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HOW TRANSPARENT IS TRANSPARENT ENOUGH? A CASE STUDY OF A MINOR NUCLEAR EVENT.

Abstract: On the 4th of June, 2008, a nuclear event occurred at the Krško NPP in Slovenia. Even though it was classified as level zero on the INES scale, the transparency policy of the Slovenian nuclear safety authorities prompted it to notify the international community. The plant was initially in an emergency state due to an unidentified leak, which in turn triggered the activation of the National Response Plan. This was the first time that the European ECURIE notification system was used outside the exercise framework. Consequently, media response was enormous and news framing varied from country to country. In this contribution we present a content analysis of the media articles related to this event and we report on the main results. The analysis included more than 200 published articles from printed and spoken media in Slovenia, the neighbouring countries, other EU member states and ECURIE members. The research methodology combined a qualitative approach with a quantitative one. Special attention was paid to the framing of the event, the messages communicated or omitted, the sources of information and the main focus of the media texts. The analysis revealed that even a transparent communication policy in a minor nuclear event by the affected country may still trigger a high intensity media coverage, emotional reactions and heated political discussion when not accompanied by an equally transparent response in the communication by international organisations. The reason lies in that the main media sources in countries with open political questions related to nuclear energy tend to end up being the politicians, rather than the resident experts.

1. INTRODUCTION

The transparent communication of nuclear authorities and operators is recognized in international documents as essential, advised and even obligatory (IAEA, 1994, 2006, 2007; *ICRP*, 1991; UNEC, 1998). However, in practice transparent communication is a challenging task due to at least three reasons. Firstly, a transparent and sound communication from the nuclear authorities towards the public is often

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hindered by scientific uncertainties (e. g. health effects of low doses), different perceptions of radiation risks (Slovic et al., 2004), and past experiences with low transparency of nuclear activities by operators and authorities (Whitfield et al., 2009). Secondly, the transparency of communication in the nuclear field might be limited for security reasons (e. g. possibility of a terrorist attack at a nuclear installation). Finally, there is a conflict of interests on how much transparency is really needed in nuclear risk and crisis communication. The different levels transparency could be summarised as:

– "public has the right to know" (UNEC, 1998),

– "specific information is privileged", to ensure safety of a nuclear infrastructure and its functioning, e. g. safe transport (Rojas-Palma et al., 2009)

– the practice of "restricted information", due to fear of misinterpretation (Visschers, 2009) or abuse of the information by general public and/or groups of pressure.

To ensure a transparent communication, nuclear emergency actors need the mass media to reach the general public. In order to manage an emergency, nuclear actors must communicate on basic questions such as: What may happen? What happened? Is there a hazard for the population? Is there a danger now, in the near future or later? What do we need to do: immediately, soon, later? (Brunner, 2002). But a control over the distribution of the type of information or what information that mass media will distribute can not be assured (Freedom of the press).

In general, to establish media attentiveness in case of a nuclear emergency should not be challenging. Nuclear events predictably induce enormous media coverage (Gamson and Modigliani, 1989). This is mainly due to the specifics of nuclear events which mostly trigger the newsworthiness. Nuclear accidents have a high catastrophic potential, they can involve high exposures and may create long lasting consequences (Dubreuil et al., 1999). High media attention to a nuclear events is also due to past contamination episodes such as the Chernobyl fallout which, even after decades, continues to induce a lot of uncertainty and distrust (Carlé et al., 2007). In general, mass media play a dominant role at all levels of communication on nuclear emergency issues (IAEA, 2006). They are the prominent information channel for the general public, being used for communication by different stakeholders and acting as the "watchdog" of society. However, media also have to fulfil the economic aspects of publishing or broadcasting, with "bad news is good news" being a well-known phenomenon in journalism. Mass media play a progressively more central role in contemporary crisis situations. They help to create, shape and terminate a crisis.

In this paper we explored the role of mass media in shaping the crisis after transparent and open communication of the main nuclear actor, in the case of minor nuclear event. What did they publishe and how did they frame the information?

We analysed media response on the nuclear event at the Krško NPP in Slovenia, which occurred on the 4th of June, 2008. Even though the event was classified as level zero on the INES scale, the transparency policy of the Slovenian nuclear safety authorities prompted it to notify the international community. The plant was initially in an emergency state due to an unidentified leak, which in turn trig-

gered the activation of the National Response Plan. This was the first time that the European ECURIE notification system was used outside the exercise framework. Consequently, media response was enormous and news framing varied from country to country. The analysis included more than 200 published articles from printed and spoken media in Slovenia, the neighbouring countries, other EU member states and ECURIE members. The research methodology combined a qualitative approach with a quantitative one.

This paper addresses the following research questions:

1.) Which countries reported about the nuclear event and what was the frequency of published media news?

2.) Did the media sources differ among the countries?

3.) What was the focus of the articles?

4.) Did the nuclear emergency stimulate the emotions presented in mass media?

The remainder of this paper is organized as follows. In the next section we describe more in detail the nuclear emergency event used as a case study, as well as the methodology used for media analysis and coding. The results and discussion are presented in section 3, followed by the conclusions.

2. METHODOLOGY

2.1. Description of the nuclear emergency event

On the 4th of June 2008 an event occurred at the nuclear power plant Krško (NPP) in Slovenia. Operators of the NPP detected an increased leakage of water from the primary system inside the containment at 15: 07. For such cases adequate procedures are in place and they required that emergency of the lowest level – *unusual event* was declared at 15: 56. According to the procedures, the plant started to decrease power at a steady rate. The reactor was shut down at 19: 50 and the plant was cooled down after that until the following day. It was found out that the seal degraded on a valve on one of the smaller pipes which were connected to the primary system. When the working conditions were reached, the valve was replaced and the fault was eliminated. At 16.07, 11 minutes after declaring the emergency, the operator of the NPP informed about the problem the Slovenian Nuclear Safety Administration (SNSA), which is as an independent nuclear safety authority. Table 1 summarised the timeline of events.

Activation of National Nuclear Emergency Response Plan in Slovenia is not necessary for an event of such minor level, but the SNSA decided to partially activate the emergency response organization. The head of the latter argued that *"Leakage from the primary system was relatively small and stable, but at that moment the reason for leakage was not known and possible increase of leakage could lead to a more serious event of the loss of primary coolant"* (Stritar, 2009).

SNSA informed the public in Slovenia and abroad in the first hour. Slovenia is a signatory of the Convention on Early Notification of a Nuclear Accident and also of bilateral agreements with neighboring countries, which refer to the early notification in case of a radiological emergency. As an EU Member State, Slovenia is as

well liable to report to the European Commission and through this to all member states in the EU in the framework of ECURIE system. All these agreements prescribe an early notification when it comes to a situation when the state should take measures for the protection of its citizens.

Table I: Timeline of the nuclear emergency event in Slovenia, 2008

4. 6. 2008:
– 15:07 Operators observed leakage in the reactor building (~3 m^3/h) – 15:56 "Unusual event" declared – Level 0 emergency – Controlled shutdown initiated – 5 MW/min – 16:09 Slovenian Nuclear Safety Agency was informed by NPP Krško – 16:27 Emergency response team was activated – 17:38 Alert message was sent to ECURIE, indicating that the leak is inside containment – 18:17 First message for domestic media was distributed – 18:35 to 19:00 EMERCON messages to IAEA, Austria, Hungary, Croatia and Italy (Word EXCERCISE from the template was not deleted – IAEA called immediately and corrected) – 18:39 ECURIE system distributed message to other countries – 19:00 EC issued media statement about the event in Slovenia – 19:50 Reactor shut down, cool down and depressurization continued – 21:20 SNSA notified ECURIE: reactor is shut down – 21:20 ECURIE second media update – "End of event" – 21:36 European Commission issued media statement about "End of event".
5. 6. 2008
– Morning: According to director of SNSA approx. 50 media vans in front of the NPP – 10:00 Report of Slovenian minister for environment and spatial planning at EU Meeting of (environment) ministers in Luxemburg, – 11:00 SNSA, press conference – 12:00 NPP, press conference – Afternoon: Greenpeace at SNSA
9. 6. 2008
– Slovenia reporte at OECD/NEA CNRA, Oslo, 9. 6. 2008 about the event – 15:30 NPP Krško back in full operation and back in electricity supplying system

2.2. Media news collection and coding

Media analysis was performed with the content analysis method. This method follows explicit rules of coding and enables large quantities of data to be categorized. The coding was performed by two independent coders plus a master coder that decided in case of disagreements in the coding of the same media news.

The media news used for this analysis have been obtained from press clippings "Daily press clipping book of Slovenian and international media", compiled by the Slovenian government communication office, from the period between June

4th to 13th, 2008. The European press newspapers included in the analysis were: Sűddeutsche Ztg., Le Monde, Le Figaro, International Herald Tribune, El Pais, Il Sole 24 Ore, Il Corriere della Sera, FT, FAZ, The Economist, European Voice, Der Standard, Neue Zuericher Zeitung, Le Soir, Il Piccolo, Die Presse, Večernji list, Vjesnik, Globus, Politika, Večernje novosti, Vreme. The Slovenian mass media included in the analysis consisted of all national and regional daily and weekly press, as well the informative program of two TV stations (TVS and POP-TV) and the public Radio station. The clipping has been made using the Sun-Fire–280R Hardware system with Sun OS 5.8 using Informix Universal Server 9.40. UC2, Excalibour Datablade 1.30. UC8 and Microsoft ASP. NET. The press folders were collected by the following key words: "Krško nuclear power plant" and "Slovenia". Articles not related to the investigated topic were excluded from the research. Finally we have analysed 207 media texts, published or broadcasted between 4–14 June 2008 in 43 different media from 13 countries.

3. RESULTS AND DISCUSSION

3.1. Which countries reported about the nuclear event and what was the frequency of published media news?

Even though the nuclear emergency event at Krško NPP was classified as level zero on the INES scale (i. e. no safety significance), the media response was enormous and news frequency varied from country to country. The average frequency of published news in media for each state (Fig. 1) allowed to identify the countries with high attentiveness to this nuclear event.

The event was most frequently reported in Italian newspapers (12 articles per newspaper) followed by Slovenia (7 articles per one mass medium), Germany (6 articles per newspaper) and Switzerland (5 articles per newspaper). The states with the lowest frequency of the published articles related to event in Krško (one per newspaper) were France, United Kingdom and Spain.

Italy, Slovenia and Germany have different nuclear status, as the public debate related to nuclear program is also quite specific.

The political and public debate in Italy was at the time of the Krško event very vivid, focused on the possibility to reopen the nuclear programme. In Italy the nuclear power was phased out with the legislation introduced in 1987 after the Chernobyl accident, the last power reactor being closed in 1990. The nuclear power debate was restarted by the government in 2005 with the intention to re-open the state nuclear program and to build new NPP's in Italy. The political discussion, as well as the public attitude towards nuclear energy, were in 2008 extremely polarized. Although Italy was without nuclear reactors in operation in 2008, 43% of the Italian population was -before the nuclear event in Slovenia- strongly in favor of energy production by NPP's (Eurobarometer, 2008).

While the high frequency of the articles in Slovenia is not surprising, since the event happened in the Slovenian NPP, it is surprising at first glance that the German media reported about the event with such high frequency (average of six arti-

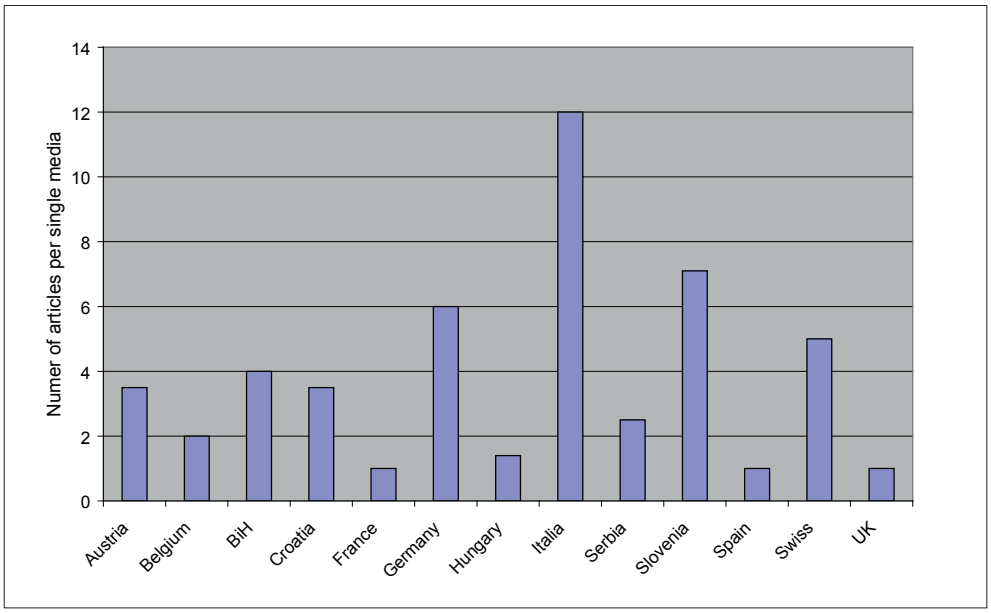

Fig. 1: Average frequency of media news in single media per country

cles per newspaper). Germany had at the time of nuclear event in Krško 15 reactors in operation, but had adopted a "Nuclear exit law" in 2000. The political discussion over nuclear energy was in the years 2002–2008 vibrant: it was set to be a key issue in coalition talks. The elections campaigns were focused on the phase-out of the nuclear program (pro and contra) and the population was divided among people being in favor or against nuclear energy. In the month before the nuclear event in Slovenia, a public opinion poll in Germany showed that 46% of Germans wanted the country to continue using nuclear energy, another 46% said they supported the nuclear phase-out policy and 8% were undecided (WNO, 2008).

The states with the lowest frequency of published articles related to event in Krško were those for which at the time of the nuclear event in Slovenia the discussion related to the nuclear program was neither in the political agenda, neither in the public agenda. Those states were France, United Kingdom and Spain. It is interesting that among this category of states appeared also Hungary. Hungary is Slovenian neighboring state and the Krško NPP is less than 100 km from the common border. Hungary has one nuclear power plant with four units and the government of Hungary remains committed to nuclear power in order to serve its future electricity needs. Also the public opinion in 2008 was in general positive towards nuclear energy (Eurobarometer, 2008) and there was no public or political discussion related to the future of nuclear energy.

The results support the assumption that the frequency of the media articles related to nuclear event in Krško NPP will be higher in the states with the nuclear

program under public and political discussion than in the states where the existence of NPP's is not considered as a future question.

3.2. Did the media sources differ among the countries?

The primary sources of the information related to problems in NPP Krško were three different notification systems used for notifying different groups of countries. The first one was the National response plan used in Slovenia, in the framework of which Slovenian citizens are informed about radiological or nuclear emergencies. The second system was the bilateral agreement among neighboring countries (Italy, Austria, Hungary and Croatia). Therefore, for Slovenian citizens and for the neighboring countries, SNSA acts as primary source of information. The third system was the European Community Urgent Radiological Information Exchange (ECURIE), used to inform all European countries and Switzerland. In all three notifying systems the source of information was the Slovenian Nuclear Safety Authorities (SNSA) as responsible regulatory body. For other ECURIE states than the neighboring countries, the European Commission should act as primary source of information.

With the content media analysis we explored the sources of information for published media news related to the nuclear emergency event at Krško NPP. The aim was to find out which sources were referred in mass media and who's information was the most quoted? The code of journalism assumes that a media article must refer to different sources of information, in order to present several views and depict the event taking different aspects into consideration. We analysed the media sources for each of the following groups of countries separately: Slovenia, neighbouring countries and other ECURIE members (distant countries).

In Slovenia the most quoted media source was the Slovenian Nuclear Safety Authority as origin of information according to the national response plan. As expected, more than 40% of media news in Slovenia referred to SNSA. Second most quoted source was the operator of the NPP at Krško (quoted in 34% of news), followed by unidentified sources of information. Almost 30% of media news distributed some information without referring to any identified source.

Fig. 2 summarises the media sources for the Slovenian media. It would normally be expected that the local government or the local population from the municipality with the Krško NPP will be highly present in the media. Surprisingly, this source of otherwise important journalistic information was in Slovenian media quoted in only few articles (1% of news).

In the neighbouring countries Italy, Austria, Hungary and Croatia the most quoted source were by far the decision makers (see Fig. 3). 44% of articles published in the neighbouring countries presented the statements of the decision makers. This category of actors includes politicians and representatives of governments other than Slovenian. The information or opinion given in the news was usually the opinion of a government or political party, e. g. the E. U. green parliament party. Decision makers were followed by secondary media sources. Secondary sourc-

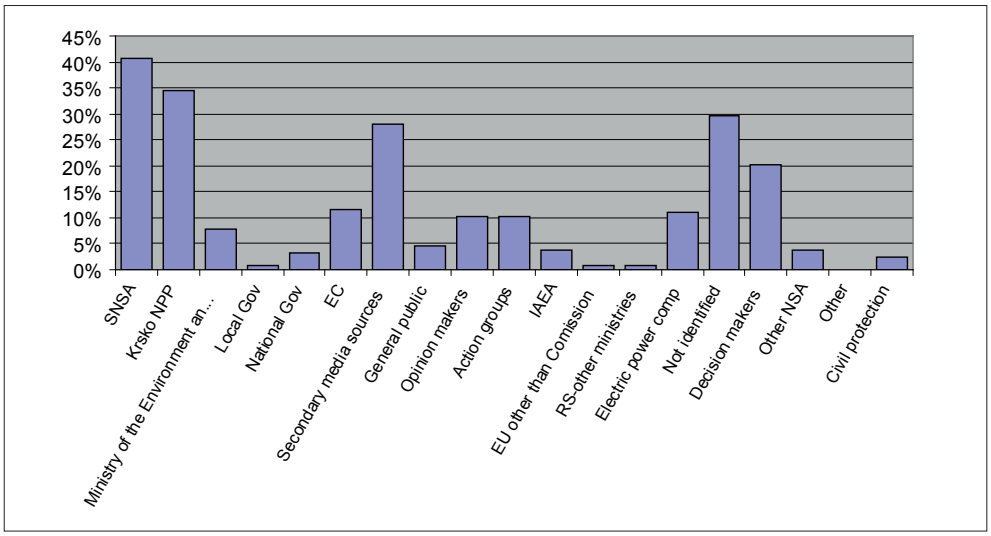

Fig. 2: Media sources in Slovenia

es of information are reports of other media houses, press agencies or correspondents abroad: *"As reported by …"*.

The primary information of SNSA related to the nuclear emergency was presented only in 15% of the articles in these neighbouring states. This is surprisingly, the same frequency as the for the information presented by opinion makers. The category opinion makers includes well-known personalities and politicians, scien-

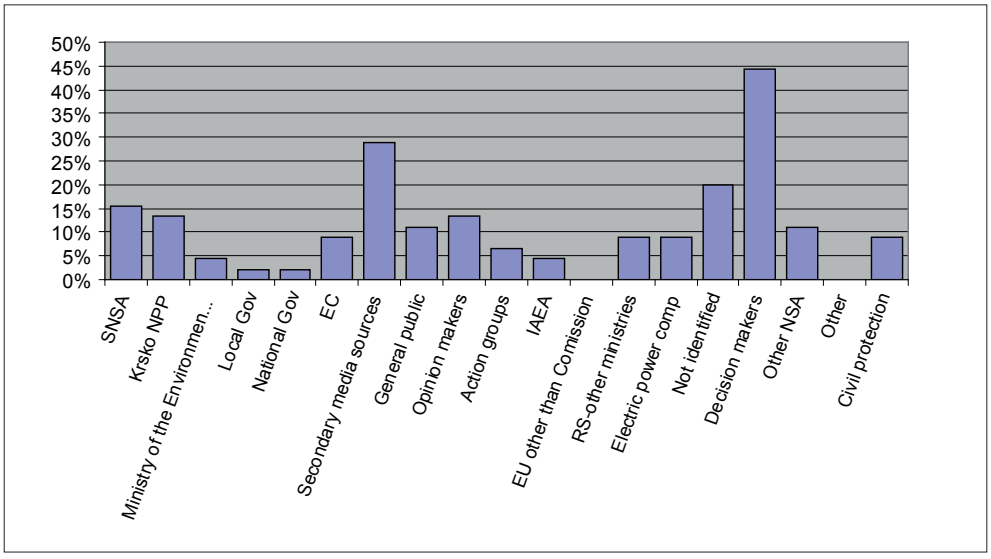

Fig. 3: Media sources in neighbouring countries (Italy, Austria, Hungary and Croatia)

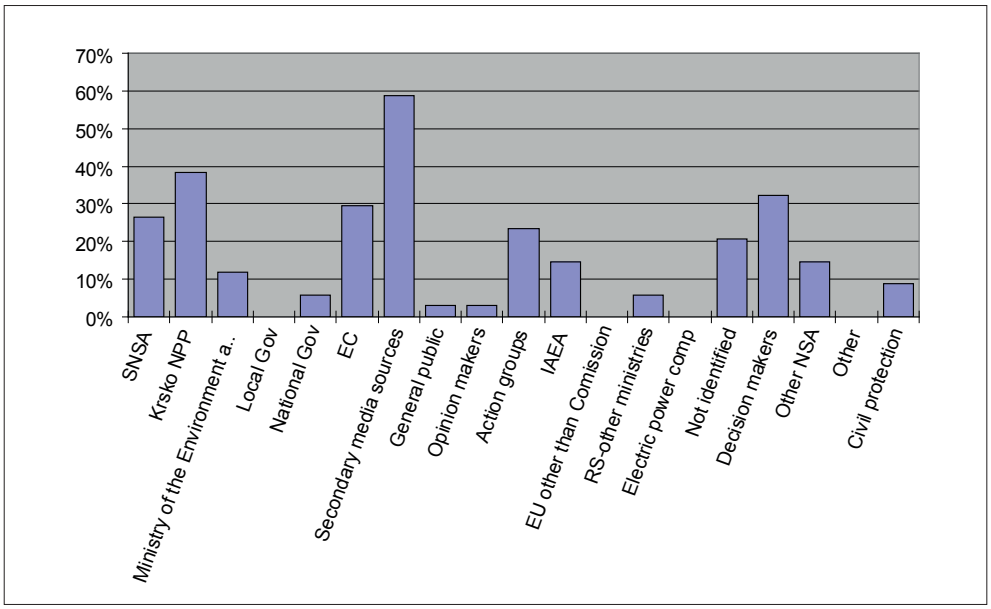

Fig 4: Media sources in other ECURIE countries (distant countries)

tists whose opinion is considered important enough to be represented separately, either in a full-fledged interview or via quotes. The actors grouped in this category represent themselves rather than an institution or a role attributed to them (the opinion given is that of an individual and not of a group). People from academic institutions also fall into this category when the opinion provided is theirs and not that of the department or division they belong to.

In more distant countries the frequency of the most quoted sources was different to those in Slovenia or neighbouring countries. The most quoted sources of information were other media. This source of information is the leading source in almost 60% of the articles related to the nuclear emergency event. In other words, media around Europe reported other media stories related to the nuclear emergency at NPP in Slovenia. This source of information for media in distant countries was followed by the operator of the NPP (39% of articles referred also to the NPP Krško). According to the journalism rule that the journalist has to go to the origin of the information (problem), this frequency of the NPP Krško appearance as source of information was to be expected. The European Commission, which distributed the information to ECURIE members and published press release, ended with less than 30% of references on the fourth place of media source frequency. This may be due to poor and technically orientated information in first published press release.

The results support the conclusion that, despite the existence of primary sources of information related to the nuclear emergency, the media around Europe pre-

ferred to refer to secondary sources of information and sometimes even omitted the primary one. While the most quoted source was the Slovenian Nuclear Safety Agency as the regulatory body in Slovenia, the most quoted sources of information in the neighbouring states were politicians and representatives of governments. A strong influence of published information in mass media can be recognised by the high frequency of secondary media sources. When the information about the nuclear emergency at the Slovenian NPP was published, mass media in Europe took it over and reported on this event as it has been reported somewhere else.

3.3. What was the focus of the articles?

The analysis of the main focus of the articles allowed to identify the main challenge and the focal point of the crisis and post crisis communication. The codes used to describe the focus of the articles were: "technical aspect", "inhabitants", "international reaction", "safety/risk aspect", "ECURIE" (European Community Urgent Radiological Information Exchange).

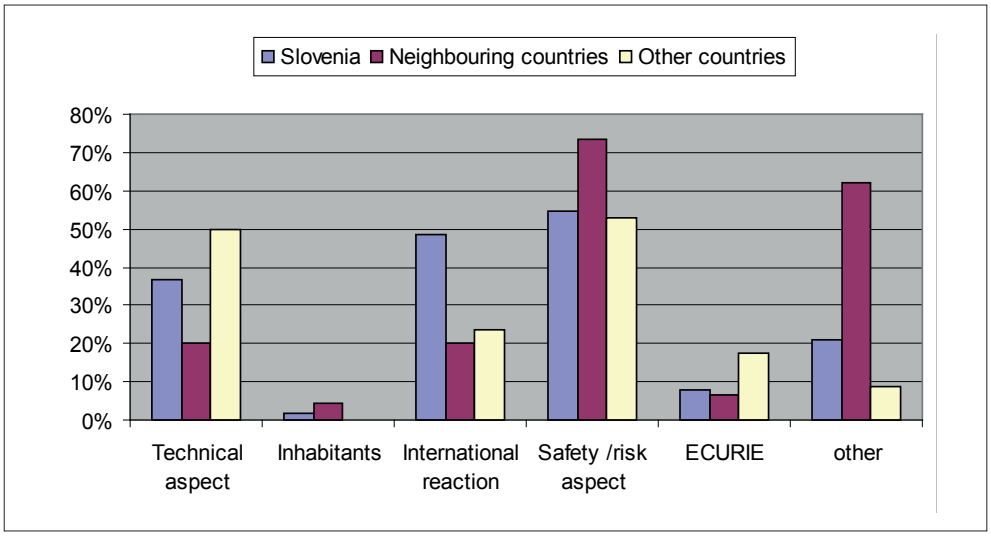

Fig. 5: Focus of the articles in Slovenia, neighbouring countries and other ECURIE members

The most important focal point of the published media news in all country groups (see Fig. 5) was the safety/risk aspect. For Slovenia, the second most frequent focal point was the international reaction. For the neighbouring states, the second most discussed focal point was "other", mainly consisting of political problems, ownership issues, ideological discussions etc. For other ECURIE countries the second most discussed focal point was technical aspects.

3.4. Did nuclear emergency stimulate the emotions?

To assess whether the event at Krško NPP was reported in the direction of a negative insinuation that could stimulate public's emotions and to evaluate public emotional response to the event we analyzed the keywords used in the articles. For this purpose the frequency of the following keywords was calculated: Chernobyl, panic, alarm nuclear accident, catastrophe, danger, dread, alert (in the sense of warning). Synonyms, antonyms and homonyms were included in accordance to linguistic properties (e. g. "dread" also expressed with the words "fear" and "threat").

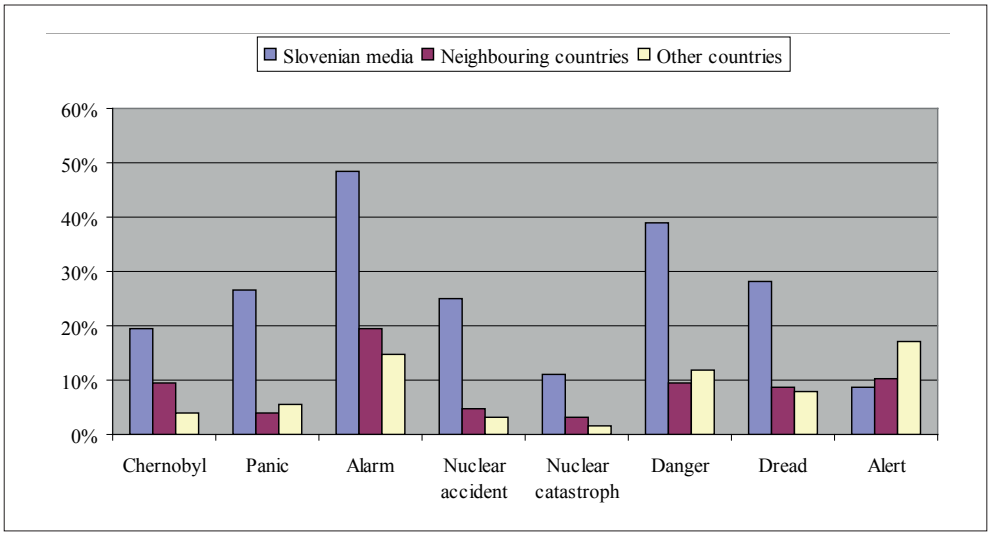

Fig. 6: Keywords in articles published in Slovenia, neighbouring countries and other ECURIE members

The results presented in Fig. 6 show that although not communicated by the primary information sources, emotional words were present in the mass media.

"Alert" was one of the messages delivered in the press release of the European Commission. The analysis revealed however that "alert" was translated to "alarm" in almost 50% of Slovenian articles, 20% of articles in neighboring countries and 15% of article from more distant countries. The connotation between alert and alarm differs quite significantly: while alert refers to a warning, alarm relates to a fear resulting from the awareness of an imminent danger.

That nuclear emergency is linked to a high catastrophic potential is proven by the frequency of the word "Chernobyl". It was used in almost 20% of the Slovenian news and 10% of the articles published in neighboring countries. If we compare the groups of countries, we can confirm that with the distance from the affected site, the use of emotional words decreased.

4. CONCLUSIONS

This paper analysed the media content after a minor nuclear emergency event as a case study. The analysis revealed that despite a transparent communication policy by the affected country, even a minor nuclear event may trigger a high intensity of media coverage. A nuclear emergency is newsworthy to fill up the first pages of press even when it has no safety significance. Previous research in communication has showed that media coverage in general is affected by strong inter-media agenda-setting mechanisms leading to parallel increases and decreases in attention to issues (Vliegenthart and Walgrave, 2008). Media outlets follow the same track and let their attention for the issue in a similar manner (Vasterman, 2005; Wolfsfeld and Sheafer, 2006).

The results clearly demonstrated that nuclear emergencies are linked to emotional reporting and political discussions. This is in line with agenda setting studies in communication (McCombs and Shaw, 1972; Walgrave and Van Aelst, 2006). These have showed that the political and public salience of issues is partly driven by media coverage of these issues. When media increase their attention to a given issue, the political elites jump on the bandwagon as well by stating their opinion, asking parliamentary questions about the issue, tabling law proposals, or issuing executive orders.

However, the main focus of media news related to the nuclear emergency studied was the safety and risk aspect. The operators and the nuclear safety authorities are obliged by law to be transparent from this point of view and they have to openly communicate the issue, regardless of the possibility of (ab)using the emergency for political purposes. With constant and transparent communication the communicators can avoid misunderstandings. The emotional reactions and heated political discussion will increase when not accompanied by an adequate and transparent response in communication by international organisations, because the main media sources in countries with open political questions related to nuclear energy tend to end up being politicians, rather than the resident experts.

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