ADAI

To
Ms. Julia STEWART-DAVID,
Head of Unit A/4 - Civil Protection Policy
European Commission
Directorate-General Humanitarian Aid and Civil
Protection - ECHO
Rue de la Loi 86, 04/027
BE-1049 Brussels

Your reference:
Date:

Our reference: ADAI-2017/024
Date: 17/06/15

Subject: Grant Agreement n° ECHO/SUB/2014/693768 - SpitFire Final Report

Dear Ms. Julia Stewart-David,

In my position of Coordinator of the Project *Spitfire - Spanish-Portuguese Meteorological Information System for Trans-Boundary Operations in Forest Fires* that ended on past 31st of March, here enclosed please find the following documents:

-   The Project Final Report (Deliverable D.08.09) and as an annex the complete financial forms that include:

-   The Standard Payment Request and Financial Statement (form F1),

-   The Consolidated Cost Statement for the Action

-   The Participants Cost Statement Summary

-   The other financial forms that constitute the entire financial statement.

Yours sincerely,

Domingos Xavier Viegas, ADAI
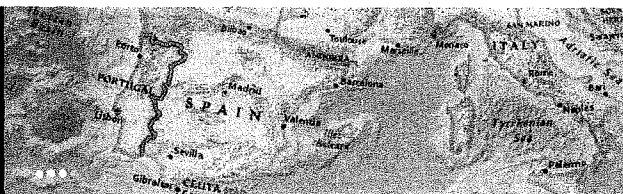
Spanish-Portuguese

for Trans-Boundary

Deliverable No.	D.08.09	Deliverable	Final report submitted to the Commission
Task No.	T08	Task	Project Management and Reporting to the Commission
Authors			Miguel Almeida (ADAI).
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File Name			D.08.09
Dissemination level (PU = Public; RE = Restricted; CO = Confidential)			RE

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SpitFire

Spanish-Portuguese Meteorological Information System for Trans-Boundary Operations in Forest Fires

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SpitFire

Spanish-Portuguese Meteorological Information System for Trans-Boundary Operations in Forest Fires

1. General Reminder

1.1 Project Objectives

The central objective of the SpitFire Project was contributing for the improvement of the efficiency of the Portuguese-Spanish (Pt-Sp) cooperative firefighting management activities related to fire events occurred in the transboundary area defined as the strip of 30km, 15km for each side of the international border connecting these two countries. Actually, this area was extended to 50km, 25km for each side of the border. The methodology to achieve this central objective was the development of an informatic tool, designated as SpitFire Platform, to facilitate the sharing of Meteorological and Fire Risk Information (MFRI) between Pt-Sp civil protection authorities and related wildfire management institutions. In the initial phase, the shared data is provided by the Pt-Sp National Institutions for weather and Climate, respectively: IPMA – Portuguese Institute for Sea and Atmosphere and AEMET – State Weather agency.
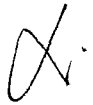
This tool should be complemented by a data repository allowing the consultancy of past data. Besides, since both countries produce different MFRI based on different methodologies and models, in order to guarantee the use of unique information in the same theatre of operations where Pt-Sp agents are simultaneously acting, a methodology to harmonize the MRFI was be developed. The SpitFire project also foreseen that the results achieved and produced should be disseminated by the potential end-users namely the Pt-Sp institutions dealing with the wildfire management.

Beyond the initial plans, two complementing products were added to SpitFire: 1) a Spitfire Web Application for Mobile Devices in order to be used at an operational and tactical levels, providing practical MFRI; 2) inclusion of a fire behaviour simulator in the SpitFire Platform (to be used at a strategical level) with automatically provision of MFRI as input data.

1.2 Partnership and expected deliverables

Partnership

The SpitFire Partnership was developed taking into consideration the necessities of the project which are distributed as mentioned in Table 1. The institution composing the Partnership are:

- ADAI (Association for the Development of Industrial Aerodynamics) – which had as the main roles the coordination of the project and the harmonization of information.

- METEO (*Farisa Asesores y Consultores S.L.* – Meteogrid) – with the software codes written for the Spitfire tools as the main role.

- AEMET (Meteorology Spanish Agency) – as the Spanish MFRI expert and data provision.

- IPMA (Portuguese Institute for the Sea and Atmosphere) – as the Portuguese MFRI expert and data provision.

- ANPC (Portuguese Civil Protection National Authority) – As the representing of the potential end-users always keeping the SpitFire results in accordance with the operational necessities.

Table 1 – Needs of the SpitFire Project distributed by the partners (capital letters indicate the main role of the partner).

	ADAI	METEO	AEMET	IPMA	ANPC
Coordination	X				
MFRI experts	x	x	X	X	x
MFRI provision			X	X	
MFRI harmonization	X		x	x	
Informatic code developers		X			
Definitions and requirements according the end-users' perspective	x	x			X

This partnership is composed by different types of entities from the public (AEMET, IPMA and ANPC) and private (ADAI and METEO) sectors, specifically: scientific community (ADAI and METEO), weather services (METEO, AEMET and IPMA) and civil protection (ANPC).

Expected deliverables

The deliverables were produced according the achievements of each task as presented in Table 2. The dates of the deliverables do not correspond to the contents of

the initial Grant Agreement since new agreements were carried out between the Consortium and the European Commission (EC) aiming the improvement of the project since new outputs were produced.

Table 2 – Resume of the SpitFire deliverables (between brackets are the months of the delivery dates - Mxx).

Task	Deliverable
T01: Requirement analysis, survey and assessment on existing services, system specifications	D.01.01 – Existing services and protocols report (M04)
	D.01.02 – Common meteorological information and Fire risk indexes requirements (M05)
	D.01.03 – System specifications and platform requirements (M08)
T02: Information collection and data repository	D.02.01 – SPITFIRE data repository (M10)
T03: Common Fire Weather Indexes	D.03.01 – Development and testing of the fire risk indexes (M23)
T04: Platform development and implementation	D.04.01 – The SPITFIRE meteorological and risk information platform (v1 – preliminary version) (M14)
	D.04.02 – The SPITFIRE meteorological and risk information platform (v2 – final version) (M22)
	D.04.03 – SPITFIRE platform evaluation report (M23)
T05: Training and operational implementation	D.05.01 – Preliminary version of operational guidelines (M16)
	D.05.02 – Final version of operational guidelines (M21)
	D.05.03 –General document of the operational use of SPITFIRE (M24)
T06: International training and interchange workshops	D.06.01 – First Workshop proceedings (M13)

Task	Deliverable
	D.06.02 – Final Workshop proceedings (M24)
T07: Publicity and communication	D.07.01 - Visibility and communication strategy (M01)
	D.07.02 - Project launch event (kick-off meeting) (m02)
	D.07.03 - Newsletter (monthly)
	D.07.04 - Websites (ongoing)
	D.07.05 - Layman's report (M38)
	D.07.06 - Closing event (*)
T08: Project Management and Reporting to the Commission	D.08.01 – Establishment of Steering Committee (M01)
	D.08.02 – Cooperation agreements signed (M01)
	D.08.03 – Operations Manual (M01)
	D.08.04 – Annual Work Programme –Year No. 1 (M01)
	D.08.05 – Monitoring and evaluation scheme (M01)
	D.08.06 – EC Progress Report No 1 (M08)
	D.08.07 – Annual Work Programme –Year No. 2 (M12)
	D.08.08 – EC Progress Report No 2 (M16)
	D.08.09 – Final report - Commission (M29)
	D.08.10 – Exit and Sustainability Plan (M29)
	D.08.11 – Final external evaluation (M29)

2. General summary of Project implementation process

2.1   General overview of the process

The objectives initially planned for the SpitFire Project were entirely reached. Moreover, additional concrete results were produced during the project – the previously mentioned fire behaviour simulator, the SpitFire Web Application for Mobile Devices (SWAMD), the extension of the area of interest from 30km width to 50km width or the Regional Training Sessions performed along the Pt-Sp border are four good examples of the extra work performed. Due to the time required for the extra work and because the Consortium felt that other directed activities of dissemination should be carried out, an extension in three months of the project duration was requested and accepted by the European Commission. Thus, the project deadline was postponed from December 31st, 2016 to March 31st, 2017.

During the entire project, the collaboration within the Consortium partners was exemplar. The coordination permanently kept the partners and the respective staff motivated and aware of the developments. The partners provided all the requests of the coordinators (general and technical). The Consortium worked as a whole. Therefore, along the project, the roles of the Steering Committee (SC) and the Management and Evaluation Committee (M&EC) loose relevance, since the project advancements were followed-up by all the staff and the main decisions of the project have a sociocratic participation with everybody involved.

2.2   comparative analysis of initial and actual schedule; planned and used resources; expected and actual results.

According to the previously mentioned, additional work was performed to assure the good quality of the project as well as the effective use of the tools produced. This extra work required the extension in 3 months of the project duration. All the objectives initially planned were so accomplished and some extra results were produced. In Table 3 a resume of the effective concretization of the objectives is presented. In Annex 1 an analysis of the accomplishment of the expected results for each action is presented.

Table 3 – Comparative analysis of the of the initial objectives and the objectives
accomplished during the project.

Objective	Level of achievement	Date (M-month)		Remarks
		Initially planned	Actual	
Harmonization of information	Totally	M15	M15	--
SpitFire Platform development	Exceeded	M24	M27	- a fire behaviour simulator was included in the tool
SpitFire Web-application for mobile devices development	New	---	M27	- this need came from the potential end-user's suggestions and it was not initially planned
Training of potential end-users	Exceeded			- Besides the training session planned in A5.2, seven additional regional training sessions were performed in different Spanish and Portuguese cities along the Pt-Sp border.
Establishment of protocols	Totally	M21	M27	- the advantage of the signature of the 3 protocols after the success of the regional sessions become clear.
Dissemination of the SpitFire outputs	Totally	M24	M26	

Besides the extra efforts in the development of new outputs, only slight deviations in the initial planned budget were observed. Actually, as can be seen in Table 4, the monetary resources value actually used in the project were 6,265 Euros (0.94%) above the initially planned. Anyway, the contribution requested to EC was preserved. In Annex 2, the budget execution is presented in detail.

Table 4: Comparative resume of the initial planned budget and monetary resources actually used in the SpitFire Project development.

Partner	Initial budget (EUR)	Actual budget (EUR)
ADAI	200,627	194,445
METEO	153,000	158,399
AEMET	103,200	103,300
IPMA	103,400	110,348
ANPC	103,200	103,200
TOTAL	**663,427**	**669,692**

3. Evaluation of project management/implementation process

In general, the project management and the process of implementation was very successful and that was traduced in the good performance of the technical component. It is worth of mention that the Desk Officer of the Project was substituted at about the 8th month of project duration as will be following described.

Positive aspects / opportunities

The management of the project was very efficient and effective mainly due the good cooperation of all the Partners and of the involvement of all the members of the SC and of M&EC, as well as the technical staff in general, in the central decisions. Actually, the project management work as a whole with an effective coordination instead of having centralized decisions.

The Workspace area of the Project website, restricted to the Consortium and EC was of great usefulness since all the common information was gathered and available to all the staff elements. Moreover, the initial meetings were very important to establish good relationships among the staff and partners, and to clearly define the objectives of the project driving all to the same direction in terms of objectives and working methodology.

The good experience of working together created the will among the Partners to work once again together in further opportunities, not only bilaterally (for example the relation between IPMA and AEMET became much stronger after the SpitFire Project)

but also as a Consortium. The potential of improvement the SpitFire tools is very high and new proposals in this context were already submitted involving the same partners.

Internal and external difficulties encountered

If the relation with Portuguese potential end-users was very easy and effective, the relation with Spanish potential end-users was more limited. While in Portugal, ADAI and ANPC facilitated the relations with other entities and personalities, the lack of a Spanish operational partner within the Consortium difficulted the dissemination in this country. On the other side, in Spain, the civil protection autonomy of the regions, instead of a central civil protection as in Portugal, dispersed the target of our dissemination activities among the operational entities.

Nevertheless, several meetings with the MAGRAMA (Spanish Ministry of Agriculture, Fisheries, Food and Environment with responsibilities in the forestry issues) and with the Spanish Civil Protection were carried out. On the other side, in the seven Regional Training Sessions held along the Pt-Sp border, the participation of 46 Spanish external participants (28.4% of the total participants) was satisfactory.

Partnership/core group cooperation (as appropriate)

The main positive aspect resulting from the project management is related to the good environment and cooperation developed among the Partners. Permanently, the Partners were involved in the central decisions and were aware of the evolvements and achievements of all the tasks, even if the participation was not so clear. On the other side, all the requests from the coordinators (Deliverables Coordinators, Actions C., Tasks C., Technical C. and General C.) had a prompt and positive answer from the Consortium staff and Partners.

The environment felt within the group was always very good and at any time there was any dispute or uneasiness between the partners. A word must be given to António Mestre from AEMET who passed away on February 16th, 2016 leaving the Consortium clearly poorer.

Cooperation with Commission

The cooperation with the European Commission knew two periods. In the first from the beginning (M00) up to month M08 practically there was no reply from the

designated Desk Officer (DO), as mentioned in the first progress report, possibly due to the starting of the project and of the inexistence of concrete results to discuss. The second period, after month M08 (August 2015), the relation between the Project Coordinator and the DO was much more effective. This period matched with the designation of a new DO (who previously was the second DO). During this period, the DO was really participative and in good time always replied to the emails answering to all the requests. The new DO participated in a Consortium plenary face meeting on 10/November/2016 and in the Final SpitFire Workshop on 11/November/2016, both held in Madrid-Spain, and this was very positive for the project since good suggestions and motivation words were expressed by him.

Comments on European value added

Besides the several tools produced with potential to be used not only in the Pt-Sp border but also in other transboundary areas, in the project management context the added value of the project was very high. This experience of MFRI sharing between institutions of different countries will strength the determination of the EC to make the institutions collaborate in terms of civil protection. This project clearly reinforced ties among the partners involved. Some Partners, like AEMET and IPMA, never have been work together in such type of projects and the good experience with SpitFire Project will certainly be the seed for future collaborations.

For a future opportunity, the participation of the DO in the Kick-off meeting would be very useful since it would promote and facilitate the interaction since an early phase.

Lessons learnt and possible improvements

The SpitFire Project was a great success both in technical terms and production of valuable tools as in the gain of experience in this kind of projects by the participants. The project management had several positive aspects as previously described however, some aspects could be improved, namely:

- The constitution of the SC and of the M&EC was equivalent as the same elements were representing the Partners in both committees. These representatives were the focal elements of each partner. Therefore, the separation in two committees only make sense theoretically since the tasks and responsibilities are different but, in practical terms, these two committees could be merged.

- Since the interaction among the Consortium partners was permanent and the scheduled unformal teleconference meetings were very regular, the project developments were permanently managed and evaluated and the decisions were constantly discussed among the entire staff. Therefore, the SC meetings and the M&EC meetings scheduled on a quarterly basis was unnecessary and a regularity of 8 months, or at any time it become necessary, should be sufficient to discuss specific matters. Regular subjects could be discussed in the more frequent plenary meetings with the involvement of a larger quorum, as effectively happened.
- The number of deliverables was excessive since sometimes the content was repeated in more than one deliverable. Other times this overload of deliverables drove to some documents poorer in content. Except for specific cases (e.g WP6 with different workshops proceedings) each task should produce a dedicated deliverable with several versions that would assure the continuous documentation of the work in progress and the achieved results.

4. Activities

The project activities can be divided in the four following points following described.

Management activities

The management activities were detailed in Chapter 3, being considered as totally in agreement with the initial plans and very successful.

Technical activities

In the Table 3 of Chapter 2 a comparative analysis of the initial planned objectives (related to the activities) and those really implemented were presented. In general, the activities actually performed went further than those initially planned. The main extra technical activities were: 1) inclusion of a fire behaviour simulator in the SpitFire Platform; 2) development of the SpitFire Web Application for Mobile Devices to be used at an operational and tactical levels. Moreover, the area of interest was extended from a strip along the border of the 30km width initially planned to 50km width.

The technical group was composed by all the staff addressed to the project and was coordinated by Miguel Almeida from ADAI. Several bilateral and plenary meetings were held during the project. The minutes of the plenary meetings are available at the

workspace (restricted password- spit2015fire) that can be accessed in the project website (www.adai.pt/spitfire).

Reporting activities

The reporting schedule was generally met with the agreed with the EC, taking into consideration the initial plans and the second agreement with the extension of the project in 3 months from December 31th, 2016 to March 31th, 2017. The next Chapter will detail the reporting issue.

Monitoring and evaluation activities

The monitoring and evaluation activities should be performed by the designated "Management and Evaluation Committee" led by the Project Coordinator (Domingos Xavier Viegas from ADAI) and composed by one representative of each Partner, namely: Miguel Almeida from ADAI (who also had the role of Technical Coordinator), Luis Torres from METEO, Yolanda Luna from AEMET and Marco Martins from ANPC.

As previously mentioned, this committee became to be less relevant since a continuous monitoring and evaluation was performed by all the staff. Anyway, every 4 months, this group met to discuss the progresses of the project. The minutes of these meeting are available at the workspace (restricted password- spit2015fire) that can be accessed in the project website (www.adai.pt/spitfire).

Dissemination activities

The dissemination performed had 3 main targets: 1) the public in general, 2) the scientific community, and 3) the potential end-users. Three vehicles were used to reach the dissemination targets:

1) participation in conferences and others resumed in Table 5, targeting mostly the scientific community.

2) organization of workshops – as planned, the 1st and the 2nd SpitFire Workshops (TP6.1 and T6.2) were organized in Lisbon-Portugal (11/Dec/2015) and Madrid-Spain (11/Nov/2016) and had the participation of potential end-users and meteorological data providers.

3) training to firefighters – besides the regular events of firefighting training held by ANPC and ADAI where the SpitFire Project and results were addressed, two other events are highlighted: a) the initially planned SpitFire Training Session (T05) occurred in Bragança at 03/Oct/2016, and b) 7 Regional Training Sessions, not initially planned, carried out along the Pt-Sp border, namely in Viana do Castelo-Portugal (07/Feb/2017),

Vérin-Spain (08/Feb/2017), Puebla de Sanabria-Spain (09/Feb/2017), Guarda-Portugal (10/Feb/2017), Mértola-Portugal (15/Feb/2017), Badajoz-Spain (16/Feb/2017) and Castelo Branco-Portugal (17/Feb/2017)

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Table 5 – Resume of the main dissemination activities performed within the SpitFire Project.

PARTNER	Type of dissemination	Dedication	Name of the mean of dissemination	Date	Name of the responsible
AEMET	Conference	Totally	XXXIV Jornadas Científicas de la Asociación Meteorológica Española-17º Encuentro Hispano-Luso de Meteorología	29/Feb/2016 to 02/Mar/2016	Ramiro Romero
IPMA	Workshop	Just a small part	Annual Joint all Staff Meeting of the ALADIN & HIRLAM Projects	29/Sep/2015 to 02/Oct/2015	Maria José Monteiro
IPMA	Conference	Just a small part	Union Civil Protection Mechanism's Exchange of Experts Programmne. Portugal and Sweden	15/Mar/2016	Ilda Novo
IPMA	Workshop	Just a small part	Annual Joint all Staff Meeting of the ALADIN & HIRLAM Projects	04/Apr/2016 to 08/Apr/2016	Maria José Monteiro
ADAI	Seminar (poster)	Totally	Seminário: Uma Década de Plano Nacional de Defesa da Floresta (Seminar: A decade after the National Plan for the Protection of the Forest)	19/May/2016 to 20/May/2016	Miguel Almeida
AEMET	Conference	Totally	9ª Asamblea Hispano-Portuguesa de Geodesia y Geofísica	28/Jun/2016 to 30/Jun/2016	Ramiro Romero
ADAI	Conference	Totally	18th International Conference on Fire Safety Science and Technology	29/Sep/2016 to 30/Sep/2016	Miguel Almeida
ADAI	Conference	Totally	14th International Wildland Fire Safety Summit	31/Jan/17	Miguel Almeida
IPMA	Conference	Mainly	10º Simpósio de Meteorologia e Geofísica e 18º Encontro Luso-Espanhol de Meteorologia	20/Mar/2017 to 22/Mar/2017	Ilda Novo
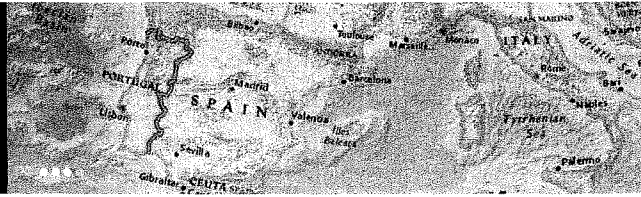
4) media releases

Four regional and national media releases dedicate to the project came out, specifically:

a) in the Portuguese National Radio Antena 1, on 10/Mar/2017, in the program *"Portugal em Direto"*, available at https://www.rtp.pt/play/p470/e277843/portugal-em-direto;

b) in The portal of the National TV RTP1, on 06/Feb, available at: http://www.rtp.pt/noticias/pais/plataforma-harmoniza-informacao-no-combate-a-fogos-em-zonas-transfronteiricas_n981011

c) in the Portuguese firefighters portal, on 08/Feb/2017, available at: http://www.vidadebombeiro.com.pt/2017/02/plataforma-harmoniza-informacao-no.html

d) in the news national portal "Notícias ao minuto", on 06/Feb/2017, available at https://www.noticiasaominuto.com/pais/736300/plataforma-harmoniza-informacao-no-combate-a-fogos-na-fronteira.

5) project website (www.adai.pt/spitfire) built to reach all the target audience. Additionally, other meetings with potential end-users were held aiming at the dissemination of the project and the obtainment of requirements and other data for the improvement of the SpitFire results.

Finally, the dissemination activities initially planned were the website creation and management, the initial and final SpitFire workshops and the participation in conferences. All these activities were entirely fulfilled and complemented with additional dissemination activities like the 7 Regional Training Sessions and press releases. Moreover, several less relevant meetings with potential end-user were held.

5. Presentation of technical results and deliverables (one section per deliverable)

During the project, 30 deliverables were produced according to the initial plans. Following an individual resumed description of each deliverable will be presented.

Deliverable D.01.01 – Existing services and protocols report

Description and purpose: This deliverable listed all the existing services in the context of meteorology and forest fires risk in Portugal and Spain. Moreover, a survey and analysis of the effective protocols between Portugal and Spain dealing the same context were carried out.

Evaluation: The objectives planned for this deliverable were achieved and the document was delivered in due time.

Value added: This deliverable was an input of A.02.05 and T05. It was important to make the state of the art in terms of information sharing and cooperative protocols. This deliverable was a kind of kick-off of the technical component of the project.

Individual dissemination: the results of these deliverable were partially included in the posters (Portuguese, Spanish and English) of the project that were presented in the SpitFire activities involving external entities.

Deliverable D.01.02 – Common meteorological information and Fire risk indexes requirements

Description and purpose: In this deliverable, the most important issues of the meteorological information and fire risk indexes analysis were reported as well as the requirements associated to them.

Evaluation: The objectives planned for this deliverable were achieved and the document was delivered in due time.

Value added: This deliverable will be an important input of T03 since it allowed the design of the methodology to harmonize data from AEME and IPMA.

Individual dissemination: The dissemination activities did not address specifically this deliverable. However, it was important to achieve results that were disseminated during the project duration.

Deliverable D.01.03 – System specifications and platform requirements

Description and purpose: The systems specifications and the platform requirements in terms software and other technical issues, as well as in terms of user interaction were compiled in D.01.03.

Evaluation: The objectives of this delivered were fulfilled however it was delivered 11 days after the initially planned deadline. No consequences resulted from this delay but just a bureaucratic default.

Value added: This deliverable assumes great relevance to T04 since it allows the design of the SpitFire Platform

Individual dissemination: The dissemination activities did not address specifically this deliverable. However, it was important to achieve results that were disseminated during the project duration.

Deliverable D.02.01 – SPITFIRE repository

Description and purpose: This deliverable had several essential chapters to describe the work done in T02. Generically, this deliverable described the SPITFIRE data repository. The most important issues were: list of data sources in Portugal and Spain; explanation of the methodology of data harmonization in order to have a common set of data for both countries; description of the web system connecting the relevant sources of data with SPITFIRE data repository; manual of use of the SPITFIRE data repository; general regulations and most important legal documentation associated to the SPITFITRE data repository.

Evaluation: This was a complete report also addressing contents of other deliverables. The objectives of this delivered exceeded the initial plans however it was delivered 32 days after the initially planned in order to have a more complete analysis of the regulatory framework of Portugal and Spain. No consequences resulted from this delay but just a bureaucratic default.

Value added: The SpitFire repository is essential to the SpitFire Platform (T04) allowing the query of past meteorological and fire risk data and indirectly the reconstruction of past fire events.

Individual dissemination: In all the activities where the platform was presented, the data repository was mentioned as a complementary added value.

Deliverable D.03.01 – Development and testing of the fire risk indexes

Description and purpose: In this deliverable, the currently used Portuguese and Spanish fire risk indexes were described. Additionally, all the results to obtain a common

weather based fire risk index and a common fire risk potential index were reported, as well as the results of the tests carried out in order to validate this common product. Moreover, the analysis and development of regional fire risk indexes were described

Evaluation: This deliverable fully reached the initial objectives being delivered in due time.

Value added: The harmonization of indexes was essential to include in the SpitFire Platform aiming the common use in cooperative firefighting operations.

Individual dissemination: this deliverable was disseminated in several conferences and a paper on an international journal is ready to be submitted.

Deliverable D.04.01 – The SPITFIRE meteorological and risk information platform (v1 – preliminary version)

Description and purpose: This deliverable provided the preliminary solution of the platform and respective assumptions to develop the platform. A prototype version of the platform was advanced in this document.

Evaluation: This deliverable exceeded the initial objectives however it was delivered 44 days after the initially planned in order to include the fire behaviour simulator that was not in the initial agreement. No consequences resulted from this delay but the positive aspect of the improvement of the platform.

Value added: a first version of the platform was essential to present to the potential end-users aiming at the suggestions for further improvements of these tool.

Individual dissemination: The platform was mentioned and described in all the dissemination activities of the Project. A video tutorial in English was uploaded in the Youtube Channel (https://www.youtube.com/watch?v=XYjHNKCC84w)

Deliverable D.04.02 – The SPITFIRE meteorological and risk information platform (v2 – final version)

Description and purpose: This deliverable was a continuation of D.04.01 with the final version of the platform. A description of the platform was provided. Three manuals (Portuguese, Spanish and English) were attached to this deliverable.

<u>Evaluation</u>: This deliverable exceeded the initial objectives however it was delivered 18 days after the initially planned in order to include the extra work like the fire behaviour simulator and the 3 manuals. No consequences resulted from this delay but the positive aspect of the improvement of the platform.

<u>Value added</u>: The SpitFire Platform is one of the great outputs of the project. After D.04.02 this tool was ready to be tested by the potential end-users in trainig and in real fire events.

<u>Individual dissemination</u>: The platform was mentioned and described in all the dissemination activities of the Project. A video tutorial in English was uploaded in the Youtube Channel (https://www.youtube.com/watch?v=XYjHNKCC84w)

Deliverable D.04.03 – SPITFIRE platform evaluation report

<u>Description and purpose</u>: This deliverable reported the work carried out to evaluate the platform. The questionnaire of evaluation must be detailed as well as the methodology to achieve it. The evaluations results of the use of SPITFIRE platform in real fire campaigns must be reported

<u>Evaluation</u>: Due to the difficult situation in terms of forest fires felt in Portugal during 2016, the test of the SpitFire Platform was poor but even so relevant for the project (see value added). Questionnaires (D.05.01) were poorly answered by the firefighters that were very busy and exhausted.

<u>Value added</u>: The reactions and comments provided were very important for the enhance of the Platform and to produce a new tool, the SpitFire Web Application for Mobile Devices that originate a request to the EC applying to an extension of the project in 3 months in order to produce this extra work.

<u>Individual dissemination</u>: The support from the end-users to define the final design of the SpitFire tools was extensively referred in all the dissemination activities.

Deliverable D.05.01 – Preliminary version of operational guidelines

<u>Description and purpose</u>: This deliverable is an operational guidebook of the preliminary version of the platform described in D04.01.

<u>Evaluation</u>: The objectives planned for this deliverable were achieved The document was delivered 4 days after the due time.

Value added: this deliverable provided the questionnaires for the Platform evaluation which were not use later as described in the D.04.03 and provided the manual for the use of the first version of the Platform what was essential for the potential end-users start working on it, giving the feedback aiming at improving the Platform.

Individual dissemination: No dissemination activities directly mentioning this deliverable were performed.

Deliverable D.05.02 – Final version of operational guidelines

Description and purpose: This deliverable is an operational guidebook of the final version of the platform described in D04.02.

Evaluation: This deliverable exceeded the initial plans since 3 video tutorials were included. The document was delivered 20 days after the due time and the referred videos were produced in March due the extension of the project.

Value added: The final version of operational guidelines was used in the final training sessions with potential end-users and will be available on the internet for future users.

Individual dissemination: Manual were presented to the potential end-users in the Regional Training Sessions.

Deliverable D.05.03 – General document of the operational use of SPITFIRE

Description and purpose: This deliverable includes protocols for weather and wildfire information interchange and other important operational documentation. Additionally, this deliverable describes the final operational guideline including the eventual changes made in A.04.03 resulting from the platform evaluation (A.04.04). Moreover, 3 video tutorials in English, Portuguese and Spanish were produced. This deliverable also reports the development of the SpitFire Web Application for Mobile Devices.

Evaluation: The objectives exceeded the initial plans in many aspects such as the web application and the videos. Initially it was planned to be delivered in 31/Dec/2016. Due to the extension, the delivery date was postponed to 31/Mar/2017 however it was delivered 10 days later with no consequences for the project.

<u>Value added</u>: The operational guidelines and the videos will allow the user to have a better use of the spitfire tools. Besides, following the recommendations from the potential end-users, this deliverable also reports the development of the SpitFire Web Application for mobile devices.

<u>Individual dissemination</u>: The operational guidelines are available on the project website (www.adai.pt/spitfire) and videos are available at the Youtube channel with links referred in the project website.

Deliverable D.06.01 – First workshop proceedings

<u>Description and purpose</u>: The presentations, achievements and other outputs of the first SPITFIRE workshop were reported in this deliverable.

<u>Evaluation</u>: This deliverable reached the initial objectives being delivered in due time.

<u>Value added</u>: this deliverable reported the suggestions provided by the workshop participants allowing the design of the SpitFire tools in accordance with the potential end-users necessities.

<u>Individual dissemination</u>: No dissemination activities directly mentioning this deliverable were performed.

Deliverable D.06.02 – Final workshop proceedings

<u>Description and purpose</u>: The presentations, achievements and other outputs of the second and final SPITFIRE workshop shall be reported in this deliverable.

<u>Evaluation</u>: This deliverable reached the initial objectives being delivered in due time.

<u>Value added</u>: most of all this workshop represented dissemination activity of the project and of the tools that were in a final phase of development.

<u>Individual dissemination</u>: No dissemination activities directly mentioning this deliverable were performed.

Deliverable D.07.01 – Visibility and communication strategy

<u>Description and purpose</u>: The Strategy was a useful tool that sets the grounds regarding the information and publicity activities necessary for implementing the RCOP. For this purpose, the CAP sets up an overall purpose and objectives, as well as specific activities and tools designed for the identified target groups. The CAP activities were comprehensively set and their link with the target groups and objectives were strengthened.

<u>Evaluation</u>: This deliverable reached the initial objectives being delivered in due time.

<u>Value added</u>: this deliverable was important to define the rules and procedures for the internal and external communication.

<u>Individual dissemination</u>: No dissemination activities mentioning this deliverable were performed.

Deliverable D.07.02 – Project launch event (kick-off meeting)

<u>Description and purpose</u>: For a successful implementation of the project, was essential to let all branches of the Spanish and Portuguese Administrations, as well as other stakeholders know that the project has started.

<u>Evaluation</u>: This deliverable reached the initial objectives but it was delivered 18 days later than the initially planned. This was just a formal delay since it had no impacts in the project development.

<u>Value added</u>: Several entities with interest to the project were contacted. This was important for further activities like the invitation for the SpitFire workshops or the training sessions.

<u>Individual dissemination</u>: No dissemination activities mentioning this deliverable were performed.

Deliverable D.07.03 – Newsletter

<u>Description and purpose</u>: Monthly newsletter containing information on the project activities and results, and addressed to relevant public authorities, private companies, specialized media, EU staff and senior officials and the general public.

<u>Evaluation</u>: With some delays, the newsletters were disseminated by the list of contacts. In the website, regularly, the complied newsletters were made available.

<u>Value added</u>: dissemination of the project.

<u>Individual dissemination</u>: the newsletters are by itself dissemination tools.

Deliverable D.07.04 – Website

<u>Description and purpose</u>: A specific section on the project was created at the existing website of all members of the consortium, containing information on the Union's Civil Protection Mechanism, a brief description of the project and its partner organizations, and the results achieved by the project. A restricted area designated "Workspace" for internal communication was embodied.

<u>Evaluation</u>: The website filled the initial objectives and become a very relevant tool of dissemination and internal communication since it had a restricted workspace embodied.

<u>Value added</u>: dissemination of the project and internal communication.

<u>Individual dissemination</u>: the website is by itself a dissemination tool.

Deliverable D.07.05 – Preliminary version of operational guidelines

<u>Description and purpose</u>: Produced on paper and in electronic format at the end of the project. It was a 10 pages long report presented in English, Spanish and Portuguese. Approval was requested from the Commission before publishing

<u>Evaluation</u>: This deliverable reached the initial objectives being delivered in due time.

<u>Value added</u>: Dissemination of the final results of the project. The delivery date was postponed to March 31st 2017 (initially was planned for December 31st 2016) due to the extension of the project in 3 months.

<u>Individual dissemination</u>: The dissemination of the Layman's Report requires previous authorization from the EC which at the data that the present final report is being produced was not given.

Deliverable D.07.06 – Preliminary version of operational guidelines

Initial description and purpose: High visibility closing event will be organised for all direct and indirect stakeholders, EU representatives, relevant national authorities on civil protection and forest-fire prevention, and the media, to ensure proper dissemination of project achievements and results

Evaluation: since the objectives of this deliverable were the same of the objectives of the deliverable D.06.02, this deliverable was not produces since it would have the same contents of the other.

Value added: Not applicable

Individual dissemination: not applicable

Deliverable D.08.01 – Establishment of Project Steering Committee

Description and purpose: The project will establish a Steering Committee (SC) to ensure coordination among stakeholders. It was integrated by a senior representative of each member of the consortium and led by the project Coordinator. The SC is expected to meet every four months to review project progress and give guidance on key issues.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: As mentioned before, the SC had a low relevance in the project since the main decisions were taken involving all the staff.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.02 – Cooperation agreements signed with beneficiaries

Description and purpose: The coordinator concluded with each partner organization an internal cooperation agreement describing their technical and financial participation in the project. Such agreement was fully compatible with the grant agreement signed with the EC. When drafting the agreements, the Guidelines for internal co-operation published together with this call, will be taken into account.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: The cooperation agreements signed with the beneficiaries were essential for legal issues and to formalize the rules within the Consortium.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.03 – Operations Manual

Description and purpose: Another important task to be under-taken during the inception phase was the development of a manual of rules and procedures. In this document, we laid the foundations of our Project Management Approach and Implementation System. The manual provides practical guidelines and establish procedures for the management, implementation and monitoring of the activities to be carried out by the project.

Evaluation: This deliverable fully reached the initial objectives. It was delivered 41 days later than the initial plans since it was started to be produced after the CE kick-off meeting (20/01/2015) and after the first internal kick-off meeting (27/01/2015). Therefore, its deliver in due time (31/01/2015) became impossible.

Value added: This deliverable was essential to clarify the rules to be followed for the good management and implementation of the project.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.04 – Annual Work Programme –Year No. 1

Description and purpose: Annual Work Plans (AWP) were jointly developed by the project coordinator and the technical team, based on the project's objectives. The 1st AWP was approved by the Steering Committee. The AWP is an instrument that is meant to bring predictability to the project's activities and will indicate clearly the priorities for the period, proposed activities and schedule. The 1stAWP was drawn up for the 1st year of the project.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: This deliverable was important to plan the several activities to develop during the first year of the project.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.05 – Establishment of monitoring and evaluation systems

Description and purpose: The system was designed and built into the project management cycle in a joint effort including all stakeholders involved. During the inception phase, we developed a system to better evaluate the progresses of the project.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: The project progresses were continuously evaluated by the Consortium as a whole in so far as the Project Coordinator share the developments. Therefore, this deliverable and system was not very useful in practice.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.06 – Progress report No 1 delivered to the Commission

Description and purpose: The progress report contains detailed information on technical and financial implementation during the period between January 1st, 2015 and August 31st, 2015.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: This report was important to inform the EC about the project progresses. On the other side, it was useful to build the present final report (D.08.09).

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.07 – Annual Work Programme –Year No. 2

Description and purpose: Annual Work Plans (AWP) were jointly developed by the project coordinator and the technical team, based on the project's objectives. The 2nd AWP was approved by the Steering Committee. The AWP is an instrument that is meant

to bring predictability to the project's activities and will indicate clearly the priorities for the period, proposed activities and schedule. The 2nd AWP was drawn up for the 2nd year of the project and later extended to the extension period of 3 months.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: This deliverable was important to plan the several activities to develop during the second year of the project and extended period.

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.08 – Progress report No 2 delivered to the Commission

Description and purpose: The progress report contains detailed information on technical and financial implementation during the period between September 1st, 2015 and April 31st, 2016.

Evaluation: This deliverable fully reached the initial objectives. It was delivered in due time.

Value added: This report was important to inform the EC about the project progresses. On the other side, it was useful to build the present final report (D.08.09).

Individual dissemination: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.09 – Final report submitted to the Commission

Description and purpose: Final technical and financial report drawn up in accordance with Annex V (technical) and Annex VI (financial) to the model grant agreement.

Evaluation: This report is being delivered in due time considering the extension of the project in 3 months.

Value added: This report summarizes the technical and financial progresses of the project. Besides it is required from the EC.

Individual dissemination: No dissemination activities mentioning this deliverable are foreseen to be performed.

Deliverable D.08.10 – Development of an exit and sustainability Plan

<u>Description and purpose</u>: To ensure the sustainability of the achievements in a longer-term perspective, a sustainability plan will be drafted setting the long-term goals of the project we want to achieve and determining what interim-targets are needed to set to achieve the goal.

<u>Evaluation</u>: This deliverable fully reached the initial objectives. It was delivered 3 months later than the initial plans due the extension of the project in the same period.

<u>Value added</u>: This deliverable was important to clarify and state what will happen to the SpitFire results after the project.

<u>Individual dissemination</u>: No dissemination activities mentioning this deliverable were performed.

Deliverable D.08.11 – Final evaluation (external)

<u>Description and purpose</u>: Once the implementation period is over, a final external evaluation was contracted with the following objectives: (i) improve project management; (ii) dissemination of main findings and recommendations; (iii) promotion of learning processes; (iv) control mechanism to assess if the objectives and results were achieved.

<u>Evaluation</u>: This deliverable fully reached the initial objectives. It was delivered 3 months later than the initial plans due the extension of the project in the same period.

<u>Value added</u>: this service was useful in order to have an external and impartial evaluation of the project. Some small technical suggestions were given for the results improvement which were implemented.

<u>Individual dissemination</u>: No dissemination activities mentioning this deliverable are foreseen to be performed.

6. Evaluation of the technical results and deliverables

General lessons learnt

The general lessons learnt were previously described and they are mostly referred to the management aspects. Resuming: 1) the Steering Committee and the

Management and Evaluation Committee are not so relevant in project where the participation and contact among the partners is so close; and 2) the number of deliverables was excessive and maybe more complete deliverable per action would be more appropriate.

Moreover, the participation of a Spanish end-user, like Spanish Civil Protection or Magrama would be interesting in order to have a stronger participation from Spanish end-users. For internal rules of these entities, them participation as a partner is difficult but they could be integrated as a formal 3ʳᵈ Party.

Strengths

Four major strengths result from this project. The first was the previously mentioned collaboration among the partners that indicates that further collaborations certainly will come. The second strength was the good collaboration with EC, ECHO and the Desk Officer that motivated each partner to present future proposals. The third strength is related to the results that have potential to be improved with an extension in concepts and contents, and to be applied in other international borders increasing the international cooperation capabilities. The forth strength is related to the great motivation from the end-users participating in the workshops and training session to effectively use the SpitFire tools − is a responsibility of each partner to continue disseminating the tools in the regular dissemination activities to assure a continuation of the SpitFire Project.

Possible challenges and/or improvements to be tackled through further action

As referred in the Exit and Sustainability Plan, the potential of the SpitFire results is enormous and the challenges pass by:

- Database extension: the provision of meteorological data may be extended to other data suppliers. For example, in the SpitFire Regional Training Sessions several representatives of the Spanish Provinces referred the possibility of a direct connection of the Platform to the regional meteorological services, enriching the SpitFire database that currently is supplied by IPMA and AEMET.
- Geographical extension: the use of Spitfire tool can be enlarged to other international borders than Portugal-Spain border. Besides other international possibilities, in and outside Europe, the use of the SpitFire Platform as addressing exclusively the fire prone areas of the European Union, can be extended to the following borders: Spain-France, France-Italy, Italy-Austria, Italy-Slovenia, Slovenia-Croatia, Slovenia-Austria, Austria-Hungary, Hungary-Romania, Romania-Bulgaria and Bulgaria-Grecia

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- <u>Extension in concepts</u>: Spitfire Platform may be useful beyond the transboundary areas. The sharing of meteorological and fire risk information is recommendable for the mutual management of fire risk in areas with common patterns. For example, SpitFire Platform may be used for the sharing of information among neighbour islands of a certain area, motivating to the international cooperation, enriching the available data sources and databases, and saving resources.
- <u>Extension of contents</u>: The Spitfire Platform is now prepared for the sharing of meteorological and fire risk information; however, it can be extended in terms of other information like the geographical location of critical and strategical elements, availability of firefighting resources, presence of firefighters in the theatre of operations, monitoring of the fire, etc. It is worth of mention that this extension was suggested by several participants of the SpitFire external events
- <u>Hazard extension</u>: In terms of hazards, the main focus of SpitFire was the wildfires. Nevertheless, the Platform, as it is, may be superficially used in the management of other hazards (e.g. extreme weather conditions, floods, etc.) where the meteorological information is essential. Besides, the SpitFire platform and concept may be extended to other transboundary hazards to which the meteorology have no direct relation (e.g. earthquakes)

Recommendations to stakeholders, partners, authorities in charge, national and EU institutions

The great interest showed by the potential end-users in the project results indicates that they are really valuable. However, if the SpitFire tools are not continuously upgrade and improved, these tools will be forgotten and all this investment will be lost. It is a responsibility of the stakeholders, partners, authorities in charge, national and EU institutions to keep these tools being used both by investment and by the dissemination. The potential of improvement previously mentioned shall be supported by the EC to really monetize the investment made in the SpitFire Project. The partners have the responsibility to submit new proposals.

7. Follow-up

The sustainability plan was not very developed in the initial phase and the only statement was that the tools produced in the project should be freely available to the potential end-users. Actually, to access the SpitFire tools a username and a password are required. These credentials are freely provided when they are required (contact data in the project webpage) and they are essential to avoid an over assessment to the server.

The SpitFire tools will be permanently free on the internet but the management will be freely provided during the 1st year after the project. The customization and the management of the tools after March 31st, 2018 shall be contracted. The not managed and customized versions will be freely available.

A protocol was established with AEMET and IPMA in order to have the tools permanently fed with the meteorological and fire risk information provided by these two institutions.

The project website will be managed until 31/December/2017, when there still are elements to upload. However, it will not be removed after this date and the Coordinator contact will be explicit for any eventual need of contact.

Spanish-Portuguese Meteorological Information System
for Trans-Boundary Operations in Forest Fires

ANNEX 1 – Resume of the accomplishment of the expected results distributed by action.

Action	Results	Level of achievement	Date		Remarks
			Initially planned	Actual	
A1.1	Common repository of methodologies, systems specifications, services and data interchange protocols	Total	M04	M04	
A1.2	List of requirements for common meteorological information and fire risk indexes	Total	M05	M05	
A1.3	Common platform requirements definition	Total	M06	M06	
A1.4	SPITFIRE system specifications and inter-operable implementation report	Total	M08	M08	
A2.1	Report on data sources available for Portugal and Spain	Total	M05	M05	
A2.2	Harmonized data sets on meteorology, and fire historical data and thematic maps	Total	M07	M07	
A2.3	Web system connecting data sources (institutions producing data) with SPITFIRE data repository to guaranty the automatic exchange of information	Total	M08	M08	
A2.4	SPITFIRE data repository	Total	M10	M10	
A2.5	Regulatory framework analysis. Set of protocols, agreements, statements and other formal and legal documentation. General regulations for SPITFITRE data repository	Total	M10	M10	

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Action	Results	Level of achievement	Date		Remarks
			Initially planned	Actual	
A3.1	Common weather-based fire risk indexes and common fire potential indexes best fitting all regions in the border area	Total	M10	M10	
A3.2	Common fire potential indexes best fitting all regions in the border area	Total	M10	M10	
A3.3	Statistical testing of fire risk indexes comparing the results using the currently and the proposed common methodologies	Total	M15	M15	
A4.1	Trans-boundary fire risk analysis and operational support platform for forest fire fighting in Spain and Portugal	Exceeded	M19		
A4.2	Operational user interface for SIG information. The outputs of Task T02 will be used	Total	M12		
A4.3	Final version of user platform developed	Exceeded	M22		
A4.4	Key performance Indicators applied to the platform use. Questionnaire to evaluate the usefulness of the platform. Evaluation report of the use of SPITFIRE platform in real fire campaigns	Uncomplete	M23		
A5.1	SPITFIRE user guidelines and preliminary and final versions of operational implementation protocols to be adopted by the competent authorities	Total	M21		
A5.2	Operational cross-training plan and activities. Portuguese and Spanish SPITFIRE platform end-users ready to use this tool in real fire events	Exceeded	M23		

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Action	Results	Level of achievement	Date		Remarks
			Initially planned	Actual	
A5.3	SPITFIRE platform ready to be used in trans-boundary firefighting activities	Exceeded	M24		
A6.1	Proceedings of the presentations and conclusions on common fire risk assessment in transboundary firefighting operations	Total	M13		
A6.2	Workshop proceedings on the presentations and conclusions about trans-boundary forest fire fighting preparedness and operation based in common fire risk analysis and protocols	Total	M24		
A7.1	(i) encourage all relevant stakeholders to participate actively in the project activities; (ii) maximize the project visibility and awareness amongst all stakeholders, target groups as well as among the general public	Total	M24		
A7.2	Present the project itself, and enhance the process of engagement among key stakeholders in the public and private sectors	Total	M01	M01	
A7.3	(i) ensure wide dissemination of projects results and achievements; (ii) ensure strong support by key stakeholders to the Spanish – Portuguese cross-border cooperation in terms of fire-risk forecasts; information exchange and interoperability of systems: (iii) increase accountability and transparency of the intervention.	Total	M24		

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SpitFire *Spanish-Portuguese Meteorological Information System for Trans-Boundary Operations in Forest Fires*

Action	Results	Level of achievement	Date		Remarks
			Initially planned	Actual	
A7.4	(I) increase awareness among the general public on forest-fire prevention and preparedness; (ii) increase support by relevant stakeholders for cross-border cooperation in terms of forest-fire risks.	Total	M24		
A7.5	(i) dissemination of project results; (ii) prepare the ground for future technical assistance on the matter.	Total	M24		
A8.1	(I) management structure established; (ii) operations manual for project implementation drafted and approved; (iii) first AWP approved; (iv) cooperation agreement between al members of the consortiums are signed; (v) kick-off meeting takes place.	Total	M01		
A8.2	(i) measure the project effectiveness in meeting its objectives; (ii) monitor progress AWPs and approved activities to ensure they are implemented on-time, according to the set procedures and within budget; (iii) provide an early warning system so that corrective measures can be introduced on-time; (iv) meet information and reporting needs.	Total	M24		
A8.3	(i) financial expenditure runs parallel to task implementation; (ii) expenditure is done in compliance with EU rules and procedures.	Total	M24		
A8.4	(i) quality assurance is guaranteed through assessment of documents and deliverables produced within the framework of the project.	Total	M24		

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SpitFire   *Spanish-Portuguese Meteorological Information System*
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Action	Results	Level of achievement	Date		Remarks
			Initially planned	Actual	
A8.5	(i) development of an exit and sustainability plan; (ii) high visibility closing event (see communication and visibility task); (iii) final reports and external evaluation delivered to the EC; (iv) hand over of materials, working papers and methodological instruments; (v) external final evaluation conducted.	Total	M26	M29	

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