

SUMMARY OF JOINT CAA-INDUSTRY “SIGNIFICANT SEVEN” TASK FORCES

Loss of Control Task Force

Advances in technology and automation that had mitigated the risk of other types of accident (e.g. CFIT) were found to have increased, or at least changed, the risk associated with loss of control. Currently, when training and testing pilot competence, the principal focus is on their handling skills rather than monitoring skills. However, safe operation of complex and highly automated aircraft relies on effective monitoring of aircraft systems, automation and the other pilot's actions.

Key Desired Outcome

- Significant reduction in the number of loss of control accidents and serious incidents in which inadequate or ineffective monitoring by the flight crew was a contributory or causal factor.

Proposed Actions to Achieve Key Desired Outcome

1. Identify best practices in human flight deck monitoring and propose associated training methods through a working group of airline industry training specialists.
2. UK Operators to prepare Pilot Monitoring Skills Training Plans based on the above and all pilots employed by UK AOC holders to receive training in accordance with these plans.

Why Proposed Actions Will Make a Difference

1. Currently, in some multi-crew loss of control events the monitoring pilot is failing to prevent the loss of control by the pilot flying.
2. An increased focus on the monitoring role within a multi-crew flight deck could be expected to improve the likelihood of the avoidance and recognition of potential loss of control events.

Note: Improved flight crew monitoring skills will help to mitigate several other risk areas (e.g. CFIT, mid-air collision and runway excursions).

Measures of Success

- Reduction in the number of genuine stall warnings (including stick-shakes or alpha floor events), undetected auto-throttle drop-outs, excessive speed and flight path excursions and configuration warnings.

Proposed Safety Performance Indicators

- Loss of control related occurrences (broken down by severity and cause: either due to technical failure, non-technical failure or environmental factors).
- Precursors to the above (note: some of these rely on FDM-based data):
 - Stick-shakes and alpha floor events;
 - Excessively low/high speed during flight;
 - Excessive pitch/bank attitude during flight;
 - Excessive in-flight normal acceleration (indicator of severe turbulence);
 - Take-off configuration warnings;
 - Simultaneous side-stick use; and
 - Undetected auto-throttle drop-out.

Proposed Leading Indicators

- Proportion of manually flown approaches (to establish a baseline).

Other Actions Proposed by the Task Force

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Change the content of the JAR-FCL Licence Skills Test (LST) by making it type specific for modern highly automated aeroplanes.
 - Extend the accessibility of Alternative Training and Qualification Programmes (ATQP) to smaller operators and those utilising Mixed Fleet Flying (MFF).
 - Enhance training of automation.
 - Enhance Multi-Crew Pilot Licence (MPL) requirements.
 - Ensure that initial training syllabi properly equip all pilots with the necessary level of manual flying skills, and that recurrent training syllabi enable these skill levels to be maintained.
 - Mandate (1) upset recovery training for all pilots, and (2) a requirement for data at the edges of the aircraft's flight envelope (for example in the stall regime, where a wing may drop) to be incorporated in full flight simulators to facilitate such training.
 - Mandate that pilots (other than holders of MPL) complete a Jet Orientation Course prior to commencement of their first type rating course on a highly automated jet aeroplane.
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Loss of Control Task Force Industry Members

- Margaret Dean AAIB
- Simon Wood FORCE
- Jim Reed MOD
- Rupert Clark RAF
- Chris Eccles RAF
- Simon Grace Thomas Cook Airlines
- Phil Luxton Thomson Airways
- Richard Jones UK Flight Safety Committee
- Alex Fisher UK Flight Safety Committee

Runway Overrun and Excursion Task Force

The Task Force considered that landing within the touchdown zone in the correct configuration and at the correct speed, and if this could not be ensured, then flying a go-around were the key factors in avoiding a runway overrun or excursion. Other factors that increased the risk included provision of incomplete runway contamination data to pilots, failure to provide compliant runway surface friction characteristics and inadequacy of safety areas surrounding the runway.

Key Desired Outcome

- Reduce the number of unstable approaches and particularly those that continue to a landing.

Proposed Actions to Achieve Key Desired Outcome

1. Produce generic best practice guidance material regarding unstable approach and associated go-around requirements, and promote and monitor through RETRE.
2. Produce generic best practice guidance material regarding precursors to runway excursions, identified through operator FDM programmes, and promote and monitor.
3. Operators set and monitor runway excursion precursor measures and, where appropriate, implement relevant training exercises through ATQP, LOFT, etc.
4. Revise air traffic procedures to eliminate/reduce controller induced unstable approaches, and revise air traffic controller training to emphasise the need for a stabilised approach.

Why Proposed Actions Will Make a Difference

- Reduction in the number of unstable approaches that continue to a landing will reduce the risk of aircraft touching down at the incorrect speed and/or position with a corresponding reduction in the risk of running off the side or end of the runway.

Note: Reduced incidences of unstable approaches will help to mitigate several other risk areas (e.g. CFIT and loss of control). Runway excursion prevention will also reduce the risk of post crash fire.

Measures of Success

- Reduction in the number of all unstable approaches and those that continue to a landing, without a corresponding increase in the number of incorrectly flown go-arounds.

Proposed Safety Performance Indicators

- Runway excursions/overruns by UK aircraft worldwide (broken down by severity).
- Runway excursions/overruns at UK aerodromes (broken down by severity).
- Precursors to the above:
 - Take-off/landing events involving aquaplaning and crosswinds;
 - Landing events involving tailwinds, flare problems and hard landings; and
 - Rejected take-offs.

The following rely on FDM-based data:

- All unstable approaches;
- Unstable approaches that continue to land;
- Deep/fast/bounced landings;
- Significant tailwind during take-off/landing;
- Significant heading deviation during take-off/landing;
- Slow acceleration during take-off and slow deceleration during landing;
- Brakes on during take-off/landing; and

- Thrust reverser not armed on landing.

Proposed Leading Indicators

- Proportion of tailwind take-off and landings flown by UK aircraft.
 - Proportion of non-precision approaches flown by UK aircraft.
 - Proportion of Cat C aerodromes visited by UK aircraft.
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Other Actions Proposed by the Task Force

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Support efforts to standardise International and European standards (EASA) associated with both runway friction and aircraft performance so that accurate, unambiguous and easy to use information is passed to flight crew to allow an accurate assessment of the take-off or landing distance required.
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Runway Overrun and Excursion Task Force Industry Members

- Paul Davies..... Bristol Airport
- Rod Young..... British Airways
- Miles Stapleton GAPAN
- Dave Whittington..... London Heathrow Airport
- Simon Butterworth Manchester Airport
- Andy Taylor..... NATS
- Mario Azevedo Moura..... NetJets
- Rob Holliday..... Virgin Atlantic Airways

Controlled Flight Into Terrain (CFIT) Task Force

CFIT risk was found to be greatest during non-precision approaches and the most common causes were: descent below decision/safety heights without appropriate visual reference, inadequate monitoring and lack of positional awareness. Terrain Awareness and Warning System (TAWS) warnings were an effective mitigation but relied on correct flight crew response, up-to-date terrain databases and software, and the most accurate source of position information feeding into them.

Key Desired Outcome

- Replacement of traditional non-precision approaches (NPAs), particularly Non-Directional Beacon (NDB) approaches, with Global Navigation Satellite System (GNSS)-based equivalents (incorporating vertical guidance) at appropriate aerodromes.

Proposed Actions to Achieve Key Desired Outcome

1. Run an education campaign aimed at operators, highlighting the safety and cost benefits of RNAV (GNSS) with vertical guidance approaches.
2. Investigate implementation of RNAV (GNSS) with vertical guidance approaches in USA to identify factors that could help accelerate implementation in UK/Europe and feed this back to the ongoing European work in this area.
3. Encourage operators to become RNAV (GNSS) approach approved and aerodrome operators to make provisions.

Why Proposed Actions Will Make a Difference

- Reduction in the high proportion of CFIT incidents/accidents that occur during NPAs.

Measures of Success

- Reduction in the number of non-precision approaches published in the UK AIP and a corresponding increase in GNSS-based approaches, and a reduction in TAWS warnings triggered during the approach.
- Increase in the number of GNSS-based approaches at EU and third country aerodromes, which are UK operator destinations.

Proposed Safety Performance Indicators

- TAWS warnings (broken down by severity, TAWS mode, phase of flight and location).
- Precursors to the above (note: these all rely on FDM-based data):
 - All TAWS warnings;
 - Incorrect response to TAWS;
 - Significant deviation below the glideslope and/or about the localiser;
 - Excessively low during the approach;
 - Unstable approaches at or prior to 500 ft that continue to land; and
 - Unstable approaches that become unstable after 500 ft, and either continue to land or a go-around is flown.

Proposed Leading Indicators

- Proportion of UK aircraft not equipped with TAWS.
- Proportion of UK aircraft equipped with TAWS that does not have a direct feed of GPS position.
- Proportion of UK aircraft flights that dispatch with unserviceable TAWS.
- Proportion of non-precision approaches flown by UK aircraft.
- Proportion of aerodromes visited by UK aircraft that do not have a precision navigation approach aid or GNSS-based approach.

- Proportion of UK commercial air transport (CAT) aerodromes that do not have a precision navigation approach aid or GNSS-based approach.
- Proportion of aerodromes visited by UK aircraft that are not equipped with Minimum Safe Altitude Warning (MSAW) systems.
- Proportion of UK CAT aerodromes that are not equipped with MSAW.

Other Actions Proposed by the Task Force

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Carry out a cost/benefit analysis of deploying MSAW systems at appropriate UK aerodromes.
- Carry out a cost/benefit analysis and feasibility study for requiring TAWS databases to be certified (including a requirement for regular updates) and for requiring a direct feed of GNSS-based aircraft position data into TAWS.
- Review the philosophy in allowing operators to dispatch with inoperative TAWS equipment for up to 10 days.
- Encourage UK operators to consider including circling approach training in their recurrent checks. It is also recommended that operators should be encouraged to provide detailed procedures for aerodromes that have significant obstacles in the circling area or special requirements when circling.
- Carry out further analysis of downloaded Mode S data to determine the incidence of altimeter subscale mis-setting.
- Review the implementation of TAWS for UK public transport helicopter operations.

CFIT Task Force Industry Members

- James Basnett British Airways
- Paul Smiles British Airways
- Simon Cotterell CHC Scotia
- Jim Pegram easyJet
- Bruce Crawford GAPAN
- Allan Howell Honeywell
- Karen Bolton NATS
- Robert Innes TAG Aviation
- Malcolm Rusby TAG Aviation

Airborne Conflict Task Force

The Task Force found that the greatest risk of airborne conflict existed outside of UK airspace (70% of the 27 high-severity airborne conflict related MORs between 2005 and 2008 occurred abroad), and the most effective barrier in resolving conflicts was the correct following of ACAS Resolution Advisories (RAs). However, it was felt that the CAA was unable to react effectively to the high number and severity of airborne conflict incidents outside of UK airspace due to a lack of information provided by the foreign States responsible for their investigation. A further challenge was managing the foreign and diplomatic sensitivities involved. EUROCONTROL data also suggested that a significant proportion of ACAS RAs were not responded to correctly, which supported the need for a review of the effectiveness of flight crew training in this area.

Key Desired Outcomes

1. Significant reduction in the number of overseas airborne conflict events involving UK registered aircraft.
2. Significant improvement in response to ACAS RAs by flight crew of UK registered aircraft.
3. Significant reduction in the number of airborne conflict events in UK airspace.

Proposed Actions to Achieve Key Desired Outcome

1. (i) Submit the evidence of the significant number of airborne conflict events taking place outside of UK airspace to DfT and seek advice on measures it would view as being politic and practical to raise the visibility of those particular areas outside of UK airspace where there is a high risk of airborne conflict.

(ii) Support the work of the ICAO group developing the use of Advanced Strategic Offset Concept (ASOC) and add some sense of urgency to it.

(iii) Fully support the proposal to ICAO to improve existing Strategic Lateral Offset Procedures (SLOP) by introducing Offset Allocation by Flight Level.
2. (i) Clarify and confirm where the definitive source of guidance for ACAS training now lies given that it is believed that Joint Aviation authorities (JAA) Temporary Guidance Leaflet (TGL) 11 is no longer extant. Similarly, efforts should be made to amend ICAO Doc 8168, Aircraft Operations to cover ACAS training adequately.

(ii) Sample the quality of Simulator ACAS training and establish the range of capabilities of devices to simulate realistic ACAS event scenarios and ensure that operators are aware of the potential of each simulator in this regard.

(iii) Review the EUROCONTROL data on the quality of pilot responses to ACAS events and take appropriate follow-up action to ensure appropriate and timely crew responses to ACAS events.
3. Airspace & Safety Initiative (ASI) Airborne ACAS Working Group to source information upon MEL alleviation decisions in order that a subsequent recommendation be considered for submission to EASA to review the Rectification Intervals that are applied to ACAS equipment and achieve standardisation across Europe.

Why Proposed Actions Will Make a Difference

1. (i) Reduction in probability of airborne conflict events occurring.

(ii) Reduction in risk of collision following any vertical error on a one or two way airway.

(iii) Reduction in risk of collision or serious vortex encounter on oceanic track systems.
2. Reduced risk of collision resulting from incorrect use of ACAS and enhancement of final barrier to mid-air collision, other than providence.

3. Enhanced coverage of ACAS as a barrier to resolve conflicts.

Measures of Success

- Reduction in the number of losses of separation and ACAS events involving UK commercial air transport aircraft inside and outside of UK airspace.
- Effective resolution of loss of separation events when they do occur.

Proposed Safety Performance Indicators

- Loss of separation in UK controlled airspace.
- AIRPROX in UK uncontrolled airspace (broken down by UK AIRPROX Board risk grade).
- All airborne conflict related events outside of UK airspace involving UK aircraft (broken down by the safety barrier that resolved the conflict).
- Precursors to the above:
 - Level busts;
 - Airspace infringements;
 - Altimeter setting errors;
 - ACAS RAs; and
 - Incorrect response to ACAS RAs (requires analysis of FDM data).

Proposed Leading Indicators

- Proportion of UK aircraft not equipped with ACAS.
- Proportion of UK aircraft flights that dispatch with unserviceable ACAS.

Other Actions Proposed by the Task Force

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Encourage the use of part-task/desktop training aids for ACAS training.
- Undertake a Europe-wide review of AIRPROX investigative and assessment organisations currently established by each Nation state to support a proposal to the European Commission supporting the formation of an organisation, similar to the UK AIRPROX Board, to examine in detail airborne conflict events in European Airspace.

Airborne Conflict Task Force Industry Members

- Ken Thomson..... DARS
- Alex Fisher GAPAN
- Karen Bolton NATS Division of Safety
- David Balchin UK AIRPROX Board

Airborne and Post Crash Fire Task Force

The majority of aircraft fire incidents analysed by the Task Force occurred in galleys, passenger and toilet areas but these were determined to be relatively low risk and unlikely to progress to a catastrophic accident. However, hidden area fires, although relatively infrequent, have a far greater potential for a catastrophic outcome. Most of the aircraft fires associated with fatal accidents occurred during the post-crash sequence and it would be more effective to address the causes of crashes (e.g. runway overruns or excursions) rather than make aircraft more tolerant to post-crash fire.

Key Desired Outcome

- Reduce the risk of hidden area fires occurring.

Proposed Action to Achieve Key Desired Outcome

- Raise fire safety awareness through a DVD/Internet training campaign to engineering and associated groups on the effects of fire/smoke events on aircraft caused by poor quality control/workmanship.

Why Proposed Action Will Make a Difference

- Improved workmanship will reduce the likelihood of poor maintenance practices causing hidden fires.

Measures of Success

- Promotion of good working practices should raise the awareness of poor workmanship, which may cause an increase of maintenance reported incidents in the short term but should provide a long-term decline in maintenance related incidents.
- Number of viewings of Internet training material.

Proposed Safety Performance Indicators

- Aircraft fires (broken down by severity, phase of flight and cause).
- Precursors to the above:
 - Smoke occurrences (broken down by severity, phase of flight and cause);
 - Fume occurrences (broken down by severity, phase of flight and cause); and
 - Excessive brake temperatures during take-off (including rejected take-offs)/landing (requires FDM-based data).

Other Actions Proposed by the Task Force

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Investigate the occurrence rate and cause of hidden area fires.
- Investigate options for low cost hidden area fire detection.
- Investigate the effectiveness of ports that may allow the discharge of fire extinguishers into some hidden areas.
- Review cabin fire fighting equipment and define suitable tools for cabin panel removal that cannot be misused.
- Carry out a study on the feasibility and potential cost benefit of identifying differing smells, fumes and smoke in the cabin, source may be from a hidden area.

- Review commercially available equipment to see if suitable sensing equipment is likely to be operationally effective in identifying differing sources of fumes.
 - Collaborate with other interested parties in defining acceptable levels of contamination in hidden areas.
 - Development of a UK CAA Fire Safety Web page showing the work being carried out in support of fire safety initiatives, with reports, training and guidance material available to industry.
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Airborne and Post Crash Fire Task Force Industry Members

- Shane Howes..... British Airways
- Helen McCarry British Airways
- Tendai Mutambirwa easyJet
- John Pearman..... flybe
- Chris Lennon..... TAG Aviation UK
- Hazel Corcoran Thomas Cook Airlines

Runway Incursions Steering Group (RISG)

The RISG is a mature group that has been able to build an excellent working relationship with industry and stakeholders by working closely together. Continued engagement with industry will help to see a reduction in the number of runway incursions by UK registered aircraft, by ground vehicles and at UK aerodromes. An example of this is the recent change in the CAA's position regarding the publication of runway hotspots in the AIP, in which advice from and investigation with industry suggested benefits from greater awareness by flight crews.

Key Desired Outcome

- Zero Category A incidents, a decrease in Category B incidents, and significant reductions in Category C and D incidents.

Proposed Actions to Achieve Key Desired Outcome

1. CAA to engage with industry and other stakeholders to provide a 'joined-up' approach to resolving runway incursion issues in a collaborative fashion. As part of the engagement process, CAA to continue to lead in areas such as runway safety, and ensuring that where appropriate, relevant AAIB recommendations are followed up by industry.
2. Audit and support all UK licensed aerodromes to ensure that, where appropriate, a Local Runway Safety Team (LRST) is in place and is effective.
3. Audit & Support aerodrome operators to, through their LRSTs, review, identify and address infrastructure and communication issues such as taxi patterns, signage and complex RT procedures; and that they develop appropriate mitigations where appropriate (for example, the publication of runway hotspots).

Why Proposed Actions Will Make a Difference

1. Will enable both parties to gain a better understanding of the issues that affect each other, and this will enable a partnership approach to robust resolution of the issues.
2. Will ensure that LRSTs are providing meaningful and useful output.
3. These are key factors in runway incursions, and will help to reduce the number of incidents.

Note: Runway incursion prevention could also mitigate the risk of runway excursions caused by an aircraft needing to avoid the incurring party.

Measures of Success

- A reduction in the number of runway incursions.

Proposed Safety Performance Indicators

- Runway incursions at UK aerodromes (broken down by severity, aerodrome size (based on traffic), location, infringing entity, causal factors, causal entity and incursion type).
- Runway incursions at foreign aerodromes.

Proposed Leading Indicators

- Proportion of UK aerodromes not equipped with Surface Movement Radar and associated safety net (e.g. RIMCAS).
- Proportion of UK aerodromes that do not operate lit stop bars 24 hours per day.
- Proportion of UK licensed aerodromes with a LRST.
- Proportion of UK licensed aerodromes with a LRST that have been audited.

Other Actions Proposed by RISG

The following actions were also proposed but were deemed to have a lower priority compared to other actions developed by this and other Task Forces. However, industry feedback will be sought that could result in renewed consideration for their inclusion in the Safety Plan.

- Share all relevant information more widely – if this involves commercially sensitive, but safety related information, then this should at least be shared on a de-identified basis with our RISG partners.
 - Develop the Runway Safety page on the CAA website to highlight and share best practice regarding Runway Incursion Prevention including LRST information.
 - Carry out research into the Human Factors elements that can lead to runway incursions.
 - Review and promote the development of technological aids that prevent runway incursions, for example, Runway Status lights, RIMCAS and on-board equipment.
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RISG Industry Members

- Richard Allen..... BAA
- Ian Witter..... BAA
- Tim Price..... British Airways
- Robb Legg easyJet
- Roger Koukkoullis London Luton Airport
- Simon Butterworth Manchester Airport
- Matt Brunton MOD
- Andy Taylor..... NATS
- Richard Jones UK Flight Safety Committee
- Rob Holliday..... Virgin Atlantic Airways

Ground Handling Operations Safety Team (GHOST)

The GHOST is mature group whose aim is to work with the UK aviation industry, organisations and groups worldwide to develop strategies to mitigate the safety risks from ground handling and ground support activities in the UK and elsewhere. MORs classified under the Ground Handling (GH) banner are numerous and very varied. The majority are classified as low risk. However, those with the potential to cause the biggest risk to aircraft safety (considering frequency and potential outcome) are loading errors and serious collisions between vehicles and aircraft, undetected prior to flight. Ramp-related MORs currently account for between 7% and 10% of all MORs.

Key Desired Outcomes

- Significant reduction in loading errors.
- Significant reduction in ground handling incidents caused by vehicles.

Root Causes

It is difficult to identify many common root causes for the wide variety of ground handling MORs, however, a lack of standardised procedures for loading and ground handling and a lack of competency¹ requirements for ground handling staff, across the UK, Europe and worldwide are common factors.

Proposed Actions to Achieve Key Desired Outcomes

There are two ways of addressing the lack of standardisation and competence within the industry:

1. Voluntary adoption of standardised guidance material by the industry, accompanied by a self-monitoring programme.
2. Increased regulation and regulatory oversight.

The GHOST is currently working on, or has completed the following:

1. Voluntary Adoption of guidance material, accompanied by a self-monitoring programme

- Development of syllabi for initial and recurrent ground handling training that could be adopted by Ground Handling Organisations (GHOs), which has been endorsed by ECAST. *Completed. Measure of uptake of the guidance as yet unclear.*
- Development of loading error education material for promulgation to GHOs and airlines. *Winter 2010.*
- Production of a draft training framework and guidance material for drivers on the apron, which has been developed in cooperation with the AOA. *Consultation Autumn 2010, publication early 2011.*
- Internationally the IATA ISAGO programme aims to introduce an industry-auditing system of ground handling providers. CAA has been an active participant in the working groups and we are monitoring the success of the programme.

Why Proposed Actions Will Make a Difference

- Increased awareness and competence leading to a reduction in human factors-related errors.
- Increased industry cooperation and shared ownership of risks.

¹ A competent person is someone who has sufficient training and experience or knowledge and other qualities that allow them to complete their job safely.

- Increased internal monitoring, supervision and auditing to monitor and correct unsafe behaviours.

Measures of Success

- Reduction in the number of loading errors reported by UK AOC holders. However, in the short term the additional awareness raised by FODCOM 20/2010 and later the DVD may cause an increase in MORs – this is to be welcomed.
- Reduction in the number of collisions between vehicles and parked aircraft at UK aerodromes. It may be possible to determine an SPI for those aerodromes that have implemented in full the new driver training scheme recommendations and one for all other aerodromes. A positive effect would hopefully encourage the other aerodromes to take up the scheme.

2. Increased regulation and regulatory oversight

- CAA is reviewing internal auditing standards as well as airline and aerodrome oversight of 3rd parties to determine whether enhanced or direct oversight of UK ground handling activities is necessary to significantly reduce GH incidents, and if so, how best it might be achieved, and will act on the outcome. *End 2011.*
- A GHOST sub-group has drafted minimum competency requirements for drivers on the manoeuvring area and runways. *Consultation Autumn 2010, publication early 2011.*
- CAA to encourage EASA SMS provisions to include oversight of 3rd parties. *Within EASA timescales.*

Why Proposed Actions Will Make a Difference

- Safety standard will be reflected in ground handling contracts.
- Increased supervision and oversight to monitor and correct unsafe behaviours.
- Decreased runway incursions by vehicles.

Measures of Success

- Decreased number of loading errors and of ground handling incidents caused by vehicles.
- Decreased runway incursions by vehicles.

Proposed Safety Performance Indicators

- Ramp occurrences (broken down by process during which they occurred, e.g. push-back, and their outcome, e.g. loading error).
- Collisions involving vehicles and parked aircraft at UK reporting aerodromes.
- Collisions, near-collisions and conflicts involving vehicles and taxiing aircraft at UK reporting aerodromes.

Possible Precursors

- Loading errors resolved before doors closed.
- Late aircraft type changes.
- Number of late turn-arounds or turn-arounds in less than the minimum scheduled time.
- Number of vehicle-to-vehicle incidents.
- Damage caused by vehicles to infrastructure/equipment.
- Exposure to de-icing.
- Can industry suggest others?

What can industry do to help?

- Implementation of SMS and robust oversight of GHOs by AOC holders and airports.

- In order for any of the above to be a success, we need continued buy-in from industry.

GHOST Industry Members

- Len Sullivan Aircraft Service International Group
- Eric Gainey Aviance UK
- Rob Erskine BAA
- John Hamshare..... BAA
- Keith Polkey BAA
- Mark Walton BBA Aviation
- David Clark British Airways
- Nick Holland..... British Airways
- Nick Clifton-Welker British Midland International
- David Curgenvan DCA International
- Neale Millett DHL Air
- Ian Freeman..... East Midlands Airport
- Graeme MacLeod easyJet
- Simon Prower easyJet
- Eddie Evans..... flybe
- Andy Fletcher flybe
- Sandra Harris..... flybe
- Christine Barringer Health & Safety Executive
- Myles Francis Health & Safety Executive
- Barry Davies Human Engineering
- Paul Gerrish Jet2
- Sharon Preston London City Airport
- Kevin Wilkins..... London Gatwick Airport
- Roger Koukkoullis London Luton Airport
- Diane Jack Manchester Airport
- Craig Charlesworth Menzies Aviation
- Richard Wiggins..... MK Airlines
- John Whitby MyTravel
- Dave Edwards..... Plane Handling
- Steve Enright Servisair
- Andrew Fox..... Swissport UK
- Carl Gissing Thomson Airways
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