



Initiative for Global management of big fires through Simulation
ECHO/SUB/2015/718664/PREP01 IGNIS

IGNIS UK EXERCISE REPORT



HUMANITARIAN AID AND CIVIL PROTECTION



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INTRODUCTION

The UK National Exercise of the IGNIS Project was held on 12th to 16th June 2017. The exercise was held at Northumberland Fire and Rescue Service's Headquarters at West Hartford Business Park, Cramlington, Northumberland, NE23 3JP, UNITED KINGDOM.

The UK exercise was one of four national simulation (virtual reality) exercises designed and delivered during the IGNIS Project. The UK national exercise was designed and delivered by wildfire and incident command specialists from Northumberland Fire and Rescue Service, with the guidance and assistance from colleagues working within the IGNIS Project partner organisations and the IGNIS Project Independent Advisory Board.

A total of four transnational exercises were successfully designed and delivered by the IGNIS Project partners:

No.	Lead developer	Date delivered	Country of delivery
1	Escola Nacional de Bombeiros (ENB)	14 – 18 November 2016	Portugal
2	Corpo Nazionale dei Vigili del Fuoco (CNVVF)	8 – 12 May 2017	Italy
3	Northumberland Fire and Rescue Service (NFRS)	12 – 16 June 2017	UK
4	ENTENTE pour la forêt Méditerranéenne (ENTENTE)	November 2016, May 2017 and June 2017	Portugal, Italy and UK

Exercises 1, 2 and 3 were developed and delivered as one 3-day long exercise within three of the project partner countries. By contrast, Exercise 4 was developed by the coordinating partner of the IGNIS Project in collaboration with a number of fire and rescue services and was delivered and tested in smaller parts within short sessions held during each of the other national exercises.

Following the delivery of each exercise (or stage of an exercise), the IGNIS partners competed evaluated the key elements of the exercise design and delivery. This evaluation was informed by feedback provided by the exercise developers, the instructors, the participants and the IGNIS Project partners and Independent Advisory Board. This feedback loop was of crucial importance for modifying and improving the design and delivery of subsequent IGNIS exercises.



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1. DATE

The simulated scenario of the UK exercise involved a large and complex wildfire incident taking place in Northumberland (UK) on 23rd, 24th and 25th August 2016.

This exercise was delivered over three whole days on 13th, 14th and 15th June 2017. The exercise was played by 3 different teams of officers/participants (one team per day) from within Northumberland Fire and Rescue Service.

2. LOCATION

The simulation exercise was held in the virtual environment of Valabre Island, a 10km x 10km virtual world incorporating a large rural and rural-urban interface environment. For the purpose of the exercise, this virtual environment was “located” within the County of Northumberland and therefore the policies and procedures used by Northumberland Fire and Rescue Service (NFRS) were applied and followed.

The actual physical location of the UK exercise was NFRS’s Headquarters in Cramlington, Northumberland. The exercise was played in a variety of different meeting rooms and utilised NFRS’s Incident Support Unit (ISU), a mobile command vehicle deployed to emergency incidents within Northumberland.

3. EXERCISE PLANNING

Planning for the IGNISUK Exercise began in 2016 during the early stages of the IGNIS Project. Officers from NFRS worked with colleagues from Escola Nacional de Bombeiros (ENB) in Portugal, ENTENTE pour la forêt Méditerranéenne (France) and Corpo Nazionale dei Vigili del Fuoco (Italy), the four partner organisations of the project, to design four large wildfire scenarios that could form the basis of four national/international wildfire exercises to be held during the IGNIS Project.

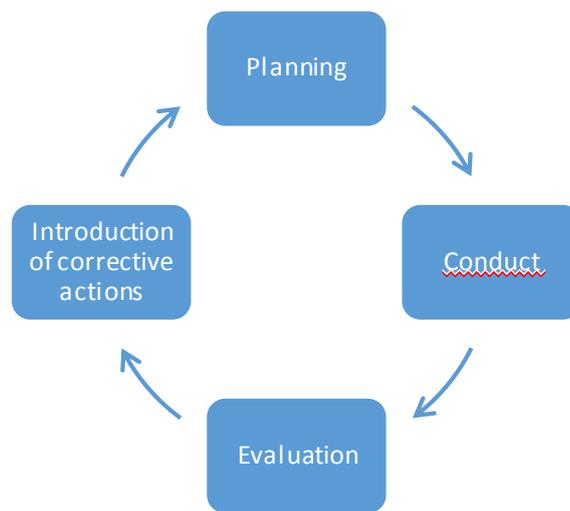
A key foundation for the planning and design for the IGNIS exercises began during two workshops held during the first year of the project: one held in France in May 2016 and the second also held in France in September 2016. During the first workshop, the partners decided to follow the Exercise Planning Cycle advocated by organisations such as the Federal Emergency Management Agency (FEMA). A copy of the cycle is included over the page. This cycle views exercises as a cyclical and ongoing process, whereby an exercise is designed, implemented, evaluated and then improved. This process was followed throughout the IGNIS Project with the four exercises being held at different times throughout the project to enable the project partners to debrief and evaluate each exercise and then feed the findings directly into the planning, design and implementation of the next exercise. The UK exercise was the final exercise of the four to be delivered and thus benefitted from the



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evaluation and feedback generated from the other exercises. Nevertheless, the IGNIS partners continued to use the exercise cycle throughout the whole project to guide their work and identified further improvements from the evaluation of the UK exercise that can be applied to future wildfire simulation exercises that are delivered after the IGNIS Project.

Figure 1 – Exercise Cycle



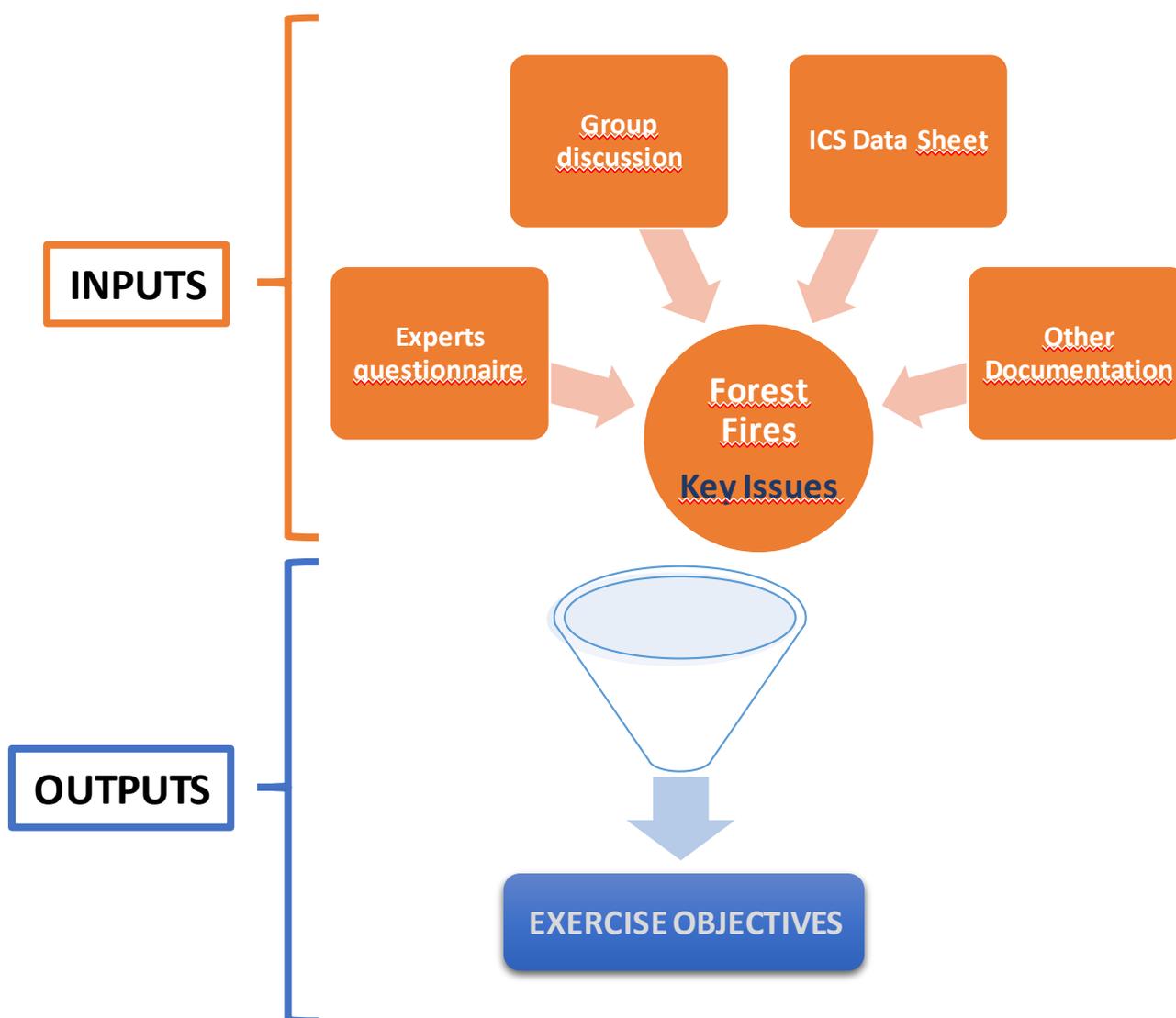
The planning phase of the exercise cycle was broken down into an eight-step process by the IGNIS partners during the first workshop:

1. Assess needs;
2. Define scope;
3. Write a statement of purpose;
4. Define objectives;
5. Compose a narrative;
6. Write major and detailed events;
7. List expected actions;
8. Prepare messages.

To complete steps 1 to 4 of the planning process, the IGNIS partners needed to gather a range of information and hold a number of discussions and debates during the first and second workshops. This whole process helped the partners to identify potential strengths, weaknesses and opportunities with regards to the development and implementation of cross-border and national wildfire simulation exercises. The IGNIS partners, led by Escola Nacional de Bombeiros (lead partner for the

development of the IGNIS exercises), used a number of elements as inputs to the initial discussion process. These inputs are shown in Figure 2, over the page. The IGNIS partners then identified 8 key objectives that all four the national exercises (including the UK exercise) would need to address. These objectives are shown in Section 3.1 of this report.

Figure 2 – Process for developing suitable Exercise Objectives for the IGNIS Project Exercises



Between May and September 2016, the IGNIS partners worked together to develop a consistent and coordinated approach to the design and content of the national exercises. During the second planning workshop (France, September 2016), the partners completed steps 1 to 5 of the planning phase for their exercise, shared and discussed the draft exercise plans with the other partners and made a number of amendments. This approach ensured that the four exercises being developed were consistent in style and approach but sufficiently different so as to produce a bank of four



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exercise scenarios that could be used within all of the partner countries. Following the completion of this valuable collaborative foundation work, the IGNIS partners returned to their home countries and continued to plan their exercise through the completion of steps 6 to 8.

For those partners that had no prior experience of using the simulation software being used during the IGNIS Project (NFRS and CNVVF), a week-long training session was organised by the software company. These sessions were held during September 2016 in the UK and Italy. Following the completion of the software training, the partners worked together to develop realistic fire spread patterns to feed into their scenarios. These spread patterns were calculated using a fire spread prediction model (called IGNIS) which is a separate piece of software that is also linked to the Valabre Island map through georeferenced points. Although time intensive, it was possible for the exercise teams to cross-reference the spread patterns and rates shown on the IGNIS software map of Valabre Island and then manually transpose this onto the virtual world of Valabre Island within the separate piece of software used for the simulation. The partners used a process of trial and error to experiment with different wind speeds and directions to literally “design a fire” that would spread realistically and compromise sufficient sites of key interest at different times during the 3-day exercises. For the UK exercise for example, it was necessary to instigate a wind direction shift on day 3 as the continuance of the wind speed and direction of day 1 and 2 would have caused the fire to spread into a lake and self-extinguish itself during the early phases of day 3, leaving the incident commander and their team with nothing to do which would have compromised their ability to achieve the aims and objectives of the exercise.

The spread patterns which were used to build the fire spread within the simulator for the UK exercise are shown in Annexes 1, 2 and 3 and were developed by NFRS and ENTENTE pour la forêt Méditerranéenne.

It is important to note that all of the IGNIS partners were assisted and guided during the exercise planning phase by members of the IGNIS Project Advisory Board, a group of independent experts in incident command and wildfire suppression training. The IGNIS Advisory Board provided an external quality assurance process so as to ensure that the exercise scenarios being developed could be potentially suitable for use in other EU countries outside of the IGNIS partnership.

Further information about the IGNIS Project and Advisory Board can be found on the IGNIS Project website: www.ignis-project.eu

3.1. Exercise objectives

The planning phase of the UK exercise identified the need for eight exercise objectives. These eight objectives were common to all four of the IGNIS exercises and were deliberately aligned to the incident command competencies for Level 3 and Level 4 fire and rescue service incident commanders in the UK. The decision to align the objectives to the UK competencies was taken following some lengthy discussions and debates during the first meetings of the IGNIS project partners in 2016. It was decided that this alignment would provide a good common framework from which all of the IGNIS partners could work to. It also enabled the partners to design, deliver and evaluate all of the IGNIS exercises using a consistent approach.



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The eight objectives were to assess:

Obj #1	Employ behaviours that permit the collection of relevant incident information.
Obj #2	Gather sufficient information regarding the incident type, size, complexity and resources.
Obj #3	Gather and interpret the information to develop an understanding of the current and developing incident.
Obj #4	Utilise an appropriate decision strategy for the situation.
Obj #5	Implement a plan that includes objectives, strategies and tactics.
Obj #6	Employ satisfactory communication behaviours throughout the incident.
Obj #7	Implement decisions utilising coordination & control behaviours.
Obj #8	Review the incident situation and modify the incident decisions and plan.

3.2. Narrative

General Situation

The date of the UK exercise scenario was set as 23rd August 2016. According to the scenario, there has been a period of 3 weeks of drought in Northumberland prior to this date. There are a number of wildfires ongoing around the UK as similar conditions have been experienced across the whole country. For example, there are a significant number of wildfires in northern and central Scotland.

On 23rd August 2016 a fire started in the forest near the town of Guevac at 10:00hrs. The fire was caused by a campfire that had not been fully extinguished. A member of the public walking their dog in the area called 999 to report the fire and Fire Control immediately mobilized a Pre-Determined Attendance (PDA) of 4 fire appliances and 1 Incident Support Unit¹ (ISU). The first crews were delayed arriving at the scene due to difficulties in identifying the precise location of the fire. This delay was the combined result of:

- vague information being passed on to Fire Control by the member of the public who reported the incident;
- difficult access to the area;
- and, limited visibility.

Three fire appliances shortly followed the arrival of the first appliance. The ISU arrived at 12:00hrs. At 11.40hrs the Incident Commander of the first fire appliance contacted Fire Control to make pumps 10 and request the attendance of a Tactical Commander. The Tactical

¹ Mobile Command Unit.



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Commander arrives at the ISU at approximately 12.15hrs, where he/she receives a briefing and handover. The Tactical Commander then takes charge of the incident. This is where the exercises starts from the point of view of the exercise participants.

Organisations potentially involved

The nature of this complex exercise meant that a number of external partner agencies might be involved in elements of the incident response at some point during the three days. It was not possible to have sufficient individuals involved in the exercise from all of these organisations, so a degree of simulation was organised through role playing and radio messages.

The exercise planning team anticipated the real or virtual involvement of the following organisations during the exercise:

- Fire and Rescue Services
- Police
- Ambulance
- Forestry Commission
- UK Borders Agency (Immigration)
- Civil Aviation Authority/Air Traffic Control
- Northumbrian Water
- Power/Utility Company
- Environment Agency
- Natural England
- Northumberland National Park Authority
- Ministry of Defence
- Mountain rescue
- Civil Contingencies Team (NCC/NFRS)
- Northumberland County Council
- National Coordination Advisory Framework (NCAF)
- European Civil Protection Mechanism (EU) and Cabinet Office (UK Government)

Weather conditions and forecast

The 3 weeks prior to the exercise scenario date had been characterised by distinctive weather conditions, including:

- Very low relative humidity levels of 40 per cent
- Strong to high winds of 30 km per hour, in a north easterly,
- Medium to high temperatures of 20 to 28 degrees Celsius.

According to the UK Met Office, these conditions were expected to continue for the next 5 days after the scenario date. The conditions had also contributed to the Fire Severity Index which was set at 5². The Fire Severity Index risk in most parts of the UK was set at 4 or 5 for

² The Met Office's Fire Severity Index (FSI) is a daily assessment of how severe a fire could become if one were to start. It is not an assessment of the risk of wildfires occurring. The FSI provides a trigger for fire prevention restrictions on access land mapped under the Countryside and Rights of Way Act (2000), but it is also used as a



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the same period, indicating a “very high” or “exceptionally high” fire severity rating for the whole England and Wales.

Critical aspects

Extreme weather conditions and very high risk of fire and fire spread. This scenario potentially puts populations at risk and may threaten the resilience of the Fire and Rescue Service.

Operational Details

Estimated period of intervention: 4 days

Point of entry for aerial assistance: Guevac Airport (small commercial airport).

Activation of the EU Civil Protection Mechanism and management of EU aerial resources: The EU Civil Protection Mechanism is activated on Day 1 of the incident following a request by the UK Government for aerial assistance to help fight the fire near Guevac. An offer of assistance of 4 Canadair is offered by France and deployed that evening to travel to the UK. The aircraft arrive on Day 2 of the exercise and are available from that point forward for deployment. Upon arrival of aerial resources and accompanying crew, it is expected that an Aerial Sector Coordinator will be appointed by the Incident Commander and will be requested to meet and brief the pilots. The ASSC will be expected to establish effective communications with the pilots and relay the most relevant information to/from the pilots concerning water filling points (scooping points), water drops, take-off and landing areas and support to the aerial sector from the ground.

Positions and resources

A number of different resources were placed within the simulation and/or were potentially available to exercise participants. The key types of resources that were available are now listed below under a number of different categories:

- Firefighting resources on the ground
 - Incident Support Unit (ISU) – command unit
 - Firefighting appliances (water tenders) with crew with beaters and hoses
 - Firefighting 4x4 vehicles with crew with beaters and hoses
 - Fire officers (avatars) to fulfil different roles required within the Incident Command System
- Resources from other partner agencies:
 - transport for evacuations (minibuses, coaches)
 - forestry operators and equipment
 - police vehicles, police officers and road blocks
 - Avatars for officers from other partner agencies
 - Evacuation centres to receive evacuees were pre-identified in Guevac (small centre) and in Esperac (large centre) and the resources available

planning tool by some Fire and Rescue Services to determine their preparedness actions and resource pre-deployments. Further information about the FSI can be found online at: <https://www.metoffice.gov.uk/public/weather/fire-severity-index/>



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within these centres were taken from a list of resources for similar sized centres that exist in Northumberland

- Aerial firefighting resources (based or arriving into Guevac airport):
 - Police helicopter providing aerial observation and reconnaissance (available on days 1, 2 and 3)
 - 4x Canadair from France (available on days 2 and 3)

On days 1, 2 and 3 the Incident Commander (exercise participant) starts the exercise from their position within a vehicle at the Fire Station near the town of Guevac. The first participation required from the participant was therefore to navigate and drive to the Incident Support Unit where they received a briefing and handover from the incident commander that they were replacing. This situation replicates the reality faced by all incident commanders who are required to mobilise from a fire station and/or their home to respond to an incident. It requires participants to employ and demonstrate the ability to process information from a radio message, determine a suitable route to the ISU and then drive to the location. The exercise operators also ensured the realism of the drive by placing vehicles in different locations and in simulating the movement of traffic around the town of Guevac.

All other exercise participants started the exercise on their given day in the location that they were allocated by the exercise directors/operator. For example, the start point for the commander of sector 1 was a location within sector 1. Their first task was to orientate themselves on the ground and map and to survey their surrounding area. They completed this orientation while the Incident Commander was driving to the ISU. All exercise participants were provided with some basic information about their role and situation so that they could participate in the exercise as soon as required/requested by the Incident Commander and/or exercise directors.

4. EXERCISE CONDUCT

4.1. Supervision, Direction and Control

Exercise Directors

Due to the size, scale and complexity of the UK Exercise, there were three exercise directors in overall control of the exercise:

Name	Position
Robert Stacey	Wildfire Project Officer and Lead Officer for Northumberland Fire and Rescue Service on the IGNIS Project
Gary Laskey	Lead Wildfire Instructor for Northumberland Fire and Rescue Service
Amy Hately	Wildfire Instructor for Northumberland Fire and Rescue Service



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The three exercise directors supervised the simulation and the overall running of the exercise over the three days. They had overall responsibility for all elements of the exercise and for ensuring the exercise ran as planned and that objectives were achieved.

All three exercise directors were involved throughout the entire exercise design process and had a detailed knowledge and understanding of all key elements of the project. The three exercise directors maintained direct contact with one another throughout the entire exercise via a dedicated radio channel. Any key decisions regarding the running of the exercise were discussed and agreed via radio. When decisions were with a very detailed was facilitator by 3 Exercise Directors.

Role Players

Role playing was an extremely important element of the project as it enabled the direction team to promote realism within the simulated scenario. 5 individuals were tasked with role playing during the exercise. Some of the role players played a single role, while others were requested to play multiple roles over the three days.

The five roles players were:

Name	Position
Bruce Hardy	Wildfire Instructor
Keith Kelly	Wildfire Instructor
Ben Allan	Civil Contingencies Officer
Nigel Fisher	Civil Contingencies Officer
Ian Irving	HVP Capabilities Officer (National Resilience)

Role players were given scripts which outlined their roles and provided important information that they may need to pass on to exercise participants at different points in the exercise. They were also given a briefing explaining the exercise scenario and how they should perform their roles. Role players were requested to contact one of the exercise directors if they had any queries during the actual exercise.

Participants

There were a total of 39 participants³ who were directly involved in the playing of the exercise over the three days.⁴ The individual participants are listed over the page⁵:

³ Please note that 6 individuals participated on more than one day of the exercise. These officers performed slightly different roles on the different days of participation.

⁴ Note that this figure excludes exercise staff that controlled, facilitated and evaluated the exercise. There were an additional 10 exercise staff directly involved in the running of the exercise. There were additional personnel from NFRS indirectly involved in the exercise but who were also vitally important for helping to ensure everything ran smoothly on the day. These additional roles included providing assistance with communication activities, managing food and refreshments and providing transport to the IGNIS partners. .

⁵ Please note that this list is purely those that were involved as exercise participants/players .

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Participants on Day 1 of the UK exercise included:

No.	Name	Position	Role in Exercise
1	Paul Langdown	Station Manager	Incident Commander
2	Stephen Kennedy	Station Manager	Operations Commander
3	Glenn Thompson	Watch Manager	Sector Commander 1
4	Martin Kammeier	Watch Manager	Sector Commander 2
5	Steven Walker	Watch Manager	HVP ⁶ Sector Commander
6	Stuart Mackenzie	Crew Manager	Wildfire Tactical Advisor ⁷
7	William Davison	Crew Manager	Command Support Officer
8	Michelle Peel	Firefighter	Command Support
9	Stuart Dixon	Firefighter	Command Support
10	Lindsay Bowling-Mowatt	Firefighter	Command Support
11	Gary Laskey/Amy Hately	Watch Managers	Helicopter Pilot

Participants on Day 2 of the UK exercise included:

No.	Name	Position	Role in Exercise
1	Gary McMorron	Station Manager	Incident Commander
2	Paul Langdown	Station Manager	Former Incident Commander ⁸
3	Andy Railton	Station Manager	Operations Commander
4	Steven Walker	Watch Manager	Sector Commander 1
5	Darren Nelson	Station Manager	Sector Commander 2
6	John Wright	Station Manager	Sector Commander 3
7	Stephen Milburn	Watch Manager	Wildfire Tactical Advisor ⁹
8	Glenn Thompson	Watch Manager	Helicopter pilot
9	IGNIS partners ¹⁰	Various	Canadair Pilots

⁶ HVP stands for High Volume Pump.

⁷ Also referred to within NFRS as Wildfire Support Officer.

⁸ Participated at the start of Day 2 to deliver a briefing and complete a handover of command to the new incident commander.

⁹ Also referred to within NFRS as Wildfire Support Officer.

¹⁰ On a rotation basis.

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Participants on Day 2 of the UK exercise (continued from previous page):

No.	Name	Position	Role in Exercise
10	William Davison	Crew Manager	Command Support Officer
11	Robert Stewart	Firefighter	Command Support
12	Stephen Warwick	Firefighter	Command Support
13	Lindsay Bowling-Mowatt	Firefighter	Command Support

Participants on Day 3 of the UK exercise included:

No.	Name	Position	Role in Exercise
1	Robin Clow	Area Manager	Incident Commander
2	Gary McMorron	Station Manager	Former Incident Commander ¹¹
3	Andy Pogson	Station Manager	Operations Commander
4	Mick Tully	Watch Manager	Sector Commander 1
5	Neville Craigs	Station Manager	Sector Commander 2
6	Stephen Kennedy	Station Manager	Sector Commander 4
7	Stephen Milburn	Watch Manager	Aerial Sector Commander
8	Craig Mole	Crew Manager	HVP Sector Commander
9	Mark Dowthwaite	Crew Manager	Wildfire Tactical Adviser
10	IGNIS partners ¹²	Various	Helicopter Pilot
11	IGNIS partners ¹³	Various	Canadair Pilot
12	William Davison	Crew Manager	Command Support Officer
13	Joseph Hunter	Crew Manager	Command Support
14	Ross Gray	Firefighter	Command Support
15	Kerry Shotton	Firefighter	Command Support

¹¹ Participated at the start of Day 3 to deliver a briefing and complete a handover of command to the new incident commander.

¹² On rotation.

¹³ On rotation. Also Chris White, Watch Manager of Hereford and Worcester FRS, was attending the UK Dissemination Event. The exercise team provided him with a briefing and allowed him to participate in this role in the exercise to get some first-hand experience of using the system.



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All participants were provided with a pre-briefing document that explained the basic mechanics of the exercise and the expectations of the participants and the exercise directors. Participants were also offered the opportunity to meet face-to-face with one of the exercise directors to get a short preview of the simulation software being used and to ask basic questions about how the exercise would be run and controlled. A number of participants took the opportunity to meet with one of the exercise directors and this helped them feel more at ease with the exercise and tools being used.

Evaluators

During the course of the UK exercise, two assessors were present to observe the exercise and to provide general feedback about the running of the exercise. The two assessors were managers from the Learning and Development Department and are responsible for designing and delivering Incident Command training and assessing the competencies of NFRS officers.

The two assessors/evaluators were:

Name	Position
Keith Laidler	Group Manager & Head of Learning and Development Department at NFRS
Paul Conway	Station Manager & Lead Incident Command Instructor at NFRS

The exercise was a pilot and the first time it had been delivered in the UK so it was decided that it would not be fair to formally assess the participants. All of the participants were informed in advance of the exercise that they would not be formally assessed and that the assessors present would be observing and evaluating their actions and the exercise delivery in general rather than evaluating the participants themselves.

In addition to recording general observations, the assessors also used an Incident Command assessment tool called Effective Command. The IGNIS partners had decided to test and use this tool during all of the four exercises to record the outcome of the assessments.

Exercise support

A team of individuals were onsite to provide additional support to the exercise to assist with administrative, logistical and technical issues. This support included production of administrative materials by administrative support staff at NFRS, technical support from specialists from XVR and NFRS, and drivers from NFRS who transported the IGNIS partners and participants.

Observers

A key element of the UK exercise was that it was to act as a demonstration to many different stakeholders to how simulation training can be used to train for wildfire incidents. There were many observers present across the 3 days from within Northumberland FRS and from other UK Fire and Rescue Services. There were also representatives of several Northumberland FRS's local partner organisations. In addition, members of the IGNIS project



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partner organisations and the Independent Advisory Board were also present during the exercise as observers. The observers provided verbal feedback to the exercise team that was fed into the debrief and evaluation process.

4.2. Briefing

All of the exercise participants were invited to attend one of a small number of pre-briefing sessions organised 1 to 2 weeks prior to the UK exercise by the IGNIS UK exercise directors. The purpose of this pre-briefing was to provide the officers with an opportunity to use the software and to ask questions of what would be required of them during the exercise. None of the participants from NFRS had ever used this particular piece of software before as part of a simulation exercise, so it was felt that they should be given the opportunity to familiarise themselves with the system prior to the actual exercise. The participants were not shown the actual exercise scenario during the pre-briefings but were shown some generic environments within the simulator and were given some basic instruction on how to move around and interact within the simulator. The majority of officers from NFRS decided to attend one of these pre-briefing sessions and most commented that the sessions had been extremely beneficial.

All the UK exercise participants were required to attend a briefing session held immediately before the commencement of each day of the UK exercise. These briefings followed a set structure, which was based on, but slightly adapted from, the structure used during the IGNIS Portugal and Italy exercises:

Briefing - Part 1 (IGNIS Project)

- What is the IGNIS Project?:
 - Summary overview of the project aims, objectives, activities and expected results
 - Introduction to the IGNIS partner organisations (delivered by each partner organisation)
 - Explanation of the design and planning process for the IGNIS exercise
- Introduction to the three key elements of the IGNIS exercise simulator:
 - IGNIS Wildfire Prediction Model
 - XVR Simulation Software
 - Effective Command Assessment Tool
 - Images from the simulator
- Overview of the IGNIS Portugal (November 2016) and Italy (May 2017) exercises
- Introduction to the IGNIS Project's Independent Advisory Board



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Briefing - Part 2 (UK Exercise of IGNIS)

- Aims of the UK exercise
- Incident Command Assessment Criteria
- Benefits of simulation training for NFRS
- Summary explanation about the scenario and simulated environment
- Explanation of the real-life locations used during the exercise
- Introduction to exercise personnel
- Familiarisation session

The familiarisation session was a key element of the exercise briefing. During this session, all of the exercise participants were given the opportunity to practise using the software and moving around within the virtual environment. This ensured the participants were ready to fully participate in the exercise as soon as it commenced. The inclusion of the familiarisation session was identified during the Portugal and Italy exercises as a vital component of the exercise. A copy of the bullet briefing note that was used to guide the content of the UK familiarisation sessions is included in Annex 4.

The exercise briefings were attended by all of the IGNIS partners and the attending representatives of the Advisory Board, which provided an opportunity for the exercise participants from NFRS to meet the representatives of the different organisations/countries involved.

Following the completion of Parts 1 and 2 of the briefing (and the familiarisation session), all of the exercise participants were given the opportunity to have a short refreshment break. The purpose of this break was to enable participants to process all of the information that had been conveyed to them and also to ask the exercise directors any further queries they had prior to the start of the exercise.

4.3. Debriefing

The debriefing process for the IGNIS UK Exercise involved three key elements:

1. Completion of feedback questionnaires by the exercise participants
2. Hot debrief conducted immediately after the completion of each day of the exercise
3. Cold debrief held on Friday 16th June 2017 with the exercise directors, role players, IGNIS partners and IGNIS Advisory Board members



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The hot debrief held at the end of Day 1, Day 2 and Day 3 followed a standard structure to ensure consistency in approach:

- Completion of the feedback forms by the participants
- Summary overview of the tactical plan delivered by the Incident Commander
- Summary overview of the software operation and facilitation by the exercise directors and other exercise staff
- Group discussion to identify positive and negative aspects of the exercise

A blank copy of the feedback form is included in Annex 4. The same feedback form was used for the IGNIS Portugal and IGNIS Italy exercises in order to generate a dataset that could be directly compared and contrasted by the IGNIS project partners.

4.4. Facilities and equipment setup

The IGNIS UK Exercise was played within a number of different locations on the site of Northumberland Fire and Rescue Services Headquarters. The different exercise participants were separated in order to add to the realism of the incident. The facilities were provided for individual officers to meet face-to-face if they met with each other within the simulation.

The different locations are shown in Figure 3 (below) and Figure 4 (over the page).

Figure 3 – Floor Layout for the IGNIS UK Exercise

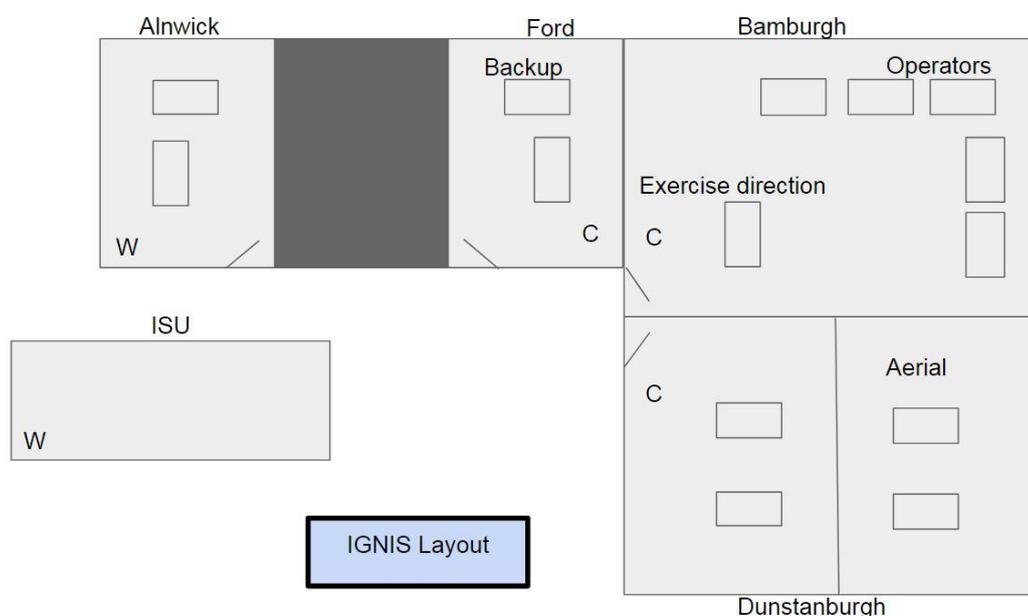
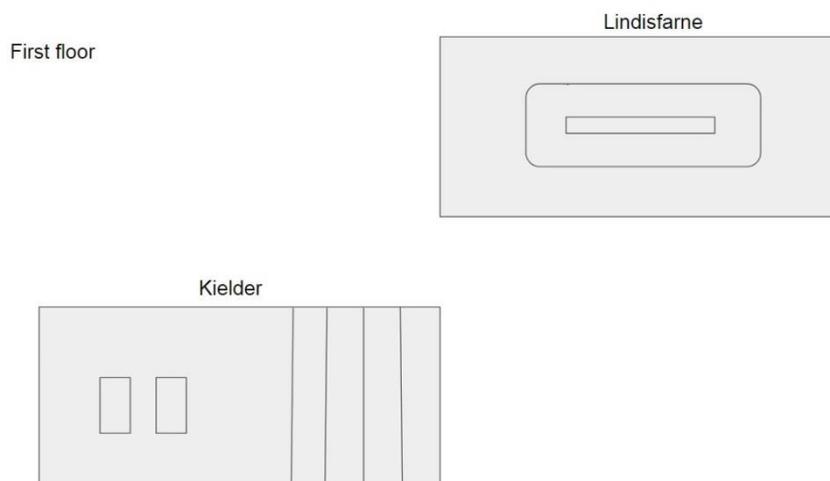


Figure 4 – First Floor Layout for the IGNIS UK Exercise



The uses of the different rooms are now explained briefly in turn:

- **Incident Support Unit** – parked outside the building in the drill yard
- **Bamburgh Room** – exercise operator/directors were based here and there 8x computer stations for use by various exercise participants (sector commanders, tactical lookouts)
- **Dunstanburgh Room** (next door to Bamburgh) – 2x computer stations with projection onto a screen for the aerial resources (helicopter and Canadairs)
- **Ford Room** (next door to Bamburgh Room) – base room for the exercise role players and their costumes and resources
- **Alnwick Room** – a spare room used for ad-hoc meetings during the course of the exercise and storage of equipment not in use at particular times.
- **Kielder Room** (lecture theatre upstairs) – large room used for the briefing sessions at the start of each day and for the debriefing sessions.
- **Lindisfarne Room** (meeting room upstairs) – large room used by the IGNIS partners and advisory board members during the course of the exercise. It provided a base to place materials and equipment and enabled the IGNIS partners and advisory board to meet and discuss the exercise while it was running.

The exercise operator had a master laptop that was linked via a router network to all of the other laptops within the exercise participant stations via a router network. The operator controlled the simulation that was projected onto the screens of each of the different stations. The participants were then able to walk around and interact with the scenario from their work station.



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The Incident Support Unit and individual work stations were all supplied with radios to enable participants to communicate with one another. The work stations and ISU also had access to the following equipment:

- NFRS Wildfire Standard Operating System
- SMEAC Briefing Forms
- LACES safety protocol
- Radio to communicate with other exercise participants and with the exercise staff
- Pens and notepaper

The exercise directing staff and role players all had a radio to enable them to contact one another. The exercise staff used two channels for communication:

- Channel 1 – a channel just for the exercise staff to use (not the participants) to manage and control the exercise
- Channel 2 – a channel used during the exercise by the participants and exercise staff to relay information and messages regarding the unfolding situation and scenario.

4x GoPro Hero Cameras were purchased for the IGNIS Project UK exercise. These cameras were placed in the main exercise room to monitor the exercise from start to finish. The ISU already has a camera recording system in place which monitored the actions and behaviour of the incident commander and incident command support team that assisted the IC. All of the exercise participants and staff were all made aware of the existence of the cameras and none objected to their presence.

This video footage was used during the exercise by the exercise directors to monitor the exercise participants and assess their involvement in the exercise. It was also used as a record of the exercise for the cold debrief process. In future, video recording of simulation exercises may be a very valuable tool for assisting with the hot debrief process, taking a participant back to where they made a decision to explore that decision-making process to evaluate the participants performance against the competency criteria.

5. EXERCISE EVALUATION

5.1. Participants' assessment (Effective Command)

The Effective Command Tool automatically generated an evaluation report based on the data inputted by the two exercise assessors. This report focused on the behaviours and actions demonstrated by the incident commanders during the 3-day exercise. The report also generated feedback for areas where the participants perhaps failed to demonstrate a competence at the appropriate level.

The outcomes of the three assessments completed by the evaluation team were that all three incident commanders had satisfied the assessment criteria for their role/function. This information was passed onto the individual incident commanders, but it was re-stressed that



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the exercise was a pilot and that the outcome of the assessment was not being recorded on their personnel file.

The other findings of the evaluation team with regards to the Effective Command tool are expressed below by one of the evaluators, Group Manager Keith Laidler (NFRS):

“As a member of Northumberland Fire and Rescue Services (NFRS) evaluation team for the IGNIS Wildfire simulation exercise which took place within Northumberland please find outlined below my personal findings and observations specifically around the "Effective Command" assessment tool;

- We initially encountered some technical problems regarding connectivity to the main site this was compounded by the connection at times "tripping out" periodically whilst in the middle of data inputting which hampered the tools use, similar problems were encountered when trying to utilise the mobile application due to connectivity and device compatibility, once these problems were rectified the system worked extremely well during all aspects of use.
- The effective command tool proved to be very user friendly, it followed a logical progression and has obviously been designed by people who understand the roles not only of the end user (assessor) but also that of the participant.
- The information tab acts as a good prompt when seeking clarification and or justification when apportioning scores.
- The ability to add comments to each section proved invaluable when it came to actually feeding back to the individuals on a face to face basis.
- The automatic generation of a final report / summary which ultimately forms the basis of candidate feedback and any subsequent development plan was an excellent feature and again showed designers had a knowledge and understanding not only of the incident command subject matter but also the end users.
- Overall I was very impressed with the tool, I found it easy to navigate through, inputting data was quick and effective even when moving from the externally sited incident command vehicle to the simulated exercise site located across a number of floors and rooms within NFRS HQ.”

The key finding of both members of the evaluation team for the UK Exercise was that the Effective Command Tool was suitable and fit for purpose for assessing UK fire officers through command of simulated wildfire incidents. The Effective Command tool worked well when used with the simulation software and overall exercise design. The only minor issues experienced concerned some initial technical problems, but these were quickly rectified. This experience of minor difficulties reiterates the importance of rigorously testing new software systems (such as the UK IGNIS exercise) prior to using them for “real” exercises and assessments.

5.2. Participants’ Debriefing

The participants debriefing sessions were extremely valuable and generated some very useful and constructive feedback for the UK exercise team and the IGNIS partners as a whole. The debriefing sessions began with each participant completing the two page feedback form. The exercise participants then discussed the tactical plan that was developed and

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implemented by the Incident Command during the exercise and then there was an open discussion about all elements of the exercise.

The feedback forms included nine closed questions that were intended to gather participants' general thoughts and opinions about the key elements of the exercise. These were designed to be relatively quick to complete. The responses to these closed questions are now presented in Figures 5 to 13.

Figure 5 – How do you rate the objectives of the exercise?

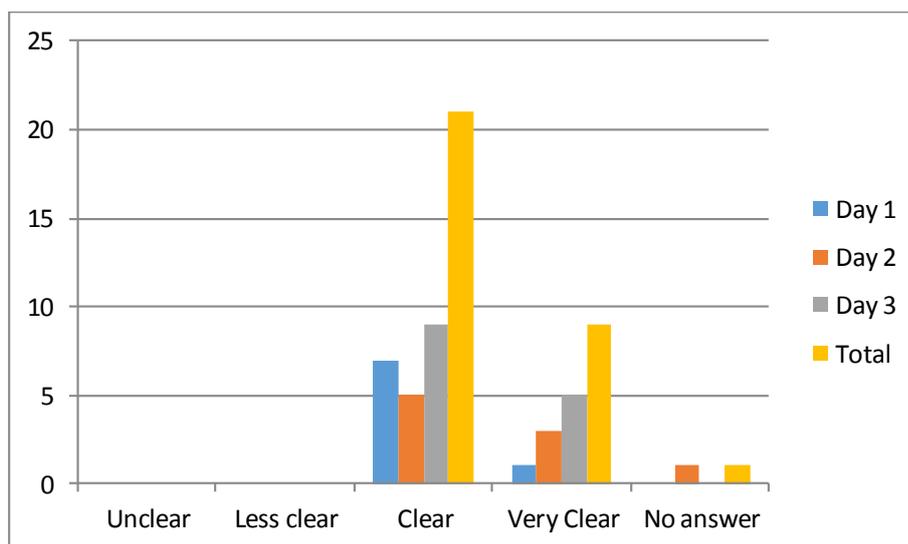


Figure 6 – How important is the briefing to the development of the exercise?

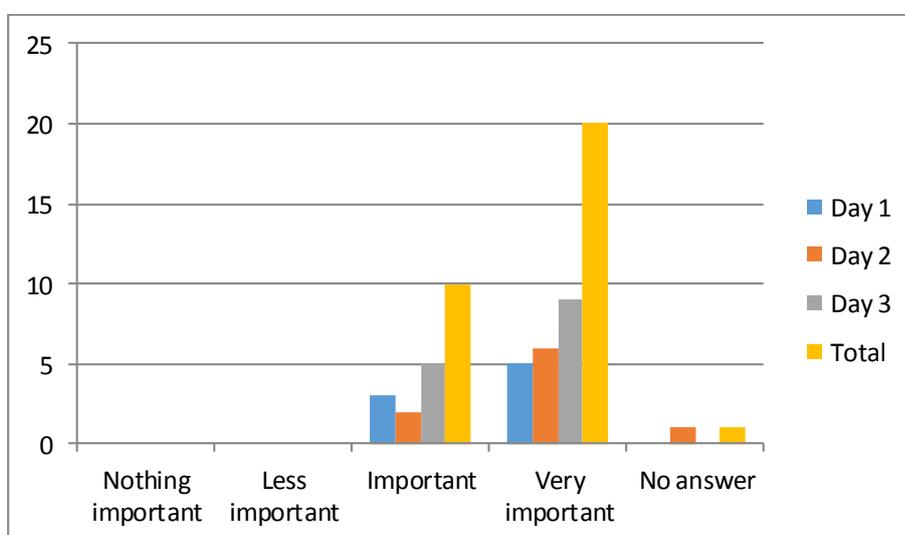


Figure 7 – How do you rate the initial adaptation to the simulation tool for the development of the exercise?

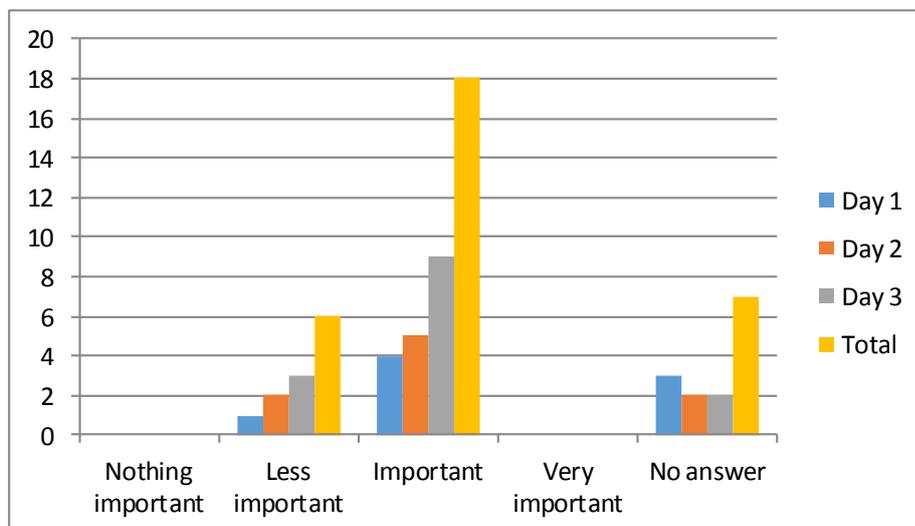


Figure 8 – How do you rate the response of the DIRDEX to the requests from the participants?

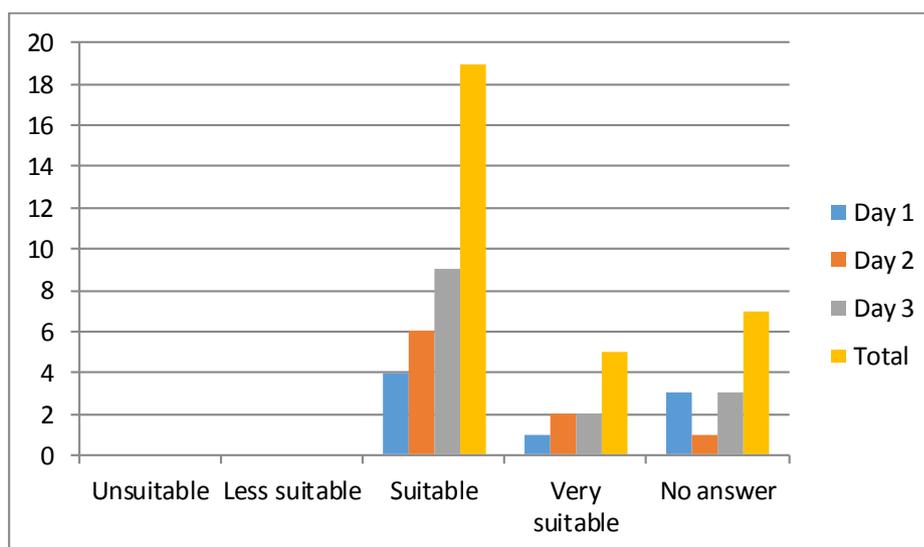


Figure 9 - Do you consider that you have the right tools to perform the function in the exercise?

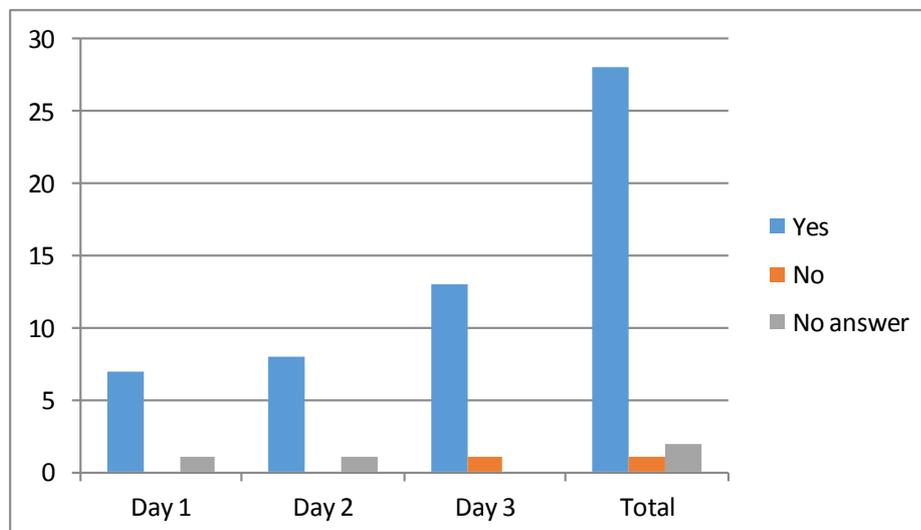


Figure 10 - How do you rate the use of virtual reality in the development of this type of exercise?

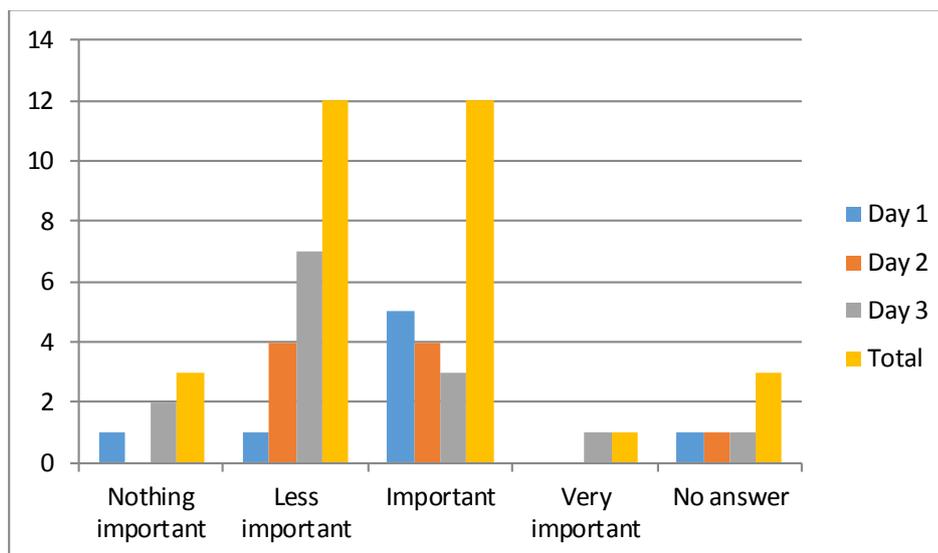


Figure 11 - Do you consider that participation in this type of exercise contributes to the improvement of your operational performance?

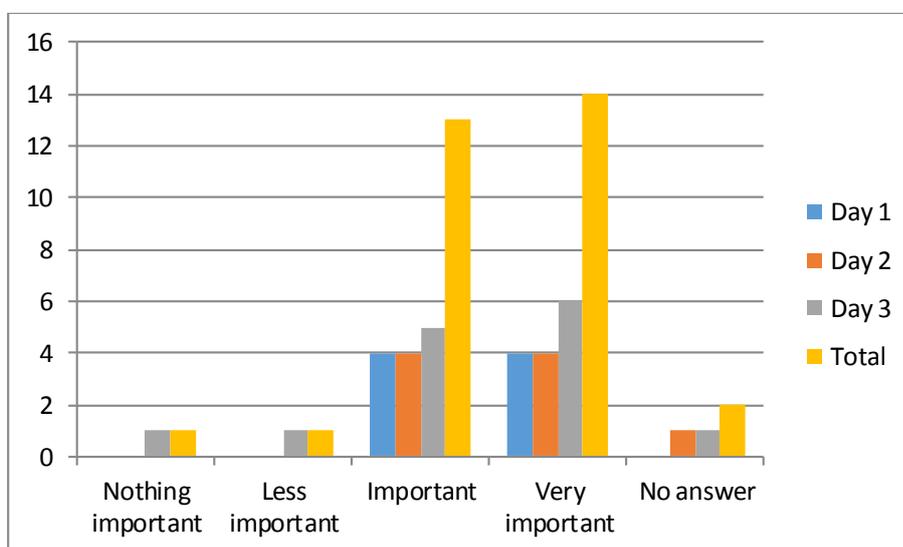


Figure 12 - According to your expectation, how would you rate the exercise?

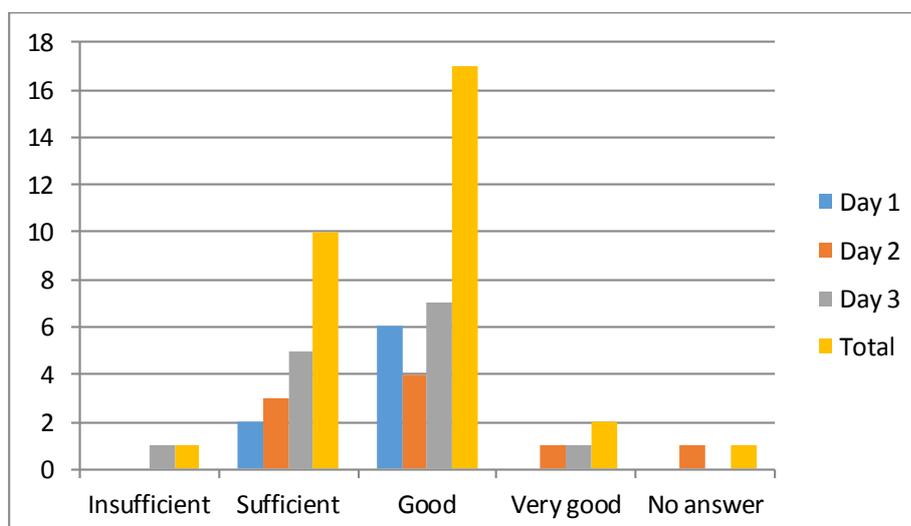
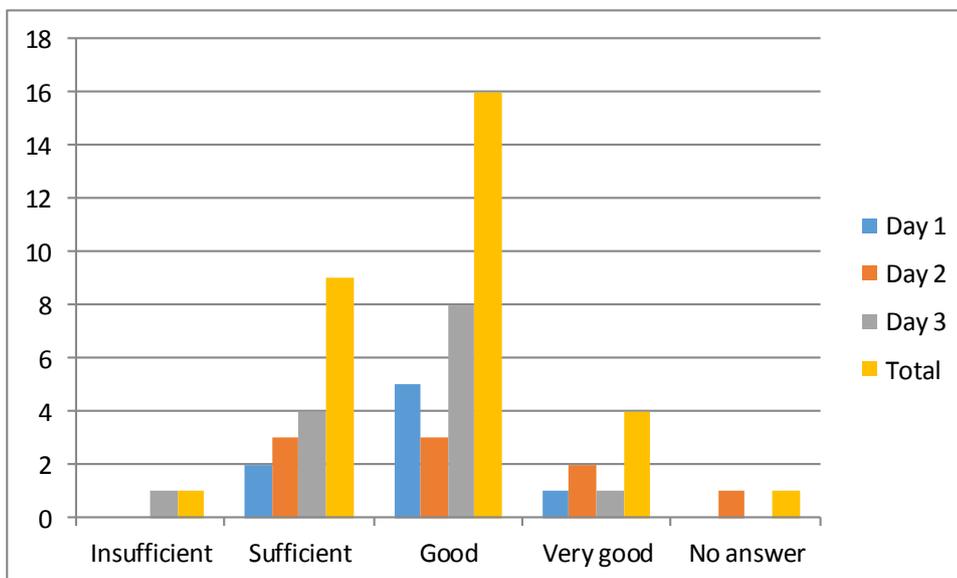


Figure 13 - In general, how would you rate the exercise?



The general feedback provided by the UK exercise participants was largely very positive towards the UK simulation exercise. In short, the majority of the UK exercise felt that:

1. The exercise objectives had been clear or very clear
2. The briefings had been important or very important
3. The initial adaptation to the simulation tool had been important
4. The responses of the DIRDEX (Exercise Directors) had been suitable or very suitable
5. They had been given the right tools to perform their function during the exercise
6. The use of virtual reality was either important or less important
7. The exercise was either important or very important for improving their operational performance
8. According to expectations, the exercise had been sufficient to good
9. General opinions of the exercise were that it was sufficient, good or very good.

Only one participant rated the UK exercise in general terms to be insufficient. It was not clear from the feedback exactly why this response was recorded, but it could be that this type of technology needs to be used more in training to make it more familiar for some members of the service. It may also be that more familiarisation training is required to enable all members of NFRS to feel that they have the necessary skills to fully participate in the simulation exercise.

Interestingly, the split of responses to question 6 was investigated during the open discussions and reasons were given. The split in responses came from those that performed different roles/functions during the exercise. The Incident Commanders who were responsible for commanding the whole incident did not actually interact very much with the software, except during the drive up to the incident. They tended to feel that the virtual



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reality element was not so important for them, as information being fed to them could be simulated in other means (such as via messages, role players etc.). Those participants that were playing other functions actually on the ground within the environment (including sector commanders, tactical lookouts and aerial sector commanders) found the virtual reality element was important to them as it provided them with a scene in front of them to observe, monitor and report on. To them, the virtual reality reflected near-realism of an unfolding incident.

The final question on the feedback forms provided some space for the exercise delegates to provide more detailed feedback about anything they wanted to raise, both positive and negative. The comments provided by the UK exercise participants are provided below, as written in their own words:

Responses to Q10 of the Feedback Questionnaire - Suggestions/Notes

Participants on Day 1

“Access to the map that could be used to populate and show progression of the job is needed”

“I had no participation for Q3 and Q4.”

“Requires more robust briefing before commencement. Requires all appliances to RVP at Incident Command before deploying – as per NFRS requirements”

“Any chance to include rate of spread into simulation?”

Software seemed to lag as incident progressed.”

Participants on Day 2

“Suggest a more user-friendly simulation control system.”

“Encourage participants to interact more i.e. not work in isolation.”

“Confirm final decision makers of sectors and overall incident.”

“Invaluable learning opportunity that needs to be maximised for all personnel involved.”

“System began to run slow (moving vehicles issue). No Grid Ref or GPS on computer screen. No real time clock.”

“Fire extinguished when water applied. This could be improved when using Canadair.”

“Software very difficult to drive vehicle, move about site. Grid Ref on screen could be helpful.”



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Participants on Day 3

“I didn’t directly observe impact of the software but am confident the learning outcomes could be achieved without the software.”

“Excellent exercise, which is essential for maintaining command competence. Great opportunity to work with ISU and crew.”

“The location map was unrealistic as an island as some towns only had one access...
[remainder unreadable]”

“I found the software did not contribute positively to the exercise. Although overall I did think the exercise was beneficial.”

“Command support did not play role in software/XVR.”

“VR is effective for IC levels 1 and 2. Not so much for 3 and not for 4.”

The UK exercise team found that all the comments that were raised during the open discussions were also documented on the feedback forms within the additional comments section, so for the sake of brevity (and to avoid duplication) only the comments recorded on the feedback forms have been included within this section of the report.

Please note that specific improvements raised by the exercise participants are included with all other suggested improvements explained in Section 7 of this report.

5.3. Observers feedback (partners and experts)

The IGNIS Project partners and advisory board members provided some valuable feedback about the UK exercise. They were present throughout the week and observed the exercise taking place across the 3 days. In general terms, the observers concluded that the exercise as run very well on all three days, but that they also noticed signs of improvements as they week progressed. This is natural considering it was the first time that the team within NFRS had delivered an exercise of this nature and there was an element of learning “on the job” and from experience.

The observers also provided some other constructive comments that formed part of the debriefing discussions. These comments included:

- The UK exercise had addressed several issues and areas of improvement that had been identified during the debriefings of the Portugal and Italy exercises;
- Participants in the UK exercise were engaged much more quickly in the scenario than they had been in the Italy exercise, showing that the UK exercise progressed at a great (and more realistic) pace than previous exercises;
- The briefings delivered during the UK exercise by both exercise directors and the participants were very good – they were well structured and covered the key



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information. The only area for improvement was for the initial handover briefings and this can be easily addressed by the development of more detailed initial handover briefings;

- The exercise directors worked very hard throughout the exercise and at times were a little overwhelmed with the number of requests being sent through by the various exercise participants. It was suggested that a larger team of facilitators might be required for an exercise of this scale to help ensure everything continues to flow and progress at all times at the expected pace;
- The observers suggested that the involvement of a greater number of the IGNIS partners might have been beneficial for simulating the cross-border nature of the exercise. Only one or two individuals from the IGNIS partners were involved at any time in the exercise.
- The virtual reality side of the simulation was not used very much by the incident commanders but was important for those occupying other roles within the incident command structure. It was suggested by the observers that the level of interaction by the incident commanders could perhaps be reviewed and it was suggested that it may be the case that virtual reality is a very good tool for commanders at a tactical level, but it may not be so useful and effective for senior commanders operating at a very strategic level. This is an issue that still needs to be explored in more depth.
- The UK exercise was designed as a test of the system and not a test of individuals, and this was the right approach to adopt as the system has not been used within NFRS before. It was evident from the exercise however, that the system could be effectively use to test and assess individuals and that was good to see.
- The use of a real command vehicle and support team for the incident commander to use was an extremely beneficial part of the exercise. It provided an opportunity to use the actual tools available to the IC at an incident, which enhances the realism. This was an improvement on all of the previous exercises.

The UK exercise team are extremely grateful to the observers for their critical and constructive feedback of the UK exercise.

5.4. Lessons learned (final debriefing)

The key lesson learned from planning and delivering the IGNIS UK Exercise is that a large-scale simulation exercise of this nature requires significant time and resources. It requires a committed team with experience in incident command and wildfire operations/training and specialists within that team that have the knowledge, skills and experience to design and build a complex an exercise scenario within a large virtual world. NFRS has never designed and delivered a simulation exercise of this scale using computer software, so the planning process involved a very steep learning curve by the NFRS project team. However, the team received significant help and assistance from the IGNIS project partners and advisory board members. This help and assistance, coupled with the findings and recommendations from the delivery of the previous IGNIS exercises were invaluable and helped enhance the UK exercise.



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In connection with the previous point, the establishment of clear and concise objectives from the outset was a significant contributor to the success of the IGNIS UK Exercise. The aim and objectives helped guide the exercise design and build and were fundamental to so many elements of the exercise. They also provided a good basis from which to evaluate the success of the exercise.

The NFRS exercise team received some basic training from the software company but due to timescales involved were then required to launch straight into the build of the large UK exercise scenario. With hindsight, another key lesson learned by the NFRS project team was that there would have been significant benefit to taking some extra time to create a number of relatively small and less complex wildfire exercises before gradually progressing to the design and build of progressively larger wildfire exercises.

The fourth key lesson learned is that the larger the scale of exercise the greater number of potential issues that might arise. While the NFRS exercise team developed substantial plans based around various “what if” scenarios, there is no way that every eventuality and potential reaction to a situation can be predicted. While it is crucial that designs of large simulation exercises include a number of expected actions, it is crucial that the exercise operator and exercise directors also develop clear contingency plans that can be implemented if a participant reacts in an unexpected way. These plans need to help the exercise maintain its momentum while allowing the exercise directors and/or operator to decide how to react in response to the participants request or behaviour. There will be delays in real life, so it is okay to build in a delay between requests for action and responses, but it is crucial that delays are kept realistic and that exercise staff are ready to provide a quick and realistic initial response to afford more time for them to discuss and agree a plan of action. Exercise directors also need to be aware that some requests or behaviours may stray too far from those that would be reasonably expected, and it may be simpler and more appropriate for ensuring the aims of the exercise are achieved by denying a request or stating that the requested deployment will occur after the completion of the exercise.

The fifth and final key lesson learned by the NFRS exercise team was that the briefings and familiarisation sessions are a key element of any simulation exercise. Not only were they key in providing opportunities for participants to become familiar with the basic functions of the software and their work areas, but they also set the scene for the entire exercise. While the briefings and familiarisation sessions ran very well during the UK exercise, this was in part due to the Northumberland exercise team’s diligence and prior experience of delivery training exercises and, in part, due to the findings and experiences of the Portugal, Italy and French exercises that had taken place previously. The Northumberland exercise team also found that it is useful to facilitate additional familiarisation sessions to participants who have never used the software before for exercise training. This helped to address some anxiety that some officers had of using an entirely new system and approach to training. NFRS would certainly consider repeating the pre-exercise familiarisation sessions 1-2 weeks prior to another large simulation exercise. NFRS would also recommend using the structure and approach to briefings that was adopted during the UK exercise.



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6. CONCLUSIONS

The overall conclusion regarding the UK IGNIS Exercise was that the exercise was extremely successful. The exercise design and implementation helped ensure that the incident commanders were successfully assessed against all eight of the exercise objectives. The simulation system and exercise framework enabled NFRS to deliver a large-scale exercise involving a large number of personnel and utilising some of the real tools and procedures used by NFRS at real wildfire incidents. The officers who participated acknowledged that the exercise provided them with lots of opportunity to practise their skills and use their wildfire knowledge to manage and suppress a simulated wildfire. They also acknowledged that the simulation exercise enabled lots of officers to be involved all at once. While the IGNIS partners viewed the exercise from the point of evaluation and competence assessment, the NFRS officers felt that the simulator would also serve as an excellent tool for training and coaching (i.e. not always being used for competence assessment for incident command).

This was the first time that the simulation software and system had been used in Northumberland and the first time that NFRS has ever run a large wildfire simulation exercise over three days. The exercise directors from NFRS were supported by a large number of personnel from NFRS and it was evident that significant resources are required in order to design and deliver these large-scale simulation exercises. Nevertheless, it is concluded that shorter and smaller-scale wildfire exercises would also be extremely beneficial for NFRS officers to complete and these will be less resource intensive to plan and deliver. The fact that there are also four large-scale exercises that are available for all of the IGNIS partners to use on the simulator will also help save time and effort spent in planning future exercises.

The development and implementation of a comprehensive planning process was absolutely crucial for ensuring the success of the exercise. NFRS officers were able to learn from the significant experience and wealth of expertise represented within the multinational project team. This expertise was available from many countries and in many different specialist areas, including wildfire suppression, incident command, command assessment, training exercises and simulation software. While this type of collaborative working is not always available for the development of training exercises, and was specifically made available during the IGNIS Project through EU cof-financing, there will be a significant legacy that NFRS will continue to benefit from long beyond the completion of the IGNIS project. For example, NFRS has made many new contacts and is well placed to both request and provide advice and assistance in the future.

The simulation software used during the IGNIS UK exercise produced virtual reality that was very near to actual reality. There are always limitations to virtual reality and it can never be exactly like the real thing. However, the feedback from the UK exercise participants was that the software and exercise design did provide a level of reality to the training which was extremely beneficial and useful. Simulation technology is a relatively new type of training technology and its capabilities are advancing all the time. It is entirely conceivable that future advances will help to further enhance the reality of the virtual worlds and potential scenarios. For example, the use of geo-location data within virtual worlds in the future would allow the re-creation of real-world locations within a virtual world to use for simulated incidents. These virtual worlds can then be directly linked to real-world mapping systems. Another related and possible future advance is to create a more seamless link between the simulation software and the incident command software used on mobile command units. For the UK exercise there was no compatibility or interaction between the simulation software and the Incident



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Support Unit (ISU) software as these had been provided by two completely different suppliers. However, if links could be made between these two different pieces of software then this could significantly enhance the reality of future exercises because it would allow the use of real-life electronic tools within the virtual world.

The final key conclusion regarding the IGNIS UK Exercise is that virtual reality can be a really useful tool for training personnel in how to command large wildfires, but the training framework that sits behind the simulation is just as important, if not more important, than the virtual environment. It is worthy of note that the split of responses to question 6 on the participant feedback forms (?????) was investigated during the open discussions and reasons for the responses given were provided by some of the participants. The split in responses came from those that performed different roles/functions during the exercise. The Incident Commanders who were responsible for commanding the whole incident did not actually interact very much with the software, except during the drive-up to the incident. They tended to feel that the virtual reality element was not so important for them, as information being fed to them could be simulated by other means (such as via messages, role players etc.). Those participants that were playing other functions on the ground within the virtual environment (i.e. those not based in the Incident Support Unit such as the sector commanders, tactical lookouts and aerial sector commanders) found the virtual reality element was important to them as it provided them with a scene in front of them to observe, monitor and report on. To them the virtual reality reflected near-realism of an unfolding incident. The NFRS exercise team accept that there could have been additional opportunities for the incident commanders to realistically engage with and use the virtual reality software to a greater degree and this could have still been completed realistically. Most Incident Commanders will step outside of the command vehicle to look at the surrounding area where they may or may not see the incident or parts of the incident. The fact that there was no laptop available within the Incident Support Unit (ISU) may have contributed to the incident commanders feeling they did not interact with the software.

The final conclusion from the UK IGNIS Exercise is that some further debate and reflection may be required in order to determine when virtual reality simulation training for large wildfires is most beneficial and for which roles/functions. It may be the case that the answer to this question varies according to the different countries and incident command systems involved.

7. IMPROVEMENTS FOR FUTURE EXERCISES

The debriefing process for the UK exercise identified improvements for future simulation exercises using the simulator, scenarios and overall framework that was developed and used during the IGNIS Project. These suggested improvements are listed below within three different categories.

Improvements to the simulation software

- Inclusion of a compass on the screen to help participants to navigate.



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- Develop a direct link between the simulation software and the incident command software used within NFRS so that both can be used together during an exercise, promoting even more realism.
- Improve the speed of the software when operating with lots of participants.
- Inclusion of geo-location data so that the simulator provides the opportunity to run an exercise in a virtual version of a real location.
- GPS units used on the fire ground/vehicles can enable commanders to track the location of people/vehicles. It is suggested that this could be included in future simulation software.
- The fire spread simulation within the simulator is quite basic and currently requires the use of two programmes. The IGNIS simulator is first used to produce a fire footprint and then the simulator is used to manually input the fire spread using a number of fire pathways. This is a time-consuming process and it would be more efficient if the fire spread simulator could be fully integrated within the simulation software. This would also make scenarios more adaptable and customisable.
- Improve the reliability of software's auto drive function (which automatically drives participants along roads and requires them only to decide which direction to drive when they reach a road junction) and use wherever possible for driving within the virtual environment.
- Place more restrictions along routes and roadways to prevent participants driving vehicles or walking their avatar into places within the virtual environment where they become stuck and unable to move/function properly.
- Improve the visual representation of different flame lengths and fire behaviours so that it is more realistic for participants. The identification of flame lengths and fire behaviour are key skills used by fire officers and fire fighters to decide what tactics to use on different parts of a fire and how to stay safe. At present the distinction between different flame lengths is hard to observe within the simulator.
- Improve the way the flames respond to firefighting actions. For example, ensure that the flame length and smoke are adjusted when water is dropped onto part of a fire by an aircraft and/or when water is applied from a hose onto the fire. This will help show participants that their actions are having an effect on the fire and they can then determine whether their actions are sufficient and effective.

Improvements to the Valabre Island map:

- Replacement of all French place names with English names
- Replacement of French cartography symbols and colours with UK Ordnance Survey symbols and colours (including changes to the contour marking system)
- Adjustment of the labelling of the Northings and Eastings so that they follow the Ordnance Survey standard approach (i.e. labels for the gridlines to be on the lines and not between the lines)
- Improve the clarity and definition on the printed versions of the maps provided to participants – the maps were a little difficult to read.

Improvements to the implementation of the exercise:

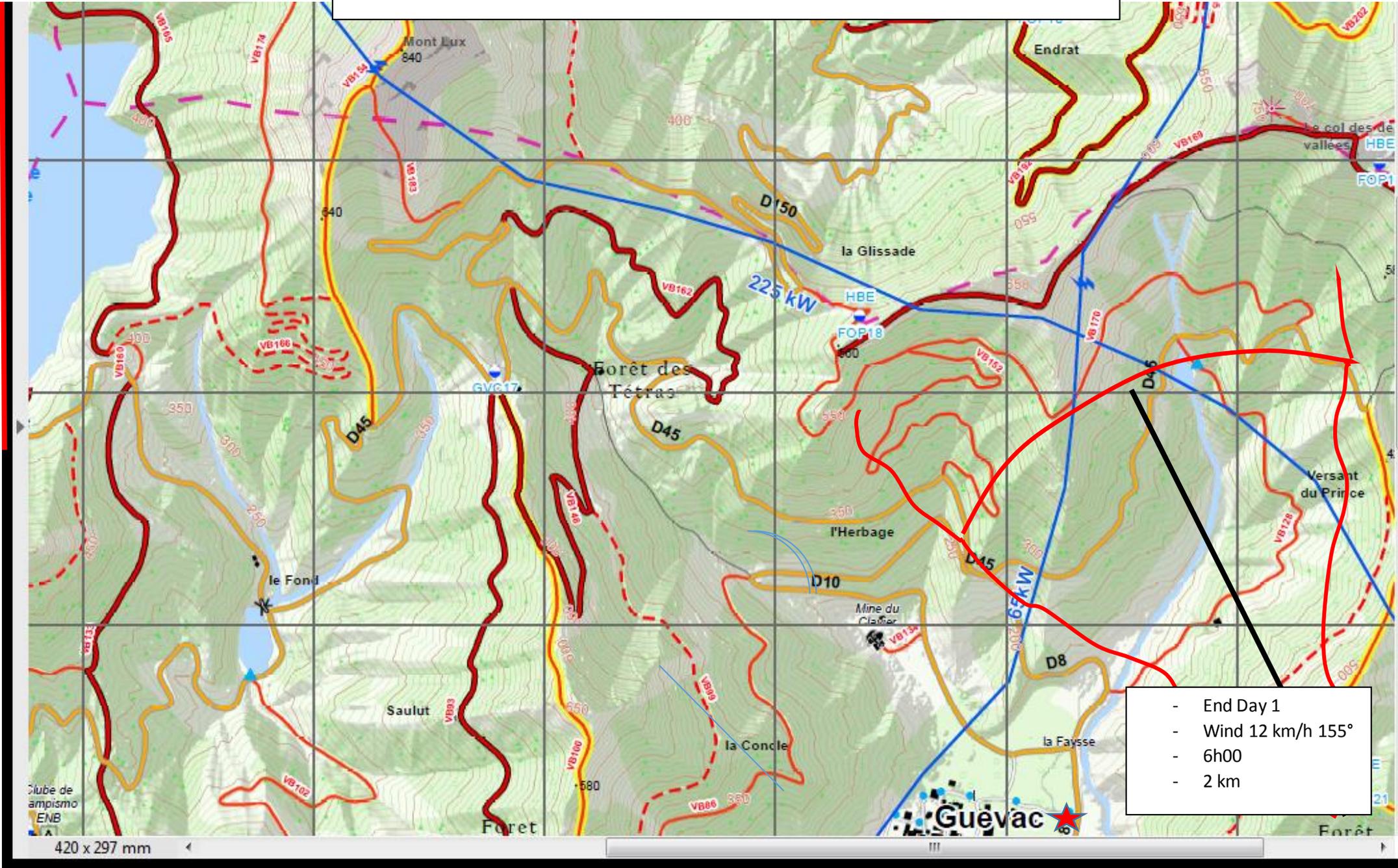
- A clock should be provided within all exercise rooms/venues that shows the time within the exercise scenario/virtual world so that participants do not become confused between “real time” and “virtual time”.



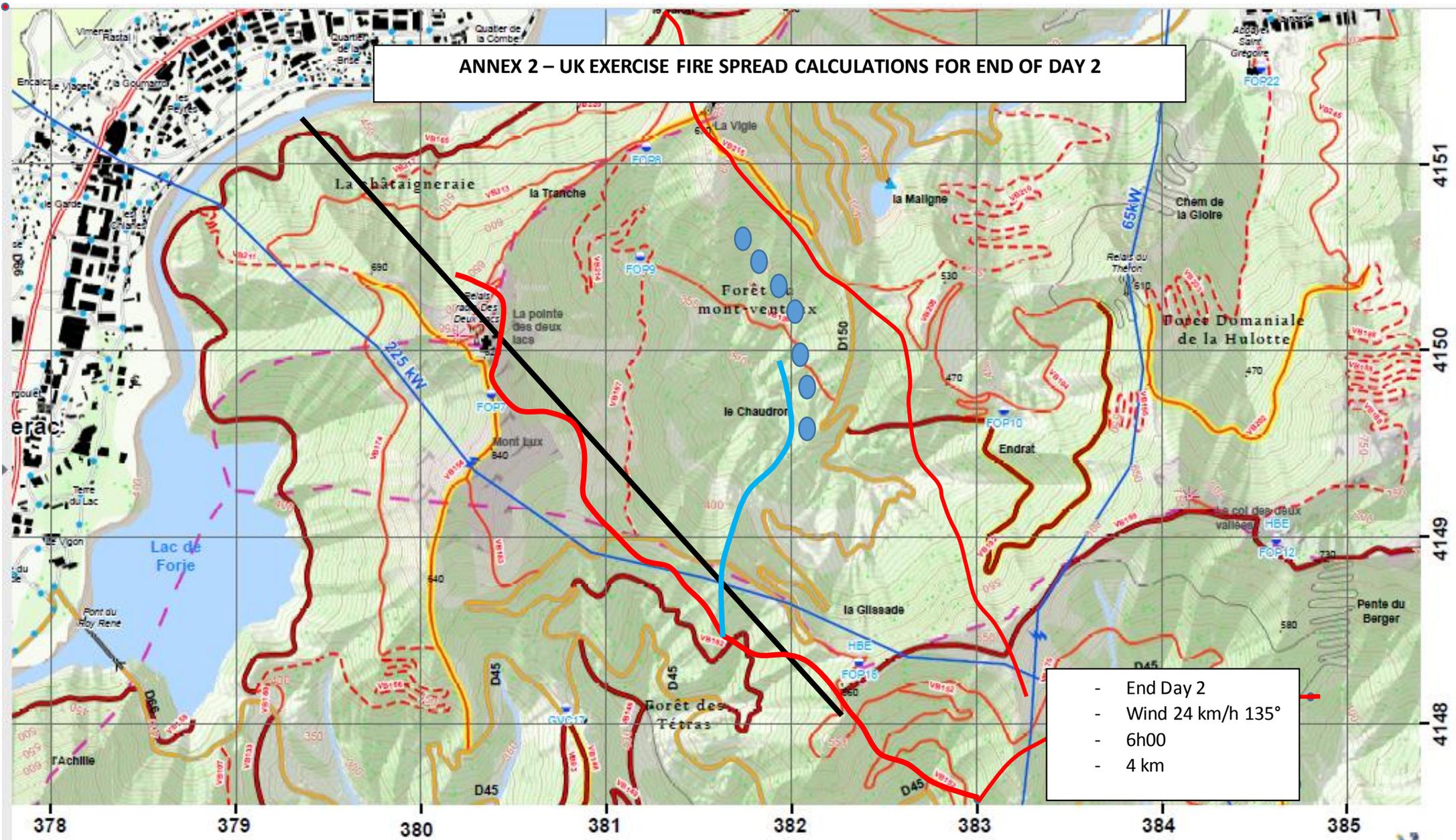
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- Ensure all arriving resources within the simulation rendezvous at a set location and receive their briefings and instructions there. Some participants found it confusing to simply be transported to a location an expected to start performing their role immediately. By making all participants rendezvous at a given location, they can all receive a thorough briefing and ask the relevant questions before deploying onto the fire ground. This is more representative of reality and could improve the flow of the exercise. However, careful planning is required in order to bring multiple participants into the exercise as it may not be possible to do this for many people at once.
- Provide a more robust briefing to exercise participants within the scenario when they arrive at their rendezvous point/incident support unit. The briefings provided during the UK exercise were not as comprehensive as would be expected on the incident ground, so exercise planners need to ensure that briefings delivered during the scenario by exercise staff (i.e. as part of the handover of command) are to the level of detail that would be expected at an incident. Exercise staff providing briefings within the exercise should also be prepared to respond to queries as this would happen during operational briefings.
- Try to avoid role players playing more than one role as this can cause confusion and detracts from the realism of the exercise. As a general rule, try and have each role player perform one role during the exercise.
- Reduce the distance that responding officers are required to drive within the simulator to arrive at the rendezvous point (RVP)/incident command point. The time taken to drive to the RVP should be kept to 5 minutes or less.
- Extend and further improve the familiarisation session by:
 - Creating a specific checklist to all the actions within the software that exercise participants will be taught to perform during the familiarisation session (i.e. how to walk, how to drive, how to enter a vehicle, how to leave a vehicle etc.).
 - Create a one page reference sheet to place in each work station to act as a reminder for how to complete basic actions within the software. Exercise participants can then use this as a reference guide during the exercise.
- Utilise live feeds to project images to relevant places and for relevant participants. These can be established using cameras and video screens within the simulator.
- The length of the exercise could be shortened. While it is useful to run an exercise over an extended period, it is difficult to sustain enough activity over a whole day to ensure all participants are engaged at all times. The loss of concentration at points is something that will happen in reality, but when it happens during an exercise it can significantly detract from the aims and objectives of the exercise. It is suggested that future exercises should run over 1, 2 or 3 hours at most. This provides ample opportunity to assess incident commanders and other participants according to their expected competencies.
- Ensure copy simulation software technical instruction guide is readily available to the exercise operator throughout the exercise. The operator needs to be very familiar with the software, so that they are not dependent upon a technical guide, but it is unlikely they will be able to prepare for every eventuality so the ability to quickly consult the guide will be beneficial. Exercise operators and directors should also be aware that if the technical guide needs to be consulted during an exercise then there may be a requirement for techniques to be employed to ensure the exercise continues to run realistically while information is being sought (i.e. establishment of realistic delay tactics).

ANNEX 1 – UK EXERCISE FIRE SPREAD CALCULATIONS FOR END OF DAY 1

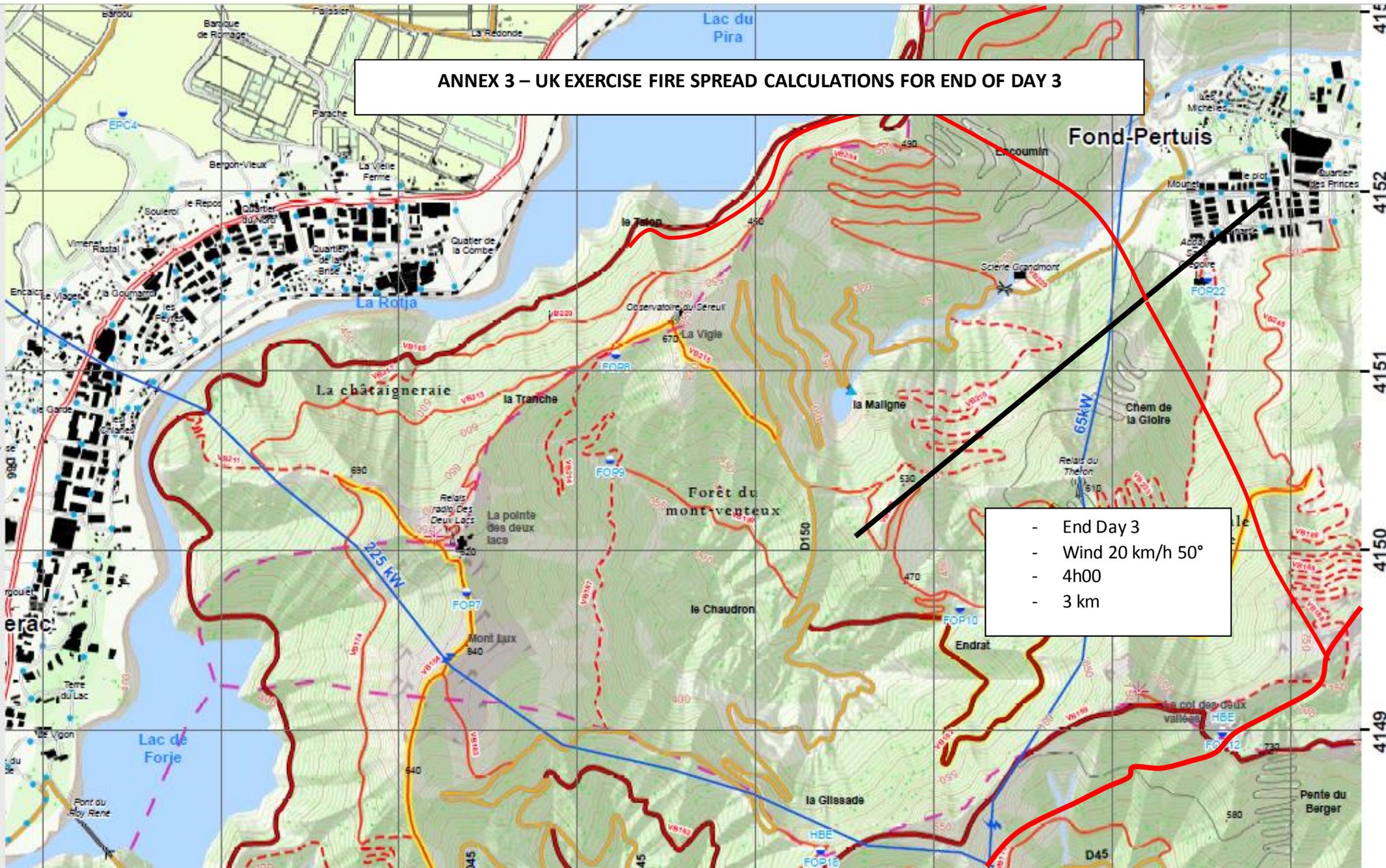


ANNEX 2 – UK EXERCISE FIRE SPREAD CALCULATIONS FOR END OF DAY 2



- End Day 2
- Wind 24 km/h 135°
- 6h00
- 4 km

ANNEX 3 – UK EXERCISE FIRE SPREAD CALCULATIONS FOR END OF DAY 3



- End Day 3
- Wind 20 km/h 50°
- 4h00
- 3 km

Annex 4 – Copy of the UK IGNIS Exercise Participant Feedback Form

10/11/2016

Final questionnaire to participants

Final questionnaire to participants



1. How do you rate the objectives of this exercise?

Marcar apenas uma oval.

- Unclear
- Less clear
- Clear
- Very clear

2. How important is the Briefing to the development of the exercise?

Marcar apenas uma oval.

- Nothing important
- Less important
- Important
- Very important

3. How do you rate the initial adaptation to the simulation tool for the development of the exercise?

Marcar apenas uma oval.

- Nothing important
- Less important
- Important
- Very important

4. How do you rate the response of DIRDEX to the requests from the participants?

Marcar apenas uma oval.

- Unsuitable
- Less suitable
- Suitable
- Very suitable

5. Do you consider that you have had the right tools to perform the function in the exercise?

Marcar apenas uma oval.

- YES
- NO

6. How do you rate the use of virtual reality in the development of this type of exercise?

Marcar apenas uma oval.

- Nothing important
- Less important
- Important
- Very important

7. Do you consider that participation in this type of exercise contributes to the improvement of your operational performance?

Marcar apenas uma oval.

- Nothing important
- Less important
- Important
- Very important

8. According to your expectations, how would you rate the exercise?

Marcar apenas uma oval.

- Insufficient
- Sufficient
- Good
- Very good

9. In general, how would you rate the exercise?

Marcar apenas uma oval.

- Insufficient
- Sufficient
- Good
- Very good

10. Suggestions / Notes:



**UK Exercise - 12th to 16th June 2017
Northumberland Fire and Rescue Service HQ,
Cramlington, Northumberland (UK)**

Familiarisation Session for UK Exercise Participants

- **Exercise Directors:**
 - Operating the software
 - Facilitating the exercise - responding to queries
- **The exercise will be run in real-time** - this means that decisions are made in real-time, resources are mobilised in real-time, actions are taken in real-time etc. To reflect reality, there will be delays between decisions being made/orders being given and things actually happening.
- **The exercise will run over 3 days** - personnel will be withdrawn over each night for safety reasons as the fire is in a remote area with steep slopes and other hazards. The fire will be monitored overnight and suppression operations will resume again in the morning.
- **The fire will threaten a range of sensitive sites** - residential, commercial, environmental, infrastructure, communication.
- **Scenario is on a simulated, fictional island** - but for the purpose of the exercise it is Northumberland:
 - NFRS Standard Operating Procedures will be used
 - NFRS Wildfire SOP should be utilised - there is an expectation that LACES will be implemented and SMEAC briefings will be used
 - JESIP principles and briefings should be implemented as appropriate
- **Each NFRS officer is playing a different role within the command structure** - There are separate stations for Ground Resources, Aerial Resources and Incident Command
 - Ground resources based in Bamburgh Room
 - Aerial resources based in Dunstanburgh
 - Incident Command is in the ISU in the yard
- **Stations for command roles** - Each officer will have a station, which will include: a Computer, Joystick, Map of the Island, Surcoat, Radio and a copy of the Agenda.
- **Incident Support Unit** - will have two trained operatives assisting the Incident Commander. There will not be a computer - this simulates a remote command post that does not necessarily have direct line of sight of the fire. If the fire is within sight of the ISU, then the Incident Commander can come into Bamburgh and look at the fire

from the software. If the fire is not in sight, the Incident Commander would have to drive to the fire to see it.

- **Start of the exercise** - The exercise will commence with the Incident Commander driving to the incident command post. This will take approximately 5 minutes. The IC will then get up from the computer station and walk into the ISU in the yard for a briefing from the current Commander. A handover will then take place and the Incident Commander will take charge.
- **How will things work:**
 - If you want to direct fire crews to take particular actions, you need to use your radio and contact the Exercise Director. Provide a clear instruction of what you want the crews to do, where you want them to go etc.
 - If you want to talk to someone face-to-face, then you need to be standing next to them within the software. This may mean you need to walk or drive to the location of the other person.
 - There are role players fulfilling the role of a range of other agencies. You can meet with the role players face-to-face and/or establish radio communications with them.
 - The agencies you may wish to contact/work with during the exercise are those that we would normally work with at wildfire incidents in Northumberland, for example:
 - Police
 - Ambulance
 - Civil Contingencies (who are providing a link between the Incident Commander and Strategic Command (Remote Silver/Gold))
 - Forestry
 - Electricity network
 - Water authority
 - Ministry of Defence
 - Environmental agency
- **Assessment tool:**
 - During the exercise, a manager from Learning and Development will be testing an Incident Command Tool called Effective Command.
 - L&D Manager will accompany Incident Commander and will practise using the tool while observing the IC.
 - **IMPORTANT:** This is not a formal assessment and will not be recorded as a formal assessment. This is merely a pilot and test to provide feedback to help guide the remaining work of the IGNIS Project.
- **Observers:**
 - There will be a number of observers walking around the exercise throughout the day. Most of these will be members of the IGNIS Project. They are here to observe and provide feedback on the exercise. They are not here to assess your performance.

If you are unsure of anything, ask one of the exercise directors or facilitators

Above all, we hope you find the exercise useful and we hope you enjoy it.

END OF REPORT