



FINAL TECHNICAL IMPLEMENTATION REPORT



July 2008



This final report on the technical implementation of the EU FloodCommand project has been collated and prepared for distribution to all key stakeholders. If you require additional copies of this document, please contact Rob Munro at VectorCommand - contact details are below.

All information remains the copyright of VectorCommand and may not be reproduced in full or in part without written permission from VectorCommand



**European Commission
Civil Protection**

ENV-A3@ec.europa.eu
www.ec.europa.eu/environment/civil/index.htm
Tel : +32 2 299 11 11
Contact: Mascia Toussaint



Maritime and Coastguard Agency

info@mcga.gov.uk
www.mcga.gov.uk
+44 (0)8706 006 505
Contact: Derek Smith
+44 (0)1304 218595
derek.smith@mcga.gov.uk



Irish Coast Guard

admin@irishcoastguard.ie
www.ircg.ie
www.transport.ie
+353 1 678 2000
Contact: Eamon Torpay
+353 1 678 3442
eamontorpay@transport.ie



Swedish Rescue Services Agency

srv@srv.se
www.raddningsverket.se
+46 54 13 50 00
Contact: Magnus Qvant
+46 46 23 36 15
magnus.qvant@srv.se



VectorCommand Ltd

info@eufloodcommand.eu
www.eufloodcommand.eu
+44 (0)2392 410400
Contact: Rob Munro
+44 (0)2392 410416
rob.munro@vectorcommand.com



Co- funded by the EC

CONTENTS

CONTENTS	3
BACKGROUND	5
GENERAL SUMMARY	6
OVERVIEW OF PROCESS	6
TIMESCALE	6
RESOURCES	7
RESULTS	7
EVALUATION OF PROCESS	10
POSITIVE ASPECTS & OPPORTUNITIES	10
INTERNAL & EXTERNAL DIFFICULTIES	10
PARTNERSHIP COOPERATION	10
COOPERATION WITH THE COMMISSION	10
EUROPEAN ADDED VALUE	11
LESSONS LEARNED	11
ACTIVITIES	13
COMPARISON: PLAN VERSUS IMPLEMENTED	13
QUALITATIVE EVALUATION	14
TECHNICAL RESULTS	15
INITIAL CONFERENCE & WORKSHOPS	15
PROTOTYPE FLOODCOMMAND SYSTEM	16
PROTOTYPE EXERCISE SCENARIO PACK	17
RELEASE VERSION FLOODCOMMAND SYSTEM	18
Protocols & Procedures	18
Draft Response Module Definitions	18
Command Support System Technology Platform	18
PHASES AND PRE-LOADABLE TOP LEVEL OBJECTIVES	18
RELEASE VERSION EXERCISE SCENARIO PACK	20
EVALUATION OF RESULTS	21
LESSONS LEARNED	21
STRENGTHS	21
CHALLENGES	21
RECOMMENDATIONS	22
FOLLOW-UP	23
ANNEX A – RESPONSE MODULE PROTOCOLS	24
CAVEATS	24
DEFINITIONS	24
COMMAND & CONTROL	25
LOGISTICAL SUPPORT	26
LIABILITY	26
ANNEX B – RESPONSE MODULE PROCEDURES	27
CAVEATS	27
DEFINITIONS	27
INITIATION	27
BUILD	27
DEPLOYMENT	28

	Final
COORDINATION	28
SUSTAINABILITY	28
ANNEX C – PROPOSED MODULE DEFINITIONS.....	29
General requirements for European civil protection modules relating to Maritime Search & Rescue capability for use in flood disasters	29

BACKGROUND

1. This is the final report on the technical implementation of EU FloodCommand, a pilot project between UK, Sweden and Ireland co-funded by the European Commission.
2. The aim of the report is to share the learning from the project with all partners and other stakeholders, as well as providing the information needed to enable the co-funding of the project to be closed.
3. Project EU FloodCommand was a programme of conferences, workshops, exercises and technology development designed to establish a European Maritime Search & Rescue (SAR) Response Module, with the following key objectives:
 - a. To establish a system to integrate Maritime SAR resources from across Member States into a coordinated response to coastal or tidal flooding.
 - b. To enhance cross-border cooperation between Member States in the fight against natural disasters.
 - c. To raise awareness of the risks of catastrophic flooding as a result of tsunami or tidal surge events.
4. The UK lead for the project was the UK Maritime & Coastguard Agency with the Irish Coast Guard and the Swedish Rescue Services Agency as Partners, and VectorCommand Ltd as Beneficiary providing the technical lead and all project and financial management.
5. The project resulted from a bid submitted to the DG Environment Civil Protection Unit in August 2006 under a call for proposals for pilot projects for cross border cooperation in the fight against natural disasters. EU FloodCommand was one of six successful applications, and was awarded co-funding to the maximum of 80% of total project cost.
6. The project began formally in February 2007, and has been completed on schedule and has met all the projects objectives.
7. The key recommendations of the Project are:
 - a. To agree to incorporate the recommended modules relating to search and rescue from flood water into the official list of Response Modules under the recast Civil Protection Mechanism.
 - b. To take action to improve the wider understanding of civil protection agencies within Member States through a comprehensive communication plan to encapsulate the vision of response modules within the framework of the recast Civil Protection Mechanism.
 - c. To consider encouraging the adoption of command support technology of the type developed under this project as a key enabler of the effective operational coordination of response modules.
 - d. To consider encouraging the use of exercise delivery utilising distributed technology as a cost effective method of regular exercising of the command and control aspects of multi-national response.

GENERAL SUMMARY

OVERVIEW OF PROCESS

8. The concept of the project was to establish a pilot Maritime SAR Response Module within the framework of the recast European Civil Protection Mechanism. To do that we needed to develop understanding in two areas: maritime SAR capability and the concept of response modules.

9. The project therefore adopted a process whereby we would explore these two areas with the Partners through regular meetings of the Project Board, with the Commission through regular email contact and meetings where possible, and with other Member States and participating nations through inviting attendance at the events which formed part of our main actions.

10. This process can be illustrated as described in Figure 1.

TIMESCALE

11. The initial timescale was as follows:

- | | | |
|----|-----------------|--|
| a. | Jan – Apr 07 | Organise and deliver an initial conference & workshop. |
| b. | Apr – Jul 07 | Develop prototype EU FloodCommand system. |
| c. | Apr – Jul 07 | Develop prototype exercise scenario pack. |
| d. | Jul 07 – Jan 08 | Develop production level EU FloodCommand system. |
| e. | Aug – Dec 07 | Train user group. |
| f. | Jul 07 – Jan 08 | Develop production level exercise scenario pack. |
| g. | Jan 07 – Jun 08 | Disseminate results and learning. |
| h. | Jan 07 – Jun 08 | Management and reporting to Commission. |

12. Unavoidable delays in the processing and selection of proposals for co-funding caused the start of the project to be delayed by one month.

13. A recognition of the realities of holiday periods then caused us to push the initial exercise (the final deliverable of Action C) back from August 07 into September 07, and to push the validation exercise (the final deliverable of Action F) back from Jan 08 to April 08. International disasters in Burma and China then caused the final dissemination conference to be rescheduled to June to allow key international experts to be present.

14. These changes have had the resulting overall shift in timeline:

- | | | |
|----|-----------------|--|
| a. | Feb – May 07 | Organise and deliver an initial conference & workshop. |
| b. | May – Aug 07 | Develop prototype FloodCommand system. |
| c. | May – Aug 07 | Develop prototype exercise scenario pack. |
| d. | Aug 07 – Mar 08 | Develop production level FloodCommand system. |

- e. Sep 07 – Jul 08 Train user group.
- f. Aug 07 – Mar 08 Develop production level exercise scenario pack.
- g. Feb 07 – Jul 08 Disseminate results and learning.
- h. Feb 07 – Jul 08 Management and reporting to Commission.

RESOURCES

14. The original project plan envisaged generating the majority of human resources from inside the beneficiary, with the exception of Partner experts and external assistance for programme management and event management.

15. The reality of the complexities of developing the structure and content of the first action (conference & workshops) and the challenges of lining up suitable expert speakers and building a credible delegate list from across Member States and participating nations meant that we could not delegate event management. It also became quickly apparent that coordination of the teams delivering the various actions required us to allocate more hours to programme management than expected. Without this the strategic vision could not have been maintained.

RESULTS

16. As at July 2008 all actions have been successfully completed in line with the expected project timeline.

17. Action A (conference & workshop) has been reported on under separate cover entitled 'EU FloodCommand Initial Conference & Workshop Report' and is available via the Project website www.eufloodcommand.eu. This action attracted greater support than expected, and resulted in a well developed understanding of the challenges of delivering the project, as well as a realisation of the lack of awareness of the European Response Module concept.

18. Action B (development of a prototype EU FloodCommand system) was informed by the outcomes of Action A (conference & workshop), and has resulted in a set of draft protocols and procedures to alert, build, deploy and coordinate a maritime SAR response module consisting of national contingents drawn from two or more Member States, along with associated command support system technology. This prototype system was trialed at the exercise event which took place in September 2007.

19. Action C (development of prototype exercise scenario pack) was also informed by the outcomes of Action A (conference & workshop), and resulted in a scenario pack sufficient to provide realistic stimulation of those involved in the trialing of the draft protocols, procedures and prototype command support system during the exercise event held in September 2007.

20. Actions B and C have been reported on in detail under separate cover entitled 'EU FloodCommand Initial Exercise Post Exercise Report', which is available via the project website www.eufloodcommand.eu.

21. Action D (development of a release version EU FloodCommand system) was informed by the Initial Exercise, and aimed to deliver a command support system which meets the User Specification detailed in Annex G of the Initial Exercise Post Exercise

Report referred to above. This development work was completed and went through a comprehensive validation during the April exercise.

22. Action F (development of a final exercise scenario pack) was also informed by the Initial Exercise, and was completed in time to enable the delivery of a validation exercise in April. The scope of the scenario pack for the Validation Exercise was agreed by the Project Board, as has the outline structure of the exercise, its aims, objectives, and who would participate. In particular, it was agreed that the Netherlands had shown great commitment to the project and should be invited to participate fully in the validation exercise alongside the full partners.

23. Action G (dissemination) is complete to the project plan, with a project website having delivered and regularly maintained with key project learning and events information, along with a Partner portal providing a secure collaboration site where documents were posted for review and virtual discussions supported through the use of discussion boards. Learning from the Project at every stage has also been disseminated through the provision of project representatives as speakers at various conferences and seminars, including the 2nd EC Civil Protection Forum. The final dissemination conference, in the form of a European Congress on Multilateral Flood Response, was held in Stockholm over 18-19 June 2008 and was well attended by senior officials and executives from civil protection organisations across Europe. While the formal dissemination under the project concludes with the distribution of this report, it has been agreed by the Project Board (in consultation with the DG Environment) that project dissemination continue beyond the formal close of the project for a period of at least 6 months, funded by VectorCommand Ltd but outside of the project finances.

24. Action H (management & reporting to the EC) has been completed as per the project plan, concluding with the publication of this final report. As this is the first of the six projects under this call to complete, the European Commission will continue to run project coordination meetings, and have agreed with the Project Board to fund attendance from the EU FloodCommand team outside of the Grant Agreement in order to ensure that learning from this project is shared with the five other projects under the call.

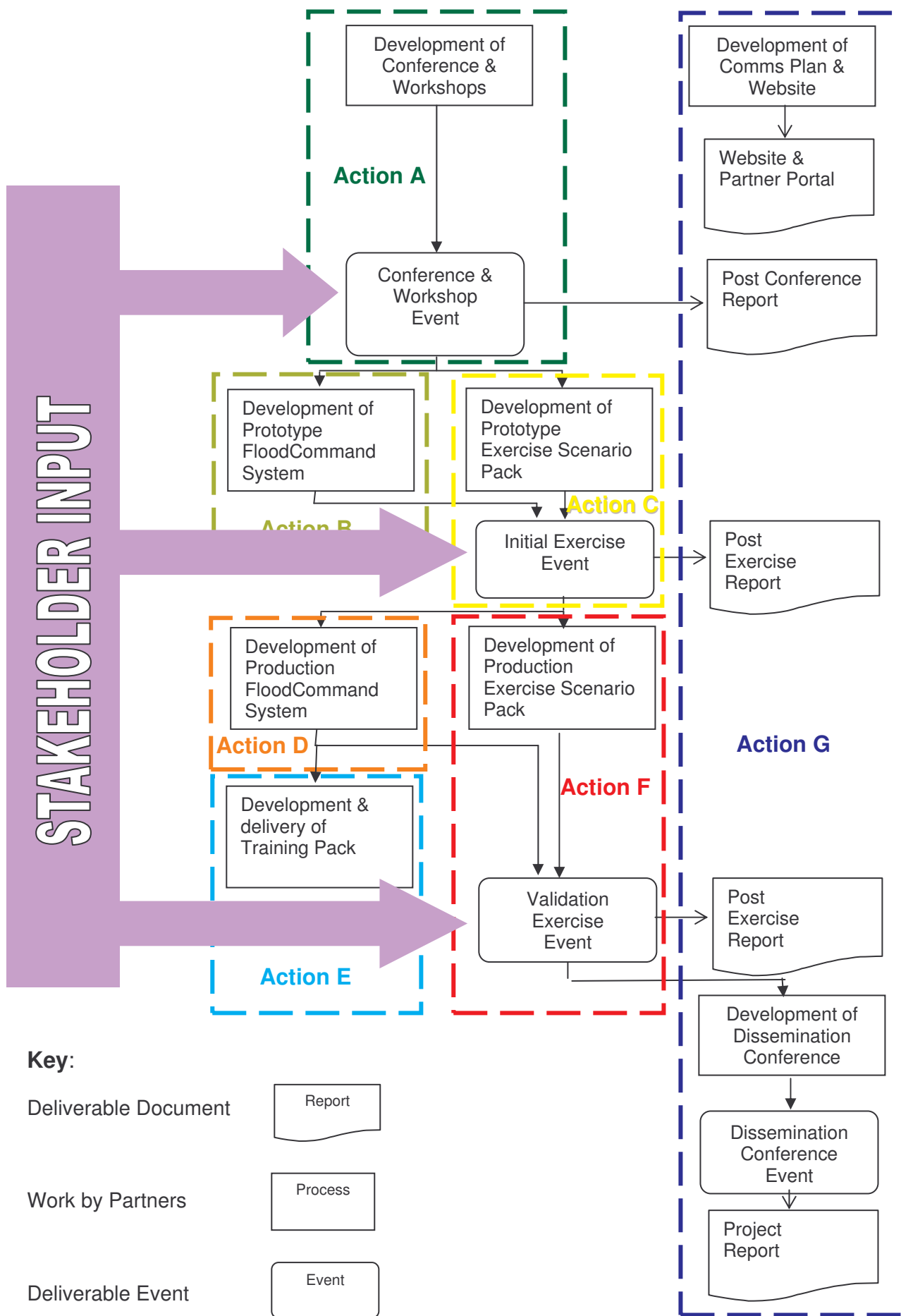


Figure 1 – Project Process

EVALUATION OF PROCESS

POSITIVE ASPECTS & OPPORTUNITIES

25. The approach of inviting as many Member States in the Community Mechanism for Civil Protection as possible to attend our key events has delivered very positive results and has provided the opportunity for wider synergies to be identified.

26. Early analysis appeared to indicate that the concept of response modules within the framework of the Civil Protection Mechanism had not benefited from a wide airing, and indeed the principles underlying the concept did not appear to be fully developed. This situation gave the project the opportunity to explore what those underlying principals might be in the context of maritime SAR response to catastrophic flooding, and offer up generic learning which could be applied to the development of modules in general.

27. It was also identified at an early stage that the recast Civil Protection Mechanism itself was not widely understood and the project has brought to light opportunities to progress this understanding.

INTERNAL & EXTERNAL DIFFICULTIES

28. Internally it has been challenging for the Partners to balance the need to travel to meet in order to develop the core concepts and key tasks, with the need to minimise the associated travel costs in order to keep within budget. This has often led to the Project Executive taking forward the project vision and issuing direction to teams from the Beneficiary, then having to secure retrospective endorsement from the wider Partner group.

29. Externally it has been consistently challenging to all Partners to ensure that the other associated civil protection organisations within their nations remain engaged with the project and contribute as required. Specifically it was hard to know who the appropriate contacts were, and even once identified it was hard to persuade them to engage with a Pilot Project.

30. It has been particularly challenging to explore concepts associated with multinational modules under the recast Civil Protection Mechanism with which few are familiar.

PARTNERSHIP COOPERATION

31. Ensuring continued buy-in from the Partners was identified at the outset as critical to the success of the project.

32. In order to achieve this a formal Project Board was established at the beginning of the Project which incorporated senior representatives from the Beneficiary and Partners, as well as a representative of the Civil Protection Authority of the lead partner. This board met almost once a month from the outset, and formal records were maintained of matters discussed and decisions made.

COOPERATION WITH THE COMMISSION

33. The Beneficiary attended an initial kick-off meeting with the Commission and then maintained regular contact with the DG Environment Civil Protection Unit and Financial Processing & Assistance Unit by email and phone, in addition to inviting officers from the Commission to attend the various actions under the project. Attendance by Commission

representatives at the Initial Conference & Workshops, and their participation in the Initial Exercise were of immense value to the project and of interest to the Commission, but attendance at subsequent actions – in particular the Validation Exercise and the Dissemination Conference – was not possible due to resource constraints.

34. It became clear at the kick-off meeting that the project would benefit from interaction with the committee of experts developing the concept of response modules. In June 2008 the project sent a representative to a meeting of this committee, and it is understood that the Project's input was helpful in contributing to the wider conceptual development.

EUROPEAN ADDED VALUE

35. It was decided at an early stage of the project that the partners and beneficiary did not wish to limit involvement in the project to just their organisations, or even just to organisations from their nations. Instead it was felt that the project would benefit from the widest possible involvement, and therefore it was agreed in principle (and subject to budget constraints) that all Member States and participating nations should be invited to contribute to all of the major events within the project actions.

36. This policy of inclusion proved immediately successful, with over 150 delegates from 23 nations attending the initial conference and workshops delivered by Action A and 60 delegates from 12 nations participating in the Initial Exercise delivered by Action C. The principle was taken further when the Netherlands expressed an interest in being more closely involved in the project, and as a result were active participants during the validation Exercise, and formed part of the speaker team for the Dissemination Conference in addition to running a parallel workshop on best practice in exercising national response to catastrophic flooding.

LESSONS LEARNED

37. The complexity of civil protection structures (differing between nations and between functions within nations) and reporting chains is such that identifying the correct agency to source an expert, or assessing to whom invitations should be forwarded for national coordination is not only time consuming, but is likely to result in different procedures for each nation approached. This means that far more time and resources has to be devoted to liaison and communication, and that this can appear disproportionate to the resources devoted purely to conceptual or technical development.

38. Many organisations and individuals are generally unaware of the Civil Protection Mechanism of 2001 and its revised (Recast) version adopted in 2007, and the emerging concept of response modules. The real challenge is that even when they have been briefed on these issues, some still reserve the right to adopt a position that the Mechanism, or the Project, or both are entirely unnecessary. In such cases there appears to be little point in continuing to devote energy into getting buy-in, but persistent communication of results is maintained on the basis that success is a great persuader.

39. Exercising utilising distributed technology generates an efficient (better value) alternative to traditional delivery which tends to be resource heavy, and the use of cutting edge simulation delivers a realistic exercise environment which allows extremely effective exercising.

40. The challenges of technical interoperability between teams drawn from different Member States within a module are best overcome by coordinating their activities through the use of a communications platform on a data layer superimposed across the module

teams. This avoids the need to adopt centralised procurement of operational communications systems or complex bespoke interface solutions to allow communications across legacy systems.

41. It is hard for a project to build on the work of previous projects as these projects are often reluctant to share their learning. In this way little cumulative effect is achieved.

ACTIVITIES

COMPARISON: PLAN VERSUS IMPLEMENTED

42. The plan envisaged a number activities or tasks, grouped by association or dependence into actions, as described visually in Figure 1.

43. Overall the activities implemented broadly followed the plan, with the only a couple of significant variations.

44. The work to put together the conference & workshops of the Action A and the dissemination conference element of Action G was internalised, and turned out to be far more resource intensive than anticipated. This meant that at the lowest level there were in fact more tasks (or activities) associated with developing and delivering these activities than had been allowed for, and therefore personnel costs were higher than predicted while subcontractor/external costs were reduced. However the benefit of removing any external margin delivered better value of money overall.

45. The other main area where implemented activities deviated from the plan was around the development of the prototype and release versions of the EU FloodCommand system. This was somewhat more complex than anticipated, primarily as the project team found themselves developing the doctrine of response modules almost from scratch prior to developing the specifics for a maritime SAR response module. This activity had not been planned for as it had been assumed that the concept of response modules in general was fairly well developed and understood. It then became apparent that the technical delivery team were spending far more time and resources on the development of the underlying technology than anticipated in order to meet the complex requirements. This caused the allocation of the budget between areas to be rebalanced in favour of development resources. There were also four adjustments to the tasks within this action in terms of mode of implementation:

a. The original proposal envisaged an alerting element to the system. The learning from the Initial Conference & Workshops was that 'alerting' would continue to be achieved through CECIS, with procedural solutions to the initiation of the maritime SAR supporting technology.

b. The Initial Exercise demonstrated that it would be neither practical nor desirable to generate a database of SAR assets from across all Member States in the form of an exhaustive inventory. However understanding of the nature of SAR assets helped inform the generation of the draft response module definitions.

c. The original vision of the supporting technology as an 'Extranet' was adjusted over time to the eventual architecture of a nodal network, with each node dual roled as both server and client on an IP network, delivering significant resilience and flexibility.

d. At the outset it was envisaged that the supporting technology might physically integrate with CECIS; it became apparent that this level of integration was not appropriate, and instead the system is to integrate procedurally through appropriate protocols, partitioning roles and responsibilities between Member State Competent Authorities (CECIS users) and the owners of maritime SAR assets (Command Support System users).

QUALITATIVE EVALUATION

46. The activities implemented under the project have all met or exceeded expectations.

47. Evidence for this assessment is the clear success of all actions in a timescale which was ambitious to say the least, being delivered within only 18 months of the kick-off meeting, and involving experts from 23 nations. The quality of the work associated with designing the conferences and the exercises, securing the delegates and delivering the events was second to none, as evidenced by the very positive feedback from all delegates to both events.

48. The activities associated with Actions D (development of release version EU FloodCommand system) and Action F (development of release version exercise scenario pack) as the key deliverables were validated at the exercise in April 2008. While there were some minor technical challenges relating to the failure of an international network provider during the first day of the exercise, overall the Command Support System technology platform proved an efficient and effective tool for the building, maintaining and sharing of a common operational picture, as well as the allocation of tasks between national contingents and the coordination of their activities on the ground.

49. Action G (dissemination), whose main deliverables were the project website, the Initial Conference and Post Exercise reports, presentations at a number of national and international conferences and seminars, the Dissemination Conference and this report, has been assessed by external observers as being highly successful. Not only has this action met its aim of keeping the Partners and the Commission up to date at all times, it has also succeeded in bringing the work of the project into prominence on the international stage – evidenced by the Project being invited to present at a number of international conferences, as well as being referenced by a number of international experts on wider treatise on flood response and international command and control.

TECHNICAL RESULTS

INITIAL CONFERENCE & WORKSHOPS

50. The conference was hosted by the UK lead partner, the Maritime & Coastguard Agency, and consisted of a blend of expert speakers, syndicate workshops and networking events, involving over 150 delegates from 23 nations.

51. The speakers were drawn from the project partners, expert agencies from the host nation, and the DG Environment Civil Protection Unit. Delegates were drawn from the Civil Protection Authorities, Maritime SAR agencies and Flood Response agencies of Member States and participating nations.

52. The material presented at the Conference concluded that the likelihood of severe coastal and tidal flooding was increasing as a result of global warming, and the impact of such flooding was likely to be catastrophic for communities living in coastal areas, tidal reaches and associated flood plains. However expert presenters also emphasised the potential for the innovative use of existing maritime SAR resources if effectively integrated into flood response, and proposed systems that would allow capabilities drawn from across disparate nations with differing political and legal frameworks to be deployed into a single coordinated response using a 'team typing' concept.

53. The outcomes from the workshops offered a greater understanding of the characteristics of catastrophic flooding allowing planning assumptions to be developed against which a capability could be built, as well as generating a better understanding of the anatomy of maritime SAR capabilities and protocols for their out of area deployment. A key output was an initial set of user requirements for a command support system that would allow a European Maritime SAR Response Module to be built from individual national contingents, track its deployment into the recipient nation, and coordinate its activity as part of the local integrated emergency management. These outcomes form the basis for the subsequent actions of the Project.

54. This action was a success on many levels. It generated the deliverables envisaged in the original project design: sharing of understanding enshrined in a comprehensive conference report and outcomes to enable the action to develop a prototype EU FloodCommand system in terms of exploratory protocols and procedures for the alerting, building, deployment and coordination of a European maritime SAR Response Module comprising national contingents from two or more contributing nations.

55. With delegations from 23 nations attending, including a number of newer Member States and participating nations, this action had significant European added value. The general format and structure was seen to be not only useful to achieve the specific aims of this action, but also had wider transferability as a format for general civil protection cooperation in many areas. Indeed many delegates commented on the amount of general civil protection business they had been able to get done by attending this event.

56. The learning from this action was disseminated through the production of a detailed report which was distributed to all delegates and key stakeholders, and summarised on the project's public website, www.eufloodcommand.eu.

PROTOTYPE EU FLOODCOMMAND SYSTEM

57. The deliverables from this action break down into two main parts: the protocols and procedure associated with initiating, building, deploying and coordinating a maritime SAR response module, and the technology to support these protocols and procedures.

58. The start point for the development of the necessary protocols and procedures was the project team's understanding of the Civil Protection Mechanism, the Monitoring & Information Centre (MIC) and the concept of European response modules, and the outputs from the workshops at the initial conference of Action A.

59. In order to progress the detailed procedures, it was felt useful first to articulate what was understood as the underlying doctrine of response modules in such a way as to clearly differentiate between this concept and the existing systems.

60. A Module can comprise resources from one or more Member States and does not have to be multi-national. Where modules differ from bi-lateral assets is that they should be self-sufficient, interoperable (including procedures, not necessarily technology) and deployable at short notice.

This implies a number of key characteristics:

- a. Modules should be equipped and trained to operate in accordance with international standards and meet the criteria set out by the Commission (in consultation with Member State experts)..
- b. The module must deliver *capability* not *resources*, where resources are simply lists of 'assets' while capability is defined as a combination of equipment, supplies and trained people able to carry out specific tasks sustained for a specific duration.
- c. The recipient nation need not necessarily have the expertise to utilise the specialised capability, as the module will be sufficiently self-contained to enable its leaders to work within the framework of the recipient nations integrated emergency management without relying on specialist input from local experts.

61. The purpose of this deliverable is to have a draft set of protocols and procedures, and the associated prototype technology to take to simulated command team exercise for trial.

62. These deliverables were trialed at the exercise in September 2007.

63. The draft protocols and procedures, and associated technology prototype were proven fit for purpose by exercise.

64. The learning from this action has been disseminated in the form of a Post Exercise Report circulated to all those involved in the exercise, along with all other key stakeholders.

65. An executive summary of this report was made available on the project's public website www.eufloodcommand.eu .

PROTOTYPE EXERCISE SCENARIO PACK

66. The deliverables from this action are a technology system for the automated deliverer of simulated command team exercises, a bespoke scenario pack relating to massive catastrophic flooding and the delivery of a trial exercise.
67. The purpose of these deliverables is to create the conditions in which the prototype protocols, procedures and technology associated with a maritime SAR response module can be trailed.
68. These deliverables were evaluated at the exercise in September 2007.
69. The Initial Exercise proved that the technology system for the automated delivery of simulated command team exercises generates significant added value by giving the capability of the partners to run subsequent exercises both internally with other national agencies and externally with other Member States. The base technology is also likely to be transferable to the exercising of the response to other natural disasters.
70. The exercise event itself generated significant European added value by giving a large number of Member States and participating nations the opportunity to raise their awareness of the concept of response modules, and encourage them to become involved as a contributing nation to this and other modules.
71. As with Acton B, the learning from this action has been disseminated within the Post Exercise Report circulated to all those involved in the exercise, along with all other key stakeholders.
72. An executive summary of this report was also made available on the project's public website www.eufloodcommand.eu .

RELEASE VERSION EU FLOODCOMMAND SYSTEM

73. The deliverables from this action break down into three main parts: revised protocols and procedure associated with initiating, building, deploying and coordinating a maritime SAR response module, the draft definition of response modules relating to search and rescue from floodwater, and fully functional technology to support these protocols and procedures.

Protocols & Procedures

74. Part of the key learning from the Initial Conference and Workshops was that it would be necessary to develop protocols and procedures to support the implementation of any response module.

75. Accordingly draft protocols and procedures were developed based on these workshop outcomes, in conjunction with the project team's understanding of the likely shape of a multi-national response and the challenges that would need to be overcome. These draft protocols and procedures were explored during the Initial Exercise in September 2007, the outcome of which was a revision prior to the validation exercise in April 2008.

76. These protocols and procedures were in some part superseded by the subsequent publication of the Commission Decision of 20 December 2007 relating to the rules governing the establishment and deployment of response modules, but are published as Annexes A and B to this report as the basis for the Standard Operating Procedures which would be required for the detailed operation of response modules relating to search and rescue from flood-water.

Draft Response Module Definitions

77. Subsequent to the publication of the Commission Decision of 20 December 2007, the Project Team adapted the understanding of the most effective utilisation of maritime search and rescue assets developed over the Initial Conference and Workshops and Initial Exercise into a form that could be described using the framework contained in the Commission Decision. The resulting module definitions were then validated during the April 2008 exercise, and are attached at Annex C to this report.

Command Support System Technology Platform

78. The further conceptual development resulted in the detail User Specification published as an annex to the Post Exercise Report on the Initial Exercise.

79. The core development work was completed and a generic Command Support System established. Subsequent work centred around the development of symbology to support the graphical sharing of information in the 'live map' module, and the anatomy of objectives and likely tasks within the 'objectives' module.

PHASES AND PRE-LOADABLE TOP LEVEL OBJECTIVES

80. The table overleaf describes the top level objectives, which were identified as being associated with the three primary phases of a Module during a particular intervention:

Preparation	Operations	Recovery
Identify Available Teams	Search	Withdraw Teams to Bases
Build Contingents	Search	Move Contingents to POD
Nominate Module Commander	Air Rescue	Move Contingents to Home Bases
Deploy Contingents	Surface Rescue	
Establish Operating Base	Logistics & Resupply	

81. It is assumed that the User will wish to define in which phase the system is operating, and will have associated pre-loaded top level objectives.

82. It is also assessed that Users should be able to add sub-objectives to Objectives in the Operations phase, but not necessarily to objectives in the Preparation or Recovery phases.

83. All objectives should have status of either:

- a. Identified
- b. Resources Allocated
- c. In progress
- d. Achieved

84. The purpose of this deliverable is to have a revised set of protocols and procedures, and the associated fully operational technology to take to distributed command post exercise for validation.

85. These deliverables were validated at the exercise in April 2008.

86. The revised protocols and procedures, module description and associated technology were proven fit for purpose by the validation exercise in April 2008, and much of the generic concepts have proven through subsequent research and discussion to be transferable to the development of other response modules. This is also the case with the Command Support System technology. This transferability will deliver significant European added value, as it have been developed with the widest possible involvement and therefore will have wide credence cross the Union.

RELEASE VERSION EXERCISE SCENARIO PACK

87. The deliverables from this action were a technology system for the automated delivery of simulated command post exercises, a bespoke scenario pack relating to massive catastrophic flooding, and the delivery of a validation exercise.

88. The purpose of these deliverables was to create the conditions in which the prototype protocols, procedures and technology associated with a maritime SAR response module could be validated across multiple control rooms running simultaneously and communicating in real time.

89. These deliverables were evaluated at the exercise in April 2008.

90. The Validation Exercise once again proved that the technology system for the automated delivery of simulated command team exercises allows ambitious exercises spanning multiple countries to be delivered with only minimal resources, and generates significant added value by giving the partners the capability to run subsequent exercises both internally with other national agencies and externally with other Member States.

91. The exercise event itself generated significant European added value by giving a large number of Member States and participating nations the opportunity to raise their awareness of the concept of response modules, and encouraged them to become involved as a contributing nation to this and other modules.

EVALUATION OF RESULTS

LESSONS LEARNED

92. The project has identified two main lessons, which it hopes to learn from prior to completing the remaining actions.

93. The first lesson relates to concepts and doctrine: the concept of a response module versus bilateral aid is not fully embedded in the civil protection agencies of the Union, and there is little or no underpinning doctrine to support the concept.

94. The second lesson, which the project team has identified, relates to the challenges of interoperability: the challenges of interoperability are so great that the most successful approach is likely to be based on avoiding interoperating between individual elements from different national contingents within a response module. This then leads to the conclusion that the principle to adopt is one of subsidiarity where coordination is carried out at the highest possible level while actions are controlled at the lowest possible level.

STRENGTHS

95. The strengths of the model being developed by the project are as follows:

- a. The general concepts can be applied to any response module.
- b. The module will not rely on organic expertise in the recipient nation.
- c. Any module built on this model can be deployed into the most stricken area as there is no presumption of existing infrastructure.
- d. The module does not presume that a contributing nation has a mature maritime SAR capability, but allows for the contribution of less specialist 'multi-purpose' assets through the 'team typing' methodology.

96. The strengths of the approach adopted to deliver the project are as follows:

- a. The pilot sets the conditions for wider adoption through involvement nations outside the partner group.
- b. The use of an iterative cycle of development, testing and development through two cycles of exercising generates a high likelihood of success.
- c. The frequent and wide dissemination of learning assists the project team in managing expectations of all stakeholders.

CHALLENGES

97. As will have been gathered from previous sections of this report, the primary challenge to the project team is to develop protocols and procedures for the initiation, build, deployment and coordination of a maritime SAR response module which will result in an enhanced capability in the fight against natural disasters while being sufficiently permissive to be acceptable to all existing partners and most potential contributing nations.

98. A secondary challenge is to maintain a project approach which is inclusive rather than exclusive, even when to do so increases the level of work involved.

RECOMMENDATIONS

99. The following recommendations are made for the attention of the European Commission, DG Environment Civil Protection Unit:

- a. To agree to incorporate the recommended modules relating to search and rescue from flood water into the official list of Response Modules under the recast Civil Protection Mechanism.
- b. To take action to improve the wider understanding of civil protection agencies within Member States through a comprehensive communication plan to encapsulate the vision of response modules within the framework of the recast Civil Protection Mechanism.
- c. To consider encouraging the adoption of command support technology of the type developed under this project as a key enabler of the effective operational coordination of response modules.
- d. To consider encouraging the use of exercise delivery utilising distributed technology as a cost effective method of regular exercising of the command and control aspects of multi-national response.
- e. The following recommendations are made for the attention of the Partners' Competent Authorities for Civil Protection:
- f. To ensure that the lessons identified by this project are disseminated widely among all organisations involved in Civil Protection, both those with potential to contribute to Response Modules and those who might at some point be in the position of incorporating external assistance into their response.
- g. To encourage the adaption of existing national capabilities into configurations suitable for utilisation under the response module format as published.

100. The following recommendations are made for the attention of Project Partners:

- a. To explore what wider use can be made of the legacy Command Support System to enhance daily operational activity.
- b. To schedule a subsequent programme of exercises between existing Partners to further train for multi-national deployments of maritime SAR assets in a flood response context.

FOLLOW-UP

101. The follow up to this project falls into three areas: maximising the benefits from the legacy systems within Partners, taking forward the work on implementing modules relating to search and rescue from flood-water, and maximising the benefits of adopting the methodology and technology utilised in the project in the contexts of other response modules.

102. The first follow-up action is to ensure that the legacy systems are embedded in the Partner nations through a programme of internal training and education, and then expand the embryonic maritime SAR response module by encouraging additional Member States to become contributing nations along side the existing project partners. This will involve a level of political will, combined with some technical work to describe their asset base in terms of the agreed team types, and then to expand the licence arrangements for the command support system technology.

103. The final follow-up action is to explore the extent to which the protocols established for this pilot project can be applied to other response modules. This would involve an assessment of the protocols by the Commission, and then an applicability check against the capabilities envisaged by the other potential response modules.

EU FloodCommand Project Board

Rod Stafford

Chair

Derek Smith

Maritime & Coastguard Agency

Magnus Qvant

Swedish Rescue Services Agency

Eamon Torpay

Irish Coast Guard

Niels Andersen

VectorCommand Limited

Philip Richards

UK Cabinet Office

ANNEX A – RESPONSE MODULE PROTOCOLS

CAVEATS

1. This draft protocol is for exercise purposes only and exists even in draft form only in the context of the recast Civil Protection Mechanism. Discussion of these protocols, or use of them in exercise, is in no way a commitment to them, and any such endorsement given during an exercise or any associated debrief session is accepted as relative only to the context of the scenario presented within that exercise.

DEFINITIONS

2. For the purposes of this draft Protocol the following definitions are adopted:

3. **Response Module.** A self-sufficient and autonomous predefined task and needs driven arrangement of the capabilities of one or more Member States representing a combination of human and material means, that can be referred to by its capacity for intervention or by the task(s) it is able to undertake. Its specific characteristics will be:

- a. made up of the resources of one or more States participating in the Mechanism,
- b. able to perform tasks in the areas of response,
- c. able to perform their tasks in accordance with acknowledged international guidelines
- d. and, therefore able:
 - i. to be dispatched at very short notice following a request for assistance,
 - ii. to work self-sufficiently and autonomously for a given period of time if circumstances on site require it,
- e. interoperable with other modules,
- f. trained and exercised to meet the interoperability requirements under paragraphs (a) and (d) above,
- g. placed under the authority of a person who is responsible for their operation,
- h. able to provide assistance to other EU bodies and/or international institutions, especially the UN.

4. **Potential Contributing Nation.** A Member State who has indicated their willingness to potentially contribute to a specific Response Module, who has capabilities which meet the criteria of the specific Response Module and has committed to participate in training and exercise activity to maintain the preparedness of the Response Module as

well as any specific arrangement required to enable the initiation, build, deployment and coordination of that Response Module.

5. **Contributing Nation**. A Potentially Contributing Nation, which has made resources available in response to the initiation of a Response Module for a specific intervention.
6. **Recipient Nation**. The Member State impacted upon by a disaster, which has requested assistance from the EU or a non Member State which the Presidency of the EU has requested be assisted.
7. **National Contingent**. The resources from a particular Contributing Nation within a particular Response Module initiated for a specific intervention.
8. **Contingent Commander**. The officer nominated by the Contributing Nation to have overall command of their Contingent.
9. **Lead Nation**. The Contributing Nation selected to act as the primary point of contact for the Response Module for a specific intervention.
10. **Module Commander**. An officer nominated by the Lead Nation to coordinate the National Contingents in order to ensure the Response Module integrates effectively within the overall response of the Recipient Nation.
11. **Contingent Liaison Officer**. An officer nominated by the Contingent Commander, who acts as liaison between the Contingent Commander and the Module Commander.
12. **Team (Type X)**. A discrete combination of appropriate equipment and material accompanied by people with the relevant training to enable the team to autonomously achieve particular pre-defined tasks with a specified endurance associated with the specified Type denoted by 'X'.
13. **Team Commander**. An officer nominated by the national agency providing that Team to the national Contingent to command the Team for the duration of a specific intervention.
14. **Full Command**. The right to affect employment conditions including pay, promotion and discipline, to define missions and manage performance, to grant leave and deal with all other administrative matters.
15. **Local Command**. The right to allocate missions within the agreed Response Module mission and limited by the duration of a specific intervention, along with the right to discipline limited to the removal from the Contingent.
16. **Full Control**. The right to allocate tasks within a defined mission.
17. **Tactical Control**. The right to allocate areas of operation and time limited windows, within which defined tasks are to be executed.

COMMAND & CONTROL

18. Full command of a Team is retained at all times by the national agency providing that Team to the National Contingent.
19. Local command of a Team is delegated to the Team Commander for the duration of the intervention for which the particular Response Module has been initiated.

20. Control of Teams within a National Contingents is delegated to the Contingent Commander.

21. Tactical Control of National Contingents is delegated to the Module Commander.

LOGISTICAL SUPPORT

22. The Contributing Nation is responsible for the logistical support of the people, equipments and material essential to the specialist capability of the Team.

23. The Recipient Nation is responsible for the reasonable provision of general logistical support to the Response Module including the provision of food, water and local operating bases.

LIABILITY

24. Contributing Nations will not be liable for any claim made against National Contingents except where such claims arise as a direct result of negligence by member of the National Contingent.

ANNEX B – RESPONSE MODULE PROCEDURES

CAVEATS

1. These draft procedures are for exercise purposes only and exist even in draft form only in the context of the EU FloodCommand Draft Protocols. Discussion of these procedures or use of them in exercise is in no way a commitment to them, and any such endorsement given during an exercise or any associated debrief session is accepted as relative only to the context of the scenario presented within that exercise.

DEFINITIONS

2. Definitions are as detailed in the EU FloodCommand Draft Protocol.

INITIATION

3. The Response Module is initiated for a specific intervention by the MIC either at the request of a Recipient Nation or on the instructions of the Commission Presidency in the case of a non Member State Recipient Nation.

4. The MIC will notify the Competent Authority for Civil Protection of all Potential Contributing Nations of the request to initiate the Response Module over CECIS.

5. The Competent Authority in each Potentially Contributing Nation then informs the nominated point of contact in each national agency predetermined as potentially contributing Teams to a National Contingent that a request has been received to initiate the Response Module.

BUILD

6. The points of contact in each national agency activate the Command Support System (CSS) and make an assessment of what Teams might be made available to the National Contingent.

7. The process to authorise the nomination of Teams to the National Contingent may differ from nation to nation, and is a matter for the Competent Authority in each nation.

8. The authorised offer of Teams is entered into the CSS, and based on this an agreement is reached between Contributing Nations as to which will take the role of Lead Nation for this intervention.

9. The Lead Nation then nominates a Module Commander, who then liaises with the MIC to confirm the details needs of the Recipient Nation.

10. Each Contributing Nation nominates a Contingent Commander.

11. Once the needs of the Recipient Nation are confirmed, the Module Commander liaises with Contingent Commanders, the Recipient Nation and the MIC to agree the Response Module mission for the intervention.

12. The Module Commander then uses CSS to build a balanced Response Module by selecting Teams from those offered by each Contributing Nation.
13. Once an offered Team has been accepted by the Module Commander the Contingent Commander identifies the specific resources required to generate the Teams which constitute their National Contingent, detailing that information on the CSS.

DEPLOYMENT

14. The Module Commander liaises with the Recipient Nation to identify a Port of Entry for the Module, as well as likely operating bases in the vicinity of the area affected by the disaster.
15. The Module Commander communicates details of the nominated Port of Entry and likely operating bases to Contingent Commanders over the CSS, along with target times for deployment.
16. Contingent Commanders liaise with relevant national agencies to coordinate the deployment of National Contingents into the Recipient Nation.
17. Contingent Commanders record the progress of the deployment of Teams within their National Contingent on the CSS.
18. The Module Commander and Contingent Liaison Officers deploy in advance of the main body of the National Contingents to establish contact with the Recipient Nation Response structures in the area within which the Response Module is to operate.

COORDINATION

19. The Module Commander liaises with the local commander of the Recipient Nation response in the proposed area of operation and, in conjunction with Contingent Commanders, agrees the operating area and tasks for each National Contingent.
20. The Module Commander enters details of all coordinating information on the CSS, and keeps it up to date with information from the Recipient Nation response.
21. Contingent Commanders allocate tasks and areas of operation to the Teams within their Contingent and record the activities of their Teams on the CSS.
22. The Module Commander periodically reviews the performance of the Response Module against the needs of the Recipient Nation response in their area of operation, and issues supplementary coordinating instructions to Contingent Commanders as required.

SUSTAINABILITY

23. The Module Commander is responsible for the coordination of general logistical support to the Response Module from the Recipient Nation. This is achieved through the collation of general logistic requirements over the CSS which are then passed to the local Recipient Nation Response Commander.
24. Contingent Commanders are responsible for liaising with their National agencies to arrange the specialist logistical support to the Teams within their Contingents.

ANNEX C – PROPOSED MODULE DEFINITIONS

General requirements for European civil protection modules relating to Maritime Search & Rescue capability for use in flood disasters

14. Aerial rescue using helicopters

Tasks	<ul style="list-style-type: none"> — Search for, locate and rescue, people in need of rescue, who without assistance would come to harm — Provide life-saving first aid as required, until people are handed over for further treatment at a rescue sites
Capacities	<ul style="list-style-type: none"> — The module should have the ability to perform the following, taking into account acknowledged international guidelines — 3 helicopters with the ability to fly day and night and in all weathers — VHF/UHF radio communications — Day and night search capability — Winch equipment with crew — 3+ hours endurance — Basic life support on board
Main components	<ul style="list-style-type: none"> — 3 SAR helicopters to guarantee that at least 2 helicopters are operational at any time — Replacement crews to allow for 24 hour operation — Technical staff — 1 maintenance set — 1 Spare parts — Personal Protective Equipment for crews entering contaminated environments (Chemical & Biological) — Communications equipment — Forward liaison role
Self sufficiency	<ul style="list-style-type: none"> — Elements (a) to (i) of Article 3b(1) apply
Deployment	<ul style="list-style-type: none"> — Operational in the affected country within 24 hours

15. Aerial search using helicopters

Tasks	<ul style="list-style-type: none"> — Search for, locate and report, people in need of rescue, who without assistance would come to harm — Provide transport capability, to and from prepared landing zones
Capacities	<ul style="list-style-type: none"> — The module should have the ability to perform the following, taking into account acknowledged international guidelines — 3 helicopters with the ability to fly day and night and in all weathers — Day and night search capability — VHF/UHF radio communications — 3+ hours endurance
Main components	<ul style="list-style-type: none"> — 3 search helicopters to guarantee that at least 2 helicopters are operational at any time — Replacement crews to allow for 24 hour operation — Technical staff - 29 — 1 maintenance set — 1 Spare parts — Communications equipment — Forward liaison role
Self sufficiency	<ul style="list-style-type: none"> — Elements (a) to (i) of Article 3b(1) apply
Deployment	<ul style="list-style-type: none"> — Operational in the affected country within 24 hours

16. Aerial search using fixed wing aircraft

Tasks	<ul style="list-style-type: none"> — Search for, locate and report, people in need of rescue, who without assistance would come to harm — Provide transport capability to and from prepared landing zones
Capacities	<ul style="list-style-type: none"> — The module should have the ability to perform the following, taking into account acknowledged international guidelines — 2 fixed wing aircraft with the ability to fly day and night — Day and night casualty search capability, using infrared sensor equipment — VHF/UHF radio communications — 6+ hours endurance
Main components	<ul style="list-style-type: none"> — 2 search fixed wing aircraft to guarantee that at least 1 aircraft is operational at any time — Replacement crews to allow for 24 hour operation — Technical staff — 1 maintenance set — 1 Spare parts — Communications equipment — Forward liaison role
Self sufficiency	<ul style="list-style-type: none"> — Elements (a) to (i) of Article 3b(1) apply
Deployment	<ul style="list-style-type: none"> — Operational in the affected country within 24 hours

17. Surface water rescue

Tasks	<ul style="list-style-type: none"> — Search for, locate and rescue, people in need of rescue, who without assistance would come to harm — Provide life-saving first aid as required, until people delivered to rescue sites and handed over for further treatment
Capacities	<ul style="list-style-type: none"> — The module should have the ability to perform the following, taking into account acknowledged international guidelines — 2 waterborne craft with the ability to operate day and night — Shallow draft — Outboard or removable engine — Minimum crew of 3 per craft — Ability to operate for a minimum of 8 hours continuous — Onboard VHF/UHF radio communications — Transportable by road
Main components	<ul style="list-style-type: none"> — 2 waterborne craft to guarantee that at least 1 waterborne craft are operational at any time — Replacement crews to allow for 24 hour operation — Technical staff — 1 maintenance set — 1 Spare parts — Personal Protective Equipment for crews entering contaminated environments (Chemical & Biological) — Communications equipment — Forward liaison role
Self sufficiency	<ul style="list-style-type: none"> — Elements (a) to (i) of Article 3b(1) apply
Deployment	<ul style="list-style-type: none"> — Operational in the affected country within 24 hours

18 Utility transport using helicopters

Tasks	— To transport people and/or equipment to and from prepared landing zones
Capacities	<ul style="list-style-type: none"> — The module should have the ability to perform the following, taking into account acknowledged international guidelines — 2 helicopters with the ability to fly during daylight hours — VHF/UHF radio communications — Crew of 2 minimum — Load lifting capability — 3+ hours endurance
Main components	<ul style="list-style-type: none"> — 2 utility helicopters to guarantee that at least 1 helicopters are operational at any time — Replacement crews to allow for continuous daylight operations — Technical staff — 1 maintenance set — 1 Spare parts — Communications equipment — Forward liaison role
Self sufficiency	— Elements (a) to (i) of Article 3b(1) apply
Deployment	— Operational in the affected country within 24 hours