plan should also be included in the AdInoS for the 2nd line, including the availability of resources.

4.2.4 3rd line

The 3rd and final line are further removed from the incident. They include forensic police and those responsible for the recovery of the bodies of victims. As such, the AdInoS should include information on what to do with contaminated bodies, how to recover them and how to stay safe while recovering them.

Other 3rd line responders could be experts that are specialised in their field. Think of the anti-poison centres, Sciensano, FANC, Zoo-prophylactic Reference Centres, the reach back mechanism of the NATO etc. They should receive the methodology with which the AdInoS is created, and a blank template. Of course this template and the methodology should be based on the sources that already exist as much as possible. This way, it can be integrated into as many countries in the EU, while still providing harmonised information. If the experts use the methodology, they should be able to concisely give the information needed to the first responders.

Table 3 Challenges of on-site Biological risk assessment for First Responders compared to CBRN risk assessment.

On-site Threats	Senses (Sight and/or Smell)	On-site Monitoring Detect-to-Warn Sensors	Risk assessment Sensor-driven (C, RN) or visual (B)	Response	Research and Development
C-threats	Limited (<i>C-threat dependent</i>)	Monitoring (C-Sensors)	Sensor results	Sensor and observation Contextual-Based Response	Training Emerging on-site Technologies
RN-threats	Nihil	Monitoring (RN-sensors)	Sensors results	Sensor and observation Contextual-Based Response	Training Emerging on-site Technologies
Bio-threats <u>Acute phase</u> (Early stage)	Nihil (No visible sign ...except for some Biotoxins)	Nihil (Lack of Agnostic Biosensor)	Agnostic Approach for Risk Assessment	Proactive Prevention Against Unknown Risks: (Screening upper respiratory samples with rapid tests and applying prophylaxis to at-risks individuals)	Agnostic / Generic method (e.g. shotgun sequencing; multiplex detection)
Bio-threats <u>Late stage</u> (Days or weeks post-release)	Visual signs (Symptoms - Visible signs on individuals)	Identify-to-Treat (Bio-Identification tests)	Targeted - Syndromic Diagnostic Approach	Biological & Medical counselling (Prevention, Surveillance, Post-Exposure Prophylaxis or Treatment)	Enhancing Targeted and Syndromic Identification (Speed, Throughput, Cost-effectiveness, Training of field operators)

Legend: Focus on the current response, training needs, and research and development in the realm of CBRN risk assessment. Highlights include the interface with medical response during the early and late phases of a crisis, particularly concerning potential exposure to biological threats.

4.3 Content of the information sources

Section 3.2 leaves us with the following content for an AdInoS:

1. **Situation Report (SitRep):**
 - Incident overview
 - Current status
 - Initial assessment
 - METHANE/BADCOLDS
2. **Hazard Assessment:**
 - Type of hazard (chemical, biological, radiological, nuclear)
 - How to detect the hazard
 - Known or unknown hazard
 - Extent of contamination
 - Potential risks
3. **Protective Measures:**
 - Recommended Personal Protective Equipment (PPE)
 - Safe zones and evacuation routes
 - Crowd management
 - Working with contaminated, traumatized victims
 - Working with vulnerable people
4. **Response Actions:**
 - Immediate actions taken
 - Ongoing operations
 - Coordination with other agencies
5. **Communication Protocols:**
 - Contact information for key personnel
 - Communication channels and frequencies
6. **Resource Availability:**
 - Equipment and materials on-site
 - Additional resources required
7. **Medical Information:**
 - Symptoms of exposure
 - First aid and decontamination procedures
 - Hospitals and medical facilities notified

4.4 The form of the information sources

The form of the information source is also important. Possible information sources for first responders include:

1. **Real-time Detection Systems:** Advanced detection systems, including portable detectors, drones, and robots equipped with sensors, can provide real-time data on the presence and concentration of hazardous substances. These systems help responders to quickly identify the type and extent of the threat³³

³³ <https://www.terrific.eu/>

2. **Decision Support Systems (DSS):** DSS software integrates data from various sensors and detection systems to provide actionable insights. These systems use models and simulations to predict the spread of contaminants, helping responders to make informed decisions about containment and evacuation measures.³⁴
3. **Communication Tools:** Effective communication is crucial during a CBRN emergency. Tools such as the PROACTIVE Crisis Communication System facilitate two-way communication between responders and the public, ensuring that accurate information is disseminated and that the needs of vulnerable groups are addressed.³⁵
4. **Geographical Information Systems (GIS):** GIS technology can be used to map the affected area, providing responders with visual representations of contamination zones, safe routes, and critical infrastructure. This information helps in planning and executing response operations efficiently.³⁵
5. **Field Manuals and Guidelines:** Preparedness projects like PRACTICE have developed comprehensive field manuals and training kits for first responders. These resources provide step-by-step guidelines for handling various types of CBRN incidents, including procedures for decontamination, medical treatment, and coordination with other agencies.³⁶
6. **Public and Private Databases:** Access to databases containing historical data on CBRN incidents, toxicological profiles of hazardous substances, and medical treatment protocols is essential. These databases provide responders with background information and reference material that can be crucial in managing an emergency.³⁶
7. **Inter-agency Collaboration Platforms:** Platforms that facilitate collaboration between different agencies and organizations ensure a coordinated response. These platforms allow for the sharing of real-time information, resources, and expertise among first responders, law enforcement, medical teams, and other stakeholders.³⁵
8. **Public Information Systems:** Systems designed to keep the public informed and provide instructions during a CBRN emergency are vital. This includes emergency broadcast systems, social media channels, and community alert networks that help manage public behavior and ensure compliance with safety directives.³⁵

To effectively assist first responders in a CBRN emergency, information sources should be provided in the following formats:

1. **Digital and Mobile-Accessible Documents:** Ensure quick access to SDSs, protocols, and guidelines via smartphones and tablets.
2. **Real-Time Data Feeds:** Utilize detection systems, GIS, and decision support systems that provide live updates on the situation.
3. **Visual Aids and Infographics:** Simplify complex data into actionable visuals.
4. **Standard Operating Procedures (SOPs):** Clear, concise, and step-by-step instructions.
5. **Training Videos and Simulations:** Offer practical demonstrations and virtual scenarios.
6. **Communication Platforms:** Tools for seamless coordination among responders and agencies.

³⁴ <https://www.terrific.eu/>

³⁵ <https://cordis.europa.eu/article/id/448499-boosting-first-responders-response-to-hazardous-threats>

³⁶ <https://cordis.europa.eu/project/id/261728/reporting>

These formats enhance the efficiency and effectiveness of first responders during a CBRN incident. In the upcoming months, the eNOTICE-2 should check together with the DG ECHO library what formats would be possible for the AdInoS.

5 End user requirements for AdInoS

Chapter 2 and 3 give an overview of the existing information sources, and the information gained in the focus groups. From these two chapters, the following end user requirements for AdInoS can be gathered:

- Fast and reliable
- Mobile (platform mounted) or portable
- Not too complicated, comprehensible: a) for trained personnel, for non-trained personnel.
- Clearly labelled information (e.g. police needs to see immediately what their information is)
- Information needed 1st line:
 - Structured characteristics of CBRNe occurrence (from territorial planning papers & Civil Emergency plans, from list of critical transports for time interval in progress, etc.)
 - PPE and how to use them for FR safety
 - Distance to contaminated patients
 - Safe distance upwind for FRs
 - Crowd management
 - Protection of the public (safe distance, RRR, shelter or evacuation)
 - Recognition of CBRNe
 - Warning symptoms: e.g. bleeding from multiple orifices.
 - Terminal symptoms (blue in the face)
 - What can you observe? BADCOLDS³⁷? METHANE³⁸?
 - Communication Plan: how to contact each authority.
- Information needed 2nd line (CWA, RAD/NUC and Bio):
 - Use of sensor data (uncrewed aerial, mobile, and static sensors in area).
 - a) Request for Data/Information sent in 1st line, b) Data/Information provided automatically to Fire Brigade / FR / Police (MOI units).
 - Dealing with unknown hazard
 - In some cases, chemicals may change due to reaction with their environment, becoming more or less dangerous. Information sources are static however. This should be mentioned in the AdInoS.
 - General guidelines for CBRNe incidents
 - Dealing with a known hazard
 - Correct antidotes and countermeasures and care
 - How to approach contaminated, traumatised victim (medical + psychological)
 - Communication Plan: how to contact each authority.
- Third line (experts, forensics)
 - AdInoS methodology
 - Recovery and disposal of bodies

³⁷ Substance Assessment. <https://www.jesip.org.uk/webapp/badcolts.html>

³⁸ Major Incident Declared / Exact location / Type of incident / Hazards / Access / Number and type of casualties / Emergency services present and required // <https://firstaidtrainingcooperative.co.uk/major-incident-management-methane/>

6 Next steps

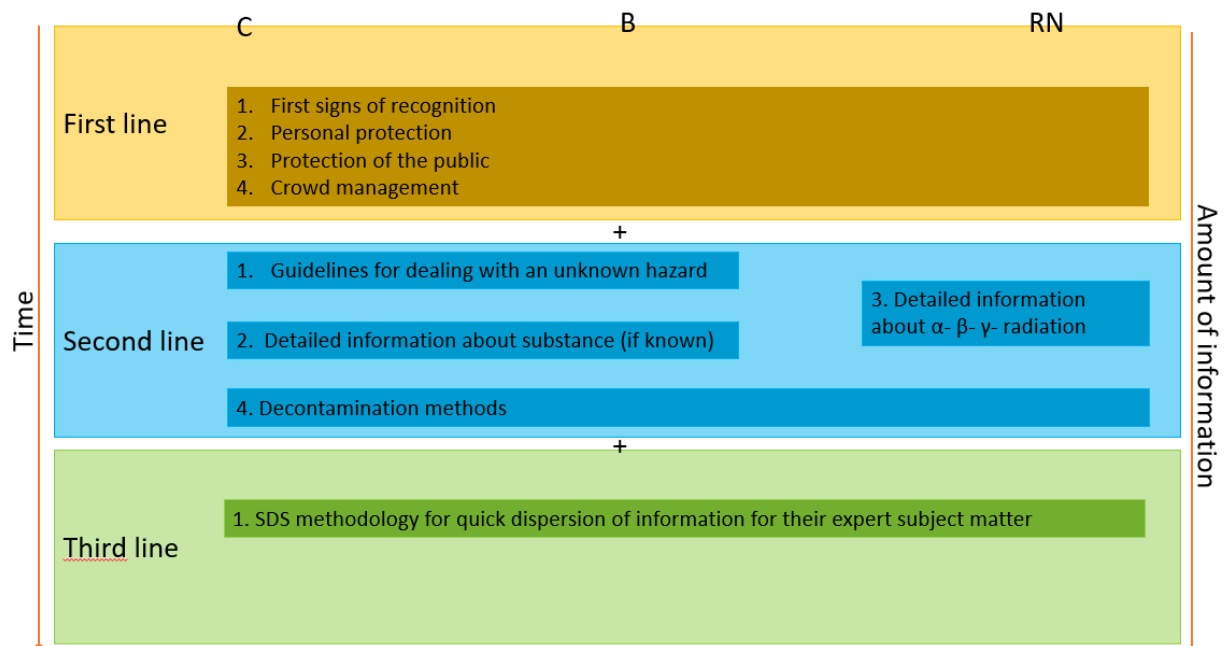


Figure 17 Proposal for methodology of the AdInoS

This deliverable is the first in work package 3. As such it is merely the first step in the process to create a AdInoS methodology. In the end user requirements, we have described what the AdInoS should contain. On top of that, we have made a division between information for the 1st, the 2nd and the 3rd line. The next step is to find out what is possible with regards to the form of the AdInoS. As one of the requirements is portable and mobile, it would be best to create an online information source that can be accessed via tablets, phones or laptops. Figure 17 shows a possible approach for the AdInoS. The content is divided among the different lines of first responders, and it builds on each other.

For the content of the AdInoS, we should focus on the current gaps. One clear gap is the small amount of sources available for CWA and Biological agents, especially on the civil side. Within eNOTICE-2, we should focus on these elements to create our first AdInoS. This way, the project can support closing an important gap.

Reliability was another important requirement. This aspect should be built into the methodology. One way to do that is to create a peer-review, replicating the academic process. Ideally, the peer review of the AdInoS would be a review from both an academic as well as a practitioner perspective. This would mean that crafting an AdInoS would need the following people:

1. Author(s)
2. Academic reviewer
3. Practitioner reviewer

D3.2 will explore the methodology of the peer-review, and the format of the AdInoS further. It will also explore how the end-user requirements can best be integrated for the AdInoS, and on what platform the AdInoS can be distributed. This platform could be the library that is part of T2.1.

Annex I

eNOTICE-2

EU Network of Training Centres for preparedness to CBRN Events

Information sheet Focus groups WP3

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Circulation list

- eNOTICE Consortium
- Participants of focus groups

Dear Sir/Madam,

We would like to invite you to a focus group of eNOTICE2. We are contacting you because of your experiences as a first responder and/or your expertise in the CBRN domain. The focus group will take place on the **25th of April 9.00-11.30**. This focus group will take place at Campus Vesta. Below you will find more information about the focus groups.

The eNOTICE-2 project and red pages

As a project, eNOTICE-2 wants to support first responders on the terrain. To do so, we need the input of these first responders, to make sure that we focus on the right priorities. One of the objectives of eNOTICE-2 is to make sure that the information gathered in the project is easily accessible to first responders. This means that one of the eNOTICE-2 project objectives is development of so-called red pages or safety data sheets (SDS). Importantly, eNOTICE-2 **does not want to replace** existing information sources, but rather **to complement** them. This means filling in the gaps that currently exist in the CBRN domain.

Goal of the focus groups

During these focus groups discussions, we are trying to find out what you, the end user, need. This means that we will collect end user requirements in the course of multiple focus groups. eNOTICE-2 will organise focus groups in Belgium, Germany, Czech Republic, Italy and the United Kingdom. These meetings in focus groups will take **around 2 hours**, you can find the agenda of the focus group down below. The focus group is a place for an open discussion about red pages. We check what information sources are currently available for first responders in the field, what information an SDS should minimally contain and what gaps exist in those information sources. On top of that, we would like to ask if there are certain topics that should be prioritised because little information is currently available for them. The focus groups will be constructed around a scenario to give some context. This scenario considers the agent that is being used, ways of decontamination and treatment of vulnerable people & assistive devices.

Agenda of the focus group

Time	Title
10 min	Introduction to eNOTICE-2 and the preliminary SDS methodology Main question: How do we translate scientific knowledge/ case-based knowledge into practical information that can be used on the field ?
20 min	Scenario description
10 min	What information sources are currently available for FRs in the field?
10 min	Who approves the information that goes into those information sources?
20 min	Are there gaps in those information sources?
20 min	What information should an SDS contain to be useful?
20 min	What topics should be prioritised?
20 min	Varia

Total time: 2 hours and 10 minutes