What is 7SHIELD ?

7SHIELD provides to the European Ground Segments of Space Systems a holistic framework that enables to confront complex cyber and physical threats against their critical infrastructure

7SHIELD FRAMEWORK

The 7SHIELD framework integrates several cutting-edge technologies from multidisciplinary and complementary fields which might be classified through the following seven (7) main thematic categories:

- IoT
- Decision Support Systems
- Semantic Reasoning
- Sensors Technologies
- Crisis Management
- High-level Analytics
- Situational Awareness

7SHIELD KEY RESULTS

7SHIELD framework integrates 20 key results (technology bricks) that have been developed and refined during the project according to the evaluations performed in the pilot operational tests and demos.

PREVENTION TECHNOLOGIES

Risk Assessment Tools	Secure Authentification Mechanism	Combined Threat Assessment Tool	Cyber and Physical Threat Intelligence

DETECTION TECHNOLOGIES

Data Collection and Edge Processing Module	Face Detection and Face Recognition Module	Video-based Object and Activity Recognition	Cyber Attack Detection Framework
Thermal and Near-infrared Image Processing for Man-made Threats Detection	Detection of Ground Based and Aerial Intruders	Combined C/P Threat Detection and Early Warning Module	Data Models for Combined Detection

RESPONSE TECHNOLOGIES

7SHIELD Knowledge Base	Crisis Classification Module	Tactical Decision Support System
Social Awareness and Warning Message Generation		UAV Neutralisation Mechanism

MITIGATION TECHNOLOGIES

Potential Impact from C/P Attacks and Countermeasures Knowledge Base

7SHIELD PLATFORM

User Interface-Common and Control	7SHIELD Integrated Platform

7SHIELD TRAINING PLATFORM

The 7SHIELD Training Platform is intended to explain to end-users and other stakeholders the objectives and benefits of the 7SHIELD framework and to provide the Ground Segment Operators with technical information on the integration and use of the 7SHIELD modules.

The 7SHIELD Training Platform is operated by Space Applications Services.

Overview Training

Pre-Crisis Training
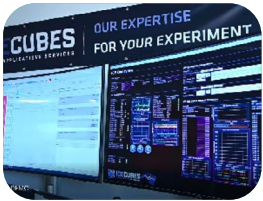
Response Training

Post-Crisis Training

✉ **7ShieldTraining@spaceapplications.com**

PILOT OPERATIONAL TESTS AND DEMONSTRATIONS

The 7SHIELD framework was tested and demonstrated in five substantial pilot use cases.

ONDA DIAS platform (SERCO, Italy) in October 2021 (1st operational trial) - Simulation of three types of cyber attacks on the ONDA DIAS.

ICE Cubes Service onboard the ISS (SPACEAPPS, Belgium) in November 2021 (2nd operational trial) and December 2022 (3rd final demo) - Simulation of threat detection and mitigation on Ice Cubes Service.

National Observatory of Athens Ground Segment (NOA, Greece) in March 2022 (3rd operational trial) and September 2022 (1st final demo) - Simulation of cyber and hybrid (cyber physical) attacks on the Ground Segment assets operated by NOA's Institute for Astronomy, Astrophysics, Space Applications and Remote Sensing.

DEIMOS Ground Segment (DEIMOS, Spain) in May 2022 (4th operational trial) - Simulation of a cyber and physical attacks on DEIMOS's Ground Segment.

Arctic Space Centre (FMI, Finland) in November 2022 (2nd final demo) - Simulation of physical and hybrid (cyber physical) attacks on the Ground Segment assets of the Arctic Space Centre operated by the Finnish Meteorological Institute.

7SHIELD

Safety and Security Standards of Space Systems, ground Segments and Satellite data assets

PREVENTION

DETECTION

RESPONSE

MITIGATION

TECHNOLOGIES AGAINST PHYSICAL AND CYBER THREATS

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