	EUROPEAN COMMISSION RESEARCH AND INNOVATION DG	Final Report

Project No: 211594

Project Acronym: ASAMPSA2

Project Full Name: Advanced Safety Assessment Methodologies : level 2 PSA (European Best Practices L2 PSA guidelines)

Final Report

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Project coordinator name:
Mr. Emmanuel RAIMOND

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INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE

Final Report

PROJECT FINAL REPORT

Grant Agreement number:	211594
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Project title:	Advanced Safety Assessment Methodologies : level 2 PSA (European Best Practices L2 PSA guidelines)
Funding Scheme:	CSA
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Final Report

Please note that the contents of the Final Report can be found in the attachment.

4.1 Final publishable summary report

Executive Summary

In the context of Nuclear Power Plant (NPP) safety, Level-2 Probabilistic Safety Assessment (L2-PSA) is a structured methodology aiming at assessing the risk of radioactive release in environment in the case of an accident on a NPP. L2-PSA completes L1-PSA which quantifies all accident scenarios due to human and equipment failures that could lead to a degradation of nuclear fuel. L2-PSA results are generally expressed in terms of frequency (per year and per reactor) of radioactive release (amplitude and kinetics) in environment.
The objective of the ASAMPSA2 (Advanced Safety Assessment Methodology : L2-PSA) coordination action (2008 to 2011), was to develop best practice guidelines for L2-PSA, with a view to harmonization at European level and allowing the development of meaningful and practical uncertainty evaluation.
This project was coordinated by IRSN and involved 21 European partners from 12 European countries: IRSN, GRS, NUBUKI, TRACTEBEL, IBERINCO, UJV, VTT, RSE SpA, AREVA NP GmbH, AMEC NNC, CEA, FKA, CCA, ENEA, NRG, VGB, PSI, FORTUM, STUK, AREVA NP SAS, SCANDPOWER.
In addition to the development of European L2 PSA guidelines, the ASAMPSA2 project offered a framework to share experience and develop competences of technical teams. It provides the opportunity to discuss the link between the research area activities on severe accident and NPP risk assessment.
Some follow-up actions are now considered in the European framework to complete these guidelines, for example on the assessment of specific risks induced by beyond-design extreme events, in relation with the Fukushima accident lessons, or on the verification of the efficiency of NPP severe accident management measures.

Summary description of project context and objectives

Within the European community responsible for fission reactor safety, a need to develop best practice guidelines for the L2-PSA methodology has been repeatedly expressed, with the aim of both fulfilling the requirements of safety authorities in an efficient way, and also promoting harmonization of practices in European countries in order to use results from L2-PSAs with a greater confidence.
Existing guidelines, like those developed by the IAEA, mainly propose a general stepwise procedural methodology, but no details on the technical applicable methodologies. Before the ASAMPSA2 project, in Europe, integration of probabilistic findings (for severe accident) and insights into the overall safety assessment of Nuclear Power Plants (NPPs) was quite differently understood and implemented.
Within this general context, the ASAMPSA2 project objectives were to highlight some common best practices, to develop the appropriate scope and criteria for different level 2 PSA applications, and to promote optimal use of the available resources.
The ASAMPSA2 guidelines scope was defined to cover Generation II and III PWRs and BWRs but also application for future Generation IV reactors. One important feature of the ASAMPSA2 project was to bring together stakeholders of nuclear industry (plant operators, plant designers, TSO, Safety Authorities, service providers, research organizations), with different roles in the safety demonstration, analysis and regulation.
The partners of the ASAMPSA2 consortium have been chosen on the basis of their high experience in the development and application of L2 PSA or severe accident analysis. They had to propose some best-practices guidelines for a limited-scope and a full-scope L2-PSA from their experience and international cooperation (especially SARNET). Such a common assessment framework was intended to support harmonized views on the role of probabilistic safety assessment on nuclear safety.
Another objective of the project was to establish specific relationships with the community in charge of nuclear reactor safety (organizations that were not involved in ASAMPSA2) in order to define the

existing needs in terms of guidelines for L2-PSA development and applications, and at the end of the project to organize an external review of the ASAMPSA2 guidelines.
In terms of dissemination and/or exploitation of the results, the main objectives of the Project were :
- to establish some public European best-practices guidelines for L2 PSA, acceptable and useful for the European End-Users, whatever their position (Safety Authorities, TSO, Utilities, Vendors …),
- to identify specific issues where research activities are still needed to allow a meaningful quantification of risks.
ASAMPSA2 was supposed to contribute to the preparation of future research activities in connection with SARNET.

Description of main S & T results/foregrounds

GENERAL CONSIDERATIONS

a) Scope of the ASAMPSA2 guidelines

The aim of the ASAMPSA2 coordination action was to build a consensus on the L2-PSA scope and on methods deemed to be acceptable, according to the different potential applications. It was clear from the beginning that, depending of the issues, there is a range of outcomes that can be considered acceptable. To represent this range, the partners initially tried to distinguish between a 'limited-scope' methodology and a 'full-scope' one, based on what is currently technically achievable in the performance of a L2-PSA. The notion of 'limited-scope' methodology may correspond to the case where the study is performed to answer some precise question (for example the quantification of LERF (Large Early Release Frequency), allowing simplification of some parts of the analysis, and limitation of the needed resources.
The distinction between limited-scope and full-scope methodologies has been widely discussed in the initial phase of the ASAMPSA2 project and the possibility to establish two separated guidelines has been examined. But from a practical point of view, it appeared that many variations in the definition of what is a 'limited-scope study' exist in relation with the different applications.
Consequently, the partners have decided to build a single document including all issues related to L2-PSA development and applications. For each technical issue, the different possible levels of details and acceptable methods are described with some recommendations. It was also stated that the guidance on applications of L2-PSA was a crucial part but also very difficult to establish. It has conducted the project partners to develop a specific volume of the guidelines on this topic.

b) Relationship with the L2-PSA "End-Users"

In the definition of the ASAMPSA2 project, the relationships with the L2-PSA 'End-Users' (establishing the needs of the 'End-Users' for the performance of a L2-PSA as well as assuring the acceptance of the guidelines to be prepared at the end of the project by a majority of the 'End-Users') were considered as a key point. A dedicated working group, coordinated by PSI, has been established to help in formalizing these relationships. At the beginning of the project, a survey was conducted to establish more precisely the needs of the 'End-Users' community regarding many aspects of performing a L2-PSA. The results of the survey were discussed during a dedicated workshop, hosted by Vattenfall in Hamburg (Germany) in October 2008. At the end of the project, an external review of the guidelines has been organized to receive the response from the End-Users community. The review has been discussed during a workshop hosted in March 2011 by Fortum in Helsinki (Finland). This final review, like the initial survey, has associated European stakeholders and also organizations from other countries, especially those members of the working group Risk of the Nuclear Energy Agency (OECD). ASAMPSA2 partners have taken into consideration the positions provided by End-Users irrespective of their role (plant operators, plant designers, Technical Safety Organizations (TSO), Safety Authorities).

c) Link with the international scientific research activities related to severe accidents

A L2-PSA is mainly based on a set of deterministic studies on the different phenomena related to severe accident progression. A large part of the guidelines concerns the way of quantifying each part of the accident progression. The first draft of the different chapters has gathered the methodologies currently used by the partners PSA experts and describe some rationale. To improve their final quality regarding the state-of-art for each topic, the guidelines have been open for review by

specialists involved in the Severe Accident Network of Excellence (SARNET) or in the working group Accident Management of the Nuclear Energy Agency (OECD).

d) Link with other existing standards

Others countries, outside the European Union, or international organizations have developed some L2-PSA guidance. The ASAMPSA2 guidelines provide a number of key references from OCDE, IAEA or countries that can be useful. In many cases, examples of good practices have been extracted from these references.

SOME OUTCOMES OF THE INITIAL END-USERS SURVEY

Feedback on the 2008 End-Users survey helped in the identification of some technical issues where harmonization or best-practices are particularly needed, for example:
- L1-PSA – L2-PSA Interface: advantages and disadvantages of the integrated and non integrated studies, use of L1- PSA probabilistic tools or dedicated tools for L2-PSA ;
- methods for uncertainty assessment depending of the considered issues and L2-PSA objectives ;
- the closure of issues in accident progression regarding research activities: in that context, an issue is 'closed' when L2-PSA developers find enough knowledge or validated codes for the assessment of risks (it can be dependent on the plant design) ;
- the assessment of initial containment leakage, use of historic data (tests), assessment of containment isolation failure …

The End-Users survey also showed that there was a lack of uniformity between the countries in the objectives and applications of L2-PSAs. Only a few EU Safety Authorities had precise safety goals regarding severe accidents, and in general the legislation or rules, when they existed, were not strictly applied. Very few utilities had a voluntary approach for 'risk-informed' application of L2-PSA (Finish utilities as mandated in legislation, EDF which has recently developed application for periodic safety review). Some utilities still had an unclear view on how and why to develop a L2-PSA. It was expected that the ASAMPSA2 project will help in harmonization of technical issues by providing a global (but practical) vision of how the different risks can be assessed within a L2-PSA taking into account the existing knowledge and codes. It should also help in harmonization on application of L2-PSA, in particular to help to identify some plant 'risk reduction options'. It seems clear today, in the context of the post-Fukushima accident, but also in the context of development of the WENRA Safety Reference Levels, that positions of Safety Authorities in Europe regarding risk of severe accident are evolving in the direction of more demanding requirements.

STRUCTURE OF THE GUIDELINE

At the end of the project, the ASAMPSA2 guidelines are composed of three volumes.

The first volume includes a general description of L2-PSA content and structure and discusses the different possibilities to present the L2-PSA results depending on applications. The project has used (as much as possible) information available on public domain, mainly from other international collaboration initiative, for example on the description of safety criteria.
The second volume of the document contains all technical recommendations gained from the experience of the ASAMPSA2 partners and external sources, for Gen II and Gen III NPPs. It covers the methodological topics (L1-L2 PSA interface, Human Reliability Assessment, event tree structure, uncertainties assessment …), the quantification of severe accident progression and containment loading, the containment performance (tightness), the plant system behaviour in severe accident conditions and the source term assessment. This volume shows the very large number of issues that must be examined in a L2-PSA and discusses topic by topic the assessment of uncertainties.
The different topics were distributed among the partners, depending on their experience, and based on resources available for this project. The development of these two volumes was coordinated by IRSN.

The last volume of the guidelines concerns the applications for Gen IV reactors, with the objective to describe how far the existing recommendations for Gen II and III reactors L2-PSA may apply for the Gen IV reactors concepts. It raises some key issues for Very-High Temperature Reactors (VHTR),

Sodium-cooled Fast Reactors (SFR), the Gas-cooled Fast Reactors (GFR) and Lead-cooled Fast Reactors (LFR). This volume can be used a starting point for L2-PSA development for these reactors.
The development of this volume was coordinated by CEA.

OUTCOME OF THE FINAL END-USERS SURVEY AND FURTHER NEEDS

The End Users Survey has conducted to the following conclusions.

a) Relevance of the ASAMPSA2 guidelines regarding recent R&D results

It is apparent that respondents appreciated the precision and level of details of the ASAMPSA2 guidelines, which can be considered as a precious handbook for the L2-PSA developers. The scientific community, and in particular SARNET representatives, have indicated that for severe accident phenomenology, no major point was missing or wrongly addressed in the guideline. They have also provided some complements for some issues. The guidelines will be also used as one of the technical bases for the preparation of next plan of activities of SARNET.

b) Expectations from L2-PSA developers on additional R&D activities

The ASAMPSA2 guidelines show that knowledge and simulation tools are in place for most severe accident phenomena but some expectations for R&D progress have also been identified, for example: method for introduction of recovery actions in L2-PSA, core degradation for shutdown states with open reactor vessel (air ingress), in-vessel and ex-vessel degraded core coolability, positive and negative impact of in-vessel water make-up, kinetics and amplitude of release in case of basemat penetration, reduction of uncertainties of source term prediction, steam explosion (corium explosibility, real status of corium in the vessel which may be too cold for explosion, capabilities of codes to accurately predict the behaviour of structures …), accurate reactivity accident modelling …

c) General comments

The ASAMPSA2 guidelines rarely proposed a single solution, but instead often proposed several possibilities to build a L2-PSA. This status is in fact consistent with the direction taken by the ASAMPSA2 partners: to identify a panel of acceptable methods but not to impose a unique set of procedures. Nevertheless, the perspective to derive a shorter document from the existing ASAMPSA2 guidelines that could be endorsed by both regulators group (ENSREG or WENRA) and utilities group (ENISS) has been identified as a useful follow-up action. Some reviewers have noted that the ASAMPSA2 guidelines do not cover the accident initiated by external events. This was not in the objectives of the project as defined with the partners and the European Commission. This topic was identified as a possible useful follow-up activity in Europe. The Fukushima accident has of course confirmed this conclusion.

d) Further needs

A set of possible follow up activities has been identified. It includes, for example:
- the improvement of tools able to incorporate deterministic simplified model to simulate accident progression in an event tree, to calculate source term assessment ; such tools should include Monte-Carlo simulations and offer possibilities for dynamic reliability methods,
- the improvement of tools and methodologies to interface L1 and L2-PSA,
- the extension of the ASAMPSA2 guidelines to external events, and some complement for shutdown states even if partially addressed,
- the elaboration of L2-PSA standardized risk metrics that could be applied for all plants,
- the elaboration of database on experimental results useful for L2-PSA developers,
- the use L2-PSA for validation of severe accident management options,
- the training and review services.

e) A proposal for a new European project : ASAMPSA_E

As mentioned above, after the ASAMPSA2 project, some follow-up projects that could be useful for

European nuclear stakeholder were identified. After the Fukushima accident, the European Commission has submitted a call of tender to promote a project making the link between PSA and extreme external events:
“The nuclear accident in Japan resulted from the combination of two correlated extreme external events (earthquake and tsunami). The consequences (flooding in particular) went beyond what was considered in the initial NPP design. Such situations can be identified using PSA methodology that complements the deterministic approach for beyond design accidents. If the performance of a L1-L2 PSA concludes that such a low probability event can lead to extreme consequences, the industry (system suppliers and utilities) or the Safety Authorities may take appropriate decisions to reinforce the defence in depth of the plant. The present topic aims at providing best practice guidelines for the identification of such situations with the help of Level 1-Level 2 PSA and for the definition of appropriate criteria for decision making in the European context. Involvement of regulatory authorities in the foreseen action is a must. Cooperation with Japan is welcome.”

28 European organizations (from 18 countries) have submitted a 3 years project, called ASAMPSA_Extended, with a format close to ASAMPSA2, including the following activities:
- Guidance for practicable and meaningful methods to characterize and introduce external events in L1-L2 PSAs,
- Guidance for a decision making process based on extended PSAs,
- Additional guidance for L2-PSA (SAM validation, complements for shutdown states of reactors …).

The outcomes of this project should help European stakeholders to verify, by means of probabilistic approaches (with PSA extended to cover risk contribution from all sources of radioactivity, all operating states for all important sources of radioelements and all types of initiating events (internal events, internal hazards and external hazards)), the NPPs safety robustness, after having included the additional improvements defined in response to the Fukushima Daïchi accident and the stress test process conducted in all European countries. The precise content of the project has to be discussed with EC. It should provide a useful framework for further improvements of L1-L2 PSA quality and impact of NPP safety.

Potential impact and main dissemination activities and exploitation results

The ASAMPSA2 project provided opportunity to gathers European experts, from a large panel of organizations, to examine how to perform meaningful risk assessment for severe accident on a NPP. It is recognized that phenomena related to severe accident are highly complex and the application of all results gained from research activities developed in Europe or outside since the TMI accident may be extremely difficult without specific guidance. The guidelines developed by the ASAMPSA2 project offer many keys to develop such probabilistic risk assessment based on up-to-date methodologies and research results.
The safety of NPPs is of prime importance for all European countries and probabilistic risk assessment is a major tool for the continuous safety enhancement process. Harmonization of practices in Europe, at a technical level, should contribute to this process.
The ASAMPSA2 project shows that such a harmonization at a technical level is possible in Europe. The interest of other countries (US, China, Japan, Korea, Ukraine …) for the outcomes of ASAMPSA2, even before the Fukushima accident, proves the relevance of this project.
The impact of the ASAMPSA2 project in the international community of nuclear safety is significant due to the involvement different types of stakeholders (but also to formalized relationships established among more than 100 organizations in Europe and the members of the Nuclear Energy Agency working groups of OECD).
Number of references used in the ASAMPSA2 guidelines refers to the experience of European organizations and the public dissemination of the ASAMPSA2 guidelines should contribute to promote this experience.

Address of project public website and relevant contact details

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4.2 Use and dissemination of foreground

Section A (public)

Publications (peer reviewed)

LIST OF SCIENTIFIC (PEER REVIEWED) PUBLICATIONS, STARTING WITH THE MOST IMPORTANT ONES											
No.	DOI	Title	Main author	Title of the periodical or the series	Number, date or frequency	Publisher	Place of publication	Date of publication	Relevant pages	Permanent identifiers (if applicable)	Is open access provided to this publication ?
1		ASAMPSA2 (Advanced Safety Assessment Methodology : L2-PSA)European Best Practices L2 PSA guidelines / Volume 1 - General / Volume 2 - Best practices for the Gen II PWR, Gen II BWR L2PSAs. Extension to Gen III reactors / Volume 3 - Extension to Gen IV reactors	E. Raimond	European best-Practices L2 PSA guidelines	1	IRSN	France	31/08/2012	All		Yes

LIST OF DISSEMINATION ACTIVITIES								
No.	Type of activities	Main Leader	Title	Date	Place	Type of audience	Size of audience	Countries addressed
1	Workshops	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA2 workshop - Initial survey on L2 PSA End-Users	28/10/2008	Hamburg	Scientific community (higher education, Research) - Industry - Policy makers	40	European contries, USA, Asia
2	Workshops	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA2 workshop - Review of the European L2 PSA guidelines	07/03/2011	Espoo, Finland	Scientific community (higher education, Research) - Industry - Policy makers	50	European contries, USA, Asia
3	Conference	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA2 presentation - FISA conference	25/06/2009	Prague, Czech Rep	Scientific community (higher education, Research) - Industry - Civil society - Policy makers	20	European countries
4	Conference	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA2 poster - EUROSAFE 2009	02/11/2009	Bruxelles	Scientific community (higher education, Research) - Industry - Civil society - Policy makers	200	European countries
5	Workshops	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA Presentation	22/03/2010	Beijin	Scientific community (higher education, Research) - Industry - Civil society	20	China
6	Publication	INSTITUT DE RADIOPROTECTION ET DE SURETE NUCLEAIRE	ASAMPSA2 presentation - ERMSAR 2010	11/05/0201	Bologna, Italy	Scientific community (higher education, Research) - Industry	50	European contries, USA, Asia
7	Conference	INSTITUT DE	Some International	26/10/2009	Willingen,	Scientific	100	OECD countries

		RADIOPROTECTION ET DE SURETE NUCLEAIRE	Efforts to Progress in the Harmonization		Switzerland, OECD ISAAM 2009	community (higher education, Research) - Industry - Policy makers - Medias		

Section B (Confidential or public: confidential information marked clearly)

LIST OF APPLICATIONS FOR PATENTS, TRADEMARKS, REGISTERED DESIGNS,UTILITY MODELS, ETC.					
Type of IP Rights	Confidential	Foreseen embargo date dd/mm/yyyy	Application reference(s) (e.g. EP123456)	Subject or title of application	Applicant(s) (as on the application)

OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND								
Type of Exploitable Foreground	Description of Exploitable Foreground	Confidential	Foreseen embargo date dd/mm/yyyy	Exploitable product(s) or measure(s)	Sector(s) of application	Timetable for commercial use or any other use	Patents or other IPR exploitation (licences)	Owner and Other Beneficiary(s) involved

ADDITIONAL TEMPLATE B2: OVERVIEW TABLE WITH EXPLOITABLE FOREGROUND	
Description of Exploitable Foreground	Explain of the Exploitable Foreground

4.3 Report on societal implications

B. Ethics

1. Did your project undergo an Ethics Review (and/or Screening)?	No
If Yes: have you described the progress of compliance with the relevant Ethics Review/Screening Requirements in the frame of the periodic/final reports?	

2. Please indicate whether your project involved any of the following issues :

RESEARCH ON HUMANS

Did the project involve children?	No
Did the project involve patients?	No
Did the project involve persons not able to consent?	No
Did the project involve adult healthy volunteers?	No
Did the project involve Human genetic material?	No
Did the project involve Human biological samples?	No
Did the project involve Human data collection?	No

RESEARCH ON HUMAN EMBRYO/FOETUS

Did the project involve Human Embryos?	No
Did the project involve Human Foetal Tissue / Cells?	No
Did the project involve Human Embryonic Stem Cells (hESCs)?	No
Did the project on human Embryonic Stem Cells involve cells in culture?	No
Did the project on human Embryonic Stem Cells involve the derivation of cells from Embryos?	No

PRIVACY

Did the project involve processing of genetic information or personal data (eg. health, sexual lifestyle, ethnicity, political opinion, religious or philosophical conviction)?	No
Did the project involve tracking the location or observation of people?	No

RESEARCH ON ANIMALS

Did the project involve research on animals?	No
Were those animals transgenic small laboratory animals?	No
Were those animals transgenic farm animals?	No
Were those animals cloned farm animals?	No
Were those animals non-human primates?	No

RESEARCH INVOLVING DEVELOPING COUNTRIES

Did the project involve the use of local resources (genetic, animal, plant etc)?	No
Was the project of benefit to local community (capacity building, access to healthcare, education etc)?	No

DUAL USE

Research having direct military use	No
Research having potential for terrorist abuse	No

C. Workforce Statistics

3. Workforce statistics for the project: Please indicate in the table below the number of people who worked on the project (on a headcount basis).

Type of Position	Number of Women	Number of Men
Scientific Coordinator	3	6
Work package leaders	0	3
Experienced researchers (i.e. PhD holders)	10	20
PhD student	0	0
Other	0	0

4. How many additional researchers (in companies and universities) were recruited specifically for this project?	1
Of which, indicate the number of men:	1

D. Gender Aspects

5. Did you carry out specific Gender Equality Actions under the project ?	No

6. Which of the following actions did you carry out and how effective were they?	
Design and implement an equal opportunity policy	Not Applicable
Set targets to achieve a gender balance in the workforce	Not Applicable
Organise conferences and workshops on gender	Not Applicable
Actions to improve work-life balance	Not Applicable
Other:	

7. Was there a gender dimension associated with the research content - i.e. wherever people were the focus of the research as, for example, consumers, users, patients or in trials, was the issue of gender considered and addressed?	No
If yes, please specify:	

E. Synergies with Science Education

8. Did your project involve working with students and/or school pupils (e.g. open days, participation in science festivals and events, prizes/competitions or joint projects)?	No
If yes, please specify:	

9. Did the project generate any science education material (e.g. kits, websites, explanatory booklets, DVDs)?	Yes

F. Interdisciplinarity

10. Which disciplines (see list below) are involved in your project?	
Main discipline:	1.1 Mathematics and computer sciences [mathematics and other allied fields: computer sciences and other allied subjects (software development only; hardware development should be classified in the engineering fields)]
Associated discipline:	2.1 Civil engineering (architecture engineering, building science and engineering, construction engineering, municipal and structural engineering and other allied subjects)
Associated discipline:	

G. Engaging with Civil society and policy makers

11a. Did your project engage with societal actors beyond the research community? (if 'No', go to Question 14)	No
11b. If yes, did you engage with citizens (citizens' panels / juries) or organised civil society (NGOs, patients' groups etc.)?	
11c. In doing so, did your project involve actors whose role is mainly to organise the dialogue with citizens and organised civil society (e.g. professional mediator; communication company, science museums)?	
12. Did you engage with government / public bodies or policy makers (including international organisations)	
13a. Will the project generate outputs (expertise or scientific advice) which could be used by policy makers?	

H. Use and dissemination

14. How many Articles were published/accepted for publication in peer-reviewed journals?	1
To how many of these is open access provided?	1
How many of these are published in open access journals?	1
How many of these are published in open repositories?	1
To how many of these is open access not provided?	0
Please check all applicable reasons for not providing open access:	
publisher's licensing agreement would not permit publishing in a repository	No
no suitable repository available	No
no suitable open access journal available	No
no funds available to publish in an open access journal	No
lack of time and resources	No
lack of information on open access	No
If other - please specify	
15. How many new patent applications ('priority filings') have been made?	0

("Technologically unique": multiple applications for the same invention in different jurisdictions should be counted as just one application of grant).	

16. Indicate how many of the following Intellectual Property Rights were applied for (give number in each box).	
Trademark	0
Registered design	0
Other	0

17. How many spin-off companies were created / are planned as a direct result of the project?	0
Indicate the approximate number of additional jobs in these companies:	0

18. Please indicate whether your project has a potential impact on employment, in comparison with the situation before your project:	Difficult to estimate / not possible to quantify, In large companies

19. For your project partnership please estimate the employment effect resulting directly from your participation in Full Time Equivalent (FTE = one person working fulltime for a year) jobs:	0Difficult to estimate / not possible to quantify

I. Media and Communication to the general public

20. As part of the project, were any of the beneficiaries professionals in communication or media relations?	No

21. As part of the project, have any beneficiaries received professional media / communication training / advice to improve communication with the general public?	No

22. Which of the following have been used to communicate information about your project to the general public, or have resulted from your project?	
Press Release	No
Media briefing	No
TV coverage / report	No
Radio coverage / report	No
Brochures /posters / flyers	Yes
DVD /Film /Multimedia	No
Coverage in specialist press	Yes
Coverage in general (non-specialist) press	No

Coverage in national press	No
Coverage in international press	No
Website for the general public / internet	Yes
Event targeting general public (festival, conference, exhibition, science café)	No

23. In which languages are the information products for the general public produced?	
Language of the coordinator	No
Other language(s)	No
English	Yes

Attachments	
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Name	
Date	29/11/2012

This declaration was visaed electronically by RAIMOND EMMANUEL (ECAS user name nemmanra) on 29/11/2012