Report of the Workshop on the planned implementation of RWY Status Lights at CDG airport Maisson de l'Environnement, CDG 29 April 2009

Organized by: Aeroport de Paris, DSNA, FAA and Eurocontrol
Present: Many European Airports, ANSPs, AFR and international organizations

Runway Status Lights (RWSL)

Consist of Runway Entry Lights (REL) and Runway T/O Lights (RT/OL)

Aim of the workshop

Open the discussion on the use of runway status lights at European Airports and in relation with stop bars.

Jaime Figueroa FAA/ATO

- RWSL trialed since 2005 at USA airport DFW and San Diego and is operational at these airports.
- Since 20 April 2009 RWSL operational at one runway at LAX
- It is a fully automated system and provides visual aids, i.e. red lights at crossing points (TWY/RWY), i.e. it signals that the runway is unsafe.
- RWSL signals that the runway is occupied by another aircraft
- The RWSL provides a status indication of the runway and do not provide a clearance to the aircraft to cross the runway or depart from the runway.
- Red lights are on for a certain time allowing the e.g. the a/c to cross and for ATC to allow for anticipated separation.
- RWSL does not have an impact on capacity
- The light system functions independent from the ATCO.
- Controllers are not able to put the lights on/off, although it appears that they can shut off the whole system.
- The ATCO will have an overview of the status of the light system on his control panel and is able to see whether the lights have turned on/off.
- When the lights are on and the pilot have received a clearance to e.g. cross the runway, the pilot must notify the ATCO, which will mean to my opinion (tvdv) that an additional procedure needs to be introduced, it will increases the R/T and has an impact on capacity?

DFW: Findings

DFW 3rd busiest airport in USA and during trials no impact on capacity was observed.
70 % runway reduction RI on test runway. Pilots feedback: 90 % satisfied.
Several incidents were prevented at DFW.

RELs and stop bars

FAA will evaluate this combined working during Summer 2009.

Jean Jezequel/DSNA

- Traffic data: 2008 555000 ATM ops and 61 million pax; Peak hour: 141 ops
- About 200 foreign airlines at CDG;
- Low visibility: 4 % of the time
- Taxiway system: 80 km. Two active control towers close to runways, centre tower for mid night period.

2 set of holding points

1. CAT I holding points at 90 m from runway centre line (used 96 %)
2. CAT 2/3 holding points at 150 m from runway centre line (used 4 %)

More than 250.000 arrivals per year cross the two departure runways.

A-SMGCS

- Level 2 in service since 2003; 4 SMRs; 18 Mode S Multilateration antennas;
- Vehicles have built in surveillance via GPS;
- Safety net provided by RIMCAS, runway incursion monitoring and collision avoidance system.

Stop-bars

- Installed at CAT II/III holding and in service only when LVP is in progress (less than 4-5 % of the time)
- In total 60 stop-bars of which 26 are permanent.
- 34 controlled stop-bars (a local controller has to manage 6-7 stop-bars).

Runway Incursions:

- 30 per year, circumstances fully known due to reporting, including 3 to 5 RI at highest severely level A and B.
- Most of RIs occur during CATI or above since 2005.

Future

- Traffic increase: more than 800.000 ops/year; All types of RIs need to decrease asap.
- First in CAT I or above; For efficiency reasons CDG needs to maintain the use of CAT 1 holding points.

RWSL advantages:

- The Local Rwy Safety Team at CDG proposed the RWSL solution.
- A-SMGCS is not available for vehicles and pilots, only for ATCOs.
- RWSL will work in parallel with Stop bars in CAT I and better conditions in 96 % of the time, for which an extension to 100 % is foreseen in the future.
- No increase in controller workload (shown by USA figures)

Planning

- RWSL will be in service late 2011 at 22 major US airports

- RWSL at CDG on the two inner runways, start in 2010 on one runway and in 2011 the other runway
- Safety case expected ready per Sep 2010
- The 24 h stop bars solution at CDG would be very difficult to implement and will lead to

Andy Taylor / LGW Tower Manager

- LGW: One take off and landing in 63 sec.
- In UK NATS provides services at 16 airports
- Stop bars during CAT I ops; during night (and H24 at MAN, BHX and LTN). .
- Stop bars during CAT II/III ops (LVP safeguarding) at all airports.
- Intermediate Stop bars – at airport with selectable routes
- One ATCO is controlling the lighting panel / stop bars, two pushes on the touch screen - Workload is not an issue
- 10 stop bars protect the runway, and ATCO operates 3 stop bars, meaning 6 clicks
- Stop bars at CAT I and at CAT II/III holding points both with wig-wags
- Last 14 months only one RI incorporating a vehicles with severity D (low)

Relevance of stop bars to pilots/drivers

- Confirms verbal clearance from ATC, even in failure contingency mode
- Does not indicate status of runway
- Known expectation of pilot reaction to ATCO.

RWSL concept of ops

- Should prevent RIs
- Should warn when an incursion has occurred
- Independent of ATC
- Lights are not tactically switchable on and off
- System automatically sets lights
- ATC needs to be aware of status of lights

REL arrival mode

- At which moment the lights will be triggered (put on) ?
- FAA uses runway unsafe to cross when the aircraft is 0.75 NM from TD

Relevance of RWSL to pilots/drivers

- Indicates status of runway
- Gives no indication of clearance from ATC
- Unknown expected pilots reaction
- Failure mode?

Considerations for combined ops RWSL / stop bars.

Marc Baumgartner / CEO IFATCA

- IFATCA World wide survey on stop bars; 51 airport replied in EUR - 10 in the Americas
- 40 % exclusively used during LVP
- During night time rarely
- In the USA controllers do not operate stop bars
- Diversity in applications of stop bars

RWY status lights

- Emerging technology, IFATCA interested in development
- Fully automated system - no controller input required
- Developed in an environment where no controller operates stop bars
- Warning for the "Formula 1" start effect (i.e. when green lights are shown the vehicle driver just goes!
- One just do not know what is going on anymore
- ATCO need to know what is going on
- FAA is able to disable the RWSL system
- Is the status of the RWSL displayed on the ATCO HMI?

Rob van Eekeren / IFALPA

- Runways are designed for landings and take-offs and NOT for crossing
- When runway crossings are one needs to build in
    - Mitigating procedures and additional safety related infrastructure
    - Additional training
    - Oversight
    - Initially it could seem to be a cheaper solution
    - Visual aids, like lights
        - Stop bars, runway guard lights, runway status lights
- Stop bars are red lights perpendicular to the traffic direction
- REL are red lights in line with the traffic direction
- RWSL can be confusing with red lights at the end of the runway, red bars in approach lights and papi especially in foggy weather.
- RWSL will need additional procedures and do we want them?

Discussions (afternoon)

- What is the objective of the workshop? To answer the question: Can RWSL and stop bars work together?
- The CAA UK would offend the dual system at UK airports
- UK CAA: one should not have two systems working independently
- Two independent systems could give two different advices
- There must be an interconnection between systems at the airport
- How to integrate RWSL with existing systems? Does it impact the workload of people that work with it?
- IATA:

    - Pilots should not be confused with different systems at airports. Call for standardization
    - Test the RWLS at a number of airports; evaluate its use in combination with other airport systems, before any decision to implementation is made
    - CDG want to implement RWSL too quickly; request is made for proper developed and agreed procedures; a safety case and a business case in which costs and benefits are clearly indicated
    - Timely involve ICAO Aerodrome Panel and Visual Aids Working Group.
- How to certify a system, which is not ICAO compliant?
- LGW does not want to have another control tool
- RWSL is an additional measure at a high price not preventing runway incursion. It is a safety net.
- What is the quality of the system in relation to its interference with SUR systems.
- System must be very secure as the pilot is the last line of defense So, develop procedure in case of failure
- NATS LHR: 3 false alerts per week, which is quite good. Pilots does not have this.
- Additional R/T might have create capacity problems
- ZRH: only one holding position CAT I/II/III
- Why not at CDG changing stop bar locations from 150 m to 90 m?
- Hazard scenarios: What is the trigger for the RWSL system?
- Objective? Avoiding collision as a safety net….
- Avoid entering an occupied runway….is the aim of the RWSL
- The system is alerting
- Common practice Aircraft T/O SOP: De-rating, slow deceleration take off of the aircraft will determine the trigger of the RWSL to go on/off
- Capacity impact by the new system? Use the DFW simulation.
- How should the pilot know what to do?
- HKG, PRG and LGW have RETILS, only a few pilots know, many think there is a car on the runway, even when notam available
- When RWSL introduced at CDG, it will be unexpected, irrespective of awareness raising amongst pilots resulting in pilots do not know about what they will encounter.
- Up to now, AFR not fully involved in discussions with AdP about RWSL implementation plans.
- Testing, evaluation, simulations must be done
- VIE: introduced clearance limits bars for 8 months, pilots are still asking what is this
- ATCO will have the status of the RWSL in front of him
- Angle of the sun shining on the RWSL could confuse the status of the lights (on/off)
- PRG ANS: afraid of workload, conflict of double clearances etc
- How does the new system impact (neg./ pos) on the existing systems?
- Costs: 200 million USD at 20 airports in USA + additional money for maintenance.