

**ANNEX I**  
 (Revised 02.04.2004)

**"DESCRIPTION OF WORK"**

**INFORMATION REQUIREMENTS AND COUNTERMEASURE EVALUATION  
 TECHNIQUES IN NUCLEAR EMERGENCY MANAGEMENT**

**EVATECH**

**PROPOSAL N°:** FIS5-2001-00113

**CONTRACT N°:** FIKR-CT-2001-00193

**PROJECT**

**COORDINATOR:** Radiation and Nuclear Safety Authority (STUK) FIN

**CONTRACTORS:** Radiation and Nuclear Safety Authority (STUK) FIN  
 University of Manchester (UoM) UK  
 National Radiological Protection Board (NRPB) UK  
 Forschungszentrum Karlsruhe GmbH (FZK) D  
 University of Karlsruhe (UNIKARL) D  
 Bundesamt fuer Strahlenschutz (BfS) D  
 Danish Emergency Management Agency (DEMA)

**DK**

VUJE Trnava Inc. (VUJE) SK

Belgian Nuclear Research Centre (SCK-CEN) B

Institute of Atomic Energy (IAE) PL

**DURATION:** 36 MONTHS

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## 1 OBJECTIVES

*The overall objective is to enhance the quality and coherence of response to nuclear emergencies in Europe by improving the decision support methods, models and processes in ways that take into account the expectations and concerns of the many different parties involved - stakeholders both in managing the response and who are affected by the consequences.*

### Countermeasure evaluation tools

*Objective 1.* To enhance the countermeasure evaluation subsystems (ESY) included in RODOS and ARGOS to help the decision makers (DMS) judge the relative merits of different strategies, through the provision of better tools:

- to compare in easy and understandable way the consequences of possible countermeasures;
- to identify potential countermeasure strategies and, conversely, screen out poor strategies;
- to rank feasible strategies and to perform informative sensitivity analysis.

### Emergency management processes

*Objective 2.* To survey, document and compare the emergency management process and duties of the parties involved in several countries with view to:

- defining information and other support needs at the various stages of the process;
- identifying whether information and DSSs may be used more effectively;
- identifying differences between countries, understanding the structural reasons, if any, for these and suggesting practices which might be shared.

### Information needs

*Objective 3.* To define the information needs of the variety of users of DSSs within the emergency management process. Specifically,

- what data should be provided to users and in what formats to enable them to develop their understanding of the evolving situation and the potential responses?
- what quantities calculated by the various transport and consequence models are of most value and in what formats and to what accuracy are they most valuable?
- how should the modelling assumptions be conveyed to the users so that they can best appreciate the inherent quality – and uncertainties – of the forecasts?
- what strategies and, particularly, what combinations of strategies in relation to the affected areas do the DMS wish (and need) to consider?

### Values that drive decision making

*Objective 4.* To deepen insight on value judgements that are brought into play by the stakeholders (radiation safety, healthcare professionals, social services, industry, etc.) and

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DMS at various stages of the emergency management in deciding between potential countermeasure strategies: specifically,

- deepening insight on the factors (radiological, socio-psychological, economic, ...) which different stakeholders considered relevant in their own decision making;
- exploring how these factors relate to the bases for international (generic) guidance on intervention;
- eliciting the relative importance of the factors in a range of accident scenarios and how these change during the course of an accident.

### **Conduction of facilitated workshops**

*Objective 5.* To develop methods for stakeholder involvement in exercises and emergency planning which will enhance public confidence and understanding in relation to nuclear emergency management: especially,

- improving planning and communication methods, especially for early phase of an accident;
- enhance negotiation methods for later phase of an accident;
- gain experience on countermeasure evaluation systems developed in the project,

## **2 PROJECT WORK PLAN**

### **2.1 Introduction**

The project has been split into four investigative workpackages and a fifth project management activity. Each work package is subdivided into tasks described in Table 1. The main work packages are:

- WP1 Development and improvement of the software for evaluation subsystem and its integration specifically into RODOS and ARGOS.
- WP2 Interviews and questionnaire based surveys of the operational emergency management processes in several European countries.
- WP3 Development of methodologies for conduction scenario-focused workshops with decision making and stakeholder participation.
- WP4 Conduct of scenario-focused workshops in several European countries.

The work package #5 deals with the management of project and its detailed description is given in chapter 4.

In the Work Package 1, a countermeasure evaluation software will be developed for RODOS and ARGOS decision support systems. The software will first be tested in a test environment and later in the workshops which will be conducted in every participating country in the

Work Package 4. The evaluation software will finally be revised on the basis of experiences gained in the workshops.

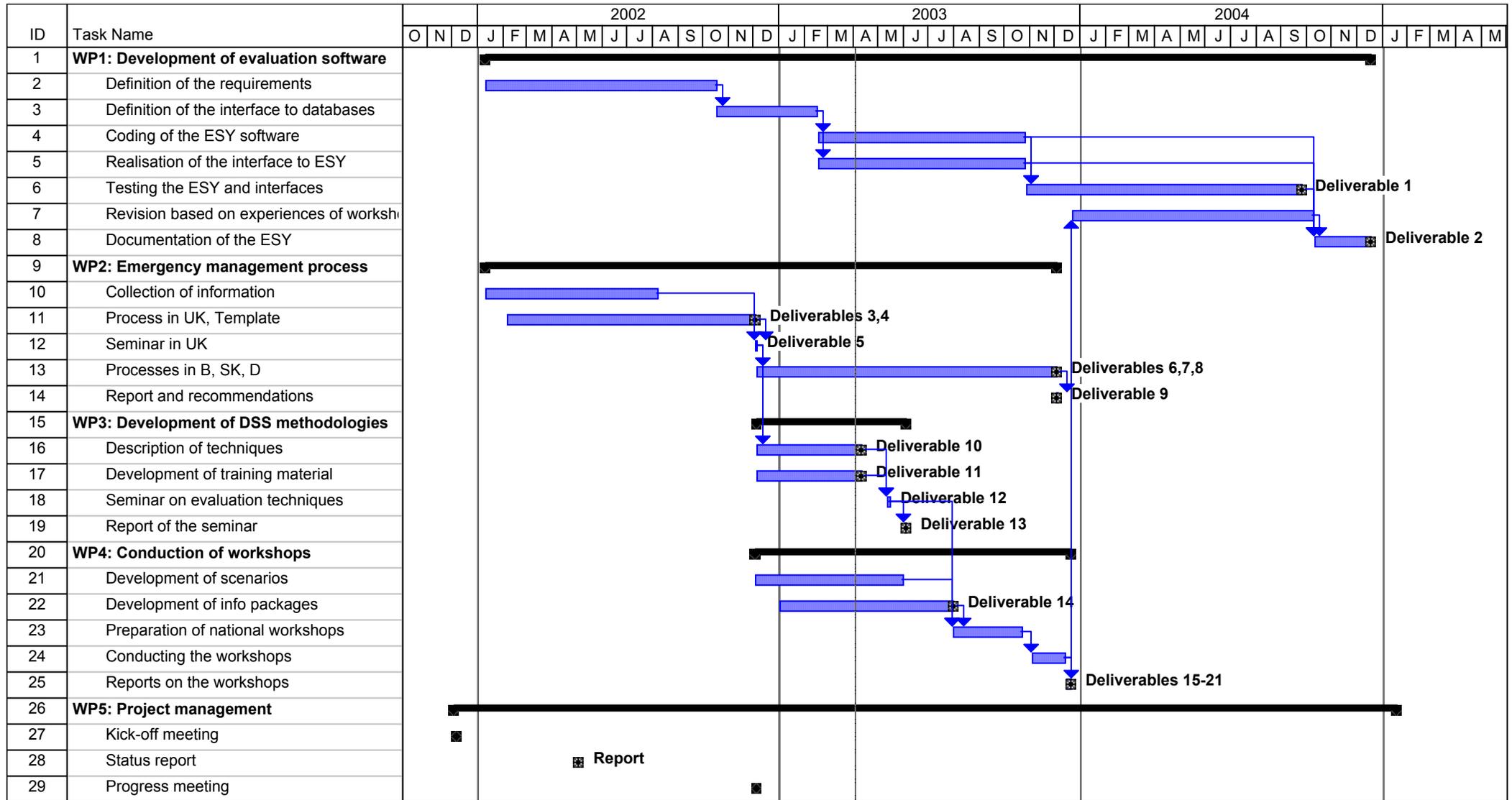
In the Work Package 2, the processes of management of nuclear emergencies will be surveyed and documented in four participating countries. Modern process modelling techniques will be used to produce a generic emergency management process model, which will be used for describing the emergency management processes in the UK, Belgium, Germany and Slovak Republic. The processes will be tested in the workshops of the Work Package 4.

In the work package 3, generic methodologies will be developed for conducting of decision making workshops and experts from all participating countries will be trained to facilitate national workshops. Training will be carried out in a seminar, at which decisions for protective actions in a hypothetical accident situation will be simulated and discussed. The trained persons will facilitate the national workshops to be conducted in the Work Package 4.

In the Work Package 4, scenario-focused decision making workshops will be arranged in all participating countries. The accident scenario to be used will be similar in every country and the software developed in the Work Package 1 will be used as an evaluation subsystem of RODOS and ARGOS. Stakeholders attending these workshops will be identified according to the emergency management processes in each country.

## **2.2 Project planning and time table**

The duration of the project is 36 months. The progress in each work package will be reported annually in Progress reports and seminannually in Status reports. The scheduling of work packages and the underlying tasks are shown in Figure 1.



### 2.3 Graphical presentation of the project's components

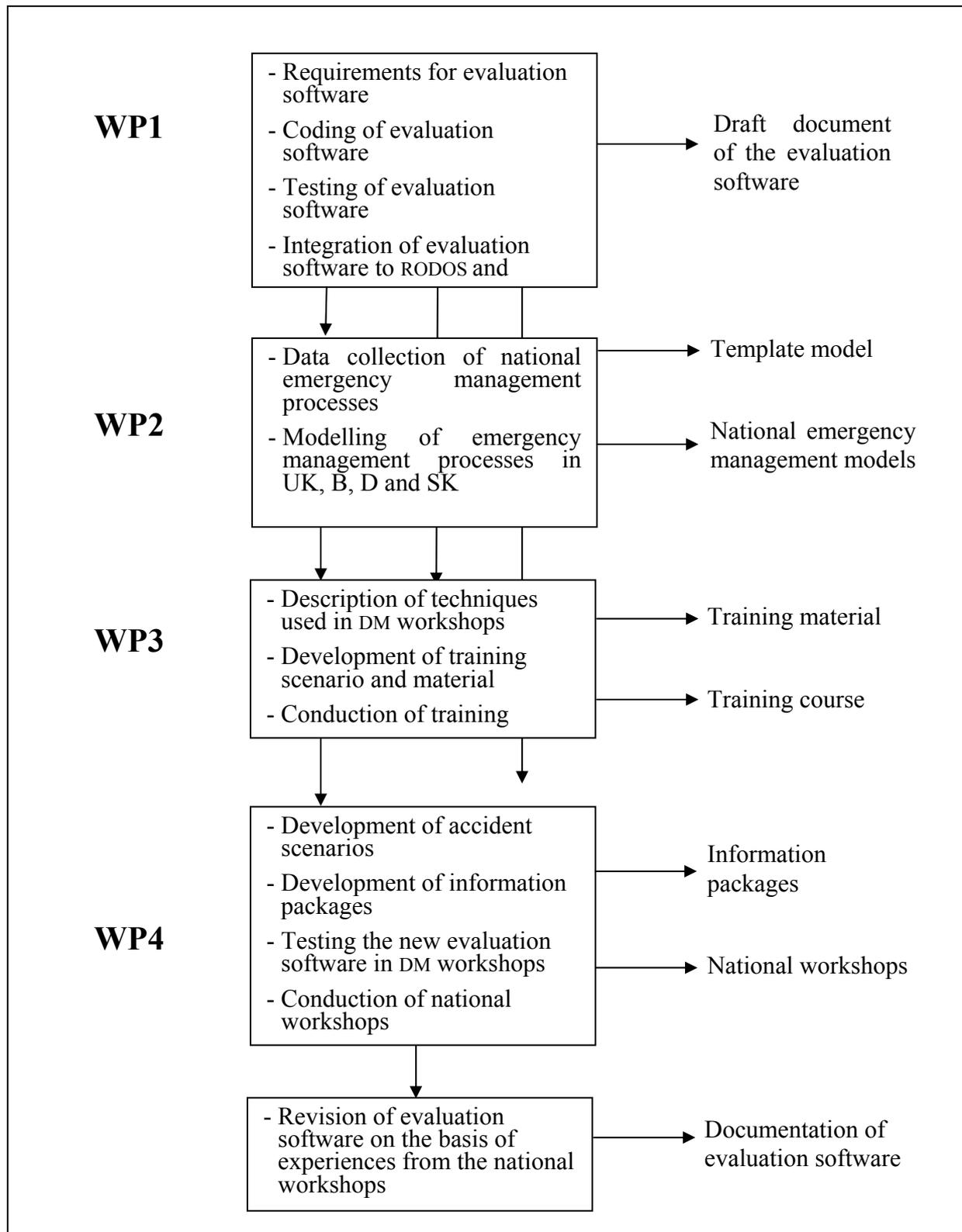


Figure 2. Graphical presentation of the project's components and the main outcomes. WP5 consists of the project management issues.

## 2.4 Detailed project description

This section gives a detailed description on the content of project and the expected outputs. Table 1 gives the list of work packages and underlying tasks with person resources, time tables and deliverables. Table 2 gives the list of deliverables and Tables 3/1-3/4 provide detailed description of the work to be performed in different work packages. The project management is included in the list of work packages and is described in more detail in Chapter 4.

*Table 1. Work package list.*

Work package No	Work package title	Lead contractor	Person months	Start month	End month	Deliverable No
<b>WP1:</b>	<b>Development and improvement of the software for evaluation subsystem (ESY) and its integration specifically into RODOS and ARGOS</b>	<b>2</b>	<b>31</b>	<b>1</b>	<b>36</b>	<b>1-2</b>
Task 1.1	Definition of the requirements for evaluation software	2,5		1	10	
Task 1.2	Definition of the interface to databases	3,2,5		10	14	
Task 1.3	Coding of the evaluation software	2,5,7		14	22	
Task 1.4	Realisation of the interface to evaluation software	5,4,3		14	22	
Task 1.5	Testing of the evaluation software and interfaces	4,5,2		22	34	1
Task 1.6	Revisions of evaluation software based on experiences of workshops	5,2		24	34	
Task 1.7	Documentation of the evaluation software	5,2		14	35	2
<b>WP2:</b>	<b>Interviews and questionnaire based surveys of the operational emergency management processes in several European countries</b>	<b>2</b>	<b>9</b>	<b>1</b>	<b>24</b>	<b>3-10</b>
Task 2.1	Collection of information on emergency management processes (Template model)	2		1	10	3
Task 2.2	Emergency management process in UK	2		1	11	4
Task 2.3	Seminar on emergency management processes	2		12	12	5
Task 2.4	Emergency management processes in B, SK, D	9, 8, 6		11	23	6-8
Task 2.5	Report with recommendations on emergency management processes	2		23	24	9
<b>WP3:</b>	<b>Development of methodologies for conducting scenario-focused workshops with decision making and stakeholder participation</b>	<b>1</b>	<b>15</b>	<b>11</b>	<b>27</b>	<b>10-13</b>
Task 3.1	Description of techniques (Template)	1		11	16	10
Task 3.2	Development of training material	1		11	16	11

Task 3.3	Seminar on evaluation techniques	1		17	17	12
Task 3.4	Report of the seminar	1		17	18	13
<b>WP4:</b>	<b>Conduct of scenario-focused workshops in several European countries</b>	<b>1</b>	<b>36</b>	<b>11</b>	<b>35</b>	<b>14-21</b>
Task 4.1	Development of accident scenarios	1		11	16	
Task 4.2	Development of information packages	1		12	19	14
Task 4.3	Preparation of national DM workshops	3, 5, 7, 8, 9, 10, 1		20	22	
Task 4.4	Conduction of national workshops in UK, D, DK, SK, B, PL and in FIN	3, 6, 7, 8, 9, 10, 1		22	23	
Task 4.5	Reports on the workshops	3, 6, 7, 8, 9, 10, 1		22	24	15-21
<b>WP5:</b>	<b>Project management</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>36</b>	<b>22-29</b>
Task 5.1	Kick-off meeting	1		1	1	
Task 5.2	1 <sup>st</sup> Status Report	1		1	6	22
Task 5.3	1 <sup>st</sup> Project Meeting	1		12	12	
Task 5.4	1 <sup>st</sup> Progress Report	1		1	12	23
Task 5.5	2 <sup>nd</sup> Status Report and Draft T.I.P	1		12	18	24-25
Task 5.6	2 <sup>nd</sup> Project Meeting	1		25	25	
Task 5.7	2 <sup>nd</sup> Progress Report	1		12	26	26
Task 5.8	3 <sup>rd</sup> Status Report	1		24	30	27
Task 5.9	Final Project Meeting (if needed)	1		35	35	
Task 5.10	Final Report	1		1	36	28
Task 5.11	Technological Implementation Plan	1		36	38	29

Table 2. List of deliverables

Deliverable No	Deliverable title	Delivery month	Nature	Dissemination level
1	Test version of the new software for countermeasure evaluation with appropriate user manual	19	De	RE
2	Final version of software for countermeasure evaluation	35	De	RE
3	Template for modelling and reporting of decision making processes	10	Me	PU
4	Emergency management process in UK	14	Re	RE
5	Seminar on emergency management processes	11	Re	RE
6	Emergency management process in Belgium	23	Re	RE
7	Emergency management process in Slovak Rep.	23	Re	RE
8	Emergency management process in Germany	23	Re	RE

9	Report with recommendations on emergency management processes	24	Re	RE
10	Techniques used for facilitating of decision making workshops (Template)	16	Re	PU
11	Training material for conduction of decision making workshop	16	Me	RE
12	Seminar on evaluation techniques	17	Re	RE
13	Report of the seminar on evaluation techniques	18	Re	RE
14	Information packages for national decision making workshops	19	Me	RE
15	Scenario-focused decision making workshop in UK	24	Re	PU
16	Scenario-focused decision making workshop in Germany	24	Re	PU
17	Scenario-focused decision making workshop in Denmark	24	Re	PU
18	Scenario-focused decision making workshop in Slovak Republic	24	Re	PU
19	Scenario-focused decision making workshop in Belgium	24	Re	PU
20	Scenario-focused decision making workshop in Poland	24	Re	PU
21	Scenario-focused decision making workshop in Finland	24	Re	PU
22	First Status Report	6	Re	PU
23	First Progress Report	12	Re	PU
24	Second Status Report	18	Re	PU
25	Draft Technological Implementation Plan	18	Re	PU
26	Second Progress Report	24	Re	PU
27	Third Status Report	30	Re	PU
28	Final Report	36	Re	PU
29	Technological Implementation Plan	37	Re	PU

Nature of deliverable: Re = Report De = Demonstrator Me = Methodology

Dissemination level: PU = Public

RE = Restricted to a group specified by the consortium (including the Commission Services)

<p><b>Table 3/1. Development and improvement of the software for evaluation subsystem and its integration specifically into RODOS and ARGOS.</b></p>
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<b>Work package number:</b>	1
<b>Start date or starting event:</b>	Month 1
<b>Partners (and person-months):</b>	UoM (18), UNIKARL(3), NRPB (8), FZK (4), DEMA (4), STUK (1)
<b>Total person-months:</b>	38

**Objectives:**

- To enhance the countermeasure evaluation subsystems (ESY) included in RODOS and other DSSs to help the DMS judge the relative merits of different strategies
- To provide tools to compare in easy and understandable way the consequences of possible countermeasures
- To identify potential strategies and, conversely, screen out poor strategies
- To rank feasible strategies and perform sensitivity analysis

**Description of work:**

Requirements for subsystem of countermeasure evaluation (ESY) in RODOS and ARGOS decision support systems (DSS) will be defined. Interfaces between the ESY and databases of RODOS and ARGOS will be clarified to be able to extract appropriate information from the DSS databases needed in evaluation system. On the basis of these clarifications, a software for countermeasure evaluation will be developed and integrated into RODOS and ARGOS. The software is intended to support the ranking of alternative strategies, and to be a reporting module to ensure that the reasoning behind the decision is captured and openly explained. The evaluation subsystem(s) will be tested with RODOS and ARGOS before its use in scenario-focused workshops in the Work Package 4. Possible revisions to the evaluation software will be done on the basis of experiences gained in the national decision making workshops of the Work package 4. The evaluation software will be documented with appropriate user manuals.

**Deliverables:**

D1	Test version of new countermeasure evaluation modules with appropriate user manuals
D2	Final version of software for countermeasure evaluation

**Milestones and expected results:**

Month 10	Definition of data needed in evaluation module and design of interface
Month 22	Revised evaluation modules coupled to RODOS and ARGOS
Month 34	Evaluation modules tested
Month 35	Final evaluation modules coupled to RODOS and ARGOS

**Table 3/2. Interviews and questionnaire based surveys of the operational emergency management processes in several European countries**

<b>Work package number:</b>	2
<b>Start date or starting event:</b>	Month 1
<b>Partners (and person-months):</b>	UoM (8), NRPB (1), BfS (1), VUJE (1), SCK/CEN (2)
<b>Total person-months:</b>	13

**Objectives:**

- To survey, document and compare the duties and emergency management processes in several countries
- To define information and other support needs at various stages of the process
- To study whether information and DSS may be used more effectively
- To identify differences between countries, understanding the structural reasons for these and to suggest practices which might be shared

**Description of work:**

The work will begin by surveying the information available on emergency management processes in a number of countries from sources including RODOS documentation developed in Framework 4, material being collected in the DSSNET and ENSEMBLE projects, and by discussions with the participants of this project. From this material, a prototype generic emergency management process model (prototype template model) will be developed. This will be used to develop a detailed model for the UK emergency management process and the template refined in the light of this experience. The methodology will then be conveyed to partners in the other countries (Belgium, Germany and Slovak Republic) via a short seminar. The template will then form the basis of describing the process in these countries. Differences between the countries will be identified and practices which might be shared will be reported. Results of the process modelling will be taken into account also in refining of the ESY software.

**Deliverables:**

D3	Generic emergency management process template and methodology
D4	Process model for the UK
D5	Report of the seminar on emergency management processes
D6-8	Process model for Belgium, Germany and the Slovak Republic
D9	Report comparing processes between countries

**Milestones and expected results:**

Month 12	Process model of UK emergency management + seminar on methodology
Month 23	Process model of Belgium, German and Slovak emergency management
Month 24	Comparison of results, identifying common, different and best practices and identifying potential advantages of DSS.

<b>Table 3/3. Development of methodologies for conducting scenario-focused workshops with decision making and stakeholder participation</b>
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<b>Work package number:</b>	3
<b>Start date or starting event:</b>	Month 11
<b>Partners (and person-months):</b>	STUK (6), UoM(2), NRPB(1), FZK(1), UNIKARL(1), BfS(1), DEMA(1), VUJE(1), SCK/CEN(1), IAE(2)
<b>Total person-months:</b>	17

<b>Objectives:</b>
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- |  |
|--|
| <ul style="list-style-type: none"> <li>• To improve planning and communication methods, especially for early phase of an accident</li> <li>• To enhance negotiation methods for later phase of an accident</li> <li>• To gain experience on countermeasure evaluation system developed in the project</li> </ul> |
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<b>Description of work:</b>
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<p>Information of techniques and methodologies for conducting decision making workshops with decision maker and stakeholder participation will first collected from the literature. Available experience and guidelines will be examined to develop procedures for running facilitated workshops supported by the use of interactive evaluation software through multi-attribute and other decision models. The collected material will be used to develop standard procedures for conducting facilitated workshops (template). This template is a part of the training material to be used at the seminar on evaluation techniques. The training material will also contain the accident scenario and off-site consequences of the accident. The seminar will be arranged to train experts from each participating country to conduct scenario-focused workshops in their own countries. The seminar is planned to be open also for non-partner countries. The trained experts will later conduct a scenario-focused decision making workshop of the Work Package 4 in their own country.</p>
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<b>Deliverables:</b>
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D10	Template on workshop methodologies
D11	Information package for conducting of facilitated workshop
D12	Seminar on evaluation techniques
D13	Report of the seminar on evaluation techniques

<b>Milestones and expected results:</b>
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Month 16	Description of techniques used in facilitated decision making workshops
Month 17	Seminar on evaluation techniques

<b>Table 3/4. Conduct of scenario-focused workshops in Belgium, Denmark, Finland, Germany, Poland, Slovak Republic and UK</b>
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<b>Work package number:</b>	4
<b>Start date or starting event:</b>	Month 11
<b>Partners (and person-months):</b>	STUK (8), UoM(3), NRPB(3), FZK(1), UNIKARL(4), BfS(2), DEMA(3), VUJE(5), SCK/CEN(5), IAE(6)
<b>Total person-months:</b>	40

**Objectives:**

- To develop methods for stakeholder involvement in exercises and emergency planning
- To verify the factors driving decision making
- To explore the information needs of all parties involved in decision making
- To explore how uncertainty could be incorporated in decision making
- To identify the forms of strategy that relevant organisations wish to consider

**Description of work:**

A programme of facilitated workshops and/or structured interviews will be organised in participating countries to understand the practical needs of DMS and stakeholders with a view to improving the DSSs and also shaping further the evaluation subsystems. The work will start by creating an accident scenario to be applied in every participating country. The workshops will concentrate on later phase countermeasures in an urban environment. The environments in different countries will be chosen so that the implemented countermeasures can be compared in the summarising report of the Work Package. The countermeasure evaluation subsystem, developed in the Work Package 1, as a part of RODOS and ARGOS systems will be used in these workshops. Because the new ESY will be used first time in an emergency exercise, there is a risk for failures. Detailed information packages for supporting the execution of workshops will be developed. Responsibility for practical arrangements of the workshops will be on the national level. Experiences gained in Work Packages 2 and 3 will be utilised. Possible differences in emergency response and their reasons will be studied and reported.

**Deliverables:**

D14	Information packages for conducting national workshops
D15-D21	Reports on the findings in each country together with advice for the further development of DSSs.

**Milestones and expected results:**

Months 19	Scenarios and information packages for the national workshops
Months 23-24	Workshops in participant countries

**Table 3/5. Project management**

**Work package number:** 5  
**Start date or starting event:** Month 1  
**Partners (and person-months):** STUK (2), UoM(1)  
**Total person-months:** 3

**Objectives:**

- To co-ordinate and deploy the resources available to the project to achieve objectives
- To manage the legal, contractual and financial matters relating to the project

**Description of work:**

- Development and oversight of working groups, project meetings and email discussion lists
- Establishment of consortium agreement, financial reporting practices, etc.
- Organisation of annual meetings and editing the regular meetings
- Chairing of project steering group

**Deliverables:**

D22-D29 Progress and status reports, final report and Technological Implementation Plan

**Milestones and expected results:**

- Yearly project meetings and regular reports

### **3 REVISIONS**

After the contractors meeting in November 2002 it was obvious that realization of the evaluation software for RODOS and ARGOS needs some added resources. Discussions to get these resources took place during December 2002 and February 2003. The discussion lead to the decision that the Partner #5, the University of Karlsruhe (UNIKARL) joins to WP1 in order to modify a commercial decision analysis software (Web-HIPRE) for the purposes of EVATECH together with other the partners in WP1. This decision called also for some additional funding to UNIKARL. The co-ordinator decided, after consultation with the Partners #2 and #7 (UOM and DEMA), that in total 15 000 € of the Commission's support will be transferred from UOM and DEMA to UNIKARL, and that UNIKARL will use 3 man-months to this topic. UOM and DEMA accepted this revision in March 2003. The revised break-down of the costs is shown in Appendix C.

The contractors meeting in November 2002 decided to reschedule the project in order to get feedback from real end-user to evaluation software. The end-users will participate in the project in the national workshops in WP4. These workshops are planned to use available decision analysis software in planning clean-up countermeasures in urban environment after a nuclear accident. Before the workshops, a training seminar was planned to be held to national facilitators of the workshops. The contractors meeting decided to advance this seminar to May 2003 in order to get the first feedback on the decision analysis techniques. This decision caused some extra costs to the project since it was originally planned to be held in autumn 2003 in connection of the next contractors meeting in Helsinki. In order to minimise the additional costs, the meeting decided hold the contractors meeting at SCK-CEN in Brussels (savings in travel costs). These revisions are shown in the Gantt Chart on page 6, and in Table 5.1.

### **4 SCIENTIFIC AND TECHNICAL PROSPECTS**

#### **4.1 Schedule for meetings and reporting**

Schedule of meetings and reporting will follow the obligations and instructions presented in the Appendix A of this Annex. Project deliverables and summary statements will be submitted in accordance with Article 4 of Annex II to this contract.

#### **4.2 Preliminary Technological Implementation Plan**

The purpose of the development of RODOS and other DSSs is their use and implementation in national emergency centres, both for emergency management and for training and exercises. Firstly, dissemination and exploiting the results of the project to potential users would improve emergency management in the European Union and in the Associated member states and provide a better fit between those systems and the processes that they support. Secondly, dissemination and exploiting the results to those who are developing DSSs will lead to further development of modules and methods to assess consequences of accident and implementation of countermeasures.

Specifically, the goal of the dissemination in the project is as follows:

- Results will be available to the emergency management community and to the developers of DSSs, and generally benefit decision making in other branches of society;

- Modules will be developed and integrated into RODOS and ARGOS which are being disseminated widely across the European Union, Eastern Europe and the Former Soviet Union;
- In addition to technical reports distributed to users and R&D teams during the progress, scientific findings and results will be published in the scientific literature in the usual way;
- Process modelling has not been widely used in the emergency management community. Thus this project will provide an element of technology transfer;

In addition, some of the methodological findings underpinning the enhancement of the ESY subsystem will have wider applicability outside of radiation community than simply DSS for off-site emergency management.

Intellectual property rights will be protected in a manner compatible with that used in the RODOS consortium during 4<sup>th</sup> Framework Programme and are likely to be used by the developers in the future. Standalone versions of the modules will be available under similar terms.

Mutual information exchange between those who have developed the systems and the users' community will guarantee a continuous improvement of both the systems' operability by initiating complementary R&D work beneficial for all who use the systems and the emergency management arrangements within which they are integrated.

Draft version of the Technological Implementation Plan (TIP) will be provided in the middle phase of the project. Final version of the TIP will be submitted within 2 months after the end of the project.

## 5 PROJECT MANAGEMENT

The co-ordination of the project will be carried out by the STUK-Radiation and Nuclear Safety Authority, Finland. A Steering Committee will be established to provide support and oversight of the scientific and development work undertaken in the four work packages. The membership will represent the institutes that lead and carry out major share of work within each work package. Members of the Steering Committee (and their responsibilities) are UOM/ Simon French (WP1 and WP2), STUK/ Kari Sinkko (WP3 and WP4), STUK/ Raimo Mustonen (project management), FZK/ Joachim Ehrhardt and DEMA/ Steen Hoe. Steering Committee meetings will be arranged at the time of the yearly contractors meetings and at other times if necessary. In addition, email contact will permit detailed discussion of issues during the year. The terms of reference for the Steering Committee are as follows:

- Co-ordination, monitoring and reviewing progress;
- Approval of the scope and scenarios of exercises and official documents;
- Establishing and maintaining QA procedures;
- Maintenance contacts with the emergency management community, RODOS and other DSS developers;
- Organisation of the annual meetings.

The work in each workpackage are supervised by Task Leaders. The following Task Leaders (TLs) have been identified for the five Work Packages defined in the proposal:

WP1: Development and improvement of the software for evaluation subsystem and its integration specifically into RODOS and ARGOS (Simon. French, UoM)

WP2: Interviews and questionnaire based surveys of the operational emergency management processes in several European countries (Simon French, UoM)

WP3: Development of methodologies for conducting scenario-focused workshops with decision making and stakeholder participation (Kari Sinkko, STUK)

WP4: Conduct of scenario-focused workshops in several European countries (Kari Sinkko, STUK)

WP5: Project management (Raimo Mustonen, STUK)

Leadership of the four work packages was given to only two TLs (S. French and K. Sinkko) in order to guarantee seamless communication between the WPs and the Project Manager (PM). The functions and responsibilities of the TLs are as follows:

- To co-ordinate and boost the work defined in the corresponding work packages;
- To schedule meetings of the tasks necessary for the effective conduct of the work programme and to prepare agendas and minutes;
- To establish links to other tasks or institutions/organisations working in the same field of activities;
- To prepare in collaboration with the task members contributions to the contractually required reports, agendas and minutes of the meetings and co-ordinate and organise the preparation of technical documents.

Duties of PM are to ensure that the project will go ahead in the planned schedule, the planned products will materialise in due course, technical and other problems appearing during the project will be solved in an adequate and cost-effective way, etc. He is also responsible for arrangement of project meetings, for exporting the results, and for other communication with the Commission.

The planned meetings and national workshops are shown in the following table.

*Table 5.1. Planned meetings, venues, timing and participants.*

Meeting / Nature / Place / month #	Participants / persons									
	STUK/ HUT	UoM	NRPB	FZK	UNI- KARL	BfS	DEMA /Prolog	VUJE/ UJD	SCK- CEN	IAE
Kick-off / getting together, detailed work plans / FZK / m1	x	x	x	<b>X</b>	x	x	x	x	x	x
Seminar in UK / Process modelling / UoM / m12	x	<b>X</b>	x	x	x	x	x	x	x	x
Project meeting / progress / UoM / m12										
Seminar at STUK / evaluation techniques / facilitated workshops / m17	<b>X</b>	x	x	x	x	x	x	x	x	x

Project meeting / progress / SCK-CEN / m25	x	x	x	x	x	x	x	x	X	x
National workshops in all the seven countries / m23-m24	National workshops									
Final project meeting / progress and conclusions / STUK / m36	X	x	x	x	x	x	x	x	x	x

**X** = Hosting partner

**x** = Participation

To enhance communication address and email files will be maintained for project and for each Task Group. As most of the project participants are involved in the ongoing activities around the development of RODOS, the project will utilise the communication channels created within the RODOS community to offer an open and fast communication forum for frequently asked questions, to distribute information, technical reports and archive of all reports produced.

The project will adopt a range of common validation and quality assurance procedures across all partners to ensure that it meets the needs of the emergency management community.

At the outset of model development, a validation strategy will be outlined. This strategy will have the prime objective of ensuring the model contributes to better decision making. It will include as a minimum:

- a list of data sets which may be used to test the models. These data sets should ideally be 'real' and appropriate to the emergency management context, but if necessary may be simulated. In the later case, steps will be taken to ensure that the model is not simply tested against its own output;
- a list of interactions with decision makers or their advisors to ensure that the model output meets their need for information in an emergency.

Software will be developed and verified using sound engineering practice, which will include:

- documented specification of the module before coding begins and agreement on this specification by the developers, with other developers who will need to interface with the module in their work and with users;
- code will be heavily modularised, commented and fully documented;
- all development will take place under strict version control;
- at the time of integration into RODOS and ARGOS, all documentation relating to the module will be completed and also a test protocol provided to ensure that the module can be tested in later releases of RODOS and ARGOS.

All scientific and technical reports will be checked by another partner for clarity and validity. Common formats and housestyle will be adopted for documentation, using MS standard tools, unless there is agreement between the authors to use some other office software (e.g. Latex). Documents will be circulated in PDF format.

## 6. THE CONSORTIUM

The partners of this project are coming from different part of Europe having different cultural, social and political backgrounds thus representing wide European view on issues to be solved in the project. The Partners are competent national safety authorities or they are working close to authorities thus being appropriate partners to work together with decision makers and their advisors in order to elicit the information needs.

Partner 1 (STUK) is responsible for the co-ordination of the project (WP5). STUK is responsible for development for methodologies for conducting scenario-focused workshops (WP3), will co-ordinate a facilitated workshops and interviews to identify the factors driving decision making on countermeasures (WP4) and participate in development and evaluation of ESY software (WP1). In performing the work package 3, STUK will subcontract the Department of Engineering Physics and Mathematics of the Helsinki University of Technology (HUT). The subcontractor has a wide experience in decision aiding methodologies.

Partner 2 (UoM) co-ordinates the work to develop and enhance countermeasure evaluation software (ESY) for RODOS and ARGOS (WP1), and co-ordinates and develops process model of emergency management process (WP2), participate in structured interviews and small facilitated workshops (WP3 and 4),

Partner 3 (NRPB) supports ESY development and will provide a link between late countermeasure module (decontamination) and ESY (WP1), participate in emergency management process assessment in UK (WP2) and will participate in organising facilitated mini-workshops and interviews to identify the factors driving decision making on countermeasures (WP3 and 4).

Partner 4 (FZK) will participate to the elaboration of the evaluation model as an expert on the RODOS system and database. In addition, support will be provided in integrating into RODOS software packages developed in the frame of this project (WP1). FZK will participate in emergency management process assessment in Germany (WP2) and will participate in organising facilitated workshops and interviews to identify the factors driving decision making on countermeasures and to evaluate the ESY software (WP3 and 4).

Partner 5 (UNIKARL) and its French-German Institute for Environmental Research (DFIU/IFARE) will participate in the development of evaluation tool and of facilitated workshops, in organising workshop in Germany to identify the factors driving decision making on countermeasures and participate in evaluation of ESY software (WP3 and 4).

Partner 6 (BfS) will as a competent national authority participate in development of methodologies for facilitated workshops (WP3) and in conduction of the workshop in Germany (WP4).

Partner 7 (DEMA) will participate in the work to develop and enhance countermeasure evaluation software (ESY) for ARGOS (WP1), and will participate in scenario-focused workshops to evaluate the software and to develop methodologies for facilitated workshops (WP3 and 4). In writing new code for ESY software for ARGOS system, DEMA will subcontract Prolog Development Center (PDC) which has been involved in development of ARGOS and the Danish nuclear information system.

Partner 8 (VUJE) is responsible for the process modelling of emergency processes in the Slovak Republic (WP2). VUJE will organise and run workshop and interviews to provide the comparison of emergency managers' thinking on the issues (WP3 and 4). In performing the national workshop, VUJE will co-operate with the national competent authority UJD.

Partner 9 (SCK/CEN) participates in the modelling of emergency management process in Belgium (WP2), in development of methodologies for scenario-focused workshops (WP3) and is responsible for conducting the workshops in Belgium (WP4).

Partner 10 (IAE) is responsible for the process modelling of emergency processes in the Poland (WP2). IAE will organise and run workshop and interviews to provide the comparison of emergency managers' thinking on the issues (WP3 and 4). In performing the national workshop, IAE will co-operate with the national competent authority NAEA.

## **7. OTHER INFORMATION**

### **7.1 Related projects**

RODOS: a real-time on-line decision support system for off-site emergency management in Europe, FI4P-CT95-0007 ("A-contract"), Co-ordinator: J. Ehrhardt, FZK

Customisation and further development of RODOS for operational use, FI4C-CT96-0006 ("B-contract"), Co-ordinator: J. Ehrhardt, FZK

Completion and customisation of the modelling in RODOS, FI4P-CT96-0053 ("C-contract"), Co-ordinator: K. Sinkko, STUK

Enhancement of the EU decision support system RODOS and its customisation for use in Eastern Europe, IC15-CT96-0318 ("E-contract"), Co-ordinator: J. Ehrhardt, FZK

DSS-NET, CT-2000-40076

### **7.2 Clustering with other projects**

The project will be formally clustered with other projects in the area of off-site emergency management in the MOSES cluster. Links will also be established with an existing cluster (SAMEN) of off-site emergency management projects.

## Appendix A

### Obligations and Schedule for Meetings and Reporting

#### A1 Meetings

Meetings will fall into one or other of the following four categories.

***Progress meetings*** These meetings will be held at the discretion of the project coordinator or those assigned responsibility for progressing individual work packages. The meetings may concern the whole project or particular work packages and their scheduling and the level of participation will be determined by the needs of the project. Indicative scheduling of these meetings is set out in Annex I (Section 2.4).

***Coordination meetings, workshops, conferences, etc, organised by the Commission***  
The Commission will organise a number of coordination meetings, workshops or conferences, etc, under the auspices of the Nuclear Energy Programme. The main objectives of these coordination meetings, workshops, conferences, etc, are to report and disseminate, to a wider international audience, the progress and achievements made by the RTD in each of the main areas of the Programme (ie, operational safety of existing installations, safety of the fuel cycle, safety and efficiency of future systems and radiation protection) or in particular sub-areas. Participation in those meetings which are directly relevant to this project, is a contractual obligation; the costs of participation will be borne by the contractor/s and can be charged to the project (ie, they are eligible costs) where the meeting is held within the duration of the contract. This obligation will be strictly limited to participation in not more than two such coordination meetings, workshops, conferences, etc. **The level of participation will reflect the needs of the project, the nature of the meeting and what is to be reported** (eg, in some cases it may be sufficient for a project to be represented by the coordinator or other participant).

***Other conferences, workshops, meetings, etc.*** Participation in other conferences, workshops, meetings, etc, should be strictly limited to that **essential** for the proper and effective conduct of the project and/or the dissemination of its results. Where participation is essential, the costs that can be charged to the contract will, in general, be limited to those for one participant; where the costs of more than one participant is to be charged to the contract, the prior approval of the Commission is required. Prior approval is also required for participation in any conference, meeting, etc, held outside the territory of the Member States, Associated States or a third State where a contractor is established, unless such a destination is provided for in Annex I (see Article 23 (4) of Annex II).

## A2 Reporting

The requirements for reporting are set out in Article 4 of this contract and amplified in Article 4 of Annex II. For convenience, a summary of these requirements, insofar as they apply to this contract, is set out in Table A1.

**Table A1: Schedule and deadlines for reporting and cost statements**

Reports/Cost Statements		Submission time <sup>1</sup> (time after contract start – months)
<b>Reports<sup>2</sup></b>		
Minutes of progress meetings		Within 1 month of each meeting
Periodic progress reports	Six monthly management reports	6, 12, 18, 24, 30, 36
	Annual scientific/technical reports	12, 24, 36
Mid term report		18
Final report		36
Technology Implementation Plan <sup>3</sup>		36
Supplementary reports/deliverables		As indicated elsewhere in Annex I
List of all reports prepared within the project		36
<b>Cost Statements<sup>4</sup></b>		
Periodic cost statements		12, 24, 36

<sup>1</sup> The **deadlines** for submission are generally two months after the period being reported on

<sup>2</sup> Three copies required of each report, except minutes (one copy only)

<sup>3</sup> See Articles 16 and 17 of Annex II

<sup>4</sup> Two copies required per participant (including the co-ordinator's integrated and summary cost statements) – see Article 4 of the Contract and Article 4 of Annex II

### Guidance on reporting

**Minutes of progress meetings:** minutes (summarising the main decisions taken and actions placed) should be prepared for **all** progress meetings between partners. This applies to meetings concerned with progressing the project as a whole and progressing particular work packages.

**Management reports:** these should be succinct and **strictly limited** to project management issues. Their content should be sufficient to enable the Commission to evaluate progress relative to the work-programme (ie, milestones, deliverables,

resource utilisation, etc) and judge whether any remedial action is needed. Any problems foreseen or experienced in executing the project should be identified at an early stage. Significant revisions to the work programme, schedule or deliverables should be drawn to the Commission's attention for approval.

***Scientific/technical reports:*** these should summarise the scientific/technical progress made in the reporting period in sufficient detail to enable the Commission to evaluate what has been achieved relative to the scientific/technical goals of the project. The report should describe/synthesise progress in the project as a whole (ie, properly integrating the contribution of all partners) and **not** comprise just a compilation of un-connected progress reports prepared by individual partners; the actual contribution of individual partners should, however, be indicated succinctly in material annexed to the report.

***Mid-term report:*** this report will form the basis of a formal, mid-term, review and assessment of progress made. The assessment will be carried out by the Commission in a meeting with the co-ordinator and representative/s of each of the partners; the need for and, where necessary, the nature of changes to the work programme for the remainder of the project will be identified. This report should be more extensive than the periodic scientific/technical reports; its content should be sufficient to enable a proper technical evaluation of what has been achieved relative to expectations and to judge the adequacy of the remaining work programme in terms of achieving the overall project goals.

***Final report:*** the format of the final report (including an executive summary) will be defined by the Commission Services at least six months before the end of the project. Publication and dissemination of the final reports will normally be the responsibility of the contractors; publication in the open literature (journals, institute/company report series, etc) is strongly encouraged with due acknowledgement to the support provided by the Community (see Article 18 of Annex II). The Commission, with the agreement of the contractors, reserves the right to publish selected final reports (or syntheses of several final reports), in particular where these may have broader strategic or political importance. A compilation of the executive summaries of all final reports will be published by the Commission.

***List of reports/documents:*** The co-ordinator will keep a register of all substantive reports/documents produced within the project; each will be attributed a code (ie, PU, RE, CO) denoting limitations on their distribution. The list of reports/documents will be provided to the Commission at the end of the project.

## Appendix B

### Justification of the costs

Partner / Item	Justification
<b>STUK:</b> Travel / subsistence costs  Subcontracting costs  Other costs	<p>The kick-off meeting, two annual contractors' meetings and the final meeting. The co-ordinator and the other WP leader must participate these meetings. Testing of ESY module at FZK might assume the co-ordinator's presence (11600 €).</p> <p>The subcontractor (Helsinki University of Technology) will model the case study and develop implementation in the currently existing softwares in WP3, plan and facilitate the seminar on evaluation technique for all ten partners. Subcontracting costs will cover salary of one student (10 months) and the professor (2 months), overheads, travels to two project meetings, and arrangements of the seminar (35000 €).</p> <p>STUK will host the national workshop (1000 € for running costs), the training course on evaluation techniques (2000 € for running costs), and the final meeting (1000 € for running costs)</p>
<b>UoM:</b> Travel / subsistence costs  Computer costs  Other costs Durable equipment  Consumables	<p>2 x 1 week visit to FZK to integrate ESY (2 x 1500 €). Process modelling meetings in Be, D, SK and UK (1200+1400+1200+700 €). Visits to NRPB in development of ESY (3x350 €). Three project meetings (3x1000 €). Two facilitated workshops (2x800 €).</p> <p>Networking, installation of software (dedicated to the project, 340+330+330€).</p> <p>Running facilitated workshops (2x1000 €)</p> <p>3600 € for PC and monitor. The computer will be dedicated to the project and cannot be to open access. The costs are not included in the overheads.</p> <p>500+250+250 € software licences, not included in the overheads.</p>
<b>NRPB:</b> Travel / subsistence costs  Other costs	<p>Year 1: Kick-off meeting + ESY requirements meeting (2 people) – 2000€.</p> <p>Year 2: One annual contractors' meeting (2 people) and ESY testing meeting (1 person) - 2600€.</p> <p>Year 3: Final meeting (2 people) - 2000€.</p> <p>All UK travel and subsistence costs are included in overheads.</p> <p>NRPB will host the national workshop (1000 € for running costs).</p>
<b>FZK:</b> Travel / subsistence costs	Three project meetings (3x655.66 €)

<b>UNIKARL:</b>	Travel / subsistence costs  Development of the evaluation software	Three project meetings (3x1000 €) Process modelling meeting (1000 €)  15 000 € are transferred from UoM and DEMA to UNIKARL to enhance the evaluation tool development <sup>1</sup> .
<b>BfS:</b>	Travel / subsistence costs  Other costs	Three project meetings (3x2x1000 €) Process modelling meeting (2x1000 €) National facilitated workshop, hire of a student to assist in organising the workshop, travel costs of participants (15000 €)
<b>DEMA:</b>	Travel / subsistence costs  Subcontracting costs  Other costs	The kick-off meeting, two annual contractors' meetings and the final meeting (4). 2 Meetings at FZK- Subcontractor is required for the meeting at FZK. Additional meetings with NRPB/FZK for integrating CSY and preparing the data structure for ESY. (In total 12000€) The subcontractor (The PROLOG Development Center A/S) will integrating the new ESY software. In total (43200€). Before integrating the ESY software PROLOG shall integrate the CSY software into ARGOS and this will be separately financed by DEMA DEMA will host the national workshop (1000 € for running costs)
<b>VUJE:</b>	Travel / subsistence costs Other costs Subcontracting costs	Three project meetings (3x2x1000 €) Running facilitated workshops (1000 €) The subcontractor (UJD) will provide all necessary facilities and equipment for the national workshop, and manpower of 1.5 months (12400 €)
<b>SCK-CEN:</b>	Travel / subsistence costs Other costs	Three project meetings (3x1000 €) Running facilitated workshop (484 €)
<b>IAE:</b>	Travel / subsistence costs  Consumable costs Subcontracting costs Other costs	Three project meetings (6000 €, no EC contribution) 5000 € (no EC contribution) 6000 € (no EC contribution) 1000 € (no EC contribution)

<sup>1</sup> To enhance the development of evaluation software into RODOS and ARGOS, the Co-ordinator decided in February 2003, after consultation with the appropriate partners, to transfer additional 15 000 € to UNIKARL from UoM and DEMA. The new break-down of the costs in each year is shown in Appendix C.

## Revised cost break-down, 27.2.2002

Appendix C

Partner	Mm	Personal	Durable	Subcontr.	Travels	Consum.	Comput.	Others	Overheads	Total	EC share	Changes
<b>Year 1</b>												
1 STUK	3,9	18 462		2 500	3 600				19 472	44 034	22 017	
2 UoM	12,2	32 213	3 600		3 250	500	340		7 981	47 884	47 884	
3 NRPB	5,0	19 871			2 000				54 644	76 515	38 258	
4 FZK	2,0	11 764			656				8 163	20 583	10 292	
5 UNIKARL	1,0	2 205			1 000				630	3 835	3 835	
6 BfS	0,2				2 000				400	2 400	2 400	
7 DEMA	0,6	2 398		5 165	4 000				2 398	13 961	6 981	
8 VUJE	1,0	3 567			2 000				4 263	9 830	4 915	
9 SCK/CEN	2,7	19 876			1 000				15 901	36 777	18 389	
10 IAE	2,7	2 000		2 000	1 600	1 400		300	2 666	9 966		
<b>Total</b>	<b>31,2</b>	<b>112 356</b>	<b>3 600</b>	<b>9 665</b>	<b>21 106</b>	<b>1 900</b>	<b>340</b>	<b>300</b>	<b>116 518</b>	<b>265 785</b>	<b>154 969</b>	
<b>Year 2</b>												
1 STUK	6,5	29 780		23 000	3 600			2 000	34 017	92 397	46 199	
2 UoM	<b>10,1</b>	<b>29 659</b>			6 250	250	330	1 000	<b>7 251</b>	<b>44 740</b>	<b>44 740</b>	<b>-5 976</b>
3 NRPB	4,8	18 488			2 600				50 843	71 931	35 966	
4 FZK	2,0	12 117			656				8 407	21 180	10 590	
5 UNIKARL	<b>4,4</b>	<b>14 768</b>			2 000	500			<b>3 890</b>	<b>21 158</b>	<b>21 158</b>	<b>10 000</b>
6 BfS	2,0				3 000				600	3 600	3 600	
7 DEMA	<b>4,5</b>	<b>19 880</b>		30 990	4 000			1 000	<b>19 880</b>	<b>75 750</b>	<b>37 875</b>	<b>-4 024</b>
8 VUJE	3,1	10 701			2 000				12 789	25 490	12 745	
9 SCK/CEN	2,7	20 671			1 000				16 537	38 208	19 104	
10 IAE	2,7	2 000		2 000	2 200	1 800		300	2 666	10 966		
<b>Total</b>	<b>42,7</b>	<b>158 064</b>	<b>0</b>	<b>55 990</b>	<b>27 306</b>	<b>2 550</b>	<b>330</b>	<b>4 300</b>	<b>156 880</b>	<b>405 420</b>	<b>231 976</b>	<b>0</b>
<b>Year 3</b>												
1 STUK	6,8	34 760		4 500	3 855			2 000	38 124	83 239	41 620	
2 UoM	<b>9,6</b>	<b>30 563</b>			3 500	250	330	1 000	<b>7 005</b>	<b>42 648</b>	<b>42 648</b>	<b>-2 989</b>
3 NRPB	3,1	13 524			2 000			1 000	37 192	53 716	26 858	
4 FZK	2,0	12 481			656				8 660	21 797	10 899	
5 UNIKARL	<b>1,7</b>	<b>6 337</b>			1 000				<b>1 630</b>	<b>8 967</b>	<b>8 967</b>	<b>5 000</b>
6 BfS	2,0				3 000			15 000	3 600	21 600	21 600	
7 DEMA	<b>2,8</b>	<b>12 329</b>		5 165	4 000				<b>12 329</b>	<b>33 823</b>	<b>16 912</b>	<b>-2 011</b>
8 VUJE	3,1	10 701		12 400	2 000			1 000	12 789	38 890	19 445	
9 SCK/CEN	2,6	21 498			1 000				484	17 199	20 091	
10 IAE	2,7	2 000		2 000	2 200	1 800		400	2 668	11 068		
<b>Total</b>	<b>36,3</b>	<b>144 193,0</b>	<b>0,0</b>	<b>24 065</b>	<b>23 211</b>	<b>2 050</b>	<b>330</b>	<b>20 884</b>	<b>141 196</b>	<b>355 929</b>	<b>209 038</b>	<b>0</b>
<b>Total</b>												
1 STUK	17,1	83 002	0	30 000	11 055	0	0	4 000	91 613	219 670	109 835	
2 UoM	<b>31,9</b>	<b>92 435</b>	3 600	0	13 000	1 000	1 000	2 000	<b>22 237</b>	<b>135 272</b>	<b>135 272</b>	<b>-8 964</b>
3 NRPB	13,0	51 883	0	0	6 600	0	0	1 000	142 679	202 162	101 081	
4 FZK	5,9	36 362	0	0	1 968	0	0	0	25 230	63 560	31 780	
5 UNIKARL	<b>7,1</b>	<b>23 310</b>	0	0	4 000	500	0	0	<b>6 150</b>	<b>33 960</b>	<b>33 960</b>	<b>15 000</b>
6 BfS	4,1	0	0	0	8 000	0	0	15 000	4 600	27 600	27 600	
7 DEMA	<b>7,9</b>	<b>34 607</b>	0	41 320	12 000	0	0	1 000	<b>34 607</b>	<b>123 534</b>	<b>61 767</b>	<b>-6 036</b>
8 VUJE	7,2	24 969	0	12 400	6 000	0	0	1 000	29 841	74 210	37 105	
9 SCK/CEN	8,0	62 045	0	0	3 000	0	0	484	49 637	115 166	57 583	
10 IAE	8,1	6 000	0	6 000	6 000	5 000	0	1 000	8 000	32 000	0	
<b>TOTAL</b>	<b>110,2</b>	<b>414 613</b>	<b>3 600</b>	<b>89 720</b>	<b>71 623</b>	<b>6 500</b>	<b>1 000</b>	<b>25 484</b>	<b>414 594</b>	<b>1 027 134</b>	<b>595 983</b>	<b>0</b>