



FAST Nuclear Emergency Tools (FASTNET project)

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Exercises Definition**



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The document describes the manner in which the exercises of WP4 will be conducted in relation to source term estimation (Exercise 1) and population protection (Exercise 2).	

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1 INTRODUCTION

The WP4 started in May 2018 and will end in July 2019. The participants are 19 out of 20 partners of the project and members of the End-Users Group (EUG).

The general objective of the WP4 is the demonstration of the operational capabilities of the FASTNET methodology and tools for emergency response. This demonstration is to be achieved through two distinct exercise activities aimed at comparing the performance of and operator experiences with the FASTNET tools:

- in estimating source terms for a series of accident scenarios and;
- within the context of their use as part of a wider emergency response including the protection of populations.

For the purpose of FASTNET, the former was termed Exercise 1 and the latter as Exercise 2.

Prior to these exercises, a 3-day training was organized at the IRSN premises in Paris in May 2018 by IRSN and LRC, with the help of ENEA, for the FASTNET method and tools developed within the project to evaluate source terms, namely the deterministic tool PERSAN (IRSN) associated to the 3D/3P method, and the BBN-based tool RASTEP (LRC). The training gathered about thirty participants from 22 European or non-European countries, 30 of them being members of the project and 8 being members of the End-Users group.

Preparation of the exercises was conducted within the framework of two separate meetings - the first during September 2018 in Oslo and the second during November 2018 in Paris. Both meetings involved roundtable discussion and group work to define the exercises, the means by which they would be conducted and ensuring that the objective of the WP would be fulfilled.

2 Exercise 1

The objective of Exercise 1 is the comparison of the FASTNET tools (PERSAN & RASTEP) with respect to the generation of source term estimates for a series of accident scenarios and collation of feedback from users as to their experience with the tools in this context.

Roundtable discussion and expert opinion led to the selection of 4 accident scenarios from the FASTNET database. These scenarios are as follows:

1. PWR LOCA. Source term: ASTEC at IRSN
2. ABB BWR. Source term: MAAP at LRC
3. CANDU Single Unit SBO with loss of emergency core cooling system (ECCS). Source term: MAAP at CNSC
4. VVER 440. A severe station blackout (SBO) accident scenario for a general VVER-440 reactor. Source term: MELCOR at UJV Rez

The format of the exercise was decided upon as being as follows. Participants have access at the beginning of the exercise to all reliable data characterizing the scenario (it is appreciated that this is not entirely consistent with “real life” where the challenge is to have access to reliable data from the very beginning of the accident and then regularly over time). The participants then have to calculate/estimate the best source term using the FASTNET tools, depending on their expertise and their ability to apply one or the other. The results will be compared to the reference source terms provided by the WP1 database (filled with results obtained with the reference SA codes) and the participants will be in a position to check if they use correctly the FASTNET tools.

Ancillary data related to participant experiences with the tools during the exercise are to be collated. Reporting is to be conducted by standardised form. Feedback will be analysed and included in the deliverable D4.2.

The exercise is scheduled to take place during December 2018 with dissemination of materials to be on December 1st, 2018 with participants to respond by December 31st, 2018.

The FASTNET tools are to be made available to participants in the following manner:

- PERSAN - available for download from a secure ftp server with distribution of a USB dongle to participants. The licence for PERSAN distribution to expire upon completion of the FASTNET activities for which access to PERSAN was necessary,
- RASTEP - each participant has their own access to a virtual machine upon which RASTEP was installed. Virtual machines to be available to participants for the duration of activities for which access to RASTEP was required.

Information as to accessing the FASTNET tools is provided in advance of the exercise. Technical contact points for both tools are established and communicated to participants as part of the informational material supplied to participants.

The following files are to be disseminated to participants for the implementation and the feedback of the exercise:

- One set of instructions as to how participants are to engage with the exercise materials and report,
- Four Excel files, one per scenario, containing all necessary data for the generation of source term estimates using both PERSAN and RASTEP,
- Two Excel reporting forms, one for each tool, each form being divided into separate reporting sections for each scenario,
- One standardised questionnaire for obtaining ancillary information as to participant experience with the FASTNET tools.

3 Exercise 2

Exercise 2 differs from Exercise 1 in that it is focused on the FASTNET tools and methodology within the wider context of emergency response oriented towards the global objective to protect populations and the processes and procedures directed towards fulfilment of that objective.

The design of Exercise 2 was established during two previous meetings of the WP4 group with roundtable discussion and expert opinion.

The general format of Exercise 2 is to be a table top activity with participants being present over the course of a day to work through the exercise materials. In contrast to Exercise 1:

- the accident is happening in almost real time,
- the predefined scenario is based on PWR technology but is not chosen in the scenarios database,
- all exercise materials are prepared by IRSN without any dissemination before the beginning of the exercise,
- information about the scenario is provided progressively to the participants on a regular basis.

During the exercise, the participants have to:

- analyse provided data,
- apply the FASTNET common graduated methodology based on the appropriate use of the 3D3P method and one of the FASTNET tools (depending on their ability to apply one or the other with regards to their experience during the Exercise 1),
- provide one or several estimations of a source term adequate for best consequence evaluations. The source term is provided in IRIX format to allow the coupling between the FASTNET tools and dispersion models,
- provide consequence evaluations with different dispersion models usually used by participants,
- report regularly (every hour) to hypothetical decision makers what they understand, they calculate ... through oral or written messages.

Ancillary data related to participant experiences with the method and tools during the exercise are to be collated. Reporting is to be conducted by standardised form. Feedback will be analysed and included in the deliverable D4.3.

The exercise is to take place on February 22, 2019 at the University of Natural Resources and Life Sciences in Vienna with the help of BOKU.

A final meeting of the WP4 group will take place on April 10 and 11, 2019 in Oslo. The focus of the meeting will be the finalisation of D4.2 and D4.3.