C-SIGMA envisions linking together existing and planned unclassified space system capabilities in a worldwide collaborative network via coordinated regional centers for international GLOBAL MARITIME AWARENESS to provide security, safety, environmental protection, resource conservation, as well as disaster mitigation and recovery. It would be a huge step toward global maritime security.

Benefits of Attending:
- Benefit from an update on the very rapid expansion of Earth Observation satellite capabilities & their impact on the maritime world
- Find out about Earth Observation Systems
- Learn how S-AIS has changed the maritime world
- How Analysis w/ AI & Machine Learning is impacting maritime operations

Topics covered will include:
- 12.00 Registration and Coffee
- 12.30 The Dramatic Expansion of Earth Observation Satellite Systems and their Impact on Maritime Awareness
- 2.00 Coffee Break
- 2.30 S-AIS Systems
- 3.15 Dynamic Data Analysis Systems, Getting Smarter and Smarter
- 4.00 C-SIGMA Concept Brief, Tying it All Together
- 4.30 Closing Remarks and End of Workshop
### REGISTRATION & COFFEE

8.30

### CHAIRMAN’S OPENING REMARKS

8.50

**Rear Admiral (Retd) Anthony Rix, Former Flag Officer Sea Training, Royal Navy**

### KEYNOTE ADDRESSES

9.00 **Training for Operations: Maintaining Operational Readiness and Achieving Maritime Domain Awareness in Multi-National Naval Operations**

- How training is essential in creating operational readiness for maritime surveillance
- Current technologies adopted by the Royal Navy for maritime reconnaissance at sea
- Future plans and developments for the Royal Navy in optimising maritime situational awareness

**Rear Admiral William Warrender, Flag Officer Sea Training, Royal Navy**

9.30 **The Italian Air Force’s Conceptual Approach to Maritime Surveillance and Reconnaissance**

- The current approach of the Italian Air Force to Maritime Surveillance and Reconnaissance
- Shaping Operations to meet the challenges in the Mediterranean maritime Environment
- Doctrine developments within the Italian Navy and how it changed in the recent years
- Prospects for future technology capability development and key interests of the Italian Air Force

**Colonel Maurizio Maggio, Office of the Aviation Inspector for the Navy, Italian Air Force**

### LUNCH

10.00 **Leveraging Commercial Partnerships for Maritime Safety and Security**

- Commercial space-based assets provide global reach and coverage without unrealistic investment
- Real-time data for weather, wind, and situational awareness – Only when and where it’s needed
- Secure integration of proprietary data with commercial information empowers enhanced models and views

**Mr William Hosack, CEO, Orbital Micro Systems**

10.30 **Morning Coffee**

### AIRBORNE ISR PLATFORMS AND OPERATIONS

11.00 **Leonardo Solutions for Maritime Situational Awareness**

- Maritime Situational Awareness and Border Control context
- Leonardo solution for Laps (NEREUS)
- NEREUS MSA Application
- NEREUS Sensors Management Application

**Mr Fabio Servillo, Land & Battlefield Systems, Maritime C4i, Leonardo**

11.30 **Utilising Airborne ISR Platforms as Force Multiplier in NATO MARCOM Operations**

- Facilitating interoperability with multi-platform airborne ISR activity
- Supporting NATO naval deployments with rotary wing reconnaissance platforms
- Combining air- and shipborne ISR capabilities to maintain maritime situational awareness and deter criminal activity
- Responding to challenges in the Mediterranean with a rapid and versatile air force

**Commodore Andreas Vettos, Commander Maritime Air Command, NATO MARCOM**

12.00 **Raytheon - Multi-Sensor Airborne ISR for Maritime Surveillance**

- In a challenging maritime environment the use of airborne intelligence, surveillance and reconnaissance assets can provide a discriminating capability, generating situational awareness and underpinning command decisions
- The deployment of multi-sensor platforms in such operations will be discussed, focusing on both the technologies and their employment to maximise effect

**Mr Philip Nettleship, Chief Technology Officer, Airborne ISR, Raytheon UK**

12.30 **A “small Nation” Navy and Air Perspective Towards Warfare and Maritime Developments**

- Developing relevant navy and air interoperable capabilities in the Far North
- Approach to the 5th Generation of Warfare and utilising digital networks and virtual combat clouds
- Information-sharing among allied Danish maritime and air agencies
- Achieving cross-domain synergy and retaining strategic superiority at sea, on land, and in the air

**Colonel Henrik Kanstrup, Acting Commander Helicopter Wing Karup, Royal Danish Air Force**

1.00 **Networking Lunch**

### ENHANCING SPACE BASED MARITIME DOMAIN AWARENESS

2.00 **Satellite Based Maritime Domain Awareness**

**Mr Christopher Winquist, Director, ICEYE Maritime Business**

2.30 **Spanish ISR & Space Observation Approach: Spanish MoD Update on SAR PAZ Satellite and Its Performance in Maritime Domain Awareness Support**

- How Spanish SAR PAZ satellite (high-resolution, day and right-time) imagery intelligence supports the MoD and Navy ISR needs
- How the data gathered and their fusion into the Maritime Domain Awareness allows a persistent environmental monitoring, an adequate border control, and increase maritime security in the Spanish waters in order to achieve strategic superiority
- Some challenges and lessons learned with the new SAR PAZ Satellite since its launch early 2018

**Brigadier General Carlos de Salas, Head C4ISR & Space Programs, Spanish Ministry of Defence**

3.00 **IMAGESAT International (ISI) – How AI lets us see the full potential of satellite imaging for maritime domain awareness**

- The development of KINGFISHER - Maritime Intelligence System
- How KINGFISHER enables detection of non-cooperative vessels in the Deep sea based on Artificial Intelligence (AI) technology, such as Deep learning, Multi Agent Simulation, Behaviour prediction, Anomaly detection etc.
- How the AI techniques enable decision support for maritime operators and provide an optimal, autonomous and economic solution for maritime systems

**Mr Ori Zeisel, Director, Business Development, Imagesat International**

3.30 **Afternoon Tea**

4.00 **Latest Insights into Airborne Maritime Surveillance**

- Frequent technical and operational requirements
- Mission Management based on Aeromission®
- Examples

**Dr Nils Robbe, Director Marketing and Sales, Aerodata AG**

4.30 **Enhancing Swedish Navy Decision Superiority with All-Round Situational Awareness and Cutting-Edge Communications Technology**

- An update on the current Naval C4i Systems development and acquisition programmes in the Swedish Naval Procurement Office
- Enhancing frequency, ranges, and sensitivity of sensors integrated onto naval platforms and maximising communication and intelligence dissemination
- How developing user-friendly and robust C4i Systems will achieve Swedish naval decision superiority
- Protecting systems against cyber and electronic warfare threats at sea

**Dr Ulf Gerhardsson, Head of Design Naval C4i System, FMV**

5.00 **Chairman’s Closing Remarks and Close of Day One**

**Rear Admiral (Retd) Anthony Rix, Former Flag Officer Sea Training, Royal Navy**
Day Two | 7th February 2019

**KEYNOTE ADDRESSES**

**9.00** Maintaining a Versatile Coastal Fleet through Acquisition of Material and Meeting Emerging Requirements
- Managing surface, air, and space-based platforms to gather intelligence off the Italian coast and into the Mediterranean
- How the development of space-based capabilities is optimising maritime domain awareness in the Mediterranean Sea and addressing the challenges at sea
- Optimising Search and Rescue capabilities with real-time information sharing and analysis
- Balancing national security and humanitarian operations while retaining a firm presence off the coast

**Chairman**

**9.30** Intelligence, surveillance and reconnaissance to work for NATO MARCOM operations — an end user’s perspective
- Combining space, airborne, seaborne, and undersea sensors to maintain maritime situational awareness
- Enhancing space-based maritime surveillance to maximise the effectiveness of naval tasks
- Fusing maritime intelligence – and visualizing the knowledge it delivers - to better adapt to the changing security environment in European waters
- Pushing interoperability, connecting stovepipes, and making ISR perform faster and more accurately - for better operational decision-making

**Commander**

**10.00** The National Maritime Information Centre - Achieving cross-government MDA for the UK
- The requirement for a cross-government maritime information sharing environment within a coherent national maritime security strategy.
- Roles and functions of the NMIC.
- Global priorities and the importance of international information sharing partnerships.
- The range of maritime security tasks enabled by effective cross-government MDA.

**Government Representative**

**10.30** Morning Coffee

**UNMANNED MARITIME SYSTEMS TECHNOLOGY**

**11.00** Enhancing Portuguese Maritime Domain Awareness with Increased Unmanned Operations
- Maximising the Portuguese Navy’s flexibility with unmanned platform integration
- How unmanned platforms and AI integration into legacy equipment will enhance Portuguese Maritime Domain Awareness and environmental considerations
- Developing the Maritime Security Cooperative Concept and its significance for future interagency naval cooperation
- The potential of maritime autonomous platforms in future ASW, demining and environmental monitoring operations

**Commander**

**11.30** Sponsor Session for Kleos Space

**Air Commodore Peter Round**, Chairman, Kleos Space

**12.00** Building a Credible and Versatile Naval Fleet through Modernising Belgium’s Maritime ISR Technologies
- Requirements for modernisation and upgrades within Belgian navy equipment
- Recent modernisation and procurement programmes of above- and sub-surface vessels
- Belgian-Dutch cooperation - an update on recent capability sharing in ISR operations
- Meeting required levels of interoperability through sustained training and multi-lateral exercises
- Safeguarding the North Sea with new platforms and improved inter agency cooperation

**Commander**

**12.30** The Devil Finds Work for Idle Ships
- Analyzing the unique operational profile of every ship
- Daily ranking of high-risk ships worldwide
- Assessing threats using ship economic performance metrics

**Mr Omer Prima**, Director Marketing Director, Windward

**13.00** Networking Lunch

**INNOVATION PANEL DISCUSSION**

**2.00** Enhancing Aerial Surveillance Within Coast Guard Operations in the UK Maritime Coast Guard Agency (MCGA)
- Requirements for an all-weather surveillance capability operating throughout the UK EEZ
- Developing technology to enable responses to unplanned tasking
- Optimising AI and unmanned platform effectiveness
- Acquiring a system of operation that can detect targets – pollution, illegal activity, etc. – anywhere within the UK EEZ
- How the Aerial Surveillance procurement process will maximise British ISR operations along its coastlines

**Mr Phillip Hanson**, MCA Aviation Technical Assurance Manager, Maritime and Coastguard Agency

**2.30** PANEL DISCUSSION

**Available Technologies to Enhance Maritime Domain Awareness and Needs for Innovative Solutions**
- Challenges to effective intelligence gathering and sharing and how to remedy them
- Emerging requirements for autonomous technologies and enhance AI capabilities
- Technology integration into legacy equipment
- Question & Answer Session

**Brigadier General Carlos de Salas**, Head C4ISR & Space Programs, Spanish Ministry of Defence

**Dr Ulf Gerhardsson**, Head of Design Naval C4ISR System, FMV

**Rear Admiral (Retd) Anthony Rix**, Former Flag Officer Sea Training, the Royal Navy

**Mr Phillip Hanson**, MCA Aviation Technical Assurance Manager, Maritime and Coastguard Agency

**SCIENCE AND TECHNOLOGY DEVELOPMENTS**

**3.00** NATO S&T Support to Maritime C4ISR
- Unmanned maritime systems
- Support of RMP (Recognized Maritime Picture) through integration of underwater UUVs systems;
- Use of UUVs/Gliders in support of Maritime Operations;
- C4ISTAR
- Innovative techniques to enhance MSA (Maritime Situational Awareness) in support of NATO operations;
- Smart Management of Maritime Big Data.

**Commander Amleto Gabelone**, Program Manager - Research Development, NATO STO-CMRE - Centre for Maritime Research and Experimentation

**Dr Leonardo Millefiori**, Project Manager, NATO STO-CMRE - Centre for Maritime Research and Experimentation

**3.30** Afternoon Tea

**4.00** Harvesting Space Technology to Support Monitoring of the Maritime Domain and Increasing Safety at Sea
- Developing systems for maritime data exchanges and establishing a pan-European information network
- SafeSeaNet, CleanSeaNet, LRIT, etc.
- How intensified intelligence sharing directly supports maritime and trade security in Europe
- Gathering imagery intelligence from space and delivering real-time optical satellite information
- Current challenges to maritime security and how space-based maritime domain awareness proves to be the solution

**Ms Helena Ramon Jarraud**, Head of Unit Maritime Surveillance, European Maritime Agency

**4.30** Chairman’s Closing Remarks and Close of Day Two

**Rear Admiral (Retd) Anthony Rix**, Former Flag Officer Sea Training, the Royal Navy

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