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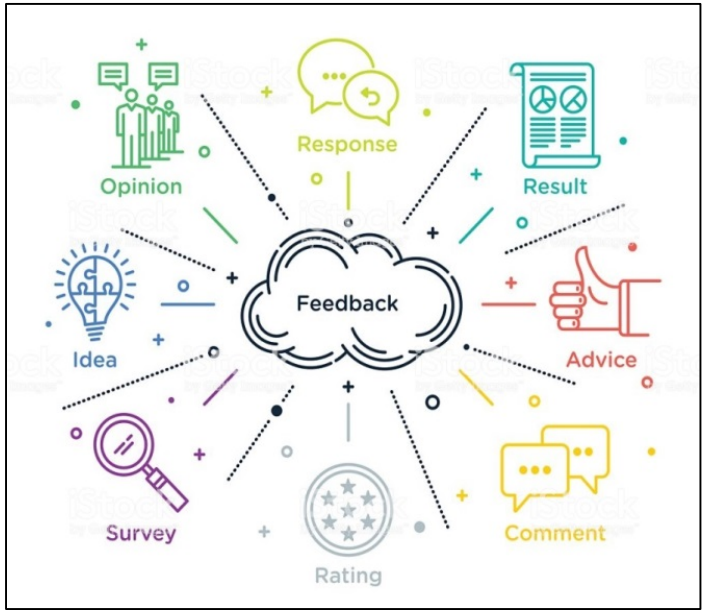
THE FASTNET PROJECT FOR STRUCTURED AND FASTER RESPONSES TO NUCLEAR EMERGENCIES

MAIN FEEDBACK FROM THE FUKUSHIMA ACCIDENT



- communicate with our international partners, especially the Accident State, neighboring countries and the IAEA
- share technical information and expertise on the affected reactor
- assess atmospheric releases and their radiological consequences with fast and robust tools,
- develop common technical expertise approaches
- be prepared and organized at the national and international levels

FASTNET ID CARD

Background

Call H2020-EE-2014-2-RIA (NFRP-02-2014), Nugenia labelled (TA2)

Target

(European) Emergency Centres

Goal

Enable Emergency Centres to provide a fast, organized and reliable prediction of accident development and the anticipation of the atmospheric releases in order to better protect the population around most of European NPPs

Key outputs

- A reference database of severe accident scenarios
- A shared graduated methodology
- 2 improved tools needed for a rapid assessment of atmospheric releases

PARTNERSHIPS

This project, coordinated by the Institut de Radioprotection et de Sûreté Nucléaire (IRSN, France) involves 20 partners and 1 third party for 48 months

A variety of stakeholders

- NSA
- Operators
- TSO
- Universities
- IAEA

From

- EU
- USA
- Canada
- Russian Federation

Participant No	Short name	Participant organisation name	Country
1	IRSN	Institut de Radioprotection et de Sûreté Nucléaire	France
	IAEA	International Atomic Energy Agency	-
2	Abmerit	ABmerit	Slovak Republic
3	Bel V	Bel V	Belgium
4	CIEMAT	Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas	Spain
5	DEMA	Danish Emergency Management Agency	Denmark
6	EDF	Electricité De France	France
7	ENEA	Italian National agency for new technologies, Energy and sustainable economic development	Italy
8	RATEN	Institute for Nuclear Research	Romania
9	BOKU	Institute of Safety and Risk Sciences - University of Natural Resources and Life Sciences	Austria
10	JRC	Joint Research Center - European Commission	-
11	KIT	Karlsruhe Institut Technology	Germany
12	LEI	Lithuanian Energy Institute	Lithuania
13	LRC	Lloyd's Register Consulting	Sweden
14	DSA	Norwegian Radiation Protection Authority	Norway
15	NRI	UJV Rez, a. s.	Czech Republic
16	SSM	Strålsäkerhetsmyndigheten	Sweden
17	STUK	Radiation and Nuclear Safety Authority	Finland
18	CNSC	Canadian Nuclear Safety Commission	Canada
19	US-NRC	US Nuclear Regulatory Commission	USA
20	SEC-NRS	Scientific and Engineering Centre for Nuclear and Radiation Safety	Russian Federation

LANDSCAPE

Before the project		After the project
Reference codes (ASTEC, MELCOR, MAAP)	⇨	A severe accident scenarios database with 108 descriptions of scenarios for 4 representative NPP designs (PWR, BWR, VVER and CANDU) and a generic concept of SFP
PERSAN, RASTEP 3D3P method	⇨	2 tools for a rapid assessment of atmospheric releases & a common graduated methodology extended to 5 NPP designs (PWR, EPR, BWR, VVER and CANDU)
Experts from emergency preparedness and emergency response communities	⇨	A common language

ACCIDENT SCENARION DB

ABB-II BWR

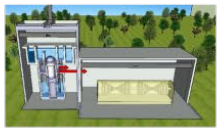
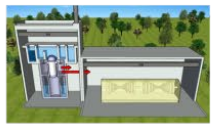


ABB-III BWR

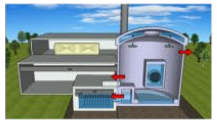


BWR GE Mark I

VVER 1000

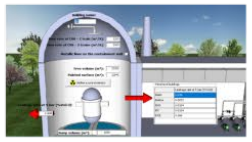
VVER 440

CANDU 6

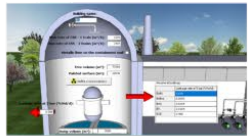


EPR

PWR Fr

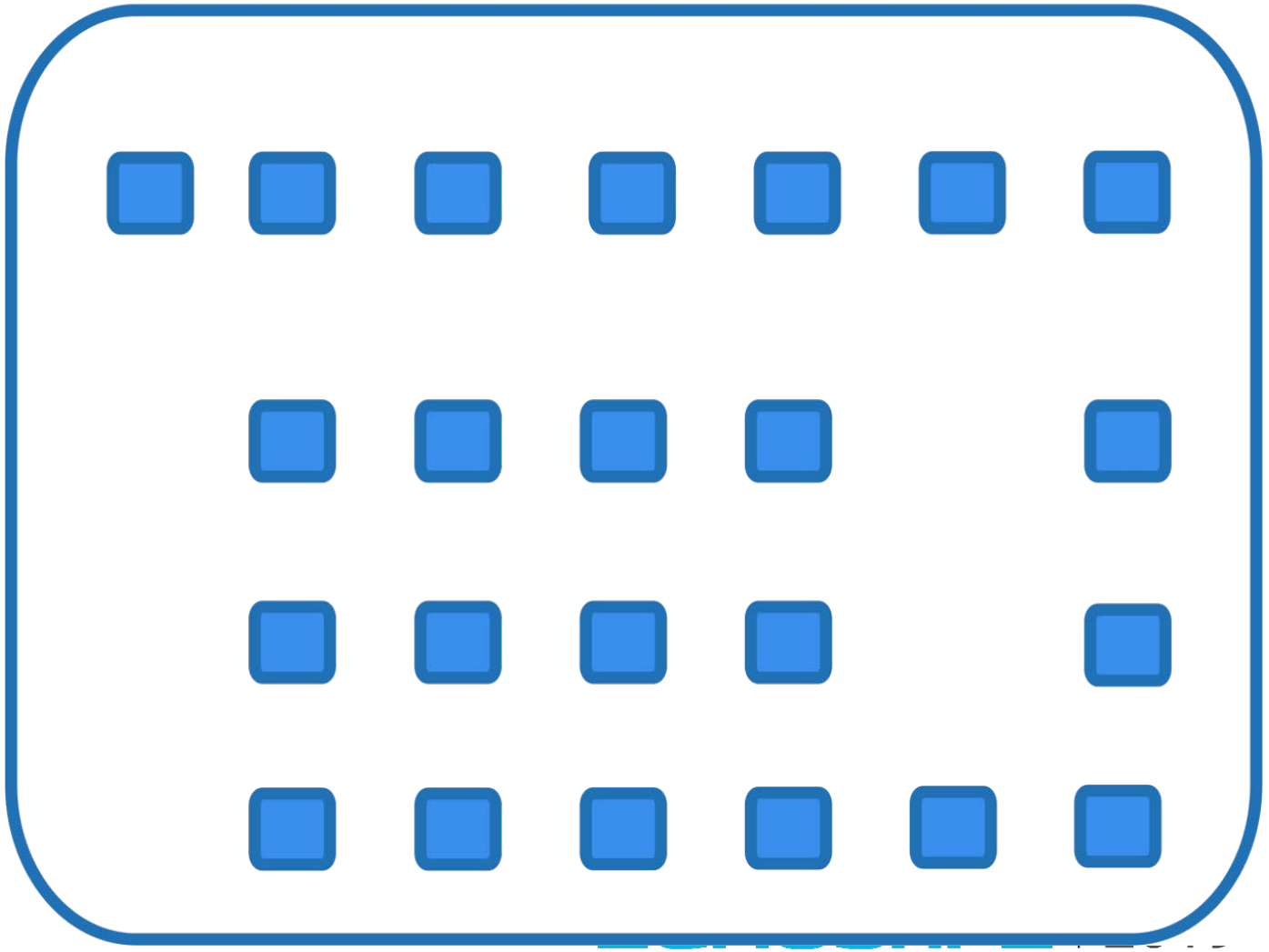


PWR Westinghouse



Senior Expert Group designed the scenarios

ATW | LB LOCAL | IB LOCAL | SB LOCAL | SBO | SFP | SGTR



METHOD & TOOLS

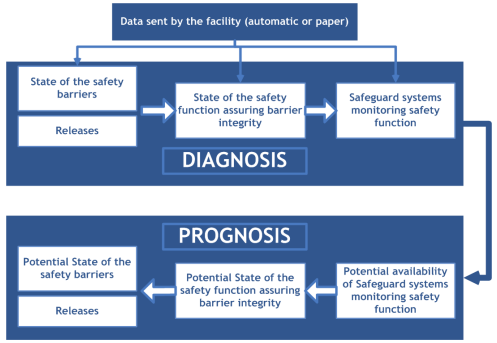
Development of existing method and tools based on 2 complementary approaches

Deterministic method and tool

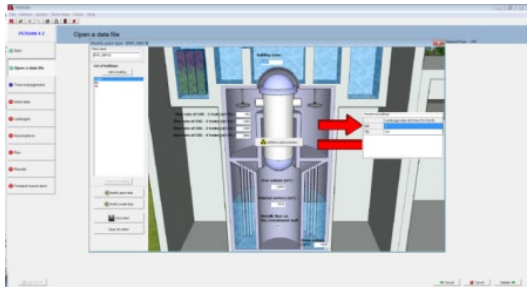
3D3P method (graduated methodology, IRSN-EDF)
PERSAN (fast ST evaluation tool, IRSN)

Probabilistic tool

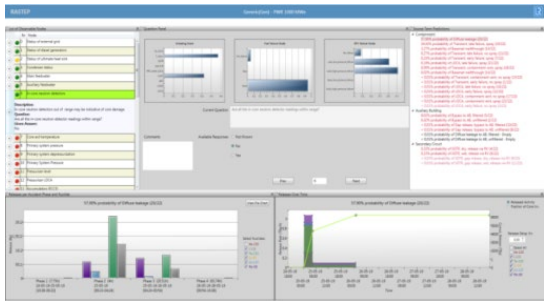
RASTEP (BBN diagnosis/prognosis tool based on L2-PSA inversion, SSM-LRC)



Common graduated methodology



PERSAN



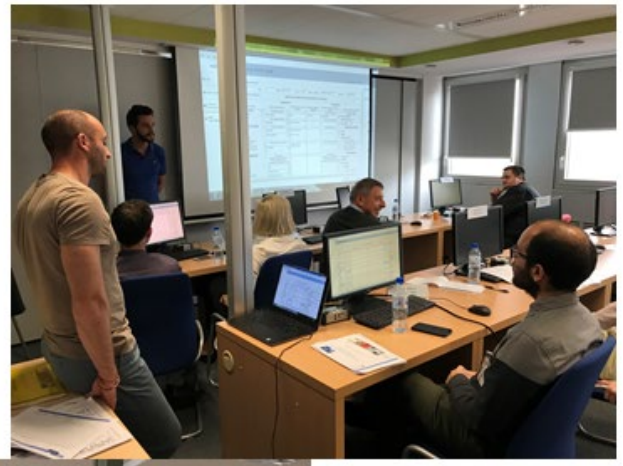
RASTEP

Extension to existing plants in Europe (PWR, EPR, BWR, VVER and CANDU)

Inclusion of functionalities to produce or integrate environmental releases data at a standard format (**IRIX, IAEA**) in order to link them with other initiatives focused on atmospheric transport, radiological consequence assessments and data assimilation

TRAINING

Training session organized in France, from May 28th to 30th, 2018, on developed method and tools (38 participants from 22 European or non-European countries)



EXERCISES

2 series of exercises

Benchmarking
(December 2018)

Estimate source terms for a series of 4 accident scenarios
(PWR, BWR, VVER, CANDU)

A total of 22 partners participated
16 used PERSAN and 22 RASTEP

Single day table top
(February 2019)

The accident is happening (PWR): analyse provided data and use the FASTNET tools and method in order to protect the population

A total of 17 partners participated
5 used PERSAN and 8 RASTEP
6 used 3D3P method

Recommendations concerning the FASTNET tools and method and the partners' response during an exercise or a crisis were provided

BENEFITS

From the Project itself

- Joint exercising
- Networking
- Cooperation
- Mutual trust and confidence

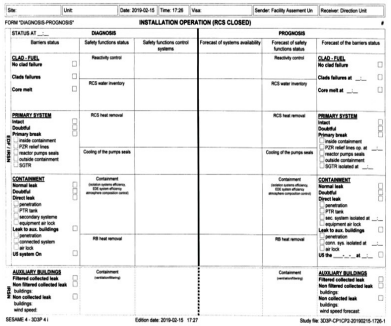
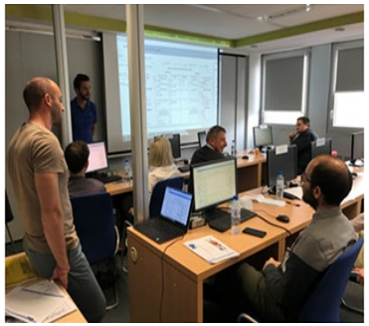
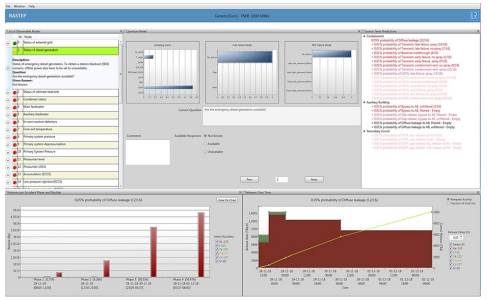
From Project results

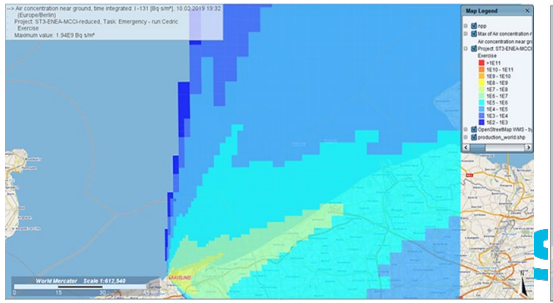
- Shared approach and methodology
- Reliable, fast and efficient tools
- Database, as starting point

Improved level of common understanding of a worldwide community of partners








FOR THE FUTURE…

- Keep the momentum up!
- Diffuse the tools and the necessary knowledge;
- Enhance the source term database
- Further operational trainings, based on every technology and taking stock of the feedback and experience gained from the FASTNET exercises;
- More joint, real-time exercises, targeting the protection of population and with a higher level of reality (table-top or full-scale formats, scenarios based on every technology and provided by different partners…).

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