

AFAN

Advanced Fire Analysis Network



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List of Acronyms

AFAN	Advanced Fire Analysis Network
ECASC	Training school of Valabre
FOAD	Open distance learning



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Executive summary

The AFAN (Advanced Fire Analysis Network) programme has defined fire analysis in detail by means of various deliverables. The partner countries have gathered their knowledge and know-how in working meetings.

They have written several documents that perfectly frame the analysis of forest fires:

- **Harmonisation of fire analysis knowledge**
- **Tools, science and best practices for fire analysis**
- **Remote assessment**

Therefore, the last action of the programme was to bring together experts from the partner countries and Europe to share techniques, knowledge and identify needs to respond to different operational situations.

The present report documents the final workshop of the project, that took place in April 2022 in Valabre. Additionally, the feedback collected from fire analysts and experts from across Europe who participated in the workshop are summarised, as well as their feedback about the exercises.

This report also summaries a few ideas to be discussed for the continuation of the AFAN network and European level training.

1. Introduction

Within the framework of the AFAN project, a series of workshops, meetings, webinars, exchanges, and other networking activities have been carried out. The last workshop, held on April 20 and 21 in Aix-en-Provence, was organized by the training school of Valabre.

These activities and the different deliverables that have been created have the main objective of creating a common framework in terms of forest fire analysis, as well as sharing the knowledge and experience of the partners, that is, capitalizing on their knowledge and experience and making it available to the analyst community.

It is an important fact since currently the level of specialization in terms of fire analysis of the different European organizations is very uneven. Each country, even each organization has its own methods of performing analysis adapted to its needs and particularities.

The objectives of joint training are multiple:

- support the network of analysts,
- share methodologies on different fire analysis tasks, share different tools,
- share how to use them,
- offer training
 - Train analysts on the implementation of fire analysis tasks during the response phase to wildfires.
 - Analysts participate in the decisions to define the strategy, identify objectives, set up priorities, order of the actions, real time monitoring the wildfire and planning.
 - Identification of fire type, spreading pattern, positioning, intensity, identify weaknesses of the fire and opportunities based on the deployment capacity.
 - The exercises are not focused on anticipating the position. They focus on understanding the fire movement in order to identify its weaknesses and establish the opportunities for control with different resources.
 - Others

2. Objectives

Fire analysts are a valuable resource during wildfires. Their experience and knowledge of fire behavior allow the organization to optimize suppression tasks and reduce the consequences of this type of emergency.

Therefore, this document aims to synthesize the most relevant aspects of the training carried out in the workshop in Garnade, and to identify the potentialities of this type of training from different approaches, including the feedback provided by the participants.

3. Workshop planning

The workshop took place over two days and was attended by project partners and invited experts from different European fire management and civil protection organizations, most of whom were fire analysts and/or incident commanders.

a. Day 1 (April 20th)

The exercise was carried out in a classroom, where the participants faced a forest fire scenario, and had information such as vegetation maps, topography, meteorological data...

At the end of the first day, they visited a fire station where they could see the means of fighting and understand another operational tactic based on the attack of incipient fires.

Table 1: Timetable for the first day. Source: training school of Valabre

9h30 - 9h00	Welcome: Composition of teams, identification of rooms, presentation of the simulator, explanation of scenarii, presentation of observers
9h00 - 9h40	Scenario 1
9h40 - 10h00	coffee break
10h00 - 11h00	Debriefing: restitution of each analysis, comments from observers, acceleration of the simulator
11h00 - 12h00	Scenario 2
12h00 - 13h00	Debriefing: restitution of each analysis, comments from observers, acceleration of the simulator
13h00 - 14h00	Lunch
14h00 - 15h30	Scenario 3
15h30 - 16h00	coffee break
16h00 - 17h00	Debriefing: restitution of each analysis, comments from observers, acceleration of the simulator
17h00 - 18h30	Visit to the Aix fire station - forest fire fighting resources

b. Day 2 (April 21th)

The experts were deployed in the field and faced with a complex situation, had to answer questions from the mayors of the threatened communes: the size of the fire, the areas to be evacuated, the quantity of human and material resources, the mobilisation of volunteers, the closure of shops, etc.

Table 2: Timetable of the 2nd day. Source: Training school of Valabre

8h00	Departure to the Tholonet
8h30 - 9h00	Presentation at the town hall: exhibition of the problems
9h00 - 11h00	Assessment
11h00 - 11h30	Team consultations
11h30 - 12h00	Presentation of the results, the probable fire outline
12h00 - 12h30	return to Valabre
12h30 - 13h00	Debriefing
13h00 - 14h00	Lunch
14h00 - 18h00	End of the programme

4. Characteristics of the exercises

On the first day, during the indoor exercises, the teams were international to share knowledge and techniques through the different national concepts. On the second day, in the field, the national teams reconstituted themselves surrounded by the European experts. They presented the work they would have done in the field, in real life.

- 4 people per team and 4 teams (IT, FR, Catalonia, Wales).
- 5 observers invited from countries like Greece, The Netherlands, Germany, Sweden, Poland.
- The teams work on themes. They share methodologies, good practices and identify a common result.
- The observer compiles information on the dynamic of the group and summarizes the work done and gives an opinion on the efficiency and possible transposition to his/her wildfire fighting environment.

5. Scenarios

a. Scenario 1

Description: The first scenario concentrates on the ability to put weather data into perspective to identify critical areas. The fire is spreading freely.

The objective of the exercise is to identify risk areas or opportunities for control.

Exercise duration: T0 (departure of the fire) to T1,5 (hours)

Analysis duration: 40 minutes

Analysis restitution: 40 minutes

Stimulus: Valabre simulator will show how the fire is spreading

Debrief of observers: 10 min

b. Scenario 2

Description: A major fire (real fire) is occurring in a town of “Bouches-du-Rhône”.

A fire analyst is required to help the incident commander. The analyst wishes to set up a line of support on the highway facing the fire. Is it an opportunity or a threat for firefighters?

The fire should not reach the TGV station in Aix and the commercial area of “Plan de Campagne” city.

Where I have to intervene, take action? where it will pass and with what intensity?

“T” like Time is the hour of beginning

Exercise duration: T + 2.5 hours

Analysis duration: 1 hour

Analysis restitution: 1 hour

Presentation of the real situation: 30 minutes

Stimulus: image ORUS, photos and videos

The weather conditions are identified by the Weather application.

c. Scenario 3

Description: You have been requested by the UCPM to provide remote assistance to a European country. You have to concentrate your expertise by answering the following questions: Is it possible to extinguish the fire? Where should action be taken? By what means and methods?

Tools: tactical situation, weather forecast, deployed means...

Exercise duration: T + 2,5 hours

Analysis duration: 1 hour

Analysis restitution: 1 hour

Presentation of the real situation: 30 minutes

Stimulus: photos and videos

The weather conditions are identified by the Weather application.

d. Scenario 4

The towns of Le Tholonet and Beaurecueil are threatened by fire brought by a violent wind (mistral).

The mayor has asked for details of the threats in order to take effective action to protect his constituents.

As such, the Command post sends analysts to meet his expectations:

- Passage of the fire: what will it threaten?
- At what time?
- Should we evacuate? All or part of it?

Situation: The wind is blowing at 90 km/h, from the West - Northwest. The fire is currently threatening the outskirts of the city (residential area)

Action: After the mayor's speech, the teams will analyze the situation: vegetation on the field, roads, houses... After 2 hours of work, a representative reviews the situation with the mayor.

Tools: maps, network tools available

6. Trainees' feedback

At the end of the workshop feedback was collected from the participants on the exercises. The feedback is presented here, in order to take into account for future exercises focused on fire analysis.

a. Training exercises

i. Pedagogy

It is advised that the training exercises start with the presentation of the tools and fire analysis techniques of each participant in order to undertint the different approaches. The objectives should be clearly defined: skills/tasks/abilities.

It is important that participants have enough time to engage in discussions and knowledge exchanges during group exercises. E.g. to discuss knowledge and arguments behind making a certain recommendation to the incident commander.

ii. Composition of the working teams

Depending on the purpose of the exercise, some organisations can be trained in teams from the same organization and some others in groups integrated by members of different organisations.

- Training same-organization teams advantages: shared methodology, language and terminology.
- Training in teams from different nationalities advantages: better for the exchange with others, bring different perspectives on how to solve a situation. This requires that a previous work is done to share a common framework.

iii. Tools during training

Fire analysts use different tools, science and good practices for different purposes (see AFAN deliverable 2.5) and is therefore necessary that the participants of the exercises know what resources will be provided and what tasks they will be asked to develop in advance.

The tools made available to the analysts are not only printed maps. Applications like mapping application or the website like Copernicus were available to them. When the group of participants is diverse, and not used to work together, discussion and exchange slots must be set up to share tools, but also terminology, knowledge, techniques and the needs of the incident Commander.

iv. The scenarios

The implementation of varied exercises with a wide range of scenarios improves analysts' understanding of unfamiliar events.

The trainees appreciated the mix of field and classroom exercises. However, they would like longer and more complexity in the scenarios.

Different levels of exercises are needed, more generalist approaches combined with exercises that help train specific capacities (see AFAN deliverable D2.2):

- Operational
- Tactical
- Strategic

It is interesting to identify the role and timing of analysts during these different levels.

It is also important to consider the different behaviors driven by realistic or expected situations (e.g. wind-changes, convective fires).

v. Scaling the fire analysis training

Participants agreed that there is currently a lack of training for fire analysis and the community could benefit from the appropriate training organised at a European level. Such training would support the common understanding and the objectives that AFAN promotes.

b. Network and knowledge exchanges:

i. Knowledge exchange and feedback

Training and exchange of knowledge and skills are very important assets in preparing wildfire campaigns. The analysis of the upcoming situation is a key decision support capacity, and the training of these skills and capacities is essential to improve the suppression capacity during the fire season.

The post fire analyses, derive to lessons learnt and improves the knowledge of the organisation managing the fire, and can be also shared with others. What technique did we use? Was it effective? >In what circumstances?

During the exercises in Valabre, participants presented to the whole group their analysis. The presentations of the different fires during the exercises raise questions that are essential for improving the procedures and techniques of the analysis. They also allow us to value the work of the analysts.

ii. European Expert Platform

These exchanges must continue beyond the training courses during the programmes; the European platform of experts must be integrated and without doubt a pool of fire analysts must be created which would support countries that request this expertise in the fight against wildfires. These experts could be made available to requesting countries in the same way as a land or air module, which will be much less available.

iii. Exchange of experts

Unfortunately, the expert exchange programme is still too little known and limits the type of exchanges that experts can have. Different types of networking exchanges across Europe should be encouraged, which would clarify the need and usefulness of fire analysis and facilitate the deployment of a common symbology for tactical situations in the different command posts.

c. Future opportunities

Following the Valabre workshop, the various experts from European countries put forward prospective ideas.

For the vast majority, the workshop created one or more opportunities for follow-up activities at the national or international level in the future, between different organizations/countries.

Staff exchanges, workshop, trainings, field tours could be opportunities to discover the different methods of analysis and exchange different approaches.

The AFAN workshops also raised awareness among European experts who could develop training and analytical skills at home and for some of them to develop this training with neighbouring countries.

Key topics that AFAN's network would like to continue expanding under the UCPM Knowledge Networks Program:

- Cooperation
- Networking
- Interoperability
- R+D in fire analysis
- Training

In conclusion, the AFAN programme has attracted a lot of interest from all participants. It is part of the future steps to 1) continue the networking and facilitation of knowledge-sharing activity and 2) to set up training courses at national and European levels.

7. Standardized European training

The workshop organized in Valabre explored and identified the needs of analysts to empower fire analysis at a European level.

Training must be standardized to share a common understanding and be able to increase interoperability.

7.1. Example of a training course

This example is indicative. It takes into account the remarks made during the workshop organised in Valabre. It will necessarily have to evolve according to future needs.

Beforehand, there is a self-learning online module, where all materials will be available to the participants. This will allow future trainees to study the programme for the next workshop. They will arrive with a deeper knowledge, and, above all, they will have identified the knowledge that needs to be deepened.

The capacities and skills to be trained during each course are defined per levels and based on the fire analysis frameworks that have been defined during the AFAN project: D2.2. Guidelines on fire analysis competencies and skills (Castellnou et al., 2021) and D2.6. Guidelines on remote assessment (Tonarelli et al., 2022).

The future trainees access these courses and arrive on the day of the training course with the required knowledge (analysis of the intervention area, identification of meteorological parameters, identification of plants, analysis of the relief...). The trainer only has to ensure that the knowledge is properly understood and implemented.

The themes of the feedback are to be defined with the training manager according to availability and the allocated budget.

The scenarios for the exercises must be prepared in advance. If a simulator is used, the modelling work and time required must be taken into account.

Table 3: Example of time table. Source: Training school of Valabre

	lundi	mardi	mercredi	jeudi	vendredi
9h00 - 10h00	Presentation of trainers and trainees	Identification of necessary resources	Indoor exercise and/or simulator	Field exercise: intelligence gathering in the field, prioritisation of risk areas	End of course colloquium
10h00 - 11h00	European tools	Drafting of a common document			
11h00 - 11h30	Coffee break	Coffee break	Coffee break		Coffee break
11h30 - 12h30	Implementation of tools	Presentation and handling of the simulator	Debriefing		Minutes of the Colloquium - review of the week
12h30 - 13h30	lunch	lunch	lunch	lunch	lunch
13h30 - 14h30	Polygon method	Indoor exercise and/or simulator	Indoor exercise and/or simulator	Report of the meeting	Departure
14h30 - 15h30	Application exercises			Debriefing	
15h30 - 16h00	Coffee break	Coffee break	Coffee break	Coffee break	
16h00 - 17h00	Feedback: valorisation of the polygon method	Debriefing	Debriefing	Feedback: mega fire in Southern Europe	
17h00 - 17h30		Feedback: analysis report	feedback: mega fire in Northern Europe		

8. Conclusions

The analysis of wildfires is different from anticipation by a scientific study of the terrain.

At a time when more and more countries are involved in wildfires, European resources will have to be shared. Their impact will be less important and, consequently, they will always be insufficient.

Analysts have a major role in the management of wildfires and national strategies are integrating them into the operational system. The result of their reflection allows for the optimisation of the use of means and the use of various techniques (toolbox).

At the European level, it is necessary to train experts in all countries and to create modules, in the voluntary pool, of analysis teams to reinforce the means of fighting in countries in need.

Training extended to all EU countries could be organised under the Nemausus programme or some project with similar characteristics which is capable of facilitating the exchange of professionals among different organizations. Trainers from all countries would supervise these short courses.

Finally, beforehand, European teams could carry out remote analyses. A liaison officer would collect all the necessary information: relief, meteorology, water stress of the vegetation, type of vegetation, means of control, etc.



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