



NARSIS

New Approach to Reactor Safety Improvements

WP6: Dissemination and communication activities

Del6.2 - Communication and Dissemination Plan



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1 Executive Summary

The report presents the preparation and maintenance of the project communication and dissemination (C&D) plan, and the subsequent implementation of C&D activities. The C&D plan will be developed at the start of the project. This will provide a more formal structure and justification of the various C&D activities, by identifying target audiences, methods and media for the C&D actions, along with an assessment of their cost effectiveness. The output from the C&D plan will be a prioritized programme of activities to ensure maximum impact within the project.

The C&D plan forms a 'living' document, which will be reviewed and revised periodically during the project. Specific dissemination activities that will form part of the C&D plan will include:

- Production of project leaflet;
- Production of periodic newsletters;
- Publication of scientific papers and participation to workshops and conferences;
- Promotion of project aims, objectives and specific research activities through media;
- Development of project material for education and training purposes directed towards Master Students and young researchers.

2 Challenges and objectives of the project

The Probabilistic Safety Assessment (PSA) procedure allows practitioners to better understand the most causes prone to initiate nuclear accidents and to identify the most critical elements of the systems. However, lessons learnt from the Fukushima Daiichi nuclear disaster point out the necessity of upgrading the current methodological framework related to areas such as cascading and/or conjunct events characterization, structure responses and uncertainties treatment. New developments in those areas would even enable the extension of their use in accident management.

Based on recent theoretical progresses, the main objective of NARSIS is to bring sound contributions to the safety assessment methodologies by reviewing, analyzing and developing/improving some aspects relative to:

1. Assessment of (i) external natural hazard events and (ii) the response and fragility of systems, structures and components (SSCs) of Nuclear Power Plants (NPPs), and re-evaluation of screening criteria;
2. Constraining of expert judgments and treatment of parameter, model and completeness uncertainties;
3. Integrated risk and safety assessment as well as Human Reliability Analysis, based on dynamic non-parametric Bayesian modelling;
4. Level 2 PSA aspects related to external events, including evaluation of accident management measures.

The global concept of the project consists in providing a scientific framework to address:

1. Theoretical improvements in natural hazards assessment and their impacts, including the evaluation of the uncertainties and the reduction of subjectivity in expert judgments;
2. Validation of the findings in the frame of the safety assessment through adequate model reduction strategies for simulations and finally,
3. Application of the outcomes at the demonstration level by providing supporting tools for severe accident management.

To reach this goal, NARSIS will rely on a multidisciplinary approach that effectively integrates knowledge from various scientific disciplines and practitioners' experiences. The improvement in characterization of potential physical threats due to different external hazards and building scenarios related to these hazards are the first concern of the project. Based on theoretical developments, the project aims at making significant leap forward in scientific approach to reactor safety by proposing updates of some elements required for the safety assessment. These advances would concern three main domains:

Objective 1: Improving the characterization of natural external hazards (e.g. better frequency estimation of high-intensity low-probability events), focusing on concomitant events (either simultaneous-yet-independent or cascading).

Indeed, existing methodologies for assessment are mostly considering single hazard events, although the effects of events occurring during the same time period, can be exacerbated (e.g. damages to dikes or dams due to an earthquake and inducing floods). The project will therefore propose a unique framework to characterize different scenarios likely to occur in the European context.

Objective 2: Improving the physical and functional vulnerability assessment of main critical SSCs of a NPP subjected to complex aggressions, by introducing some vector-based fragility surfaces (instead of fragility curves), correlation effects and consequent damage scenarios.

The project will propose methods to consider several intensity measures (either for single or multiple natural hazards) for fragility evaluation of the SSCs to the external events, considering ageing (e.g. corrosion, fatigue ...) effects and possible interactions (e.g. soil-structure in case of earthquakes).

Objective 3: Improving the evaluation and treatment of uncertainties, including uncertainties related to the integration of the expert judgment in the PSA.

One of the main difficulties in determining the occurrence frequency of external natural hazards is the lack of reliable observations for those events whose probability should be estimated, since adequate data samples from experience are incomplete or only available for short durations. Resulting analyses include significant uncertainties irrespectively of the computational method applied. Thus, even if more and more models and techniques allow reducing the importance of expertise in the safety assessment procedures, experts' judgments are still cornerstones in many steps. In the hazard evaluations, the low probabilities of concerns and the lack of reliable data make the level of experience inadequate. Improvements in the integration could rely on the development of experts' judgment representation techniques, in order to aggregate several opinions or sources of information, and on the evaluation of the uncertainty related to expert-based information. Therefore, the NARSIS project aims at proposing new scientifically based procedures to better constrain the uncertainty related to the knowledge incompleteness.

The scientific theoretical developments and improvements proposed in NARSIS, will be verified on a simplified virtual reactor representative of the European generation II & III fleet, which will be also useful to compare different safety assessment strategies (e.g. fully deterministic or probabilistic, and mixed deterministic-probabilistic).

3 Communication and dissemination challenges: goal and resources

NARSIS project is expected to produce new knowledge that requires further attention regarding dissemination and communication of the outcomes. Indeed, even if the results of the project are mainly in the interest of the nuclear community, they can also bring new inputs to many other scientific sectors. This is the reason why the project has dedicated a specific work package (WP6) to dissemination and communication considering the interlinkages with all other work packages and having as an objective to ensure that adequate information provided by the project reach the right audiences inside and outside of the project.

The first resource for achieving this purpose will be found within the Consortium. NARSIS consortium is a balanced blend of prestigious scientific and industrial organisations and comprises 18 partners from 10 countries. The consortium has all the expertise needed to achieve the ambitious and multi-disciplinary objectives of the project. The large but complementary spectrum of the partners' expertise that guarantees the successful achievement of the research program is enhanced by their effective national and international presence and implementation. This can provide focal points to communication and dissemination objectives including identification of the most appropriate stockholders who can take benefit from the project results.

The competence of the four leading Academic partners will provide additional audiences and further opportunities for dissemination of the project outcomes among young generation of researchers. Furthermore, partners' knowledge can help identify media contacts. Insights from events in partner countries can also provide interesting prospects in relation to the press and media outreach activities.

Communication is not a goal in itself but is a means to support, inform and influence. Therefore, communication tools will serve disseminating research findings to relevant stakeholders from scientists, industrials, nuclear plants operators and policy makers at national and European level. The specific goals will be:

- Raising awareness about the challenges of nuclear safety and shearing potential improvements provided by the project;
- Informing and educating the target audiences as appropriate;
- Engaging target audience groups and notably regulators to get input /feedback on their expectations;
- Promoting the use of the project outputs and their implementation through practical knowledge transfer;
- Raising public confidence in nuclear energy.

4 Target groups

The relevant target audiences were already defined in the proposal stage. The aim of engaging large audiences in the progress of the project is to create a critical mass that will assist in addressing dissemination challenges and to ensure that the project's results reach interested stockholders across the European Union. This includes in particular:

4.1 Regulators and decision-makers

International and national regulators and decision-makers are the first target group regarding the outcomes of the project. Since the project addresses the update of some elements required for the safety assessment, a particular attention will be paid to fully inform this group and interact with them with the objective of facilitating further revision and improvement of the regulatory rules. However, the works done in the frame of the project must not be perceived as interference with the official mission of these authorities. Therefore, cooperation and information exchange with these authorities in the project will take place through the "NARSIS International Advisory Board", where interested national regulators and NUGENIA as well as IAEA representatives will be kept informed continuously about the progress of the project and will be able to give insight into specific (sensitive) issues. Establishing some partnerships at the national and international levels, will ensure also the sustainability of the works being carried out under the project.

4.2 Scientific and academic community

This includes universities and research centers, working on nuclear safety issues. The ambition of the NARSIS project is to foster research breakthroughs and to provide pioneer knowledge. This challenge will be achieved through the close cooperation with universities, in particular by supervising 5 PhD theses, one launched in the frame of the project and 4 others underway in relation with different topics addressed by the project.

Furthermore, some pedagogic materials and lectures targeted towards master students and young researchers, will be prepared, based on the scientific findings of the project. The collaboration with the European Nuclear Education Network (ENEN) will allow the distribution of these lectures to a larger number of European and non-European universities.

Another focus of action is the cooperation and exchange of information with other EU research projects working on the multi-risk topics and probabilistic approaches that can be also mutually beneficial.

Finally, several non-nuclear scientific communities can take benefit from the project findings. This includes research activity sectors such as earth science, risk management, optimization, etc.

4.3 Media

Media play a significant role regarding the visibility of the project: this includes printed media, but also more and more online media, which has become a common means to deliver information to the greatest number of people. The use of specialized media is instrumental to attract attention of specialized audiences and to increase awareness regarding the project at the local, national and/or international scales. Interviews with journalists and bloggers in online media such as IDW or RTFLASH will allow delivering to a large audience, NARSIS' technical and scientific messages in a concise form. Posts on professional social networks (e.g. ResearchGate, LinkedIn, etc.) will also be used for this purpose.

5 Communication and dissemination tools

Communication and dissemination tools to be used during the NARSIS project life will include:

- Project logo
- Project website
- Project leaflet
- Newsletter
- Meetings with Decision makers
- Scientific publications
- Scientific Workshops
- Media Communication

5.1 Logo and Visual identity

Memorable logo plays a key role in branding the project. Logos serve as symbols of the innovation that underlies the project purpose and creates the face of the brand. The development of a visual identity must ensure the consistency of the project and makes it easily recognizable. A brainstorming took place to find an appropriate concept, intending to visually reduce the message to its core and to be immediately understandable and memorable. This has led to the following project logo:



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5.2 Project website

The NARSIS public website (www.narsis.eu) is operational since March 2018. It has been configured and adapted to meet the needs of the project. It is managed by the BRGM IT team that collects and uploads all material provided by project partners. This public website serves as a central point for information about the project, mostly designed for external users.

The website allows connection to a private area designed for exchange of information among the consortium partners. Access to this area needs logging and password codes. It allows users to view or edit the contents of a folder uploaded by a consortium member and to share information. Users with access right can view, comment and/or modify the files. Shared folders are added to each member's accounts, and changes to the contents are synchronized to the accounts of everyone who has access to them.

5.3 Project leaflet

A project leaflet will be produced with the aim of promoting the NARSIS project through brief overview of its objectives. The paper form of leaflets are expected for distribution at external events (e.g. conferences, symposium, etc.) related to the different topics studied by the project. The electronic version in PDF format will be sent by email whenever matters relating to the objectives and tasks of the NARSIS project are discussed.

5.4 Newsletters

A periodic newsletter will be edited every six months and electronically distributed to the nuclear community in large and to other stakeholders interested by the scientific developments foreseen in the frame of the project, either thanks to dedicated mailing lists or using associative channels (e.g. NUGENIA). The intent is to inform widely about the last project results and highlight key activities. The newsletter will be also a communication channel for collecting feedback from readers. Each issue will emphasize one particular topic treated within the project through an “editorial” page which will be a substantive article describing fundamental aspects of the topic.

5.5 Meetings with Decision makers

Particular effort will be made to report as much as possible NARSIS outcomes to the relevant organizations and decision-makers such as the IAEA, regulatory bodies and TSOs. The intent here is to present results and findings of the project and to facilitate collaboration in order to prepare future standards for application. This will be done by inviting regulatory bodies to participate to the project meetings (every six months), evaluate the project progress, provide advices regarding regulators’ expectations, and review the whole process during the project lifetime. Furthermore, NUGENIA community will be informed through participation of the consortium representatives in the annual forum. External acknowledged international experts could also be sought in order to stimulate further international cooperation.

5.6 Scientific publications and articles

Publication of the project key findings is a crucial step in community-based research. Indeed, beyond contractual commitment there is an ethical obligation to ensure that research findings are disseminated to research institutions and communities. NARSIS partners will prepare and publish scientific and technical papers in major international peer-reviewed journals and high-level conferences, related in particular to nuclear technology and safety (e.g. TINCE, ICONE, SMIRT, PSAM, ICNMNS, etc.), and natural risks. Scientific publications are expected to start from Month 24. At least 2 papers are expected per WP. This will ensure that NARSIS has a long-lasting impact beyond the project duration. We foresee ‘Open Access’ distribution to maximize valorization of the research results. IP arrangements and confidentiality rules are established in the NARSIS consortium agreement. The general principle however is to let as many people as possible sharing the outcomes of the project.

5.7 Scientific events

Over the course of the project, NARSIS will organize two scientific workshops to share information and to foster dialogue and engagement. The first event will mainly address scientific communities and academics and will be organized at the project midterm. The second workshop will be organized at the end of the project targeting wider audience including key scientists, decision-makers and regulatory bodies, policy organizations such as IAEA and OECD, industry and non-nuclear institutions that could take benefit from NARSIS findings in their own sector of activity.

5.8 Media

Different online tools, such as online journals and blogs can be used in combination, to inform a large audience on the project's research findings. It's also a good way to raise the profile of the research project and build its authority. The objective is to communicate widely about the research developments/findings and work progresses, to announce and share publications/presentations and to write about relevant research issues. Furthermore, journalists could be invited to NARSIS workshops and made aware of the project outputs via the various distribution channels.

Alternatively, LinkedIn social platform will be used to engage with key stakeholders. LinkedIn groups provide the opportunity to network and discuss with other professionals working on issues related to project interests. Already well established groups such as "Nuclear Criticality Safety" with more than 800 members can provide the opportunity to post information about NARSIS results and to gain new insights and ideas for the project's research. LinkedIn may be used also to provide news on the project and make wide announcements of upcoming events of interest for the community.

Regarding the scientific audience, a ResearchGate Project will be created for NARSIS, in order to disseminate the scientific productions (e.g. publications, conference papers, etc.) of the project.

The accounts on LinkedIn and ResearchGate platforms, of beneficiary organizations and institutions, as well as those of the researchers involved in the project, may serve as a channel for communication and dissemination of the NARSIS activities. However, a dedicated staff assisting the NARSIS Coordinator, will be in charge of setting up and managing the project's social media account where needed, as well as of centralizing the information to be shared and communicating regularly with the audience, including replying to messages. This staff will also help updating the content of the project public website as often as needed.

6 Monitoring and evaluation

The success in disseminating results and outcomes will constitute an evidence of the overall success of the NARSIS project. Therefore, NARSIS includes key metrics to allow measuring performance and assuring improvement during the lifetime of the project. The expected as well as available results will be collected during the project, and exploitable results will be identified at the earliest development stage as possible, to ensure that the communication activities will not compromise the Intellectual Properties Rights. The dissemination plan will be closely aligned with NARSIS deliverables and milestones and will be revised accordingly, in close collaboration with the project coordinator and project partners. Communication and dissemination activities will likely be increased according to project deliverables.

To achieve monitoring and evaluation of the communication and dissemination effectiveness of the project, the following instruments with related indicators will be set up:

Communication Channel	Objective, target	Indicators
NARSIS Public Website	Containing all dissemination materials (e.g. deliverables, brochure, newsletters, conference presentations, NARSIS workshops' proceedings) for a wide scale dissemination. Get links from other projects websites, associated networks, etc. to point to NARSIS website. The website will be kept open after the end of the project.	Total number of visits during project lifetime (between 1,000 and 2,000).
Project leaflet	Leaflet presenting the project, as well as factsheets will be edited and printed to easily and systematically communicate on the project achievements in international events. They will be also available from the website.	<i>No specific indicator</i>
Newsletters	A periodic newsletter will be edited and electronically distributed to the nuclear community in large and to other stakeholders interested by the scientific developments foreseen in the frame of the project. The intent is to inform widely about the last project results and highlight key activities, as well as to be a communication channel for collecting feedback from readers.	number of subscriptions; number of readers' feedback
Project Events	Organization of two dissemination events (mid-term and final) with international experts belonging or not to the nuclear community. These workshops will notably be used to solicit interactions among experts and to obtain feedback on NARSIS deliverables.	Number of external participants and of scientific papers presented.
Scientific & technical publications	The consortium partners will prepare scientific and technical papers in major international peer-reviewed journals	2 Journal papers at least per WP (from WP1 to WP5) during

		the project lifetime. Success criteria will be assessed from the journal impact factor and circulation.
Presentations at external events and international conferences	The consortium partners will prepare and deliver oral and poster presentations at the international forums, seminars and conferences.	Number of conference papers and/or presentations per year
Education and training	To contribute to the sustainability of NARSIS outcomes beyond the project lifetime, pedagogic materials and lectures targeted towards master students and young researchers, will be prepared, based on scientific findings of WP1, 2 and 3. Collaboration with The European Nuclear Education Network (ENEN) is foreseen to better organize the distribution of these lectures to larger number of European and non-European universities. Furthermore, the completion of PhD theses within the project is another expected outcome.	Number of lectures and related ECTS Number of students / young researchers who will follow these lectures 5 PhD thesis narratives
Social Media	To communicate widely about the research developments/findings and work progresses, and write about relevant research issues To announce and share publications / presentations To network and discuss with other professionals working on issues related to project interests To provide project news and make wide announcements of upcoming events	Number of likes, shares, new followers, profile visits Types of followers Quality of received feedbacks