

COST

Domain Committee ESSEM

COST Action ES1006

Start Date 28/04/2011

Evaluation, improvement and guidance for the use of local-scale emergency prediction and response tools for airborne hazards in built environments

MONITORING PROGRESS REPORT

Reporting Period: 28/04/2011 – 01/05/2012

This Report is presented to the relevant Domain Committee.
It contains three parts:

- I. Management Report prepared by the COST Office/Grant Holder***
- II. Scientific Report prepared by the Chair of the Management Committee of the Action***
- III. Previous versions of the Scientific Report; i.e., part II of past reporting periods***

The report is a “cumulative” report, i.e. it is updated annually and covers the entire period of the Action.

Confidentiality: the documents will be made available to the public via the COST Action web page except for chapter *II.D. Self evaluation*.

Based on the monitoring results, the COST Office will decide on the following year's budget allocation.

Executive summary (max.250 words):

The Action successfully completed the first year of operation. Organizational structures were established, the Action work plan was particularized and agreed on and additional experts and stakeholders were invited to complete the expertise available in the Action. As planned, the first substantial scientific delivery of the Action is a 'state-of-the-art' report on local-scale hazmat dispersion modelling. The document is the first of its type compiled on a multi-national and inter-disciplinary level in Europe involving both scientific expertise as well as stakeholders such as decision makers and users of full-featured of emergency response systems. Results were disseminated at the first dedicated Open Workshop.

I. Management Report prepared by the COST Office/Grant Holder



I.A. COST Action Fact Sheet

Title
Evaluation, improvement and guidance for the use of local-scale emergency prediction and response tools for airborne hazards in built environments

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Details	
Draft Mou: oc-2010-1-7453	Mou:
Start of Action: 28/04/2011	Entry into force: 17/01/2011
End of Action: 27/04/2015	CSO approval date: 02/12/2010

Objectives
Releases of hazardous agents in complex built environments pose a tremendous challenge to emergency first responders and authorities in charge due to the large number of casualties potentially involved. Air motions in built-up areas are very complex and adequate modelling tools have to be applied properly in order to predict the dispersion of hazardous materials with sufficient accuracy within a very short time. Different types of tools are applied; however, it is not always clear what the advantages and limitations of individual model approaches are. Therefore, it is of exceptional interest to compile a detailed inventory of the different models and methodologies currently in use, to characterize their performance and to establish strategies for their improvement. A consensus on reliable, efficient and suitable model approaches for given local threats and their scientific advancement is imperative. Consequently, the Action is aiming for a substantial improvement in the implementation of local-scale emergency response tools. By characterizing threat scenarios, compiling dedicated test cases, revealing model limitations and improving model approaches, the Action is delivering guidance for a reliable application of local-scale emergency response tools. The Action is a first cross-community initiative to join, to coordinate and to harmonize European efforts in threat assessment and reduction for local-scale airborne hazards.

Parties							
Country	Date	Country	Date	Country	Date	Country	Date
Austria	21/01/2011	Bulgaria	25/03/2011	Croatia	17/02/2011	Czech Republic	17/03/2011
Denmark	05/07/2011	Finland	07/02/2011	France	17/01/2011	Germany	20/01/2011
Greece	17/01/2011	Hungary	08/03/2011	Israel	01/03/2011	Italy	17/01/2011
Luxembourg	24/05/2011	Netherlands	17/03/2011	Norway	11/02/2011	Portugal	25/01/2011
Slovenia	12/07/2011	Spain	17/01/2011	United Kingdom	17/01/2011		

Total: 19

Intentions to accept the MoU							
Country	Date	Country	Date	Country	Date	Country	Date

Total: 0

Working Groups

Working Group 1 – Threats, Models and Data Requirements (16 members)
 Working Group 2 – Test, Evaluation and Further Development of Models (27 members)
 Working Group 3 – Applicability, Implementation and Practical Guidance (10 members)

Website

<http://www.elizas.eu/>

I.B. Management Committee member list**Management Committee**

Chair	Vice Chair
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I.C. Overview activities and expenditure

Instrument		Event					Total
Type	Action	Start Date	End Date	City	Cntr.	Title	Total
DISSEMINA	ES1006	2012-01-11	2012-01-17	(n.a.)	(n.a.)	Website Management	2500
MEETING	ES1006	2011-04-28	2011-04-28	Brussels	BE	Kick Off	15629,64
MEETING	ES1006	2011-10-06	2011-10-07	85300 Kos	EL	MC/WG meeting 2	12122,75
MEETING	ES1006	2012-01-12	2012-01-13	Vienna	AT	Editorial Board Meeting	5170,06
MEETING	ES1006	2012-02-13	2012-02-14	Utrecht	NL	MC/WG Meeting Utrecht 02-2012	16502,55
MEETING	ES1006	2012-03-26	2012-03-27	92100 Boulogne-Billancourt	FR	COST ES1006 Editorial Board meeting	4054,07
MEETING	ES1006	2012-04-23	2012-04-24	Vienna	AT	Expert meeting	20
STSM	ES1006	2012-04-15	2012-04-22	Torino	IT	Drafting inventory of reference data avail	1300

II. Scientific Report prepared by the Chair of the Management Committee of the Action, describing results achieved during the Action operation in this period, in no more than 3 pages (the report is "cumulative"). All items listed in Sections A, B, and C, below, must be addressed.

Additional documentation such as extended scientific reports, proceedings of workshops, seminars or conferences may be provided separately as an annex to this report, and should be referenced in the report.

Despite the administrative delay of almost 6 months for establishing the grant management at the grant holder institution, the Action still managed to achieve all objectives as defined for the reporting period in the Memorandum of Understanding and the related workplan. The organizational structure of the Action was implemented as proposed in the MoU and substantial efforts were undertaken to widen the participation of COST countries within the signing period. Contacts have been established to affiliated members of the Action from Japan (Japan Atomic Energy Agency, Nuclear Safety Research Association of Japan) and the US (Naval Research Laboratory, Washington D.C.) providing active contributions to the Action. Additional efforts were made to incorporate young scientists as early as possible, resulting in the involvement of 10 early stage researchers already within the first year of the Action. The Action was announced to the related scientific and stakeholder community by presentations and publications at three major conferences (Annual GMU Conference 2011, Fairfax, VA, USA; Harmo14 - 2011, Kos, Greece; Numerical Simulation of Turbulence - Application to safe and secure society - 2012, Tokyo, Japan). Two additional publications at stakeholder conferences have been already accepted (June and October, Italy).

The scientific work started with particularization and complementation of the workplan. Although the general outline of the work was agreed on by all MC members, a number of organizational details of the work had to be clarified and specified in detail. The Action is dealing with local scale emergency response management and hazmat dispersion modelling at local scale. Usually, these topics are - at least partly - subject to non-disclosure and restrictions in this regard apply particularly to stakeholders involved in the Action. Moreover, some MC/WG members are engaged by or affiliated to private companies selling related software products. Since an open and un-biased exchange of information and unrestricted sharing of expertise are vital for the scientific success of the Action, a 'code of conduct' was elaborated and agreed on by the Action members. This, for example, limits WG membership only to actively contributing participants willing to share their simulation and management tools entirely.

In order to facilitate an efficient information exchange among the working groups, the required means have been established. The Action started a dedicated GoogleGroup instantly after the kick-off meeting. Throughout the year, the GoogleGroup was gradually replaced by the Action-specific website. The Working Groups were provided with rapporteurs responsible to collect scientific information at WG level, condense it to essential key results and distribute relevant information to remaining groups. This approach was proven to be very efficient already in the process of compiling the first document of the Action. Key authors and the before mentioned rapporteurs formed an Editorial Board managing efficiently the preparation of the first document of the Action.

The major scientific achievement of the Action within the first year is a 'state-of-the-art' report on local scale hazmat dispersion modelling, also acting as background and justification document for the Action work. The report is based not only on information available through members but also information collected from outside the Action via a questionnaire developed and widely distributed within participating countries. The report is structured into four major parts elaborating vital elements of the scientific and practical discourse on the reliability of local-scale emergency response. A structured catalogue of challenges has been developed and described with substantial input from WG3, an extensive overview on application-specific modelling approaches and tools is provided first time at European scale but also considering most recent developments in the US and Japan. A basic classification of dispersion modelling for emergency planning and response is given. Instead of just providing a list of models applied, the report characterizes and

classifies types of models and particularises strengths and weaknesses of individual types of models. Furthermore, the basis for a scientifically justified quality assurance of local-scale hazmat dispersion models is documented as developed mainly based on input from WG1 and WG2 of the Action. The basic concepts intended to be applied in the scope testing and evaluating local-scale hazmat dispersion models were developed and documented in the document. One STSM was dedicated to carefully review, homogenize and finalize the chapters of the book published on May 31st, 2012. A low-res PDF-Version of the document is attached in Annex 1 of this report.

Within the last quarter of the first year the focus of activity was shifted gradually from establishing the organizational and scientific basis of future work to first independent results generated by the Action. Three STSM's have been organized and successfully completed. One STSM was dedicated to drafting further elaborated and more detailed evaluation procedures for local-scale hazmat dispersion models. This successfully finished work package was vital for starting dispersion model testing as soon as possible. A second related STSM was developing the basic concepts for a dedicated model inventory. Based on a questionnaire developed by the Action and the corresponding first feedback available from stakeholders and model users, a basic structure for the intended model database was developed. The third STSM in the context of independent scientific work of the Action was developing the basis for a model- and application-specific test and reference data base required for model testing and evaluation. Results from the STSMs were discussed and summarized during the 4th MC/WG meeting held on May 29/30, 2012 formed the basis for the detailed work plan of year two of the Action.

As proposed, the first year was finalized by the 1st Open Workshop on Local-Scale Airborne Hazards Modelling and Emergency Response organized and hosted by the Action. At the Symposium, the Background Document was presented mainly to external experts, stakeholders and wider scientific community. A critical review of the proposed work of the Action by the external participants was intentionally initiated during discussions and comments and suggestions provided particularly by stakeholders will be influencing the next phases of the Action.

As the first major deliverable of the Action, the Background document is attached to this progress report.

II.A. Innovative networking

- *Innovative knowledge resulting from COST networking through the Action. (Specific examples of Results vs. Objectives)*
The questionnaire: on-going activity during the entire period of the Action; innovative because it is the first dedicated survey on stakeholders at European scale
Original in Europe: the databases of models and observed data specific for emergency response.
- *Significant scientific breakthroughs as part of the COST Action. (Specific examples)*
May be possible at a later stage of the Action.
- *Tangible medium term socio-economic impacts achieved or expected. (Specific examples)*
Expected: improvement of hazmat dispersion modelling module in emergency response systems, to achieve a higher reliability of results and an improved efficiency of complex modelling tools.
- *Spin off of new EC RTD Framework Programme proposals/projects. (List)*
Will be possibly an output at a later stage of the Action.
- *Spin off of new National Programme proposals/projects. (List)*
Will be possibly an output at a later stage of the Action.

II.B. Inter-disciplinary networking

- *Additional knowledge obtained from working with other disciplines within the COST framework. (Specific examples)*

The Action represents the first inter-disciplinary platform specifically dedicated to local-scale airborne hazards modelling. As documented in the 'state-of-the-art' report, the scientific and implementation challenges require involvement of wide range of expertise ranging from atmospheric sciences and engineering over toxicology to emergency management and risk analysis. It was found to be very supportive having most of these areas of expertise represented by individual Action members. Substantial differences in the way of describing and dealing with local-scale dispersion problems have been identified and another practical outcome of the Action is the glossary of terms currently prepared by colleagues with different disciplinary background.

- *Evaluation of whether the level of inter-disciplinarity is sufficient to potentially provide scientific impacts.*

All relevant areas of expertise for potentially providing scientific impact are represented by MC/WG members. Special proficiency is intended to be involved on a temporary basis by inviting experts to join WGs. Participation of stakeholders is intended to be increased as necessary. Contacts were taken with them in several among the Countries participating in the Action via a questionnaire.

- *Evaluation of whether the level of inter-disciplinarity is sufficient to potentially provide socio-economic impacts. (Specific examples)*

The recommendations and guidelines intended to be developed for improving the reliability and efficiency of emergency response systems will be elaborated and evaluated jointly with all Action participants, scientists, first responders, stakeholders and, at the required date, possibly also involving social scientists psychologists. The recommendations and guidelines will be one of the major outcomes of the Action with a direct impact on society. By improving the capabilities of first responders at local scale, a substantial improvement of the 'everyday security' of citizens will be achieved.

II.C. New networking

- *Additional new members joining the Action during its life.*
16
- *Total number of individual participants involved in the Action work. (Number of participants. Give % of female and of Early Stage Researcher participants)*
45 (31% female, 25% ESR)
- *Involvement of Early Stage Researchers in the Action, in particular with respect to STSMs, networking activities, and Training Schools. In addition, justification should be provided if less than 4 STSMs were carried out during the year.*
4 STSMs, all carried out by ESRs
- *Involvement of researchers from outside of COST Countries. (Number of participants from non-COST Countries approved by the CSO. Give % of such participants from countries with reciprocal agreements. Specify their contribution)*
Formal involvement of experts from non-COST countries is under preparation, interest in participation in the model evaluation activities has been indicated by experts from Japan and the US (already actively participated in the 1st Open Workshop)
- *Advancement and promotion of scientific knowledge through publications and other outreach activities. (Number of publications and other outreach activities that resulted from COST networking through the Action. Complete list should be given in an annex)*
3 conference papers/presentations
1 complete report (first document, 'Background and Justification Document')
- *Activities and projects with COST network colleagues.*
One joint research proposal at national level submitted (France/Germany)
Further activities are under discussion.
- *The capacity of the Action members to raise research funds.*

III. Previous scientific report(s)

Part II of past periods' reports are to be found here.