D7.2 User Training

Work Package:	WP7 Pilot implementation, evaluation and training
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Due date:	31 December 2022
Version number:	1.0 **Status:** Final
Dissemination level:	Public

Project Number:	883284 **Project Acronym:** 7SHIELD
Project Title:	Safety and Security Standards of Space Systems, ground Segments and Satellite data assets, via prevention, detection, response and mitigation of physical and cyber threats
Start date:	September 1st, 2020
Duration:	30 months
Call identifier:	H2020-SU-INFRA-2019
Topic:	SU-INFRA01-2018-2019-2020 Prevention, detection, response and mitigation of combined physical and cyber threats to critical infrastructure in Europe
Instrument:	IA

Revision History

Revision	Date	Who	Description
0.1	13/01/2023	SPACEAPPS	First Release
0.2	19/01/2023	SPACEAPPS	Internal review at SpaceApps
0.3	20/01/2023	ENG, STWS	Internal peer review
0.4	20/01/2023	KEMEA	Security check
0.5	23/01/2023	SPACEAPPS	Incorporate ENG and STWS inputs
1.0	24/01/2023	SPACEAPPS, ENG	Final version

Quality Control

Role	Date	Who	Approved/Comment
Internal review	20/01/2023	ENG	Document accepted, only minor changes suggested
Internal review	20/01/2023	STWS	Document accepted, only minor changes suggested

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Executive Summary

During the course of the 7SHIELD project, the training activities included:

- The design and development of the 7SHIELD Training Platform
- The presentation of the 7SHIELD Training Platform and content to the project's end-users/decision makers, but also external stakeholders
- The implementation of a series of Webinars for targeted end-users (pilot operators, site managers).

The 7SHIELD Training Platform was developed to support current and future end-users (both Satellite Ground Segment operators and stakeholders) to familiarise themselves with the benefits and capabilities of the 7SHIELD framework.

It provides a general overview of the 7SHIELD framework as well as detailed online User Manuals for the efficient use of the 7SHIELD tools and platform, for the operators and stakeholders.

The 7SHIELD Training Platform is organized in four modules:

1. **Overview Training,** explaining the overall goals and concepts of the 7SHIELD project
2. **Pre-Crisis Training,** to describe the tools provided to implement Prevention actions
3. **Response Training,** to describe the tools provided to implement Detection and Response actions
4. **Post-Crisis Training,** to describe the tools provided to implement Mitigation actions

Each module is complemented by video tutorials to describe relevant aspects of the tools and by the extract of the Webinars that were implemented during the project development to support Ground Segment's operators.

The 7SHIELD Training Platform will maintain accessible to the public for a year after the project completion. This will allow additional external parties interested in the 7SHIELD outcomes to benefit from the 7SHIELD training content.

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Definitions and acronyms

CA	Consortium Agreement
CI	Critical Infrastructure
CIP	Critical Infrastructure Protection
C/P	Cyber/Physical
DoA	Description of Action
EC	European Commission
EU	European Union
GA	Grant Agreement
GS	Ground Segment
KR	Key Result
PC	Project Coordinator
TM	Technical Manager
UI	User Interface
WP	Work Package

1.   Introduction

In the framework of 7SHIELD and in order to support the familiarisation of current and future end-users with the benefits and capabilities of the tools offered, Space Applications developed a Public Training Platform (incorporating a set of Users Manuals) and provided a series of respective Webinars.

1.1.   7SHIELD Training Platform Development

The 7SHIELD Training Platform development started in March 2022 (M19) with the design of the layout and architecture and user interface.

In July 2022 (M23) a User Manual Template was proposed and shared to collect feedback from each tool provider. In the same month, a personalised kick-off meeting with each partner was organised to explain the overall objective of their task, deadlines and expected outcome. In this occasion, the Final User Manual Template was provided to the partners to collect inputs in a harmonised manner.

In the following months, the Users Manuals were collected and progressively integrated into the 7SHIELD Training Platform. SPACEAPPS followed up closely with the coordination and log of the inputs from July 2022 to December 2022 (M23-M28).

The production of the video demo and tutorial was coordinated in synergy with the development of video content for the Info Day.

When the 7SHIELD Training Platform was more mature, the content was made available to the operators as pre-study material to complement the live Webinar sessions organized by SPACEAPPS.

1.2.   7SHIELD Webinars Development

During the Webinars organized before each Operational Test and Demonstration pilot, the operators got real-time support during the set-up of the tools, a presentation about the overall objectives of the tools and a real-time interactive demonstration of the interface navigation.

After each Webinar, the training material as well as the recording was made available to the operators in the 7SHIELD MS Teams and Sharepoint.

2. 7SHIELD Training Platform Overview

The 7SHIELD Platform is based on Moodle[1], an open-source Learning Management System already used at SPACEAPPS for internal and commercial training.

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Each module is complemented by video tutorials to describe relevant aspects of the tools and by the extract of the Webinars that were implemented during the project lifecycle to support Ground Segment's operators.

The 7SHIELD Training Platform is developed by SPACEAPPS, and populated with Users Manuals and videos provided by the partners of the 7SHIELD Consortium.

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[1] http://www.moodle.org

3. 7SHIELD Training Platform Structure and Navigation

3.1. 7SHIELD Training Platform Structure

The Overview Training module, targeting decision makers and operators, provides an overview of the 7SHIELD project and the increased need for security and resilience of the European Ground Segment of Space Systems, in terms of prevention, detection, response and mitigation actions of combined physical and cyber threats.

Pre-Crisis, Response and Post-Crisis Training modules are organized in stand-alone courses. Each course provides a detailed description of the tools following the structure below:

- Map of the overall 7SHIELD Architecture
- Short Description
- Main Purpose and Benefits
- Main Functions
- Integrations with other Tools
- Infrastructure Requirements
- Operation Manual

3.2. 7SHIELD Training Platform Navigation

Access to the 7SHIELD Training Platform is provided through the following web page:

https://7shield.spaceapplications.com/

Figure 3-1 – 7SHIELD Web page

The content of the 7SHIELD Training Platform is public and accessible without need of registration by the users.

From the 7SHIELD Webpage, the user can also be re-directed to the 7SHIELD Training Platform Welcome page (see figure below).
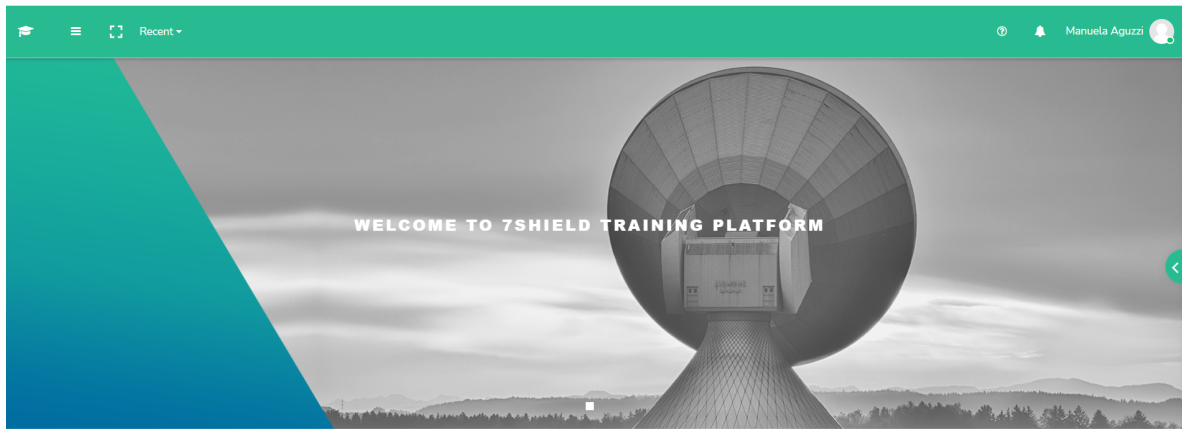
Figure 3-2 – 7SHIELD Training Platform Welcome Page

After a short description of the 7SHIELD project, by scrolling down the welcome page, the user reaches the course selection.
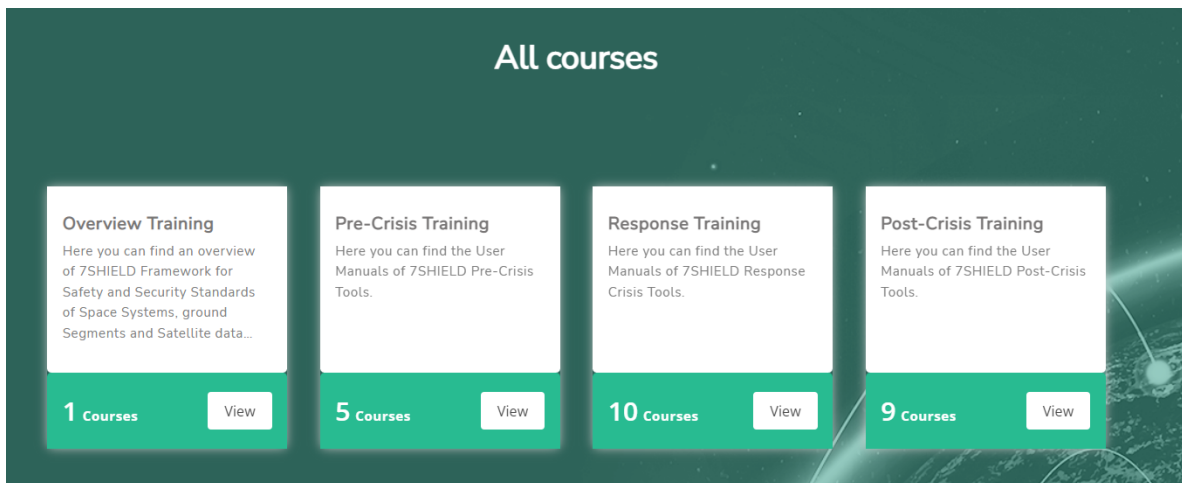

Figure 3-3 –Training Platform Screenshot – All Courses

By clicking on 'View', the user can access all the User Manuals of the corresponding category. They are organised in modules with reference to the Key Result (KR) number in the frame of the 7SHIELD Project.
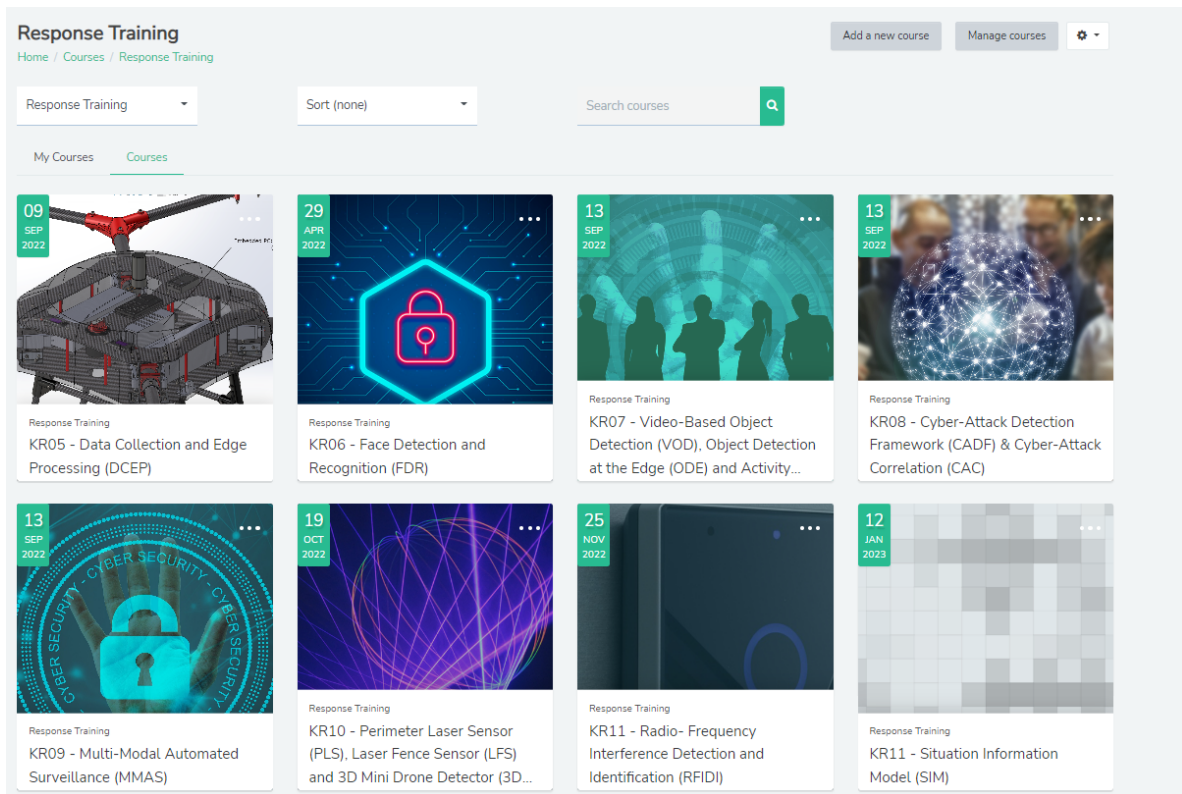
Figure 3-4 – Training Platform Screenshot – Module Selection

The figure above shows the User Interface of the Response Training module. By clicking on one of the courses on the Response Training page, the user can access the content of the specific module's training course.

Each course starts with a 7SHIELD Architecture's Map where the specific tools are located and how it interacts with the other tools.
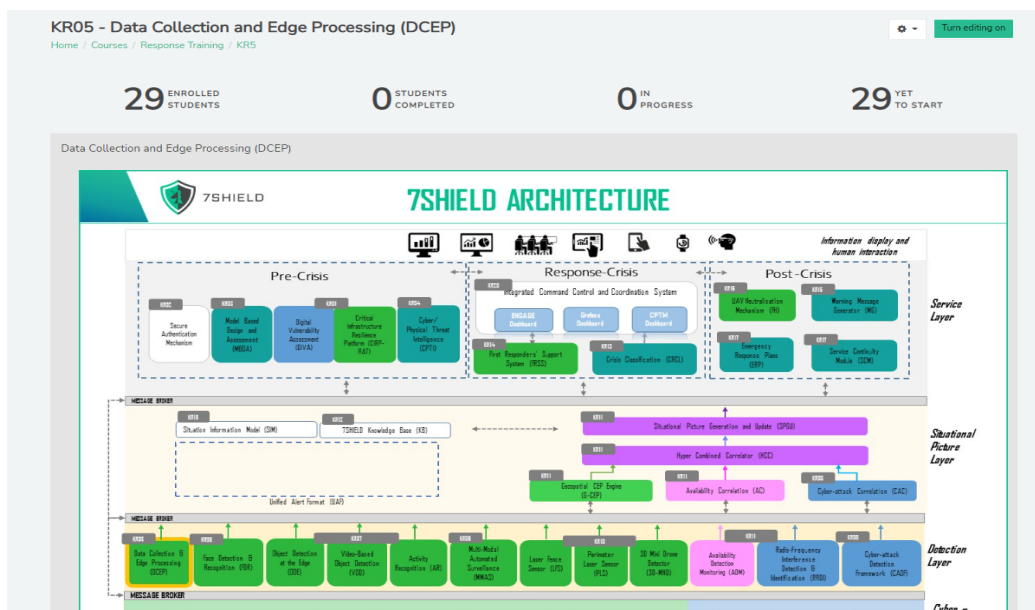

Figure 3-5 – Training Platform Screenshot – 7SHIELD Architecture's Map

When the tool has a User Interface or hardware, a short tutorial is included. The tutorial explains the overall functions and benefits of tool and provides a familiarisation with the User Interface.
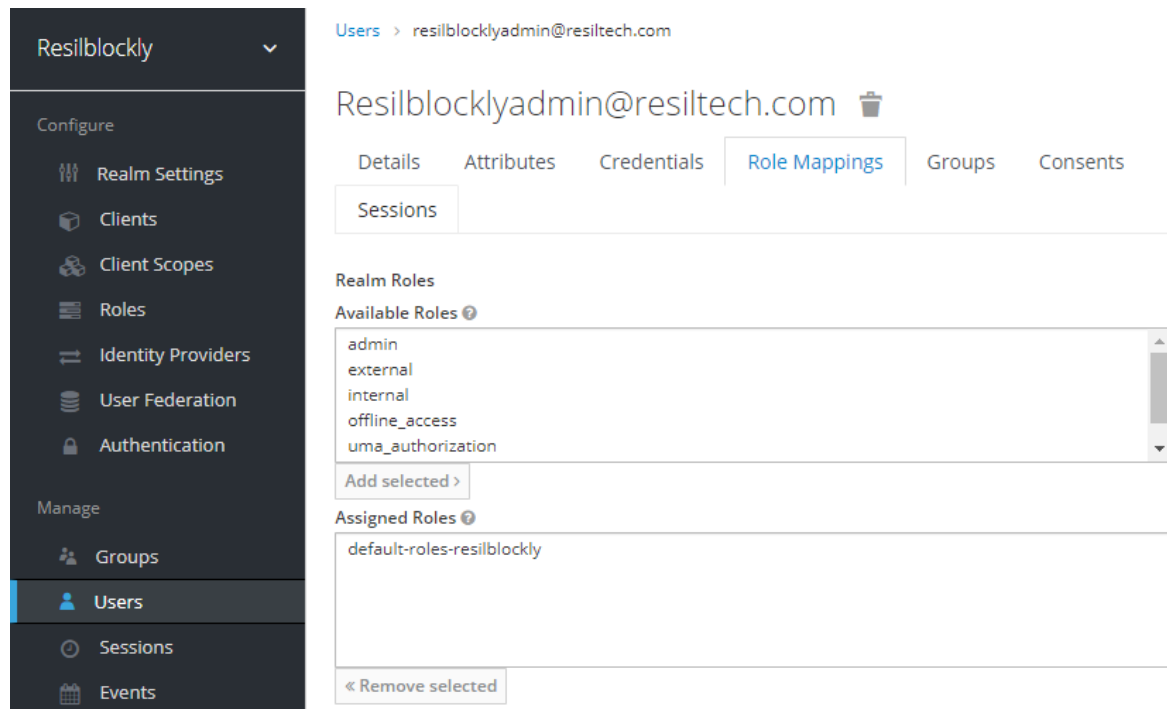

Figure 3-6 – Training Platform Screenshot – SSO module, The Role Mappings Tab

After the tutorial, the content is provided in form of text and images according to the following outline:

1. Short Description
2. Main Purpose and Benefits
3. Main Functions
4. Integrations with other Tools
5. Infrastructure Requirements
6. Operation Manual

Content

1. Short Description

The Data Collection and Edge Processing (DCEP) component is a software that was designed for the needs of the 7Shield project and is installed on the embedded PC of the UAV. More specifically, this component provides all communication capabilities with the control room as well as the handling of basic drone functions such as autonomous flights, camera synchronization and locating objects during the flight. In the image below we can see the embedded pc on which DCEP is installed.
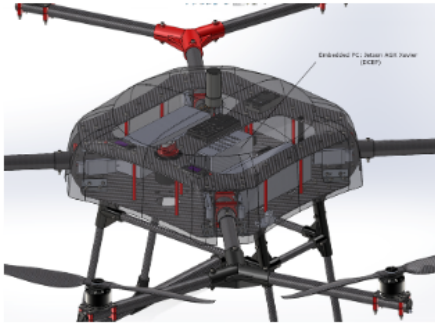

Figure 1- UAV

2. Main Purpose and Benefits

The main objective of the DCEP component is to communicate with the control room and handle functions related to flight scenarios. More specifically, this component is in continuous communication with the control room and responds to commands related to the flight status of the UAV. Furthermore, the basic function of DCEP is the execution of autonomous flights based on each flight scenario. In the following images we can see the communication of the UAV with the control center as well as the execution of an autonomous flight.
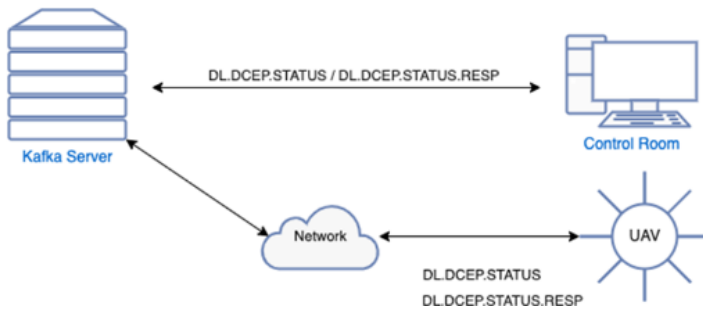

Figure 3-7 – Training Platform Screenshot – Training module example

In case of tools with a relevant User Interface, the 7SHIELD Training Platform provides a detailed interface description and step-by-step procedure to set-up and use each tool.

7.2. Other Dashboards Section

In this section, visible in the highlighted section in Figure 6 of the home page, there are the other independent external dashboards (e.g., web applications) that are available through the Cyber-physical Threat Monitoring Dashboard. In Figure 7 a list of other dashboards.

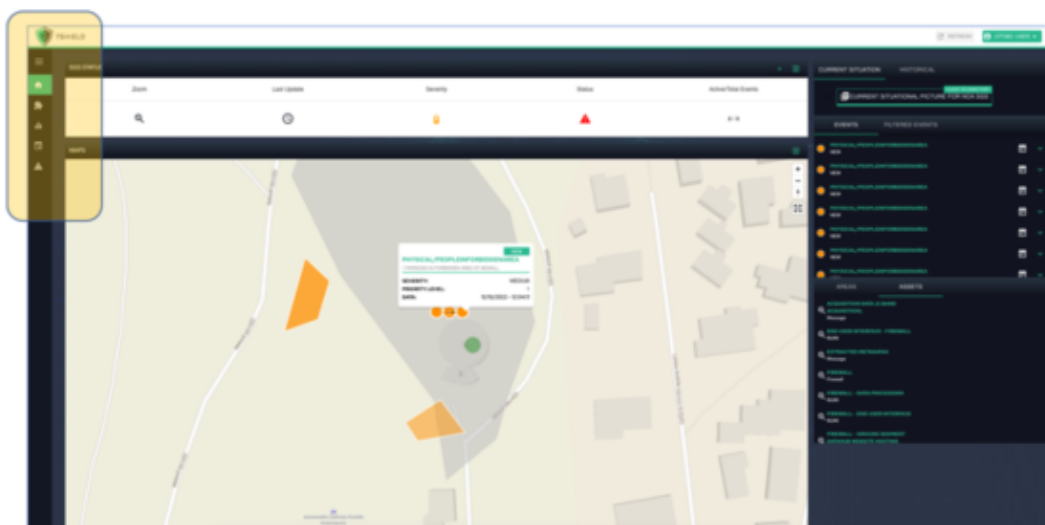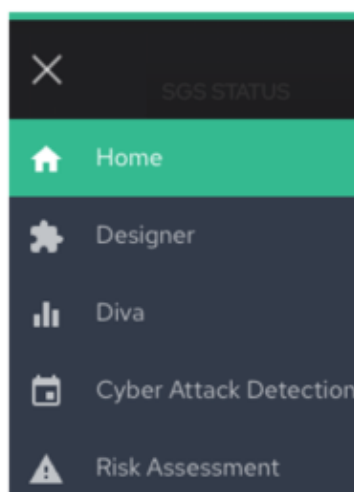Figure 6: Other Dashboard Section in the Home page
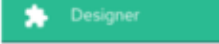

Figure 7: External Tool List

Clicking on the [Designer] link is possible to access the MDBA Tool in a full screen mode (Figure 8)

Figure 3-8 – Training Platform Screenshot – CPTM Tool description example

4.   7SHIELD Training Platform Content

Here below is the list of Training Content available in the Training Platform, with the indication of the KR number and specific module.

Table 1 - List of the Training Content on the 7SHIELD Training Platform

Phase	KR	KR Name	Module	Responsible partner
			7SHIELD Introduction	ENG
Pre-Crisis MGMT	KR01	Risk Assessment Tools	Critical Infrastructure Resilience Platform (CIRP-RAT)	STWS
			Digital Vulnerability Assessment (DiVA)	ENG
	KR02	Secure Authentication Mechanism	Secure Authentication Mechanism	SERCO
	KR03	Combined Threat Assessment Tool	Model Based Design and Assessment (MBDA)	RESIL
	KR04	Cyber and Physical Threat Intelligence	CTI Detection (CTID)	CSNov
			Cyber and Physical Threat Intelligence (CPTI)	ENG
Crisis MGMT	KR05	Data collection and edge processing module	Data Collection and Edge Processing (DCEP)	ACCELI
	KR06	Face detection and face recognition module	Face detection and face recognition (FDR)	CERTH
	KR07	Video-based object and activity recognition module	Object Detection at the Edge (ODE)	CERTH
			Video-Based Object Detection (VOD)	CERTH
			Activity Recognition (AR)	CERTH
	KR08	Cyber-attack detection framework	Cyber-Attack Detection Framework (CADF)	CeRICT
			Cyber-attack Correlator (CAC)	CeRICT

	KR09	Thermal and near-infrared image processing for man-made threats	Multi-Modal Automated Surveillance (MMAS)	INOV
	KR10	Detection of ground based and aerial intruders	Laser Fence Sensor V3.0 (LFS)	DFSL
			3-Dimensional Mini Drone Detector V3.0 (3D MND)	DFSL
			Perimetral Laser Sensor	DFSL
	KR11	Combined C/P Threat Detection and Early Warning module	Geospatial Complex Event Processing Engine (G-CEP)	STWS
			Availability Detection Monitoring (ADM)	CSNov
			Hyper Combined Correlator (HCC)	CSNov
			Availability Correlator (AC)	CSNov
			Situational Picture Generation and Update (SPGU)	ENG
			Radio- Frequency Interference Detection and Identification (RFIDI)	EETT
Post-Crisis MGMT	KR12	7SHIELD Knowledge Base	7SHIELD Knowledge Base	CERTH
	KR13	Crisis Classification (CRCL) Module	Crisis Classification (CRCL)	CERTH
	KR14	Tactical Decision Support System (TDSS)	First Responders' Support System (FRSS) & & Command and Control (C2) structure	INOV
	KR15	Social Awareness and Warning Message Generation	Message Generation System (MSG)	CENTRIC
	KR16	UAV neutralisation mechanism	UAV Neutralisation Mechanism (UNM)	DFSL

	KR17	Potential impacts from C/P attacks and countermeasures knowledge base	Emergency Response Plans (ERP)	KEMEA
			Service continuity (SC)	RG
	KR19	Data Models for Combined Detection	Unified Alert Format (UAF)	CSNov
			Situation Information Model (SIM)	ENG
	KR20	User Interface-Common and Control (C2)	ENGAGE Dashboard	STWS
			CPTM Dashboard	ENG

5. 7SHIELD Training Webinars for end users

5.1. 7SHIELD Training Webinars for Operators

During the 7SHIELD project lifecycle, SPACEAPPS coordinated the implementation of a series of webinars for GS operators.

The list of webinars implemented before each Operational Test is presented below:

- Oct 2021 - Webinars for Operational Test at SERCO
- Nov 2021 – Webinars for Operational Test at SPACEAPPS
- March 2022 - Webinars for Operational Test at NOA
- May 2022 – Webinars for Operational Test at DEIMOS

Below the list of Webinars implemented before each Pilot Demonstration Scenario:

- 16 Sept 2022 - Webinars for Pilot Demo at NOA
- 02 Nov 2022 – Webinars for Pilot Demo at FMI
- 05 Dec 2022 – Webinars for Pilot Demo at SPACEAPPS

The preparation phase of each webinar consisted of the following steps:

- Development of a Training Template in PowerPoint
- Identification of the training users' needs for the specific scenario
- Identification of the tools to be included in the webinar
- Preparation of a draft list of tools to be presented during the training webinar
- Coordination of the partners' availability
- Editing of the schedule based on partners' availability and training flow
- Set-up of the online tool for the webinar
- Send the respective invitation to the partners and share the schedule
- Collection and log of the training material prior to the webinar
- Moderation during the training webinar
- Recording of the training webinars
- Final delivery of training material, including video, to the end-users, through the 7SHIELD repository

The overall objectives of the webinars were to enable GS operators to perform smoothly the Pilot Testing, to better understand the information given by the 7SHIELD tools involved in the demonstration via the User Interface, to enable them to interpret the alerts and

notifications during cyber-physical threat detection, and to be aware of the options available to implement response and mitigations strategies.

The webinars were often an opportunity to further coordinate and finalise some aspects of the Pilot Demo preparation, e.g. tools access and set-up, with the support of the responsible partners.

Further, during the webinars, all the partners were invited to increase awareness of the general evolution of the tools in the 7SHIELD framework.

5.2.   7SHIELD Training Platform presentation to decision makers

During the 7SHIELD Info Day, which took place on the 14th December 2022, the Training Platform was both presented to the onsite participants and broadcasted live. It included a demonstration of the platform navigation and organisation of the content.

Further to presenting the 7SHIELD training to decision makers and external stakeholders during the Info Day, the 7SHIELD Training Platform will be maintained accessible for public access for a year after the project completion. This will allow additional external parties interested in the 7SHIELD outcomes, to have a more interactive experience but also benefit from the 7SHIELD training content at will.

6.   Conclusions and next steps

During the course of the 7SHIELD project, the training activities included:

- The development of the 7SHIELD Training Platform
- The implementation of a series of webinars for targeted end-users (pilot operators, site managers).
- The presentation of the 7SHIELD Training Platform and content to decision makers and external stakeholders

The 7SHIELD Training Platform was developed to support current and future end-users (both GS operators and stakeholders) to familiarise themselves with the benefits and capabilities of the 7SHIELD platform.

It provides a general overview of the 7SHIELD framework for stakeholders as well as detailed online User Manuals for the efficient use of the 7SHIELD tools by the operators.

The 7SHIELD Training Platform is organized into four modules. Each module is complemented by video tutorials to describe relevant aspects of the tools and by the extract of the webinars that were implemented during the project development to support Ground Segment's Operators.

The 7SHIELD Training Platform will be maintained publicly accessible for at least until March 2024. During this timeframe, SPACEAPPS will maintain the infrastructure for the 7SHIELD Training Platform to ensure its accessibility by the end-users (both internal and external, current and new).

If requested, SPACEAPPS can organise dedicated webinars and training sessions in collaboration with the partners (upon agreement and availability, but also tailoring the training content if needed).