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EUROCONTROL

NET*ALERT* - the Safety Nets newsletter

WELCOME

After the dedicated SPIN meeting on runway safety nets, hosted by skyguide, this issue of NET*ALERT* looks at potential solutions to reduce runway incursions.

As ANSPs around the world weigh up their options, anyone looking to deploy airport safety nets should read our Q&A session with skyguide. We also take a look at an emerging airport safety net: Runway Status Lights (RWSL). This system warns pilots and drivers on the status of the runway they are about to enter using lights embedded in the pavement. Despite encouraging results obtained in the United States, we highlight some of the challenges faced by Zurich airport when trialling this system.

Our third article continues a regular theme of providing examples of real-life events, this time summarising an incident on the runway surface.

You'll also notice the inclusion of airport safety nets in our update on SESAR projects, including RWSL. Finally, scroll down to the last page for our usual round up of SESAR projects.

Best wishes for 2014!

A-SMGCS – implementation in Switzerland

NETALERT N° 15 highlighted a number of factors that need to be considered when implementing runway safety nets in A-SMGCS Level 2. Below, we catch up with ***Montserrat Mendoza*** *and* ***Myriam Wildi*** *of skyguide to understand the lessons learnt from the real-life implementations of A-SMGCS at Geneva and Zurich.*

Montserrat Mendoza
SAMAX project manager, skyguide

Myriam Wildi
ATM Expert – ex-TWR/APP ATCO, skyguide

Q: What is SAMAX?

A: SAMAX, or the Swiss Airport Movement Area Control System, to give it its full name, is the A-SMGCS Level 2 operated at Geneva and Zurich airports. The system relies on Surface Movement Radar (SMR) complemented by multilateration (MLAT - also called Resolution Units (RUs)) to provide surveillance data.

Q: How is SAMAX/A-SMGCS used by controllers at Geneva and Zurich airports?

A: SAMAX is used to increase tower controllers' and apron managers' situational awareness in both normal and low visibility conditions. It helps controllers coordinate operations and warns them of potential interactions. To facilitate coordination with tower controllers, the system also provides runway status information to approach controllers.

SAMAX also includes a Runway Incursion Monitoring and Conflict Alerting System (RIMCAS). In addition the Zurich SAMAX also provides stop bar overrun alerts.

Q: What types of alerts does RIMCAS generate?

A: Our A-SMGCS operational concept is based on the EUROCONTROL CONOPS. Two types of RIMCAS alerts are provided. Stage 1 information (visual only, orange label) warns the controller of a potentially dangerous

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A-SMGCS - implementation in Switzerland

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situation. A Stage 2 alert (visual (red label) and audio) warns the controller of a situation which needs immediate action.

Geneva - facts and figures

- 529 movements/day in 2012
- 1 concrete runway + 1 grass runway dedicated to general aviation users

SAMAX

- 1 SMR + 10 MLAT sensors
- RIMCAS
- stop bars at taxiway intersections active in all visibility conditions

Q: What are the other features associated with RIMCAS?

A: First of all the status of RIMCAS is displayed on the controllers' HMI (ON/OFF) and degraded mode information (e.g. loss of MLAT) is available in pop-up windows. Tracks which produce continuous false alerts can be manually tagged by controllers. Finally, RIMCAS can be de-activated by the system supervisor if the number of inappropriate alerts becomes unacceptable.

Q: How long did it take to deploy the system?

A: The SAMAX project started in 2000 and A-SMGCS Level 1 was implemented in 2004. The installation of the A-SMGCS Level 2 started in 2007 with the definition of the operational concept. After a number of iterations to refine system requirements, procedures, safety activities and validation exercises RIMCAS was deployed operationally, first at Geneva in December 2009 followed by Zurich in May 2010. We then had a 'stabilisation phase' until March 2012 to fine tune the system. In parallel, stop bar overrun alerts were developed and went operational at Zurich in January 2012.

The project team coordinated and discussed each step with the skyguide Safety Nets Task Force (SNTF). This body, established in 2002, harmonizes the management of safety nets related topics through a multi-disciplinary team of skyguide staff (operational, technical, safety staff), under the operational lead of long-time SPIN member Isa Alkalay.

Q: What activities were performed prior to the implementation of RIMCAS?

A: A number of safety requirements were identified, the majority of which were applicable to the equipment itself. We also established requirements for an operationally acceptable level of false alerts, as well as procedures and training. The latter two requirements had an emphasis on the de-activation and re-activation of RIMCAS.

Q: How did skyguide test and validate RIMCAS?

A: An operational evaluation was performed using a qualitative analysis based on feedback gathered from test controllers. In addition to that, RIMCAS statistics were drawn from systematic offline analysis of daily logs and recordings. This resulted in further fine tuning to reduce the number of nuisance alerts and created additional system requirements.

Tests were also performed in the tower simulator, for example to recreate runway incursion occurrences and evaluate controllers' reaction time.

Q: What were the biggest challenges encountered during the system implementation?

A: Achieving an acceptable level of false alerts was our greatest challenge. We established that a maximum of 3 false Stage 2 alerts (i.e. requiring immediate controller action) per day on at least 80% of days was acceptable. It took almost two years of controller feedback, testing and fine tuning to meet that criterion - at Geneva, a quarter of Stage 2 alerts raised were true alerts, with false and nuisance alerts making up the remaining 75% of alerts. Almost 90% of the false alerts were to do with double tracks or ghost tracks.

Q: You mentioned that your staff undertook specific training. What did this focus on?

A: We started by giving controllers and technical supervisors a refresher on the main concepts of runway incursion, safety nets and hot spots. This was followed by theoretical explanations of how A-SMGCS, SAMAX and RIMCAS work, a description of the associated operational procedures and a discussion on the system limitations and issues identified. Training activities were concluded by

Zurich - facts and figures

- 740 movements/day in 2012
- Complex 3 runway layout used in various configurations

SAMAX

- 2 SMRs + 14 MLAT sensors
- RIMCAS
- stop bars at taxiway intersections active in all visibility conditions with overrun alerts

showing movies of real situations depicting true alerts as well as false and nuisance alerts.

SAMAX and RIMCAS provide an additional means to monitor the airport surface and warn the controller about hazardous situations. However we also emphasised to our controllers that they do not replace the human visual monitoring and therefore they needed to be careful about extended head-down time.

Q: What are your future plans?

A: Now that the system is operational we plan to install additional multilateration sensors at both Geneva and Zurich by the end of 2013.

Q: Finally, what advice would you give to others when implementing or tuning their A-SMGCS system?

A: Do not underestimate the complexity and time required to successfully implement an A-SMGCS and an associated RIMCAS. Ensuring that the quality of the surveillance data is fit for purpose can be a challenge, but integrating A-SMGCS into the tower environment should not be overlooked either. Controllers have to familiarise themselves with a system that can generate false alerts and therefore adapt their working habits. This takes time, but is an investment worth making.

Emerging runway safety nets
- Runway Status Lights

According to FAA research, the majority of runway incursions are attributed to pilot deviations. The Aircraft Owners and Pilots Association (AOPA) estimates that "the three most common errors by pilots that lead to runway incursions are failure to hold short, turning on the wrong taxiway, or crossing a runway without clearance". In response, the FAA developed a concept of Runway Status Lights (RWSL). With the first systems now in operation in the United States, and investigations underway in Europe, this article provides an overview of this airport safety net for pilots and controllers, and summarises an assessment by skyguide at Zurich airport.

The Runway Status Lights (RWSL) system is a FAA initiative, developed by Lincoln Laboratory, designed to increase pilots' and vehicle operators' situational awareness by using a combination of red lights embedded in the runway pavement. The lights are turned on whenever a runway is unsafe to cross/enter/take off from and warn pilots/ vehicle drivers of potential conflicts with traffic already on the runway. There are 3 types of RWSL - see overleaf.

One of the characteristics of runway incursions is that a normal, safe situation can rapidly develop into an imminent hazard. Given the time-criticality of such cases the rationale for developing RWSL was that direct notification to the taxiing crew, via status lights, could offer a more effective means of prevention than involving an air traffic controller.

The RWSL system determines the locations of aircraft and vehicles on the airfield, as well as arriving or departing aircraft, on the basis of data from multiple surveillance sources: multilateration for tracking surface aircraft and vehicles with working transponders, surface primary surveillance radar to track aircraft and vehicles with a disabled/no transponder and local airport surveillance radar for airborne targets. The collected data is then fused to produce a single surveillance picture on and near the airport surface. On the basis of this information, combined with pre-defined thresholds, the RWSL system determines which lights should be illuminated. As discussed in the earlier article on A-SMGCS, in fusing surveillance data from several sources, a significant challenge is avoiding the generation of multiple tracks for a single aircraft, and potentially causing undesirable false illuminations.

RWSL and ATC

RWSL require no controller action to operate, they automatically illuminate and turn off. Therefore, with the controller and the RWSL operating autonomously, how should pilots and vehicle drivers respond in the event of contradictory instructions?

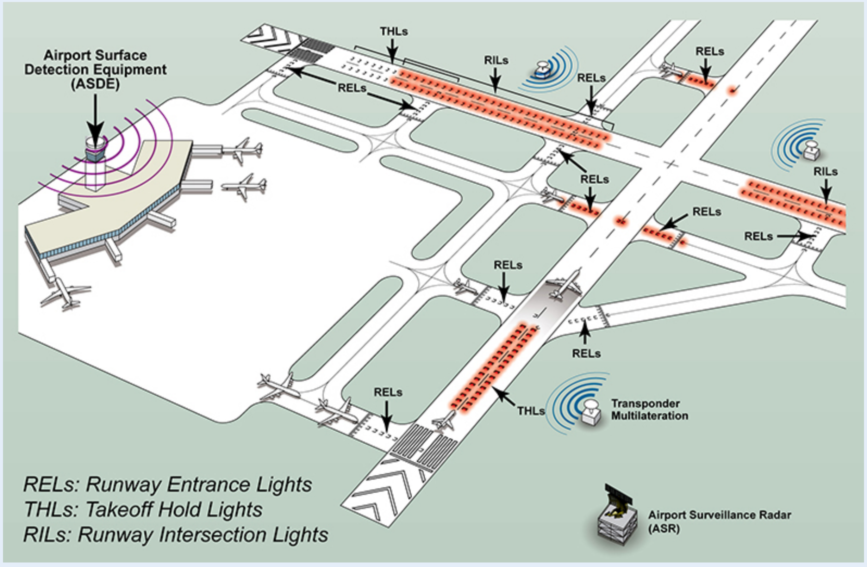
There are no ICAO procedures for RWSL. In the United States, RWSL indicate runway status only and not clearance to proceed. Neither do they change the pilot's statutory responsibility for the safe operation of the flight. If pilots or vehicle operators receive contradictory information from ATC and RWSL (clearance to proceed but lights illuminated), they should hold short of the runway and ask ATC for clarification.

RWSL status can be displayed to controllers for monitoring. In the U.S. controllers are

Emerging runway safety nets - runway status lights

continued

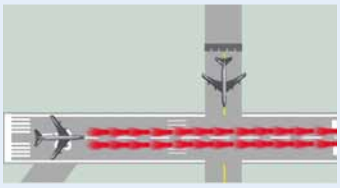
The three types of RWSL



Source: Lincoln Laboratory Tech Note

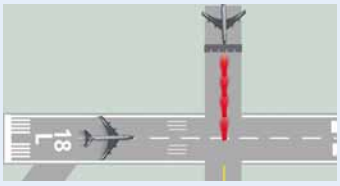
RWSL CONOPS

Takeoff Hold Lights (THLs)



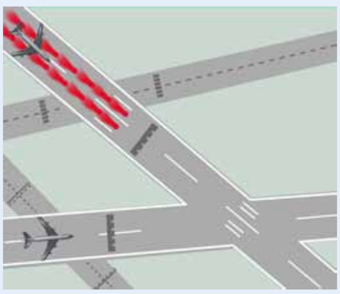
■ Takeoff Hold Lights (THLs) indicate that it is unsafe to take off because the runway ahead is occupied by another aircraft or ground vehicle. The THLs extinguish once the runway is clear of conflicts. THLs are normally positioned where departing aircraft line-up on the runway/commence their take-off roll.

Runway Entrance Lights (RELs)



■ Runway Entrance Lights (RELs) are placed at the intersections of runways/taxiways to signal that it is unsafe to enter or cross a runway. When an aircraft starts its take-off roll the RELs illuminate, each extinguishing one after another as the departing aircraft passes them. RELs can also illuminate to warn pilots at the intersection of a landing aircraft.

Runway Intersection Lights (RILs)



■ Runway Intersection Lights (RILs) are used on crossing runways. They warn pilots that the runway intersection ahead is unsafe to enter or cross due to high-speed traffic operating on the other runway. For departing aircraft, if possible, pilots are expected to abort takeoff when encountering illuminated RILs or use best judgement to ensure that proceeding with takeoff is safe.

expected to use best judgment and follow best practices: (i) do not clear pilots to take off through red THLs and (ii) do not clear pilots or vehicle operators to cross through red RELs.

The integration of Runway Status Lights with other airport safety nets remains challenging, especially their interaction with RIMCAS/A-SMGCS Level II and stop bars. This is touched upon in the case study for Zurich airport described overleaf. In the United States work is also to be undertaken to accommodate specific procedures (such as Land and Hold Short Operations (LAHSO)).

RWSL benefits

The direct impact of RWSL on runway incursions is difficult to measure accurately although studies and operational trials in the United States show benefits. A study undertaken by Lincoln Laboratory reviewed runway incursions in the U.S. that occurred between 1997 and 2000 at 100 of the busiest airports. Focusing on "high hazard" occurrences (miss distance less than 30 meters), the study determined that RWSL might have prevented or mitigated 75% of the 167 identified incursions.

RWSL deployment

In the United States RWSL is operational at Orlando, Washington Dulles and Phoenix Sky Harbor international airports, with 17 US airports scheduled to receive the RWSL production system by 2017. The FAA is also trialling a fourth element to RWSL, the Final Approach Runway Occupancy Signal (FAROS) warning landing pilots that the runway ahead is obstructed. In Europe trials are taking place at Paris Charles De Gaulle as part of SESAR.

Further reading

This article is primarily based upon three sources:

- Operational Evaluation of Runway Status Lights, James R. Eggert, Bradley R. Howes, Maria Picardi Kuffner, Harald Wilhelmsen, and D. Jonathan Bernays. The full paper can be found at (http://www.ll.mit.edu/publications/journal/pdf/vol16_no1/16_1_7Eggert.pdf)
- Human Factors Assessment of Runway Status Lights and Final Approach Runway Occupancy Signal, Maria Picardi Kuffner and Captain Robert Perkins. The full paper can be found at (http://rwsl.ll.mit.edu/Image-Lib/IFALPA_AGE_6November2009.pdf)

Other interesting reading:

- FAA TV: RWSL Demonstration Video (http://www.faa.gov/tv/?mediaId=349)

Zurich airport - RWSL trialled

Zurich is another European airport that investigated the use of RWSL. With its complex runway configuration, Zurich airport identified crossing runway operations as a top risk and therefore selected RWSL as a possible mitigation for runway incursions. RELs, THLs and RILs were assessed .

The runway safety nets used at Zurich (RIMCAS and stop bar overrun alerts) are not always in operation at airports in the United States. Therefore a crucial part of this trial was to determine how, as an independent system, (i) RWSL operated alongside Zurich controllers and the runway safety nets they used and (ii) if this added any complexity to their implementation. The trial concluded that:

- RELs performed adequately but brought little additional benefit to the already implemented stop bars;
- RWSL and RIMCAS address the same conflicts but one delivers warnings to pilots/vehicle drivers and the other to controllers. This led to concerns about the possibility of contradicting actions if both systems alerted simultaneously (similar to issues encountered between STCA and TCAS);
- Monitoring the status of RWSL increased the head-down time of controllers.

Furthermore, there were additional concerns about the interaction of RWSL with pilots;

- RILs illuminating when a departing aircraft is close to V1 could lead aircraft to break at high speed, potentially skidding off the runway or still infringing the crossing runway despite breaking.
- THLs could lead to an increase of incidents where aircraft depart without clearance.

Patric Burri, domain manager ATM TWR/APP at Zurich airport concludes *"The study revealed that implementing RWSL was technically possible. However, any operational system would require extensive tuning and improvements in ground surveillance data, and would need to be adaptable to changing concepts at Zurich. Given the complexity of the operation at the airport, as well as some of the challenges highlighted by the trial, we concluded that we should not be a pioneer of RWSL in Europe. Furthermore, our decision not to implement was heavily influenced by the absence of European standards for RWSL. Nevertheless we continue to closely monitor the progress at Paris CDG and Boston."*

Locations of RWSL during the Zurich trial

Runway incursion
at Luxembourg

At Luxembourg airport on a foggy morning in January 2010, a B747-400 freighter was given clearance to land despite a maintenance van being parked on the active runway. This article summarises the incident and highlights some of the recommendations made by Luxembourg's Administration des Enquêtes Techniques (AET). It also recaps how A-SMGCS can warn controllers of vehicles on the runway.

The incident

On 21st January 2010, Luxembourg airport is wrapped in fog and Low Visibility Procedures (LVP) are in operation. With a cloud base of 100 feet and a visibility of 100 meters, the tower controller and his assistant/coordinator cannot see the runway. The airport is not equipped with a Surface Movement Radar (SMR).

A maintenance crew has been carrying out repairs on defective runway lights, vacating the runway a number of times to accommodate arriving and departing aircraft.

Later this morning a scheduled cargo flight begins its approach. Shortly before landing, the pilot flying notices the maintenance van positioned slightly to the right of the runway centreline, 340 meters from the threshold. However, the aircraft had already passed through its Category III approach decision height of 17 feet. At this height a go-around manoeuvre would not have prevented the aircraft from impacting with the van.

The right landing gear of the aircraft subsequently hit the roof of the maintenance van. Fortunately the damage to the aircraft was limited to cuts on a single tyre and the maintenance crew were unharmed, having run to the side of the runway when they became aware that an aircraft was approaching. (In the subsequent incident report the TWR assistant/coordinator stated that he had instructed the maintenance van to leave the runway on the ground frequency and heard an audio signal that led him to assume the vehicle had left the runway).

Incident timeline

11:33:24	Tower clears the maintenance vehicle to enter the runway.
11:40:27	The aircraft contacts Luxembourg Approach (APP) for the first time. Crew is informed that LVP are in operation.
11:49:34	APP instructs the aircraft to turn left to intercept an ILS approach on Runway 24.
	The TWR controller stated that he instructed the TWR coordinator / assistant to get the maintenance vehicle off the runway when the aircraft was still 16 to 18 miles from the airport
11:50:55	The aircraft reports established on the Localiser of Runway 24, APP transfers the aircraft to Tower (TWR) controller.
11:51:54	TWR clears the aircraft to land.
11:53:46	The aircraft reaches decision height of 17ft. Pilot Flying (PF) calls for "landing".
11:53:51	The aircraft completes auto-landing and exits the active runway.
11:53:59	The aircraft informs TWR that PF spotted a vehicle on the runway (the other pilot was monitoring instruments whilst landing according to company procedures and did not see the vehicle).

AET recommendations

The AET incident report made several recommendations and highlighted a number of best practices. Those of general interest are listed below:

- All communications associated with the operation of each runway should be conducted on the same frequency as utilised for the take-off and landing of aircraft (as defined in ICAO Doc 9870 'Manual on the Prevention of Runway Incursions');
- Standard read-back procedures should be applied between ATC and pilots/ vehicle operators to positively confirm that the sensitive area has been vacated;
- During LVP procedures, no vehicle should enter the manoeuvring area to ensure that they do not interfere with the ILS ground equipment;
- Temporarily occupied runways should be clearly and unambiguously marked on all active working positions.

In terms of runway safety nets, the AET stated that;

"an A-SMGCS Level 2 implementation at Luxembourg Airport could have alerted the TWR controller of a potential unsafe condition, enabling him to take corrective actions."

Accordingly the report recommended the implementation of A-SMGCS Level 2 to increase controllers' situational awareness.

Runway incursion at Luxembourg

continued

A-SMGCS and runway incursions by vehicles

Can A-SMGCS Level 2 warn controllers of runway incursions involving vehicles? The answer is yes. If an aircraft is on final approach whilst another aircraft or vehicle is within the protected area, A-SMGCS Level 2 has the ability to provide:

- Position of the aircraft and vehicles on the surveillance HMI screen;
- Type/location of the alert situation and identification of the conflicting mobiles;
- A warning before the aircraft crosses the threshold (based on the EUROCONTROL concept, first a visual warning would be displayed to the controller, followed by a visual and audible alert if the situation deteriorates to the point of requiring immediate action).

Source: "ASMGCS Update for OST 06-4.ppt", JAA, Brussels, 12/09/2006, B. Collin

Further reading

The final incident report was published in December 2012 by Luxembourg's Administration of Technical Investigations and is available online: http://www.skybrary.aero/bookshelf/books/2039.pdf
More information on A-SMGCS can be found on EUROCONTROL's website: http://www.eurocontrol.int/articles/a-smgcs
ICAO Doc 9870, AN/463 'Manual on the Prevention of Runway Incursions': http://cfapp.icao.int/fsix/_Library/Runway%20Incursion%20Manual-final_full_fsix.pdf

SESAR airport projects

With airport safety nets being added to the portfolio of SPIN and the Safety Nets team, our future round-up of SESAR projects will be extended to include research in this area. By way of introduction we summarise the main SESAR projects opposite.

In brief

The main SESAR airport project is P6.7.1 (airport safety support tools for pilots, vehicle drivers and controllers) led by DSNA. This comprises five work areas as per the diagram opposite. Technical and validation support (e.g. specifications and prototypes) to P6.7.1 is provided by some of the projects in WP12 (airport systems).

P.6.7.1 - Airport Safety Support Tools for Pilots, Vehicle Drivers and Controllers

- Runway Safety Lights - WA2
- Conflicting ATC Clearances – WA3
- Conformance Monitoring – WA4
- Alerts for Vehicle Drivers – WA5
- Traffic Alerts for Pilots – WA6

__P6.7.1__ has the following partners: DSNA (leader), AIRBUS, ALENIA, DFS, NORACON, THALES, SEAC, EUROCONTROL.

P.6.7.1

WA2 - Runway Safety Lights (RWSL)

Work Area 2 builds on the extensive material and experience acquired on RWSL by the FAA. It will assess the suitability of RWSL for operations in Europe while remaining consistent with the FAA CONOPS to facilitate the creation of harmonised US/Europe operational procedures to flight crews.

Validation trials at Paris Charles De Gaulle started in July. After system installation, shadow mode operational tests will be performed followed by live trials on closed and active runways. Initial feedback shows concerns with the surveillance performance in terms of accuracy and false tracks.

WA3 – Conflicting ATC Clearances

Work Area 3 focusses on the detection of conflicting ATC clearances. Integrated within A-SMGCS, this concept analyses Electronic Flight Strips and warns the controller in situations where conflicting ATC clearances could lead to an unsafe situation if not corrected.

A V3 validation exercise took place in 2012 at Hamburg airport using an industrial prototype delivered by P12.03.02. The main aim was to demonstrate operational feasibility of the concept in a complex environment with crossing runways and identify potential safety improvements. Feedback from the participating controllers was that the concept provided a useful predictive safety support tool that would work in conjunction with additional safety nets.

WA4 – Conformance Monitoring

Work Area 4 aims to investigate a concept that alerts controllers and flight crews when aircraft and vehicles deviate from their assigned ATC clearances. The alerts associated with the concept are not meant to replace the existing RIMCAS alerts in A-SMGCS Level 2 but are designed to alert before the RIMCAS triggers, allowing the controller more time to resolve a potential incident.

V2 validation activities to assess conformance monitoring alerts for controllers took place at EUROCONTROL's Institute of Air Navigation Services in 2012. Also in 2012 conformance monitoring alerts for pilots were validated through a V1 validation exercise performed on Airbus' O3P ("Outils de Prototypages de Postes de Pilotage") simulator.

WA5 – Alerts for Vehicle Drivers

Work Area 5 is investigating two concepts to assist vehicle drivers: alerts of a potential risk of collision with an aircraft and alerting of infringements into restricted or closed areas. Alerts are presented to the vehicle drivers on a HMI displaying a moving map complemented by an aural and/or flashing warning.

An initial V2 validation exercise took place in Malmo during 2011. An additional V2 trial is planned for early 2014 prior to V3 live trials.

WA6 - Traffic Alerts for Pilots

"Traffic Alerts for Pilots" (Work Area 6) focuses on the implementation of indications and alerts in the cockpit to alert the crew of potential risks of collisions with surrounding aircraft or ground vehicles equipped with ADS-B.

Using RTCA DO-323 (Safety, Performance and Interoperability Requirements for Enhanced Traffic Situational Awareness on the Airport Surface with Indications and Alerts (SURF IA)) as starting point, WA6 is developing its own SURF-ITA application for European operations. The outcome of this study will then be used to define a common system baseline for the United States and Europe.

V2 validation exercises have taken place using Airbus' MOSART (MOdular Simulator for Airbus Research Tests) simulator. Results reaffirmed the need for surface traffic alerts (especially in low visibility conditions) and help refine operational and HMI requirements. Planning activities for V3 validation trials are expected in mid-2014.

P12.03.02

Enhanced Surface Safety Nets

This project produces industrial prototypes to support validation activities (both simulations and live trials). Its aim is to develop new algorithms to accurately detect potential conflicts and warn controllers in the event of a conflict situation. For example to alert controllers when an aircraft or a vehicle using the aerodrome movement area makes an unauthorised or hazardous manoeuvre (P6.7.1 – WA4), or when a controller gives conflicting instructions (P6.7.1 – WA3).

The project consists of three phases. In each phase, five different prototypes are produced by five different manufacturers (THALES, SELEX, NATMIG, DFS, INDRA), according to operational requirements derived from P6.7.1, system requirements derived from P12.01.07 for architecture and other system projects from WP12.

Partners: THALES (lead), DFS, DSNA, INDRA, NATMIG, SELEX, EUROCONTROL

Other projects providing support to P6.7.1 include P12.5.2 (airport Safety Nets and wind-shear detection and alert for controllers), P12.3.4 (enhanced surface guidance) and P9.14 (airport surface alerts (ownship and traffic)).

SESAR update

Our regular review of SESAR safety nets related projects follows…

Evolution of Ground-Based Safety Nets (P4.8.1)

Work Area 1 on enhanced ground-based safety nets using existing down-link aircraft parameters (DAPs) in TMA and en-route environments progressed well over the summer. Several milestones have been reached in preparing for the V3 simulations with the industrial STCA prototype using DAPs.

Validation exercises are currently on-going in Work Area 2 - Enhanced ground-based safety nets adapted to future TMA and en-route environments with enhanced 3/4D trajectory management. Fast Time Simulations analysis of data provided by P4.7.2 and P4.7.3 is in progress. V2 exercises are expected to be completed early next year.

In Work Area 4, NATS has initiated the update of the development plan for G-SNETS evolution in 3/4D trajectory operations.

Planning is underway to bring together P4.8.1, P4.8.2 and P4.8.3 into a new P4.8.1 project.
Partners: DSNA (leader), NATS, ENAV, SELEX, EUROCONTROL.

Safety Nets Adaptation to New Modes of Operation (P10.4.3)

The SJU has now approved the change request and subsequent restructure of P10.4.3 phase 2 to take into account the development and verification of an Indra prototype for RA downlink data processing. Work is in progress on all three industrial prototypes and test plans. Verification test reports and performance assessments have been submitted.
Partners: THALES (leader), DSNA, ENAV, EUROCONTROL, INDRA, SELEX.

Evolution of Airborne Safety Nets (P4.8.2)

Validation of ACAS Xa (the mainstream version of ACAS X) for European operations (Work Area 4 phase 2) is progressing according to plan. Collaboration with the ACAS X team in the United States is covering several activities: regular provision of software changes, support to integration into European validation tools and European feedback on ACAS X development. These inputs have already triggered some modifications of the ACAS X software. Coordination activities have intensified with SC147/WG75 to develop future ACAS Xa MOPS (Minimum Operational Performance Standards) with an initial meeting planned in December 2013 in Washington DC.

An initial safety assessment consistent with the project safety plan was delivered in September. Further safety assessment activities looking at refinements to the estimation of ACAS Xa generated risks in Europe have started. The preparations for the V2 validation exercises assessing the evaluation of ACAS Xa in Europe are on-going with the production of scenarios, selection of encounters, setting up of simulation platforms and the definition of reference and solution scenarios. These exercises will carry on until next year.
Partners: DSNA (leader), AIRBUS, NATS, EUROCONTROL.

TCAS Evolution (P9.47)

Following the approval of the change request submitted to the SJU, work progresses on P9.47. The definition of surveillance requirements for ACAS Xa also started. P4.8.2 and the U.S. ACAS X team are currently reviewing these requirements.

In the meantime, the implementation of extended hybrid surveillance capability into TCAS II continues and is expected to be completed by year end. Primary objectives for the definition of operational requirements and scenarios for GA in European environment (Work Area 4) have also been identified and agreed.
Partners: Honeywell (leader), AIRBUS, DSNA, EUROCONTROL.

Ground-Airborne Safety Net Compatibility (P4.8.3)

P4.8.3 provided data to support the V3 validation of the prototype for the presentation of RAs to the controllers working positions. Discussions are still on-going regarding the use of collected ATC data for the V2 validation exercises but mitigations are in place allowing to run the exercise if an agreement is not reached. The V2 validation exercise should therefore take place in spring 2014, with the V3 exercise scheduled in autumn 2014. P10.4.3 delivered the technical specifications of the RA Data Processing prototype which are currently under final review by P4.8.3. The SJU reviewed the V3 validation plans and documents and green-lighted the exercise to be a part of SESAR release 4.
Partners: DSNA (leader), DFS, AENA, INDRA, AIRBUS, EUROCONTROL.

ACAS monitoring (15.4.3)

The verification and evaluation of the ACAS monitoring system prototype is nearing completion. The evaluation report has been submitted to the SJU and is under review. The feasibility study has been reviewed and comments are being addressed. Additionally, the integration study has been updated alongside the project proposal for ASTERIX CAT04.
Partners: THALES (leader), INDRA, EUROCONTROL, DFS.

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