

SESAR-JU IR PJ.34-W3 AURA EXE#05:
Assessing the Impact of UAS Contingencies on
ATC Operations in ATM-U-space Shared Airspace

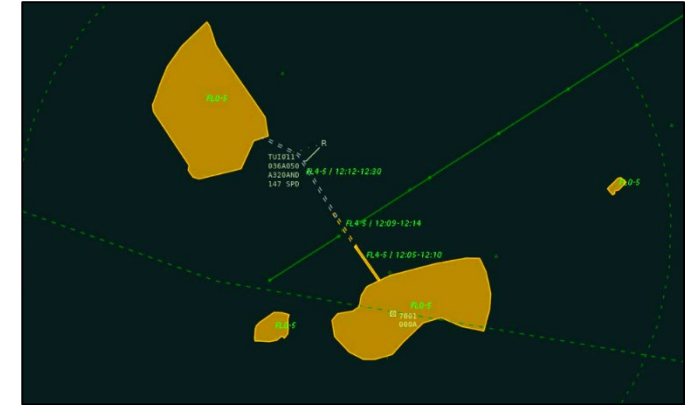
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10-Mar-2023, Geneva Airspace World

AURA

SESAR 2020 SHOWCASE

AURA Concept Considerations for Contingencies

- Reconfiguration of airspace boundaries between U-space and ATM within AUSA when *U-space contingencies* occur
 - Concept determines that:
 - ATC CAS is considered a blue volume
 - U-space is considered an orange volume
 - AUSA is airspace that is shared between ATC and U-space and can be delegated to either (from blue to orange and vice versa)
 - Language considerations
 - Contingency (all that does not happen according to the plan)
 - Emergency (a contingency that requires immediate actions)



What is the DAR Manager (DARM)?

- DAR Manager (DARM)
 - ...is responsible for dynamically allocating parts of AUSA to manned or unmanned traffic according to airspace user needs and in coordination with all actors responsible for the airspace in the impacted area, in both the strategic and tactical phases
 - ...shall assess the complete airspace change demand taking into account all predefined rules and constraints related to the impacted airspace part such as safety, aircraft prioritization, balancing traffic demand and capacity, and fair and equitable access
 - ...shall communicate the approved airspace changes to all affected actors
- Further considerations:
 - DARM tasks are supported by automation tools
 - Tools must also provide ATC and U-space Situational Awareness
 - DARM needs to respond to emergency DAR requests and violations of geo-fences
 - DARM responsibilities could (potentially) be integrated into controller roles

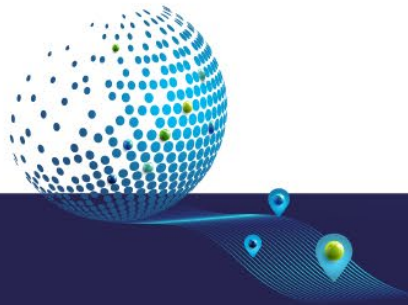


Defined Operational Scenarios

- Scenario 6 (UC 6.1/6.2): Management of the airspace in the vicinity of the airport runway by ATC when U-space contingencies occur
 - Runway Inspection Drone
 - Urban Air Mobility (UAM) Movement to a City Vertiport
- Scenario 7 (UC 7.1/7.2): Management of the AUSA airspace by ATC when U-space contingencies occur
 - Infrastructure Inspection Drone
 - Search and Rescue (SAR) Traffic in TMA
- Baseline/reference runs (without DARM):
 - No DAR contingency requests possible
- Solution runs (with DARM)
 - Focus of scenarios on ATCO (TWR/APP) and DARM interaction

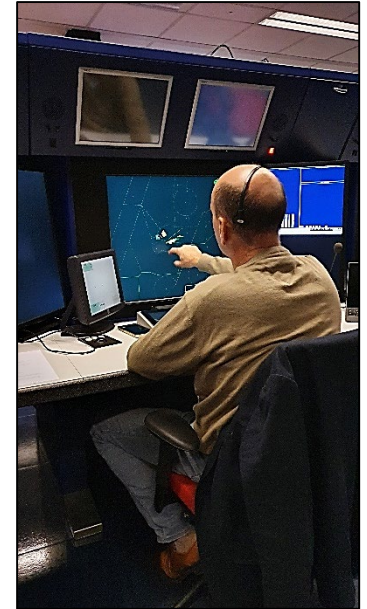


Video Simulations Exercise #05



Results (1/3)

- ATCOs were satisfied to be able to see the areas claimed for emergencies on their radar displays (there should not be too much detail leading to clutter, though)
- Technical feasibility
 - If more than two aircraft are in holding, coordination with APP of Schiphol is required to use some airspace because of the limited area around Rotterdam airport
 - DARM provides information aurally, which seemed better in the tested circumstances in comparison to providing it only visually
→ may be different when there is more traffic (more communication)



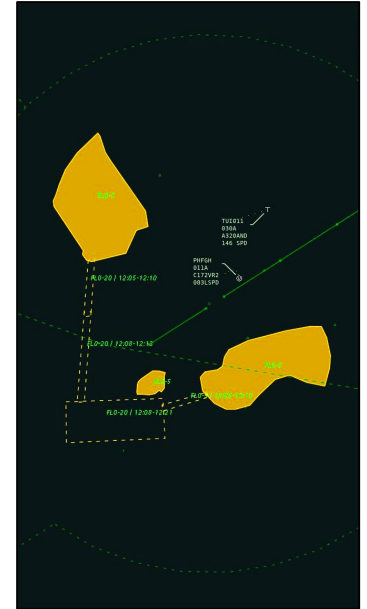
Results (2/3)

- Concept clarification
 - Definitions are needed for the required minimum separation between U-space airspace and manned traffic (also considering the U-space contingencies that could occur)
 - The presence of a DARM has added value as it increases ATCO SA during emergencies
 - The optimal location for the DARM should be determined with care
- Performance assessments
 - Impact on manned traffic can be reduced by accurate information about U-Space airspace claims
 - this will also positively improve the ATCO trust in the system
 - Emergencies originating from U-Space in airport vicinity can have large impact on efficiency of operations and workload of ATCOs/DARM



Results (3/3)

- HMI and Automation
 - DARM needs negotiation option to discuss details of requests
 - In case of an emergency the DARM should get clear notification
 - Occupational status of an area should be clearly displayed on the ATCO HMI with appropriate terminology
 - Refinement of the HMI when to make UAS visible and when not (depends on type of movement and contingency)
 - Improve the HMI by adapting the level of detail to ATCO role
 - Increase the contrast between displayed text and background



Questions

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