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<tr>
<th><strong>Author(s)</strong> :</th>
<th>van Santen, Rikus; Illing, Mareike</th>
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<th><strong>Contact</strong> :</th>
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**Coordinator:** TECNUN
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EXECUTIVE SUMMARY

The report at hand serves to summarize the lessons learned in the fourth workshop of the ELITE (Elicit to Learn Crucial Post-Crisis Lessons) project. The workshop taking place from 27 to 30 June 2014 in Weeze, Germany, focused on the testing of the ELITE living document and on its operability and usefulness for the end users and the overall Community of Practice. This report includes the workshop preparation processes, the participant registration, and minutes of all workshop sessions. Moreover, excerpts from the key note speech are delivered herein as are findings of the exercises.
I. INTRODUCTION

This report documents the preparation of the fourth workshop that intended to gather the Community of Practice at one table in order to use a table-top format to test the ELITE living document. Workshop IV took place from 27 to 30 January 2014 in Weeze, Germany, with each the first and last day being used by the ELITE consortium to meet and to welcome the participants. As in all other workshops so far, disaster relief experts participated alongside representatives of civil protection agencies and research institutions. The report includes the invitation and registration process, the progress of the actual workshop as well as a short summary and lessons learned review. The workshop progress is mirrored by a mixture of minutes of the different workshop sessions and excerpts from presentations that were held during the two days.

First, read through the organization of the fourth workshop that includes the preparation and registration procedures. For a full insight into the means of communication and consortium cooperation, please review the lessons learned report from workshop I “Forest Fires” as these means have not deviated much.

This report then illustrates the fourth workshop’s agenda and objectives followed by the workshop minutes. Throughout the minutes, excerpts from presentations are included in order to best indicate the discussion points made and meaning for the project’s end product, the living document.

Finally, the workshop minutes are preceded by a discussion of next steps and the preparation of the final conference as talks took place among the consortium partners in Weeze, too, and the conference was officially announced within the workshop programme.
II. **Organization of the Implementation of the WP2-Assignments: Planning of Workshop IV “Table-Top Format”**

1. **Invitation Process**

An invitation letter was used in order to inform potential participants about the upcoming workshop. Herein, reference was paid to the former workshops and the results already found. The content of the workshop, thus, had been described as follows:

> “Each group will be given dedicated tasks related to the problem areas revealed and defined in the previous workshops on forest fires, earthquakes and floods. […] problem areas are interoperability, logistics, communication (risk communication and inter-agency communication), information management etc.” (Excerpt from Annex A. Invitation Letter)

The pool of participants contained contacts and suggestions of all consortium partners, renown experts from the disaster relief and civil protection fields, and participants of the first workshops. In the initial planning stages, it was decided to invite both experts that have been visiting the workshops before and those, that were completely new to the project. When looking at the full list of experts in Annex B, one realizes that some experts have been following the project from workshop I onwards while others participated the first time. To invite experts along this principle allowed for a better insight into how people will use, see, and value the ELITE living document. (For a comparison of experts throughout the workshops, see Annex B.3.)

As was done prior to the first workshop, a staggered principle of invitation was used. As a selection of participants was invited in a first round of whom not everyone could confirm their participation, a second round of invitations was sent out. In the following, find a final list of participants and participating consortium members:

2. **Travel information and arrangement, registration**

Since the final workshop took place in Weeze, Germany, too, the same pamphlet of travel information was used as for the first and second workshops. The pamphlet is to best inform the workshop participants about their whereabouts, journey to and from the workshop, overall information about their geographical destination and travel recommendations.

The participants’ registration occurred via email. The participants indicated their interest and best informed the workshop organizers about their preferred times of travel and their preferred airport of departure. Accordingly, all travel schedules were prepared successfully and on-time. Taxi shuttles were organized for to and from Düsseldorf International airport, the participants were informed about it along with the travel information pamphlet.

3. **Agenda-Setting**

The initial agenda was planned via email and telephone conferences prior to the workshop. This allowed including a tentative agenda in the invitation. Nevertheless, last changes were made in full agreement of all consortium partners on Monday, 27 January 2014. Throughout the workshop, no significant adjustments had to be made concerning the workshop. Its objectives were clear and guided along in the agenda. See Annex B for the full schedule.
4. Arrival, Transport and Accommodation

The point of arrival for the workshop participants deviated from that in workshop I. The consortium members decided that the total duration of the workshop should last two full days instead of one and a half which required the experts to arrive on Monday and leave on Wednesday from the late afternoon onwards. This procedure allowed for longer discussions to be included in the agenda. Thus, the consortium members and almost all participants arrived on Monday, 27 January 2014. Those that were not able to arrive the night before the workshop still managed to be there for the starting session. The accommodation and transport arrangements remained similar to those in the first and second workshop.

III. Workshop Documentary – Meeting Minutes and Presentations

1. Monday, 27 January 2014: Prior to the Workshop

Traditionally, the Monday prior to the actual workshops has served as a meeting day for the consortium partner to discuss last minute changes or improvements for the upcoming workshop and to discuss issues with the individual work packages and deliverables. Hence, the meeting on Monday, 27 January 2014 followed these agenda bulletins:

- Group division for the reporting exercise during Workshop IV
- Technical support during Workshop IV
- Briefing of reporting exercise/reporting within the exercise
- Overall agenda of Workshop IV
- Meeting of steering/scientific committees on Thursday
- Elite 2.0, suggestion of a research project that could be related to the ELITE project in the future

<table>
<thead>
<tr>
<th>Consortium Members Participating in Day One</th>
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<tbody>
<tr>
<td>José Maria Sarriegi</td>
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<td>Raquel Gimenez</td>
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<td>Leire Labaka</td>
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<td>Tonje Grunnan</td>
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<td>Maren Maal</td>
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<td>Gert Lang</td>
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<td>Stewart Kowalski</td>
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<td>Bénédicte Goujon</td>
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<td>Rikus van Santen</td>
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<td>Mareike Illing</td>
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<td>Vanessa Zähres</td>
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Group Division & Technical Support

In order to successfully conduct the reporting exercise, three groups were set up. This allowed for a better comparison of work loads and the usage of the ELITE living document. Moreover did the consortium agree that three groups with each six experts would offer a group size that still allowed working effectively. To both observe and guide the participants throughout the exercise, one technical observer and one content observer were assigned to each group. The technical observers on the one hand stemmed from TECNUN and Thales analysing the manner of working with the ELITE document. Additionally could they offer technical support when something went wrong or the end users got stuck in the interface. The content observers, on the other hand, were chosen from FFI and the Red Cross Research Institute. They observed how the different groups dealt with the content framework. This framework will be discussed a little further on; however, it assigned a particular task to the groups to use the ELITE living document.
Further, the group assignment included the appointment of one team coordinator who was “made” responsible to lead the groups toward the writing of a report using the ELITE document. From all the participants that were invited, those experts were chosen that have worked as senior officers in disaster and crisis management and each functions as consultant to different national and international disaster prevention and coordination institutions. Thus, the group division looked as follows. The technical support was covered by the technical observers from TECNUN and Thales, as already mentioned. The rest of the consortium took on observing roles but was allowed to move freely inbetween groups.

<table>
<thead>
<tr>
<th>Group 1</th>
<th>Group 2</th>
<th>Group 3</th>
<th>Roles</th>
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<tr>
<td>Raquel Gimenez</td>
<td>Labaka Leire</td>
<td>Bénédicte Goujon</td>
<td>Techn. Observer</td>
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<tr>
<td>Gert Lang</td>
<td>Tonje Grunnan</td>
<td>Maren Maal</td>
<td>Content Observer</td>
</tr>
<tr>
<td>Edward Pearn</td>
<td>Peter Glerum</td>
<td>Wolfgang Krajic</td>
<td>Team Coordinator</td>
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<tr>
<td>Piet Schneider</td>
<td>Mark Wilson-North</td>
<td>Thomas Nesensohn</td>
<td>Team Member</td>
</tr>
<tr>
<td>Karl-Dieter Brückner</td>
<td>Bernhard Kaiser</td>
<td>Ana López Loiarte</td>
<td>Team Member</td>
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<td>Gian Paolo Pollini</td>
<td>Aurelio Dugoni</td>
<td>Stefano Grimaz</td>
<td>Team Member</td>
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<tr>
<td>Concetta Mattia</td>
<td>Ciro Bolognese</td>
<td>Ove Stokkeland</td>
<td>Team Member</td>
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<tr>
<td>Ionel Alin Mocioi</td>
<td>Jyri Silmäri</td>
<td>Björn Robach</td>
<td>Team Member</td>
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<tr>
<td>Claudia Coccetti</td>
<td>Dario Giuseppe Galluccio</td>
<td>Giulio Gualtieri</td>
<td>Team Member</td>
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<td>Oksana Galarowicz</td>
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Briefing & Reporting Exercise

The consortium agreed on a common way to introduce the reporting exercise, explaining its objectives as well as its overall procedure. It was agreed that Mr. Rikus van Santen from I.S.A.R. Germany introduces the workshop and therefore also exercise’s objectives. Raquel Gimenez from TECNUN was entitled to lead the participants through the ELITE living document’s technical aspects. The workshop objectives included both technical and content elements:

1) to study end-users in the way they search for, gather, process, evaluate and reproduce information,
2) to test the current version of the ELITE living document,
3) to offer participants a learning opportunity in team work, crisis data analysis and reporting,
4) to receive end-user feedback on the different functions in the ELITE living document.

The task of the reporting exercise was defined as “Three independent groups [that] are to come up with a complete report on lessons identified during and in the aftermath of the crisis in Japan 2011” wherein the participants were allowed to use any input with reference to their sources. Naturally, the primary source of information was to be the ELITE Living Document. Nevertheless, the participants were allowed to use their own experience within the Japanese disaster of 2011 as well as information from a teleconference with a team leader of UK ISAR, a British governmental organization involved in the Japanese disaster relief. The teleconference was included in order to justify and rectify information found using the ELITE wiki.

Technical elements that were to be used and practiced by the participants were to search, to vote on, to comment, to upload, and to classify information on the ELITE living document. Moreover, the participants should use different characteristics to rate and find documents thereon.
Further Agenda Points

The agenda for the workshop was agreed on by all consortium members taking part in the meeting on Monday, 27 January 2014. Time slots for evaluation surveys from both TECNUN and FFI concerning the technology of the ELITE living document and its content respectively were included in the agenda. The meeting of the steering and scientific committees of the ELITE project were transferred to Thursday’s agenda, where each work package was to receive half an hour of discussion. Moreover, the introduction of a potential follow-up project that could easily relate to ELITE was shifted to Thursday’s agenda.

2. Tuesday, 28 January 2014: Workshop Day 1

Introduction

The first workshop day started out with the introduction of the ELITE project, the consortium partners, and the invited participants. Following the short round of introductions, the project coordinator José Maria Sarriegi, TECNUN introduced the ELITE project in a more detailed manner to those newcomers that have not participated in prior workshops. Foremost, he explained the main objectives of ELITE.

1) To establish a Community of Practice (CoP) in crisis management
2) Create a tested and validated ELITE living document of crisis management
3) Implement the ELITE living document
4) Analyse the learning process from lessons learned to lessons implemented
5) Deliver recommendations for future research

Moreover, the project coordinator explained the definition and use of a Community of Practice, as prior workshops proved that whilst in the disaster management and civil protection scenery and mechanisms, Communities of Practice exist already, the term is rather uncommon. Therefore, the definition and explanation for the building of a CoP were discussed:

Figure 1. Excerpt from the introductory presentation to the ELITE project (TECNUN, 2014).

The objectives were presented detailed and one-by-one. Moreover was the overall project summarized so far, explaining the composition of the consortium and the corresponding tasks. For a full insight into the presentation see Annex D.1.
Key Note Speech: Union Civil Protection Mechanism by Wolfgang Krajic

The next bulletin point on the agenda was this workshop’s key note speech. Independent consultant for and former representative of the Austrian Military, NATO, UN OCHA and the European Commission, especially DG ECHO, Mister Wolfgang Krajic, gave an insight into the Union’s Civil Protection Mechanism (UCPM) and how lessons learnt are dealt with herein. By using only three slides, Mr. Krajic managed to give an extensive perspective on what meaning disaster and crisis management, best practices and lessons learned carry within the European Union.

Krajic illustrated briefly the history of DG ECHO and DG Environment to which the Union Civil Protection belonged before. He explained the first mechanism’s origin to lay in the consequences of Agila’s earthquake in 2001, where the European Union first recognized the need for a European combined effort in crisis and disaster management. The Treaty of Lisbon incorporates civil protection for the first time within a legal framework, with DG ECHO heading it. Today 120 missions have been conducted throughout the Union and worldwide.

The UCPM derives most its lessons learnt (and it always speaks of lessons “learnt”) from its missions. It really is “based on what teams bring back from their missions”. However, large-scale inter-European exercises such as MODEX, etc. allow for additional lessons. It is striking that 95% of all missions are really those of disaster response. As a matter of fact, the European Commission uses a clear, distinct definition of the terms “crisis” and “disaster” – whereof the ELITE project deals mostly with disasters. A crisis, according to the UCPM, derives from man-made disasters or misbehaviors and results in civil war, armed conflict, large-scale riots, etc. Natural disasters, on the other hand, define earthquakes, floods, and forest fires.

Concerning the delivery of lessons learned, the EUCPT (European Union Civil Protection Team) has to report to the European Commission within four weeks after mission. The team leader leads, manages and hands in the report. It is noteworthy at this point, that the UCPM benefits from its institutional memory and something defined as being a learning organisation. However, the European Commission remains a political organ – this limits the institutional learning in a sense, too.

The disaster in Japan illustrates in what sense, the political character of the UCPM can limit the lessons learned in a way. Immediately following the disaster and the EUCPT mission, the European Commission instated a lessons learnt meeting to which the Japanese ambassador to the European Union had been invited. The presence limited the illustration of detailed best practices and lessons learnt, as operational strategies where left out. Due to the lack of lessons delivered in this scenario, the reporting mechanism is two- or three-fold: One summary of the overall mission delivers political lessons learnt and aspects that are significant diplomatically. As a second step, operational exchange of best and malpractices takes place immediately following the disaster. The third component of the reporting nowadays often occurs the observation of a series of events related to the disaster under consideration.

The reporting mechanism deviates nowadays from what was used under DG Environment. The DG Environment used a matrix to report lessons learnt. It was organized by phase, lessons learnt, and an action plan. Ever since the Civil Protection Mechanism was shifted to DG ECHO, no new reporting matrix has been established. Nevertheless, the inclusion of lessons learnt in the Treaty text, especially in §30d, manifests their significance for the Commission at large.

The UCPM is run within an institution formerly known as Monitoring and Information Center (MIC), then as Emergency Response Center (ERC), and now as the Emergency Response Coordination Center (ERCC). Internationally, the European Commission pays attention to all kinds of regional civil protection mechanisms, such as those established by ASEAN, the African Union, ECOWAS, UEMOA. However, the European Union never clearly defines civil protection.
Questions from the audience:

Do you consider the UCPM a top-down or a bottom-up approach? And what about the lessons learned? Aren’t they conducted in a top-down manner?

The EUCPM delivers both. The coordination during a disaster or crisis is clearly top-down. However, the lessons learned meetings and reportings are bottom-up. In a sense, the UCPM follows a rather balanced system of providing and receiving.

Does any classification or certification of training exist within the UCPM?

There is an elaborated training system with at least 50 courses, such as induction courses, Operations, team leader courses, or specialized ones in information management, assessment, safety & security, etc. However, within the UCPM no final testing takes place for several reasons. The Commission favors a qualification system, the member states do not. First of all, the training is adult vocational training. In some countries within the Union, a senior and high-ranking officer that fails such a course may experience a serious hurdle in his career that is disproportionate to the usage of qualification. Moreover, standards would have to be established that suit all 29 member states. Who would evaluate what, when, according to which system and with what right? These questions are rather complicated to answer within the EU. Hence, a system of self-evaluating takes place most of the time now. However, the Commission considers developing a system that is comparable to the UN INSARAG certification system in the future.

Is there an exchange system among experts?

Yes, the German Federal Technical Relief Unit (THW) coordinates the exchange of experts program.

Is there a difference between lessons learnt and lessons learned?

No. The common language within Brussels and DG ECHO is lessons learnt. However, the usage is not universally homogenous but depends on the individual behind a job.

Does NATO have the same problem with certification and qualification?

As all military and security-related frameworks do use distinct and defined ordering system, communication works better. However, the branch has lost significance for NATO today.

It is remarkable that the OSOCC-system is adopted within the EUCPT, UNDAC, IFRCRC. Each IM has enjoyed and conducted the same identical OSOCC-training. However, there is still no true certification system.
Following the keynote speech, the reporting exercise was introduced in order to see about the coordination and cooperation as well as the search for information on a given disaster among experts. As mentioned already in the section about the consortium meeting and agenda preparation, the reporting exercise should take place in three groups. The overall objectives were to:

- to study end-users in the way they search for, gather, process, evaluate and reproduce information;
- to test the current version of the ELITE living document;
- to offer participants a learning opportunity in team work, crisis data analysis and reporting;
- to receive end-user feedback on the different functions in the ELITE living document.

For the participants, this meant to search, vote, comment, use different characteristics, upload, and classify documents and information on the ELITE living document. One team coordinator was appointed in order to determine – in discussion with the assigned group – and lead through a strategy to fulfill the reporting. These small Communities of Practice (CoP) “consist of end-users from different nationalities, levels and backgrounds” and are to create a report that is useable for all and representative of all. The assignments to each group are:

Thus, all groups are to look up lessons learned about the earthquake, tsunami, and nuclear catastrophe on the ELITE living document. These lessons can deal with pre- and post-disaster elements as well as the phase during the disaster scenario. FFI and the Forschungsinstitut des Roten Kreuzes have developed a framework that intended to guide the groups through the exercise.

The topics that needed to be covered were communication, interoperability, coordination and decision-making, risk assessment, logistics, and recovery in the pre-crisis, implementation and post-crisis phase. For a detailed insight into the framework see Annex E. All groups were equipped with a Wiki handbook, too, explaining how to navigate around the ELITE living documents prototype.

The reporting exercise was started by introducing the individual sessions. For the sake of this report, each session will be introduced by the very introducing slide. Then a summary of observations and results will be stated. However, the minutes of each group exercise sessions are kept small-scaled.
The main objective of the first session was explained as finding a suitable structure for the final report, and therefore dividing the group into logical roles. Moreover, the group needed to decide on the way of searching for and collecting information.

Observing the three groups, three distinctively different approaches could be detected. Whilst group one and three followed a rather individual group approach, wherein one person or a small group within the team were assigned individual tasks to be fulfilled self responsibly, the second group followed an approach of group discussion throughout the exercise. The communication was far more concentrated and vivid in the second group as opposed to the other two groups.

In a second session, the groups were to implement an action plan and finish the second day with a draft report. The summary by the three team coordinators at the end of the day sounded as follows:

**Group Summary Group 1: Ted Pearn:**
One major comment of the group coordinator is that a better categorization of the documents might help. Moreover, the reports that are available on the ELITE living document force the group to assume a lot about lessons learned and strategies used. This is dangerous concerning the credibility of the final report.

In group One, no rating was done.

**Group Summary Group 2: Peter Glerum:**
The group coordinator’s main comment was that a lack of an evaluation system does not allow for true lessons learned. The reports that were to be found on the ELITE living document “told” a story about the earthquake and tsunami disaster in Japan in 2011, but hardly revealed any true lessons learned.

In group Two, no rating was done.

**Group Summary Group 3: Wolfgang Krajic:**
The major criticism about the ELITE living document is that there is no evaluation or true lessons learned so that one needs to distill the critical information about the 3 084 pages to be found on the ELITE living document. Group Three did no rating of documents.
Day two started out with an interactive task for the groups and intended to give them the opportunity to validate their gathered information. A telephone conference was organized for each group lasting 20 minutes. A team representative from UK ISAR was available to report on his mission to Japan in 2011 and able to confirm or negate certain information that was found using the ELITE living document.

The second session of the day and the last of the workshop aimed at finishing and uploading the report on the ELITE living document. Moreover, the teams were asked to detect the main difficulties and best practices about reporting. The results have not deviated much from the commenting that followed day one.

The main problem was seen in the quality of the documents. Mostly, the reports and information that was uploaded did not deliver lessons learned per se but rather documented different missions or the happening of the actual disaster. To distill the relevant information for a report on best practices and lessons learned from this information required to make assumptions in several regards. Whereas some assumptions could be verified by the telecon partner from UK ISAR, most assumptions remained what they were. Thus, the call for more qualitative document was articulated for the trustworthy use of the ELITE living document. Ted Pearn suggested to use and upload four different levels of documents to ensure a great scope of information but also a higher level of credibility: (1) government documentary, (2) documents from agencies, (3) media reports, and (4) miscellaneous reports from other parties involved.

In addition, one significant remark is that one needs to have a clearly defined target group for a lessons learned report. As long as one does not have the information on whom the report addresses, one can hardly search for, collect, and distill the relevant information. This was also indicated as a reason for why the groups did not rate any documents. In the experts’ common understanding, they do not dare to judge upon the relevance of a document as its relevance depends on the perspective with which it is regarded. Different target groups search for different documents and information. Thus, no single document is irrelevant for all target groups.
Results of the Group Exercise

The full results of the three different groups can be found in Annex F. Results. However, within this sub-chapter, relevant findings and remarks will be mirrored one-by-one to summarize the group efforts. Thus, group one came up with the following considerations and final remarks towards the reporting exercise:

**FINAL CONSIDERATIONS**

Research on Wikipedia has equal Recovery from disaster reconstruction, but there are many aspects of reconstruction: social, economic, infrastructure. In this key is analyzed the website. Looking for in the earthquake session, no documents were found relating to the social and economic aspects. Almost all the documents relating to the disaster at the Fukushima plant and its repair.

In the Focus session we have found some interesting document about recovery, for example, “Earthquakes Guidelines on preparing, responding and recovering” (IFRC) or “Red Cross finale report - Japan” or “WHO Report”.

This consideration leads us to recommend a simplification of search keys. It has also been noted that there aren’t many other references to the reconstruction in other large earthquakes (Abruzzo, Umbria, etc...) That might be useful to those who search.

(Excerpt from Annex F.1. Results from Group One.)

Group Two followed a different approach in working on the exercise. The team discussed most vividly about the usage of the ELITE living document and the interface. Moreover, they discussed about the individual chapters of the report. Their outcome can best be summarized in their matrix.

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<tr>
<th>Pre-Crisis</th>
<th>Implementation</th>
<th>Post-Crisis</th>
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<tbody>
<tr>
<td>Lessons Learnt</td>
<td>Source</td>
<td>Lessons Learnt</td>
</tr>
</tbody>
</table>

Communication
Interoperability
Coordination and decision-making
Risk assessment
Logistics
Recovery

(Matrix used by Group Two, see Annex F.2. Results from Group Two for further information)

Group three followed an approach were each team member fulfilled one task individually. Concerning the ELITE living document, Wolfgang Krajic criticized the search functionality. Overall comments were already made on day one. However, group members have additional comments that are pinpointed at this moment:
Comments on ELITE by Björn Robach:

The basic idea and platform of the Elite Wiki can become very useful and handy for the end-user. Please let me compare the ELITE Wiki with a toolbox.

Right now we have a good and clearly arranged toolbox, but if we look insight we just have some basic tools which are not too useful in the most situations. What we have to do to have everything with us on site, we have to fill the toolbox with many more valuable tools we need.

Comments on ELITE by Thomas Nesensohn:

Normally I am searching information on a lot of websites like vosocc, google, news, bing, ...

I think one platform for information is nowadays to less

In the ELITE there are very long documents to read, you can find a lot of information but you need also a lot of time to prepare it for a lessons learned

I think the site needs on the left site like "ebay" a categorie list where you can choose with clicking

(Individual Group Comments by Group Three, excerpt from the report under Annex F.3.)

Evaluation & Plenary Session

Following the group work, the plenary session was opened to discuss about the reporting exercise and the workshop in particular. Several questions were discussed at length, the following gives an overview of the different topics:

What was the added value of the telephone conference for the overall workshop?

The telephone conference aimed to offer the participants the opportunity to validate the ELITE living document, and more importantly, the information they derived from it. Moreover, ELITE is intended as a tool to get to the source of information, too. The Community of Practice shall offer all ELITE members/participants/followers the opportunity to share expertise.

What is striking is that only one group actually used the telephone conference to inquire whether the expert had other documents about lessons learned from the Japan disaster in 2011.

Another comment from the audience is that using one’s own experience can also mean that one uses one’s own methodology to inquire information. It does depend on the perspective.

Did any one group criticize the categories according to which the documents are organized?

Yes, and most need changing.

The topics that were suggested by and included in the framework were developed from all former workshops. Were they suitable for the overall report on lessons learned?
The audience responded that really this depends on the different level to whom the report would be addressed. A professional from the tactical level may ask for something different than one from the operational level. Moreover, each document on the ELITE living document uses its different topics with hardly any similar methodology. Overall, there is a common agreement that there is always going to be different documents for different audiences.

**IV. FOLLOW-UP OF THE ELITE PROJECT FOLLOWING THE FINAL WORKSHOP**

The consortium members closed the final workshop with additional meetings on Thursday, 30 January 2014. The first topic to be discussed herein was the final conference in June 2014 in Poland that will be organized by the Polish Main School of Fire Services (SGPS). For the conference, the overall outcomes of the final workshop were important.

### Summary of Findings from Final Workshop With Regards to ELITE End-Product

The most noteworthy finding from the final workshop is the undistinct usage of the terms disaster and crisis within the ELITE project in combination with a focus on natural disasters such as earthquakes, floods, and forest fires. Moreover, the ELITE CoP indicated that it is neither necessary nor desirable to separate the three disaster types.

One positive aspect throughout the workshops was the composition of all the different experts whereof some participated in only one workshop, and some participated in all four. For a full insight view Annex B.3.

The most striking points of criticism from all workshops, but mostly the final one is that the ELITE living document so far does not compete well with common search engines (e.g., Google, Yahoo, Bing) and information systems (e.g., GDACS, VOSOCC). Using these common tools, the experts have been finding their information throughout the years. Moreover have they used their very own Community of Practice beforehand. Hence, the beneficial aspects of the ELITE living document must – in accordance with the participants’ opinion – lay in the exclusiveness of documents available. Only if the ELITE end product does offer this very added value to the CoP, then the success will be guaranteed.

Nevertheless, the workshops were graded as helpful to the consortium members as they delivered good results for each work package and their fulfillments.
ANNEX A. INVITATION LETTER

Invitation
To Whom It May Concern,

On behalf of ELITE consortium, I would like to welcome your organization to participate in the fourth ELITE workshop.

This workshop and the one to be held on the 11th of July will be held in Schloss Moyland, Germany, and will be open to organizations from all over Europe.

The workshop will cover the following topics:
- ELITE consortium update
- Thematic sessions on disaster management and preparedness
- Workshops on the development of a crisis management plan
- Networking opportunities

The registration fee for the workshop is €50 per person. Participants will be responsible for their own travel and accommodation expenses.

If you are interested in participating in the workshop, please confirm your participation by email to eliteit@google.com by the 1st of June.

We look forward to seeing you there.

Kind regards,

[Signature]

[Name]

Executive Director

ELITE Consortium
ELITE
Elicit to Learn Crucial Post-Crisis Lessons

Aim of the workshop

The workshop is intended to elicit information on how the different organizations in the Community of Practice learn and share lessons learned from crises.

The overall aim is to define best practices on improved preparedness, management and recovery from crises, resulting in guidelines of best practices.

The specific objectives of the exercise are:
- Identify end-users in the way they search for, gather, process, evaluate and reproduce information.
- Identify preliminary version of the ELITE living document database.
- Isolate participatory learning opportunities in team work, crisis data analysis and reporting.
- Increase end-user feedback on the different functions in the ELITE living document database.

Form of the exercise:
- The form of the exercise is twofold. The experts are called upon to form a commission and do a case-study of an actual micro-disaster using the ELITE prototype.
- The intention is to come up with an integral lessons learned report composed of the information provided by all available fragmented reports on this specific crisis.

Tentative workshop agenda

January 27th:
1900 Welcome dinner

January 28th:
0900 Welcome
0905 Information about ELITE project
0930 Status of ELITE living document
1000 Key note speech
1045 Coffee break
1100 Introduction to reporting exercise
1125 Reporting exercise
1200 Lunch
1300 Reporting exercise
1330 Final plenary - Summary of reporting exercise
1445 Coffee break
1500 Wrap up and information about project
1600 End of day/Departure

Location

Accommodation:
The workshop will take place at Training Base Winze, Flugfeld-Lengfeld, Winze, Germany.
The training base offers hotel facilities with hotel rooms, cafeteria and bar.

How to get there:
Shuttle buses will be set up from the airports of Luxembourg and Winze to the training base.

Registration/Booking:
Contact info@eliteteam.eu for help with registration and booking of travel and accommodation.
**ANNEX B. LIST OF WORKSHOP PARTICIPANTS**

**ANNEX B.1. CONSORTIUM MEMBERS PARTICIPATING IN WORKSHOP IV**

<table>
<thead>
<tr>
<th>Consortium Members</th>
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</thead>
<tbody>
<tr>
<td>Coccetti, Claudia</td>
<td>ANCI Umbria</td>
</tr>
<tr>
<td>Galarowicz, Oksana</td>
<td>SGSP</td>
</tr>
<tr>
<td>Galluccio, Dario Guiseppe</td>
<td>ANCI Umbria</td>
</tr>
<tr>
<td>Gimenez, Raquel</td>
<td>TECNUN</td>
</tr>
<tr>
<td>Goujon, Bénédicte</td>
<td>Thales Research &amp; Technology</td>
</tr>
<tr>
<td>Grumann, Tonje</td>
<td>Forsvarets Forskningsinstitutt (FFI)</td>
</tr>
<tr>
<td>Gualtieri, Giulio</td>
<td>ANCI Umbria</td>
</tr>
<tr>
<td>Kowalski, Stewart</td>
<td>University College Gjøvik</td>
</tr>
<tr>
<td>Labaka, Leire</td>
<td>TECNUN</td>
</tr>
<tr>
<td>Lang, Gert</td>
<td>Forschungsinstut des Roten Kreuzes</td>
</tr>
<tr>
<td>Maal, Maren</td>
<td>Forsvarets Forskningsinstitutt (FFI)</td>
</tr>
<tr>
<td>Raspa, Roberto</td>
<td>ANCI Umbria</td>
</tr>
<tr>
<td>Sarriei, José Maria</td>
<td>TECNUN</td>
</tr>
</tbody>
</table>

**ANNEX B.2. LIST OF PARTICIPANTS IN THE CoP IN WORKSHOP IV**

<table>
<thead>
<tr>
<th>Participants</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolognese, Ciro</td>
<td>Italian National Fire Service; Alessandria Fire Brigade</td>
</tr>
<tr>
<td>Brückner, Karl-Dieter</td>
<td>Österreichisches Rotes Kreuz, LV Wien Katastrophenhilfdienst</td>
</tr>
<tr>
<td>Dugoni, Aurelio</td>
<td>ANPAS Associazione Nazionale Pubbliche Assistenze</td>
</tr>
<tr>
<td>Glerum, Peter</td>
<td>Independent Consultant</td>
</tr>
<tr>
<td>Grima, Stefano</td>
<td>Director of SPRINT, University of Udine (IT)</td>
</tr>
<tr>
<td>Kaiser, Bernhard</td>
<td>Austrian Federal Ministry of Defense and Sports</td>
</tr>
<tr>
<td>Krajic, Wolfgang</td>
<td>Director, Synergies International Consulting s.p.</td>
</tr>
<tr>
<td>López Loarte, Ana</td>
<td>Directorate of Emergency and Meteorology services, Basque</td>
</tr>
<tr>
<td>Mattia, Concetta</td>
<td>ANPAS Associazione Nazionale Pubbliche Assistenze</td>
</tr>
<tr>
<td>Mocici, Ionel Alin</td>
<td>Police Academy “Alexandru Ioan Cuza”, Fire Officers Faculty, (HU)</td>
</tr>
<tr>
<td>Nesensohn, Thomas</td>
<td>SARUV</td>
</tr>
<tr>
<td>Pearn, Edward</td>
<td>Consultant with UN and NATO</td>
</tr>
<tr>
<td>Pollini, Gian Paolo</td>
<td>Province of Terni, Italy</td>
</tr>
<tr>
<td>Robach, Björn</td>
<td>Feuerwehr Duisburg, Germany</td>
</tr>
<tr>
<td>Schneider, Piet</td>
<td>Police Academy of the Netherlands</td>
</tr>
<tr>
<td>Silmäri, Jyri</td>
<td>South-Savo Regional Fire Service</td>
</tr>
<tr>
<td>Stokkeland, Ove</td>
<td>Skien Fire Service</td>
</tr>
<tr>
<td>Wilson-North, Mark</td>
<td>MarGins Consulting</td>
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## ANNEX B.3. COMPARISON OF EXPERTS’ PARTICIPATION THROUGHOUT THE WORKSHOPS

<table>
<thead>
<tr>
<th>Workshop I</th>
<th>Workshop II</th>
<th>Workshop III</th>
<th>Workshop IV</th>
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<tbody>
<tr>
<td>Bover, Marta Miralles</td>
<td>Battle, Masdeu Jordi</td>
<td>Alvarez Seco, Ariane</td>
<td>Bolognese, Ciro</td>
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<td>Bosch, Jordi</td>
<td>De Keizer, Henk-Jan</td>
<td>Brückner, Karl-Dieter</td>
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<td>Halvorsen, Carina</td>
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<td>Dugoni, Aurelio</td>
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<td>Garczyński, Maciej</td>
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<td>Glanzer, Markus</td>
<td>Grimaz, Stefano</td>
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<td>Lespiaucq, Jean-Pierre</td>
<td>Klaassens, Siske</td>
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<td>Mazel, Christoph</td>
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<td>Klaassens, Siske</td>
<td>López Loiarte, Ana</td>
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<td>Nesensohn, Thomas</td>
<td>Montanucci, Barbara</td>
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<td>Pagidas, Dimitrios</td>
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<td>Parkes, Rudolph</td>
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<td>Pollini, Gian Paolo</td>
<td>Rossi, Luca</td>
<td>Schneider, Piet</td>
<td>Silmäri, Jyri</td>
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<td>Rebez, Alessandro</td>
<td>Schneider, Piet</td>
<td>Stokkeland, Ove</td>
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<td>Robach, Björn</td>
<td>Schuurman, Paul</td>
<td>Summer, Morten</td>
<td>Wilson-North, Mark</td>
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<tr>
<td>Saenz de San Pedro, Alba</td>
<td>Silmäri, Jyri</td>
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<tr>
<td>Schneider, Piet</td>
<td>Stocker, Christian</td>
<td></td>
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</tbody>
</table>

**Marked in blue** = participant visited all four workshops  
**Marked in red** = participant visited multiple workshops
Monday, January 27
19:00 Welcoming dinner, hosted by the ELITE consortium

Tuesday, January 28
08:00 Breakfast
09:00 Welcome, Rikus van Santen, I.S.A.R. Germany
09:15 Introduction of the consortium
09:25 Introduction of the participants
09:40 ELITE project presentation, José Maria Sarriegi, TECNUN
10:00 Key note speaker: Union Civil Protection Mechanism, Wolfgang Krajic
10:45 Coffee Break (group picture)
11:00 Introduction of reporting exercise
11:15 Reporting exercise
12:30 Lunch
13:30 Reporting exercise
17:00 Plenary session – status of exercise
17:30 End of day
17:45 Guided walk through Training Base Weeze, Rikus van Santen, I.S.A.R. Germany
19:00 Dinner
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Agenda for:
ELITE Workshop IV,
Weeze, 27th - 29th January, 2014

Wednesday, January 29

08:00 Breakfast
09:00 Briefing/Status from day 1
09:15 Reporting exercise
10:00 Telecon Group 1
10:20 Telecon Group 2
10:40 Telecon Group 3
11:00 Coffee break
11:15 Reporting exercise
12:30 Endex and lunch
13:30 Final conference
14:00 Report presentations
15:00 Open session project continuity
15:45 End of day/departure
ANNEX D. INTRODUCTORY PRESENTATIONS ON DAY 1

ANNEX D.1. INTRODUCTION TO THE ELITE PROJECT BY TECNUN

ELITE project
4th Workshop: Holistic

ELITE COP

- End users / customers of project results
- Heterogeneous, complementary and cooperative network of stakeholders
- Learn and share

COMMUNITIES OF PRACTICE (COPS)

- Communities of Practice (CoPs) are groups of people who share a common interest and concern, and who expand their knowledge and expertise in this area by sharing ideas, experiences, insights, tools and best practices (Ruffner, 2010; Snyder, 2003; Wenger, 2002)

WHY BUILD A COP?

- CoPs facilitate knowledge exchange and learning
- CoPs support formal and informal knowledge sharing
- Trust, empathy and reciprocity are the building blocks for relationships that join members
- CoPs provide many advantages such as:
  - time saving
  - reduction of errors
  - increase in productivity
  - reduction in duplication of effort

OBJECTIVES

- Objective 1: To Establish a Community of Practice (CoP) in Crisis Management
- Objective 2: Create a tested and validated ELITE living document of crisis management
- Objective 3: Implement the ELITE living document
- Objective 4: Analyse the learning process from lessons learned to lessons implemented
- Objective 5: Deliver recommendations for future research
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Objective 1: To Establish a Community of Practice (CoP) in Crisis Management
- Much information exists as fragmented tacit knowledge in the heads of various responders and crisis managers, and in the civil protection agencies, NGOs, critical infrastructures, private firms and industries throughout Europe.
- These organisations, located in different European countries, normally produce independent reports on emergency preparedness and evaluations of rescue and recovery operations.
- The establishment of a CoP in crisis management will facilitate the sharing of lessons learned and disaster knowledge.
- The heterogeneity in the real world is represented in the ELITE CoP.

Objective 2: Create a tested and validated ELITE living document of crisis management
- The ELITE living document is a publicly available web solution comprised of the following:
  - A 'living' repository of best practices
  - A 'living' repository of guidelines
  - Social media features where authorized agents can freely operate and interact
- The ELITE living document will be maintained according to a Wiki philosophy, where authorized agents can update and maintain crisis management best practices and guidelines.
- The ELITE living document will include one security module for the definition of roles, permissions, and attributes regarding the tools and information stored in the ELITE living document, as only authorized agents should have access for inserting, modifying and deleting information.

Objective 3: Implement the ELITE living document
- The project will organise three scenario-based workshops within the realms of earthquakes, floods, and forest fires and a tabletop exercise will be conducted in combination with the fourth integrated workshop.
- The project shall perform a comprehensive literature review with the purpose of identifying the most relevant problem areas and lessons learned.
- The document analysis and the workshop information will form the basis for designing interview guides for semi-structured interviews.
- As part of the categorisation phase, the project will apply the MYRADA methodology.
- In the analysis phase, three reports on lessons learned will be written, one for each disaster type. The findings are integrated and incorporated in a holistic analysis lessons learned report.

ELITE Living Document: Features
- A Wiki environment has been used to support the CoP.
- It supports any type of file: text, video, audio, pictures...
- Information is classified using useful criteria to make easier the search process.
- Information is rated and commented by experts.
- It includes social media features and forum discussions to interact and share experiences.

Objective 4: Analyse the learning process from lessons learned in lessons implemented
- It is crucial to derive best practices among the varying learning processes and training regimes for crisis management across Europe.
- The framework for learning process and training regime identification, analysis, evaluation and dissemination will give concrete guidelines on how to use the ELITE living document.
**Objective 6: Deliver recommendations for future research**

- The project will deliver recommendations for future research in these topics:
  - Knowledge gathering, categorisation and analysis processes.
  - Best practices and guidelines for each individual analysed disaster type: floods, earthquakes and fires.
  - Integration of common aspects of different disaster types.
  - Use of social media for learning and cooperation purposes.

**KEY RESULTS**

1. The establishment of the ELITE CoP that enables the involvement of end-users in the project as well as a broad dissemination and continuous update of the living document.
2. A tested and validated living document, which integrates the lessons learned in previous disasters, for improved preparedness, management and recovery from crises.
3. Holistic analyses of gathered lessons learned revealing common problems, best practices and solutions to transfer knowledge between disaster areas.
4. Inventory of relevant learning processes and training regimes in crisis management and an analysis of their benefits and weaknesses.
5. Deliver recommendations for future research.

**WORK PACKAGES**

- WP1: Project Management
- WP2: ELITE Learn and Practice Workshops
- WP3: ELITE Living Documentation
- WP4: ELITE Learning Processes Analyses
- WP5: Dissemination

**WORKSHOPS**

- **WS1:** Forest Fires. Weeze. 14-15 April 2013
- **WS2:** Earthquakes. Weeze. 25-25 June 2013
- **WS3:** Floods. Vienna. 8-9 October 2013
- **WS4:** Holistic. Weeze. 28-29 January 2014
- **Final Conference:** Warsaw. May – June 2014

**CONTINUITY OF THE PROJECT**

- We are analyzing several alternatives
  - Transferring the results to the EC, so it could be responsible
  - Transferring the results to some other already existing institution
  - Build up a new entity to maintain and improve the results of this project.
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Workshop IV Lessons Learned Workshop Report

WP 4: KNOWLEDGE GATHERING, CATEGORISATION AND ANALYSIS

Objectives
• Gather both first-hand and second-hand data through interviews, questionnaires, workshops and a tabletop exercise
• Develop a meaningful classification and categorisation system building on the MYRIAD tool
• Design questionnaires for the categorisation process
• Design interview guides for semi-structured interviews
• Analyse and systematise interoperability challenges regarding responders and their equipment
• Systematise lessons learned into the ELITE living document
• Make lessons learned available through the ELITE living document
• Integrate social networking tools with the ELITE living document
• Involve end-users in the holistic analysis to validate the results in all stages

Work package number 4
Start date or starting event: Month 3
Work package title: Knowledge gathering, categorisation and analysis
Activity Type: SUPP
Participant number: 1 2 3 4 5 6 7 8
Participant short name: TECNUN FFI G UC FRK ISAR TRT SG SP IMAA-CNR ANCI Umbria
Person-months per participant:
3 10 2 2 4 2 2

WP 5: LEARNING PROCESS ANALYSIS

Objectives
• Analyse the learning process from lessons learned to lessons implemented
• Learn from past experiences and transfer into reusable knowledge, but also skills and know-how to tackle various crises. Reusable knowledge and experience is essential in order to facilitate learning
• Identify, analyse and evaluate learning processes in crisis management
• Develop a framework for learning facilitation based on experience gained in the ELITE project and present experience in the relevant domains, but also by examining how learning processes are implemented in real-world crises
• Develop a framework for learning enabling knowledge and experience transfer and learning process improvement across crisis management domains and countries within the EU

Work package number 5
Start date or starting event: Month 7
Work package title: Learning process analysis
Activity Type: LEAD
Participant number: TECNUN FFI G UC FRK ISAR TRT SG SP IMAA-CNR ANCI Umbria
Person-months per participant: 3 10 2 2 4 2 2

WP 9: DISSEMINATION OF LESSONS LEARNED

Objectives
To disseminate results, technological concepts and developments of the project
to monitor, analyse and develop new and improved crisis management systems during the project
To ensure the external communication of the project, to make the end-users aware about established key to use solution concepts,
To disseminate knowledge about the ELITE project and the its impact on the end-users
To develop and follow different dissemination strategies
To contribute to future research on the vulnerability community
To inform relevant stakeholders such as crisis managers, emergency and humanitarian relief organizations (COs and NGOs) and emergency financing systems
To develop the ELITE project in terms of the 3Ts (Technology, Training, Translation) and the 6Es (Education, Ethics, Empowerment, Evaluation, Experience, Engagement)
To disseminate information about available EU tools, having already been in use or process of dissemination/implementation such as programs, nationalities, tools, mechanisms built up to improve world safety level of the EU citizens
To disseminate information to its stakeholders, readers and interested colleagues who have developed the prototype.

Workshop number: 9
Topic: Dissemination of Lessons Learned
Type: LEAD
Participant number: TECNUN FFI G UC FRK ISAR TRT SG SP IMAA-CNR ANCI Umbria
Person-months: 1 2 3 4 5 6 7 8

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Annex E. Framework for the reporting Exercise

Framework for the reporting exercise

28th - 29th January 2014, Weeze
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Framework for reporting exercise

Main topics for lessons identified report:
Lessons identified on all these topics must be covered in the report. If relevant topics are missing, these can be added.

1. Communication
2. Interoperability
3. Coordination and decision-making
4. Risk assessment
5. Logistics
6. Recovery

The topics should address all phases in a crisis if possible: pre-crisis, during the crisis, post-crisis.

Process

1. Pre-crisis phase
2. Implementation phase
3. Post-crisis phase

To support the discussions and writing of the lessons identified report, extra guidelines/questions are included under each heading.

Communication

- Describe the communication between actors (for example different first responders, NGOs, governmental agencies etc.) in all phases of the crisis. The report must cover:
  - Inter-agency communication
  - Crisis communication to the population
  - The role of media and social media in the crisis
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Interoperability

- How was the interoperability between the different actors (for example, different first responders, NGOs, governmental agencies, etc.) in all phases of the crisis?
  - Did the cascading effects have an effect on the interoperability?
  - Which actors managed to cooperate in an effective and efficient manner?

Coordination and decision-making

- How did the coordination and decision-making work out (roles, responsibilities, etc.)?

Risk assessment

- To what extent was Japan prepared for a crisis with cascading effects? Please describe.
- How did the natural disaster affect critical infrastructure, and what was the impact of crisis management in terms of the allocation of resources and communication.
- Were risk assessments conducted during the crisis? Please give examples.

Logistics

- What were the challenges related to logistics? (transportation of personnel and equipment, means/tools of communication, etc.)

Recovery

- What was done in the recovery phase and by whom?
Annex F. Results

Annex F.1. Results from Group One

GROUP 1

Framework for the reporting exercise

28th - 29th January 2014, Weeze
Describe the **communication** between actors in all phases of the crisis.

All is communication! With all things you make communication, All the people can make communication… that is one of the problem!

About a Japan earthquake: how it has worked in the communication? And how did it work?

Have been considered to the following stakeholders at different stages (Pre crisis Implementation phase, Post crisis) of communication:

- Inter-agency communication
- Crisis communication to the population
- The role of media and social media in the crisis

About the Inter-agency communication, exists almost exclusively as internal communication (workers’ safety processes, etc..) and written almost entirely after the crisis.

(An example) Prepare for the Unexpected Communications

Lesson Learned: Communication methods and equipment should support accurate and timely information exchange, consistent and clear communications with the public, and information-sharing between the utility and the government.

Procedures

Lesson Learned: Optimum accident management strategies and associated implementing procedures (such as emergency operating procedures and accident management guidelines) should be developed through communications, engagement, and exchange of information among nuclear power plant operating organizations and reactor vendors. Decisions to deviate from these strategies and procedures should be made only after rigorous technical and independent safety reviews that consider the basis of the original standard and the potential unintended consequences.

Nuclear Safety Culture

Lesson Learned: Behaviours prior to and during the Fukushima Daiichi event revealed the need to strengthen several aspects of nuclear safety culture. It would be beneficial for all nuclear operating organizations to examine their own practices and behaviours in light of this event and use case studies or other approaches to heighten awareness of safety culture principles and attributes.

About a Crisis communication to the population, in all Articles and documents consulted there is a reference to communication, for example: “Earthquakes Guidelines on preparing, responding and recovering” (IFRC) or “Red Cross finale report - Japan” or “WHO Report”.

---

**Workshop IV Lessons Learned Workshop Report**
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(Another example of other documents consulted)
In Focus session:
Japanese government report – pre crisis
Red cross guidelines – post crisis

In Lessons learnt:
L. I. from the tsunami disaster in Japan – post crisis
Fukushima Lessons learned: post crisis
Red cross report – post crisis

FINAL CONSIDERATIONS

I have to analyze the content of the site, and I notice a few things: almost all information and notices contained are post-crisis, made to learn from the bad experience; I looking for only video for the communication in pre crisis and in implementation phase (for example: Civilino of the Italian Department of civil protection, or the not professional video edit in local TV).

One only case about a best practice in communication in the Earthquake Guidelines from by IFRC (radio communication to the population) apart from that, I’m not find anything about the role of the media or social media.

The documents on the pre crisis, made by Volunteering is not updated (Italian example: the project “earthquake, I don’t risk”)

I noticed the lack of dates in document titles and keywords that do not give access to all the sections (with a word earthquake is not accessed directly, or even to focus on lessons learned) After this analysis, I think it’s fair to simplify navigation with keywords adding dates to the documents, and I think that good practice would put other communications made both for the pre crisis, implementation phase and the post crisis.

Interoperability

Looking to the item of interoperability you really must do research in the living document. It costs a lot of time. The document used for this ‘exercise’ was written for the Tepco company but is also very useful for those who are working in other organizations related to rescue working.

Is does not give an clear answer on the questions if something can be related to pre-crisis, implementation or post-crisis. Nevertheless there are some results and we mention these in below.

In this report we worked on de items pre-crisis, implementation and post-crisis, not every issue can be posted under one item, some items are posted under several items and in a different order.

Pre-crisis:

Training and periodic drills must be sufficiently challenging and realistic to prepare operating crews and emergency response personnel to cope with and respond to situations that may occur during a multi-unit accident, including a nuclear accident resulting from a natural disaster.
Plant design features and operating procedures alone cannot completely mitigate the risk posed by a beyond-design-basis event. Additional preparations must be made to respond if such an event were to occur.

Establish strategies for staffing operating crews, other key plant positions, and site and corporate emergency response organizations quickly in the initial stages of a multi-unit event and over the long duration of the event response.

Optimum accident management strategies and associated implementing procedures (such as emergency operating procedures and accident management guidelines) should be developed through communications, engagement, and exchange of information among nuclear power plant operating organizations and reactor vendors. Decisions to deviate from these strategies and procedures should be made only after rigorous technical and independent safety reviews that consider the basis of the original standard and the potential unintended consequences.

Actively participate and make best use of operating experience information shared in international organizations and forums.

**Implementation/post-crisis**

Communication methods and equipment should support accurate and timely information exchange, consistent and clear communications with the public, and information-sharing between the utility and the government.

Off-site resources and support should be provided on a priority basis following significant events such as a loss of off-site power. Emergency response plans and other corporate guiding documents should clearly state that the needs of nuclear stations are to be given highest priority in the event of an emergency situation.

On-shift personnel and on- and off-site emergency responders need to have in-depth accident management knowledge and skills to respond to severe accidents effectively. Training materials should be developed and training should be implemented using the systematic approach to training.

**Pre-crisis, implementation and post-crisis:**

Plans must address the immediate emergency response needs for human resources, equipment, and facilities in the first few hours of an event, as well as the need for a long-duration response capability. In addition, plans should address how to engage the domestic and international nuclear industry to obtain needed support and assistance during an event.

**Post-crisis/implementation/pre-crisis**

Accident management training was conducted through computer-based learning.

Although the training material was sufficiently broad in scope, it lacked the depth and level of detail needed to create a questioning attitude for critical parameter assessment, including recognition of instrumentation limitations in accident environments. Reliance on the computer-based training setting and on infrequent refresher training (every three years) creates vulnerabilities in knowledge retention and depth of understanding.

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**Coordination and decision-making**
1.1. Pre-Crisis phase

In general:

- Preparation for the unexpected → flexible solutions!
- In order to prevent future disasters, fundamental reforms must take place. These reforms must cover both the structure of the electric power industry and the structure of the related government and regulatory agencies as well as the operation processes. They must cover both normal and emergency situations.

In detail:

- On-site and off-site facilities necessary for coordinating emergency response activities should be designed and equipped to remain functional in the event of a natural disaster and/or a nuclear emergency. Contingency plans are important for Off- and On-Site. There were no contingency plans for relocating the off-site center or for other actions to take if the center were unavailable.
- Establish contingency plans, training, and guidance to help personnel cope with the emotional concerns that can impact decision-making and reduce personnel effectiveness during a natural disaster or nuclear accident.
- Lesson Learned: Nuclear operators must establish the necessary infrastructure to respond effectively to severe accident conditions, mitigate core damage, and stabilize the units if core damage does occur. This infrastructure includes necessary personnel, equipment, training, and supporting procedures to respond to events that may affect multiple units, last for extended periods, and be initiated by beyond-design-basis events. Provisions should also be made to allow an effective corporate and industry response in support of the affected nuclear operating organization.
- Lesson Learned: Establish strategies for staffing operating crews, other key plant positions, and site and corporate emergency response organizations quickly in the initial stages of a multi-unit event and over the long duration of the event response.
- Lesson Learned: Ensure primary and alternative methods for monitoring critical plant parameters and emergency response functions are available. Use drills and exercises to ensure emergency response personnel are able to use the available monitoring tools and methods.
- Application of decision making:
  - The general director for disaster management in the Cabinet office should work full time on these matters for things to get done.
  - Systems that are regularly used should be used during emergencies as well. Systems that need to be turned on at times of emergencies will never work.

- Recommendation: Reform the crisis management system
  A fundamental reexamination of the crisis management system must be made. The boundaries dividing the responsibilities of the national and local governments and the operators must be made clear. This includes:
  1. A reexamination of the crisis management structure of the government. A structure must be established with a consolidated chain of command and the power to deal with emergency situations.
  2. National and local governments must bear responsibility for the response to off-site radiation release. They must act with public health and safety as the priority.
  3. The operator must assume responsibility for on-site accident response, including the halting of operations, and reactor cooling and containment.
Recommendation: Criteria for the new regulatory body
The new regulatory organization must adhere to the following conditions. It must be:
1. Independent: The chain of command, responsible authority and work processes must be: (i) Independent from organizations promoted by the government (ii) Independent from the operators (iii) Independent from politics.
2. Transparent: (i) The decision-making process should exclude the involvement of electric power operator stakeholders. (ii) Disclosure of the decision-making process to the National Diet is a must. (iii) The committee must keep minutes of all other negotiations and meetings with promotional organizations, operators and other political organizations and disclose them to the public. (iv) The National Diet shall make the final selection of the commissioners after receiving third-party advice.
3. Professional: (i) The personnel must meet global standards. Exchange programs with overseas regulatory bodies must be promoted, and interaction and exchange of human resources must be increased. (ii) An advisory organization including knowledgeable personnel must be established. (iii) The no-return rule should be applied without exception.
4. Consolidated: The functions of the organizations, especially emergency communications, decision-making and control, should be consolidated.
5. Proactive: The organizations should keep up with the latest knowledge and technology, and undergo continuous reform activities under the supervision of the Diet.

Recommendation: Develop a system of independent investigation commissions
A system for appointing independent investigation committees, including experts largely from the private sector, must be developed to deal with unresolved issues, including, but not limited to, the decommissioning process of reactors, dealing with spent fuel issues, limiting accident effects and decontamination.

- Emergency Relief
- Health Infrastructure and Care
- Community Based Disaster Preparedness
- Capacity Building of JRCS National Disaster Preparedness

Implementation phase
Lessons learnt:

Core cooling:

- Early in the response to an event, clear strategies for core cooling and recovery actions should be developed and communicated to control room and ERC personnel. In addition, leaders should establish clear priorities and provide direction and oversight to enable the strategy to be implemented effectively

- Lesson Learned: Clearly define and communicate the roles and responsibilities of emergency response personnel to help ensure effective post-accident communications and decision-making.

- Usage of simulation technology to learn for a lot of possible situations

  - Emergency Relief
Post-Crisis phase

- Optimum accident management strategies and associated implementing procedures (such as emergency operating procedures and accident management guidelines) should be developed through communications, engagement, and exchange of information among nuclear power plant operating organizations and reactor vendors. Decisions to deviate from these strategies and procedures should be made only after rigorous technical and independent safety reviews that consider the basis of the original standard and the potential unintended consequences.

- Recommendation: Government responsibility for public health and welfare

Regarding the responsibility to protect public health, the following must be implemented as soon as possible:

1. A system must be established to deal with long-term public health effects, including stress-related illness. Medical diagnosis and treatment should be covered by state funding. Information should be disclosed with public health and safety as the priority, instead of government convenience. This information must be comprehensive, for use by individual residents to make informed decisions.

2. Continued monitoring of hotspots and the spread of radioactive contamination must be undertaken to protect communities and the public. Measures to prevent any potential spread should also be implemented.

3. The government must establish a detailed and transparent program of decontamination and relocation, as well as provide information so that all residents will be knowledgeable about their compensation options.

- Bestpractice: from Report: japanese red cross.

  - Assistance for those Affected by Nuclear Power Plant Accident
  - Improving the Living Conditions of Affected People
  - Social Welfare Support
  - Children’s Education Support

Risk Assessment

Pre-crisis

The magnitude of the earthquake, the tsunami, the accident at the Fukushima power plant and so forth was all expressed as unexpected and unprecedented events.

The earthquake was a surprising one, even for Japanese specialists having great experience in seismology. But, on the other side, Miyagi Prefecture predicted (99%) that such disaster will occur off, but not at this magnitude, because the earthquake prediction is based on phenomenon that experienced with it.
After the Great Hanshin Earthquake in 1995, measures were made with nuclear power plants and the resistance to earthquakes was given priority while measurements regarding tsunamis were postponed. After the Great East Japan Earthquake (2011), in addition to the seismic movement, a prediction map for tsunamis was created.

The earthquake resistant criteria were reinforced, in Japan, after 1982, because of the Great Hanshin Earthquake on the studies developed by Kozo Keikaku Engineering. Therefore, 480,000 people were saved in March 2011.

**SOURCE: JAPAN DISASTER PREVENTION FORUM**

The plants were in good condition, with well-maintained equipment and well-organized work spaces, even under outage conditions. No one expected or was prepared for the massive earthquakes and the tsunamis that would occur before the day ended.

Over the years, nuclear plant operators around the world have focused on continuously improving plant safety by ensuring compliance with regulations, operating plants within their design bases, and making safety improvements based on worldwide operating experience and best practices, including addressing lessons learned from core-damaging events at Three Mile Island Nuclear Station and Chernobyl Nuclear Power Plant.

Organizations have also worked to improve plant programs, processes, and personnel performance.

Improved performance resulted in a high level of confidence in the ability to protect the core and the health and safety of the public given any of the anticipated accident scenarios. However, the Fukushima Daiichi and Daini events reveal the need to also be prepared for the unexpected – including circumstances that go beyond the design basis. No matter how well plants are operated and maintained, there is always the potential for unexpected and high-consequence situations. On reflection, it is evident that Tokyo Electric Power Company (TEPCO) and the broader commercial nuclear industry were not prepared to respond to maintain critical safety functions or to implement effective emergency response procedures and accident management strategies under the extreme conditions encountered at Fukushima Daiichi.

Procedures were developed based on the assumption that a loss of all AC power would not last for more than 30 minutes and that the coping time could be extended up to eight hours using station batteries. This assumption was based on the multiple off-site transmission lines, the availability of backup diesel generators, and extensive features to cross-tie and share electrical power sources among the units. In retrospect, the lack of contingencies to address a longer loss of AC power, together with the lack of extensive damage mitigation guidelines, resulted in the station having no planned alternatives for local operation of equipment necessary to maintain critical safety functions.

Over the years, TEPCO had implemented several changes to improve the ability to mitigate the risks of a core-damaging event. Examples are installing air-cooled diesel generators, modifying the plants to allow cross-connection of electrical buses and cooling water systems, adding fire engines for fire protection, and constructing seismically isolated buildings for use during emergency response. Many of these improvements were vital to the response efforts following the tsunami; however, they were not sufficient to prevent or fully mitigate the consequences of the event.

The strategies, equipment, and training required for a response to a beyond-design-basis event were not in place to build an additional layer of defense-in-depth in the face of a prolonged loss of AC and DC power. Many lessons learned in this report describe areas in which preparations for the unexpected should be considered. Examples are design and procedure changes to allow operators to perform vital actions when normal power and other services are not available; and sufficient staffing, facilities, procedures, and training to support emergency response activities if an event were to occur.

**SOURCE: FUKUSHIMA LESSONS LEARNED**
Implementation

The earthquake caused seismic movement to skyscrapers for a long period, isolating some residents.

IBM Research considered that Information and Communication Technology – ICT wasn’t being used as expected. One reason for this being the control of information. For example, depending on the shelter, relief supplies either weren’t enough or were too plentiful.

In the high-rise office buildings, the copy machines become killing machines.

**SOURCE: JAPAN DISASTER PREVENTION FORUM**

Tsunami Damage

Most bridges suffered little or no damage from the tsunami. This was despite bridges not being specifically designed for tsunami. The lack of damage is often surprising.

In contrast, in Otsuchi not only the superstructure of the railway bridges washed away, but only one of the columns was knocked over.

In conclusion almost all bridges resisted to the debris coming by water waves.

Fukushima Power Plant

The maximum tsunami height impacting the site was estimated to be 46 to 49 feet (14 to 15 meters). This exceeded the design basis tsunami height of 18.7 feet (6.1 meters) and was above the site grade levels of 32.8 feet (10 meters) at units 1-4. All AC power for units 1-5 was lost when emergency diesel generators and switchgear rooms were flooded. The seawater intake structure was severely damaged and was rendered nonfunctional.

**SOURCE: CRITICAL INFRASTRUCTURE DURING THE JAPAN EARTHQUAKE 2011**

The loss of primary and secondary containment integrity resulted in ground-level releases of radioactive material.

Shortly after the earthquake, the Japan Meteorological Association issued a major tsunami warning, indicating the potential for a tsunami at least 3 meters high.

The maximum flood height was estimated to be 23 feet (7 meters) on the seaward side of the plant and 49 feet (15 meters) in the area of the main buildings. This exceeded the design basis tsunami height of 17.1 feet (5.2 meters) and was above the grade level of 13.1 feet (4 meters) on the seaward side of the plant and 39.4 feet (12 meters) at the main buildings.

**SOURCE: FUKUSHIMA LESSONS LEARNED**

Post-crisis

Solutions resulted from risk assessment after the crisis:

- A prediction map for tsunamis was created (finally) – by the Japan National Institute for Earth Science and Disaster Prevention
ELITE
Elicit to Learn Crucial Post-Crisis Lessons

- A production of a network of seismic stations started, in laboratory stage, in the seabed of Japan - by the Japan National Institute for Earth Science and Disaster Prevention – to get data sent straight from the ocean.
- Japan National Institute for Earth Science and Disaster Prevention specialists have been able to simulate precisely the engineering with the wave motion and an earthquake, the propagation of tsunamis and the shaking of a building – Japan’s technology is progressing.
- Kozo Keikaku Engineering – provided design of buildings to resist to earthquakes or other natural disasters as strong wind, flood or typhoons. This information was provided to the private sector in Japan.
- IBM Research proposed a futuristic technology outlook, proposing the “resilience business and services” – a company system making a society as a whole more resilient.
- The seismic movement of the skyscrapers influenced the research on not only the building, but also the furniture installed and how it shakes. Therefore the damaged can be decreased by fixing furniture and other security measures.
- A simulation of evacuation must be done, carefully, depending of the day of the week.
- From the point of view of education, rather than showing a map of how much flooding a tsunami will cause, instead, showing a picture of a tsunami coming has much more impact. Therefore the visual effects must be spread to the world, not just doing calculations.

**SOURCE: JAPAN DISASTER PREVENTION FORUM**

At Fukushima Daiichi, conditions have improved significantly since the March 11 event. Much of the debris from buildings, equipment, and vehicles that was left following the tsunami and explosions has been removed, and a large temporary wall has been constructed to help protect against future tsunamis. In contrast, the wreckage of pumps, cranes, buildings, and large equipment that remains is a stark reminder of the power of the tsunamis that struck the site.

“For nuclear professionals, it is not possible to visit the Fukushima Daiichi site without coming away with a renewed commitment to ensuring nuclear safety.” John Conway, Senior Vice President, Energy Supply, Pacific Gas & Electric Company

**SOURCE: FUKUSHIMA LESSONS LEARNED**

Lessons learnt

Be prepared for unexpected and unprecedented phenomenon and crisis.

Maintain the regulations up to date and build them up according to the scientists’ simulations.

Keep the population informed using the images of effects of the previous disaster, rather than dry information, as results of calculations obtained in labs or the surface of the flooded areas on a map.

Develop a culture of disaster preparedness to the population situated in the vulnerable areas (depending on the type of risk).
Make the simulations as closed as it possible to the reality, taking into accounts all aspects and all data and measurements obtained from real sensors or network stations.

Use the information and communication technology in time of the crisis to help the specialists to better coordinate their resources (human or material) and to take and apply the best solutions.

Plan better for an efficient evacuation of people in case of disasters.

There are many lessons that could be learned about the behavior of bridges impacted by tsunami waves studying the data collected after the earthquake in 2011 in Japan.

Concerning the power plants, the Plant design features and operating procedures alone cannot completely mitigate the risk posed by a beyond-design-basis event. Additional preparations must be made to respond if such an event were to occur.

Logistics:

Pre Crisis Phase:

The damage from the earthquake and tsunami was enormous; over 120,000 houses were totally damaged, and more than 470,000 people had to leave their home and evacuate to over 2,400 shelters.

Delivery of relief goods was planned to be executed through depots at two levels—prefectural and municipal. Especially in the first two weeks, fuel shortages made downstream deliveries from prefectural depots very difficult. Also, manpower shortages and the inconvenient building specifications of depots were the main causes of unnecessary stockpiling in depots.

Telecommunications disruptions furthered mismatches between real needs and supplies. But the professional support of logistics specialists was effective in relieving the bottlenecks in depots.

The time table of typical actions after an earthquake disaster require Quick inspection of building damage together with needs assessment must be done in the first stage of actions. The post earthquake quick damage inspection system in Japan is introduced, as an integral part of the plan and one can see from that logistics is clearly indicated within the plan, for example:

Information and transportation flows in the official relief goods delivery system Companies, public bodies, inhabitants in other areas Companies, public bodies, inhabitants in other areas Evacuation shelters, hospitalsCabinetOffice, etc. Request Request Request Supply Transportation Information flow Transportation flow Transportation Independent offer by goodwill Transport information Transport information Order, arrival schedule Inventory check Order, arrival schedule Inventory check Shipping information Prefectural (first level) depot in affected area Prefectural disaster responding office Municipal (second level) depot in affected area Municipal disaster responding office Transportation Request Shipping information Shipping information
Delivery of relief goods was planned to be executed through depots at two levels—prefectural and municipal. Especially in the first two weeks, fuel shortages made downstream deliveries from prefectural depots very difficult. Also, manpower shortages and the inconvenient building specifications of depots were the main causes of unnecessary stockpiling in depots. Telecommunications disruptions furthered mismatches between real needs and supplies. But the professional support of logistics specialists was effective in relieving the bottlenecks in depots.

The relief goods delivery system in Japan:

In Japan delivery of relief goods and services is the responsibility of the prefectural governor, who responds to requests from the municipalities. According to the post disaster plan, delivery of relief goods was to be executed using depots at two levels: prefectural and municipal. Shipping order request Collection points in shipping prefectures Reported Internet information

Implementation Phase:

It is evident from reports of the disaster that the logistics part of the plan did not cover all the possible affects resulting from this major event. In fact it is clear that the magnitude of the event totally overwhelmed the available resources and capabilities of all those concerned, requiring a considerably longer period to source action the various stages of the Plan.

Therefore it would be prudent to regularly reassess and adjust the disaster plan to take account of any changing circumstances and current risk assessment opportunities and in short “plan for the unexpected”.

Support of logistics specialists was effective in relieving the bottlenecks in depots.

Delivering several kinds of goods, such as food, drinking water, clothing, and bedding, either to people’s homes or to more than 2,000 shelters, was a challenge, especially in the first several weeks when fuel was in short supply. This was especially true for the smaller local transport companies that did not have their own storage facilities. By the end of June, 1,800, 1,400, and 2,400 trucks were dedicated to transporting goods from prefectural depots to municipal depots in Iwate, Miyagi, and Fukushima, respectively. Fuel shortages combined with power outages and telecommunications failures hampered local government efforts to meet emergency needs.

Although many believe that transportation problems were the critical factor, several other forces were at play. The workload spiked at the same time that many staff were being lost to the disaster. Moreover, while the disaster countermeasure manuals state that the economic or industrial support branch of the local government is responsible for the delivery system, workers in that section did not have enough knowledge or experience with logistics and supply chain management. They simply stored the goods in public buildings, with no logistics management plan, so the space was quickly filled.

The building specifications and design of the depots was also a contributing factor. The depots require large storage and handling capacity as well as easy access to expressways, especially prefectural depots. Privately owned warehouses would have been ideal if they had not been damaged. The space under viewing stands in athletic fields, race courses, and indoor gymnasia also served well as depots. In Miyagi Prefecture, large warehouses located near Sendai Port were severely damaged by the tsunami.

The disaster disrupted business operations such as information aggregation; meanwhile, the failure of some communications systems hampered the evacuation of people to safe areas. Very little of the real-time information that was needed to ensure timely and accurate procurement of goods was available: including the location of the shelters, the correct addresses of the recipients of goods, or information about the type and amount of assistance that communities needed.
Information about whether relief goods had actually been received could not be easily communicated among depots for several weeks after the earthquake.

Lessons Learnt:-

• Suitably designed depots with cargo-handling equipment such as forklifts are needed, along with the support of logistics professionals.

• Information on arrival times at each depot is crucial for planning storage and location management.

• Prior quantitative estimates of urgently needed goods should be carried out based on regional demographic statistics. This helps arrange “push delivery”, supply-driven deliveries, in the first few days after the disaster.

• Emergency delivery systems should be closed down as soon as feasible to allow normal commercial distribution systems to take over. They are capable of serving a variety of consumers, and are more flexible and demand driven.

• At the intermediate stage, logistics management is best delegated to designated municipal authorities in unaffected areas.

The need for specialized support

As stated earlier, local government officials without sufficient knowledge, training, or experience in logistics management performed the specialized functions of receiving, sorting,

Post-crises Phase:-

Preparing a “Better” logistics plan

Since it is impossible immediately after disaster to collect information about affected populations and the extent of damages and loss, it is helpful to design simulations of different scenarios to generate data on the expected number of victims, including data on vulnerable groups such as the elderly, disabled, women, children, and so on. Based on these simulations, contingent emergency stocks of basic goods—packages of water, food, household goods (such as tableware, kitchen wrap, tissues, towels, toothbrushes, masks, and blankets) and emergency medicines for the first three days following the disaster should be stored locally, typically at community-level schools and centres.

Since the initial disaster response is invariably carried out rapidly without geographical or population information from the affected areas, data need to be gathered or forecast in advance and stored in databases to implement “push delivery” of first-response aid.

Switching back to commercial systems

National and local governments should use supply chain and logistics management as they respond to victims’ changing needs. As many victims move from shelters into temporary housing, and as normal distributors such as shops, supermarkets, and convenience stores Logistics gradually recover, national and local governments should facilitate the return to normal commercial supply.

More specifically, the early restoration of commercial demand and supply chains, the rapid restoration of market dynamics, and the speedy distribution of donations to increase local purchasing power and liquidity should be a priority for municipal
and local authorities. Job creation and conditional or unconditional cash transfers are highly effective short-term post-disaster measures, and are often more important than continuing the supply and distribution of relief goods by public agencies.

The speed and manner of the transition from public to private supply logistics should be determined by how dependent the affected population is on relief supplies, and on the robustness and speed with which the private sector networks can restore commercial operations. In this case, delivery of relief goods lasted for 40 to 50 days after the disaster. Commercial businesses reappeared in about a month.

Public facilities, such as gymnasia and community halls, can be used as logistics depots as they are well designed with strong-enough floors, wide-enough entrances and exits, and good accessibility for cargo handling.

• Prior agreements can be put in place between the government and logistics companies specifying the terms and conditions and payment methods for hiring logistics professionals, machinery, and depot facilities.

Lessons Learnt:-

• There should be prior identification and training of local government staff that will be tasked with responding to large-scale disasters.
• There should be prior formulation of a list of goods and a standard format for shipments and orders for smooth and seamless activation of the disaster response.
• There should be an enhanced system of procuring all necessary service required following a National emergency.
• In each region, the division of roles, cost-sharing arrangements among the related organizations, as well as appropriate workflow should be discussed in an interdepartmental council. In addition, training in logistics management should be conducted regularly to make sure that the workflow is smoothly implemented in the wake of disaster.

RECOVERY

What was done in the recovery phase and by whom?

Early recovery phase from ERC personal:

- Senior site managers decided on a strategy that included depressurizing the reactors and providing core cooling using AC-powered makeup pumps. This strategy was clearly communicated to control room and ERC personnel.
- Some senior leaders had in-depth knowledge of the electrical distribution system, and these leaders worked with others to develop plans for replacing seawater pump motors and installing temporary cable to power the pumps from electrical distribution panels in other buildings not affected by the tsunami.
- The headquarters ERC took action to locate needed temporary generators, replacement seawater pump motors, and electrical cable and have these materials transported to the site quickly following the tsunami.
- Ongoing management monitoring and direction were provided to organize the workforce and supervise field activities.
- The station staff and contractor personnel worked under difficult conditions to complete installation of the motors and cabling and restored heat removal capability before pressures reached the point that required containment venting.
TEPCO took extensive action at all of its plants to address lessons learned from the company’s own operating experience following a large earthquake at Kashiwazaki Kariwa Nuclear Power Station in 2007. Seismically isolated buildings were constructed at each station, fire fighting systems were improved, and modifications were installed to allow fire engines to be used as an alternate injection source to the reactor. Enhancements to site evacuation plans following the 2007 earthquake were instrumental in successfully evacuating about 6,700 workers from the six units at Fukushima Daiichi. These improvements, most notably the seismically isolated building, were vital to the response efforts following the tsunami.

Reviewing national preparations for post-accident recovery and for transition from the emergency to the recovery phase. Improvements in international communications and exchange of information and expertise among regulatory authorities, their technical crisis centres and relevant international organisations are also being studied and implemented.

Two years after the accident, the NEA continues to assist the Japanese authorities in dealing with their recovery efforts, associated challenges and research plans. Current issues include more comprehensive safety reviews, decontamination, radiological protection and stakeholder dialogue. The NEA is also supporting research programmes designed to improve understanding of how the accident progressed as well as to obtain safety-related information during decommissioning and dismantling.

The implementation of protective measures remains problematic, in particular as the situation transitions to longer-term recovery, and those evacuated wish to return to their normal lives. This transition requires significant resources and efforts to effectively engage with stakeholders so as to understand and appropriately address their concerns. This is particularly complex in a post accident situation where public trust may often be low.

To date, a considerable amount of work has been completed to gather in-depth experience and feedback from the Fukushima accident, but much more remains to be done by the whole nuclear community. As the accident-recovery process continues to evolve and reach specific conclusions, the latter could have an effect on the long-term recommendations for research and development. Such work could be included in NEA ongoing research, with the goal of developing enhanced analysis methods for those areas that were found to require increased scrutiny following the preliminary safety assessments and technical evaluations carried out after the accident (i.e. severe accidents, external hazards assessments). These and other activities, some to be identified, will continue for several years to come.

**FINAL CONSIDERATIONS**

Research on Wikipedia has equal Recovery from disaster reconstruction
But there are many aspects of reconstruction: social, economic, infrastructure.
In this key is analyzed the website.
Looking for in the earthquake session, no documents were found relating to the social and economic aspects. Almost all the documents relating to the disaster at the Fukushima plant and its repair.

In the Focus session we have found some interesting document about recovery, for exemple, “Earthquakes Guidelines on preparing, responding and recovering” (IFRC) or “Red Cross finale report - Japan” or “WHO Report”.

This consideration leads us to recommend a simplification of search keys.
It has also been noted that there aren’t many other references to the reconstruction in other large earthquakes (Abruzzo, Umbria, etc..) That might be useful to those who search.
Annex F.2. Results from Group Two

Japan earthquake lessons learnt

Group 2

Plan of action I
Matrix
- Communication
- Interoperability
- Coordination and decision making
- Risk assessment
- Logistics
- Recovery
- Pre-crisis phase
- Implementation phase
- Post-crisis phase

Recommendations with source

Plan of Action II
- Three groups each 2 topics
- Filling in the Matrix
- Process evaluation in between
- Evaluating the group contribution
- Interview with UK ISAR team member
- Definitive presentation

Report
- General remarks
  - There is a lot of information about the earthquake in Japan
  - There are only a few reviews with lessons learnt
  - Most reports are a description with only "hidden" remarks like this was done quickly etc.
  - We choose not to interpret the information
  - We only used the information in the living document and the interview

Teleconference results
- UK ISAR arrived outside the rescue phase.
- Information provided only on the tactical level
- Interoperability:
  - Good selection of Base of operation and good connection to local authorities.
  - Logistics:
    - Very well coordinated in Japan
    - Only light equipment good enough for the wooden buildings
    - Transport assistance local was good: school busses
    - Coordination was well managed
  - Planning during the night for work during daytime
  - Well arranged risk information (radiation) and planning on basis of that

Main lessons learnt

- Most of the documentation doesn’t include recommendations about how to improve
- Japan had a plan how to handle a modelled disaster but were not able to adapt the plan to this particular situation

Lessons for the exercise

- Guidance on: for who do we execute the task
- Whole afternoon information search needs a break

Lessons for Elite

- Further development of the search engine
  - search terms, history, search in documents
- How to achieve receiving real lessons learnt documents in the living document
- Credibility/quality of the uploaded documents
  - Who is user, who makes use of it
- Detailed comments in the evaluation sheets of the participants.
Annex F.3. Results from Group Three

Japan earthquake, tsunami and nuclear emergency, 11 March 2011 onward

ELITE Reporting Exercise, Jan 2014

Lessons Identified Report

Results of Working Group 3

(Ove Stokkeland, Björn Robach, Wolfgang Krajic, Stefano Grimaz, Giulio Galtieri, Ana Lopez, Oksana Galanowicz, Thomas Nesensohn)

1. Communication (Ove Stokkeland):

1.1 Pre-crisis phase:

- Need of tsunami warning systems (siren and speaker system; in place in most areas in Japan)
- Information and communication technologies have a great potential to improve the resilience of organizations during the management of emergencies, by providing the right information in due time to anticipate evolution and take appropriate decisions, by providing reliable communication channels between stakeholders in the field and in control rooms, by providing tools and systems to simulate phenomena, to monitor situations, to track resources and vehicles, etc.

1.2 Implementation phase

- Good communication and help from LEMA to set up radio links and integrate with other agencies. Tsunami warning systems did alert some of the population. But it did also hamper the search by faulty alarms. Work could not be performed during night time because the tsunami warning system did not function after the incident.
- Medical data were lost or could not be accessed because of lack of power and no internet connections which made medical treatment worse.
- Telephone services remained variable with disaster messaging services in operation through mobile phone providers the first week post event. A total of 831 736 telephone lines remained out of service on 17 March 2011. A reported 6468 base stations of NTT, Soft Bank, KDDI, Emobile and Wilcom mobile companies were not functioning.

1.3 Post-crisis phase

- Red Cross wants to prepare command truck for communication and prefabricated equipment for emergency operation centers.
One of the key learning points associated with ICT is that cell phones should be allocated to roles not people, and stay in the EOC. This ensures that any contact list is valid 24 hours/day and minimises individuals receiving calls ‘out-of-hours’.

ICT equipment needs to have asset-labelling for the role/function it belongs to. This is especially important for laptops that have specialised software installed to perform a role. The laptop needs to remain with the role/function and not leave the EOC, but be handed over to the incoming incumbent at shift changeover. Mobile equipment also needs to be recorded as to its whereabouts. Tracking of valuable hardware is vital in an emergency.

Wireless networking is essential in an emergency situation. Any future EOC site should be equipped with wireless technology, along with necessary technology, fibre distribution, and additional networking so the IT team is ready from day one of the emergency operation.

2. Interoperability (Björn Robach):

In the context of the research I think that teams should understand the roles and responsibilities of LEMA and are able to integrate effectively, resulting in a coordinated and efficient effort. Only two documents were found that deal with interoperability of teams in wide context.

**World Health Organization report on earthquakes.pdf (excerpt):**
Immediately after the earthquake, WHO joined the United Nations Disaster Assessment and Coordination (UNDAC) team on stand-by. WHO also undertook three missions to Japan for fact-finding, information collection and public health risk assessment. The Japan Society for Traumatic Stress Studies reported that a mental health team from Hyogo Prefecture had been active in the field since 18 March. A number of other prefectures had also initiated activities in the field by 22 March 2011. The Ministry of Health, Labour and Welfare took the lead in the coordination of mental Health workers.

**UN OCHA.pdf (excerpt):**
The Government of Japan’s Emergency Management agencies are leading the response through the emergency Response Team, headed by Prime Minister Naoto Kan. Information from the Government of Japan, including situation reports can be found at [http://www.kantei.go.jp](http://www.kantei.go.jp). The Chief Cabinet Secretary’s Office is responsible for coordinating volunteer groups and NGOs through its Volunteers Coordination Unit.

A network of NGO/ volunteer organizations “Japan Civil Network for Disaster Relief in East Japan” has been established in order to facilitate the communication and exchange of information among the organizations working in Tohoku area to support the survivors. A website has been created ([http://www.jpn-civil.net/](http://www.jpn-civil.net/)) where readers have access in Japanese to information on the activities each organization is carrying out.

The aim of the network is to coordinate the assistance provided in Tohoku area by the NGOs/volunteer organizations. Coordination of international NGOs and their local partners will be provided by Japan Platform ([www.japanplatform.org](http://www.japanplatform.org)) and JANIC ([www.janic.org](http://www.janic.org)). The next inter-agency meeting is scheduled for the 2 April in Tokyo.
NGOs and volunteers start to focus assistance to those living outside the evacuation centres and outside of the distribution network.

The Government of Japan has received 134 offers of assistance from countries as well as 39 offers from international organizations. It has accepted relief items from 29 countries and international organizations. The Government says the need for further international assistance is limited and any support should clearly be in accordance with the Government of Japan’s criteria:

With regard to relief items, the Government of Japan has received offers for relief goods/material from many countries, and international organizations. The Government is identifying the needs and trying to match the offers with the identified needs for efficient and effective delivery. As the transportation and storage capacity is still limited, it is strongly recommended not to send any relief goods without coordination with the Government or the local authorities.

4. Risk Assessment (Stefano Grimaz, Giulio Galtieri)

4.1 Analysis of Documents

Event description

<table>
<thead>
<tr>
<th>Primary event: very strong earthquake</th>
</tr>
</thead>
<tbody>
<tr>
<td>No historical data</td>
</tr>
<tr>
<td>Earthquake unexpected</td>
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</tbody>
</table>

Cascade events:
- tsunami
- nuclear disaster

Damage/impacts

<table>
<thead>
<tr>
<th>Nuclear plant</th>
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</thead>
<tbody>
<tr>
<td>Bridges: little damage, good response even</td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>if not designed for tsunami and impact of boats</th>
<th>Fuel storage</th>
</tr>
</thead>
</table>

**Weakness/problems:**

- connections
- embankments
- foundations and substructures
- not easy predict what not was already experienced before
- life-lines
- primary supports severely affected (communication, transportation, fuel) become not available

**Strengths:**

- Embankments reduce the velocity of tsunami if at distance from the coast
- Hospital seismic design

**Improvements after/Suggestions for future**

- Efforts for: Rapid repair and for maintaining on service in case of aftershoks
- Considering the impact on alternative communication services (rail and plane)
- After main earthquake a prediction of

Critical infrastructure during the Japan earthquake 2011.pdf
Japan Disaster prevention forum.pdf
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<table>
<thead>
<tr>
<th>tsunami was created based on seismic stations in the seabed</th>
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</table>

## 4.2 Risk Assessment Questions:

**Japan preparation for a crisis with cascading effects**

- Japan was prepared for crisis mainly for earthquake but not specifically for tsunami.
- Japan was well prepared for technological aspects caused by internal accidents but not in term “just in case” during emergency from NaTech events

*World Health Organization report on earthquakes.pdf*

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**Effects on Critical Infrastructures**

- Effects caused mainly by cascade effects (tsunami and nuclear disaster).
- Life-lines (electricity, roads, bridges, embankments) structures and facility supports (communication transportation fuel supply).
- Japanese nuclear industry were not prepared to respond to maintain critical safety functions or to implement effective emergency response procedures and accident management strategies under the extreme

*World Health Organization report on earthquakes.pdf*
Impact of crisis management in terms of allocation of resources and communication

<table>
<thead>
<tr>
<th>Corporate enterprise risk management processes should consider</th>
<th>World Health Organization report on earthquake.pdf</th>
</tr>
</thead>
<tbody>
<tr>
<td>the risks associated with low-probability, high-consequence events that could lead to</td>
<td>Fukushima lessons learned.pdf</td>
</tr>
<tr>
<td>core damage and spread radioactive contamination outside the plant.</td>
<td>Lessons learned from the tsunami disaster in Japan.pdf</td>
</tr>
</tbody>
</table>

**Communication:**

- a) methods and equipment should support accurate and timely information exchange, consistent and clear communications with the public, and information-sharing between the utility and the government
- b) improvement of the reliability of websites, and developing robust websites for crisis situations and awareness on risks.
- c) reinforce communication and information sharing about risk management and recovery efforts

**Resources:**

- off-site resources and support should be provided on a priority basis following significant events such a loss of off-site power

**Risk assessment conducted during the crisis**
3. Coordination and decision-making (Wolfgang Krajic)

Source: “RedCross_Report_Final_Japan”

Coordination (and Partnerships):

Although JRCS did not issue an international appeal for aid, the disaster brought generous
donations from all over the world … What is the lesson learned (or learnt) from that?

JRCS staff members were invited to join and share the experience and lessons in symposia or
workshops in other countries, such as the Netherlands, the U.S., Switzerland, Canada, Australia, and the
Republic of Korea. What is the lesson learned from that?

Source: INPO Report: “Lessons Learned from the Nuclear Accident at the Fukushima Daiichi
Nuclear Power Station”

4.0 LESSONS LEARNED
4.1 Prepare for the Unexpected
4.2 Operational Response
4.3 Accident Response
4.4 Design and Equipment
4.5 Procedures
4.6 Knowledge and Skills
4.7 Operating Experience
4.8 Nuclear Safety Culture
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3. The 3 - 2011 Failure of the Japanese Horizontal Coordination Mode at Fukushima

5. Logistics (Thomas Nesensohn)

5.1 Pre-crisis phase

- from the call: pre-alarm system did not work right

5.2 Implementation phase

- Haneda Airport was closed –and reopend at 03:37 on 12. March
- International Narita Airport reopened at 06:00 on 12. March
- More information about airports
- Bridges are damaged
- Roads are damaged
- Problem with dirty water
- No electricity
- Landslides
- No fuel
- No food to eat
- From the call: Japan is very well organized for earthquakes and so on
- From the call: japan organized the transport to the airport
- From the call: they evacuate the BoO with helicopters

5.3 Post-crisis phase

- JP tried to re-build the streets
- Rebuilding rail links
- Producing drinking water

6. Recovery (Ana Lopez, Oksana Galarowicz)
Since recovery phase is very crucial, we should focus on it even at the beginning of the operation as there is no gap between relief and recovery and recovery is the biggest challenge during natural disasters. Recovery phase can last 3 or 5 years after disaster and is performed by government, aid agencies, NGOs and other local and international organisations. After earthquake in Fukushima, 2011, recovery phase included several activities, which are described in some reports created by different institutions:

- According to OCHA report, individuals and private sector companies, along with countries and aid organisations have contributed in total $951 million bilaterally to the Government of Japan, Red Cross Societies, NGOs and other partners to support relief efforts. The Japanese Red Cross Society received a record $ 725 million from more than 1.1 million local donations. The Japanese diplomatic establishments abroad have received $ 12 million, according to the Japanese Ministry of Foreign Affairs.
- Red Cross report informs that in July 2011 government formulated a Basic Policy on Reconstruction, estimating the budget for next 10 years, which is 23 trillion JPY (USD 231 billion). In 2 years after disaster, government assistance included support for disaster survivors and local government, reconstruction of infrastructure, disposal of tsunami debris, industrial revitalization, promotion of employment.
- There was also announced a new strategy for evacuees of the nuclear disaster that focuses on decontamination, education, health and psychological care for children, support for parental care and improvement of living conditions.
- Donations collected by Japanese Red Cross were divided into 2 categories: 1) relief and recovery programme; 2) cash grant programme.
- Japan Meteorological Agency introduced a new tsunami warning system on March 7, 2013.
- World Health Organisation planned to hold a global forum to share the important lessons learnt from the Japanese earthquake.
- People residing in evacuation centres were offered temporary housing.
- National recovery plan was published on June 25, 2011. It included the issues foreseeing large-scale societal changes concerning tsunami preparedness; overall makeup of the city (relocating them to safer area); improvement of coordination among systems of medical care, public health and welfare; better communication with community leaders.

It can be concluded that recovery phase is still going on in Japan, since the activities and steps taken by authorities and organisations have got their long-term objectives and results will be observed in future.

On ELITE Living Document Technicalities

Comments on ELITE by Wolfgang Krajic:

ELITE query (category search): “Earthquakes”, “English”, “Lessons Learned”, “Coordination”
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Result:

Query (general search): coordination
File names (Query: category search: “English”, “Best practices”):

Example: File:1906 SF Earthquake.pdf

Comments on ELITE by Björn Robach:

The basic idea and platform of the Elite Wiki can become very useful and handy for the end-user. Please let me compare the ELITE Wiki with a toolbox.

Right now we have a good and clearly arranged toolbox, but if we look insight we just have some basic tools which are not too useful in the most situations. What we have to do to have everything with us on site, we have to fill the toolbox with many more valuable tools we need.

Comments on ELITE by Thomas Nesensohn:

Normally I am searching information on a lot of websites like vosocc, google, news, bing, ...

I think one platform for information is nowadays to less

In the ELITE there are very long documents to read, you can find a lot of information but you need also a lot of time to prepare it for a lessons learned

I think the site needs on the left site like "ebay" a categorie list where you can choose with clicking