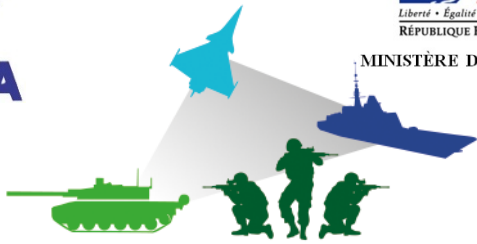




MINISTÈRE DES ARMÉES



CONTACT

Rassembler les Forces, au cœur de l'action

Tactical Communications - Nation's perspectives

French SDR Program : A global approach

Serge Debono

CONTACT - International Manager



CONTACT

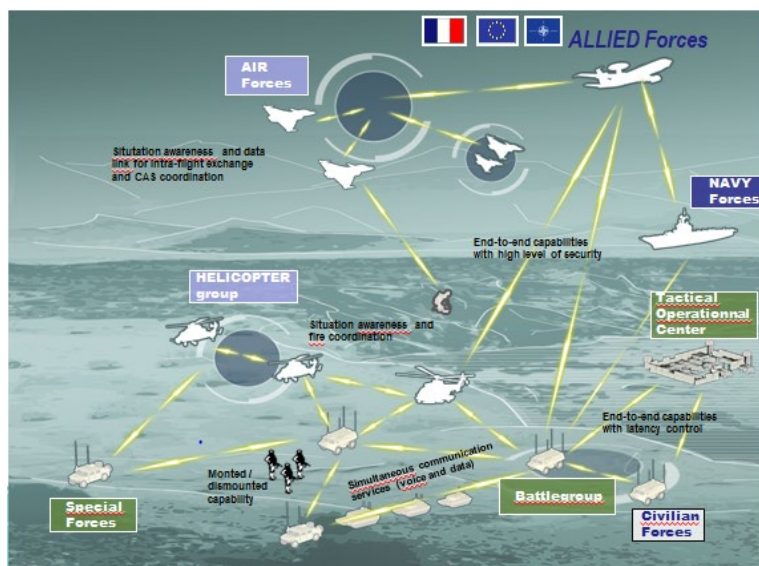
BRINGING TOGETHER THE FORCES AT THE CORE OF THE ACTION

- **A Full communication system**
 - For joint operation
 - For coalition
- **Cutting-edge technologies**
 - Meet operational needs and constraints
 - Offer tactical superiority
 - Enable future evolutions
- **A global inter-operability approach**
 - Active participation to international interoperability working group
 - SDR technology ready to implement coalition waveforms

CHALLENGES

■ Operational context

- Joint
- Multinational
- Civilian security actors



■ Operation need for digitalisation

- Share quickly the same operational picture
- Speed up decision making
- Improve coordination

■ Programmatic

- Smooth migration
- Incremental programme
- Economical optimization

■ Technical

- High data rates to cope with increasing data exchange
- Secured communications
- Large number of nodes
- Nodes moving differently
- Various elongations
- Optimization of frequency resources

PROGRAMME DRIVERS

- **Build a new system, not only a new set of radios**
 - Joint program, for joint operations
 - Robust tactical network, offering high data rate and end to end security
- **Simplify the experience for the user**
 - A standard interface for all products
 - Efficient Mission Planning Tool
- **Offer cutting-edge new capabilities**
- **Grant continuity with legacy**
- **Short loop between system designers and end-users**
- **Allow the services to evolve**
 - The system is here for ~30 years
- **Implement and/or contribute to standards to foster interoperability**

A FULL COMMUNICATION SYSTEM

WaveForms



Networking functions



Management system

Central & local management



Large set of Software Defined Radios (SDR)



End to end encryption

Up to NATO Secret



MULTIPLE PLATFORM RADIOS



NCT-t

Ground



ERS-p



ERS-a



ERS-in
(infra – naval)

Air / Navy

Near future

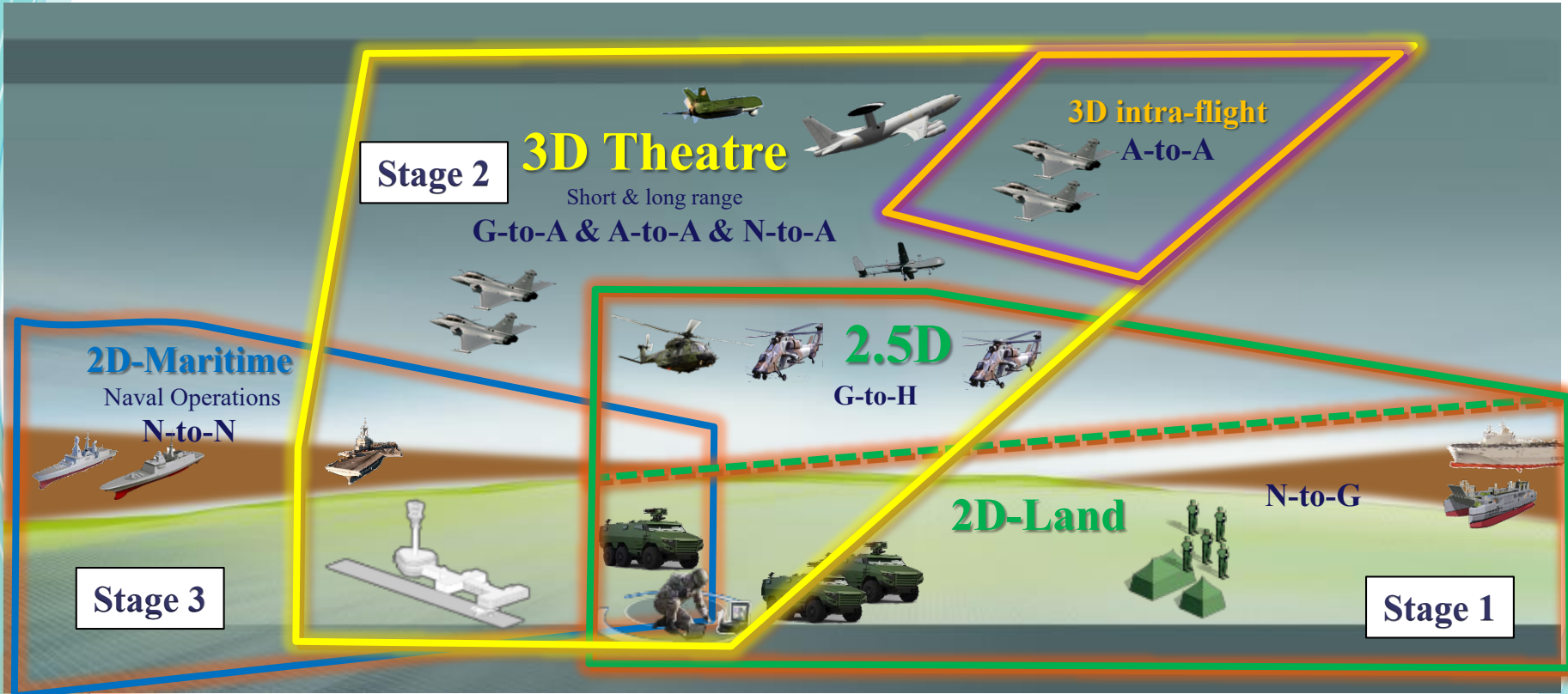


NCT-m



ERS-u

OVERALL PROGRAMME ROADMAP



A joint and incremental programme

CONTINUITY OF OPERATIONS

- **Simultaneous voice & data services to connect a full brigade (2000+ nodes) in a single network**
- **A resilient / self-healing Network :**
 - Radio failure or destruction
 - Jamming or unavailability of a radio link
- **Initial configuration can be adjusted during missions**
 - Accurate flexibility : Smart entry/exit of new nodes in the network
- **Smooth handling of transition from mounted to dismounted combat**
 - Continuity of communications between the dismounted soldier and the troops that are still inside the vehicle
 - The platoon leader can switch to another vehicle

NEW CAPABILITIES 1/2

- Geographical exchanges & transverse channels:
 - in addition to hierarchical comms
 - a shortcut to speed-up time-critical information dissemination

**Better tactical coordination
&
acceleration of
the tempo of the
manoeuvre**



NEW CAPABILITIES 2/2

■ CROSSBANDING

- A system combining the benefits of the VHF (range) and UHF (high data rates) bands
- Automatic switch to the most suitable service

■ Advanced voice services:

- Multiple conferences on a single channel (up to 2 in VHF and 4 in UHF)
- Dedicated Community of Interest to stick to operational needs

■ Open & evolving systems designed to evolve over time

- For national or coalition purposes
- Thanks to software technologies (SDR) and adaptative hardware design

CONTACT INTEROPERABILITY

A global approach



NATO CATLOS

NBWF
WBWF
SATURN SEDR

↓

NEW STANAG

NATO members + PFP



CONTACT programme

SCA / ESSOR compliant Radios

FR



ESSOR HDRWF

Architecture
A state of the art WBWF

FR + IT + SP + PL + FIN
+ DE (In process)

European initiatives

PESCO ESSOR

9 nations agreed to work together to develop SDR technologies for European military radios thereby reinforcing the European strategic autonomy.

↓

- Work on CONOPS
- Development of new coalition waveforms

EDIDP

The European Commission is contributing financially to new development linked to ESSOR PESCO

FR + IT + SP + PL + FIN (ESSOR HDR)
DE + NL + PT + BE

PARTICIPATION TO ESSOR

- France is part of the ESSOR HDR project
 - Involving also SP, IT, Fin, POL and DE integration under discussion
 - Managed by OCCAR
- ESSOR provides Interoperability through portability
 - Architecture of SDR for military purposes - Published
 - a common ESSOR methodology which is a key to interoperability and Waveform portability
 - HDR WF : a advanced wideband waveform

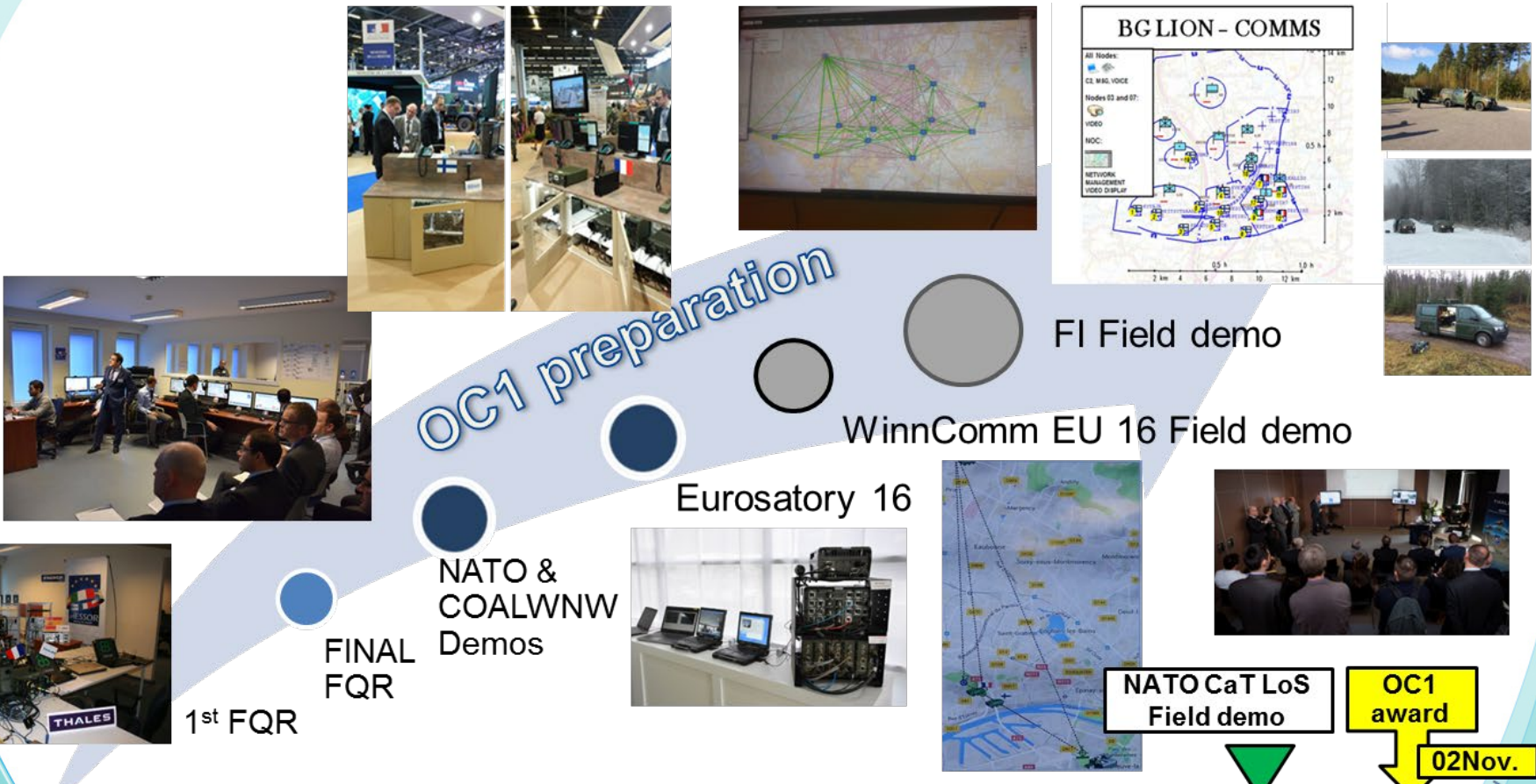
architecture



methodology

Interoperability
through
portability

INTEROPERABLE SDR : implemented with success by ESSOR



● Lab test activities

● Field test activities



PARTICIPATION TO LOSCAT

NATO Line Of Sight CAbility Team

- **Active participation in the design of future coalition waveform**
 - **SEDR – joint work with the US to define a new WF for air-combat**
 - **NBWF – definition of requirements for long term coalition NBWF**
 - **WBWF– definition of requirements for coalition WBWF**
- **The ESSOR countries are proposing the ESSOR HDRWF as a WBWF STANAG**
 - **Draft STANAG already circulated**
 - **Final draft mid 2020**
 - **NATO waveform Policy compliant**

CONCLUSION – TAKE-AWAY

- **CONTACT: A global answer**
 - for all the Armed Forces (Air, land, navy)
 - for national and coalition operations
- **Scalable System : up to a full brigade (2000+ nodes) in a single network**
- **Highly resilient : resistant to EPM threats, self reconfiguration (loss of node / change of topology)**
- **Secured : end-to-end crypto**
- **Cutting-edge collaborative combat capabilities**
- **Fit for future evolution**