Minutes of meeting

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Subject	WP1 meeting		
Location	KIT Campus North, Building 419, Hermann von Helmholtz Platz 1, 76344 Eggenstein-Leopoldshafen, Germany		
Start Date	17 February 2017, 09:00 H	**End date**	17 February 2017, 11:00 H
Recorder of Minutes	Irène Korsakissok		
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List of Attendees			
	Andronopoulos, Spyros		NCSR Demokritos, Greece
	Bedwell, Peter		PHE, UK
	Geertsema, Gertie		KNMI, Netherlands
	Hamburger, Thomas		Bundesamt für Strahlenschutz
	Tomas, Jasper		RIVM, Netherlands
	Korsakissok, Irène		IRSN, France
	Leadbetter, Susan		MET Office, UK
	Lind, Ole Christian		CERAD/NMBU, Norway
	Pázmándi, Tamàs		Centre for Energy Research, Hungarian Academy of Sciences , Hungary
	Périllat, Raphael		Bertin Technologie (working for IRSN), France
	Szántó, Péter		Centre for Energy Research, Hungarian Academy of Sciences ; Hungary
	Vries, de, Hans		KNMI, Netherlands
	Astrup, Poul		Technical University of Denmark (DTU), Denmark
	Schichtel, Thomas		KIT

Agenda attached: No
Presentations attached: yes

Irène Korsakissok (IRSN) began with a presentation including a reminder of objectives, tasks and deliverables.
Information was given to all participants that the “workshop on meteorological ensembles and other methods to reduce uncertainties”, organized by IRSN & UK Met Office, will take place in IRSN (Paris, France), 26-28 June 2017.
Proposal (to be adjusted if needed): 0.5 day for WP1 meeting on 26th June PM, then 1.5 day of workshop (27 and 28th AM) -> end of workshop 28 at 12h.

Task 1.1 Analyzing and ranking sources of uncertainties is divided into 4 subtasks.

1. Using ensemble data for meteorological uncertainties (lead UK MetOffice)
2. Using meteorological measurements to reduce uncertainties (lead EEAE)
3. Uncertainties related to source term (lead IRSN)
4. Literature-based overview of dispersion models-related uncertainties (lead IRSN)

It was acted that, during this task (roughly the first year of the project), no dispersion calculations will be made. In particular, subtask 1.1.4 was renamed in order to make it clear that it will rely on bibliography and previous work, not on calculations. The multi-model ensemble calculations that were discussed previously will be included in task 1.2 (discussion between Spyros Andronopoulos, NCSRD/EEAE, Peter Bedwell, PHE, Irène Korsakissok, IRSN).

D1.1 Guidelines ranking uncertainties for atmospheric dispersion. It was proposed that the plan would follow the subtasks of task 1.1, with each subtask leader coordinating the redaction of their part, and each subtask participant contributing to the redaction. WP1 participants agreed on that.

D1.2 Published dataset of meteorological ensemble data was discussed (Hans de Vries, KNMI, Susan Leadbetter, UK MetOffice). Since publishing complete datasets of meteorological ensembles would be technically difficult and not possible (in terms of license and rights) for most data, it was proposed that "published dataset" would mean that the data detailed description would be publicly available, but the data themselves would be shared only within CONFIDENCE participants. Links will also be provided to freely available ensemble data when possible (Tigge, MEPS data provided by NMI[1]).

Task 1.2 Uncertainty propagation and analysis is divided into 2 subtasks:

1. Simulation and comparisons to observations for the Fukushima case (Lead: IRSN)
2. Simulation for the synthetic case(s) studies (Lead: RIVM for Borssele, NRPA for Norway)

Fukushima: Irène Korsakissok (IRSN) proposed that the Fukushima case study would be a benchmark for all participants running dispersion calculations (among those, only RIVM appears not to have already run the Fukushima case). Not all participants will use the same ensemble approach: most will take into account meteorological uncertainties (using an ensemble) and source terms (using a set of several source terms), some will take into account other uncertainties, using Monte Carlo method (IRSN) or multi-model approach (EEAE). It allows evaluating the quality of ensemble approaches through comparisons to observations, thus discriminating under-dispersive or over-dispersive approaches. IRSN will provide radiological observations:

- Cs137 air concentrations on stations
- Gamma dose rates on stations
- Cs137 deposition map (high-resolution airborne data)

It was decided that the Fukushima case study will be run over the Japan territory (a shorter scale of 100km was proposed but not retained). KNMI can provide ECMWF ensemble data for this case to all participants. If an agreement is found with DMI (not officially CONFIDENCE participant), NMI may also provide the meteorological ensemble used in the FAUNA projects: 21 members, 54h forecast, 1h, 0.05 degrees (about 6 km) resolution. The question of the forecast range was raised but no conclusion has been reached yet: what should be used, 12h, 24h, 3-days, 5-days forecast? IRSN pointed out that available source terms are representative of a posteriori uncertainties, since they have been constructed on the basis of environmental measurements. It would be difficult (but interesting) to be in a complete framework of *forecast* runs, as if the accident had not happened yet. As it is, uncertainties are still large enough. The question of the forecast

[1] http://thredds.met.no/thredds/catalog/meps25files/catalog.html

ranges to be used in the Fukushima study will be further addressed during the workshop of June 2017.

Concerning the synthetic case studies, Jasper Tomas (RIVM) presented the Borssele case, Ole Christian Lind (NMBU) made a presentation of the CERAD case study over Norway. There were some discussions as to the opportunity to include other case studies (in France or in UK) but the added value was limited.

Borssele case study: it would be interesting to choose several "typical" meteorological situations to run this case. Four situations were proposed (Susan Leadbetter, UK MetOffice, Gertie Geertsema and Hans de Vries, KNMI): "easy" (meteorological uncertainties are small), "high pressure, low wind", "sea breeze" and "storm front". Concerning the source terms, RIVM can provide a reference accident source term without uncertainties. Since the Borssele reactor is a PWR, same type as in France just smaller, it should be possible to use a set of source terms provided by IRSN as output from task 1.1.3, or, at least, a range of variability of some parameters. For meteorological data, ECMWF ensemble is available (18km resolution, 15-day forecast) + GLAMEPS ensemble (multi-model) for 2-day forecasts. Higher resolution deterministic models (HIRLAM 11km, HARMONIE 2.5 km) are also available. There might be a possibility to construct an ensemble at higher resolution by mixing several model configurations and several forecast times (discussion with Hans de Vries and Gertie Geertsema, KNMI).

CERAD/Norway case study: Ole Christian Lind (NMBU) proposed an accident on the Russian floating power plant Akademik Lomonosov, based in St Petersburg (Planned transport along the Norwegian coast in 2018, to reach its final destination). IRSN cannot provide source terms for this case, Tamàs Pázmándi (MTA) proposed to work on it. From a scientific viewpoint, this case study is interesting as a complement to Borssele because of the complex orography of the area of interest. The meteorological situation(s) are still to be determined. The MEPS ensemble can be provided by NMI (2.5 km resolution, 1h, 10 members, over Scandinavia). In addition, nowcast/radar data are available (7.5 minutes, 1 km, 2h forecast), ECMWF and GLAMEPS ensembles are also available.

There is a need to clarify how many participants will run each case study and each meteorological situation. This will be further discussed among WP1 participants by email and finalized during the WP1 meeting in Paris on June, 26th 2017.

Task 1.3 Emergency response and dose assessment is divided into 2 subtasks:

1. Food chain uncertainty propagation (Lead: BfS)
2. Recommendations and operational methodology in an emergency context (Lead: PHE)

This task was not discussed in detail. It was concluded that it would become more specific as task 1.2 would progress. Task 1.3.1 will consist in developing the food chain ensemble capability and using it on the case studies. Task 1.3.2 will consist in trying simplified approaches on the case studies, instead of full (costly) ensemble calculations.

D1.3 Published set of probability maps of threshold exceedance for scenarios provided to WP4-6: This was not extensively discussed during the WP1 meeting. It was noted that the initial set of maps, due M06 (in June) will consist in synthetic maps provided by IRSN to WP4-6. Further discussions between IRSN and WP4-6 leaders are needed (ongoing as this report is written). The synthetic maps (and outputs from task 1.2) will be geolocalized (using GIS) in several sites of interest for the panels.

D1.4 Guidelines for the use of ensemble calculations in an operational context, indicators to assess the quality of uncertainty modeling and ensemble calculations, and tools for ensemble calculation in emergency response.

It was noted that it actually includes several deliverables, with different leaders:

- The "guidelines" will be composed of several parts, corresponding to the different case studies that will be done in task 1.2. Each organisation responsible for their case study (IRSN for Fukushima, RIVM for Borssele and NRPA for Norway) will coordinate the results and redaction of their part.
- The "indicators to assess the quality of uncertainty modeling and ensemble calculations" will be included in the Fukushima case study (comparisons to observations).
- The "tools" part includes the description of the calculation chains used during task 1.2 and the operational declinations proposed in task 1.3.2.

D1.5 Software tool which allows the propagation of uncertainties up to the dose assessment models. It will be the output of task 1.3.1 (lead: Bfs), that is, the updated JRODOS system with capability of doing ensemble calculations, up to food chain modeling. BfS/KIT will provide such tool with a suitable description.

A point of attention raised was the need for a common format for data exchange. For meteorological data, participants from weather offices confirmed the GRIB2 format is already a standard. For the outputs of dispersion calculations, participants agreed that IRIX format may be adapted for very integrated outputs, such as shapefiles. For "full" data (air concentrations or dose rates on stations at each time step for each member, deposition on a grid for each member), the NetCDF format was declared more suitable. Concerning the facility for data transfer, IRSN can provide SFTP servers accessible to other WP1 participants. MTA can also provide support if necessary.

Actions to be taken	Person Responsible	Deadline	Status
Organization of the workshop on meteorological ensembles	Susan Leadbetter (UK MetOffice)	26-28 June 2017	
Discussion with WP4-6 leaders on outputs and interactions and creation of synthetic maps	Irène Korsakissok (IRSN)	23 June 2017	ongoing
Discussion among WP1 participants on the case studies (who will run which case)	Irène Korsakissok (IRSN), with Jasper Tomas (RIVM), Jan Erik Dyve (NRPA)	26-28 June 2017	
Preparation of D1.2 dataset of meteorological ensembles	Susan Leadbetter (UK MetOffice), with Hans de Vries (KNMI) and Heiko Klein (NMI)	23 June 2017	
Agree on a common output format (NetCDF based)		December 2017	