TUG Meeting Minutes 11/28/2018

INTRODUCTIONS

Good turnout, pilots and operators from many different flight departments and organizations, including American Express, Netjets, XOJET, Dassault, MMU, Aviation Hall of Fame at TEB, TEB tower, TEB Security, TEB Noise Abatement, Safety Operating Systems, Cellblock, and members of the local community among others.

OPS UPDATE: SCOTT MARSH, TEB MANAGER OPERATIONS & SECURITY

September stats were down overall by 7.5%. Fuel was down 6%. September 20th was day in month with most operations at 717. Highest day in October was the 20th with 709 operations. Construction: ongoing nightly closures of runways or taiways for AoA lighting circuit rehabilitation (repairing cables after Superstorm Sandy). The project is about 60% complete. Runway 6/24 closures start at 10pm, during which southerly flow difficult with Newark traffic overhead. Still building taxiway V, the acute-angled taxiway off of runway 24 connecting the holding pad between runway 19 and 24. Taxiway B was removed. Draining project is now complete. Better water draining especiallt in south complex. Friday night 11/30, TEB airport will be closed for 12 hours from 10pm Friday night until 10am Saturday morning for runway intersection work.

DELAYS: GARY PALM, TEB TOWER

Delays: October had 1677 departure delays. There were 5 SWAP Severe Weather Avoidance Plan events over a 3-day period. There were 3 single-runway days due to winds which caused delays. There were 13 days where volume caused delays. There were only 2 recorded delays that were caused by runway or taxiway closures.

RWY 6 RVR & RUUDY6: DAVID BELASTOCK, TUG CHAIR

Runway 6 got a new transmissometer. Starting December 14th, you'll see TEB charts showing RWY 6 RVR for takeoff will be lowered to 500 RVR. Transmissometers work in both directions, so the question has been asked when we could expect to see RWY 24 takeoff vis lowered.

Through a massive educational effort, TUG distributed posters to FBOs reminding adherence to the RUUDY6 departure and worked with Ops Group to spread the word about continued deviations. 2016 had 17 total deviations, 2017 had 25, 2018 has so far had 39. Deviations keep rising. Most are unauthorized climbs. RUUDY is like an ICAO noise-abatement procedure: hustle to 1500' AGL then drift out/clean up. Aircraft using Collins Proline in ASEL mode and light corporate jets are among the worst offenders. Let's keep brainstorming on how to reduce deviations though better training and utilization of automation.

LOSS OF CONTROL IN FLIGHT, JOHN M. COX

Leading cause of fatalities in aviation: loss of control in flight (LOC-I). With loss of control in flight, you must be able to think your way through the situation and be able to follow certain steps. In-airplane experience of LOC-I and recovery training is best, simulator is good, but simulator must have extended envelope, which most do not. Steps must be systematic and deliberate: to first push nose to unload the wing and end the stall (stall may not be obvious by flight instruments but must be assumed), next roll aircraft to the nearest horizon, next adjust power appropriate to the upset, finally stabilize the aircraft back to known pitch angles and airspeeds.

Citation 525 Jan 18, 2016 N711BX near SLC broke up in flight due to high G loading, loss of control due to FMS failure, IMC conditions, and spatial disorientation: https://www.ntsb.gov/_layouts/ntsb.aviation/brief.aspx?ev_id=20160118X53003&key=1

https://aviation-safety.net/database/record.php?id=20160118-0

Colgan 3407 Feb 12, 2009 https://en.wikipedia.org/wiki/Colgan_Air_Flight_3407

US Air 427 crashed in Sep 1994 after encountering wake turbulence of a Delta 727 on approach to PIT: https://en.wikipedia.org/wiki/USAir_Flight_427

In January 2017 a german Challenger 604 at 34,000' encountered severe wake turbulence 16nm later from an A380 at 35,000' in RVSM airspace SE of Oman, the aircraft was deemed totaled and injuries to crew and pax, but aircraft diverted and landed in Muscat: https://ops.group/blog/airbus-380-flips-cl604-full-report-is-now-published/

Air France 447 crashed in the Atlantic on June 9, 2009 after not recovering from a stall that lasted 3 minutes 30 seconds: https://en.wikipedia.org/wiki/Air_France_Flight_447

Swept-wing aircraft want to be on their back, you must first unload to gain control, you must address the stall first by pushing nose and unloading the wings before any other steps or recovery is possible. At altitudes above 40,000', you are thrust limited. You cannot power out of a stall. The old recommendation from the FAA to minimize pitch change and trying to power out of a stall is dangerous, it does nothing to unload the wings and stop the stall. John Cox's career has included high-performance actual stalls in transport category aircraft. Useful to stall a real jet in a closed-training environment at high altitude to understand the G break and the instability, can do this with APS in a Marchetti S211: https://apstraining.com/

LITHIUM-ION BATTERY FIRES INFLIGHT, JOHN M. COX

Captain John M. Cox, FRAeS, MBA, CEO of Safety Operating Systems

Watch a similar presentation by John Cox: https://www.youtube.com/watch?v=dgplvdBrVvc

There are 45 billion passengers flying every year. 2 places where there's an increase in risk: 1) drones, and 2) lithium battery fires. There's no way to predict these fires. As professionals, it's our job to answer these questions: 1) what will we do as an industry to fix this, and 2) how will we get this information and these tools out to everyone in order to mitigate to an acceptable risk?

Watch this video of an e-scooter in a Singapore apartment catch fire: https://www.youtube.com/watch?v=7u_6jCVK6Us

Royal Aeronautical Society SAFITA 2018 report: https://www.aerosociety.com/media/9215/safita-part-1_reference_fourth-edition.pdf

Between 1991 and 2018, there were 191 inflight fires from lithium batteries. It is estimated that only a third of the fires are reported, so the real numbers are much higher. There were 32 reported inflight battery fires in 2016. There were 46 reported in 2017, which is a 44% increase from the year before. In 2018 it is estimated to be a battery fire onboard an aircraft once a week. Most are crushed in movable seats in business class. The average single-aisle aircraft has 140 passengers, each passenger has an average of 4 lithium-ion batteries with them (think iphone, ipad, laptop, other devices). The math means there are 560 L.I. batteries onboard. In other words, the crew has 560 dangerous unknowns to deal with. The battery industry admits that 1 out of every 10 million batteries produced will catch fire. Air travel carries 4.3 billion passengers with 4 devices each, there should be 1290 batteries failing catastrophically each year on aircraft. There was a battery thermal runaway in the London Tube, a secondary risk is that people assumed it was a terrorist attack which caused ensuing panic. In 2012, the FAA finally started testing battery fires inflight. They concluded there would be 50% obscuration of visibility within 5 minutes. From watching videos of many different actual and tested fires, the obscuration is much more extreme and happens much more quickly. We watched a video of a customs office in Bogota searching luggage when a small lithium-powered flashlight shorted out then had thermal runaway. The smoke and fumes created 100% obscuration within 15 seconds. To make matter worse, the fumes from the fire (hydrogen and ether) are also extremely flammable too. The arcs emitting from the fire are from molten copper wire, also extremely dangerous.

FAA list of lithium battery events: https://www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat/aircarrier_info/media/battery_incident_chart.pdf

3/19/2016 Alaska Airlines has iphone fire: https://abc7chicago.com/technology/washington-teens-iphone-bursts-into-flames-on-flight-to-hawaii/1253824/

RyanAir flight August 2018 had an emergency evacuation in Barcelona: https://www.nbcnews.com/nightly-news/video/portable-battery-explodes-on-ryanair-flight-latest-in-incidents-involving-lithium-ion-batteries-1291216451995

UPS 1307 DC8 in 2007 took 3 hours to put out the fire after landing at PHL, burning at 1500+ degrees F:
https://aviation-safety.net/database/record.php?id=20060208-0
http://www.flightsafety.org/asw/apr08/asw_apr08_p28-33.pdf

UPS 006 crashed in Dubai on 3 Sep 2010 due to autoignition of more than 81,000 lithium-ion batteries:
https://www.usatoday.com/story/news/nation/2013/07/24/ups-crash-dubai-lithium/2582213/

Asiana Airlines Flight 991 on 28 July 2011 crashed into Korean Straight after uncontrolled cargo fired likely caused by the 880 lbs of lithium-ion batteries on board:
https://en.wikipedia.org/wiki/Asiana_Airlines_Flight_991

Atlantic City FAA tests fires of 5000 batteries in 727 cargo compartments in June 2016. Depending on the aircraft and location of outflow valves, airflow may move aft with positive pressure in flight deck, but in this test it wasn't enough to prevent significant smoke in flight deck :
https://www.fire.tc.faa.gov/pdf/TC-16-37.pdf

Atlantic City FAA test of lithium-ion laptop fire in flight deck of 727, when you use halon to extinguish the open flame, the device keeps exploding and puts out immense smoke, halon cannot control thermal runaway or spewing of flammable electrolytes. Within 55 seconds of initial flame, there is 100% obscuration. If this happens in your flight deck with your smart phone, tablet, or laptop, how will you fly the plane?: https://www.youtube.com/watch?v=JgFFVu7edXU

FAA AC 120-80A Dec. 22, 2014:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_120-80A.pdf

SAFO 09013 Safety Alert to Operators, guidance not to pick up or move a burning device, moving it can trigger more explosions, and do not transfer to a "burn bag;" the only thing containment bags are good for is pizza:
https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/safo/all_safos/media/2009/SAFO09013SUP.pdf

FAA AC 20-42D says water eventually provides sufficient cooling, but since most batteries are waterproof, access is unlikely and fire will keep burning. Takes up to 2 gallons of water to start to control fire, so if fire is in cockpit, you will have ruined your avionics with water:
https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_20-42D.pdf

Airbus A350 has an actual checklist entry for pilots to address lithium-ion battery fire

Info 17021 FAA doc says look out for "FAA tested" fake certification on products:
https://www.faa.gov/other_visit/aviation_industry/airline_operators/airline_safety/info/all_infos/media/2017/InFO17021.pdf

If an electronic product has at least 1 unit failure per 200,000 products produced, that will cause a recall. If it's any amount less than that, the product will not be recalled. That means many high-risk batteries can legally stay on the market and fly on your plane.

SAFITA Royal Aeronautics Society says the largest cause of in-flight fires is lithium-ion batteries.

Gray market chargers ($10 Brand X chargers) are far more dangerous.

We need to consider all L.I. batteries as hazmat, and we need to carry them in hazmat containers.

L.I. battery fires are the perfect fire triangle: creates its own ignition, its own fuel, and its own oxygen.

Takeaways:

1) Current FAA guidance is inadequate
2) Need more training for L.I. battery fires and need to follow it
3) Pilots need to be trained to deal with smoke-filled flight deck
4) Need system that captures, extinguishes, and contains the device/fire/smoke/fumes

Many companies are at the forefront of compliance: SkyRegional, a Canadian commuter, all their Embraer fleet have Cellblock. All Embraer demo planes have Cellblock, all Airbus Belugas carry Cellblock, all NASA aircraft have Cellblock

CELLBLOCK PRESENTATION, DYLAN VANDEMARK

CellBlockEX is an innovative dry granulate that is able to quickly extinguish a thermal runwaway event and uptake vapors without the use of halon or liquids. CellBlockEX is made of glass beads which are 80% air, contain no silica, and made from post-consumer materials. The contents cause no hazard to health or environment. Capable of extinguishing class A, B, C, D & K fires. When in contact with fire, beads form an impervious shell that suffocates the fire and displaces the oxygen. FAA says you need to battle a L.I. fire by pouring small water bottles on the fire for 15 minutes, but water only accelerates the hydrofluoric gas, and creates toxic steam and fumes. With the CellBlock LIBIK Kit (LIBIK: Lithium Ion Battery Incident Kit), if a device is overheating, use LIBIK blanket and LIBIK gloves to transfer it to the LIBIK bag before the fire starts. If the battery is already on fire, throw LIBIK pillow pad on device first then throw LIBIK blanket over it; after it has cooled, with LIBIK gloves on and using LIBIK blanket, you can then transfer it to the LIBIK bag. The fabric in LIBIK blanket was tested in an extreme-heat fire and after 30 minutes still hadn't failed; most fabrics fail within 12 seconds. Miami Air was an early adopter of CellBlock. LIBIK X is a bag that can contain and handle explosion with filtered exhaust:

https://cellblockfcs.com/wp-content/uploads/2018/12/libik-ede-4-page-web.pdf

https://cellblockfcs.com/wp-content/uploads/2018/11/libik-x-insert-web.pdf

This brochure focuses on our PED-Pad Pillows and Fire Shield Blanket:

https://cellblockfcs.com/wp-content/uploads/2018/12/tech-ped-pad-blanket-web.pdf

Videos: https://cellblockfcs.com/video-library-2/

Test results and certificates: https://cellblockfcs.com/documents/

CELLBLOCK DEMONSTRATION, MATTHEW VANDEMARK

TUG group went outside where CellBlock presenters, Matt and Dylan Vandemark, had set up a comprehensive testing tent. They proceeded to reproduce several battery fires in a controlled manner, then extinguished and contained each fire using various versions of their CellBlock LIBIK products. It was impressive to see the real sequence and symptoms of a lithium-ion battery fire, and then to see how quickly and easily you can extinguish the fire and subsequent fires and contain the toxic fumes using their PED pad, blanket, and containment bag.