

Delta Air Lines, Inc.

Airport Safety Management Systems

April 21, 2016

Kirk Thornburg
Vice President, Aviation Safety and Corporate Compliance Quality



Safety Management System (SMS) at Delta

A Perspective from 5 years of an SMS Pilot Program:

We identify more potential hazards **early** in the process

We have learned that assigning **a single Risk Acceptor** provides

Focused Accountability

A More Balanced Decision

It is **OK for Safety Professionals to Disagree** on a given Risk Condition

Safety Management System (SMS)

Integrated Safety Round Table (iSRT) – A Model to Share

Purpose is to

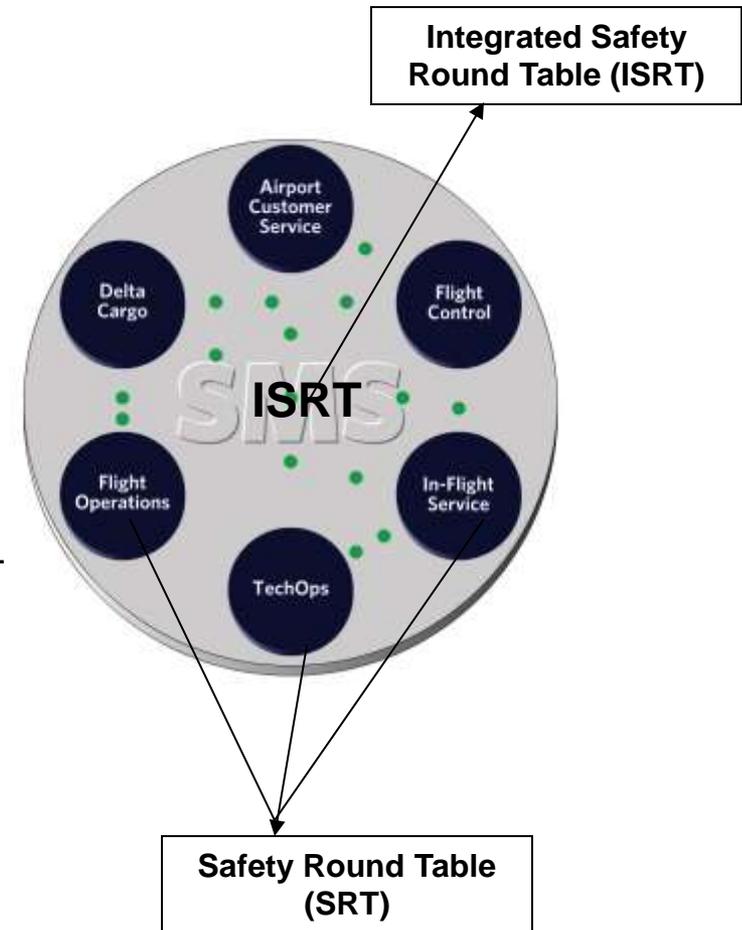
1. Share safety information
2. Communicate cross-divisional concerns
3. Assign safety action to divisions
4. FAA interface and information sharing

Process

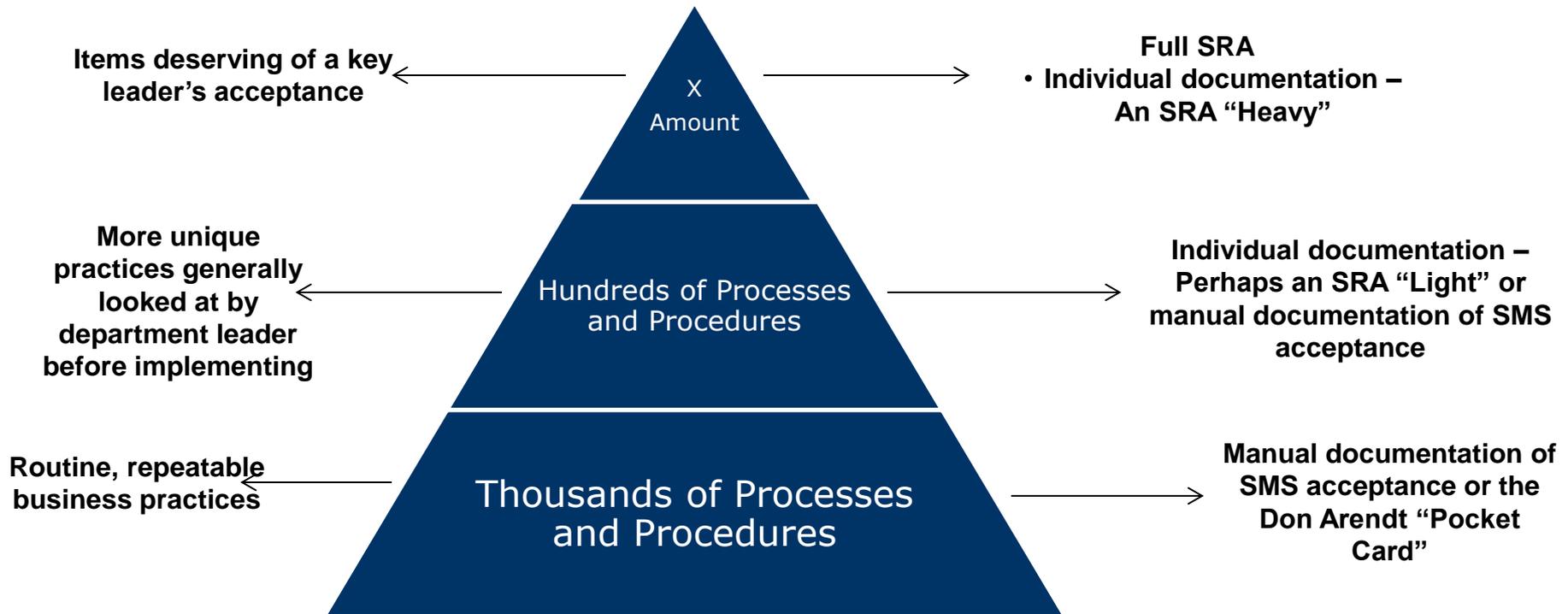
1. Items currently in work
 - Status briefing
2. Worked items
 - Proposal to close
3. Corporate function facilitating the cross-divisional resolution based on data and analysis

Participants and Representation

1. Divisional business leaders
2. Corporate Safety and SMS
3. FAA



Safety Management System (SMS) Pyramid Model Approach



SMS Must be Scalable

	<u>Full Formal SRA Capability</u>	<u>Routine SRAs</u>
Delta Mainline	36 - 60	500 - 1000
Delta Connection Carrier	12-15	100 - 150

Airport/Air Carrier SMS Interface

Examples under discussion right now

Background:

With the finalization of Part 121 SMS requirements nearing, Delta sees interface opportunities with our business partners, particularly airports we serve. Recognizing that Airport SMS standards are in development, Delta seeks to more effectively leverage risk reduction actions and identified hazards from the airport environment.

Examples:

1. **Deplaning During Lightning** – Should you deplane passengers during a lightning storm? Is it safer on the aircraft or should you move passengers to the terminal through jetway?



Questions

- Airline Decision, Airport Decision, FAA Decision?
- Safer to remain on the Aircraft? Or Should you move passengers through the jetway to the Terminal/Gate?
- Should we invest in Technology – Safe Gate Approach, Lighting Dissipation Technology on Jetways?

Airport/Air Carrier SMS Interface

2. Drones – We all have a vested interest here

Questions

- FAA Regulations Enforceable?
- Drone Manufacturer's Voluntary Actions?
- Who Organizes the Answer? FAA? Airlines? Airport Community?



3. Lasers – Reporting source location quickly



Questions

- Can local Airport SMS teams design a local process to ID locations faster
- Engage FAA and Local Law Enforcement on stiff penalties, fines and jail time

Airport/Air Carrier SMS Interface

Examples:

4. **Next Generation of Electronics/Risk** – We should ask ourselves honestly did we react quick enough to threats from emerging electronics in the recent years?

At Delta, recently

- Taxiway evacuation when **e-cigarette engaged** in passenger bags in cargo hold, cargo fire detection/suppression alerted before a/c was airborne
- Expedited evacuation when passenger's bag with **laptop (lithium battery)** and bic lighter ignited as aircraft pulled up to the gate
- Bag fire in airport bag room due **to hookah pipe and torch** present
- No **hoverboard** incidents yet but banned in late 2015 due to growing reports of lithium battery runaways.

Many airlines considering a fire suppression bag that uses absorbent material and water to suppress fire/heat

What Electronic Life Enhancement Device is Next?

Airport/Air Carrier SMS Interface

Airport Hazard Identification

- As part of the a key Delta hub Airport's SMS implementation, a confidential hazard reporting process has been developed for employees to report safety concerns identified anywhere at the airport.
- Reporting form can be used by any employee at the airport, regardless of employer (i.e., Delta employees).
- Hazards found on airport grounds which affect a specific air carrier's operations could be reported through the airport's reporting system or the air carriers reporting system

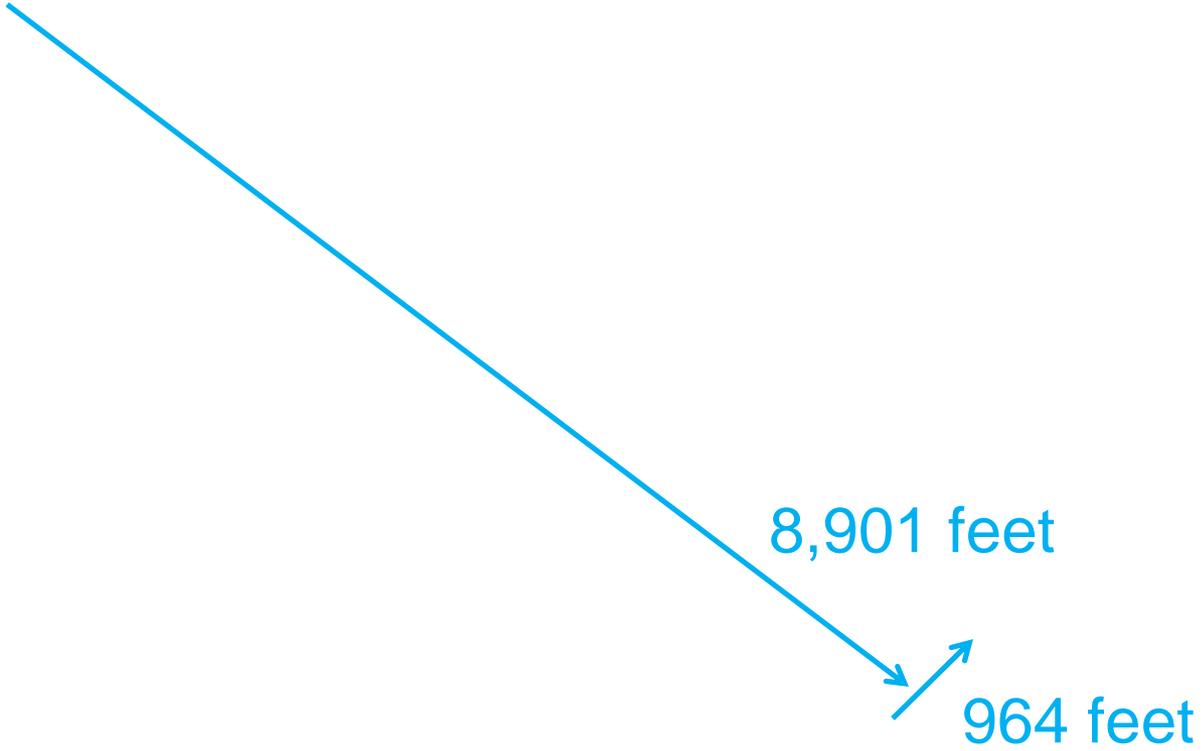
An integrated system that assigns the hazard report to either an airport or air carrier assessment process is recommended.

Technology

Crane Hazard In NYC was viewed at iSRT level at Delta Airlines

- FOQA Data Added to Google Earth Displays
- Fusion Data Concept – ATC, Weather, Aircraft Parameters will add more in the future
- Recent ASAP report – Pilot felt they got too close





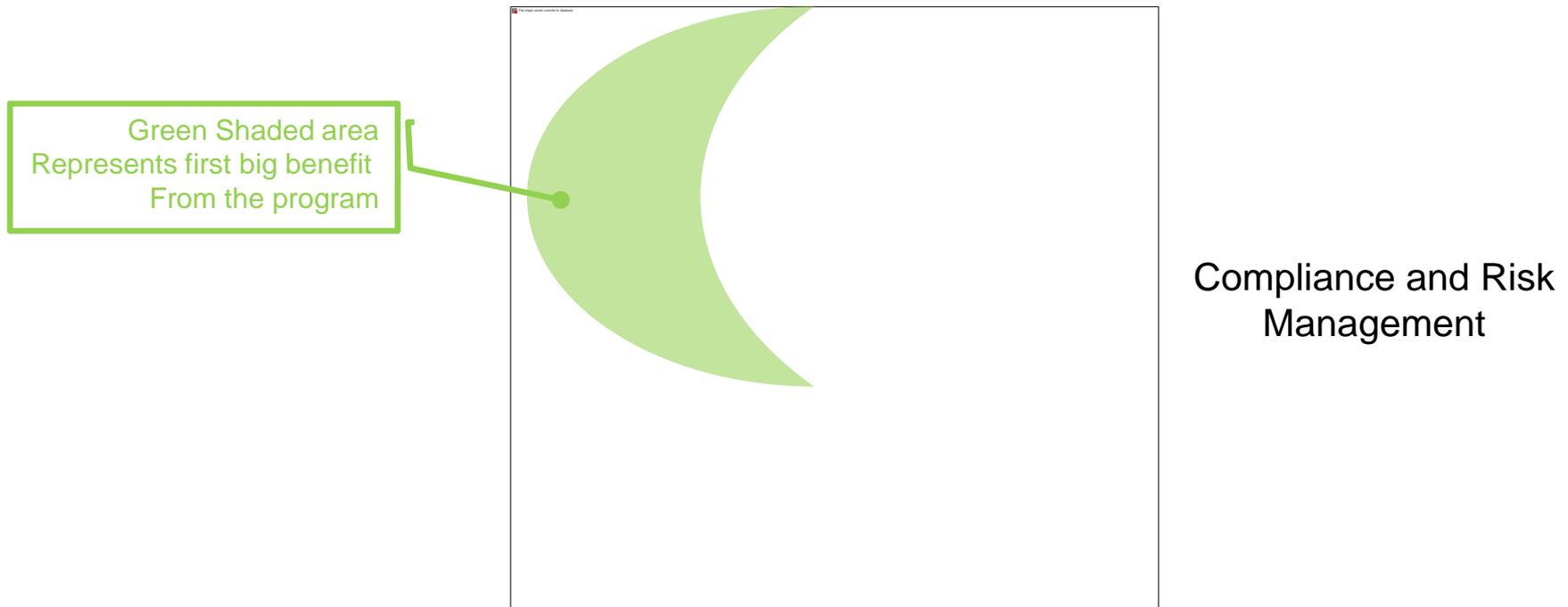


Crane 1
Crane 2



Involving the FAA in SMS Safety Risk Management Safety Assurance Agreement (SRMSA)

Non Safety Regulatory Non Compliance – Introduced by the SMS Program Office to our process, SRMSA processes occur as follows:



- **When Safety of Flight is of immediate concern**, DL takes immediate action to terminate all non compliance.
- **When Safety of Flight is not an immediate concern**, DL takes immediate action to terminate the conduct that caused the non compliance and works a plan acceptable to the FAA to return to compliance.

Safety Risk Management Safety Assurance Agreement (SRMSA) FAA Lessons Learned

Legal and Risk Management Issue

Documentation Location of Non Compliance Data/SRAs – Delta Legal is reviewing policy regarding control of formal Safety Risk Assessments (SRAs) and documentation of non compliance.

- Forces discussion on how the FAA confirms compliance to the SMS rule but safety sensitive data must stay in their hands
- Delta is reviewing FOIA risk of information being attained by outside parties
- Delta is reviewing discovery request risk from civil litigation cases

Current solution is legal disclaimers on all DL SRAs and a negotiation as to where electronic and hard copy SRAs are retained.

Constrained Gate Operations Assessment

Four Growing DL Hub/Gateway Cities

Normal Station Audit (SRM): During an annual Delta station audit, on discussing violations of our safety lines, the station answer was "This was what Corp Real Estate Gave Me"

Assessment Objective (SRA): Determine if our facility change process identifies a risk owner and how do we make balanced decisions regarding safety, operations objectives, and cost?

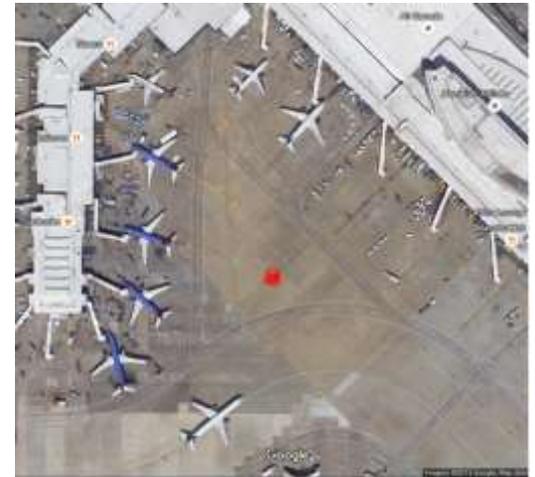
Interesting Observations:



Can I fit my GSE outside the safety lines?



Why does the roadway end here?



Can we disconnect an RJ here and Avoid Block Taxiway?

Constrained Gate Operations Assessment

Four Growing DL Hub/Gateway Cities

Stakeholder Coordination Mitigations: Two Checklists Developed for our Leaders:

Station Profiles Page Tab – Unique Station Design Considerations

In the station profiles web page, stations should record on the unique station design and operational constraints tab, requirements that must be maintained over time at the station. Examples include:

1. **Additional Marshalling Requirements to move aircraft on or off a gate** – This may include additional wing walkers, unique approach line marking, extended wing walker positions as the aircraft approaches or pushes back.
2. **Gate Security Layout** – In order to aid gate agents boarding a flight, certain gates may require specific stations or barriers in order to prevent unauthorized access to the jet bridge during boarding
3. **Unique Jetway Configuration** – Due to the type of jetway or ramp slope, a particular gate may have specific jetway operational constraints as to aircraft type used or approach methods for the jetbridge to use to position against the aircraft
4. **Dual Gate Jet bridges** – Some airports have single door access to two aircraft boarding operations. Station specific controls may have been designed to prevent passengers from boarding the incorrect aircraft.
5. **Exemptions** – Some exemptions may have been granted by ACS Safety to deviate from normal operating procedures. These exemptions may have been approved conditionally. Any conditions to operating in the station under an exemption may be listed here.
6. **Towing/Taxiing limitations** – Certain move equipment (Super tugs) may be required for certain gate pushback operations. These should be recorded here.
7. **Remote Parking limitations** – Any restrictions associated with remote parking (Access stands, ramp markings, etc.) should be recorded here
8. **Security Issues** – Include any unique security requirements (TSA – Canine; SQR Technology Gates; Employee screening procedures)
9. **Live PAD Arrival Operations** – Document any remote park operations where you may offload passengers and detail transportation methods to the terminal
10. **Deicing at the Gate** – Describe any gates where deicing operations are allowed and any restrictions or mitigations required for the deicing operation.
11. **Excessive Ramp Slope Mitigations** – If you station uses gate areas/ramps that exceed acceptable slope norms, record mitigations (particularly winter/icy conditions) to be used
12. **Airport Specific Operations** – List any unique specific operational factors that may be in place at your specific operations (Aircraft tows must be under supertug equipment at certain areas of the airport, e.g.)

This is not an all-inclusive list. Any station specific operational requirements should be noted in this section to insure the practice, mitigation, or facility design requirement is maintained over time.

Initial Release X/XX/XX

DRAFT

Airport Facility/Gate Design Change Checklist			
Designed for Senior ACS Station Leaders to validate readiness for operations with the facility/gate change.			
Change Description:		Sta	Date
No.	Item	Y	N/A
1	Initial meeting with CRE to provide station requirements for the change	<input type="checkbox"/>	<input type="checkbox"/>
2	Assemble area use Delta stakeholders to explain pending change and gain concurrence to proceed with change. Cover timeline, operational changes, risks to personnel, aircraft, or operating equipment. <input type="checkbox"/> Catering Provider <input type="checkbox"/> Fueling Provider <input type="checkbox"/> Lavatory Servicer <input type="checkbox"/> Line Maintenance <input type="checkbox"/> GSE <input type="checkbox"/> Deicing Servicer <input type="checkbox"/> Cargo Ops <input type="checkbox"/> Delta Connection Operations **	<input type="checkbox"/>	<input type="checkbox"/>
** Coordinate through MD or GM, Delta Connection Operations, ATL			
Note: ACS Station Leader assumes operational risk and has ultimate authority to Accept risk at the station after consulting with stakeholders			
3	Review configuration change for out of the "box" station needs, i.e. <input type="checkbox"/> Vehicle Parking <input type="checkbox"/> Cargo Staging <input type="checkbox"/> Adjacent roadways <input type="checkbox"/> GSE Turn Envelope <input type="checkbox"/> High Wind Event <input type="checkbox"/> Station Security Plan	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Provide feedback from stakeholder meeting to CRE of any changes to requirements	<input type="checkbox"/>	<input type="checkbox"/>
5	Conduct Safety Risk Management (SRM) per ACS Safety Guidelines – If Hazards exist, perform step 5, if not, N/A step 5	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6	If hazard exists from step 4 SRM, conduct SRA or request SRA to be performed by ACS Safety - Note: Any SRA score > 69 requires redesign with CRE	<input type="checkbox"/>	<input type="checkbox"/>
7	Attain CAR approval	<input type="checkbox"/>	<input type="checkbox"/>
8	Attain Airport/OAL approval	<input type="checkbox"/>	<input type="checkbox"/>
8	Determine if change is simple or complex – see footer * 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9	If complex, insure CRE attains Network, ACS Safety approval	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	Attain implementation plan from CRE, Airport Operations, Contractors, etc. Monitor completion such that station is ready prior to need date for operational change	<input type="checkbox"/>	<input checked="" type="checkbox"/>
11	Document any exemptions attained in ACS Safety Sharepoint site	<input type="checkbox"/>	<input type="checkbox"/>
12	Update Station Profiles page with capabilities changes and unique station operations requirements	<input type="checkbox"/>	<input type="checkbox"/>
13	Communicate Completion to airport stakeholders	<input type="checkbox"/>	<input type="checkbox"/>

*Simple Approval if all of the following apply

- o SRA scores between 0-29
- o Change is explicitly outlined in Ramp Standards Manual

**Complex Approval if any of the following apply:

- o SRA scores between 30-69
- o Change is not explicitly outlined in Ramp Standards Manual
- o GOM exemption required

Diversion/Overflow Airport Planning

ATL Closure Scenario

Identification of Secondary Hazard: In our assessments of constrained gates at our growing airports, the subject of diversion airports for a major hub like ATL came up.

Assessment Objective (SRM): Do our key diversion airports for ATL know their diversion capacity? What would they do if more aircraft were forced to their station than their plan called for?

Assessment is Just Beginning:

- First airport assessed yielded the following hazards
 - Most probable remote parking area has DL history of damage (light pole contact)
 - Not likely we could park a widebody aircraft without nose gear positioned on non load bearing portion of the ramp.
 - Airport has gates under construction that likely limits our total aircraft quantity for the station?
 - We do not have jet tugs that could handle widebodies, so widebody aircraft would have to maneuver on airport in and out of position on own power – How would we get passengers off to comply with tarmac delay rule if extended ATL closure?
 - Have our station personnel worked an overflow plan (close/park on taxiway) with the airport?
- Five (5) additional airport assessments are planned in the next 90 days



Safety Management System (SMS) Rule

Interest to Champion Collaboration with Airport Authorities

Request: Coordinate Taxiway Treatment Planning during Icing Conditions

- Event on 11/22/2014 –
 - A/C 3771 (B737) slid off the taxiway after turn out from landing and lost all control. All 3 gear are in the grass and the AC struck a sign on the right engine.
- Event on 1/18/2015 -
 - AC 3157 (A319) While on taxiway C, approaching the apron, while attempting to stay to the right of the ILS critical hold line, the aircraft began to slide and braking was ineffective. Aircraft came to stop with nose wheel slightly off the paved taxiway on hard packed ground. Tow crew had difficult time moving aircraft and the area near the incident was sanded to provide additional traction
 - Recently enlarged ILS hold area with dual taxiways B and C prompted discussion on taxiway treatment of this area

Delta paid more attention to three airports this past winter on the airport's snow and ice control and air carrier notification process. We see where an SMS approach adds value to these winter coordination meetings.



Safety Management System (SMS) Rule

Interest to Champion Collaboration with Airport Authorities

Request: Review Engine Run Up Designated Areas

- Delta has identified a hazard in that taxi/run mechanics have missed a checklist item to insure sufficient fuel is on board when accomplishing high power engine run ups
- In two recent events, the location where the engine run up was performed had additional hazards in adjacent ravines, waterways, and adjacent to an active runway.



Photograph of where aircraft came to rest.

03/03/2012 - Ship 3609 737-700 Aircraft was pointed toward a ravine during run up. Aircraft slipped on wet surface and departed the taxiway run up area, **slid down the ravine** and incurred significant airframe and engine cowl damage.

08/17/2014 - Ship 5808 757-300 aircraft was pointed toward active runway 19L with water on two sides. Aircraft slipped on the surface and made **a runway incursion 15 feet past the hold line.**



Should we partner with the airport community to reassess designated run up areas such that requirements are established to allow for aircraft slippage during high speed run-up to allow for sufficient stopping before encountering a hazard? Our Tech Ops Safety Team has started contact with key airports

Safety Management System (SMS) Rule

Interest to Champion Collaboration with Airport Authorities

Request: Field Condition Reporting (FICON) Processes

- Quality Audit Focus area for 2015 yielded numerous reports across DL system where station personnel are not keeping Field Condition Reports current in our system.
 - Initial investigations report a wide variety of methods that an airport authority communicates field condition reporting to the airport operators
- Recent Runway Excursion SRA completed by DL Flight Ops identified Field Condition Reports as critical decision information for takeoff operation. A recommendation to track instances of inaccurate Field Condition Reports under the SMS function
- Delta requires its station personnel to keep Field Condition Reports current on a station database profile that its Dispatch Operations depend upon when issuing Flight Releases
- DL Connection Carrier worked this concern with the Great Lakes region and with their various airports they fly in that region. The carrier reports Region coordinated a policy to use NOTAMs as communication vehicle but still had to work with each of 11 airports to get a commitment to use NOTAMs.
 - Concern arose at this carrier due to a flight that reached destination airspace only to find the airport closed and Skywest Dispatch/Operational Control Center had no knowledge of the closure.

Process seems antiquated and susceptible to human error given today's information technology solutions. Should we partner to establish a better way to get an airports FICON to the cockpit of today's airlines?

Final Thought

If the FAA Administrator Visited your Airport, can you answer what your Top Risk Areas are?

