

of radiological risks

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D9.90 - Report on venues, challenges, opportunities and

recommendations for stakeholder engagement in emergency and

recovery preparedness and response

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Abstract

The report provides the outcomes of six case studies performed in Belgium (two), France, Slovak Republic, Slovenia and Spain in relation to stakeholder engagement in emergency and recovery preparedness and response, in the framework of the ENGAGE project work package WP2. A joint methodology was followed, with the objective to investigate how stakeholder engagement is implemented in practice, how it is understood and what the main findings are. The national cases revealed many good practices of stakeholder engagement, although it is still evident that prevailing involved stakeholders are the official actors. The recently adopted BSS directive which was transposed in the additional legal framework provided a trigger for the improvement of the previous EP&R arrangements and the stakeholders engagement in that respect.

Some new approaches and practices on stakeholder engagement can be seen. However, the results also show that more engagement is required and the cases provide information where the improvements could be established. The outcomes of the performed investigation will inform the recommendations discussed in the final report of ENGAGE.





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1. Introduction

The ENGAGE project, funded under the H2020 CONCERT, aims at *ENhancinG stAkeholder participation in the GovernancE of radiological risks* [1]. It is a two-year project that started on November 20th, 2017, and which seeks to identify and address key challenges and opportunities for stakeholder engagement in relation to medical use of ionising radiation, post-accident exposures and exposure to indoor radon. In all these situations, stakeholder engagement is a key issue for improving the governance of radiological risks and the radiation protection of the exposed individuals.

The ENGAGE project aims are:

- a. to assess why, when and how stakeholders engage in radiation protection;
- b. to develop novel approaches to analysing stakeholder interaction and engagement, and provide guidance to meet the challenges and opportunities identified in response to (a);
- c. to investigate the processes for enhancing radiation protection culture and their role in facilitating stakeholder engagement, and develop guidelines for building radiation protection culture; and
- d. to build a joint knowledge base for stakeholder engagement in radiation protection.

The ENGAGE project is organized in four main work packages (WPs) coordinated by the management WP, which interact to achieve the objectives as presented in Figure 1.



Fig. 1 Interaction between ENGAGE work packages

ENGAGE WP 2 on "Stakeholder engagement in practice" investigates how legal requirements, different guidelines and recommendations for stakeholder engagement are implemented in practice. Specifically, it analyses how radiation protection communities respond to the expectations and demands for stakeholder engagement, and what kind of engagements practice, forms and instruments can be found in radiation protection fields, with or without reference to existing requirements.

For this purpose, WP2 is informed by results obtained in WP1 "Rationales and frameworks for stakeholder engagement in radiation protection", in which the rationales for stakeholder engagement in radiation protection and the related legal or contextual drivers are clarified (how is stakeholder engagement envisaged, who is involved and for what purpose). The results of WP1 were published in Deliverable 9.85 "Rationales and frameworks for stakeholder engagement in radiation protection in the





medical field (Part 1), nuclear emergency and recovery preparedness and response (Part 2) and indoor radon exposure (Part 3)" [2] and Deliverable D9.86 "Report on stakeholder engagement in radiation protection: transversal issues and specifics of different exposure situations" [3].

The expected outcomes of ENGAGE WP2 are:

- 1) An evaluation of the impact of past or ongoing participatory activities in radiation protection decision making processes.
- 2) A comparative analysis of stakeholder engagement practice, identifying broader lessons that can be learned, as well as what is specific to each field and why.

WP2 activities were structured along several tasks. First step of Task 2.1 was to develop the "Methodology for analysing stakeholder engagement in practice", which provided the framework for analysing ENGAGE case studies. Guiding research questions for analysing stakeholder engagement in practice were developed. The list of questions is described in section 2 of this report.

The second step within Task 2.1 was a review of selected academic literature, radiation protection research projects connected to stakeholder engagement, current stakeholder engagement practice within radiation protection platforms, as well as past experiences of stakeholder engagement in the three exposure situations and, beyond that, international experiences in stakeholder engagement in radiation protection and connected fields. This review was published in ENGAGE "D9.82 – Report on key challenges, best practices and recommendations for stakeholder engagement" [4]. Based on this review, the initial list of research questions formulated for WP2 was enriched (see section 2).

In Tasks 2.2, 2.3 and 2.4, a deeper analysis was carried out on the role of stakeholder engagement in practice in the three exposure situations considered in ENGAGE, based on the guiding research questions: i) medical exposure to ionising radiation, ii) emergency and recovery preparedness and response (EP&R), and iii) exposure to indoor radon. Current or recent practices, challenges and triggering factors for engagement were studied specifically by means of case studies for each of these exposure contexts.

The aim of this report is to describe objectives and results of the case studies carried out with respect to emergency and recovery preparedness and response. The report focusses on the detailed description of summarized findings of each case study carried out (section 3). A first comparative conclusion is provided (section 4).

A deeper comparative assessment regarding the findings of the case studies in the three exposure situations will be carried out in the "Final report of the ENGAGE project" (D9.94, due end of November 2019). Here also the evaluation of findings and formulation of recommendations in the light of ENGAGE project aims will be dealt with.





2. Stakeholder Engagement in Practice: Aim and Methodology of Case Studies

At the outset of the ENGAGE project, the research for WP2 started from the hypothesis that while stakeholder engagement and informed decision-making are nowadays recognized as essential factors for an effective governance of radiological risk, the practical implementation of policy and legal requirements for stakeholder engagement is confronted with multiple challenges. We must therefore understand better why, when and how stakeholders are engaged in radiation protection. This understanding is necessary to facilitate the development of guidelines and a knowledge base for a more robust stakeholder engagement in radiation protection.

ENGAGE defines stakeholders as: actors (individuals or groups, institutional and non-institutional) with a tangible or intangible (yet to be shaped or discerned) interest in the radiation exposure situation and the related radiation protection issues, directly affecting decisions, or affected by the formulation and resolution of a problem or challenge. In this perspective, stakeholders are constructed in interaction with actors, issues, contexts. Various publics are also (potential) stakeholders.

While the overarching question in ENGAGE WP1 was "What are radiation protection (RP) communities being asked to do? That is, what "external" pressures, mandates, demands, and/or expectations have emerged in public venues commending the engagement of stakeholders (including wider publics) in RP?,

in WP2 we analysed "What are RP communities doing?"

- That is, how are RP communities responding to these pressures, mandates, demands, or expectations and how does this show in practice (e.g. specific cases)?
- Which (other) real or potential forms and instruments of stakeholder engagement and public participation can be observed in RP practice, showing no reference to existing requirements?

More information on how these research questions have been created can be looked up in section 2 of "D9.82 – Report on key challenges, best practices and recommendations for stakeholder engagement" [4].

In order to operationalise the overarching questions of WP2, these were further explicated in the following derived questions:

- a) What levels of awareness about external prescriptions of stakeholder engagement in radiation protection do researchers and practitioners reveal?
- b) How do researchers and practitioners understand and practice stakeholder engagement (at individual and institutional level)?
- c) What were the rationales for stakeholder engagement, the final objectives? Has there been a critical evaluation of the attainment of objectives and of the impact of stakeholder engagement? Have there been any guided improvement activities?
- d) What forms of acceptance, resistance, denial, or alteration of engagement do you observe or encounter? And how do these forms change over time?
- e) What are radiation protection actors and communities doing that may de facto count as stakeholder engagement (but are not necessarily labelled that way)?
- f) Are there any alignments/misalignments between case practice, on the one hand, and external conceptions and prescriptions, on the other, and if so why? Which challenges and opportunities do you encounter for stakeholder engagement in your specific case?
- g) What else have you found, or should we be asking?

The guiding questions a) - g) have informed the analysis reported in D9.82. Following the literature review the following research questions h) – o) were added:





- h) What are the benefits of implementing stakeholder engagement processes (in the situation studied)?
- i) What are the lessons learned for the establishment of efficient stakeholder engagement processes?
- j) Can you identify in official documentation or discourses, or in secondary sources, any references to a "participatory turn" for your field or case? If so, please document and indicate how this turn is understood, why and when it came about.
- k) Can you identify in official documentation or discourses, or in secondary sources, any mention (explicit or implicit) of a shift away from expert-based or technocratic decision making to more inclusive, open, democratic, participatory decision making? If so, please document and motivate, and indicate why and when this shift came about.
- I) Is dealing with emotions one aim of engagement in relation to medical exposure to ionising radiation? And which kind of emotions play a central role?
- m) How can goals and ideals about patient centred communication in radiology be implemented into day-to-day academic and private practice?
- n) How to accelerate the process of bringing together the different disciplines which are necessary to start a stakeholder process in a certain radiation protection field?
- o) How to raise awareness of the need to engage among radiation protection researchers?

Further information on how the guiding research questions were applied are described in each case study description.

In the subsequent section 3, the case studies carried out with respect to emergency and recovery preparedness and response are described. In general, the selection of case studies was aimed at covering a broad range of participation practices, stakeholders, and settings. The methods used focussed on desktop research, interviews and observation. More details will be provided in the case study descriptions.





3. National Case Studies

Previous proposals and discussions among members of ENGAGE task 2.3 from Belgium, France, Slovak Republic, Slovenia and Spain have introduced three areas for case studies to be studied in the involved countries: development and participation in the EP&R plans (at different levels: national, regional, local), stakeholder engagement in drills and exercises (different levels and different facilities) and EP&R information as requested in BSS in practice. The table 1 provides the first division of the case studies per topic per country.

Table 1: Distribution of case studies per topic per country

Topics Country	Development and participation in preparedness and response, e.g. the EP&R plans (different levels: national, regional, local)	Drills and exercises (different levels and different facilities)	EP&R information cf. BSS directive in practice, article 70 (prior information) and article 71 (information in the event of emergency) with Annex XII
Belgium	Emergency preparedness, response and recovery plan		
Belgium	Contextualised view on participation comprising both institutional and non-institutional processes and actors, focusing on what may de facto count as engagement, but is not necessarily labelled that way		
France	Stakeholder involvement experience from the Steering committee for the management of the post-accident phase of a nuclear accident or a radiological emergency (CODIRPA) of the French Safety Authority (ASN)		
Slovakia		Drills and exercises practice at different levels related to the nuclear accident at Slovak NPPs: INEX4, INEX5 and National exercises performed in Slovakia	
Slovenia			EP&R information and communication as prescribed in BSS directive in practice at different levels (national, regional, local) in Slovenia
Spain	Role of research institutions and RP societies or associations to help stakeholders seat and work together on EP&R: example of CIEMAT, ISGlobal and SERP (Spanish Radiation protection Society)		

For each of the case studies related to one of the involved countries (Belgium, France, Slovak Republic, Slovenia, Spain) an explanation of the case study is given (including topic, background information, short description of case study, methodology) followed by the analysis and main findings.





3.1. Belgium

In Belgium, two case studies were conducted regarding stakeholder engagement in EP&R. A first case study focuses on stakeholder engagement as encountered in the development and implementation of the revised Belgian Nuclear and Radiological Emergency Plan. The second case study offers a mapping of different initiatives undertaken by Belgian EP&R stakeholders (institutional and non-institutional), thus providing insight also in those activities which might not formally be recognized as stakeholder engagement.

3.1.1. Description of case study 1

The objective of the case study was to identify participatory practice in the preparedness for nuclear and radiological accidents, in relation to the Belgian nuclear and radiological emergency plan. The Belgian nuclear and radiological emergency plan (Belgian Royal Decree [5]) has a relatively long history, as it was originally published in 1991. In 2003, a first revision was made, and more recently, the plan has been revised before its publication in 2018. The plan defines stakeholders in a "broad sense", to include any individual person, group, institute, organisation,..., that i) may be affected by the consequences (radiological or other) of an emergency situation; ii) has to act in order to limit its consequences; or iii) participates in the management of the event. The involvement of stakeholders is seen to progressively increase from no involvement in the emergency phase (when emergency actions and short-term protective measures are taken), to re-establishing dialogue in the transition phase and progressively more involvement in the post-accident phase. Dialogue with the stakeholders is also highlighted as part of the preparedness for nuclear emergencies. The document particularly points out that during the transition phase, the consultation of stakeholders directly concerned with establishing a strategy for the return to a normalized situation is organized (again) and their engagement increases progressively. It also mentions that the preparedness process includes distribution of information to the population and dialogue with the stakeholders.

Data is collected through a multi-method approach including document analysis, interviews, and a focus group discussion on stakeholder engagement in the preparedness phase. Interviews took place with three members of the federal authorities who coordinated the development of the new nuclear and radiological emergency plan (i.e. members of the Belgian crisis centre, and the nuclear safety authority), a respondent who had experience with emergency planning at the provincial level, and two members of local civil society organizations (CSOs). These respondents expressed their experiences with and personal viewpoints on the 2018 plan, focusing specifically on the engagement of stakeholders in the development of the plan, and as foreseen in emergency situations by the plan. The interviews were analysed with the help of NVivo 12 software. The focus group participants included emergency actors, radiation protection and waste management experts, and CSO representatives.

3.1.2. Analysis and results - Case study 1

Two main contexts for stakeholder engagement can be distinguished; on the one hand, stakeholder engagement in developing the plan, and on the other stakeholder engagement as prescribed in the plan. Both will be discussed.

Engaging stakeholders in the development of the plan

In some respects, the process of stakeholder engagement in developing the 2018 nuclear and radiological emergency plan took a top-down approach. The plan was written by actors at the federal





policy level, which is the policy level responsible for the nuclear field. However, a range of stakeholders could learn about and comment upon the plan through consultation processes. At different stages of drafting the plan, the federal authors sent it out for consultation to different stakeholders (first to scientific partners, later to a broader range of stakeholders). These stakeholders could then formulate comments on the draft, which were to be considered and potentially implemented by the authors. This process is illustrated by a respondent who had the experience of being consulted at the level of the provincial authorities. Together with colleagues, this respondent made different comments, and although some of these comments were tackled in the final version, the impression also existed that the most important comment -that the document is too large to be practically used- was not dealt with appropriately; "our main concern was that the plan was way too large, and nothing's done with that concern, which I think is a pity" (translated from Dutch). The example of the Swiss model was given where all important information is summarised in one page.

At other instances, a bottom-up process could be identified in the form of initiatives taken by local civil society organizations (CSOs) primarily active in the field of radioactive waste disposal. These organizations -set up as local partnerships during siting procedures for Belgian short-lived low and intermediate level nuclear waste- had formulated a range of conditions connected to the surface storage of nuclear waste in their community. One of these conditions was the optimization of nuclear emergency planning. Through studies and self-initiated workshops, these organizations developed a range of recommendations and questions related to emergency planning, which they provided to the provincial and federal authorities. Respondents active in these CSOs expressed their perception that many of these recommendations and questions had been tackled in the new emergency plan, and in the Royal Decree they are explicitly mentioned as one of the consulted actors. The latter point is notable, as one of the members of these CSOs also explicitly stated that he perceived their influence to be indirect, and he did not consider the organization as formally involved in the process of drafting the new plan – nor did he think this was necessary.

Different respondents discussed the process leading up to the development of the new plan, stating how the 2018 revision is a consequence of a range of factors and evolutions, such as the Fukushima disaster, newly published directives and guidelines, and the general fact that the last revision of the plan already dated from 2003. One respondent made it explicit that in this sense, the plan is a continuous process; "we didn't just wake up one morning [with the idea to revise the plan], it's the fruit of a long process, and this process is always in motion", and in this sense the plan represents "a moving process recorded in a legal document at one moment" (translated from French). How stakeholders would be involved later on in this ongoing process, was less clear however.

Engaging stakeholders in emergency situations

Turning to stakeholder engagement during emergency situations as prescribed in the plan, different respondents highlight how integrating stakeholders is in fact a sign of current times in which participation and involvement have become key words. Only two interviewees, both members of the federal authorities who coordinated the development of the new plan, also mention prescriptions on stakeholder involvement set by different international directives and guidelines (BSS Directives, IAEA guidelines).

The nuclear and radiological emergency plan itself defines stakeholders "in a very broad sense, as every interested party (every individual person, group, institute, organisation, …) that can be affected by the (radiological or other) consequences of the emergency situation, that have to act to limit its consequences, or that participate in the control of the event" (translated from Dutch). Respondents share this broad conception, identifying an extensive spectrum of possible stakeholders, not in the least



the general public itself. For some interviewees, "in fact, stakeholders in this broad sense are everyone" (translated from French). Implicitly, however, a distinction is drawn by the respondents between those stakeholders who have to be involved because of their professional background (e.g. first responders, authorities at different levels, experts), and the more general public which might be affected. Interestingly, respondents from the local CSO's made it explicit that their organizations or the public more broadly should not necessarily be formally involved in every aspect of the emergency plan, as long as their worries and questions are taken in consideration.

Overall, engagement as discussed by most respondents seems heavily directed towards preparation for an emergency, not only in order to provide awareness on possible risks, but also in terms of knowing what to do in an emergency situation. For those professionally involved, whether or not explicitly described in the plan, this means knowing (and agreeing with) what to do in order to fulfil their expected roles (e.g. what to do as a first responder in such a situation, which information to provide as a doctor on questions asked during emergency situations, how to evacuate prisoners for whom one has a responsibility as prison managers, who will drive the buses used for evacuating people, etc.). For the general public, this mostly means knowing how to cope with the emergency situation (e.g. whether/how to take iodine pills, how to protect yourself and your children, etc.). The emergency plan highlights the importance of a structural dialogue, and different respondents indeed highlighted how mere information-provision is not sufficient. According to them -and in line with the prescription on the establishment of a dialogue- more interactive forms of engagement are/have to be provided; stakeholders should be able to discuss proposed strategies, and to express their questions and worries. This means that besides brochures, television spots, etc. also more interactive forms of engagement should be used, such as school visits, discussion sessions and events. And although this structure for dialogue does not seem to be fully formalized at the moment, some initiatives are taken. In terms of the new plan, the authorities have for example committed themselves to provide information sessions in local communities (when they express an interest for the issue). Particularly interesting is that also bottom-up initiatives have been developed, in the form of local CSO's who have implemented campaigns to inform citizens through school visits and an online video.

In the nuclear and radiological emergency plan, attention is explicitly directed to stakeholder engagement in the transition and recovery phase, as it states how "the interaction with the stakeholders, which is re-started in the transition phase, should be continued and extended". Concrete action regarding stakeholder engagement in these post-emergency phases currently seems less developed, however. Respondents mostly focused on the preparedness phase when discussing stakeholder engagement in case of a nuclear emergency, and more formal steps towards the definition of a network or group of stakeholders to be engaged in post-emergency phases seems lacking at the moment.

Different challenges for stakeholder engagement are identified by respondents. A main challenge when engaging stakeholders in the light of a (possible) nuclear or radiological emergency, is a perceived lack of interest of the general population. Different reasons for this were formulated by respondents, ranging from a failing communication strategy on these events, to a habituation effect, and just plain indifference. Also first responders were sometimes difficult to involve according to one respondent, as they lack resources. This lack of resources - in terms of people, finances and/or time- suggested a more general challenge, as it requires investments both to be engaged as a stakeholder, and to organise processes of stakeholder engagement. Another challenge pointed out was the preparation of the post-emergency phase, particularly relating to the balance between the efficiency of, and the level of stakeholder involvement in, the decision process concerning recovery.





3.1.3. Main findings - Case study 1

This case demonstrates that stakeholder engagement in EP&R might entail both engagement in the drafting of an emergency plan (a central step in preparedness) and in the actual emergency phases (as prescribed by the plan). In relation to the former, the Belgian experience highlights how stakeholder engagement can be organized both top-down and bottom-up. The engagement process itself, however, might be the subject of further reflection, as not all stakeholders are engaged in a similar way (e.g. different phases of consultation), and the actual writing and revising of the plan lies with a few federal actors, thus posing a potential bottleneck for comments and reflections made by other stakeholders.

Second, through interactions with local CSO's, this case study shows how local actors not necessarily wish to be formally engaged as stakeholders, as long as their worries and concerns are known and addressed. This opens the door to further discussion on the desired level of stakeholder engagement, whereas the highest level of involvement, as a sign of our times is often perceived as a sort of golden standard to be strived for. While one-way communication is nowadays widely perceived as insufficient, questions can be asked whether hierarchical understandings of stakeholder engagement are always appropriate. Stakeholders should have the opportunity to be engaged at the level they perceive meaningful, thus should be provided with the means to do so.

Thirdly, stakeholder engagement in both the pre- and post-emergency phase is deemed important in the Belgian nuclear and radiological emergency plan, not least because it provides insights into stakeholders' expectations, concerns and vulnerabilities. However, different steps still have to be taken to put this in practice. Currently, most attention seems directed towards preparedness -both of the general public, and of professionally involved stakeholders, although not in entirely similar ways, and neither fully formalized-, while the engagement of stakeholders in recovery and post-accident phases seems less developed. Of course, post-emergency engagement will be largely based on a particular event, which is hard to imagine in very concrete and elaborate ways beforehand, but which might offer a clear stimulus for engagement once it confronts different stakeholders.

Finally, different challenges for stakeholder engagement are identified, which in essence all relate to difficulties in engaging different stakeholders; either professionals (first responders) or the general public. Apart from the notion that some stakeholders not necessarily desire formal engagement, some recommendations can be formulated, based on the reflections of the respondents. First, providing the necessary resources (time, people, money) is a prerequisite for organizing sustainable stakeholder engagement. It can also be taken into account that some non-experts stakeholders (such as citizen scientists) wish to be involved, but may lack the needed resources and recognition; involvement of citizen scientists is perceived as an opportunity (e.g. in relation to crowdsourcing for disaster response), although experts stress the need for technical guidance. Second, engaging stakeholders should have a transparent outset and be sufficiently interactive (no mere information-provision), as actors want their concerns to be heard and dealt with. And finally, it might prove helpful to set up initiatives which are not exclusively focusing on EP&R, but which integrate EP&R with other risks by which stakeholders might be affected. In this way, stakeholders' investments can be limited, and their involvement can be streamlined. Additionally, the example of the Belgian partnerships for radioactive waste disposal shows how CSO's or other associations (e.g. parents or youth associations), not concerned primarily with EP&R can become and active stakeholder in this field.





3.1.4. Description of case study **2**

Stakeholder engagement in EP&R is partially characterized in Belgium by formal initiatives and mechanisms developed by governments, non-governmental organizations, emergency responders, operators, and experts (see for examples case study 1). These initiatives and mechanisms comprise actions such as public awareness raising activities (e.g. public information campaigns), workshops or emergency exercises, and are aimed at involving a wide variety of stakeholders in preparedness for the different accident management phases. At the same time –besides formalized, top-down forms of stakeholder engagement-, also informal, 'uninvited', or unruly forms of participation can exist [6]. These may comprise public protests, grassroots citizen science activities, or individual actions taken up by private citizens or consumers. Contrary to formal participatory activities, -which can be termed the 'core' of stakeholder engagement-, these activities at the 'periphery' of participation are not institutionally embedded and are generally not considered as viable or legitimate emergency responses in their own right. In addition, they are not well documented and remain under-researched – although arguably, public protests (e.g., against nuclear power plants in Belgium) are a notable exception.

In an effort to shed light on these informal participation practices, this case study consists of a purposeful mapping of 'participation' in EP&R in Belgium. The research approach combines insights from systematic mapping and methodologically inclusive research synthesis. We approach purposeful mapping as a qualitative, interpretive, and connective method that seeks "... to produce new knowledge by making explicit connections and tensions [...] that were not visible before" [7]. In this case study, different sampling strategies are used to identify and analyze previously unconsidered or marginalized 'stakeholders' and participation forms. This is done with the aim of accounting for variety and difference, given the observation that EPR today is increasingly characterized by diversity and complexity.

Data is collected through the use of online search engines (Google), with a range of keywords and combinations of keywords, both in Dutch and French (the two most spoken languages in Belgium)¹. These key words –entailing terms such as 'nuclear', 'radioactive', 'emergency', 'stakeholder', 'participation', 'citizen', 'public'- attempt to gain an overview of different forms and initiatives of stakeholder engagement in the Belgian EP&R field, and sampling is thus as exhaustive as possible. The period of interest comprises ten years, ranging from august 1, 2009 until august 1, 2019. In a second phase, this sample was scanned for outlier cases, meaning that initiatives and forms of stakeholder engagement which seemed unique, remarkable or deviant were selected. This second phase of sampling separated the 'periphery' from the 'core'.

¹ The (combination of) key words used: (noodplan OR Kernongeval OR radioactiviteit) AND (participatie OR betrokken OR panel OR debat OR vergadering OR workshop OR actie OR protest OR network) AND (stakeholder OR burger OR bevolking) / (plan d'urgence OR accident nucléaire OR radioactivité) AND (participation OR implication OR commission or débat OR réunion OR workshop OR action OR manifestation OR network) AND (intervenant OR citoyen OR citoyenne OR population) / (noodplan OR kernongeval OR nucleair OR nucleaire OR kernramp OR radioactief OR radioactiviteit OR radioactieve) (participatie OR betrokken* OR panel OR commissie OR debat OR vergadering OR workshop OR actie OR demonstratie OR protest OR network OR network OR rapport OR interventie OR mobilisatie OR briefing OR campagne OR artikel) AND (spreker OR burger OR bevolking OR populatie OR inwoner) (Tihange OR Doel OR Mol OR Dessel OR Fleurus OR kerncentrale OR "nucleaire site" OR "nucleaire sites" OR kernreactor) / (plan d'urgence OR accident nucléaire OR radioactivité) AND (participation OR implication OR commission OR debat OR reunion OR workshop OR action OR manifestation OR réseau OR nucléaire OR rapport OR intervention OR mobilisation) AND (intervenant OR citoyen OR citoyenne OR population) AND (Tihange OR Doel OR Dessel OR Mol OR Fleurus) / (nood OR ongeval OR incident OR accident OR ramp) AND (participatie OR betrokken* OR panel OR commissie OR debat OR vergadering OR workshop OR actie OR demonstratie OR protest OR network OR netwerk OR rapport OR interventie OR mobilisatie OR briefing OR campagne OR artikel) AND (spreker OR burger OR bevolking OR populatie OR inwoner) AND (Tihange OR Doel OR Mol OR Dessel OR Fleurus OR kerncentrale OR "nucleaire site" OR "nucleaire sites" OR kernreactor) AND (plan OR kern OR nucleair OR nucleaire OR radioactief OR radioactiviteit OR radioactieve) / (urgence OR accident OR désastre OR catastrophe) AND (participation OR implication OR commission OR debat OR réunion OR workshop OR action OR manifestation OR réseau OR rapport OR intervention OR mobilisation) AND (intervenant OR citoyen OR citoyenne OR population) AND (Tihange OR Doel OR Dessel OR Mol OR Fleurus) AND (nucléaire OR radioactivité OR plan)





3.1.5. Analysis and results - Case study 2

Overall, different Google searches returned more than 400 'hits' which are deemed relevant regarding different forms of stakeholder engagement in the Belgian EP&R field. This number however entails both webpages in French and Dutch, which means that also several duplicates are included of pages which exist in both languages.

Overall, the majority of cases reported on relate to initiatives taken by (federal and/or local) authorities, and focus on the provision of information to the public or other possibly affected stakeholders regarding issues related to preparedness for a nuclear emergency, often directly referring to the (revised) Belgian Nuclear and Radiological Emergency Plan. These cases make up the 'core' of stakeholder engagement in the Belgian EP&R field. Examples are a campaign set up by the federal nuclear authorities on what to do in case of an emergency, Q&A sessions organized by the federal and local authorities to inform citizens on the revised nuclear emergency plan, or information on local emergency plans (partly dedicated to nuclear emergencies) on websites of local municipalities.

However, a range of activities and initiatives are identified, which seem to deviate from this core. These cases form outliers situated in the 'periphery' of stakeholder engagement in the Belgian EP&R field. They were identified as 'outliers' for a range of reasons, and thus call for reflection on the issue of stakeholder engagement for a variety of causes.

Cases for example differ from the 'core' regarding the actors who initiated the stakeholder engagement. An initiative was for example taken by citizens of neighbouring countries to file complaints against Belgian authorities in other to protest the Belgian NPP's. As such, this initiative urges for reflection on the (geographical) boundaries defining stakeholders: to what extent are stakeholders living beyond certain borders actually perceived as stakeholders, and to what extent is their engagement enabled and/or perceived as legitimate? Another example regarding a deviant 'initiator' is found in the case of a local partnership focused on the issue of nuclear waste, which set up a campaign to inform citizens on what to do in case of a nuclear emergency, inter alia through school visits. Although their prime focus lies on engaging with initiatives on the management of radioactive waste, this case demonstrates how it may be worthwhile to further investigate how existing networks or groups of stakeholders can be/are enrolled in engagement regarding EP&R.

Second, references are also found to forms of stakeholder engagement which differed from the core because of the (non-human) objects involved. For instance, in a local municipality a group had formed which argued for a higher visibility of and better care for a 'radioactive artwork', which was erected in their town decades ago. This 'artwork' (in essence a large concrete block with a low radioactive core and a letter to the future) was redecorated by these citizens, and they campaigned for a better and more visible spot for the monument in the town, in order to honour its message. Another example of a deviant case revolving around a particular object, is a reference to an entrepreneur who advertised to refurbish basements into emergency basements. Whether such a case should be perceived as a form of stakeholder engagement (through market mediation) or as a form of commodification of safety, can offer fruit for further reflection.

A third way in which initiatives seem to deviate, is in their very opposition to the 'core' formed by (federal) authorities. Protest actions and critiques by NGO's towards (earlier versions of) the Belgian Nuclear and Radiological Emergency Plan can be fitted under this header. They are these sorts of initiatives which incite an awareness on challenges to dominant understandings of EP&R and stakeholder engagement, which open attentiveness to possible evolutions in these dominant understandings under pressure of this opposition, and power dimensions at play in this field.





A fourth example of how forms of stakeholder engagement can be perceived as deviant, is through their regional specificity. It was noticed for example how in Wallonia –the French speaking part of Belgiuma substantial number of cases reported on how local citizens directed questions, comments and criticisms regarding nuclear emergencies and nuclear emergency planning to their (local) authorities. In Flanders –the Dutch speaking part of Belgium-, however, such cases were not identified. Hence, while this form of engagement seems to belong to the 'core' of stakeholder engagement in Wallonia, in Flanders it seems to be inexistent, or at least very much part of the 'periphery'. This as such urges for attentiveness towards regional and contextual differences regarding stakeholder engagement.

A fifth and final example which is identified, are 'outliers' in terms of the medium which is used for stakeholder engagement. An illustration which can be fitted under this case, is the use of 'Facebook Live' sessions to organize a Q&A on how to behave in case of a nuclear emergency. These sessions were organized by the federal authorities, and open to the general public (mostly directed to schools and teachers), and in this sense seem to belong to the 'core' of stakeholder engagement in Belgian EP&R. However, the use of social media in this particular way was not encountered in other cases, and calls for an awareness and reflection on how the mediums used to enable stakeholder engagement can actually affect this engagement, e.g. in terms of stakeholders involved, forms of participation (dis)couraged, and the durable character of engagement.

3.1.6. Main findings - Case study 2

Through identifying initiatives and forms of stakeholder engagement which seem more at the 'periphery' of the Belgian EP&R field, this case aims at opening relatively unexplored avenues for future research on stakeholder engagement. Instead of highlighting those initiatives and actions which currently dominate EP&R in Belgium, and as such are characteristic of this particular context, the sampling of deviant cases offers insight in 'what could be'. This means that a particular interest is taken in how stakeholder engagement could be organized, how it could evolve, and what possible alternatives there are to the core which dominates (perceptions about) current engagement.

In this sense, it is important to highlight that neither core, not periphery are static; the boundaries of what is dominant and what is an outlier constantly evolve, and are fluid; what is identified as an outlier might become dominant one day, or what dominates might move to the periphery over time. The idea of stakeholder participation in itself might be a good example of this; while rather marginal decades ago, it now has pervaded much policy discourse and action. As such, the notion of core and periphery opens up opportunities to reflect on the distribution of power and resources, and how these evolve over time.

Finally, a word on the use of internet searches for mapping cases of stakeholder engagement. The choice to use an internet search engine was a deliberate one, as it provides access to this information which is also easily accessible to the general public. At the same time, however, we acknowledge that such searches can never provide a fully exhaustive mapping of 'what is out there' in terms of stakeholder engagement. Some initiatives which were identified in earlier searches for example did not come up anymore in later searches, and some activities which we know to exist where not found through this mapping exercise. While this might be perceived as a limitation to the methodology employed in this case study, it should also be perceived as an indication of the powerful position of search engines as gatekeepers to information. Given their powerful position as access points to information, these search engines can play an important role precisely in the evolution of the boundaries between 'core' activities and initiatives, and outliers in the 'periphery' of stakeholder engagement.





3.2. France

3.2.1. Description of case study

The case study focuses on stakeholder involvement experiences that took place in the last 14 years (2005-2019) in the Steering committee for the management of the post-accident phase of a nuclear accident or a radiological emergency (CODIRPA) chaired by the French Safety Authority (ASN).

In 2005, the National directorate for nuclear safety and radiation protection (DGSNR) which since 2006 has become the French Nuclear Safety Authority (ASN), established a Steering committee for the management of the post-accident phase of a nuclear accident or a radiological emergency (CODIRPA), at the request of the Government. This process involves a large number of stakeholders affected by post-accident management (public authorities, operators, NGO's, TSO experts, etc.) through Working Groups (WGs) and Pluralistic Committees. Four main phases in this process can be identified:

- 1st Phase (2005-2007): Progressive involvement of non-institutional experts
 - Co-construction at the national level of the first elements of the policy with a pluralistic participation
- 2nd Phase (2008-2010): Consultation at the local level
 - with local administrations, decentralized State services (Prefectures) and representatives of the civil society (municipalities, NGOs)
- 3rd Phase (2010-2011) Co-construction at the national and local level
 - o Local Emergency Response Plans
 - Drills and exercises (including a PA dimension)
 - o Guidelines for the so-called transition and late phases
 - o Publication of the "Policy elements for post-accident management of nuclear accident"²
- 4th Phase (since 2012): Evolution of the policy after the Fukushima accident
 - More severe accident taken into account (long-lasting releases) and complementary works in progress (Water resource management, Waste management, Q&A to Local Health professionals, Guidance for population living in a contaminated territory)

The objective of the case study is to analyse the process of stakeholder involvement in a view to understand why this process was set up, what were the benefits for the elaboration of the Post-Accident Policy, and to identify obstacles for its implementation and lessons learned. The description of the process is based on:

- the experience of CEPN who participated to several WGs,
- the point of view of the Head of the Ionizing Radiation and Health Department of the ASN, in charge of managing CODIRPA (semi-structured interview February 2019),
- the point of view of one member from an NGO (EDA Environnement et Développement Alternatif), who participated since the beginning in the CODIRPA (semi-structured interview, April 2019),
- the use of documents published by ASN.

Guiding questions which were addressed:

- 1. What were the rationales for stakeholder engagement, the final objectives? Has there been a critical evaluation of the attainment of objectives and of the impact of stakeholder engagement? Have there been any guided improvement activities? How was the concept of stakeholder engagement process understood and implemented?
- 2. What forms of acceptance, resistance, denial, or alteration of engagement do you observe or encounter? And how do these forms change over time?

² The report is available on the ASN website: <u>https://www.asn.fr/Prevenir-et-comprendre-l-accident/Gestion-post-accidentelle/Elements-de-doctrine</u>





- 3. As there is no prescription in France for SH engagement in the elaboration of the Policy for postaccident, would it be necessary to have such prescription?
- 4. Which challenges and opportunities do you encounter for stakeholder engagement in your specific case?
- 5. What are the benefits of implementing stakeholder engagement processes (in the situation studied)?
- **6.** What are the lessons learned for the establishment of efficient stakeholder engagement processes?

3.2.2. Analysis and results

Creation of CODIRPA

In June 2005, when the CODIRPA was created, there was no regulatory framework that imposed by law to start the reflection about post nuclear accident management issues and to establish specific response plans for hypothetical events that were considered 'unlikely to occur' (these emergency and response – i.e. post-accident – plans are now required since the transposition of the European 2013/59/Euratom directive into the French Law). However, the nuclear safety and radiological protection authority together with the ministries and other concerned stakeholders, drafted a government circular (DGSNR/DHOS/DDSC 2005/1390³), which defined the organization of the State services for radiological emergency situations not covered by already existing emergency response plans in case of disasters or malevolent acts (ORSEC, PPI-ORSEC or Pirate-NRBC). This circular stated a new sharing of responsibilities for the crisis response and public information between the licensees and operators, the prefect of department, the DGSNRTSOs (e.g. IRSN), firefighters, social medical and health services, the mayors, etc.

ASN⁴: In this context, four trigger factors/events have fostered the creation of CODIRPA:

- the strong commitment of the President of DGSNR (A.-C. Lacoste) to initiate at the national level a pluralistic reflection about post-accident management and display exemplarity on the international scene in this domain,
- the dissemination of feedback from post-Chernobyl accident management synthesized in the PAREX study in 2005 (e.g. ETHOS and CORE projects implemented in Belarus)⁵,
- the aftermath of 09/11 terrorist attacks in USA, which raised the possible vulnerability of nuclear installations to such external events,
- the publicization and reinforcement of the campaign of pre-distribution of stable iodine tablets in the vicinity of nuclear power plans ('PPI perimeters'), started since 1997.

Shortly (about one year), the promulgation of the 'TSN Law' - no 2006-686, 13 June 2006 - on Transparency and Security in the Nuclear Field improved and clarified the roles and duties of the nuclear safety regulatory body which, at this occasion became an independent administrative authority (renamed ASN). This law laid down a set of measures to prevent accidents in nuclear installations and to limit the possible consequences. At the same time, it met with procedures guaranteeing public

³ <u>Circulaire DGSNR/DHOS/DDSC n° 2005/1390 du 23 décembre 2005</u> relative aux principes d'intervention en cas d'événement susceptible d'entraîner une situation d'urgence radiologique hors situations couvertes par un plan de secours ou d'intervention

⁴ All texts in France case study in Italic reflect personal opinion from the person interviewed

⁵ <u>https://www.asn.fr/Prevenir-et-comprendre-l-accident/Accident-de-Tchernobyl</u>





information on nuclear activities and (new) structures for topical consultation and discussion with the interested parties.

The creation of CODIRPA, one year before the TSN Law, anticipated these new status and prerogatives of ASN with the strong willingness to engage stakeholders and interested parties in the reflection and construction of the French post-nuclear accident management policy.

Stakeholder Involvement process

At the national levels, four ministries (Home Affairs, Environment, Agriculture, Health) were invited to participate, as well as Technical Support Organisations (TSOs) for developing or strengthening regulatory and technical capabilities in radiological protection and safety (IRSN⁶), health and medical surveillance (INVS⁷), industrial risks (INERIS⁸). It has to be noted that, from the beginning, it was decided to engage non-governmental organizations and environmental protection associations including antinuclear NGOs in the process of elaboration of the doctrine (e.g. ACRO, EDA, CLCV, Robin des Bois, CEPN)⁹. Only one of them refused to participate to the works (CRII-RAD¹⁰). Some did not refuse explicitly but never participated (e.g. FNE¹¹) to the elaboration of the first elements of the post-accident management doctrine.

EDA: The EDA Association - Environment and Alternative Development - was created in 1990, with the initial objective to the fight against soil pollution and its impact on the health of the population. It continues now its activities, including all sorts of pollution. Since its creation, this Association wanted to carry out its actions in a constructive way, being involved as stakeholder in the search for alternative solutions with all the actors concerned.

When ASN contacted EDA asking for its participation in the CODIRPA, EDA was already involved in several actions in the nuclear field undertaken by IRSN (Department on Openness to Society). However, there was initially some reluctance of some members of the Association to participate in CODIRPA because they thought that the NGO 'should not compromise with the nuclear power lobby'. But there was also a willingness to participate from several other members (including the former president) because it was an opportunity to form their own opinion and to play a watchdog role by being able to intervene in decisions.

It has to be noted that some of the NGO representatives pointed out that they participated to the work on an *intuiti personae* basis, without an official agreement (and sometimes expressions of reluctance) made by the General Assembly or other members from their associations.

In a first phase, it was voluntarily decided not to include operators in the CODIRPA process as there were other existing instances to discuss the topic with them. In 2008, they were invited to join together with representatives of neighbour country authorities (Luxemburg, Switzerland, Germany - Belgium

⁶ IRSN : Institute for Radiation Protection and Nuclear Safety – <u>www.irsn.fr</u>

⁷ INVS : French Institute for Public Health Surveillance – invs.santepubliquefrance.fr

⁸ INERIS : French National Institute for Industrial Environment and Risks – <u>www.ineris.fr</u>

⁹ ACRO: Association pour le Contrôle de la Radioactivité dans l'Ouest - <u>www.acro.eu.org</u>; EDA: Environnement et Développement Alternatif - <u>eda-lille.org</u>; CLCV: Association nationale de défense des consommateurs et usagers <u>www.clcv.org</u>, Robin des Bois: Association pour la protection de l'Homme et de l'environnement <u>www.robindesbois.org</u>; CEPN: Centre d'étude sur l'Evaluation de la Protection dans le domaine nucléaire – <u>www.cepn.asso.fr</u>

¹⁰ CRII-RAD: Commission de recherche et d'information indépendantes sur la radioactivité - www.criirad.org

¹¹ FNE : France Nature Environnement – <u>www.fne.asso.fr</u>





declined) and representatives of the Local Liaison Committees (they are pluralistic public information committees established in the vicinity of each nuclear installation, whose roles and prerogatives were reinforced by the TSN Law in 2006).

The sustainability of the participation of external stakeholders was ensured by specific funding (T&S costs reimbursement and grants given to 3 environmental associations).

EDA: Travel and accommodation expenses for attending meetings were covered by ASN. In addition, the Association received an annual grant that allowed to cover other operating costs of the association.

In fact, there was no specific condition for being a member or participating at CODIRPA work. Postaccident issues include so many aspects that it was not considered *per se* as a domain of expertise. As such, there was no verification of possible conflict of interest.

A that time, CODIRPA was the first and unique pluralistic structure launched and steered by ASN: the President of ASN chaired personally the CODIRPA as well as all plenary meetings.

ASN: the participation of the President as a chairperson was a key element. It showed to members (about 40, initially) that they were engaged into a decision-making structure that had a real capacity to foster changes.

Functioning of CODIRPA

Although there is an official mandate (signed by the Prime Minister – and renewed periodically every \sim 5 years) for the DGSNR (and then ASN) to elaborate a policy for post-accidental management, the methodology and endpoint of the work has never been explicitly defined, nor its organization and agenda.

ASN: "The path is made by walking" could be the motto of the CODIRPA. For instance, there was no agreement of rules of engagement by establishing in advance the scope, objectives, roles, rules and risks of engagement at the beginning, or by defining how possible conflict would be solved and how and by whom the participation to the work would be considered or evaluated.

<u>1st Phase</u>

Step by step, different topical working groups have been created, according to the most important issues identified in the CODIRPA plenary group sessions (36 meetings have been organized since 2005). The first ones that have been created were all chaired by people who did not belong to ASN staff. This was a willingness of the President of ASN. The memberships of the different working groups were also pluralistic with people representing regulatory bodies, TSOs, and NGOs. All in all, about 300 people have worked in the different WGs.

Topics, mandates of these WGs, deliverables and reports have been defined progressively, through a consultation process between members (without vote).

List of the Working Groups (first phase)

- WG 1 Lifting of protection emergency provisions
- WG 2 Life in contaminated rural territories
- WG 3 Radiological Consequences and dose assessment*
- WG 4 Medical and health surveillance





- WG 5 Indemnification
- WG 6 Contaminated crops and soils and waste management
- WG 7 Organization of Public Authorities
- WG 8 Public Information
- WG 9 Impact on water resources and water management
- *WG 10 Hypotheses used for assessing radiological consequences and doses

ASN: It has to be pointed out that the TSOs, and especially IRSN were fully involved in WG activities and they provided their expertise to satisfy the CODIRPA members' demands. The strong implication of TSOs has been an important condition of the success of CODIRPA works. Sometimes, specific demands could be hastened by the existing system of referral between ASN and IRSN, but most of the times and especially at the beginning of CODIRPA works it was not necessary to proceed this way.

The results, advancement and perspectives of the work were presented at an international seminar¹² on 6-7 December 2007 (200 participants from 18 countries). The first 6 WG reports were made available and published on the ASN website at the beginning of 2008.

2nd Phase

During the second phase of CODIRPA works (2008-2009) the first elements of policy have been consolidated and new scenarios of accidents have been studied.

In parallel, a procedure for local actor's consultation at the Prefecture and municipality levels was put in place, in order to confront the first elements of the doctrine with local ('on-the-field') reality, vulnerabilities and stakes. Especially, the consultation focused on the post emergency - transition to recovery phase aspects: a specific guidance for this phase was presented and discussed at the local level by different stakeholders (decentralized State services, local elected people, and NGOs). Elements of doctrine have been incorporated into *communal safeguarding plans* (PCS) that have to be activated in case of an emergency (i.e. natural or industrial catastrophes).

EDA : In 2009, the Association organised at the local level (Lille city, North of France), a conference to discuss nuclear post-accident preparedness and the involvement of citizens and local actors in the governance of major risks. However, they found difficulties in involving some anti-nuclear actors (who didn't want to be involved in such discussion) or local elected people (afraid of this subject and cautious to participate to such a conference, especially before new elections).

<u>3rd Phase</u>

Two pluralistic committees ("commissions") were then created to look at the post-accident issues in a more transversal/chronological way in order to complement the topical approach adopted during the first phase: the first one was devoted to the "transition" phase, the other worked on the "longer term" aspects. The commissions were in charge of the elaboration of Guidelines for the so-called *transition* and *late* phases and the drafting of the "first elements of doctrine ("*Policy elements for post-accident management of nuclear accident*"). These activities were almost terminated by the end of 2010, and

¹² <u>https://www.asn.fr/Prevenir-et-comprendre-l-accident/Gestion-post-accidentelle/Archives-et-travaux-connexes/Seminaire-international-post-accidentel-nucleaire-du-6-et-7-decembre-2007</u>





were presented at a second international seminar¹³ (5-6 May 2011) organized - by unfortunate coincidence – less than 2 months after the Fukushima accident. (The report was finally published in 2012).

Finally, the main post emergency - transition to recovery phase - aspects that were included in the CODIRPA doctrine have been incorporated into the governmental French National Response Plan¹⁴ for "Major nuclear or radiological accident(s)" (2014) elaborated by the SGDSN (General Secretariat for Defence and National Security).

The post-accident phases were challenged during drills and national emergency exercises that have been conducted from 2009, and more routinely from 2012, using the CODIRPA elements of doctrine.

4th Phase

The fourth phase of CODIRPA (since 2012) is still running several WGs and is now adapting the elements of doctrine taking account of post-Fukushima accident feedback. The membership has not evolved a lot, and most of those who were members at the beginning of the process are still participating actively to the works, even if some are now occupationally retired.

ASN: there is now a need to revitalize the activity of CODIRPA at the occasion of the new mandate (which started in 2019). The new members are probably less active, maybe because they do not have the impression to be pioneers and because Fukushima commences to be far behind. New topics of reflections must be found to revitalize the works, for instance: - role and usage of social medias, - tools for increasing awareness at the local level, etc as well as new modalities and methodologies of implication (e.g. serious games vs. exercises, territorial microprojects on a specific question related to post-accident management/preparedness, etc., with the implication of regional branches of ASN, new actors in different regions). Moreover, the representatives of NGOs who are involved for 13 years in CODIRPA activities are still the same persons. Weariness is inevitable; it is regrettable that younger generations are not much represented in the WGs. The renewal and rejuvenation of membership should be considered.

EDA: The current work of CODIRPA is too much theoretical, and there are repetitions and redundancies in discussions compared to the first phases. Moreover, we always find the same persons in the WGs or Plenary Sessions. Different stakeholders should now be involved in the process.

List of the Working Groups (second to fourth phase)

- WG 11 issued a specific report on the impact of "long duration releases", which noticeably led to the enlargement of the PPI perimeter around NPPs at a distance from 10 to 20 km.
- WG 12 elaborates recommendations to update of the elements of doctrine at the light of post-Fukushima accident experience as well as according to the evolution of capabilities in modelling and monitoring.
- WG 13 on the "Involvement of territories in preparedness to post-accident management" (GTPP), which is led by a NGOs representative, is developing different tools for increasing the

¹³ <u>https://www.asn.fr/Prevenir-et-comprendre-l-accident/Gestion-post-accidentelle/Archives-et-travaux-connexes/Seminaire-international-post-accidentel-nucleaire-du-5-et-6-mai-2011</u>

¹⁴ Plan national de réponse Accident nucléaire ou radiologique majeur - Numéro 200/SGDSN/PSE/PSN - Édition Février 2014. - <u>http://www.sgdsn.gouv.fr/uploads/2018/02/plan-national-nucleaire-fevrier2014.pdf</u>





awareness of the local communities to nuclear accident management and the roles of professional in such circumstances:

- A subgroup elaborates a specific guidance for answering to people's concerns and worries about living conditions in a potentially contaminated area;
- A subgroup answers to hundreds of questions that could be asked by patients to their medical doctors or other health professionals;
- A subgroup elaborates a website dedicated to post-accident management from the perspective of local actors (education personnel, health professionals, elected people, associations, etc.)

Other WGs have not yet issued their final recommendations:

- WG 14 Waste disposal and storage
- WG 15 Marine environment (not started)
- WG 16 Superficial and underground water resources (not started)

Today, as already said, the European directives (which have been transposed in the French Law) stipulate that Emergency & Response plans have to be designed in advance. The regulatory framework does exist, but it is quite 'light' and not too much prescriptive even if reference levels have been established.

Evaluation of the process

Evaluation by the representative of the Safety Authority, ASN

The richness and usefulness of CODIRPA works is derived from its **unique and original process of engaging new stakeholders (in fact, their engagement was self-initiated), especially local NGOs, in decision-making**. The complexity of post-accident management issues imposes to engage a lot of different people, with skills and competences in different domains, and with local perspectives and acute knowledge of the potentially affected territories. **It has been difficult to involve all needed types of stakeholders** (for instance CODIRPA failed to involve jurists).

The stakeholder **participation** to CODIRPA activities was **not prescriptive**. It is difficult to conclude that it is the best way of engaging people. In France, other types of committees (like the Local Commissions of Information - CLIs) have been created by the way of regulation. Most of the time it brings more rigidity, less flexibility, imposes strict quotas in the number of representatives of the different bodies; in such committees, participants 'take sides' instead of giving personal opinions.

There was no formal evaluation process put in place to assess the whole process of CODIRPA. Nevertheless, it has to be noted that there has been no reservation made by members about the reports issued by the WGs and the "elements of doctrine" published in 2012. However, during plenary sessions, objections have been expressed by different members.

The keys of success of CODIRPA until now are: **the absence of a prior structuration of activities, the accessibility and openness** (no numerus clausus), **the use of a common language, the search for consensual decisions and orientations of the works** (i.e. the least objectionable by the largest number of members).

The CODIRPA has shown its efficiency (it was not straightforward that the results of the work will be finally incorporated into the national policy!). A similar approach could be also useful with regard to the emergency phase management (elaboration of the PPI perimeters, for instance). The implementation of a pluralistic approach in the elaboration of national plans/doctrines, especially in the nuclear domain, remains quite rare. In France, two other experiences of co-construction and





concertation with external stakeholders, that are supported by ASN, have to be mentioned: the PNGMDR (Radioactive waste and matters management plan) and the COFSOH (Orientation Committee on Organizational and Human Social Factors).

Evaluation by the representative of an NGO: EDA

What was **much appreciated** in the participation of CODIRPA are:

- A *climate of respect and trust* in the working groups and the plenary meetings.
- The construction over time of a mutual understanding between all members of the WGs and the experts from the Authority or the TSO (IRSN).
- A direct language, without waffle.
- The opportunity to **share with experts the territorial issue**s.

What was *missing* or *should be improved*:

- There were **not enough dissemination and sharing of the wor**k outside the WGs. Notably there were not enough involvement of ASN or IRSN in actions to disseminate the Post Accident Doctrine at the local level, among the Local Commissions of Information (CLIs) or inhabitants.
- There is a feeling that **the work has not been valued at the height of everyone's commitment**.
- Some **key actors are missing**: farmers, professional unions, journalists and the media, representatives of the different colleges of the CLIs.

For the future:

- There is a need to think about new means of communication, notably for the young generations (web, apps, ...).
- There is an issue regarding the perpetuation of the involvement of some NGOS within debating fora, due to an ageing of their members and to difficulties to involve younger ones.

3.2.3. Main findings

Keys of success of the stakeholder engagement process in the elaboration of the post-accident management doctrine in France:

- The absence of a prior structuration of activities
 - The WGs were created step by step, in order to answer to the questions raised in the discussion
- The accessibility and openness to any member in the WGs (no numerus clausus),
- The construction with time of a common language, a mutual understanding between all members of the WGs, creating a climate of respect and trust
- The strong involvement of the President of ASN, personally chairing the plenary sessions
- The strong implication of TSOs
- The search for consensual decisions and orientations of the works (co-construction process)

Challenges associated with a long process (CODIRPA work started in 2005)

- Feeling of weariness of some participants, together with redundancies of the subjects discussed in the WGs
- Difficulties to have a renewal and rejuvenation of participants
- Need to revitalize the CODIRPA and to find new modalities and methodologies of implication
 - Local meetings on specific thematic, involving the relevant actors
 - Exercises, territorial microprojects on a specific question related to post-accident management/preparedness, etc., with the implication of regional branches of ASN, and new actors in different regions
- Need to involve new stakeholders, especially at local level, and/or representing actors not yet involved but who have a major role to play in post-accident management.





Challenges associated with the involvement of some NGO's

- Availability of their members
 - Few members can devote their time sufficiently over the long term
 - o Solicitations into RP related topics increase with time
 - Ageing of members and difficulties to have young generations involved
- Financing issues
 - NGOs, especially the smallest ones, are facing financial resource depletions.

3.3. Slovak Republic

3.3.1. Description of case study

The Slovak legislation regulates emergency preparedness, planning and emergency response plans in several pieces of legislation listed in [8].

In case of an incident or an accident at a nuclear installation involving release of radioactive substances (in accordance with the Act No. 42/1994 Coll.I. on civil protection) the **competent authorities to deal with the crisis** are:

- municipality and municipality mayor if an event does not extend beyond the municipality territory,
- the District Office and the head of the District Office, if the incident does not extend beyond the cadastral area of the municipality and does not extend beyond the boundary of the territorial jurisdiction of the District Office,
- the District Office at the seat of the region and the head of the district Office at the seat of the region, if the incident extends beyond the boundary of the territorial jurisdiction of the District Office and does not extend beyond the territory of the region,
- the Government and the Prime Minister, if an event extends beyond the region's territory.

Each of these authorities manage relief works within its territorial competence and prepare proposals of measures to address the crisis and supporting documentation for adopting decisions to effectively address the situation on the endangered area.

The principle of subsidiarity is generally valid in the area of civil protection. This means that an emergency is supposed to be solved at the lowest level. In case the government structures at that level cannot deal with the situation or in case the emergency spreads over a bigger area, a higher level of government organization takes over the coordination of response. In practice, the higher levels are generally ready to take over from lower levels on their own accord. A typical situation when principle of subsidiarity is applied would be when there is an international aspect to the emergency.

District offices and municipalities, according to the Act of NC SR No. 42/1994 Coll. I. on the Civil Defence, are **publishing information to the public** on the website or on a public notice board, while there is a 30 days period, during which the affected public can raise comments. Justified comments shall be reasonably taken into consideration in developing the public protection plan. Information is reassessed and updated, as needed; once updated, it is published as a minimum on a three-year basis. The public information includes in particular information about the source of threat, the possible scope of an emergency and the consequences in the territory and environment affected, hazardous properties and identification of substances and preparations which might give rise to an emergency, information on the method of public warning and rescue efforts, tasks and actions in an emergency, particulars of where further information relating to the public protection plan can be obtained. State administration authorities and self-governing bodies issue **manuals for the public** containing advice for the public which are aimed to furnish as much as possible information on how to act and behave in natural





disasters, accidents and calamities. Since 1999 the Ministry of Interior has issued the popular and educational **periodical "Civilná ochrana, revue pre civilnú ochranu obyvateľstva"** addressed to all who are actively involved in the performance of tasks under Act of the NC SR No. 42/1994 Coll. on public civil protection, but also to all readers interested in the public civil protection issues. The revue brings in the respective columns up-to-date information, runs a methodical supplement devoted to practical performance of civil protection tasks, etc. A separate space is devoted to local government as well.

Updating **Handbooks for the population** – part of 2-year calendars (recently 2017 - 2018) and their distribution in the emergency planning zones is done regularly.

The complexity of the emergency preparedness and post-accident management has been recognized and was analysed deeply in the Slovak Republic.

It has to be stressed that within the framework of the international and national projects enhancing emergency and post-accident preparedness, response and recovery management in Slovakia, specific actions have been undertaken to develop and apply methods and models of stakeholder engagement and participation to allow and support dialogue and to foster the dissemination of a practical radiation protection culture within the civil society.

There was **evolution of the actions** as new projects brought new dimensions and the process could go deeper in details. The success of the actions was the main motivating factor for the wider range of stakeholders, and willingness to actively participate was evolving with time. Nowadays the emergency and post-accident recovery management processes are improving and some are changing conceptually. This influences also the preparedness process to potential radiological events.

More details on particular actions could be found in the reports and articles in the references given to the Slovak Republic case study.

Furthermore, active participation in the organisation of training activities on the use of decision support tools (mainly RODOS) in decision-making on recovery issues resulted in better structured and more inclusive decision processes at national, regional and local levels; accurate information for the emergency and recovery stakeholders; and more efficient use of existing decision support systems and tools, with a focus on real problems and solutions.

Emergency response plans are tested and reviewed during the exercises on regular basis and are revised at regular intervals based on the exercise conclusions.

The rationale for stakeholder engagement is mainly:

- to create structures that would be able to react promptly in case of an accident, and
- to identify, establish and create a shared understanding of the roles, responsibilities and expertise in case of an accident.

A collaboration emergency drill in concurrence with local state administration and self-governing authorities, ÚJD SR emergency response centre (ERC), and other ERC units, as appropriate (fire brigades, heath care, army, etc.), is undertaken on a three-year basis. The exercises are attended by observers and referees, who after completion of the exercises evaluate their course. On the basis of their conclusions, measures are taken to improve the activities of emergency response organisation.

The framing of the emergency and post-accident issues changed during the course of the process of stakeholder engagement and involvement since 2003 in the Slovak Republic, especially the post-accident issue. Emergency exercises with participation from national and local stakeholders including



post-accident issues have been initiated by nuclear safety authorities and VUJE in a position of TSO and partly supported from research projects (EURANOS or NERIS-TP projects).

More transparently, it was confirmed by the preparation and conducting of the INEX 4 Exercise when different groups of stakeholders were formed, who were well prepared to communicate and coordinate their activities, but who also recognized gaps and issues for improvement in the area of emergency preparedness and post-accident management. The international exercise INEX 4 is given here in case study as an example.

In relation to the national activities the recent DROZD 2018 exercise is given as an example of stakeholder engagement and involvement in such kind of activities.

For the analyses of stakeholder engagement within emergency preparedness and response process the activities of the Ministry of Interior of Slovak Republic and their Civil Protection Offices at different level are presented.

3.3.2. Analysis and results

INEX4 Exercise

INEX 4 was an issues-driven table-top exercise focusing on Consequence Management and the Transition to Recovery in response to malicious acts involving the release of radioactive materials in an urban setting developed by WPNEM - OECD/NEA and adapted, prepared and conducted in the Slovak Republic on January 26–27, 2011 (just before the Fukushima accident), with 76 participants from 36 organizations.

The main goals of INEX 4 were to allow participating countries to i) test or identify elements for improving their arrangements for consequence management and transition to recovery in response to a malicious event involving dispersion of radioactive materials in an urban area (affecting people, critical infrastructure, environment, economics, etc.), and ii) exchange experiences with other countries that have conducted an INEX 4 exercise. To meet these goals, the following common key objectives had been set:

- Test and investigate the adequacy of national arrangements (including national coordination and communication), and where appropriate international arrangements, for consequence management and the transition to recovery;
- Review and share information on approaches to consequence management and the transition to recovery, in order to identify good practice and to allow review and improvement of national and international arrangements; and
- Identify key areas and approaches to international coordination and communication in order to provide a basis for improvements in international emergency management systems.

While the scope of response to an urban-based malicious event may be broad, in order to present a manageable exercise from the perspective of planning, conduct and evaluation, the following specific topical areas had been elaborated:

- 1. Decision-making on protection strategies for consequence management and the transition to recovery:
- 2. Public health, including issues in information and communication;
- 3. Monitoring and assessment, including capability assessment;
- 4. Safety and security of populations and infrastructure;
- 5. Planning for recovery.

It was the **first of such kind of exercise** prepared, organized and conducted in the Slovak Republic.





The exercise itself took place in January 26-27, 2011. A VUJE representative worked as facilitator within the discussions during the exercise. The expertise and consultations during exercise preparation have been led by VUJE; the scenario was developed in co-operation with all crisis management representatives involved in the exercise. The early phase issues of an accident were covered by national table-top exercise held on December 9, 2010 out of the scope of an international INEX4 exercise. Willingness to be involved in radiation protection decision making processes or to implement radiation protection actions was recognized and expressed by stakeholders involved in the process.

The active involvement and engagement in complex issues and active participation in different activities contributed to the collaboration of a wide range of stakeholders. All together 36 different stakeholders participated in the exercise with an overall number of participants of 76. Essential participants were Bratislava District Authority, Nuclear Regulatory Authority, Regional office of environment, Ministry of Defence, Slovak Medical University, Public Health Authority (national and regional level), Regional Headquarters of Police, City district Bratislava - Nove Mesto (local stakeholder), Slovak Hydrometeorological institute, National Emergency Centre - Health Rescue Centre, Hospitals representatives, Department of Health Crisis Management of Bratislava Region, Regional Veterinary and Food Administration, Bratislava Watyerprovider, Transport organisation and Railway of the Slovak Republic, City District of Bratislava - Ruzinov (local stakeholder), City Hall Bratislava, Ministry of Foreign Affairs, Regional Headquarters of Fire and Rescue Service, Rescue and Transport Health Service and others.

It was the first time that Police have been so widely involved in such an exercise. A wide range of medical institutions and authorities have been involved for the first time as well.

The exercise scenario was situated to Bratislava, capital of the Slovak Republic with vehicle-borne improved explosive device detonated near the Orange Arena (Ice Hockey Arena) during the Ice Hockey World Championship which took place in the end of April 2011.

Taking into account the location of the accident just near the Ice Hockey Arena - the place of IIHF World Championship in the time of match, the Slovak legislation, experiences of exercise players and Safety Project which was under development were taken into account.

Radiation protection culture came into play strongly and radiation protection of police and first responders has been improved significantly as a consequence of the INEX 4 exercise and lessons learned.

The exercise outputs encouraged deeper analysis of the situation in the Slovak Republic in the area of emergency planning and preparedness. The subsequent Fukushima disaster and response to the situation accelerated the process of design and development of: a) the Concept of the organisation and development of Civil Protection and b) the Concept of organisation, operation and development of the Integrated Rescue System in the Slovak Republic.

This exercise has shown the **efficiency of the process of stakeholder engagement and involvement.** Stakeholders expressed the clear message, that without all activities including education and training, development and improvement of radiation protection culture the INEX4 exercise will not happen. Lessons learned have been recognized and reported to the OECD/NEA WPNEM working group [9] as well as at the governmental level of Slovak Republic.

Findings:

• Preparation and conducting of the early phase of an accident response and crisis management with all stakeholders and units involved was essential as such kind of an accident with such a wide range of measures has not been exercised before;





- The exercise was a big step forward in the clarification of the interconnections of stakeholders and their responsibilities and in crisis management of an emergency situation including "dirty bomb" aspects in an urban area/environment with radiological consequences;
- The detailed accident scenario was essential in discovering new problematic gaps which have to be solved and enhanced;
- Medical and Public Health staff appreciated the initiative very much and exercised interoperability of the Ministry of Health units and authorities together with hospitals. Based on a detailed evaluation form they are able to develop and update the documentation and guides;
- From the point of view of Public Health Authority of Slovak Republic such kind of accident is manageable, but it could be problematic with a severe nuclear accident;
- Preparedness of the Regional Crisis Staff was on a good level;
- The information flow and exchange of information was improving in the process of exercise development and preparation and was at higher level during the exercise itself.

Conclusions and recommendations:

- It is essential to have developed a new/updated National Emergency Plan, which was not revised since 2003 in the area of nuclear or radiological accident; it is needed to develop it at the complex basis for any possible accidents/events not only nuclear/radiological;
- It should be good to have established a Centre of Crisis Management where experts, specialists and representatives from different branches, who are politically independent, will be present and will be prepared to provide advice to the Central Crisis Staff at governmental level in case of a nuclear accident;
- An advisory body to the Central Crisis Staff is missing, which could have key competences in emergency planning and preparedness and countermeasure implementation;
- It is needed to provide information and present the European Handbooks on recovery management to the Safety Council so, that they can be systematically implemented for use under particular branches;
- Monitoring of radiation situations has to be improved essentially;
- Terrorism is at front of interest nowadays (RA, BIO), therefore it is essential and necessary to equip police and rescue services with means of radiation protection and personal detectors in a systematic and durable manner;
- Improvement of communication between rescue teams and responders has to continue;
- The financial resources for such kind of accidents have to be preserved and their form of availability and guides for use has to be developed;
- The new and systematic solution for public information is needed. Working with media representatives, their training and education and improvement of the way of communication is necessary. The emergency web site of the Nuclear Regulatory Authority has to be improved in the near future, but it will be used only for the purpose of information provision in case of population affected by the emergency releases from nuclear installations;
- Continue preparing and conducting other exercises in the future, in order for the provision of information to be increased and emergency preparedness and response to be improved based on the exercise results.

National DROZD 2018 exercise

The national interoperability exercise DROZD 2018 took place in October 25, 2018 [10]. The exercise was based on the simulated incident under the conditions NPP Bohunice V-2 at the representative full scale simulator and its progression to the severe accident. The simulated incident was related to the release of radioactive materials out of the NPP site, implying that protective measures for the NPP





Bohunice employees and population near the Bohunice NPP were required. Exercise players: NPP - the whole emergency response organisation, including employees; Nuclear Regulatory Authority; Regional level: the whole Regional Crisis Staff in Trnava; First responders; Schoolchildren.

The observation conducted by VUJE representative under the CONFIDENCE project [11] took place in two settings: i) Regional Civil Protection and Crisis Management Office and ii) check point: schoolchildren evacuation - arrival and decontamination. One observer participated in each setting under the exercise timing coming through them one after another.

Pictures given in the Annex 5.3 are documenting Regional Crisis Staff (Trnava) work during the table-top exercise and particular steps within different protective actions at check point "Vincov les".

The essential aspect for the ENGAGE project case study was the observation made in "Vincov les" check point where monitoring, decontamination of transport means, rescue staff and evacuated people and medical care have been demonstrated. The observation we are using in that case study is related to stakeholder engagement and involvement.

The observer from VUJE, who was actively involved in the process of stakeholders' engagement and involvement met at place one stakeholder from Ministry of Interior working at Central Monitoring and Management Centre of Ministry of Interior (CMMC). This person was participating in a workshop organized within the PREPARE project and supportive national project [14]. He was trained and actively participated in discussions. Nowadays he is retired but still working in the area of civil protection and providing professional training, also for helpers in current exercise. He knew the director of a private secondary school situated in Sladkovicovo, municipality next to "Vincov les" area providing helpers for that DROZD 2018 exercise - boys and girls in age around 16 studying graphics of digital media. The director of the private secondary school with schoolchildren participated also in the exercises HAVRAN in 2012 (just after Fukushima accident in 2011). He has been participating for the second time in such kind of an exercise together with schoolchildren. The director is very much motivated. He worked previously at different positions in the area of civil protection, also related to use of ammonia and was a chief of the Civil Protection Crisis Staff. The director of the school was present at the exercise, making video recording and providing video documentation of the exercise.

Among the challenges identified in relation to stakeholder engagement it was recognized that **local actors in communities with personal experiences linked to nuclear** (either in close proximity to a nuclear facility, or having been involved in different activities related to radiation protection or emergency preparedness and response) **are more willing to engage in emergency exercise and post-accident issues**.

Civil Protection Offices activities

As a part of 2-year **Calendars updating Handbooks for the population** (recently 2017 - 2018) and their distribution in the emergency planning zones is done regularly within the emergency planning zones of Bohunice (21 km) and Mochovce NPPs (20 km) to each family. The Calendar itself contains information at the date when sirens notifying the accidental release of radioactivity are tested.

The Calendar contains the map illustrating the emergency planning zone with indication of sectors which form the basis for the evacuation declaration. The important emergency telephone numbers are included as well as telephone numbers to the Regional Crisis Management Departments, Emergency Preparedness office of NPP Bohunice and NPP Mochovce and Information centre of both NPPs.





The information on availability and distribution of Calendars to the inhabitants within the Emergency Planning Zones is made by local administration representatives who are educated and trained by Regional Civil Protection Office members on a regular basis. After each new elections the newcomers and the whole Municipality Crisis Staff are educated and trained in the area of emergency preparedness and response.

More details are given in the Annex 5.3.

The education activities at local level including non-institutional organisations are very important for civil protection. Since 2007 first in **kindergarten and** then extended to the **schools** the **activity** focusing on civil protection and behaviour during the emergency situation is conducted each year in the nice environment of the Smolenice Castle, NPP Bohunice emergency planning zone area. The activity was initiated by Smolenice kindergarten director in collaboration with the police office with a focus on civil protection under the leadership of Peter Opalek, uncle of small and proud Marek. The interest of children in different activities related to civil protection provoked the extension of activity to the regularly prepared and conducted education activity in the middle of June each year. In June 2014 just a few days before the prepared regular education activity Peter Opalek tragically died. Since 2015 the activity has changed into the Memorial of Peter Opalek. Nowadays a wide range of stakeholders including NGO's, volunteers, parents of children in kindergarten and schools are participating in preparation and conducting that education activity.

The main focus is given on civil protection under the emergency situation and management of the accidents. The third stand from seven as usual is related to the civil protection means, their different forms (professional and improvised) for individual protection in case of an accident. Children are educated how to recognize the wind direction. They are educated what to choose and pack in the evacuation bag in order to avoid packing dangerous and unnecessary things. The instructors are members of the Civil Protection Office from Trnava Regional Crisis Staff.

Six kindergarten and seven classes from Smolenice elementary schools have participated in the activity in 2017 [12]. The representatives of Trnava region, mayors of villages and towns in the Trnava region, Police and Fair services, NGO's, seniors from senior centres and population from six neighbourhood villages have participated as observers. The directors of the kindergartens and schools in the region participating in the education activity have expressed their big interest and gave feedback on such kind of education. Many of them especially appreciated the stand related to the activity in case of emergency as those activities are not very much known to children. **Participation of children together with parents is a big advantage.** The experiences received in a **way of play game** are essential for building trust to first responders and importance of their daily activity and work. The education in a form of adventure and exercises for children is very effective and is sought-after by different schools and kindergartens in the region.

Exercising of the arrangements for establishing contacts with other Member States (INEX5)

The rationale for stakeholder engagement is mainly:

- to strengthen the preparedness at the local/national level by setting up dedicated fora, develop new decision-support tools (e.g. the European Handbooks) or adapt existing tools (e.g. RODOS Decision Support system) developed within the EU projects.

In December 2015, a 2-day interoperability exercise was organised with the scenario of developing a simulated incident at NPP Mochovce entitled INEX 5 in a series of international exercises, organized by the Organisation for Economic Cooperation and Development - OECD and its Nuclear Energy Agency -



NEA. The INEX 5 exercise, as staff exercise, addressed the aspects of the management of emergencies in the notification, internal and external crisis communication and interfaces within the Slovak Republic and also in relation to international organizations at all levels of management from the Central Crisis Staff (hereinafter only as "CCS") and crisis staffs of the district offices to the activities of the license holder.

INEX 5 exercise took place in Slovakia in December 2015 with participation of 78 representatives of 22 emergency response organisations. The exercise was oriented to respond to an accident initiated by natural disaster, connected with a nuclear emergency that leads to a significant off-site release of radioactive substances. A specific emphasis was on alerting, internal and external crisis communication and interfaces inside Slovakia as well as in relation to international organizations on all levels. The national objective of the exercise was coordination of state administrative authorities since the start of event – emergency due to the unfavourable meteorology situation, all levels of event classification at the NPP and early phase of the accident, update of the national emergency plan.

22 findings were observed. Some of the most important in relation to stakeholder engagement are:

- interconnection of particular elements of the monitoring network is missing
- insufficient ensuring of the countermeasures realisation based on the off-site emergency plans related to the region and municipality
- insufficient personal protective equipment of first responders
- insufficient personal protective equipment of providers of health care, more emphasize on preparedness of the medical care providers for population protection (education and training of medical staff)
- insufficient equipment of the state administration offices with communication means
- missing or weakly ensured permanent staffing of ÚVZ SR and County offices (24/7 duty)
- missing revised National Emergency Plan,
- missing revised National Notification Plan as a part of National Emergency Plan,
- missing plan for public communication
- ensure the system of priority calling for crisis management authorities,
- put in use the Recovery Handbooks via developed directive by the Ministry of Interior
- there is no instruction on providing the feedback to the NRA about implemented, ordered or planned countermeasures on population protection
- revision of the procedure on immediate order of iodine prophylaxis just after the sirens sound
- improvement of the public awareness about the protective measures
- missing regulation on implementation of iodine prophylaxis out of the emergency planning zone
- insufficient development of procedures on information exchange at national level in case of the radiation threat from other countries
- insufficient procedures on optimisation based on the EC Directive 2013/59/Euratom
- insufficient procedures of state administration offices for implementation of countermeasures in case of the accident abroad affecting SR
- insufficient procedures of the state administration offices in the area of population and goods mobility to and from the SR in case of an accident within the SR.

The Government by its resolution No. 536/2016 decided to arrange for implementation of findings together with a schedule for their implementation by the end of 2017 [13].

Conclusions and recommendations:

The international cooperation, sharing of the assessment of the exposure situation and coordinating of protective measures and public information tested during the recent INEX5 exercises confirmed conclusions from the INEX4 exercise.





The most important one is that deep review and update of National Emergency Plan is ultimately needed. In addition, the missing of a plan for public communication in case of nuclear accident and the need for creation of a unified information centre were stressed.

A National Plan for Notification which is part of National Emergency Plan is missing related to the issues of coordination, communication and interaction between responsible actors within the Slovak Republic and with neighbouring countries and international organisations by creating a common communication network.

Among the challenges identified in relation to stakeholder engagement the following have been recognized:

- Institutional stakeholders might not recognize the urgency or need for allocating resources or participating in a dialogue on the longer-term phases
- most stakeholders (even those having roles and responsibilities in case of a nuclear emergency) lack previous experience with post-accident issues and knowledge about radiation protection background
- roles and responsibilities in the longer term after an accident are not clearly identified, which hampers reflection about strategies to cope with a hypothetical accident;
- experts and media should be trained to communicate radiation-related concepts.

Scenario-based workshops and exercises - management of existing exposure situations (Postaccident management, recovery Handbooks)

Rationale for stakeholder engagement is mainly:

- to "build mutual trust and understanding between stakeholders", rather than promoting the acceptability of an accident
- to develop "robust and practicable restoration strategies"
- to share experiences about initiatives on emergency and rehabilitation preparedness and management throughout Europe, and to develop and apply participatory methods and models that enable and support stakeholder dialogue.

EURANOS project and wide stakeholders' involvement in different activities was key in the process of radiation protection culture development. Stakeholders have been directly involved in the development of the Generic Handbooks for Assisting in the Management of Contaminated Inhabited Areas, Food Production Systems and Drinking Water and Recovery Phase.

The stakeholder panel was set up and convened in Slovakia to determine the suitability of such a handbook with regard to its scope, format and content and further their customisation to the Slovak Republic conditions. The findings from the second round of stakeholder panels when they were reconvened to provide feedback on the overall applicability of the handbook -including the annexes for customising the handbook for different regions of EU- were taken into account during finalization of the first versions of the handbooks.

The seminars and scenario-based facilitated workshops within the Handbooks development and demonstrating process took place in the time period May 2005-May 2011. All together 10 seminars and workshops have been developed and conducted attended in average by 16 representatives of different groups of stakeholders in each. All Handbooks have been adapted to Slovak conditions and were made available for free to all institutions which participated in the project from Slovakia. The conclusion of participating stakeholders was that handbooks should be given the status of official national documents as a basis for their use by wider communities of specialists and organizations related to emergency





preparedness. The relation should be established in such a way that the use of handbooks will go up to the local authorities and self-government in suitable and appropriate form. NRA SR provided them officially to the Ministry of Interior and County offices for direct use and to all other institutions involved in the emergency preparedness and recovery management who expressed an interest. Unfortunately, these documents did not reach the official status at the level of legislation in the form of official guidance even if it was required by stakeholders.

Within that work presentation of rehabilitation project results in Belarus after the Chernobyl accident (ETHOS project) have been studied, analysed and discussed within the stakeholders' activities.

All this experience was used in preparation and conducting of lectures by NRA SR representatives at the Academy of Police Force in Bratislava preparing first responders together with other risks to be managed, acknowledging that radiation protection is not the only concern in a specific situation or for the target stakeholders.

Among other activities the following activities were conducted by NRA SR related to presentation of Handbooks to:

- the Mayors during the periodical training Trnava District, Malacky District, presented by the NRA SR, supervision of the Ministry of Interior
- the lecturers of the Educational and Technical Institution of the Ministry of Interior in Nitra and Spisska Nova Ves.

The NERIS-TP project provided an opportunity for the development of the process for post-accident preparedness in the Slovak Republic involving a large group of actors at the national, regional and local levels: national and regional authorities, public and private research organisations, academia, mayors of local communities, the army, first responders and operators, among others [9].

This process contributed to gaining insights not only into the complexity of the emergency preparedness and post-accident management, but also to a clearer understanding of "the relations among different stakeholders, and their roles and tasks within the post-accident preparedness process". The process consisted of seminars, workshops, training courses and exercises and "enabled a common language and a shared understanding of the challenges".

Interestingly, the process led to changes into the framing of the emergency and post-accident issues, and the commitment to develop a "decision-framing process that is inclusive and participatory, with open and two-way discussions, leading to relationships where issues can be identified, discussed and resolved, resulting in sustainable decisions", which had been the main of the engagement processes.

As shown by the analysis carried out in the NERIS-TP project, participation in the context of postaccident preparedness and recovery takes place in various forms and venues: involving interactions between national stakeholders (governmental and non-governmental) and/or local stakeholders; in emergency exercises, seminars, decision workshops, panels, among others; and ranging from consultation to cooperation between local or national stakeholders and scientists.

To support development of high-level initiatives on emergency preparedness and rehabilitation and radiation protection culture it was agreed to inform about results of stakeholders' panels more intensively also at the governmental level, what should have an effect on the future development and effectiveness of the process. The information should not only be published via media and publications in journals and conferences but should be prepared as information for the government council and referred by the Nuclear Regulatory Authority Chairman.

The Slovak stakeholder panel has shown that they are able to work together, to communicate problems, to absorb newcomers to the working groups. It was proved by **participation of representatives of Police**





(Regional Directorate of Trnava and Nitra regions) within the CONFIDENCE workshop on study of capacity of local actors to rebuild dignified living conditions, identify the uncertainties local actors are confronted with and of the resources for local actors to deal with these uncertainties and ways to improve existing emergency and post-emergency arrangements in the national context [10]. The Police representatives initiatively expressed their strong interest to participate in the workshop based on references from their colleagues and partners/stakeholder from the Regional Crisis Staff Civil Protection Offices of Ministry of Interior of SR.

Working in the form of facilitated workshops with scenarios developed using customized operational tools (RODOS, RTARC, Web-HIPRE, MCDA) makes work more efficient, focuses on possible real problems and finding real solutions.

There is a common understanding in necessity of continuation of joint meetings of stakeholders and willingness to have organized annually workshops for sharing experiences, identifying gaps and improving preparedness.

The need in training and exercising the recovery and rehabilitation issues at national, regional and local level was expressed within the stakeholder panel.

The positive experience from stakeholder engagement initiatives in one particular country or in the framework of specific European projects was in some cases an incentive for other countries to follow the example. It was the case of Slovak republic when CODIRPA in France was studied and presented in more details to Slovak stakeholder community. The workshop held in May 16-18, 2016 in Demanova provided opportunity to discuss in more detail the need of the establishment of the working groups related to the different aspects of the long-term consequences and post-accident management and their work in close cooperation with a wide range of stakeholders.

Conclusions and recommendations:

The good practice on the scenario-based workshops and exercises has to have a systematic status with the goal of assigning responsibilities for implementation of strategies for the management of existing exposure situations and ensure appropriate coordination between relevant parties providing as appropriate for the involvement of stakeholders in decisions regarding the development and implementation of strategies.

- The revised National Emergency Plan should include explicitly the responsibility and interaction with stakeholders on development and implementation of strategies.
- The conclusion from the INEX5 exercise on the development of methodological directive of Ministry of Interior and to put in practical use of the handbooks for management of contaminated inhabited areas, food production systems and drinking water has to be given in practice and not remain only on paper.

Among the challenges identified in relation to stakeholder engagement the following have been recognized:

- local actors generally lack significant time and resources required for long-term engagement on post-accident issues
- sustainability of engagement of local actors is facilitated by the availability of expertise and resources; the links established with other communities, particularly those affected by past accidents; equal influence of different actors in setting up the agenda of the network; opportunities to develop specific knowledge and influence public policy decisions on postaccident management





• sustainability of networks joining local and national actors depends on the "capacity of some actors (public or private, local or national) to steadily mobilize resources and federate stakeholders" and the existence of institutional or legal frameworks for engagement.

3.3.3. Main findings

Based on the analysis from the cases discussed deeply and illustrated by the examples given in previous chapters we can summarize particular main findings.

1. Establish a legal framework for public policies on post-accident management

As a bottom up approach took place in the EURANOS Recovery Handbooks development in Slovakia and stakeholders including local actors have been initiators of Handbook's use demonstration within the international and national projects, their wider implementation is difficult without giving that activity legal status and establishing a legal framework for public policies on post-accident management.

2. Development and employing a structured dialogue methodology

Establishing inclusive governance structures of local-national stakeholder platforms allowing all types of actors to influence the agenda and operation of the platform will provide the way of engaging with institutional and non-institutional stakeholders based on the structured dialogue methodology.

3. Provide local actors and other stakeholders with access to expertise on nuclear and postaccident issues: expert-local actors partnership

Not all actors with roles and responsibilities in emergency and post-accident management have specific radiation protection knowledge needed for development of common understanding of the issue. Continued engagement of previously participating stakeholder representatives and engaging of local actors in education and training activities, exercises and cooperative projects is the way how to reach this goal.

4. Integrate nuclear in more general disaster preparedness and response frameworks

Availability of resources for local actors to engage in preparedness and post-accident issues via educational activities and exercises starting from the kindergarten through engagement with schools up to the local and professional institutions and organisations working together will strengthen acceptance of nuclear preparedness in the lights of the general emergency preparedness and civil protection. Collaboration with local elected representatives and engaging with local stakeholders and local radiation protection and civil protection experts is the way of sustainable emergency preparedness process.

5. Develop the strategy and prepare communication with all types of stakeholders

Creating a community of local and national actors familiar with accident and post-accident issues in the preparedness phase using agreed communication tools and channels is essential need for rapid action in case of an emergency. Identifying vulnerabilities and uncertainties in the preparedness phase and creation of opportunities for collaboration and engaging with media, spokespersons and journalists in the preparedness phase via round table discussions, exercises and trainings is the way how to be better prepared for communication of different issues related to radiation protection and post-accident issues.





3.4. Slovenia

3.4.1. Description of case study

The investigation topic was EP&R information and communication as prescribed in BSS directive in practice at different levels (national, regional, local) in Slovenia. The following information has been analysed in the context of provision of information on emergency preparedness and response:

- what are available contents for different stakeholders (and in particular the public) and comparison with the BSS directive required information (Article 70 and 71),
- where are they available,
- who is involved in the development,
- how the information is communicated to the public,
- responses of different stakeholders (nuclear regulatory authority, civil protection authority, municipalities, other involved institutions, public, ...).

The objective of the case study is to find if there are differences or similarities between requirements and practice, and what recommendations and/or lessons learned can be pointed out.

According to the BSS Directive, Article 70 (more in Annex) the prescribed minimum information shall be available for the members of the public likely to be affected prior an emergency about the health protection measures applicable to them and about the action they should take. This information shall be communicated to them without any request. This information shall be regularly updated and permanently available to the public and distributed at regular intervals and whenever significant changes take place. In addition, also further elements are defined in Section A of Annex XII of the BSS Directive:

- 1. Basic facts about radioactivity and its effects on human beings and on the environment;
- 2. The various types of emergency covered and their consequences for the public and the environment;
- 3. Emergency measures envisaged to alert, protect and assist the public in the event of an emergency;
- 4. Appropriate information on action to be taken by the public in the event of an emergency.

According to the BSS Directive, Article 71 (see Annex) there is also a request for information to the members of the public actually affected in the event of an emergency. They shall be informed without delay about the facts of the emergency, the steps to be taken and, as appropriate, the health protection measures applicable to these members of the public. The information applicable to this article shall cover also relevant points listed in section B of Annex XII, such as information on the type of emergency which has occurred and, where possible, its characteristics (e.g. its origin, extent and probable development) and advice on protection, which, depending on the type of emergency could include restrictions on foodstuffs and water, simple rules on hygiene and decontamination, recommendations to stay indoors, distribution and use of protective substances and evacuation arrangements. This advice could be accompanied by special warnings for certain groups of the members of the public and announcements recommending cooperation with instructions or requests by the competent authority. As prescribed in BSS Directive those provisions had to be transposed to the national legislative system by February 2018. Therefore, the investigation was performed on the current Slovenian legislation.

Analyses include investigation of the available information as presented in the Slovenian relevant legal framework, information available on webpages and review of relevant published documents. In addition, a series of interviews with responsible staff and other relevant persons to obtain information about the information and its interpretation was performed with responsible persons at Nuclear Regulatory Authority, Civil Protection Authority, representative of Municipality Krško and Brežice and a





representative of the local community which is nearest to the NPP. The research of collected material is followed by analyses, comparisons and reporting. The collected data are recorded and analysed to answer the questions for WP2. The results of investigation are compared with legal requirements. Good practices and/or recommendations are identified.

3.4.2. Analysis and results

The investigation on EP&R information and communication as prescribed in the BSS directive in practice at different levels (national, regional, local) in Slovenia was performed as indicated in the methodology. The results include overview of desk top analyses and discussions with different representatives.

Desk top analyses

The National Emergency Response Plan for Nuclear and Radiological Accidents, Version 3.0, from 2010 (National plan) [16], is based on threat assessment and complies with the Protection against natural and other disaster act, lonizing radiation protection and nuclear safety act and other legislation. It was prepared by the *Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR)* of the Ministry of Defence (MoD) in collaboration with other authorities and adopted by the Government of Republic Slovenia. The plan covers accidents at the Krško Nuclear Power Plant (NPP), accidents in other nuclear and radiation facilities in the Republic of Slovenia (RS), nuclear and radiological accidents abroad with a potential impact on Slovenia, and other radiological accidents involving ionising radiation sources.

The important responsibilities to plan, coordinate, monitor and evaluate the implementation of this national emergency response plan have *SNSA (Slovenian Nuclear Safety Authority – Nuclear Regulatory Body)* and the *ACPDR*. At the regional level the important formal functions have *Municipality Krško* and *Municipality Brežice* which have adopted plans which include detailed analyses of protective measures taken in the event of a nuclear accident at the Krško NPP. In addition, also the nearest **local community Spodnji Stari Grad** and **Krško NPP** were taken into investigation.

Therefore, the desk top analyses on EP&R information and communication as prescribed in BSS directive (article 70 and 71) focused on the webpages of those organisations and the published documents.

Slovenian Nuclear Safety Administration

SNSA has a webpage <u>http://www.ursjv.gov.si/si/</u> where they offer several topics to the users: home with latest news (mainly their activities or their responds in case of individual nuclear issues or events), description of all nuclear and radiation facilities in Slovenia, radiation in environment with measurements of gamma dose rates in Slovenia, legal and other documents including international conventions and directives, information centre and also data about SNSA itself.

In the section on legal and other documents you can find the new Ionizing radiation protection and nuclear safety act (Atomic Act) adopted in 2017 [17] with 2 articles, transposing the BSS directive articles 70 and 71:

Article 134 (Informing the public that could be affected during an emergency)

(1) The operator of a radiation or nuclear facility and other providers of planning shall regularly inform the public about the essential facts of the emergency plans, in particular of protective measures and the manner of their implementation.





(2) Conveying the information referred to in the preceding paragraph shall be carried out without explicit requests of the public and the information shall be updated in regular time periods or upon major changes. It must be permanently available.

Article 135 (Informing the public and competent authorities in emergencies)

- (1) In case of an emergency under this Act, an operator of a facility or an operator carrying out a radiation practice shall ensure that the authority which issued the licence for carrying out a radiation practice is notified of the event within the shortest possible time, as well as other authorities competent in accordance with regulations on protection against natural and other disasters, who shall promptly inform the public in the affected area of the relevant facts of the emergency, in particular of protective measures.
- (2) In case of transport of nuclear materials, radioactive substances, spent fuel and radioactive waste, the shipper and the organiser of the transport has the obligation of notification under the preceding paragraph.
- (3) Regulations in the field of protection against natural and other accidents shall apply to the method used for and the extent of informing the general public, the public in the affected area and the competent ministries and authorities under this Article and for the procedure for regular review and confirmation of statements to the public on the important facts from the protection and rescue plans."

In the same section there is also a link to the National Emergency Response Plan for Nuclear and Radiological Accidents <u>http://www.sos112.si/slo/tdocs/jedrska.pdf</u> which includes among others:

- General Information on Nuclear and Radiological Accidents and some basic facts about ionising radiation, external and internal radiation and the consequences of deterministic and stochastic effects.
- Sources of danger with descriptions of nuclear facilities where accidents can happen in Slovenia, radiation facilities with some examples, examples of where radiological incidents can occur and how accidents abroad could impact Slovenian population.
- Emergency measures envisaged to alert, protect and assist the public in the event of an emergency, like initial notification, and then separately for case of accident in NPP, for other facilities and accidents abroad,
- Information on actions and measures to be taken by the public in the event of an emergency, again for accidents in NPP and in general for all accidents.

In the National plan there is also a section which describes how the information flow for the public should be organised: Krško NPP sends the notification of an incident within 15 minutes after the determination of a level of risk. Otherwise, information is sent every 30 minutes during an incident. National-level draft press releases are prepared by the SNSA and, if possible, coordinated with the entity responsible for the incident. The first national-level press release is formulated and submitted for publication by the SNSA. Further press releases are formulated and submitted for publication by the SNSA in cooperation with the Public Relations Office of the Ministry of Environment and Spatial Planning (MESP), until the activation of the Republic of Slovenia (RS) Civil Protection (CP) Headquarters. Following the activation of the RS CP Headquarters, press releases, based on drafts of the SNSA, are formulated, updated and submitted for publication by the RS CP Headquarters and their Public Relations Office. Press releases are submitted every three hours or every 30 minutes following any major change.

In the SNSA section on information centre there is a high variety of information, like assistance to the parties, different trainings, conferences and seminars, inspection decrees, national reports and reports of expert missions, INES scale and events, and also individual issues. Under this last topic there is also an area with information in case of nuclear or radiological events which was just recently updated





<u>http://www.ursjv.gov.si/si/info/posamezne_zadeve/ob_izrednih_dogodkih/</u>where the following is provided:

- Some information on what extraordinary events are, where radiological or nuclear accidents can happen, links to threat and risk assessments, links to two new leaflets (ionizing radiation in case of accident and first responders),
- There is also a link to additional national and international documents related to EP&R http://www.ursjv.gov.si/si/zakonodaja in dokumenti/dokumenti/,
- Link to Rules on the use of potassium iodide from 2010 and 2014,
- Link to WHO Guidelines for use in planning and responding to radiological and nuclear emergencies for lodine thyroid blocking from 2017.

Administration of the Republic of Slovenia for Civil Protection and Disaster Relief (ACPDR)

ACPDR host the website <u>http://www.sos112.si/slo/</u> with much information which include also data on EP&R in case of nuclear or radiological accidents. In the section on protection against natural and other disasters <u>http://www.sos112.si/slo/page.php?src=sv1.htm</u> there are two areas with relevant information. The threat assessment in Slovenia in case of nuclear or radiological accidents from January 2019, adopted by ACPDR, <u>http://www.sos112.si/slo/tdocs/ogrozenost_jedrska.pdf</u> and risk assessment for nuclear or radiological accident in Slovenia <u>http://www.sos112.si/slo/tdocs/ogrozenost_jedrska.pdf</u> and risk assessment for nuclear or radiological accident in Slovenia <u>http://www.sos112.si/slo/page.php?src=os17.htm</u> from September 2018. Both documents are new and basically address various information which is relevant in case of any nuclear or radiological accident in Slovenia. Threat analyses include descriptions of all nuclear and radiation facilities and activities, possibilities for different accidents and descriptions of possible developments of accidents in nuclear facilities, with use of radioactive sources, crime act, orphan sources, transportation of radioactive and nuclear substances, drop of satellite with radioactive substances, ships on nuclear power, nuclear accident abroad. For each of the potential accident also measures are described. In the document on risk assessment related risks are identified and assessed.

The National Emergency Response Plan for Nuclear and Radiological Accidents http://www.sos112.si/slo/page.php?src=os121.htm_is adopted in July 2010 and would need to be updated. It is prepared according to the structure defined in the Decree on the Contents and Drafting of Emergency Response Plans. Just recently, in April 2019, [18], the government adopted an amendment to this decree where BSS directive Annex XII, section A, Prior information to the members of the public likely to be affected in the event of an emergency (in connection to Article 70 of BSS directive) and section B, Information to be provided to the affected members of the public in the event of an emergency (in connection to Article 71 of BSS directive) were adopted. According to the amended decree, the new requirements shall be implemented in two years. The information related to BSS directive, article 70 and article 71, is provided in the analyses of SNSA.

In addition, there is a variety of information found on webpages:

- How to react in case of nuclear or radiological accident where also brief information is provided <u>http://www.sos112.si/slo/page.php?src=np21.htm</u> about what to do in case of an accident:
 - o alarm signal would start, with information how to react on public media,
 - each individual measure is briefly described (sheltering, ITB, evacuation, measures for protection of food, water and feed, ...),
 - o further information and contacts are given.
- Protection in case of nuclear and radiological accident and use of iodine tablets http://www.kalijevjodid.si/ where several leaflets are available with basic information.
- How to act in case of nuclear accident where information is given for the local population near the NPP, what to do and where to go in case of Krško NPP accident <u>http://www.kalijevjodid.si/pdf/nek_zlozenka.pdf.</u>





Municipality Krško and Municipality Brežice

Both municipalities have adopted plans which include detailed analyses of protective measures taken in the event of a nuclear accident at the Krško NPP. They are available as electronic versions: for Krško municipality from 2012 https://www.krsko.si/files/other/news/71/109784Obcinski%20nacrt%20ZiR%20za%20jedrsko%20ali% 20radiolosko%20nesreco%203 1.pdf, [19] and for Brežice municipality from 2013 https://www.brezice.si/obcinska_uprava/zascita_in_resevanje/ [20].

Both plans are harmonised with the Regional Emergency Response Plan for Nuclear and Radiological Accidents <u>http://www.sos112.si/db/file/Brezice/jedrska_radioloska_maj2017.pdf</u> [21] for Posavje adopted in 2012. The content of the plans is similar as they are aligned with the prescribed formats.

Information as requested by BSS directive, article 70 and 71, is at the same level (practically the same) as it is in the National Emergency Response Plan for Nuclear and Radiological Accidents. Some specific information, like telephone numbers of the municipality, where population can get information about an accident, instructions for citizens for implementation of evacuation in case of an accident in Krško NPP, an overview of shelters in the municipality of Krško, instruction for citizens for the implementation of protective measures in case of an NPP accident, are given in annex and are not published on the internet. However, in the leaflet *How to act in case of nuclear accident* which is available on webpages (https://www.krsko.si/post/89422, and

https://www.brezice.si/obcinska uprava/zascita in resevanje/).

In addition, also the nearest **local community to Krško NPP Spodnji Stari Grad** (only 500 m away from NPP) was checked for information – there is no specific information for this community in relation to the EP&R in case of nuclear accident.

All plans, also municipal and regional, include in chapter 10 Personal and mutual protection with the following text: *In order for the inhabitants to efficiently implement measures for the protection of their health and lives, they must be fully informed of the effects of radiation, its danger, the level of risk, as well as all possible and necessary protective measures. Inhabitants receive in advance all necessary instructions regarding the method of notification in the event of an accident, the type and levels of risk as well as the necessary protective measures and their implementation. This statement, which foresees sharing of information and also proactive dissemination of all related instructions, risks assessments, protective measures data and their implementation, shows that the EP&R plans build on inhabitant engagements.*

According to the information on the websites, a leaflet on the use of iodine tablets was disseminated to the population in 2013 and in 2014. Also, additional information was published in 2016 regarding the recommendation that inhabitants in the 10 km zone should ask for white prescription at the local doctors to pick up the tablets at the pharmacy. The dissemination of leaflet '*How to act in case of nuclear accident*' was not reported lately, although it is present on the internet.

Krško NPP

On the website of NPP Krško <u>https://www.nek.si/sl/jedrska-in-sevalna-varnost/nacrt-zascite-in-resevanja</u> there is basic information related to the EP&R in case of a nuclear accident. There is also a short summary on EP&R for Krško NPP with brief information about the content of the plan, which has 8 chapters. On this webpage also a classification of levels of risk is provided. The given information includes:





- Levels of risk (0 unusual event, 1 alert, 2 site emergency, 3 general emergency) and basic description, what is included in EP&R for NPP, and how it link to national, regional and municipal plans,
- Link to leaflet How to react in case of nuclear or radiological accident (see above);
- Protection in case of nuclear and radiological accident and use of iodine tablets http://www.kalijevjodid.si/ where several leaflets are available.

The information is almost the same as in all other webpages. The only difference is the summary on the EP&R plan for the NPP itself.

Discussion with representatives

SNSA

According to SNSA information, in 2017 they performed 53 individual and group trainings, exercises and drills in total of 130 h with 99 participants from SID group (18 people from SNSA, plus ACPDR and JSI). The national level exercise is held once per 3-5 years. For dissemination of approaches in EP&R and information to local population the responsibility is with Municipalities (Krško and Brežice) and the NPP operator. In exercises the local population is very rarely involved (almost not). Transposition of BSS in view of information provision (BSS Directive article 70 and 71) was applied to the new Atomic Act, the details (the annex XII from BSS Directive) are included in the amendment of the Decree on the Content and Elaboration of Protection and Rescue Plans (within ACPDR responsibility).

Further discussion revealed that the SNSA is very well aware about the related requirements from the BSS Directive. For the purpose of complete transposition, they maintain a living document on the overview of harmonisation of the BSS Directive with national legislation. This document demonstrates that articles 70 and 71 were transposed to ZVISJV, the annex XII is in Amendment to the Decree on the content and elaboration of protection and rescue plans, adopted just in April 2019. The deadline for transposition of BSS Directive was February 2018.

The SNSA recently (in March 2019) upgraded the information on the webpage "In case of emergency" with more information and also with two new leaflets (one on the "Radiation in case of emergency" and one on issues for "First responders"). The reason was that all governmental webpages will be harmonized on a new server, therefore the content is reviewed and upgraded. These new leaflets also reflect the findings from the EPREV (Emergency Preparedness Review) mission. Especially first responders are not well informed, therefore this leaflet is also distributed at the education centre for protection and rescue, to the main police office and to the fire association of Slovenia. They also improve the information about lodine prophylaxes according to the current procedure – the citizens have to obtain white medical prescriptions to be able to take the tablets at pharmacies. They are also developing practical training for on-line certificates.

According to the SNSA the stakeholders are mainly the responsible authorities and other official actors involved in emergency preparedness and response. The responsible for coordination of all EP&R activities on national level is ACPDR and their regional offices at regional/local levels. But in practise SNSA is also involved in other activities related to EP&R, with other stakeholders, like communication with population likely to be affected in the vicinity of nuclear facilities. Although they stress that the prime responsibility to provide information is with "the operator of a radiation or nuclear facility and other providers of planning" (Atomic Act). In the case of a NPP these would include the NPP operator NEK, and municipalities which also receive funding for the activities according to the Decree on the areas of limited use of space due to a nuclear facility and due to planning of intervention measures for





a nuclear facility (from 2014). According to this decree five municipalities within 10 km around the NPP are receiving more than 5 mio €/year for assuring planning and implementation of intervention measures (article 11 of decree). SNSA also believe that the distributions of hard copies (leaflets) to the households might be a slightly old fashioned approach as the later surveys showed low awareness between citizens about the EP&R issues. Better approaches to assure information provision should be found (like social media, discussion in round tables,).

In development of information material, the SNSA cooperate with the Slovenian Radiation Protection Authority (SRPA) and ACPDR. No other risk communication experts are involved (like social scientists, psychologists,). A big challenge is always how to prepare information in understandable language which could be appropriate for the general population, and how to describe the topic not to frighten them. In fact, at the SNSA they have different employees with diverse background, which are involved in the preparation of messages.

The advantages of stakeholder engagement are according to SNSA numerous: feedback to improve the approaches and materials, constructive opinion, inputs and new insights, search for better solutions. One of the drawbacks is the time which is usually prolonged when there are many stakeholders to consult.

ACPDR

In accordance with its statutory powers, the Administration for Civil Protection and Disaster Relief (ACPDR) maintained and ensured preparedness and developed procedures for the effective response of the system to nuclear and radiological emergencies. The main efforts are therefore oriented to the transpositions of new legal provisions in the National Emergency Response Plan for Nuclear and Radiological Accidents (from 2010). Several technical bases are now under development, like new estimated times of evacuation, which will be prepared by NEK until end of 2019. Then the new version of the national EPR plan development will start and will also include all these data and also provisions from updated legislation. During its development, according to the procedure, all responsible authorities and actors will be included, so several issues could be discussed further. One of this is the current measure which foresees that in case of emergency the children in schools or in kindergartens are cared for by teachers and carers. This particular assumption is questioned by many different stakeholders (like individual citizens, representatives of municipalities, also results of a2012 survey with local population in a 3 km zone around NPP).

According to the plan it is the obligation of municipalities to inform the local population about the plan, about the risk and foreseen measures, together with a telephone number which people can use if they desire more information. It is perceived by a representative of ACPDR that the population trust the NPP operator and they are not really interested in the EP&R issues. The ACPDR also participated in several activities of municipalities, like the update and distribution of leaflets (how to act in case of nuclear accident and information about use of iodine tablets) but there was no big interest by citizens. According to the information of the ACPDR representative, a similar attitude of the local population is also observed in other EU countries.

For ACPDR the stakeholders are representatives of responsible authorities and actors included in the EP&R. They are involved in harmonisation of the national EP&R plan, which is according to the procedure also in public hearing, therefore all could provide comments, suggestions or observations. However, it is up to ACPDR to address the received comments. The ACPDR tries to include information related to EP&R for nuclear or radiological accidents also at all other events: days of protection and rescue, education and training of first responders, fairs. They participate also in activities of municipalities around the NPP if they are invited.





They have a lot of material available also at their website: leaflets, short summary information, videos and spots. In their development they collaborate with SNSA, NPP, other ministries, municipalities. They produce also specific material for people with disabilities (visually impaired and deaf), but the information for them is general and not specific for the case of a nuclear or radiological accident.

In their work and collaboration with stakeholders they can see how others are perceiving the problems and this brings also feedback for their future work and possibilities to improve the results. However, participation of many stakeholders is also time consuming as there are many views to be considered. But the participation can be seen also as raising awareness on the topic. Usually the local population is not involved in the exercises, but one exercise several years ago included also approximately 100 citizens.

Municipality Krško

Municipality Krško is responsible for municipal EP&R. The stakeholders involved in the process of planning and implementation of protection measures in case of a nuclear accident in an NPP are all citizens and administrative bodies as well as institutions in the potentially affected area. Institutions are included in the process of planning of protection measures according to their work responsibility (area). In this context it is important to know basic information about the risk.

In relation to implementation of Atomic Act articles 134 and 135, which are devoted to information to potentially affected and affected population in case of a nuclear accident, the Krško municipality among others has published the basic information on webpage in following: EP&R plan, threat assessment and leaflets (already mentioned). In the elementary schools of the municipality they started with lectures about implementation of protective measures in case of accidents, with emphases on protective measures in case of nuclear accidents. The households received the leaflet 'How to act in case of nuclear accident' (in 2014 at last state exercise NEK 2014) and a leaflet on Potassium Iodine.

The municipality also established the displays with radiation in the environment – in the city hall, in Spodnji Stari Grad and in the education centre Krško – Sevnica. Data about radiation in environment from nine measurement points are constantly available.

Municipality Brežice

The municipality Brežice is responsible for the municipal EP&R plan. They participate in EP&R planning with stakeholders such as SNSA, ACPDR – national and regional level, regional and nation civil protection headquarter, NPP itself, other municipalities and responsible actors like police (who have to close the 10 km zone). They would need to cooperate still with municipalities, in which the relocation centres are foreseen. They need to provide the information to the population and in this they collaborate with other responsible actors on the national and regional level. As part of preparedness, they have all related material published on the municipal webpage and they also try to inform the public, but there is no big interest from the public in the provided information. Once, when they wanted to present new updated information. During an emergency, national and local media are obliged to inform the public. The municipality is responsible for very concrete measures, for example, they would perform the evacuation of sectors based on the guidance (and on the concrete situation). In theory, they would need to inform in advance, as soon as possible to perform sheltering or iodine prophylaxes, but in practice they expect that information would be delayed (as was the case with big nuclear accidents, where responsible actors denied the events at first).

Exercises are organized in the municipality with other responsible actors, but rarely the lessons learned are then taken into account to develop improvement actions. The responsible actors are not really very





informed and more activities of awareness, training and education should be carried out. The exercises would need to be very concrete as they are an opportunity to see what is not functioning well, to identify mistakes and to learn. In the EP&R plans, there is no appropriate information on for example what to do with contaminated water, or the availability of sufficient and appropriate protection equipment (e.g. dosimeters) for the police (they control the closed area). Also, the foreseen measure that the institutions would take care for children is questionable, as in practice parents would go and pick up their kids. This would be very chaotic. Therefore, it can be assumed that many planned actions would not function well.

The EP&R plan was in 2013 presented to citizens; the invitation was published in the newspaper "Posavski obzornik", distributed to all households free of charge, but no one attended. Also distribution of iodine tablets was not very successful. The reasons for such lack of attention can be attributed to some observations. Panic reaction is mindless behaviour, but in case of nuclear accident it is normal and rational to escape. There would be traffic jams on roads, near schools, on bridges. People would not respect in such emergencies police instructions or any other instructions. These cases are not addressed in the EP&R plans. Also, there is doubt about timely provision of information, as they say that there would be panic. Migration crises prove these expectations – the local responsible were left to themselves (even after 9 days). They would need to improvise – many things are not organised (like protection equipment, control of food and water, relocation centres, which are opened without any facilities (football stadium)). In overall, EP&R plans are written, but in reality, there are many open issues which are not solved.

There is also the issue of how the municipality is threatened. The prevailing wind is in the Sava river direction, and many times from NPP to Brežice direction. So, it is believed that Brežice is more at risk. It was proposed to enlarge the 10 km zone, but the arguments against said that than also Croatia would be included in the zone. All EP&R plans are prepared to fulfil formal requirements. In practice you cannot really rely on those.

Local community Spodnji Stari Grad

Local community Spodnji Stari Grad is the nearest village to the NPP in the municipality Krško. The community has elected representatives and has more than 200 inhabitants. According to the representative of the community there is not a lot of information about EP&R for the case of an accident in the NPP. They understand that a plan is adopted, but with no further information on the content and the foreseen measures. They remember the EU project, where also the municipality was involved and received resources for engagement. In the frame of this project a leaflet was developed and distributed, but opinion among local is that the information was not real. They expected that they would be involved in a way, but municipality has never organised anything. In 2014 the international Nuclear Transparency Watch organised the discussion and round table, where also citizens were present along with authorities (national, regional, local, and from neighbouring Croatia) and at that time they first heard about the plans. They also remember one event in the NPP, 3-4 years ago, when steam was released, and a lot of noise was made during the night. Everybody was frightened, although this was not a radiological event. At that time the representative of the community received private information stating that it was not important event, but he did not receive official information.

It is proposed that information about risk, how the alarming would be implemented, what to do and where to go should be organised in a systematic manner by municipality, as they receive funds for such activities. In 2013 there was an exercise, which the locals remembered but population was not involved, only actors. They are aware that some information is available on the municipality webpages, but according to feedback from population, they do not know where to search and even how to understand





the messages, since the information is given in very formal language. It would be much better to have presentations and discussions locally, back to back to other events in communities, as people are interested, and they would come. The content should include, what could happen, how to protect, what to do, who would take care about the family members which are somewhere else. They are very sceptical, that people would leave their children in schools and kindergartens even if this is the official approach.

After their intervention they placed the sirens for automatic alarm on one building. The elected representatives of local community required from the municipality to inform the population about the EP&R plans. They expect that the lectures and discussions should be organised in winter times when people have more time. Even when people are neighbours to NPP for more than 35 years, if something really happens there would be panic and chaos. Also, people would need to exercise and be involved. According to the opinion of the interviewee It is ridiculous that they were much more prepared in previous country Yugoslavia when every month there was an exercise for all people and also organisations, than in own state. It would be also needed that one single point of information on a webpage is organised where all information and messages could be uploaded.

3.4.3. Main findings

The following findings can be revealed from the evaluation and analyses of available information in relation to EP&R for nuclear accidents in Slovenia. Attention was directed to the case of a nuclear accident in an NPP.

- The Slovenian legislation requires that the operators of a radiation or nuclear facility and other providers of planning regularly inform the public about the essential facts of the emergency plans, in particular of protective measures and the manner of their implementation. Therefore, the responsibility for implementation of requirements from BSS directive article 70 is given to operators and other providers of planning. That would mean the following operators: all operators of nuclear and radiation facilities, many operators from medicine, industry and research (for use of RA sources or use of devices with ionizing radiation. The providers of planning are ACPDR (responsible for national plan), ACPDR regional offices (for regional plans), municipalities Krško and Brežice (for municipal plans), other municipalities accepted evacuated inhabitants or are connected to sources of ionizing radiation (most of municipalities in Slovenia) and ministries (almost all, action plans). The responsibilities for development of plans are very scattered and include many different organisations. Therefore, it is not clear if the plans are prepared by all, if they are harmonized with the national plan, and if they cover the content which is requested also in the context of BSS Directive article 70 or as ZVISJV-1 article 134. Also, as indicated by the IAEA EPREV mission report (2017), the national plan is outdated (from 2010) and does not address the latest international (IAEA, GSR-Part 7, 2015) and national (ZVISJV-1, latest 2017) requirements. According to the information from some representatives of the local population the EP&R plans are not really known to the population and in addition, they do not really show the interest for the content. Even further, according to the opinion of the municipality representative, several issues of the EP&R plans should be developed in more detail, and also accordingly communicated to authorities, actors, institutions and population.
- In the frame of the Slovenian Atomic Act (ZVISJV-1) there is no further instruction on what information should be provided to the members of the public likely to be affected in the event of an emergency, like it is in the Annex XII section A, prior information to the members of the public likely to be affected in the event of an emergency (in connection to Article 70 of BSS





Directive). This gap was just recently addressed by the new decree on the content and elaboration of protection and rescue plans and should be included in new plans in the next two years. Analyses of the National Emergency Response Plan for Nuclear and Radiological Accidents and other relevant plans (from operators of nuclear and radiation facilities or providers of planning) revealed that all plans have almost the same information (copy-paste), but the content and its extent is very modest. The comparison of information as requested in the BSS Directive and as provided in the plans is given in the table below:

BSS Directive, Annex XII, section A	National Emergency Response plan for nuclear and radiological accident	
Basic facts about radioactivity and its effects on human beings and on the environment.	General Information on Nuclear and Radiological Accidents and some basic facts about ionising radiation, external and internal radiation and the consequences of deterministic and stochastic effects on humans.	
The various types of emergency covered and their consequences for the public and the environment.	Sources of danger with description on nuclear facilities where accidents can happen in Slovenia, radiation facilities with some examples, examples of where radiological incidents can occur and how accidents abroad could impact the Slovenian population.	
Emergency measures envisaged to alert, protect and assist the public in the event of an emergency.	Emergency measures envisaged to alert, protect and assist the public in the event of an emergency, like initial notification, and then separately in the case of an accident in NPP, for other facilities and accidents abroad.	
Appropriate information on actions to be taken by the public in the event of an emergency.	Information on actions and measures to be taken by the public in the event of an emergency, again for accident in NPP and in general for all accidents.	

The information about basic facts of radioactivity and its effects on human beings, various types of emergency covered and their consequences for the public, emergency measures envisaged to alert, protect and assist the public in the event of an emergency and on actions to be taken by the public in the event of an emergency is provided. But the extent of information is very limited and modest, and the environment is not covered. The information should be actively disseminated and given to the members of the public likely to be affected in the event of an emergency. Slovenia is small, meaning that an accident could impact the entire population, and therefore education and dissemination would need to be organised across the country in accordance to the locally adopted habits.

 In the frame of Slovenian Atomic Act (ZVISJV-1) there is no further instruction what information should be provided to the members of the public actually affected in the event of an emergency, like it is in the Annex XII section B, Information to be provided to the affected members of the public in the event of an emergency (in connection to Article 71 of BSS directive). Just recently this part was transposed to a new decree on the content and elaboration of protection and





rescue plans and should be included in new plans in the next two years. Analyses of the National Emergency Response Plan for Nuclear and Radiological Accidents and other relevant plans (from operators of nuclear and radiation facilities or providers of planning) revealed that there are several requirements about when information should be provided and also about what has to be given. The comparison between Annex XII, section B requirements and national emergency plan provisions is given below:

ANNEX XII, section B. Information to be provided to the affected members of the public in the event of an emergency	National Emergency Response plan for nuclear and radiological accident
 a) information on the type of emergency which has occurred and, where possible, its characteristics (e.g. its origin, extent and probable development); 	 the consequences of an accident; the effect of an incident on the population and the environment;
b) advice on protection, which, depending on the type of emergency, may:	 the expected assistance; the mitigation measures; the implementation of personal and mutual protection;
(i) cover the following: restrictions on the consumption of certain foodstuffs and water likely to be contaminated, simple rules on hygiene and decontamination, recommendations to stay indoors, distribution and use of protective substances, evacuation arrangements;	
(ii) be accompanied, where necessary, by special warnings for certain groups of the members of the public;	
c) announcements recommending cooperation with instructions or requests by the competent authority.	• the cooperation in the implementation of protective measures.

The analyses of the results show that some details on what to provide to the members of the public affected in the event of an emergency is requested in the Slovenian EP&R plan (it is not part of legislation). However, there are not sufficient details on the extent of information and also not all content is covered. The information should be actively disseminated, and therefore the methods, channels and its content should be developed in advance as much as possible. It can be recognised, that two leaflets are prepared, distributed (partially) and available on the internet for the local population. But as Slovenia is very small, the channels and dissemination would need to be organised across the country in accordance to the locally adopted habits.

 The arrangements for communicating with the public during the emergency are focused on procedures for issuing press releases and for providing factual information. There are no arrangements in place to ensure that public information puts the health hazards into perspective and to address public concern regarding possible health effects as it is required in BSS Directive. In addition, also due consideration shall be given to pregnant women and children as the individuals who are most vulnerable with regard to radiation exposure.





- The population within 10 km of the Krško NPP receives information about the potential for emergencies on a regular basis through public communications and leaflets which are distributed to all households. The leaflets contain information on the NPP, possible hazards, the warning system, evacuation routes, and reception centre locations. The municipalities provide additional information to the potentially-affected population in the area of the emergency using a special telephone number which is later transferred to the information centre established by the ACPDR. In case of a level 2 or 3 emergency at Krško NPP, ACPDR establishes an information centre to provide additional information for the population of the LPZ. However, a survey performed in 2012 with the local population living in the 3 km zone obtained the following results [22]:
 - Knowledge of protective measures in the event of a nuclear disaster: only partly familiar with measures (more than 50 % not or only partly)
 - Preparedness to evacuate: more than half do not have knowledge of basic key information,
 71 % do not know the place of their reception, 66 % do not know the evacuation routes
 - Preparedness at local institutions: organisation of evacuation would be a problem, not included in drills, no protective equipment
 - Evacuation of children from primary and secondary schools and kindergartens is the most critical point of the whole evacuation.
 - Evacuation of caring facilities for elderlies would be very difficult or even impossible lack of knowledge, equipment and resources.

Also, as emphasised by a representative of the local population in the discussion, the EP&R plans are not well known with no further information on the content and the foreseen measures.

- The stakeholders as perceived by the authorities are almost limited to official representatives. Only municipalities perceive the local population as their principal stakeholder. However, as the NPP is in operation already for several decades and could have wider impacts, not limited to the population near the NPP, the need for two-way communication with the potentially affected population should be more underlined in all levels.
- Some representatives pointed out that there are several advantages of stakeholder engagement, like feedback to improve the approaches and materials, constructive opinion, inputs and new insights, search for better solutions. Also, the importance of exercises and lessons learned in such events was mentioned.

3.5. Spain

3.5.1. Description of case study

The study with the title 'Stakeholders involvement in Radiation protection (Nuclear Emergency and post-accidental recovery) in Spain'¹⁵ describes the role of research institutions (such as CIEMAT, UPM and ISGlobal) and of the Spanish Radiation Protection Society in contributing to engagement of above listed stakeholders in their joint work at different levels of participation in the EP&R in at the local, national and international levels. Challenges and strengths, related to EP&R and stakeholder engagement in Spain, are detected by various groups of stakeholders at the national level and are summarised here.

This case study intended to observe and analyse stakeholders' involvement in Radiation protection (Nuclear Emergency and post-accidental recovery) in Spain:

1. How research institutions (CIEMAT & ISGLobal) and Spanish radiological protection society (SEPR) brought stakeholders together.

¹⁵ This is a summarized version, more full description of this study is expected to publish in a journal.





2. Stakeholders' narratives on the EP&R situation in Spain: what can be improved and what are challenges and benefits of different stakeholders' participation.

The aim of this study is to observe and analyse stakeholders' participation at seminars: their motivations, interest, activeness or passiveness, etc. Moreover, specifically, the goal is to analyse the stakeholder's opinions referring to Emergency preparedness and Recovery issues in Spain, its strengths and challenges, also opinions or story telling about successful activities implemented in questions of radiation protection and sharing opinions of what can be improved and what are the barriers or difficulties that exist.

Radiation protection in EP&R is linked to many different stakeholder groups: European and national legislative bodies and authorities; institutions and ministries concerned by radiation protection questions such as health, environment, consumption, emergency affairs, military and firemen, medical and other professionals, including local authorities and energy (nuclear) industries. Some NGOs or state associations/societies can also be involved in radiation monitoring and radiation protection. Finally, stakeholders also include the general public: people living near NPPs or affected by previous nuclear or radiological accidents and incidents. Effective knowledge transfer and information dissemination would not be possible without including other key players, such as educational workers, medical workers and journalists, bloggers and other social media figures.

The methodological approach on which this case study builds consists of:

- 1. two individual interviews with members of CIEMAT and SEPR;
- 2. analysis of stakeholders' discussion during events, and their replies to specific questions prepared for the stakeholders' panel workshop and the focused group discussions on stakeholders engagement (two workshops and two group discussions in total).

3.5.2. Analysis and results

Improving stakeholder involvement, including the general population, in case of nuclear or radiological emergencies is a pending issue on the agenda. The need for- and benefits of- involving affected populations were already observed in the aftermath of the Chernobyl and Fukushima accidents (Alexander, Burt, & Nisbet, 2005 [23]; Brown et al., 2016 [24]; Monteiro Gil et al., 2017 [25]; Liutsko & Cardis, 2018 [26]); as well as the important role of mass media in emergency and risk communication (Gallego et al., 2017 [27]; López-Asensio et al. [28], 2018; Prezelj et al., 2016 [29]). In Spain, the first steps towards working with stakeholders in issues of nuclear or radiological emergencies were provided by a joint effort between research institutions (CIEMAT and UPM) and governmental authorities (CSN and DGPCEE), in the framework of European Projects (eg. EURANOS, 2004). Other institutions (ISGLOBAL and SEPR) joined later on. The participation of research institutions in stakeholder involvement is crucial and brought positive results in it. Its main limitations are dependence on financed projects and non-continuity in case of finalization of findings.

3.5.3. Main findings

Good practices in stakeholder engagement:

- The first efforts to bring different stakeholders together in Spain was positively assessed by the participants, who stated: "It is easier to communicate when you meet the people in person"
- Some organizations such as the Red Cross shared positive experiences regarding communication with the general public, and their role in clarifying messages and alerting on possible misinformation





- When working with the general public, select the information to be transmitted and provide clear and concise messages
- Other good practices include Training and information courses by the University of Valencia, addressed to all first responders (firemen, health workers, civil protection, environmental agencies) with 2-3 editions per year

Challenges for improving to stakeholder' participation in EP&R (Emergency Preparedness and Recovery) in Spain:

- More explicit & clear roles (organizational chart with all relevant stakeholders involved)
- Timely, adequate & transparent communication between different stakeholder' groups
- Reduce the gap between theory and practice by working together to simplify emergency plans and prioritize human lives
- Enhance preparedness by including as many stakeholders as possible (NGOs, journalists, general public) in activities related to communication and education/training on basic radiation protection
- Improve radiation protection training (resources and motivation) among professionals involved in emergencies

4. Conclusions

The case studies on stakeholder engagement in emergency preparedness, response and recovery (EP&R) pointed out several good approaches under implementation in different national contexts, but also many gaps which should be better addressed by the responsible authorities. Stakeholder engagement in EP&R is still understood many times as engagement of formal organisations only. These include responsible authorities (like regulatory authorities for civil protection, nuclear safety and radiation protection), bodies within or under different ministries (like police, fire fighters, civil rescue forces, medical and health institutions, schools...), local authorities (municipalities and local responsible bodies) and other officials. Only in limited cases are NGOs, local population or potentially affected citizens involved as stakeholders. In several countries, the extent of engagement is limited to yearly exercises with involvement of a number of actors. Case studies also reveal that also institutional stakeholders lack many times the understanding of ionizing radiation, the related risk, and measures to be implemented in case of a nuclear or radiological accident. Therefore, besides regular engagement, trainings should also be implemented. Citizens have even less knowledge and information, and are mostly not prepared. In addition, stakeholder engagement in emergencies addresses mostly the immediate response phase, and to lesser degree the transition and post emergency phases. However, some countries started to approach those two phases as well. The BSS directive, adopted in 2013, provides possible triggers for improvement of the situation and gradual change of emergency management. Case studies demonstrated that such changes are already taking place in relation to stakeholder engagement in EP&R.

In Belgium, the revised nuclear and radiological emergency plan explicitly mentions the involvement of stakeholders in emergency preparedness, and in the transition and post-emergency phases. In practice, stakeholders were involved in the development of this revised plan through consultation processes, and some initiatives for their engagement in emergency preparedness have taken place. However, this case study also highlighted how some of the requirements found in the Belgian emergency plan are not (yet) formally translated into practice, how certain stakeholders may not wish to be (formally) involved, how





power can shape forms and outcomes of engagement processes, and how resources remain a critical and challenging factor in stakeholder engagement. A mapping exercise of 'deviant' cases moreover highlights forms of stakeholder engagement which are currently at the 'periphery' of Belgian EP&R, but which hint at possible evolutions in the ways stakeholders could/should be involved.

In France a national process for the management of the post-accident phase of a nuclear accident or a radiological emergency (CODIRPA) was established and coordinated by French nuclear regulatory authority. The process has been very unstructured and flexible, opening the possibilities for participation to variety of organizations and individuals, for joint construction of content, context and further discussions, based on common learning and feedback from all involved. The process has significant results, also due the very visible role of the regulatory authority.

In Slovak Republic experiences with stakeholder engagement, and especially local actors, substantiate the need for establishing a legal framework for public policies on post-accident management. Such requirements call for inclusive governance structures of local-national stakeholder platforms allowing all types of actors (also non-institutional) to influence the agenda and operation of the platform. Such conditions should give local actors and other stakeholders access to expertise on nuclear and post-accident issues through expert-local actors partnerships.

The analysis of a case study in Slovenia shows that even if all required documents are in place and regularly practice (with exercises, drills and other ways of trainings), gaps for effective stakeholder engagement exists. The information as requested by the BSS directive is to a certain degree transposed in the legal framework, but in way which lacks in clarity and transparency. The extent of information for the public is very limited and modest, some particular areas as requested by the BSS directive are not covered. More attention should be given to the needs of the potentially affected public which should be systematically addressed, according to the local habits. Stakeholder engagement might bring many advantages to improving EP&R, and therefore it is very important to establish ways for a continuous collection of feedback. This can be achieved through discussions, collection of opinions, surveys, reports from exercises, drills, and other activities, among others.

Spanish research institutions, governmental authorities and other professional societies, with support from European projects, have played an important role in organising workshops and other actions related to engagement of relevant stakeholders in Emergency Preparedness and Response to nuclear accidents in Spain. These joint exercises helped to create a network between different stakeholders that are not used to working together but should do so in case of a nuclear or radiological emergency. Joint participation in preparedness activities should lead to a better understanding between them and allow a more efficient response in case of a real emergency situation. Remaining challenges include providing an adequate basic knowledge on radiation and radiation risks and safety to other stakeholders such as other authorities involved, mass media, NGOs and the various publics.





5. Annex Additional details for national case studies

5.1. Details for Slovenian case study

Related requirements from BSS Directive

Article 70 Information to the members of the public likely to be affected in the event of an emergency

1. Member States shall ensure that the members of the public likely to be affected in the event of an emergency are given information about the health protection measures applicable to them and about the action they should take in the event of such an emergency.

2. The information supplied shall include at least the elements set out in Section A of Annex XII.

3. The information shall be communicated to the members of the public referred to in paragraph 1 without any request being made.

4. Member States shall ensure that the information is updated and distributed at regular intervals and whenever significant changes take place. This information shall be permanently available to the public.

Article 71 Information to the members of the public actually affected in the event of an emergency

1. Member States shall ensure that, when an emergency occurs, the members of the public actually affected are informed without delay about the facts of the emergency, the steps to be taken and, as appropriate, the health protection measures applicable to these members of the public.

2. The information provided shall cover those points listed in Section B of Annex XII which are relevant to the type of emergency.

ANNEX XII Information to members of the public about health protection measures to be applied and steps to be taken in the event of an emergency as referred to in Articles 70 and 71

A. Prior information to the members of the public likely to be affected by an emergency

- 1. Basic facts about radioactivity and its effects on human beings and on the environment;
- 2. The various types of emergency covered and their consequences for the public and the environment;
- 3. Emergency measures envisaged to alert, protect and assist the public in the event of an emergency;
- 4. Appropriate information on action to be taken by the public in the event of an emergency.

B. Information to be provided to the affected members of the public in the event of an emergency

1) On the basis of the emergency response plan previously drawn up in the Member States, the members of the public actually affected in the event of an emergency shall rapidly and regularly receive:

(a) information on the type of emergency which has occurred and, where possible, its characteristics (e.g. its origin, extent and probable development);

(b) advice on protection, which, depending on the type of emergency, may:

(i) cover the following: restrictions on the consumption of certain foodstuffs and water likely to be contaminated, simple rules on hygiene and decontamination, recommendations to stay indoors, distribution and use of protective substances, evacuation arrangements;





(ii) be accompanied, where necessary, by special warnings for certain groups of the members of the public;

(c) announcements recommending cooperation with instructions or requests by the competent authority.

2) If the emergency is preceded by a pre-alarm phase, the members of the public likely to be affected shall already receive information and advice during that phase, such as:

(a) an invitation to the members of the public concerned to tune in to relevant communication channels;

(b) preparatory advice to establishments with particular collective responsibilities;

(c) recommendations to occupational groups particularly affected.

3) This information and advice shall be supplemented, if time permits, by a reminder of the basic facts about radioactivity and its effects on human beings and on the environment.

Slovenian national legislation

Transposition of related BSS requirements into Ionising radiation protection and nuclear safety act (ZVISJV-1), Off. Gaz. 76/2017:

The definitions used in Atomic Act in relation to different stakeholders correspond to the one used in BSS directive related to the EP&R. It includes two groups: population likely to be affected and actually affected population. In the article devoted to definitions they are not described, and they are introduced just in articles. The only related definition is "members of the public" which means individuals who may be subject to public exposure.

The Atomic Act transposed several requirements from BSS directive in Slovenian legal system which relates to information provisions to different groups:

- The training programs for emergency workers must ensure that safety measures are given and regularly updated information on health risks that could be exposed to them during emergency intervention and on the necessary preventive measures in such cases. This information must take into account a set of possible accidents and means of transmission. In case of accident information shall be supplemented with current information.
- The operator of a radiation or nuclear facility and other planning entities must regularly inform the public of the important facts of the protection and rescue plans, and in particular the protection measures envisaged and the manner in which they are implemented.
- The notification referred to in the preceding paragraph must be carried out without explicitly inquiring of the public, and the information must be updated at regular intervals or in the event of major changes. They must be accessible on a permanent basis.
- In the event of an accident, the operator of the facility or the practitioner of the radiation activity shall ensure that the authority issuing the permit for carrying out the practice of radiation is informed of the event as soon as possible and other competent authorities, in accordance with the regulations on protection against natural and other accidents, which immediately inform the population in the affected area of the relevant facts regarding an emergency, and, in particular, of protective measures.
- In the case of transport of nuclear materials, radioactive materials, spent fuel and radioactive waste, the obligation to notify under the preceding paragraph shall be with transporter and the organizer of the transport.





There is also entire and detailed transposition of requirements from BSS Directive, Annex XII, section A, Prior information to the members of the public likely to be affected in the event of an emergency (in connection to Article 70 of BSS) and section B, Information to be provided to the affected members of the public in the event of an emergency (in connection to Article 71 of BSS directive) in April 2019 adopted Decree on content and development of emergency preparedness and response plans.

There is also adopted The National Emergency Response Plan for Nuclear and Radiological Accidents, Version 3.0, 2010, based on threat assessment and complies with the Protection against natural and other disaster act, Ionizing radiation protection and nuclear safety act and other legislation. It is the operationalisation of the requirements from acts. It includes among others:

- General Information on Nuclear and Radiological Accidents and some basic facts about ionising radiation, external and internal radiation and the consequences of deterministic and stochastic effects.
- Sources of danger with description on nuclear facilities where accidents can happen in Slovenia, radiation facilities with some examples, examples of where radiological incidents can occur and how accidents abroad could impact Slovenian population.
- Emergency measures envisaged to alert, protect and assist the public in the event of an emergency, like initial notification, and then separately for case of accident in NPP, for other facilities and accident abroad,
- Information on actions and measures to be taken by the public in the event of an emergency, again for accident in NPP and in general for all accidents.

Leaflets

Leaflet: How to act in case of nuclear accident, version 3, 2014







Leaflet: Use of iodine tablets

Tablete kalijevega jodida

Učinkovit ukrep za zaščito žleze ščitnice za primer jedrske ali radiološke nesreče



www.kalijeviodid.si



UPRAVA REPUBLIKE SLOVE ZA ZAŠČITO IN REŠEVANJE v sodelovanju z:

REPUBLIKA SLOVENIJA MINISTRSTVO ZA ZDRAVJE

REPUBLIKA SLOVENIJA MINISTRSTVO ZA KMETIJSTVO IN OKOLJE 8 WA REPUBLIKE SLOVEN



Dobra pripravljenost blaži posledice nesreč

Diaž posledice nesisec Verjetnost, da bi se med obratovanjem Nu-klame elektrame Krško (NER) zgodila jediska nesroča z nadločkimi vijhir na okolje, je zelo majrhan. Aklinna is tudi vejetnost, da bi nas ogradlo sevanje zandi klakšne druge radiolska ali jedna ensorte v Stovenja il sosednjih državah. Toda takšne možnosti ni mogoče uključiti zato imano na taviti občin, ogji n država načite za začičko in nelevanje tudi za takšen prime:

tudi za takšen primer. Pri jednski ali radiološki nesteči bi se v okoje lahko sprosti rediolaštime snovi radiola-tivni plini in pratni delici. Sijenje radiolativni ni snovi ali radiolativne provi bila bi bilo odvisno od vetra in drugih meteoroloških opojev. Plini bi se v znaku redičil, erosoli in deliz pa počas usedali in s padavinami sprali iz ozračja na tla. Za radiolavinami sprali iz ozračja na tak. Za radiolavinami sprali iz ozračja na tak. Za radiolavinami sprali iz ozračja na tak. Za radiolavinami sprali iz ozračje ce bi bilo bi pustu radiolavinami snovi na ogrozeme mbračju, bi bili haliko izpostubjeni zusanjemu in notranjemu radiolativnem sova i iz znovi iz radiolaktivne po bilaka, notranje pa zradi vdihavanja ali rano hrano ali pijačo.

rano hrano ali pijačo.

rano nano an pigoto Sirjenja radicaktivnih snovi, stopnje sevanja in kontarninacije s svojimi čutili ne moremo zaznati. Zato imamo samodejne merilne po-staje, ki jih kakoj zaznajo in sprožijo ustrezen odziv pristojnih služb.

Če bi se zaradi kakršnega koli vzroka v ozračje sprostile radioaktivne snovi, so med drugimi predvideni naslednji ukrepi:

umik prebivalcev v zaprte prostore – zaklanjanje,
 zaužitje tablet kaljevega jodida – jodna profilalsa – za osebe do 40. leta starosti i začasen umik prebivalcev z ogroženega okolja – evakuacija.

Tablete kalijevega jodida so učinkovite sredstvo za zaščito žleze ščitnice

svenstvio Za zakčito žleze ščitnice Ob jednik ali radioliški neseti bi bil med spotřenimi radioliški neseti bi bil med neseti telo Nakopit bi se v vlesi štimici in povešal možnost, da žiolemo za rakom ali pravočano zaubil tablete kaljevega jodda, bi zapolnil žlezo štimico zn reradiolativnim pridi v telo, izloči z telesa. Začiča s kaljeven pridi v telo, izloči iz telesa. Začiča s kaljeven pridi v telo, izloči iz telesa. Začiča s kaljeven pri otročni.

Tablete kalijevega jodida so zaščita le pred notranjo kontaminacijo z radioaktivnim jodem. Ob jedrska al radiolski nesreči bi bili v ozračju lahko tudi drugi radioaktivni elementi, zato bi bilo potrebnih več. zaščitnih ukrepov.



Zaužije tablet kaljevega jodida je predvi-deno in smiselno za ljudi do 40. leta starosti. S starostjo se možnost obolenja ščitnice zaradi sevanja zmaršjuje, zvišuje pa se razvoj neželenih učinkov kaljevega jodida, zato tudi Svetovna zdravstvena organizacija odsvetuje uporabo tablet kaljevega jodida po 40. letu. To je učinkova zaščita za mlajel judi in ado pomembna za otroka Tablete so najučin-kovitegie, če jih zaužjemo letu. Tablete so evedno snicek marjiš. Ozemuna zamada pomeni pol manjši učinek, vendar je tablete se vedno snicek ozažiti. Učinek enega odmeka traja 24 ur.

Tablete kalijevega jodida so zdravilo in jih je treba jemati v skladu s priloženimi navodili. Zaužijejo se v enkratnem odmerku, glede na starost:

Odmerek				
Novorojenčki do 1 tedna	v obilki saztopine v zdravstvenih organizacijah			
Dojenčki do 1 meseca	N tablete	/dobile in raziopile		
Otroci od 1 meseca do 3 let	½ tablete	v žici prekuturne vode		
Otroci od 3 do 12 km	1 tableta			
Otroci od 12 let naprej	2 tabletí			
Odrasli do 40 let	2 tableti			

Openerite: Est druge charde imgi labla tadi takire kaljoorge jaldat nelstone aliale, ovstat so pri kaukatajem ulivanja nadi. Padotonje inkunaje a apin to boloviti, zanaf katabi kaljoorga jaldat emeri jemat, padotes jemajinisem navada v katoli sa taditami. Ob provenu tadite r iekami se powratigut s famostenin populati okator india se pomratigut samostenin populati adata in tadi se pomratigut provide nelstani ulika Ceimate Atavatene teizar al ordan jemijer Arakata, pedpiana na Anatolio innyt, se pomratije s sujim oceknin zakotani.

Zaužitje tablet kalijevega jodida odredi poveljnik civilne zaščite in takoj obvesti prebivalce

In Tables obvesti prebnvalce Tablete kalijevega jodida lahko zaužijemo samo v primeru, će bi v oznaže uhajale radioaktime snovi zaradi jednske ali radio-loške nesveče. Zaužili biji hi slev potent, ko bi ta zaščitni kultergo odredil poveljni. Civline zaščitne Republike Slovenije in bi ma k temu pozval prek medijev obveščanja. Njegov poziv bib la takoj objavljen na spletni strani in poslan Slovenski tiskomi agenciji.

in posian sloverava tasovni agenciji. V Sloveniji imamo zadostno količino tablet kuljevega jodda. Za prebivalce Slovenije so shranjene v izbranih slovenskih boliniknicah. Ce b bi zrazdjelen ulepe zazditja tablet, bi jih predstavnik za začišto in relevanje razdelili prehvalcem na ograđenem odmorfili. Za ga-silce, policiste in relevalce, ki bi prvi posredo-vali ob jedrski ali radiciošti meseči, so tablete na sedošh njihovh organizacij Pekolvalo v okolici NIK hranjo te tablete doma.

Jedrske in radiološke nesreče se razvijajo Jedrške in radiološke nesreče se ravijajo pravljoma postopoma in je dovolj izas za razamno ravnanje in zaščito. Po prvem obvestlu o nesreči ni treba hiteti in ravnati nepremšljeno. Pozorno moramo spremljati navodila civilne zaščite.



Prebivalci naselij v okolici NEK prevzamejo tablete kalijevega jodida v lekarnah

Perkváck, U Znija v načisti naseljih v sloki M K in še into-dopini B (di s. prevamjo taktiv klajivoga jada v kladini klamah in jih hranjo dma. Prevamjo jih bezplačna zace in a duvišnie klame, pri forma perkolji posisu or. utjene katise: Antoriempa zanavanja, klaktiv je teka krani vorijanihe malado pri state imperatura do 25 °C in anaj dorega otnik.

anorga noisi. Wavelijn v radnik UK kar je v načrih radni in strivanji internane kri danožy taložijaji načilnih direpo, haniji taliče kaljivoga jadka kad gopadnače dražke, anod in supor ograzivači, kaliči si vrsti in dug vojesti je isloživali anod na ten denačji haniji taliče a ne otoče, učneci naj dobi, vrstik menaj straži poljani svojeje opadise. Ukolji na vrsti je islava doga v nači in islah ali na gierne strari svorklajivojdi si.

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Leaflet: Radiation in case of emergency and First responders

5.2. Details for Spanish case study

Workshops on EP&R with stakeholders' participation in Spain used for this case study:

- 1) CIEMAT, WP4 workshop CONFIDENCE project, with stakeholders, CIEMAT, Madrid, 27-28 of June 2018
- 2) SERP-CIEMAT-ISGlobal Seminar with stakeholders (21st of September, UPM, Madrid):

https://www.sepr.es/convocatorias/eventodetalle/374/148%7C147/jornada-taller-preparacion-frente-a-emergencias-radiologicas-y-nucleares-claves-para-la-mejora?filter_reset=1

The workshop "*Preparing to radiological and nuclear emergencies: Keys of improvement*", Jornada Taller "Preparación frente a emergencias radiológicas y nucleares: claves para la mejora" (In Spanish), UPM, Madrid, 21st of September 2018.



5.3. Details for Slovak Republic case study

Emergency planning and national organisation of emergency preparedness and response

Under the legislation of the Slovak Republic the crisis management bodies are: Government of the Slovak Republic; the Security Council of the Slovak Republic; ministries and other central government authorities; the National Bank of Slovakia; security council of the region, district office; security council of the district; municipality.

The Government of the Slovak Republic, as the supreme authority of crisis management, in compliance with the Act No. 378/2002 Coll. I. establishes a Central Crisis Staff as its executive body that coordinates the activity of government bodies, local government bodies and of other components designed to resolve a crisis situation during a crisis period, i.e. during resolution of an incident or an accident of a nuclear installation or during transport of nuclear material (but does not have a preventive function).

The chairman of the Central Crisis Staff is the Minister of Interior of the Slovak Republic.

Part of the National Emergency Preparedness Organization is also the National Strategy for Security Risks Management of the Slovak Republic adopted by the Government Resolution No. 3/2016 dated 13 January 2016. The Strategy addresses creation of a National Register of Security Threats (ranging from terrorist attacks to natural disasters through accidents of various type including nuclear and radiation accidents) including their monitoring, system for addressing them and restoration to the state before the occurrence of a potential threat.

In order to provide the necessary measures to cope with potential emergencies at nuclear installations, in addition to measures to protect the public and the economy in case of an accident with impact on the surroundings, the **national organization of emergency preparedness is structured on three levels**.

The **first level** consists of emergency committees of nuclear installations, the main functions of which are to manage work and measures on the territory of nuclear installations so that they establish the status of technological equipment, to manage measures for coping with emergency situations and to limit the consequences on the personnel, equipment, environment and public. Another function at this level is an informative function for state administrative activities on the level of local government, which secures information about the status of equipment and the possible impacts on the surroundings.

The **second level** is organized regionally and consists of crisis staff of local government and selfgovernment, the territory of which falls within the area of risk, where there can be danger to life, health or property and where there are measures planned to protect the population (EPZ - Emergency Planning Zone). This area is defined by the boundaries of the plant of nuclear installations JAVYS Bohunice (only the territory of NPP Bohunice V-1, NPP Bohunice A-1, TSÚ RAW and ISFS), 21 km around NPP Bohunice V-2 and a radius of 20 km around NPP Mochovce.

The **third level** is a national level, the Central Crisis Staff of the Government of the Slovak Republic with its supporting units (e.g. Emergency Response Centre of ÚJD SR, Centre of Radiation Monitoring Network — ÚRMS, Central Monitoring and Control Centre — CMRS). Their task is to address an emergency if the scope of an extraordinary event exceeds the territory of the region. Included on this level are emergency commissions of the licensees, which closely cooperate with the ERC of ÚJD SR, but also with local state administration. The main task of an emergency commission is to organize and coordinate quick liquidation of major and emergency events in corresponding production and distribution facilities.

To cope with emergencies at nuclear installations and their impact on the surrounding environment, emergency documentation has been developed laying down the operating procedure and organization



at the respective emergency stages at different levels of the national emergency preparedness. The licensee has **on-site emergency plans** elaborated setting forth the organization of emergency response and its implementation concerning the management of emergencies and personnel protection, including employee health protection. In addition, the licensee has operating regulations, allowing recognition and classification of an emergency event according to international recommendations. Plans for public protection in areas under risk are developed at regional level including measures on protection of public, health, property and the environment and links to the on-site emergency plan.

Internal (on-site) emergency plans and related documents are drawn up so as to ensure the protection and training of staff for the case where there is a significant release of radioactive materials into the working environment or the surroundings, and it is necessary to take measures to protect the health of persons at the nuclear installation or population in its vicinity, while creating a system, the goal of which is to introduce effective measures before the real release of radioactive substances.

Protective measures are part of the **public protection plan (Off-site Emergency Plans)**, drawn up by the territorially competent state authorities and municipalities located in the area at risk (EPZ) with a defined distance up to 21 km for NPP Bohunice V-2 and 20 km for NPP Mochovce.

The aforesaid public protection plans are linked to the off-site emergency plan of the licensee that shall be obliged to present the public protection plans elaborator with documents relating to the public protection in the area of threat.

Public protection plans developed for the region territory are subject to the process of assessment by ÚJD SR and of approval by the Slovak Ministry of Interior. They describe in detail the method of implementing measures, with selected measures containing activity by severity level and time behaviour of an incident or an accident including available and usable workforces and mean to carry out rescue works and ensure the implementation of public protection measures. Also, part of documentation are activity methodologies, databases and aids necessary for effective and proper decisions.

In an extraordinary event having a nature of a radiation incident at nuclear installation (NI), the local authorities - the crisis management bodies, provide for measures resulting from the public protection plans. These activities are carried out by the relevant Crisis Staffs (CS) that works together with the Central CS of the Government of the Slovak Republic as needed. To prevent the risk of delay in fulfilling tasks related to the public protection, the appropriate commissions are part of the national emergency response organization.

In line with the on-site emergency plan, the public protection plan and based on the assessment of the technology situation, identification of the source member, values measured by the teledosimetry system, first measurements of the radiological situation in the nuclear installation environment and the meteorological situation, the licensee provides for notification of the appropriate authorities and organizations in the area at risk and for immediate warning of the public in the occurrence of a level 2 event and of a level 3 event, respectively. Subsequently, upon a decision of central government authorities, local government and municipalities, other immediate and follow up measures are provided for, mainly of iodine prophylaxis, sheltering or evacuation, etc. These measures are to be implemented in the territories affected by the radiation event consequences, including those where the emergency consequences may spread in terms of forecast.

The Act No. 128/2015 Coll.l. imposed an obligation on the Ministry of Interior of SR to develop a National Emergency Plan for all kinds of industrial emergencies including nuclear. The National Emergency Plan is under development.





National DROZD 2018 exercise

The national interoperability exercise DROZD 2018 took place in October 25, 2018 [10].

The pictures documenting observation at Regional Civil Protection and Crisis Management Office in Trnava (Bohunice NPP region) and at check point (Galanta, "Vincov les", schoolchildren evacuation, decontamination) have been taken in agreement with the GDPR requirements confirmed by signature of attendance list by participants.

Pictures are documenting Regional Crisis Staff (Trnava) work during the table-top exercise and particular steps within different protective actions at check point "Vincov les".



Figure 1. Regional Crisis Staff - table top exercise



Figure 2. Helpers preparation and briefing - secondary school students



Figure 3. Monitoring and decontamination of bus, recording and drone observation





Figure 4. Monitoring and preparation for decontamination



Figure 5. Decontamination of persons



Figure 3. Medical care

Civil Protection Offices activities

Calendars updating Handbooks for the population contains the information at the date when sirens notifying the accidental release of radioactivity are tested, map illustrating the emergency planning zone and civil protection handbook for population.









Civil Protection Handbook contains information on:

- What to take with me when evacuation is announced
- When you own animals
- Before leaving house/block of flats
- Evacuation
- Nuclear Power Plant,
- What is radioactivity
- What is a radiation event
- Warning and notification of population
- How to protect against radioactive materials
- When receive advice on sheltering (what to do)
- When receive advice to take KI pills (what to do)
- When receive advice to evacuate (what to do)
- Who has to be evacuated
- Where will be evacuated.









The education activity at local level including non-institutional organisations since 2007 first in **kindergarten and** then extended to the **schools** the **activity** focusing on civil protection and behaviour during the emergency situation is conducted each year in the nice environment of the Smolenice Castle, NPP Bohunice emergency planning zone area.







Six kindergarten and seven classes from Smolenice elementary schools have participated in the activity in 2017 [12]. The representatives of Trnava region, mayors of villages and towns in the Trnava region, Police and Fair services, NGO's, seniors from senior centres and population from six neighbourhood villages have participated as observers. The directors of the kindergartens and schools in the region participating in the education activity have expressed their big interest and gave feedback on such kind of education.







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