

EU Security Call - Sea Borders Surveillance System

© BAE SYSTEMS 2008. All Rights Reserved.

This is an unpublished work created on the date(s) shown, any copyright in which vests in BAE SYSTEMS. All rights reserved. The information contained in this document/record is proprietary to BAE SYSTEMS unless stated otherwise and is made available in confidence; it must not be used or disclosed without the express written permission of BAE SYSTEMS. This document/record may not be copied in whole or in part in any form without the express written consent of BAE SYSTEMS which may be given by contract.



Opportunity

- South Coast Partnership has an opportunity to benefit from work undertaken in the EU Security 2nd Call which has a budget of [REDACTED].
- BAE Systems has gained a position in the SELEX led consortium to bid for an Integrated Programme worth up to [REDACTED].
- South Coast Partnership can influence the direction of the programme which is directed at Sea Border Surveillance through participation in the User Group.

Security Call : Sea border surveillance system

The task is to improve sea border surveillance. Key problem areas in achieving this are:

- Interoperability and integration of relevant (heterogeneous) sensors, sensor networks and other information sources (e.g. databases).

- **Integration and fusion of data and information from sensors, sensor networks and other information sources**

Protection of sea borders relies on accurate maritime surface pictures of vessels of all types. The priority is monitoring ship movements along extended sea borders in high-traffic areas. **This includes detection (identification) and tracking of small, large, non-reporting and reporting vessels.**

Application of both wide-area surveillance and local observation nodes is important. The sensors can be land based, vessel based, airborne (also situated on unmanned platforms) or space borne. Sensor networks for sea border surveillance will typically consist of combinations of land, vessel, air and space sensors.

More specific goals are to improve:

- monitoring of vessel movements (including non-reporting vessels) on the European sea border
- confirmation of the identity of reporting vessels and detection

- **vessel tracking and classification**

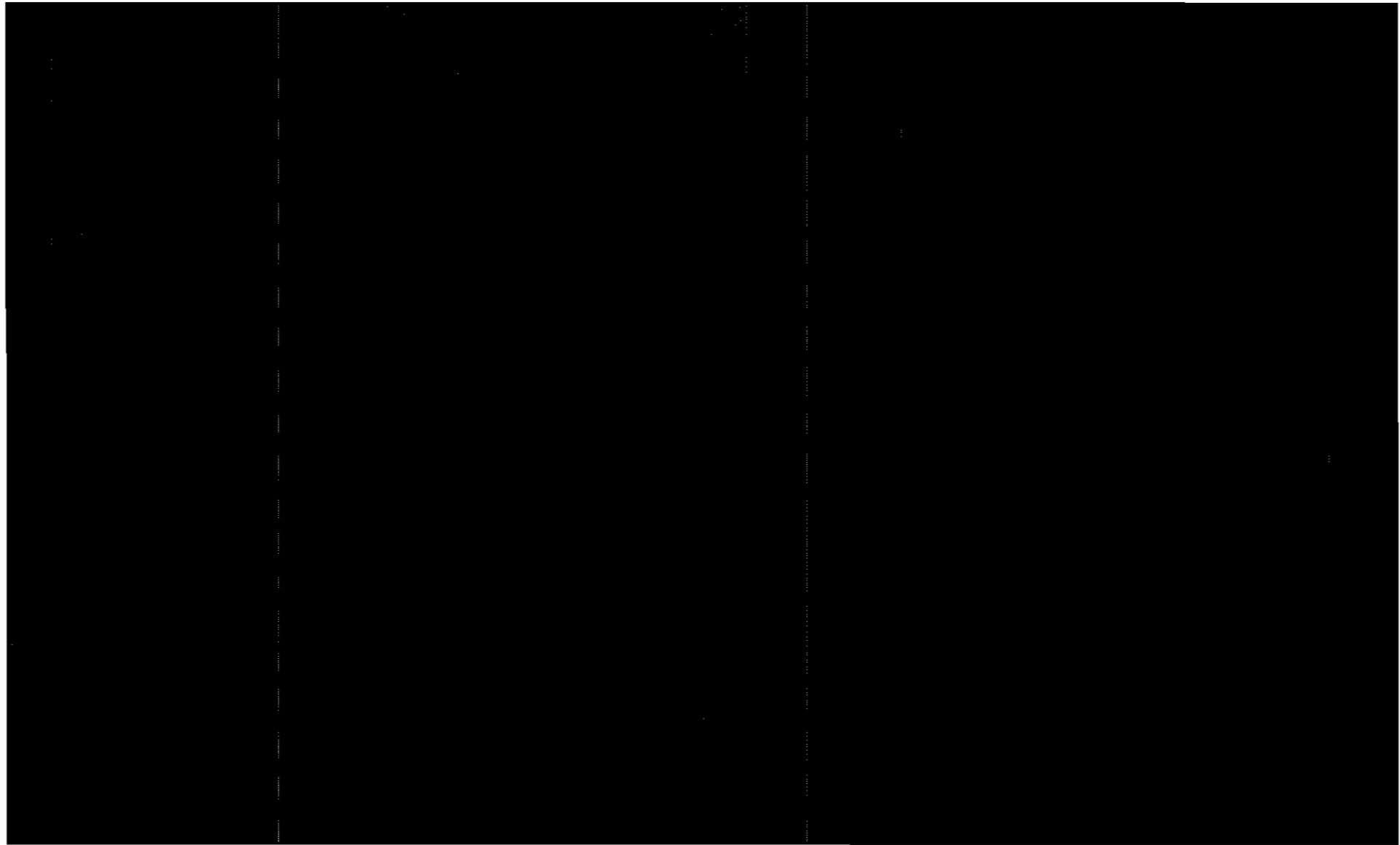
- **detection of small vessels**

- **detection of suspicious behaviour (e.g. deviations from expected routes)**

- **understanding of intentions of the vessels**

- **early identification of potentially threatening situations.**

The outcome would be an integrated and cost-effective sea border surveillance system capable of providing accurate situational awareness including early identification of possible threats and illegal actions.

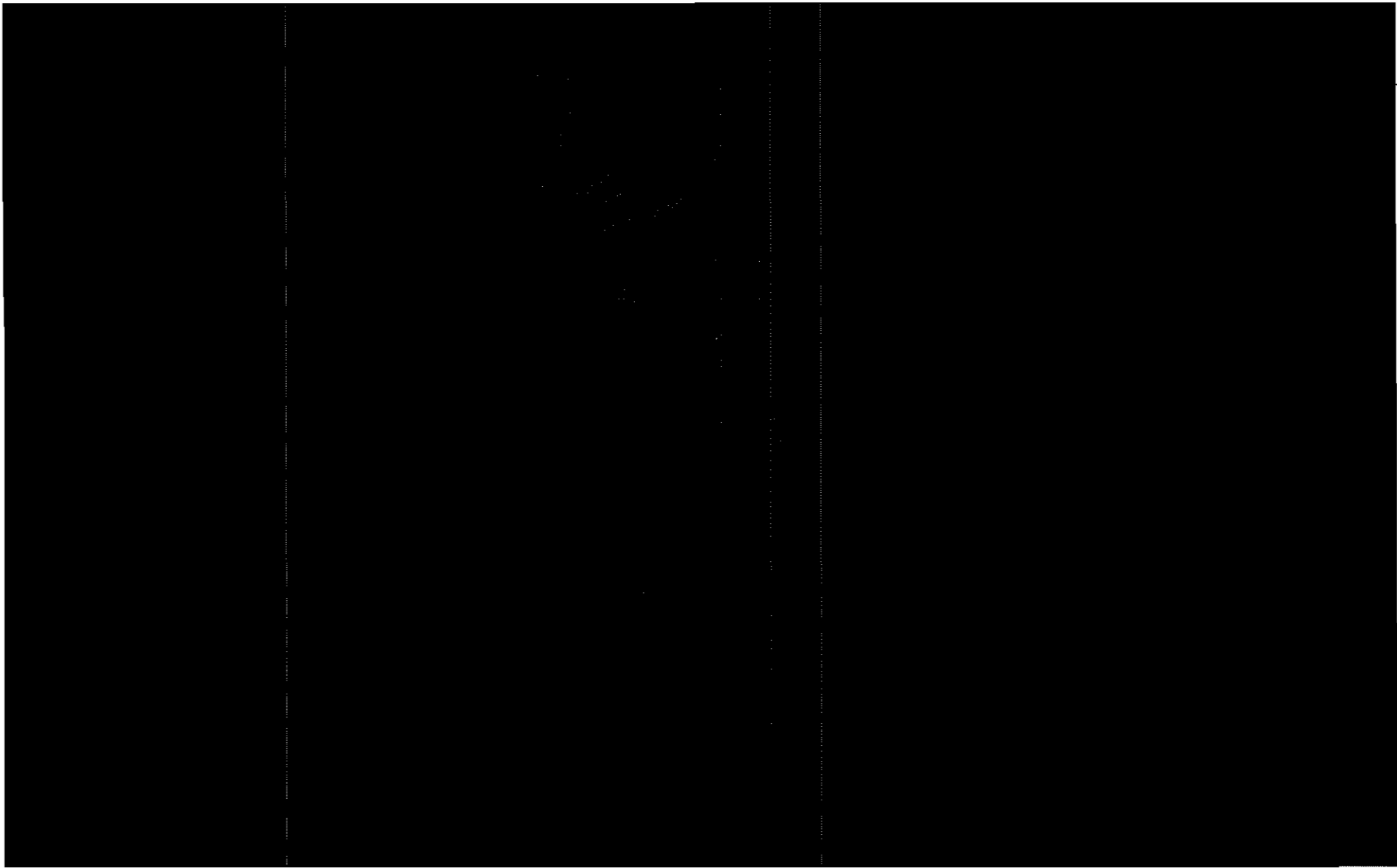


SBSS – Project approach (1/2)

- The aim of the project is to design, validate, experiment and demonstrate a set of specific improvements, in terms of Maritime Border Surveillance, that can be generated through the “Networking and data fusion of relevant (heterogeneous) sensors, sensor networks and other information sources”
- Note - The SBSS project is not targeting the design of a European Maritime Border Surveillance System.

SBSS – Project approach (2/2)

- The Surveillance systems and sensors to be networked, as well as the improvements to be generated will be identified for three scenarios, considered to be representative of the challenges for European sea border surveillance.
- The legacy systems, operating in the context of the subject surveillance operations, will be supplemented in the integration analysis by state of the art technologies and non conventional sensors. Related networking and data processing solutions will be conceived and designed to achieve the detection, tracking, classification and identification capabilities indicated by the users as effectively needed to support their operational needs. Behavioural analysis techniques will be applied throughout the sensing chain to enhance the situation awareness, risk analysis and prevention capabilities.



Scenario 1: Illegal immigration and smuggling contrast in the english /la manche channel and North Sea

- Threats: [REDACTED]
- Users: [REDACTED]
- Scenario Development: BAE, [REDACTED]
- Legacy systems:
 - VTS and Coastal Radars Netherland
 - VTS France
 - VTS UK
 - Maritime Patrol Aircraft
- State of Art systems:
 - UAS (Unmanned Aerial system)
- Non Conventional Sensors:
 - Passive radar
 -
- External systems/information
 - TBD
 -

Scenario 2: Good trafficking and environmental monitoring in Atlantic waters close to canary islands

- Threats: [REDACTED]
- Users: [REDACTED]
- Scenario Development: [REDACTED]
- Legacy systems:
 - MPA
 - Satellite
- State of Art systems:
 - [REDACTED]
 - [REDACTED]
- Non Conventional Sensors:
 - TBD
- External systems/information
 - TBD

Scenario 3: Good trafficking and illegal immigration contrast in Sardinia and Sicily Channel

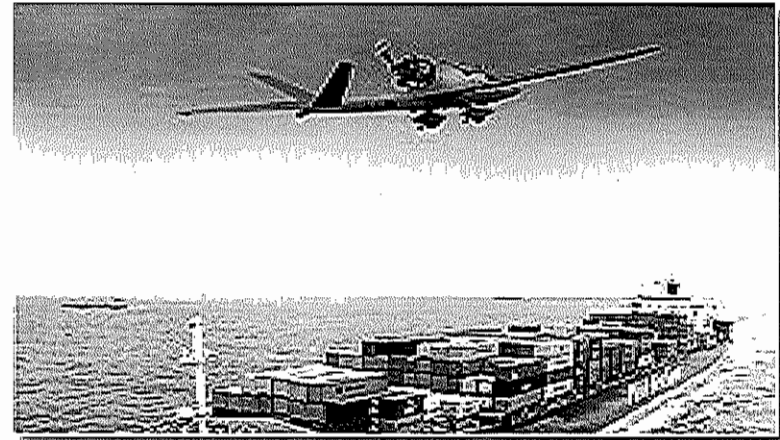
- Threats: [REDACTED]
- Users: [REDACTED]
- Scenario Development: [REDACTED]
- Knowledge on Legacy systems:
 - VTS
 - Coastal Surveillance
 - MPA
 - Satellite
- State of Art systems:
 - [REDACTED]
 - [REDACTED]
- Non Conventional Sensors:
 - [REDACTED]
 - [REDACTED]
- External systems/information
 - TBD

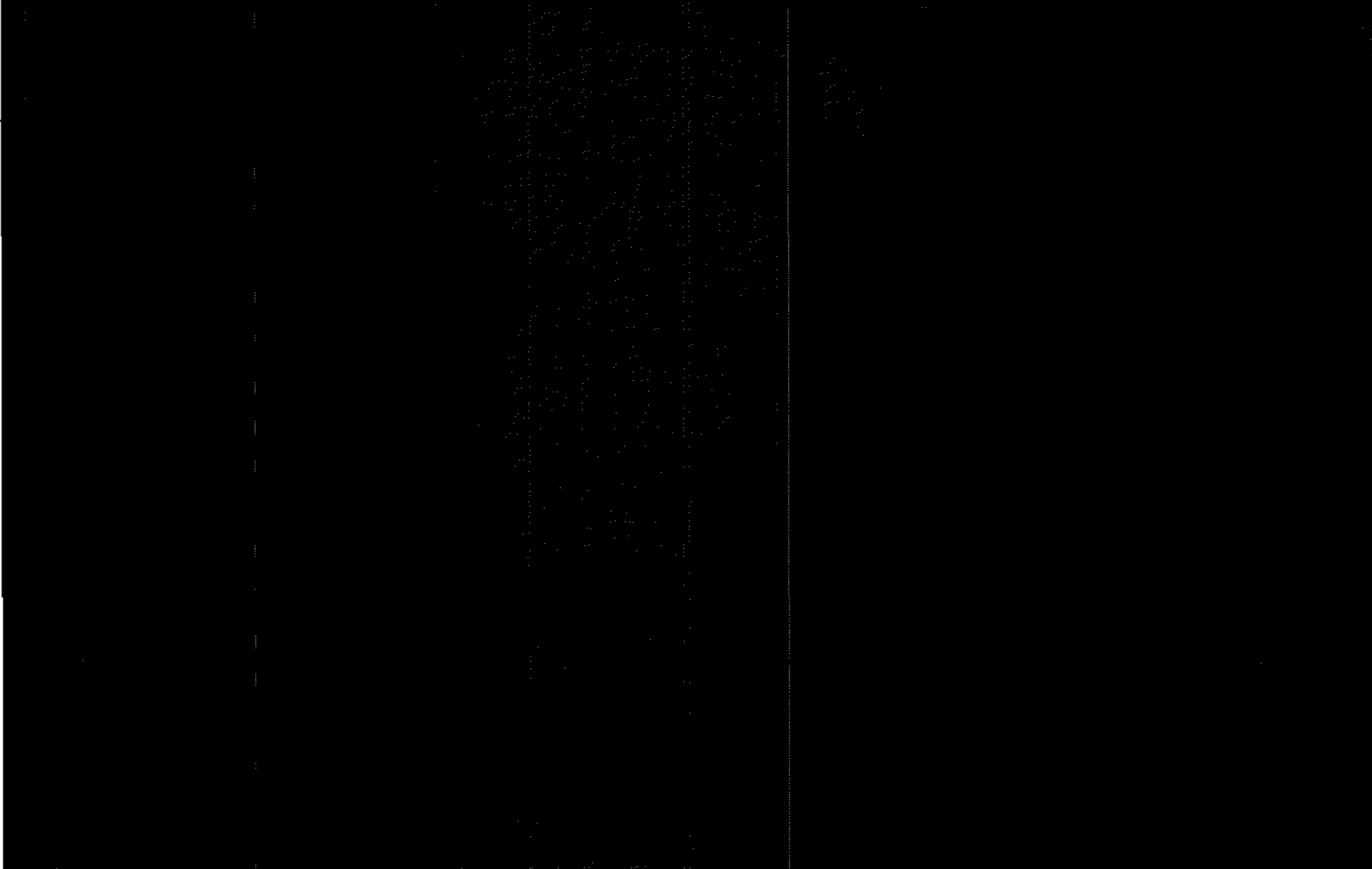
UK - User Requirement

- Economic cost to UK of organised crime is 24bn Euros
- A key concern is cross border smuggling through uncontrolled routes in English Channel
 - 8000 traffic movements every year
 - 200 – 300 ships per day.
 - Patrol area is between 120 and 150 miles of coastline
- Two key requirements are:
 - Identification and Monitoring of Shipping in the English Channel to detect anomalous behaviour
 - Policing of illegal movement into & out of the UK
 - fast ribs involved in clandestine immigration. Large ocean going vessels carrying illicit commodities stand off shore and act as 'mother ships' to small vessels
 - contraband transportation
 - duty avoidance

UK - South Coast Partnership

- BAE Systems is actively engaged with the UK South Coast Partnership (SCP) to investigate how their requirements can be met through the use of unmanned aircraft to detect anomalous behaviour.
- The SCP includes:
 - UK Border Agency
 - UK Police Forces (Kent & Essex)
 - Serious Organised Crime Agency
 - Marine & Fisheries Agency

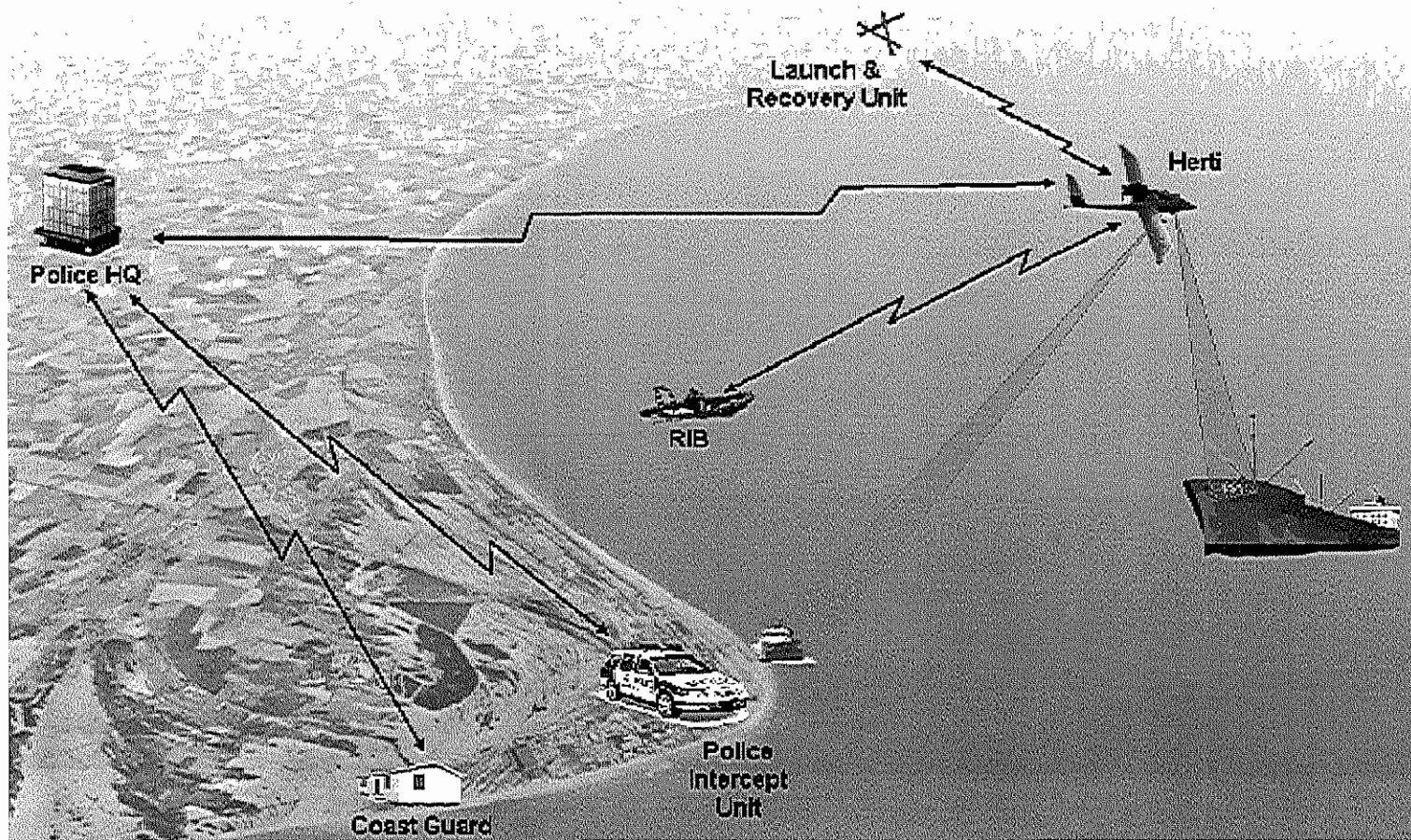




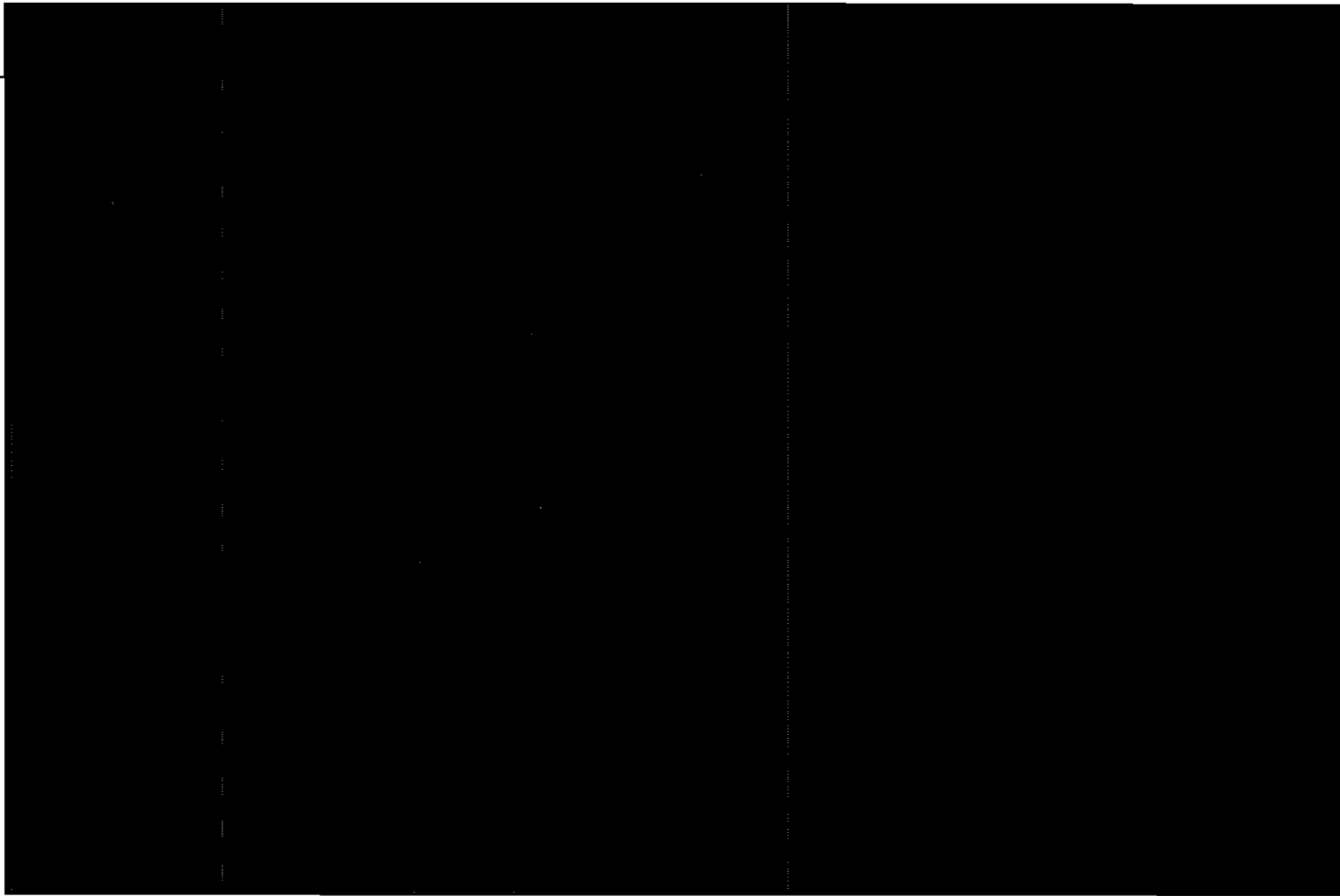


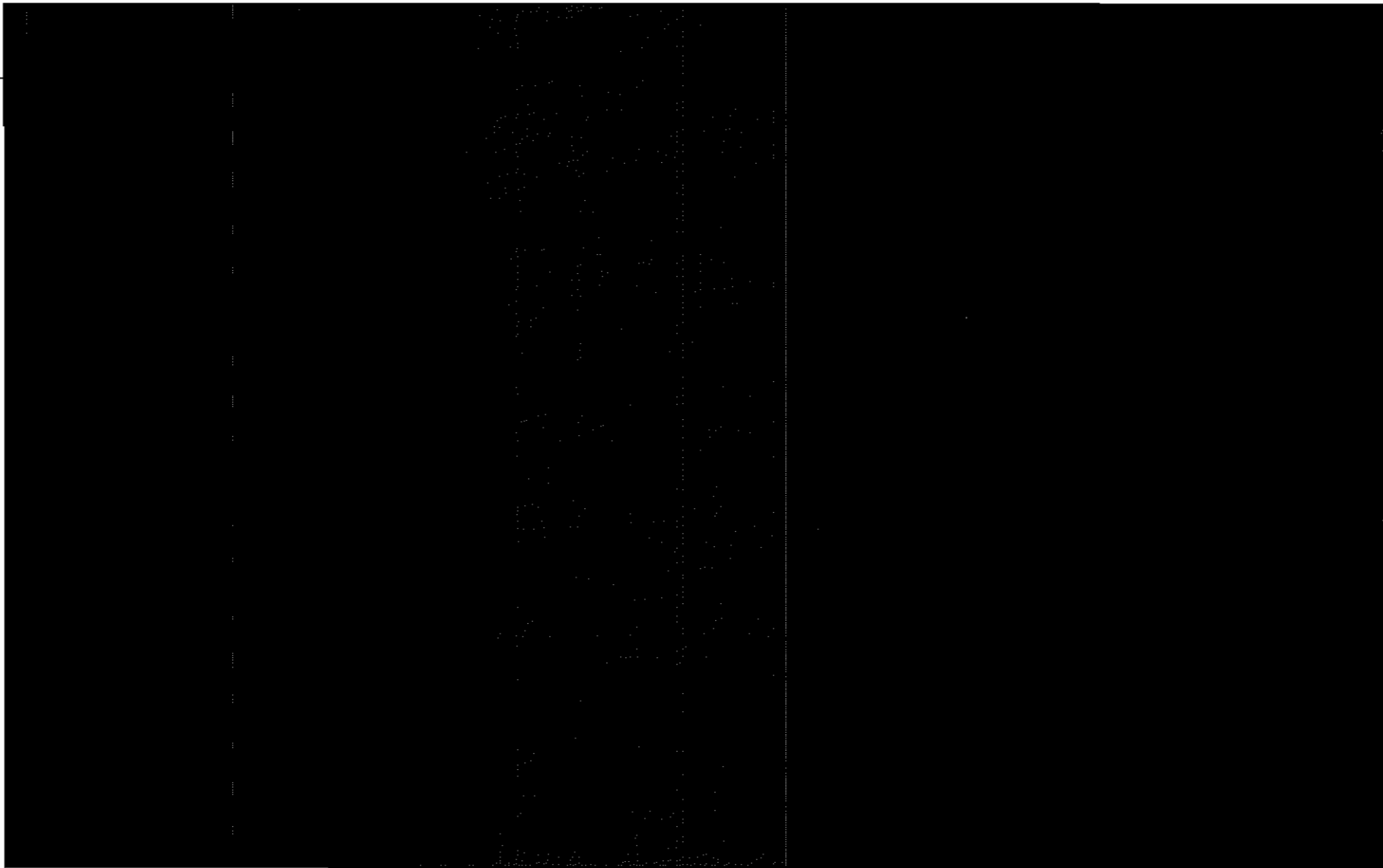


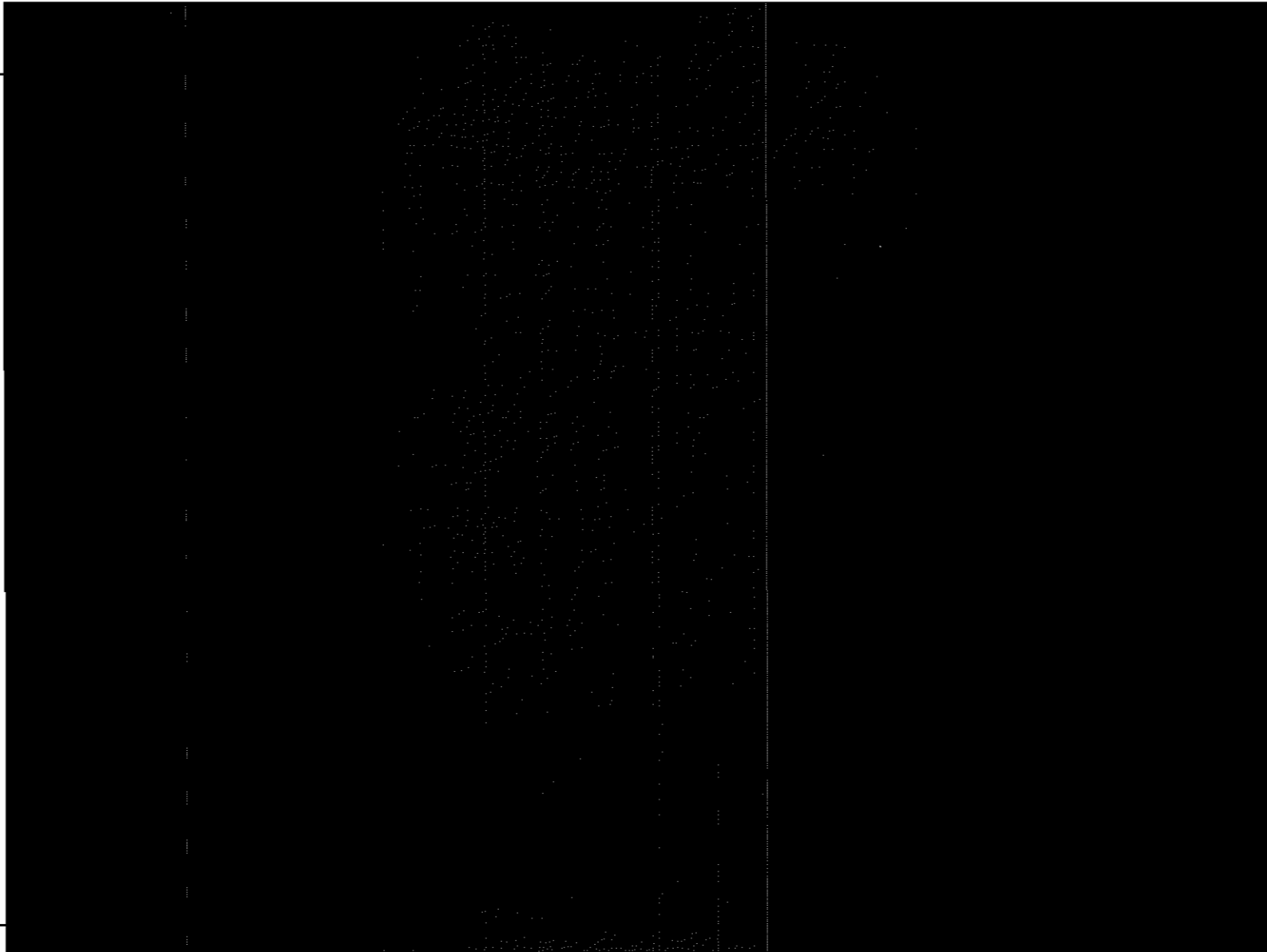
Scenario



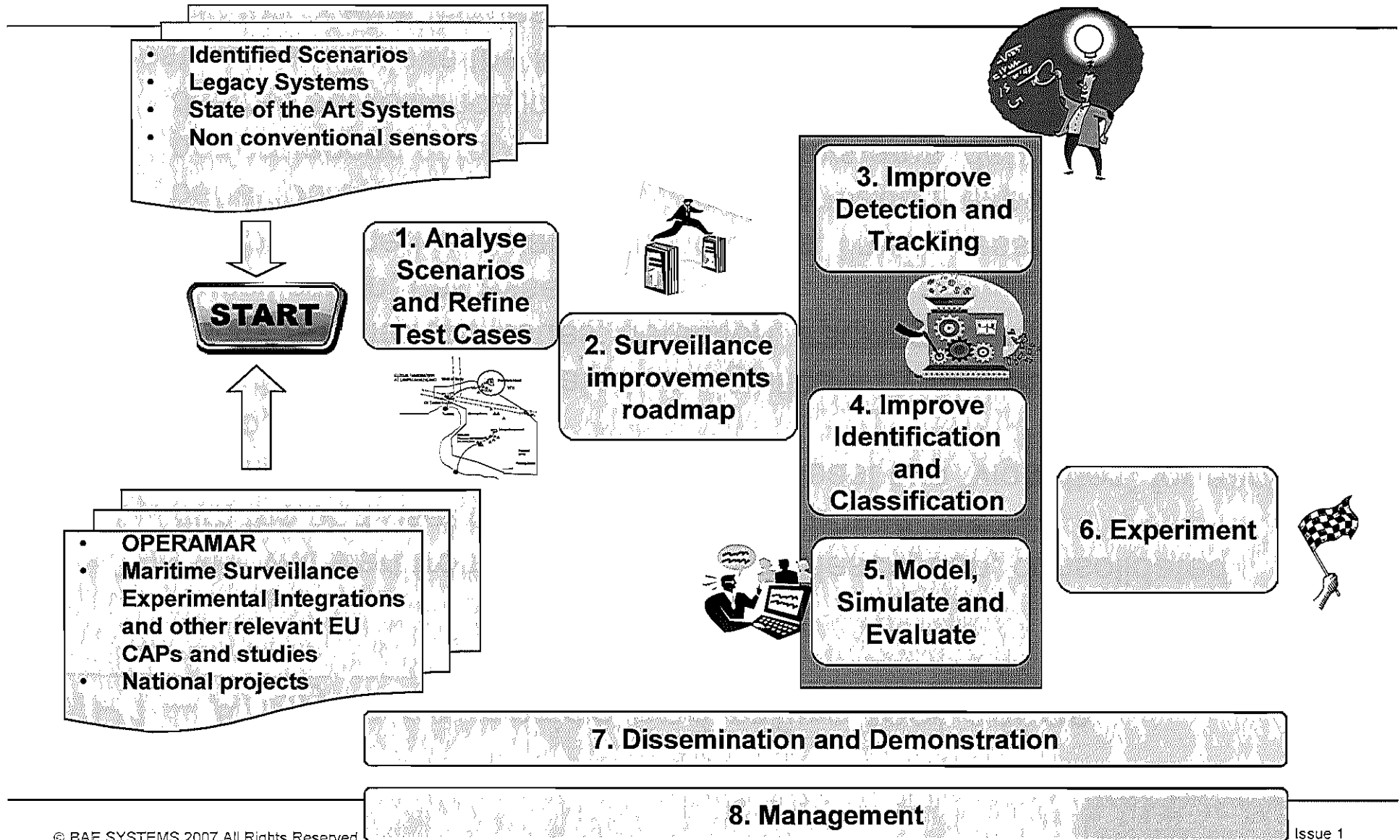








PROJECT WBS



WP1 – Analyse scenarios and refine test cases

- The WP will start from a sound scenario description, consolidated by/with the end user during the proposal phase
- The main objective will be to develop at least two “vignettes” for each scenario, that:
 - Are identified and validated as significant by end users
 - Focus on different issues: detection, tracking, identification, classification, risk assessment
 - Will be defined in detail (e.g. locations, times, vessels sizes and behaviours, weather, background information, expected performances of legacy sensors and systems, detailed definition of desired surveillance improvements ...)
- Test cases will drive the improvement design, will be used for evaluation of effectiveness of results, may guide “live demonstrations”

WP2 – Surveillance improvement roadmap

- Analyse performance of “as is” system solutions with respect to “test cases”
- Analyse the (legacy, state-of-the art and non conventional) sensors networking and integration roadmap and reference architecture
- Identify critical issues
- Match improvements roadmap with legal, operational and human factor constraints
- Provide guidelines to experimental demonstrator
- Define expected results by the experimental demonstrator

WP3 – Improve detection and tracking

- This WP will concentrate on improvements of the system capability to assess the presence of vessels in the area of interest (e.g. probability of detection vs. false alarms), to state where they are, what is their velocity, etc.
- Improvements may derive from architectural solutions (networking), new data processing engines, algorithms and/or innovative/flexible use of sensors

WP4 – Improve identification and classification

- This WP will concentrate on the techniques to generate the planned improvements in terms of system capability to augment and to present effectively the knowledge on selected tracks/vessels (identity, size, crew, origin, destination, cargo, etc.....)
- The WP will also cover anomalous behaviour detection / risk assessments
- Improvements will derive from architectural decisions (networking), new data processing engines, and/or innovative (net-centric)/flexible use of sensors and external databases

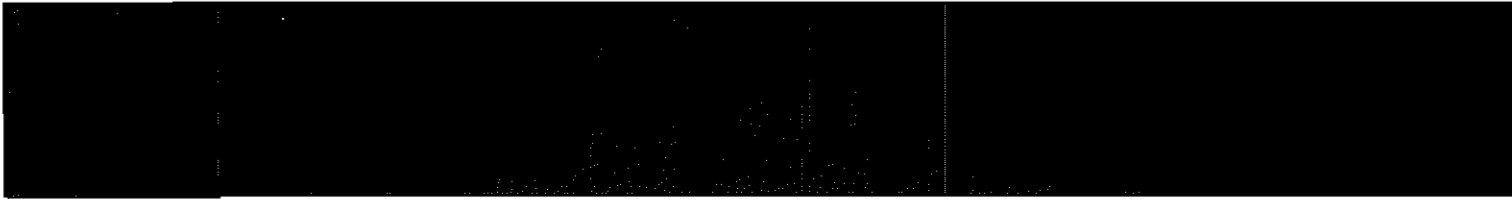
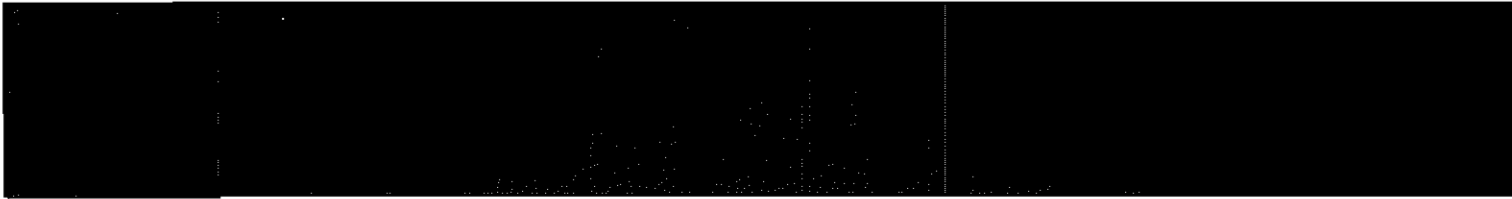
Other WPs description

WP5 – Model, simulate and evaluate

- This WP will provide an environment capable to represent the scenarios and vignettes and to test and measure the “improvements” generated by WP3 and WP4 with respect to the “as is” situation
- The environment must be flexible enough to test various types of “improvements” (incl. new software engines, new networking solutions, use of new sensors/databases, more flexible use of sensors, ...); both concepts and technologies must be validated
- The WP will define how to measure improvements
- The WP will include the conduct of evaluation sessions
- Coordination with WP4 and WP5

WP6 – Experiment

- This WP includes all the activities conducted in real environments to experiment, consolidate and validate the project findings, possibly involving both legacy systems and experimental prototypes

- 
- 

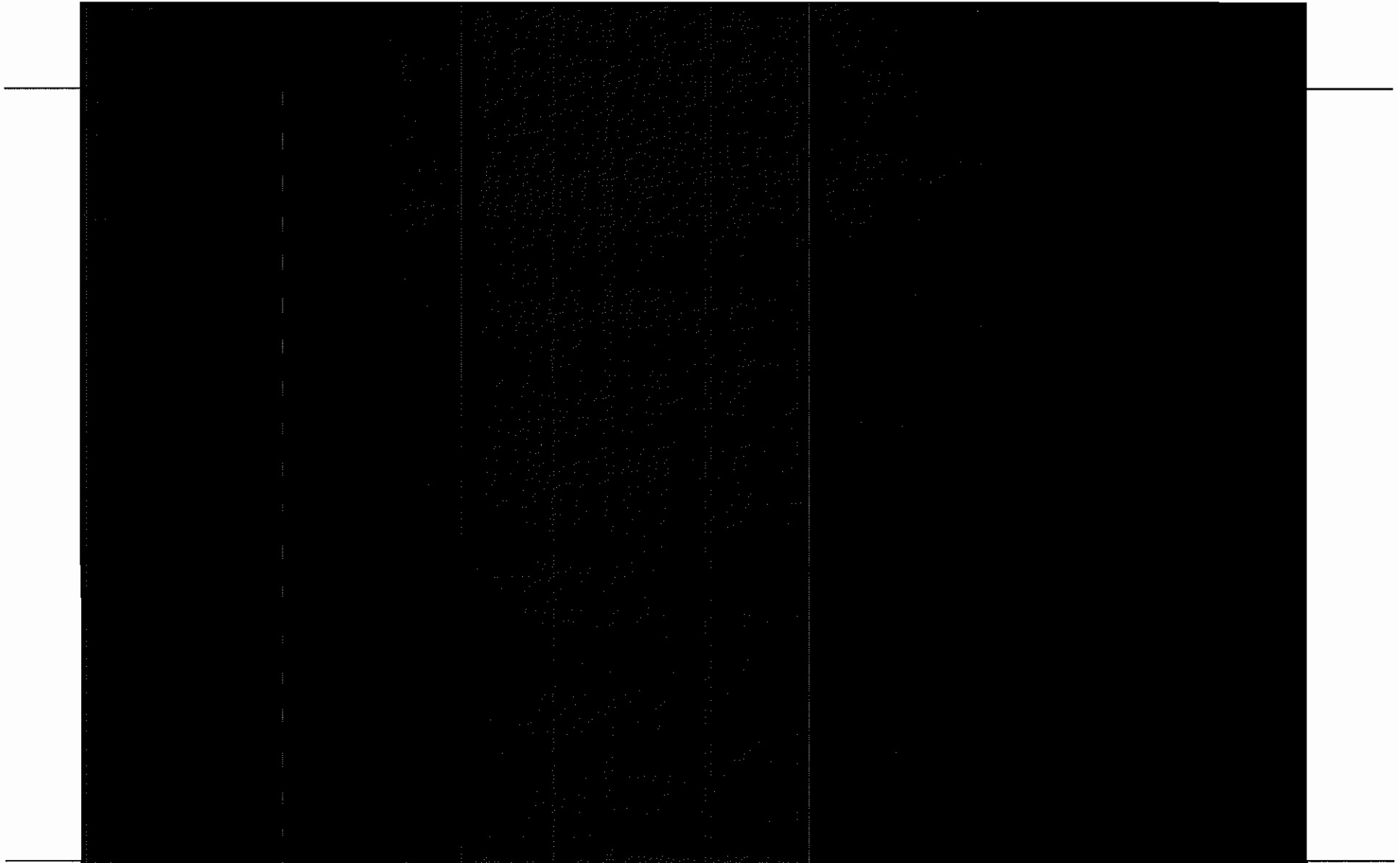
Other WPs

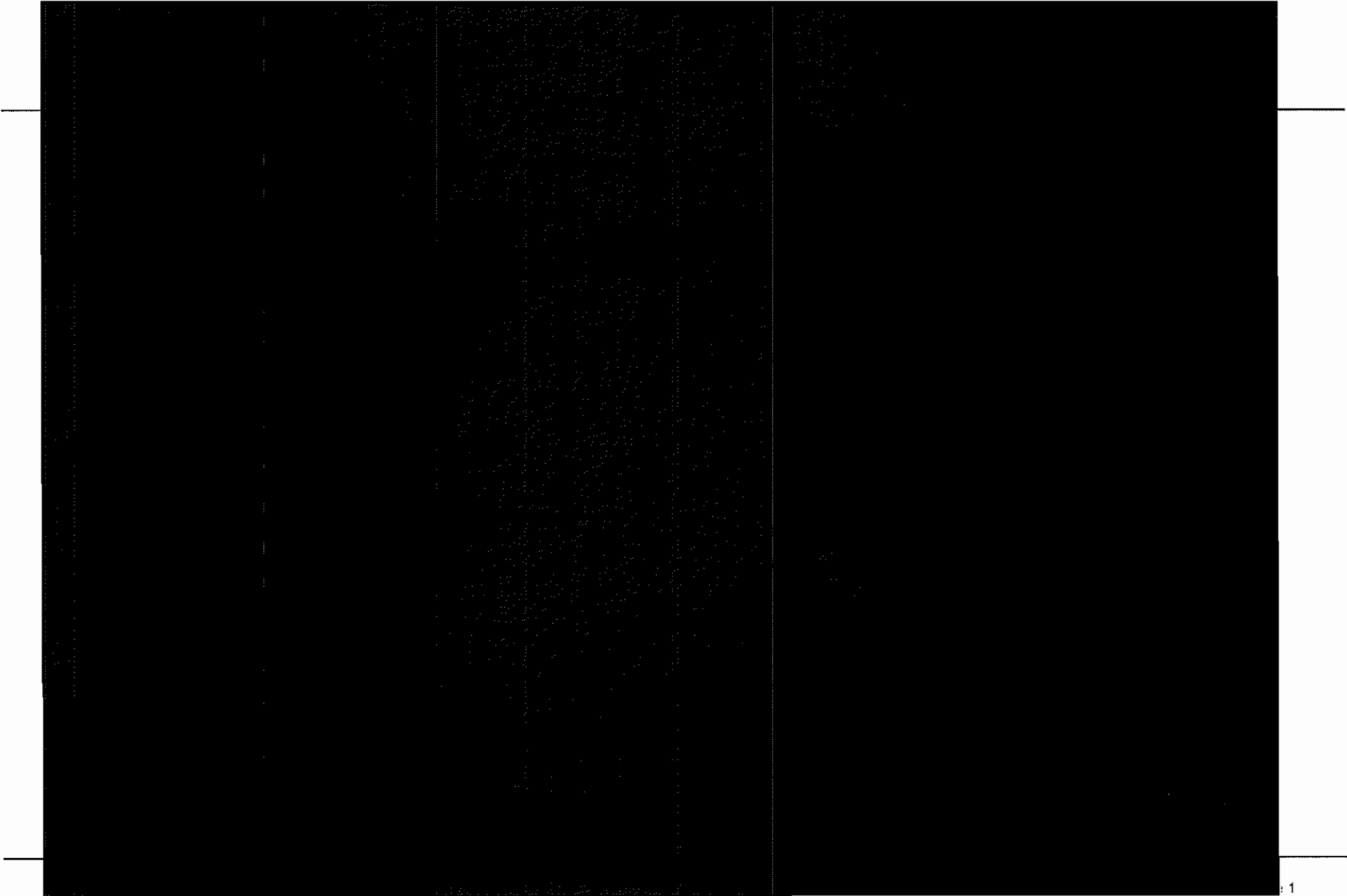
WP7 – Dissemination and demonstration

- Duration, location and core activities for demonstrations to be agreed with End Users before proposal submission
- Dissemination: methodology and actions TBD by WP leader (End Users involvement?)

WP8 – Management

- Strictly limited to project management activities eligible to 100% funding
- Technical management remains within the technical WPs





Proposal Preparation Plan – Milestones

