



CURSOR
Accelerating Search and Rescue operations

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Coordinated Use of miniaturised Robotic equipment and advanced Sensors for search and rescue OpeRations

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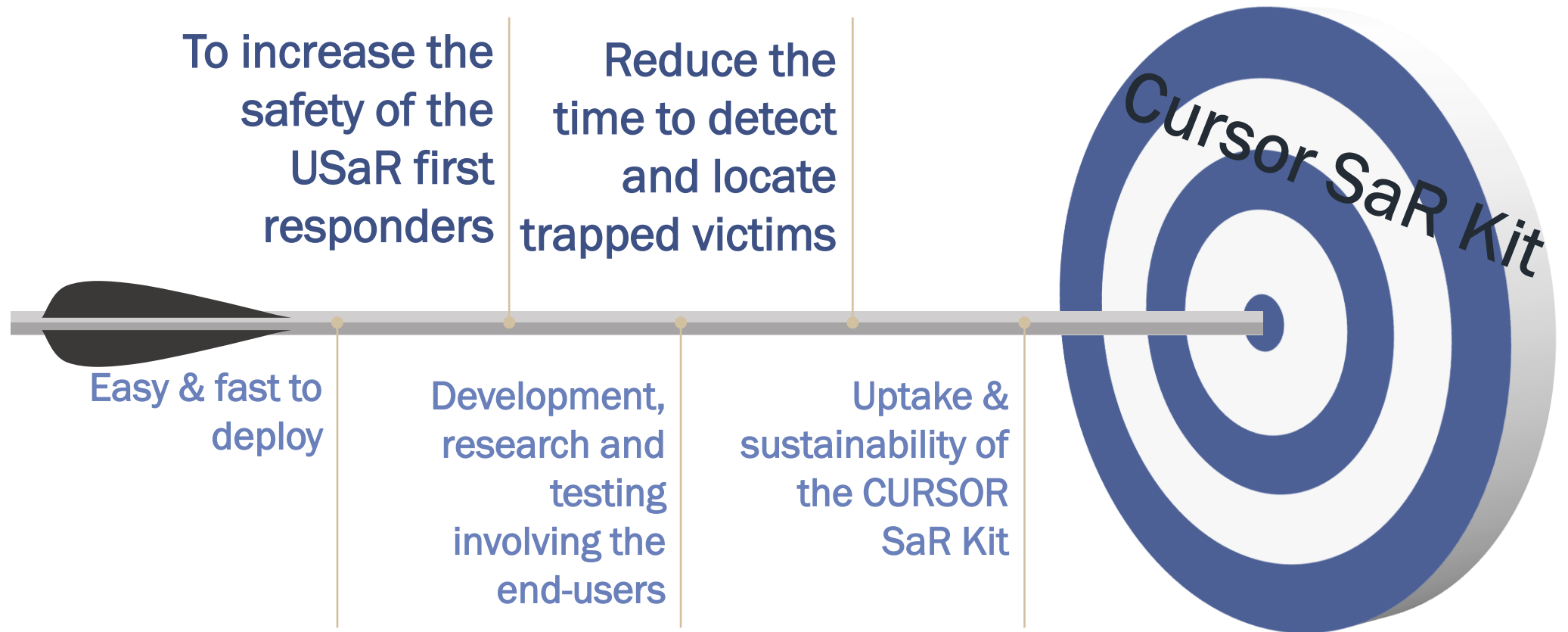
Project CURSOR coordinator

31 January 2020, Brussels, Belgium

Project to policy kick off seminar



CURSOR objectives



The solution – CURSOR SaR Kit

“Mothership” UAV Platform

- On-board high processing and storage
- Fuel/Battery (hybrid) powered
- Sensing**
 - HD Visual cameras (night & day) and IR
 - LiDAR
 - Ground penetration radar
 - GSM/Wi-Fi “Catchers”
 - High-powered spot light
- Operations**
 - Photogrammetry
 - Radar/Laser/RF Signal scanning
 - 1-2 hrs operational time
 - Ad-hoc disaster comms
- Localisation and Comms**
 - GPS module
 - Long range transceiver (control & data-comms)
- Processing**

“Transport” UAV Platform

- On-board high processing and storage
- Battery (hybrid) powered
- Sensing**
 - HD Visual cameras (night & day) and IR
 - High-powered spot light
- Operations**
 - 80 mins operational time
 - Transport “worms” (drop & place)
 - ~25 Kg lifting power
 - Entering indoor spaces/navigation
- Localisation and Comms**
 - GPS module
 - Long range transceiver (control & data-comms)
- Processing**

Information Management

- Multi-source Information Fusion
- Aggregation of sensing and positioning data from all platforms
- Data-normalisation and filtering
- Data correlation
- Decision Making
- Data Reasoning
- Updated learning process

Adaptation of interfaces (data & protocols) & Radar/Laser/RF Signal scanning processing

Miniaturised Sensor Robot (MSR) – Robotic “worms”

- Sensing**
 - Electrochemical & gas sensors (“sniffers”)
 - Visual (day, night) & IR camera
 - Mic and siren
- Localisation and Comms**
 - Positioning beacons
 - RTLS & Comms beacons
- Processing**
 - On-board micro-CPU
 - Miniaturised battery
- Operations**
 - Vibrating to penetrate debris
 - 2-3 hrs operational time (disposable)
 - Communicating sensing & localisation outputs
 - Placed by UAVs/manually
 - Forming a dense local network

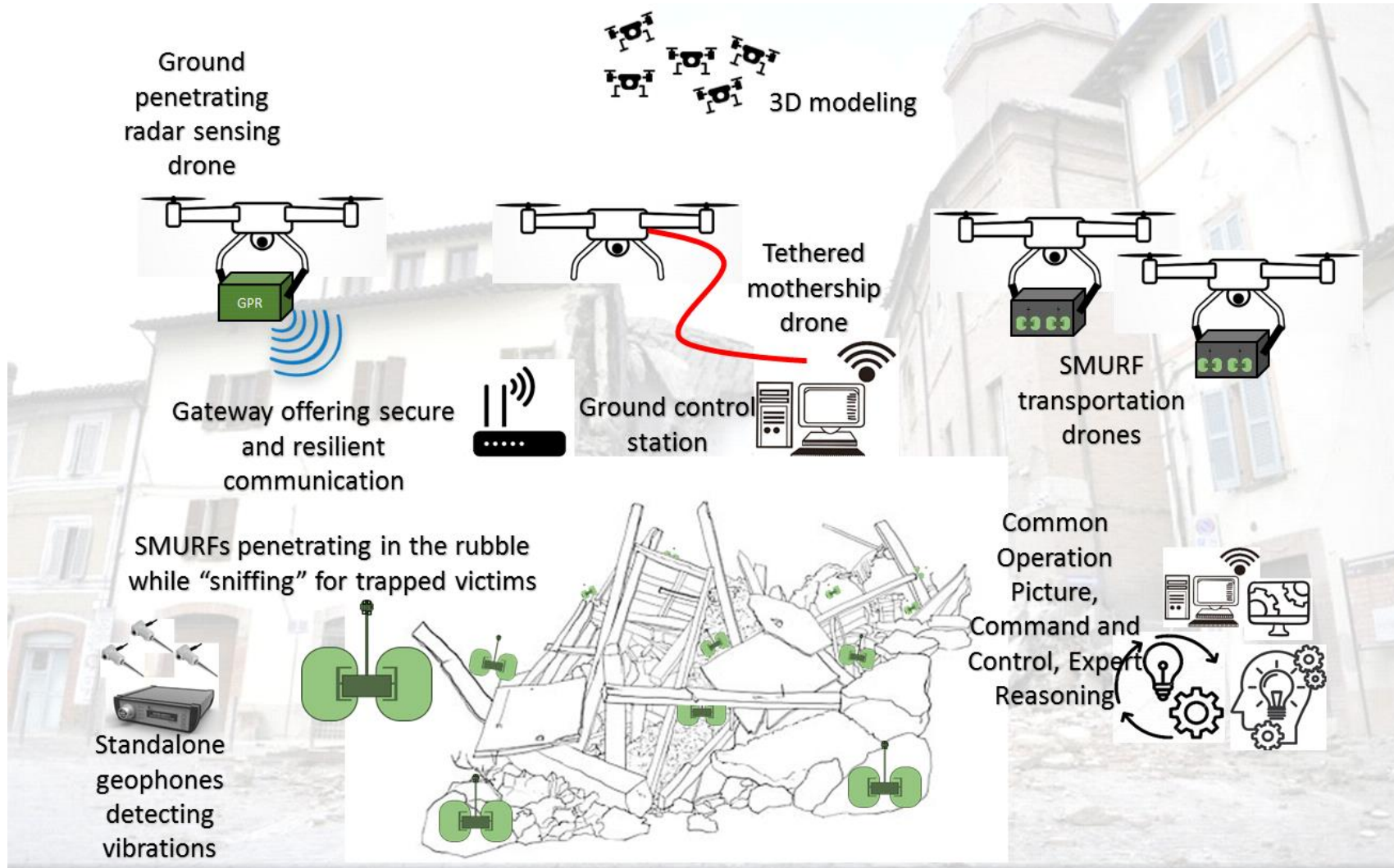


Stand-alone sensing and field comms

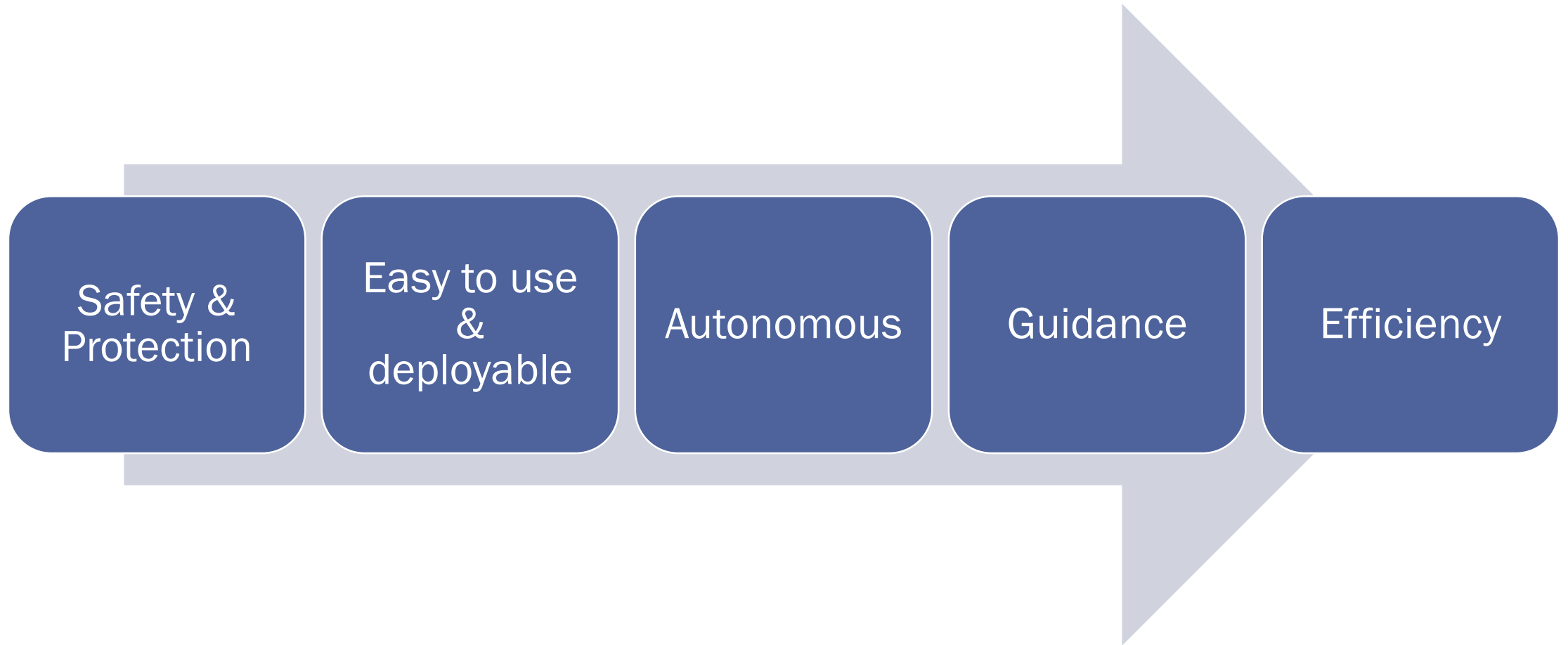
- Bi-directional data (sensing & localisation data, units control and USaR comms)
- Sensing**
 - Arrays of geophones
- Comms**
 - Ad-hoc deployable multiple-RF field network
- Operations**
 - Vibrations detection and mapping
 - Resilient & Constantly available
- Processing**
 - Local processing

Common Operational Picture, Visualisation and Geo-annotation, Sectorisation and Incident Management

CURSOR SaR Kit



How the SaR kit serves 1st responders

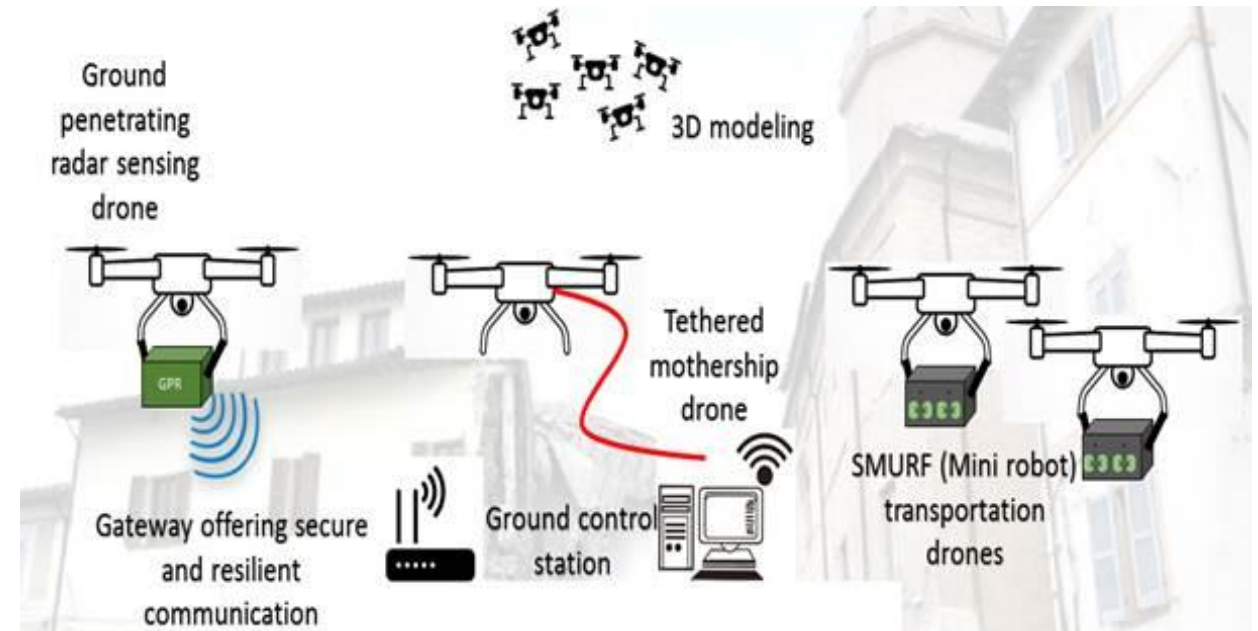


First responders involvement

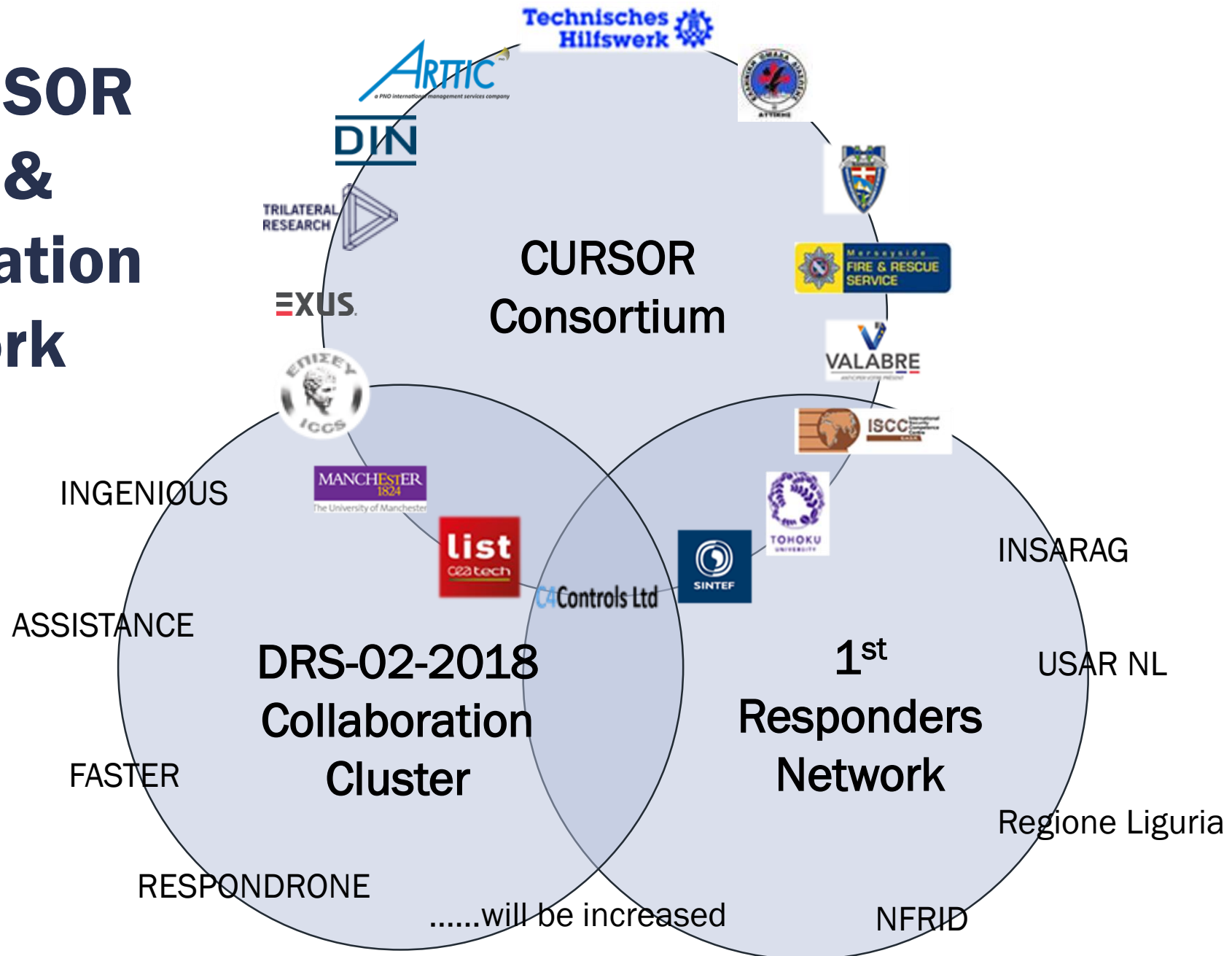
- Continuous and thought-out involvement of FR throughout the project
- The requirements for all the CURSOR SaR Kit components come from FR
- The evaluation system during lab-and field tests allow to set goals and follow up as well as assess the improvements
- First Responders Board involvement for validation purposes
- Involvement of external civil protection experts for validation and reliability purposes
- Testing the CURSOR SaR Kit components in external exercises (e.g. Modex)

Operating the drones in CURSOR

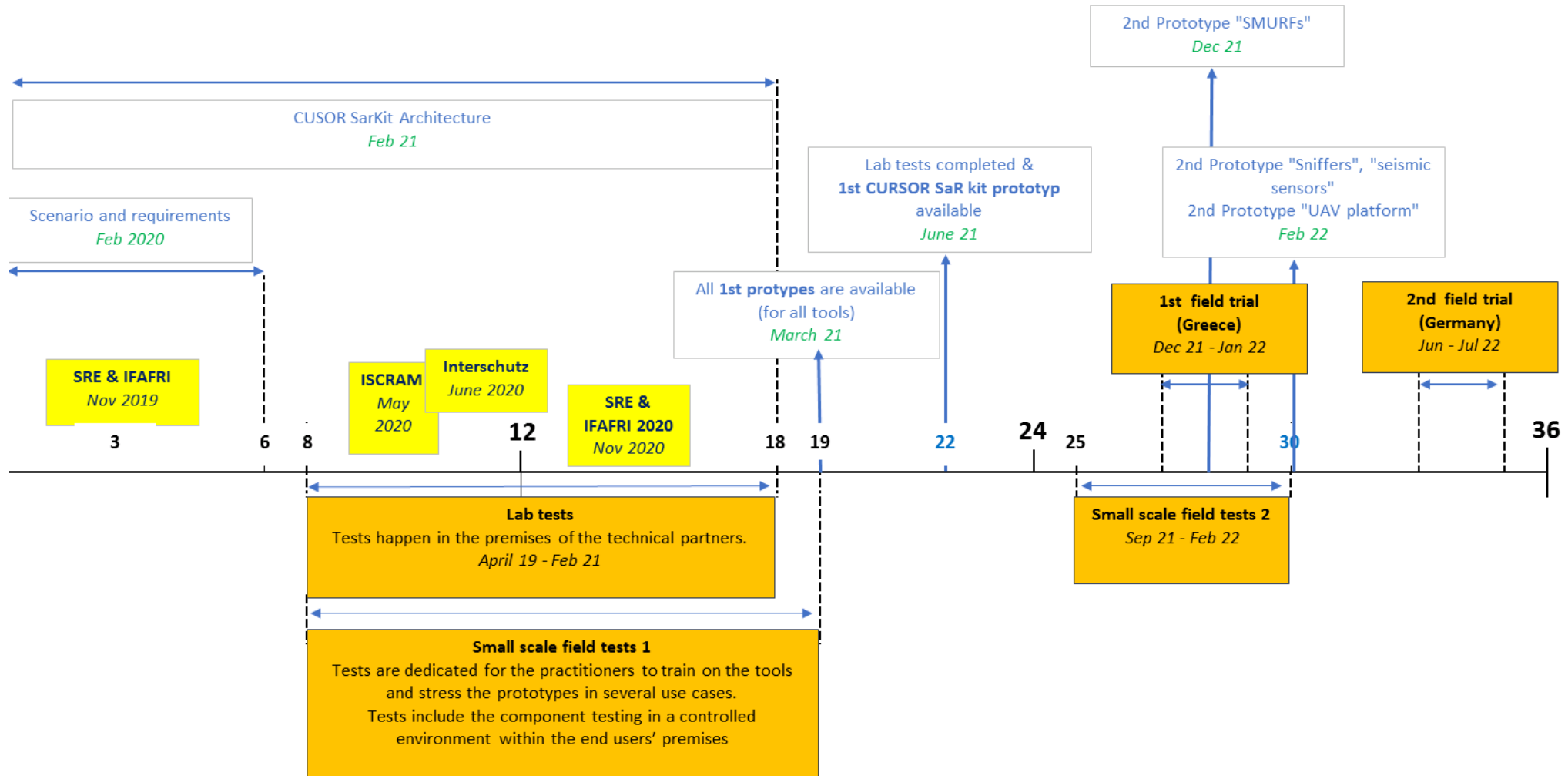
- 4 drone components: mothership, 3D swarm drones, GPR drone and transport drones
- New EU drone aviation rules (July 2020) simplify practical application of the drone technology
- Drone technology during the S&R missions is relatively new
- Drone traffic during missions has to be planned



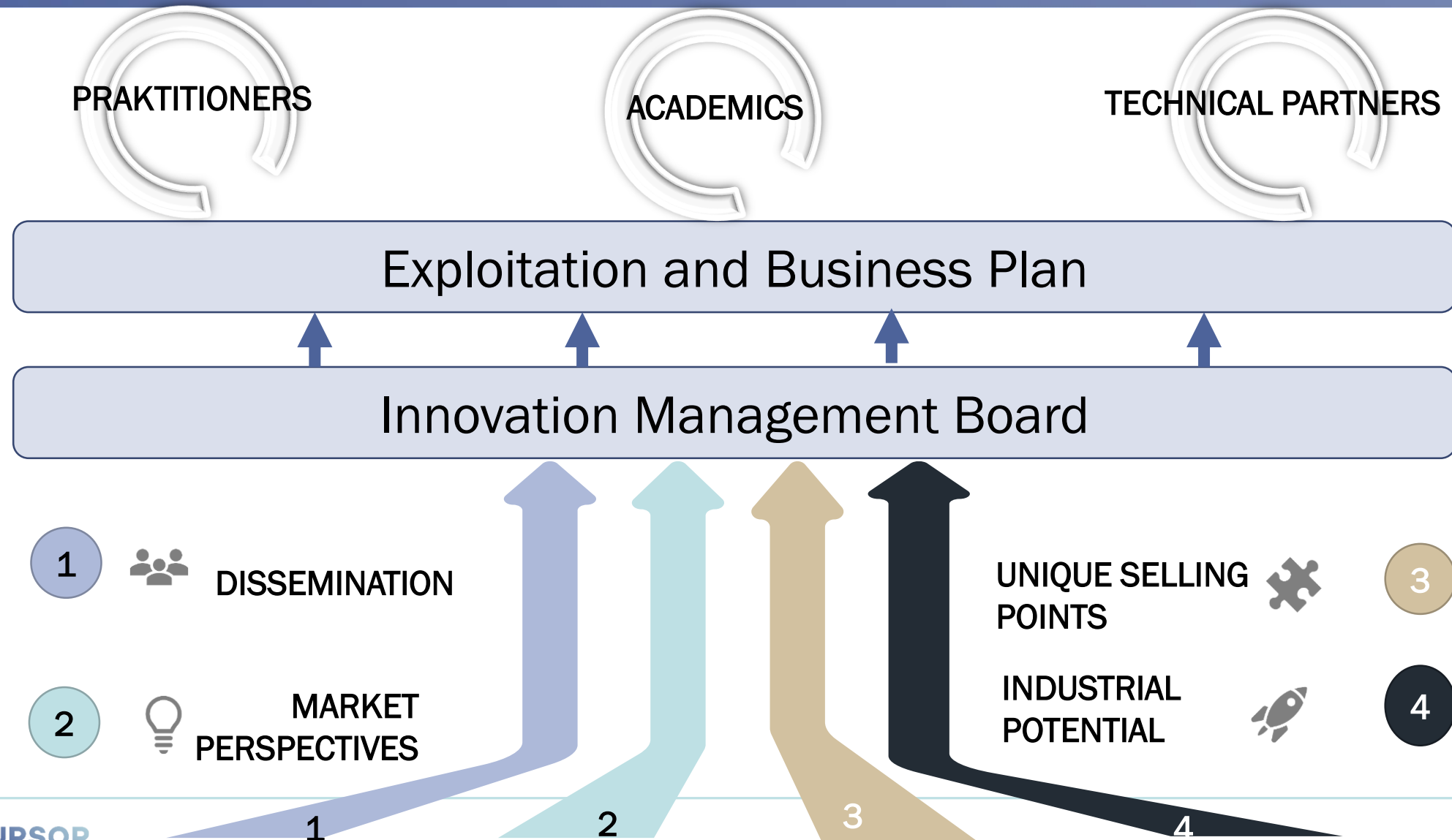
The CURSOR Team & Collaboration Network



Roadmap – project main events & DRS02 cluster activities 2020



CURSOR exploitation strategy



Contribution to DG ECHO

DISASTER RISK MANAGEMENT

- Linking the research projects outcomes with MS policy development
- Through advisory missions exploit research outcomes

- Modules exercises
- Exchange of Experts – to support fact finding missions
- Training courses as dissemination possibilities
- EU Civil Protection knowledge network

EUCPM

INTERDISCIPLINARY APPROACH

Sustainable forest management → forest fire risk prevention & management → civil protection outcome



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Thank you



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