

# IATA Lithium Battery Workshop

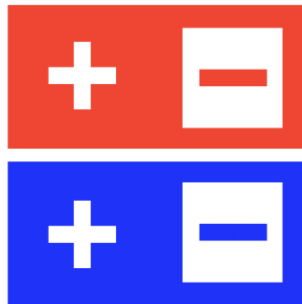
29 – 30 October 2019, Amsterdam, Netherlands





# IATA Lithium Battery Workshop

29 – 30 October, Amsterdam, Netherlands





#IATA\_Cargo



*coffee break*



# IATA Competition Law Compliance

Do not discuss:

- Pricing, including fares, service charges, commissions, etc.
- Bids on contracts or allocation of customers
- Geographic/Product market allocations and marketing plans, including
  - Expanding or withdrawing from markets
  - Group boycotts
  - Your commercial relations with agents, airlines or other third parties

Any discussion aimed at influencing the independent business decisions of your competitors

You will be asked to leave the meeting, and the meeting may be terminated, if the above-mentioned discussions occur.

Remember: All discussions count, even informal ones outside the meeting room!

# Thank you to all our sponsors!



Shaping Europe's smartest cargo hub at Amsterdam Airport



# Chairman Opening Remarks

Geoff Leach  
Director  
DG Office UK



# Keynote Speech

Teun Muller

Policy Specialist

Netherlands Ministry of Infrastructure and the Environment

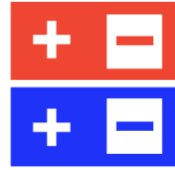
**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



Amsterdam, Netherlands  
29-30 October 2019



**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



**Amsterdam, Netherlands**  
29-30 October 2019

# Regulatory Update

David Brennan

Asst. Director Cargo Safety &  
Standards





# Summary

- Changes to the content of the DGR based on decisions by the IATA Dangerous Goods Board.
- Addition to DGR of Appendix I – Impending Changes, including changes agreed by ICAO DGP at DGP/27.
- Update to Annex 6 – Operation of Aircraft, Part I – International Commercial Air Transport - Aeroplanes

# Section 3 - Classification

## 3.9.2.6.1(g)

- The requirement for the UN 38.3 test summary to be made available by manufacturers and subsequent distributors of lithium cells and batteries becomes effective as of 1 January 2020.
- The UN Subcommittee reinforced at the 55<sup>th</sup> session in July 2019 that:
  - the test summary must be publicly available but it is not required to accompany the consignment; and
  - the test summary is intended for standalone cells and batteries as well as cells and batteries installed in equipment.

**Lithium cell or battery test summary in accordance with sub-section 38.3 of Manual of Tests and Criteria**

The following information shall be provided in this test summary:

- (a)** Name of cell, battery, or product manufacturer, as applicable;
- (b)** Cell, battery, or product manufacturer's contact information to include address, phone number, email address and website for more information;
- (c)** Name of the test laboratory to include address, phone number, email address and website for more information;
- (d)** A unique test report identification number;
- (e)** Date of test report;
- (f)** Description of cell or battery to include at a minimum:
  - (i)** Lithium ion or lithium metal cell or battery;
  - (ii)** Mass;
  - (iii)** Watt-hour rating, or lithium content;
  - (iv)** Physical description of the cell/battery; and
  - (v)** Model numbers.
- (g)** List of tests conducted and results (i.e., pass/fail);
- (h)** Reference to assembled battery testing requirements, if applicable (i.e. 38.3.3 (f) and 38.3.3 (g));
- (i)** Reference to the revised edition of the Manual of Tests and Criteria used and to amendments thereto, if any; and
- (j)** Signature with name and title of signatory as an indication of the validity of information provided.

# Section 4 – Identification

## Table 4.2 – List of Dangerous Goods

- UN 3536, **Lithium batteries contained in cargo transport unit** – added “†” symbol to identify that there is additional information in Appendix A.

# Section 4 – Identification (cont.)

## Subsection 4.4 – Special Provisions

- A802 – Added reference to exclusion for lithium batteries prepared in accordance with Section IB.

**A802** Notwithstanding the absence of a packing group in column E, substances and articles assigned to these entries must be packed in UN Specification packagings that meet packing group II performance standards. This does not apply when aerosols are prepared for transport in accordance with the limited quantity provisions or for lithium batteries prepared in accordance with Section IB of Packing Instructions [965](#) or [968](#).

# Section 5 – Packing

## Packing Instructions

- PI 968 – PI 970 – “aggregate lithium content” has been applied to batteries, consistent with UN terminology.

The general requirements apply to all lithium metal batteries prepared for transport according to this packing instruction:

- Section IA applies to lithium metal cells with a lithium metal content in excess of 1 g and lithium metal batteries with an [aggregate lithium content](#) in excess of 2 g, or to quantities of lithium metal cells or batteries in excess of those permitted in Section IB of this packing instruction which must be assigned to Class 9 and are subject to all of the applicable requirements of these Regulations;
- Section IB applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with an [aggregate lithium content](#) not exceeding 2 g packed in quantities that exceed the allowance permitted in Section II, Table [968-II](#); and
- Section II applies to lithium metal cells with a lithium metal content not exceeding 1 g and lithium metal batteries with an [aggregate lithium content](#) not exceeding 2 g packed in quantities not exceeding the allowance permitted in Section II, Table [968-II](#).

# Section 7 – Marking & Labelling

- 7.1.3.1 – revised to clearly state that all marks, i.e. limited quantity, environmentally hazardous substance, **lithium battery mark**, must be applied on one side of the package.

## 7.1.3.1 General

All marks must be so placed on the packages or overpacks that they are not covered or obscured by any part of or attachment to the packaging or any other label or mark. Marks required by [7.1.4.2](#) (Figure [7.1.A](#)), [7.1.5.3](#) (Figure [7.1.B](#)) and [7.1.5.5](#) (Figure [7.1.C](#)) must be applied on one face of the package. Where marks are applied by means of a label, the label must not be folded or affixed in such a manner that parts of the same mark appear on different faces of the package. The required marks must not be located with other package marks that could substantially reduce their effectiveness.

# Appendix A - Glossary

- New definition of “Aggregate lithium content” – the sum of the grams of lithium content contained by the cells comprising the battery;
- New definition of “Lithium batteries contained in cargo transport unit” – Typically this applies to lithium batteries installed in multi-modal shipping containers (cargo transport unit) where the completed unit acts as a large storage battery. The completed unit will contain lithium ion batteries plus battery management systems and may contain air conditioning and fire suppression systems



# Appendix I – Impending Changes

Provides advance information on changes arising from:

- the revisions in the 21<sup>st</sup> edition of the UN Model Regulations; and
- decisions agreed by the ICAO Dangerous Goods Panel to revise the Technical Instructions.

Not shown are further changes as agreed by the ICAO DGP at the 27<sup>th</sup> meeting of the DGP (DGP/27) and any changes agreed by the IATA DGB at DGB/116 in March 2020.

# Appendix I – Impending Changes (cont.)

## Section 1 – Applicability

- New exception added to 1.2.7.1 will except data loggers and cargo tracking devices from the Regulations when in use.
  - text shown in Appendix I was modified at DGP/27 by the DGP to address concerns that UN text was too broad.

## 1.2.7 Exceptions ¶

1.2.7.1 Except for information provided to operator employees, as shown in 1.4.2, the provisions of these Regulations do not apply to dangerous goods carried by an aircraft where the dangerous goods are: ¶

...¶

(i) → data loggers and cargo tracking devices with installed lithium batteries, attached to or placed in packages, overpacks or unit load devices are not subject to any provisions of these Regulations provided the following conditions are met: ¶

1. → the data loggers and cargo tracking devices must be in use or intended for use during transport: ¶

2. → each cell or battery must meet the provisions of 3.9.2.6.1(a), (e), (f) if applicable and (g): ¶

3. → for a lithium ion cell, the Watt-hour rating must not exceed 20 Wh: ¶

4. → for a lithium ion battery, the Watt-hour rating must not exceed 100 Wh: ¶

5. → for a lithium metal cell, the lithium metal content must not exceed 1 g: ¶

6. → for a lithium metal battery, the aggregate lithium content must not exceed 2 g: ¶

7. → the number of data loggers / cargo tracking devices in or on any package or overpack must be no more than the number required to track or to collect data for the specific consignment: ¶

8. → the data loggers and cargo tracking devices must be capable of withstanding the shocks and loadings normally encountered during transport: ¶

9) the devices must not be capable of generating a dangerous evolution of heat: ¶

10) the devices must meet defined standards for electromagnetic radiation to ensure that the operation of the device does not interfere with aircraft systems. ¶

### Note: ¶

This exception does not apply where the data loggers or cargo tracking devices are offered for transport as a consignment in accordance with Packing Instruction 967 or 970. ¶

# Appendix I – Impending Changes (cont.)

## Section 1 – Applicability (cont.)

- 1.5 – changes agreed to implement competency-based training. Tables 1.5.A and 1.5.B will be deleted.

# Appendix I – Impending Changes (cont.)

## Section 4 – Identification

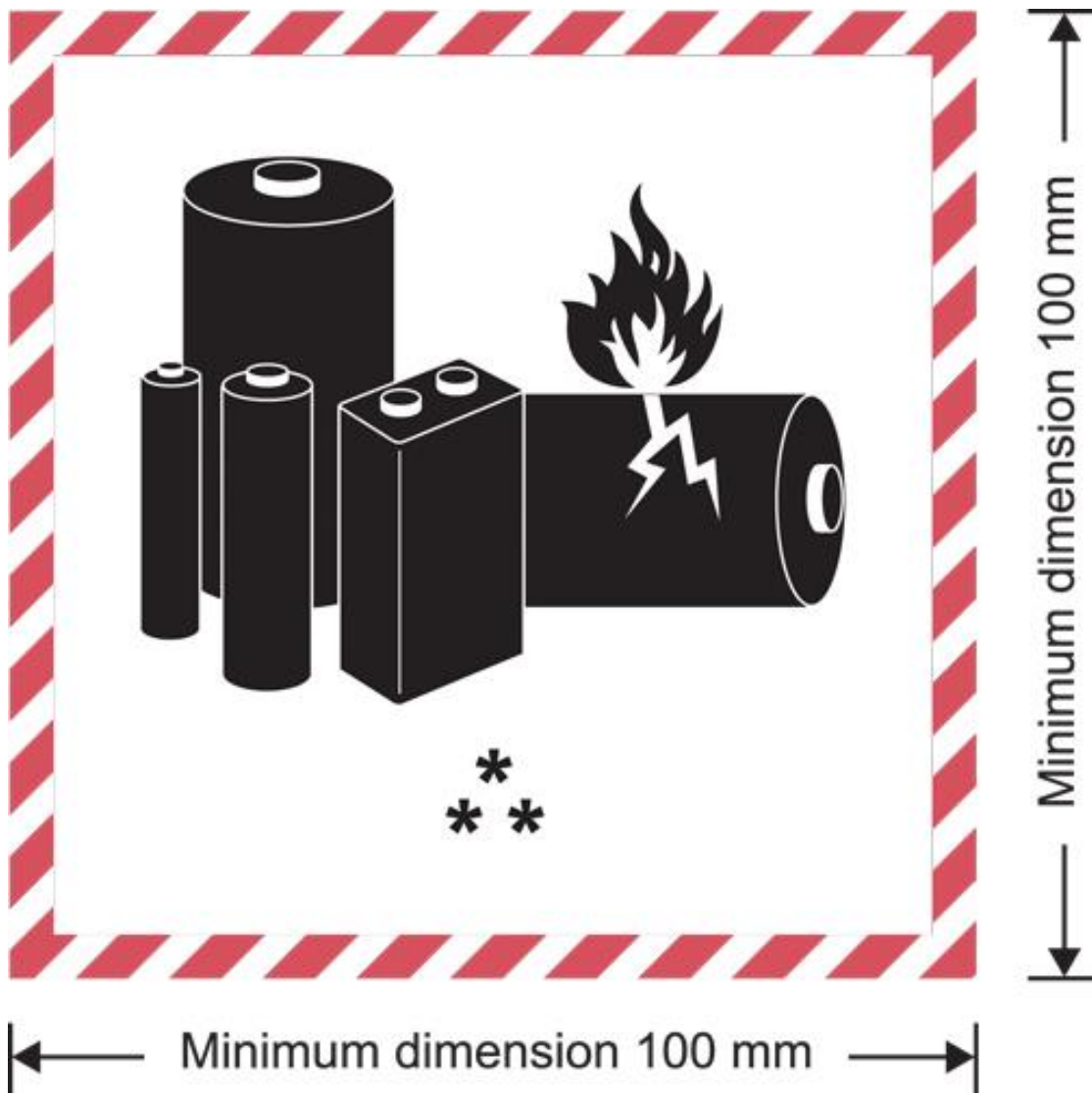
### ➤ Subsection 4.4 – Special Provisions:

- A154 – for damaged / defective lithium batteries revised at DGP/27;
- A201 – revised at DGP/27 to permit small quantity of lithium batteries for medical devices to be shipped on a passenger aircraft with approval of the State of origin and approval from the operator.

# Appendix I – Impending Changes (cont.)

## Section 7 – Marking & Labelling

- 7.1.5.5 – change to allow for the lithium battery mark to be a rectangle or a square with minimum dimensions of 100 mm x 100 mm. Reduced size to be 100 mm x 70 mm



**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



# Changes to Annex 6

Cargo  
Compartment  
Safety



ICAO

International Standards  
and Recommended Practices

Annex 6 to the Convention on International Civil Aviation

Operation of Aircraft

Part I — International Commercial Air Transport — Aeroplanes  
Eleventh Edition, July 2018



8 November 2018, all previous editions of Part I of Annex 6.

the applicability of the Standards and Recommended

INTERNATIONAL CIVIL AVIATION ORGANIZATION



# Background

- ICAO Air Navigation Commission raised concerns that the risks posed by the transport of cargo by air may not be sufficiently mitigated. In particular that lithium batteries may overwhelm aircraft systems in the event of a fire.
- Cargo Safety Sub-Group (CSSG) established in Feb 2017 under the ICAO Flight Operations Panel:
  - develop requirements in Annex 6 for operators to conduct safety risk assessments on the carriage of cargo;
  - develop associated guidance material on conduct of safety risk assessment and identifying appropriate mitigations.

# Objective

- Annex 6 – Requirements for operators to conduct safety risk assessments on carriage of cargo, including the carriage of dangerous goods;
- New ICAO Document – Guidance material on conducting safety risk assessment, including the carriage of dangerous goods.

# Considerations

- Cargo compartment fire suppression systems are certified to suppress fires that are likely to occur:
  - typically Class A fires – common combustible materials, e.g. paper, wood, clothing.
- Certification and limitations of aircraft cargo compartment fire suppression system:
  - what information do the aircraft manufacturers provide to the operators on the capabilities of the aircraft fire suppression system?

# Considerations (cont.)

- Expectation by Flight Operations Panel members that the operator understands what cargo (and baggage and mail) is being offered for transport and the associated risks that may be introduced.
  - this position was supported by aircraft manufacturers and IFALPA

# Outcome

- Chapter 15 – Cargo Compartment Safety
  - transport of “items” in the cargo compartment:
  - the State of the Operator shall ensure that the operator establishes policy and procedures for the transport of items in the cargo compartment, which includes the conduct of a specific safety risk assessment. The safety risk assessment shall include at least the:

# Outcome (cont.)

- hazards associated with the properties of items to be transported;
- capabilities of the operator;
- operational considerations (e.g. area of operations, diversion time);
- capabilities of the aeroplane and its systems (e.g. cargo compartment fire suppression system capabilities);
- containment characteristics of ULDs;
- packing and packaging;
- safety of the supply chain for items to be transported; and
- quantity and distribution of dangerous goods items to be transported.

# Outcome (cont.)

- Fire protection, elements of cargo compartment fire protection system and summary of demonstrated cargo compartment fire protection certification standards shall be provided in aircraft documentation.
  - this recognizes that the operators have not been provided with sufficient information on the fire suppression capabilities of the aircraft by the manufacturers.
- The operator shall establish policies and procedures that address items to be carried in the cargo compartment. Ensure to a reasonable certainty that a fire can be detected and suppressed, until the aircraft makes a safe landing.

# Where are we?

- Amendment to Annex 6 to include Chapter 15 agreed by Member States following State letter sent in August 2018.
- Chapter 15 becomes effective November 2020 following endorsement by ICAO Council scheduled for January 2020.
- Guidance on policy and procedures that address the items to be transported in the cargo compartment are provided in the *Guidance for Safe Operations Involving Aeroplane Cargo Compartments (Doc 10102)*. This document is still under internal review by the ICAO Secretariat.



# Thank you

David Brennan

[brennand@iata.org](mailto:brennand@iata.org)

[www.iata.org/dangerousgoods](http://www.iata.org/dangerousgoods)



Thank you to our sponsor!

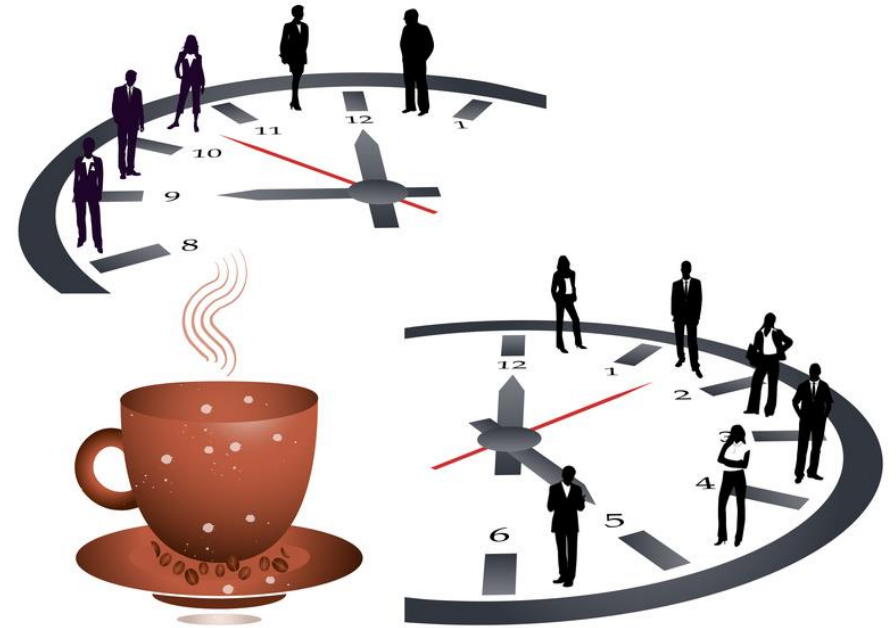


**NWCTECH**



# Networking break 10:30 – 11:00

Kindly sponsored by;



IATA  
LITHIUM  
BATTERY  
WORKSHOP



Amsterdam, Netherlands  
29-30 October 2019

# Update on the Development of a Hazard-Based Classification System for Lithium Batteries

Duane Pfund

Director, Office of International Standards,

Pipeline and Hazardous Materials Safety Administration &

Chairman of the UN Subcommittee of Experts on the Transport of Dangerous Goods

**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



Amsterdam, Netherlands  
29-30 October 2019



# IATA Lithium Battery Workshop



**Duane A. Pfund**

Pipeline and Hazardous Materials Safety Administration

U.S. Department of Transportation

October 29, 2019



# Overview

- UN Sub-Committee of Experts on the Transport of Dangerous Goods
- Lithium Battery Hazard Based Classification
- FAA Tech Center Testing
- FAA Reauthorization of 2018 Mandates
- Undeclared DG - Check the Box initiative



# Global Safety Framework

## United Nations Economic and Social Council (ECOSOC)

- United Nations Sub-Committee of Experts on the Transport of Dangerous Goods
  - Multi-Modal transport standards
  - Established in 1954
  - UN Recommendations published in 1956
  - US HazMat Regulations adopted in 1991
  - Reformatted as UN Model Regulations in 1996
  - TDG designated as physical hazard focal point
    - UN Manual of Tests and Criteria
  - PHMSA US Head of Delegation and TDG Chair



# Current “UN 38.3” Lithium Cell and Battery Tests: UN Manual of Tests and Criteria

- Test 1: Altitude Simulation
- Test 2: Thermal
- Test 3: Vibration
- Test 4: Shock
- Test 5: External Short Circuit
- Test 6: Impact
- Test 7: Overcharge
- Test 8: Forced Discharge





# Hazard Based Classification

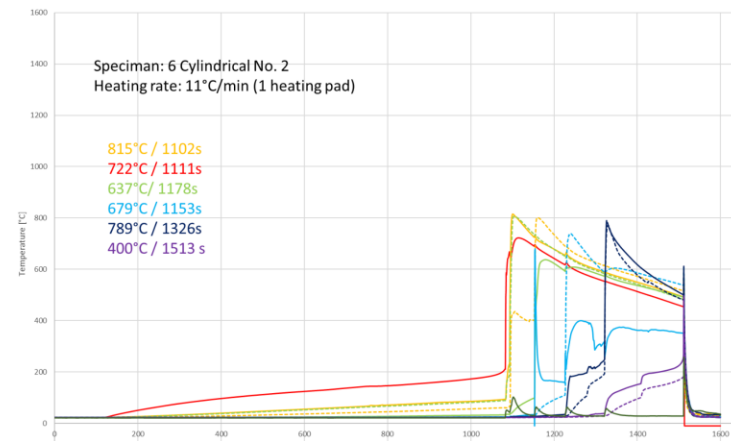
- Work began during the 2017-2018 biennium
- Purpose of UN classification project?
  - Address new lithium battery technologies entering market
  - Provide greater “granularity” to classify different lithium battery chemistries based on varying hazards



# Hazard Based Classification

Participants in working group include –

- Lithium cell, battery, equipment, and automobile manufacturers from Korea, China, Japan, U.S., and Europe
- Dangerous goods transport authorities
- Test labs
- Aircraft manufacturers
- Airlines
- Packaging manufacturers

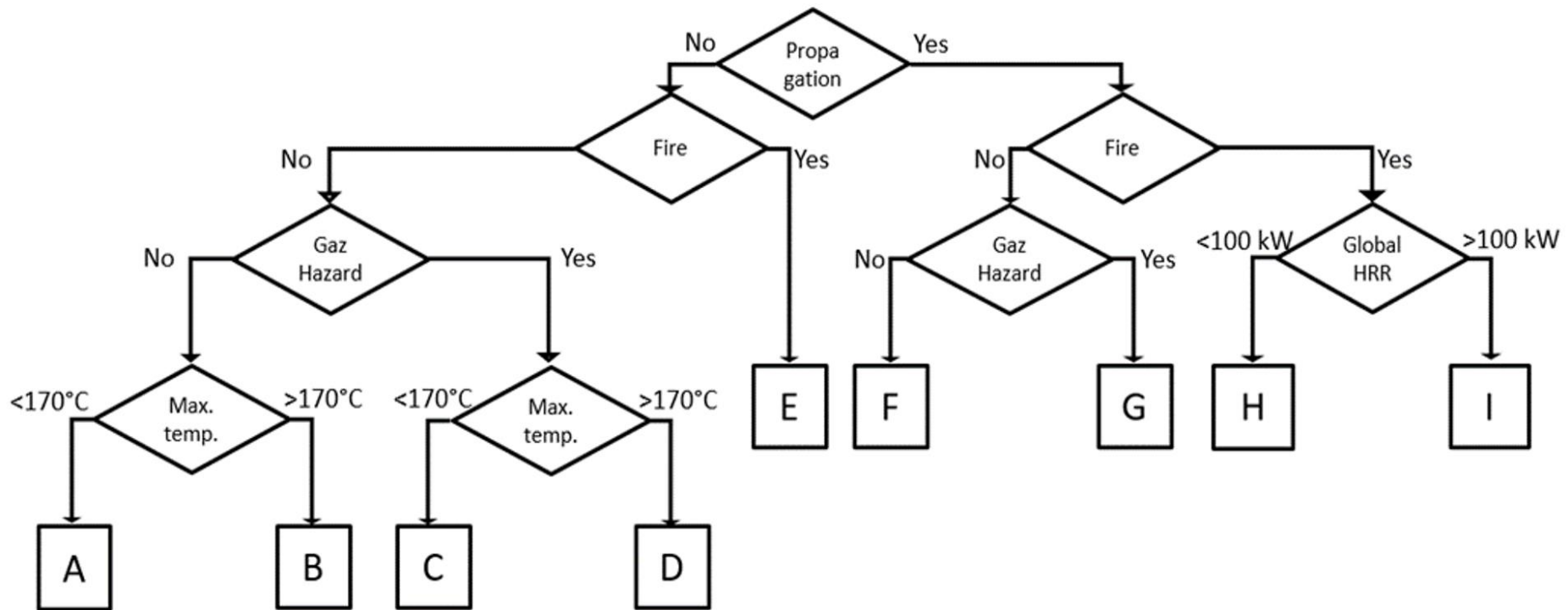


# Schedule of Meetings

- November 6 – 8, 2017 Paris, France
- December 6 – 8, 2017 Geneva, Switzerland
- December 5 – 6, 2018 Geneva, Switzerland
- October 7 – 9, 2019 Arlington, Texas
- May 2020 Europe (tentative)
- Fall 2020 China (tentative)



# Hypothetical Classification System for Lithium Batteries – Version 1



A: Benign hazard

D: High temp and gas

I: Propagation, violent reaction, high temp, gas hazard with flame



# Baseline Testing on Lithium ion Cells

- Baseline testing completed on lithium ion cells by seven labs located in U.S. (3), Poland (1), China (1), France (1), and Germany (1)
- Lithium ion cells tested at 100% SOC
  - 2.45 Ah – 18650
  - 4.80 Ah – Pouch
  - Cells from same manufacturers and same lots



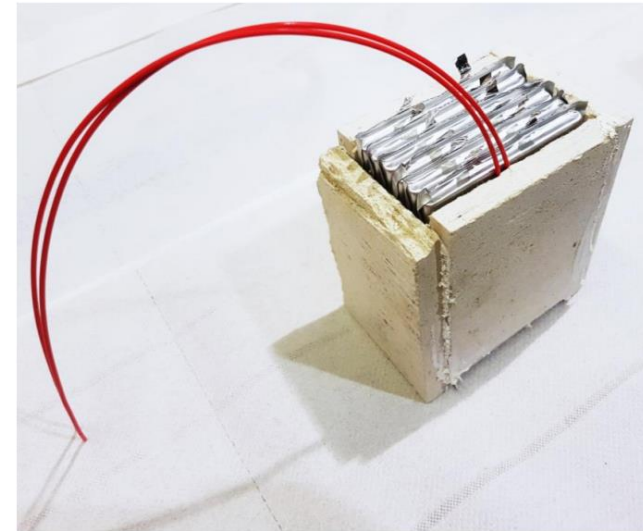
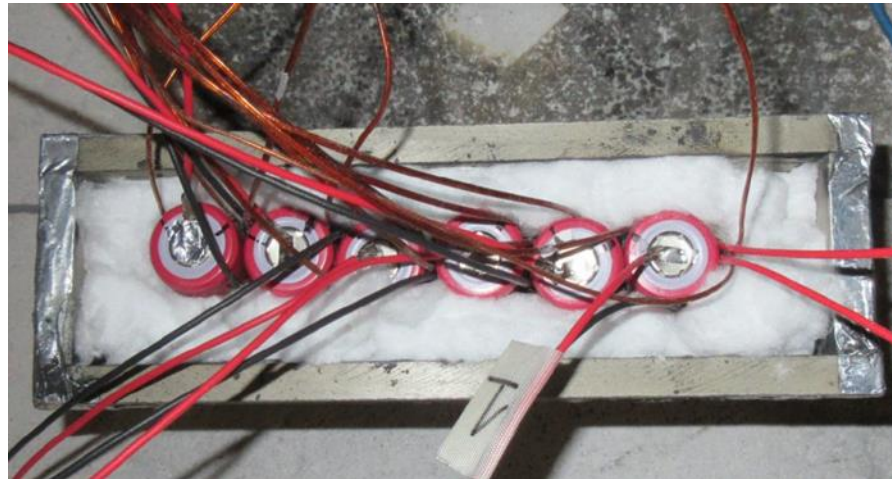
# Hazard Based Classification

- Baseline testing measuring:
  - Initiation temperature of trigger cell
  - Max temperature of each cell
  - Temperature of initiation of transfer cell
  - Max temperature of runaway
  - Time to propagate from the moment of cell reacting to an adjacent cell reaction
  - Voltage and weight of cell before and after test
  - Volume/identification of gas production
- Assessing reproducibility and consistency of results



# Hazard Based Classification

## Typical Test Setup for Cells



# Results of Baseline Tests on Lithium ion Cells

- 100% SOC resulted in significant propagation and energy release
- Test results between labs were relatively consistent
- Variability in test results indicates protocols (e.g., setup, procedures) will need to be refined
- Test data, meeting minutes available on RECHARGE website (<https://www.rechargebatteries.org/>)





# Next Steps, Timeline

- Labs reconvene to refine new test procedures
- Revise testing concept/flowchart
- Test same lithium ion cells at lower state of charge
- Likely four to six years to complete project
- Extensive consultation within UN Sub-Committee of Experts and ICAO Dangerous Goods Panel



# FAA Test Data



- **The Federal Aviation Administration William J. Hughes Technical Center**  
Various presentations and reports can be found at:

<https://www.fire.tc.faa.gov/systems/lithium-batteries>



# FAA Reauthorization Act of 2018

## Six lithium battery mandates

- Adopt ICAO Technical Instructions
- Establish a lithium battery safety working group (Gov't)
- Establish a Federal Advisory Committee (Industry)
- Perform cooperative compliance and outreach efforts
- Packaging efficacy and possible improvements
- Policy on international representation



# Lithium Battery Air Safety Advisory Committee

**20 members including battery and product manufacturers, vehicle producers, shippers, cargo and passenger service providers, pilots, and members representing emergency response providers and test labs.**

- The Committee will provide the Secretary with timely information about new lithium ion and lithium metal battery technology and transportation safety practices and methodologies.
- Will make recommendations with respect to lithium ion and lithium metal battery air transportation safety, including how best to implement activities to increase awareness of relevant requirements and their importance to travelers and shippers.
- First meeting scheduled for January 22-23<sup>rd</sup> in Washington D.C.



# Undeclared Dangerous Goods Check the Box Initiative

Is **Hazardous Matt**  
hiding in your  
package?



[checkthebox.dot.gov](https://checkthebox.dot.gov)



# Each year, approximately 1,500 transportation incidents occur when **undeclared hazardous materials** are shipped.

These incidents involve diverse types of hazardous materials and cause serious safety consequences for transportation workers, emergency responders, and the general public.

## Notable Incidents



HOUSTON, TX: 2017 - An undeclared intermodal container being transported by rail caught fire when 55 gallon drums of lithium batteries entered thermal runaway and exploded.



MIAMI, FL: 2013 - TSA screeners found an unknown spilled substance, later identified as the toxic pesticide Malathion. Six airline, TSA, and EMS personnel were injured during the response.



DALLAS, TX: 2014 - Unmarked boxes containing smaller inner packages of sulfuric acid leaked and injured four UPS employees.



LINWOOD, PA: 2012 - A package of unmarked formaldehyde was dropped and then leaked, injuring eight airline employees.



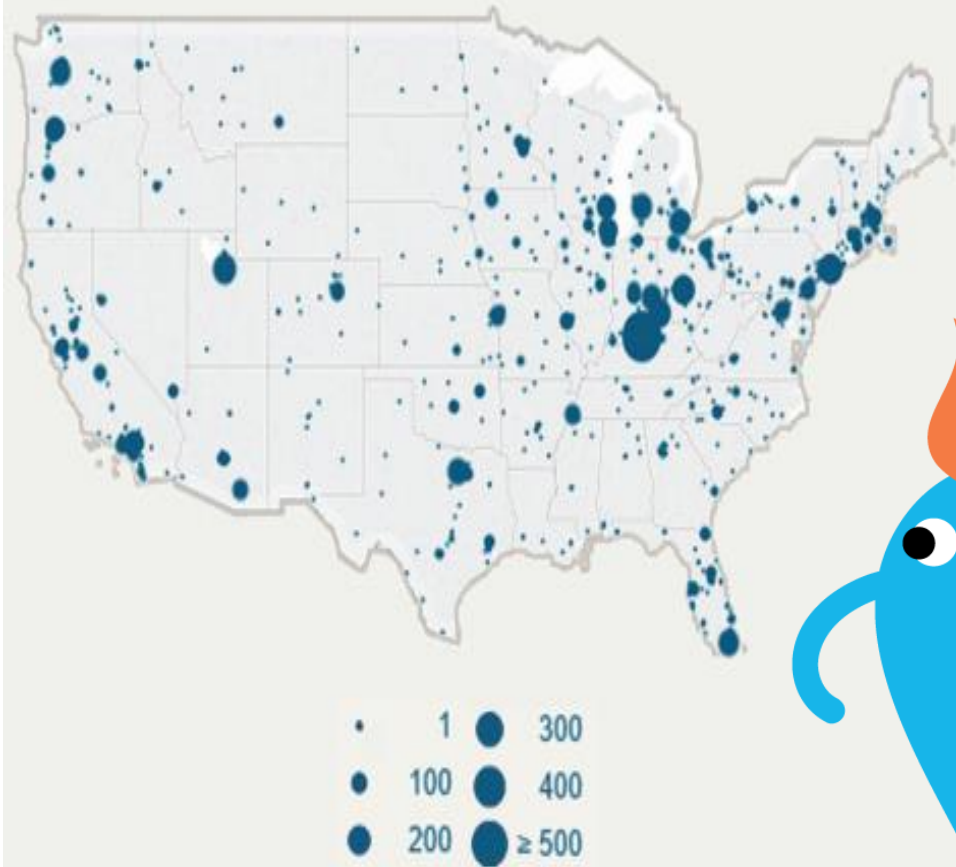
JACKSON, MS: 2013 - An unmarked package containing oxidizing liquids was punctured during handling. Three FedEx employees were injured while examining the inner container.



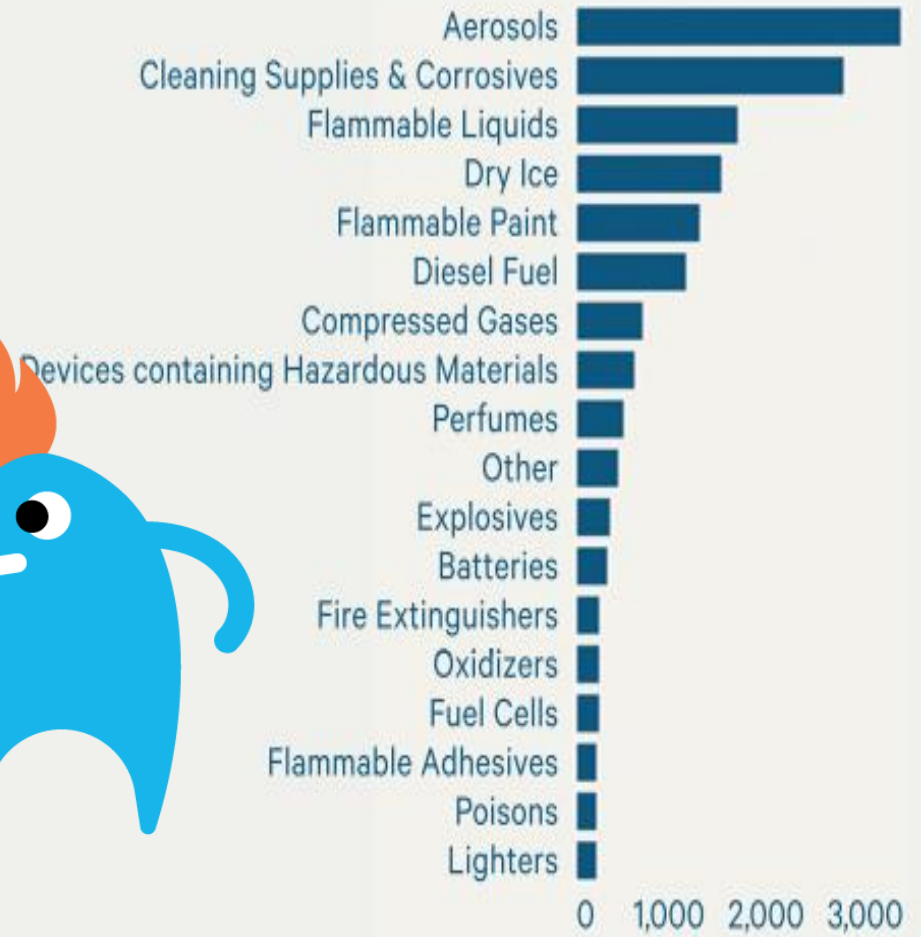
ANDERSON CA: 2008 - A box of undeclared fire extinguishers leaked at a UPS sorting facility, injuring three employees.



## Incidents with Undeclared Hazmat by Location



## Incidents with Undeclared Hazmat by Commodity



Source: <https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/Welcome.aspx>



# Problem

## Shippers & Freight Forwarders

1. Lack of knowledge
2. Economic benefit





# Goal

Reduce the risk of undeclared Hazardous Materials in transportation by developing a outreach program aimed at assisting shippers in:

1. Identifying what materials are considered hazardous materials when shipped
2. Providing access to guidance on how to safely ship hazardous materials





Is  
**Hazardous Matt**  
hiding in  
your package?

Because **Hazardous Matt**  
has friends you might  
not expect.

 **CHECK  
THE BOX**



# Any Questions?



# New and Developing Technologies for Lithium Batteries

Dr Aurélie Godon

Li-ion Technical Manager

SAFT



# Networking Lunch 12:30 – 14:00



Kindly sponsored by;



iSHARE

# Interactive Session – Supply Chain Scenario

Think in Their Shoes

**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



Amsterdam, Netherlands  
29-30 October 2019



# Scenario 1 – End-to-End Shipping Process

Refurbished laptops

Where did they come from?

Used laptops

The screenshot shows the Best Buy website interface. At the top, there's a navigation bar with the Best Buy logo, a search bar containing 'refurbished laptops', and various utility links like 'Bangor ME Open till 9 pm' and 'Cart'. Below the navigation bar, there are tabs for 'Products', 'Brands', 'Deals', and 'Services'. The main content area shows search results for 'refurbished laptops' in PC Laptops. It includes related searches, a 'Get it fast' section with 'Store Pickup at Bangor' and 'Pick up today' options, and a filter sidebar for 'Processor Model' and 'Brand'. Two laptop listings are visible:

- HP - EliteBook 14" Refurbished Laptop - Intel Core i5 - 8GB Memory - 500GB Hard Drive - Black**  
Price: **\$269.99** (Save \$30, Was \$299.99)  
FREE Shipping: Get it by Fri, Oct 18  
Want it faster? More shipping options are available in checkout to 04785.  
Store Pickup: Order now & Bangor will have it ready for pickup by Tue, Oct 22.
- Dell - Latitude 14" Refurbished Laptop - Intel Core i5 - 8GB Memory - 128GB Solid State Drive - Black**  
Price: **\$279.99** (Save \$20, Was \$299.99)  
FREE Shipping: Get it by Fri, Oct 18  
Want it faster? More shipping options are available in checkout to 04785.  
Store Pickup: Order now & Bangor will have it ready for pickup by Tue, Oct 22.

A large blue text overlay across the center of the page reads: "How are the used laptops shipped?"

IATA  
LITHIUM  
BATTERY  
WORKSHOP



# Instructions

Each table, determine who to be the shippers, freight forwarders, and operators (ground service providers)

SHIPPERS



What do you need to consider when preparing the shipment?

FREIGHT FORWARDERS



What actions do you need to take when accepting the shipment from the shippers?

OPERATORS / GSPs



What should you take into account when accepting and transporting this shipment from your freight forwarders?

Breakout: 15 minutes  
Present: 5 minutes



# Scenario 2 – Acceptance & SRA



What should I consider as part of my Safety Risk Assessment (SRA) when accepting this shipment?



**ELECTRONIC DEVICE, LITHIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI 967.**

**ELECTRONIC DEVICE, LITHIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI 967.**

Breakout: 15 minutes  
Present: 5 minutes

**IATA  
LITHIUM  
BATTERY  
WORKSHOP**



Shipper's Name and Address FRESH-EQUIP INC 10000 W. OHARE AVE. CHICAGO, IL 60666		Shipper's Account Number	<b>Not Negotiable</b> <b>Air Waybill</b> Issued By			
Consignee's Name and Address REFUR TRADING CO. LTD TRADE & IND. TOWER, SAN PO KONG, H.K.		Consignee's Account Number	Copies 1, 2 and 3 of this Air Waybill are originals and have the same validity.			
Issuing Carrier's Agent Name and City SPEED FREIGHT INC		It is agreed that the goods described herein are accepted in apparent good order and condition (except as noted for damage) SUBJECT TO THE CONDITIONS OF CONTRACT ON THE REVERSE HEREOF. ALL GOODS MAY BE CARRIED BY ANY OTHER MEANS INCLUDING ROAD OR ANY OTHER CARRIER UNLESS SPECIFIC CONTRARY INSTRUCTIONS ARE GIVEN HEREBY BY THE SHIPPER. AND SHIPPER AGREES THAT THE SHIPMENT MAY BE CARRIED VIA INTERMEDIATE STOPPING PLACES WHICH THE CARRIER DEEMS APPROPRIATE. THE SHIPPER'S ATTENTION IS DRAWN TO THE NOTICE CONCERNING CARRIER'S LIMITATION OF LIABILITY. Shipper may increase such limitation of liability by declaring a higher value for carriage and paying a supplemental charge if required.				
Agent's IATA Code		Accession Information				
Airport of Departure (Addr. of First) CHICAGO		To By First Carrier HKG				
Airport of Destination HONG KONG		Handling Information				
No. of Pieces (PCP)	Gross Weight	Rate Class Commodity Rate No.	Chargeable Weight	Rate Charge	Total	Nature and Quantity of Goods (incl. Description of Volume)
1	50.0		50.0	2.78	139.00	ELECTRONIC DEVICE, LITHIUM ION BATTERIES IN COMPLIANCE WITH SECTION II OF PI 967.
1	50.0				139.00	
Prepaid		Weight Charge		Collect		Other Charges
139.00				RAC 50.00		MYC 30.00
Total Other Charges, Due Shipper		Total Other Charges, Due Carrier		Total Prepaid		Total Collect
80.00		219.00				
Currency Conversion Rates		Charges in Dest. Currency		29 OCT 2019		CHICAGO
Per Carrier's Use Only at Destination		Charges at Destination		Total Collect Charges		0.00



# Scenario 3 – Classification & Packing



I WANT TO SHIP...

Breakout: 8 minutes  
Present: 2 minutes

A lithium ion battery (18 Wh) contained in a camera AND spare battery(ies) for the camera



- 1) What is the proper classification?
  - A. UN 3481, Lithium ion batteries packed with equipment?
  - B. UN 3481, Lithium ion batteries contained in equipment?

- 2) How many spare battery(ies) can I have?
  - A. None
  - B. 1
  - C. 2
  - D. 3



# Takeaway...

1. The push for the circular economy is growing and with it an increase in the movement of used consumer electronics to be refurbished and re-sold. What is the safety impact and what additional controls / regulatory requirements should be considered?

# Takeaway...

1. The push for the circular economy is growing and with it an increase in the movement of used consumer electronics to be refurbished and re-sold. What is the safety impact and what additional controls / regulatory requirements should be considered?
2. Safety risk assessments should be considered for adoption by all entities involved in the transport of cargo. Identifying potential risks and establishing safety mitigations is good business. As identified, the implementation of Chapter 15 – Cargo Compartment Safety to Annex 6 – Operation of Aircraft will require operators to consider the competence of other entities in the supply chain.

Thank you to our sponsor!

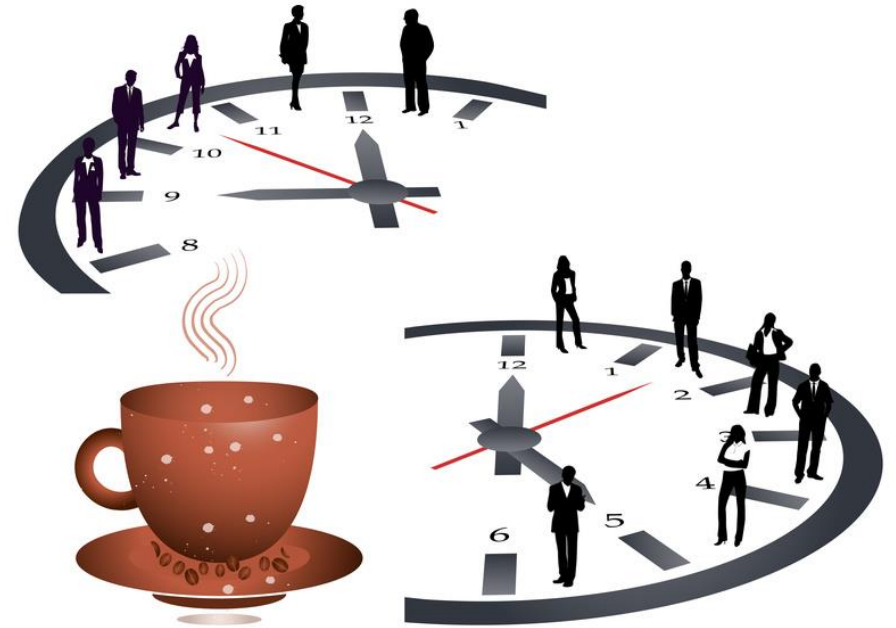
***Rapiscan***<sup>®</sup>  
***s y s t e m s***

An OSI Systems Company



# Networking break 15:30 – 16:00

Kindly sponsored by;



IATA  
LITHIUM  
BATTERY  
WORKSHOP



Amsterdam, Netherlands  
29-30 October 2019

# Joint Session

## Lithium Battery Workshop, Cargo Security & Facilitation Forum and Air Cargo Operations

### Moderator:

Dietmar Jost

Customs & Security Advisor

GEA

### Panelists:

Howard Stone, VP Aviation Security, UPS

Liz Merritt, Managing Director Cargo, A4A

Alex Rodriguez, Compliance Manager, MSA Security

Eric Gillett, Policy Specialist Dangerous Goods, UK CAA

Jimmy Pang, Managing Director, Alliance Knowledge Mngt Ltd

**IATA**  
**CARGO**  
**EVENTS**

Amsterdam, Netherlands  
29-31 October 2019



# IATA Lithium Battery Workshop: Safety Risk from Undeclared/Misdeclared Lithium Batteries



Eric Gillett, Policy Specialist Dangerous Goods

29<sup>th</sup> October 2019



# Undeclared/Misdeclared in Cargo



# CAA Workshop Recommendations

**How can product designers, manufacturers and distributors be made more aware of UN 38.3 test requirements and dangerous goods shipping requirements?**

- Establish national regulations requiring importer to obtain evidence of tests
- Reshaping consumer demand by focusing on verifiable test status during marketing
- Global access to test credible test reports via databases
- Measures to stop abuses of certification marks, e.g. UL
- States to promulgate IATA lithium battery guidance, e.g. via social media

# CAA Workshop Recommendations

**How can counterfeit, poorly manufactured or untested batteries be prevented from entering the supply chain, or be intercepted at the earliest opportunity?**

- Further scrutiny of the supply chain by air operators stemming from emerging ICAO Annex 6 requirements
- ICAO to resolve responsibilities of freight forwarders and explore opportunities for detection through screening (Flight Ops WG-Safe Carriage of Goods)
- IATA commitment to develop protocol for sharing non-compliance data between members without breaching anti-trust regulations
- Enhancement of IATA Air Cargo Agent accreditation process

# Detection through screening

- Lithium batteries within small parcels are identifiable through visual x-ray
- UK cargo sector is developing similar methodologies but recognising that cargo packages and consignments are often larger making visual screening more complex.

**Alkaline**



**Nickel Metal Hydride**

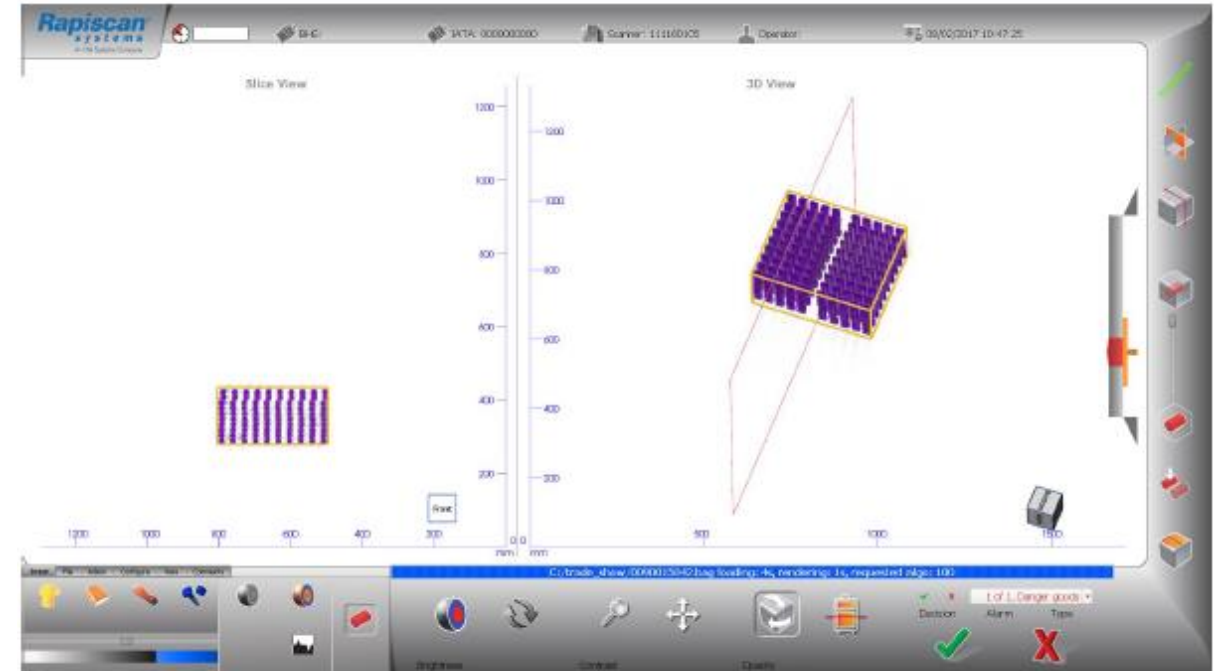


**Lithium**



# Automated Screening Solutions

- On advanced screening equipment, algorithms can be developed to detect particular dangerous goods
- Good potential for machine learning (AI) solutions
- Operational within one UK express courier sector site
- Low False Alarm Rate



# Workshop Questions

**How can freight forwarders, air operators and their agents leverage existing data to identify potential shipments of undeclared or misdeclared dangerous goods?**

- Potential electronic systems to analyse:
  - Air waybill and customs declaration data using natural language processing and fuzzy matching against list of dangerous goods from the ICAO Technical Instructions, synonyms, etc.
  - Package mass density
  - Shipper/forwarder compliance history data

# Workshop Questions

## **How can the various regulators and other agencies collaborate more effectively on investigation and enforcement?**

- CAA to establish working group with Customs, Office for Product Safety (trading standards), etc. to develop agency agreements for sharing intelligence and collaborative enforcement.
- Better coordination of related activities by ICAO, Universal Postal Union, IATA, World Customs Organisation, International Federation of Freight Forwarders Associations (FIATA) and The International Air Cargo Association (TIACA)



Thank You

Niá:wen (Mandarin)    Niá:wen (Mandarin)    masi chok (Cantonese)    唔該 (Cantonese)    T'ooyaksiy' nisim' (Tagalog)    Graciās (Spanish)    màhsì' You (Mandarin)    a.d.s.t. (Hindi)    Miigwech (Welsh)    ありがとうございました (Japanese)    Se:kenh: (Korean)

谢谢 (Chinese)    Thank (English)    masi chok (Cantonese)    唔該 (Cantonese)    T'ooyaksiy' nisim' (Tagalog)    Graciās (Spanish)    màhsì' You (Mandarin)    a.d.s.t. (Hindi)    Miigwech (Welsh)    ありがとうございました (Japanese)    Se:kenh: (Korean)

Merci (French)    Obrigado (Portuguese)    Miigwech (Welsh)    Se:kenh: (Korean)







**950+**

**Aviation Cargo  
Industry clients**

**Supply Chain  
Compliance  
consulting**



- Tokyo
- Narita
- Dalian
- Tianjin
- Beijing
- Shanghai
- Ningbo
- Xiamen
- Chongqing
- Chengdu
- Guangzhou
- Shenzhen
- Hong Kong
- Taipei
- Singapore





# Professional Training

# 2,000+

people annually

### Aviation Safety Courses

- Dangerous Goods courses
- Lithium Battery courses
- E-Commerce

### Aviation Security Courses

- Regulated agent courses
- RACSF – in-town screening courses
- ACC3 Security Awareness

### Supply Chain Courses

- TAPA FSR auditor course
- TAPA TSR auditor course



ALLIANCE KNOWLEDGE MANAGEMENT LIMITED  
SUPPLY CHAIN MANAGEMENT CONSULTANCY

### Awarded by



### Partner & Supported by





# Cross Border Re-export Aviation Screening 2020

## Solution Beyond Cargo Screening

(Beyond screening)

**Jimmy Pang**

Oct 2019 AMS

IATA Lithium Battery Workshop 2019

*Industry best-practice to make Hong Kong to be the best safe, secure and efficient air Hub*



**200,000 shippers**



**1,485 Regulated Agent**

# AIRLINES OPERATING AT HKIA AS AT MARCH 2019

Aeroflot Russian Airlines  
AeroLogic\*  
Air Astana  
Air Belgium  
Air Busan  
Air Canada  
Air Cargo Global\*  
Air China  
Air France  
Air Hongkong\*  
Air India  
Air Japan  
Air Mauritius  
Air New Zealand  
Air Niugini  
Air Seoul  
AirAsia  
AirBridgeCargo Airlines\*  
AirExplore  
All Nippon Airways  
American Airlines  
Asiana Airlines  
ASL Airlines Belgium\*  
Atlas Air\*  
Aurora Airlines  
Austrian Airlines  
Aviastar-TU\*  
Bangkok Airways  
Bismillah Airlines\*  
British Airways  
CargoLogicAir\*  
Cargolux Airlines\*

Cargolux Italia S.p.A.\*  
Cathay Dragon  
Cathay Pacific  
Cebu Pacific Air  
China Airlines  
China Cargo Airlines\*  
China Eastern Airlines  
China Southern Airlines  
Delta Air Lines  
Easter Jet  
EgyptAir  
EL AL Israel Airlines  
Emirates  
Ethiopia Airlines  
Fiji Airways  
Finnair  
Garuda Indonesia  
HK Express  
Hong Kong Air Cargo\*  
Hong Kong Airlines  
IndiGo  
Japan Airlines  
JC (Cambodia) International Airlines  
Jeju Air  
Jet Airways  
Jetstar Asia Airways  
Jetstar Japan  
Jetstar Pacific Airlines  
Jin Air

Juneyao Airlines  
Kalitta Air\*  
KLM Royal Dutch Airlines  
K-Mile Air\*  
Korean Air  
Lanmei Airlines (Cambodia)  
Lufthansa  
Lufthansa Cargo\*  
Malaysia Airlines  
Malindo Air  
Mandarin Airlines  
MIAT Mongolian Airlines  
Myanmar National Airlines  
National Air Cargo\*  
Philippine Airlines  
Philippines AirAsia  
Polar Air Cargo\*  
Qantas Airways  
Qatar Airways  
Raya Airways\*  
Royal Brunei Airlines  
Royal Jordanian  
S7 Airlines  
Saudi Arabian\*  
Scandinavian Airlines  
Scoot  
SF Airlines\*  
Shandong Airlines  
Shanghai Airlines

Shenzhen Airlines  
Sichuan Airlines  
Silk Way West Airlines\*  
Singapore Airlines  
Sky Angkor Airlines  
Sky Gates Cargo Airlines\*  
Sky Lease Cargo\*  
Small Planet Airlines  
South African Airways  
Southern Air Inc.\*  
SpiceJet  
Spring Airlines  
SriLankan Airlines  
Suparna Airlines\*  
Talia S.p.A.\*  
Swiss International Air Lines  
Thai AirAsia  
Thai Airways  
Thai Smile Airways  
Turkish Airlines  
T'way Air  
United Airlines  
United Parcel Service\*  
Vanilla Air  
Vietjet Air  
Vietnam Airlines  
Virgin Atlantic Airways  
Virgin Australia International Airlines  
Western Global Airlines\*  
Xiamen Airlines

\* Freighter services only

## 126 Airline Operators



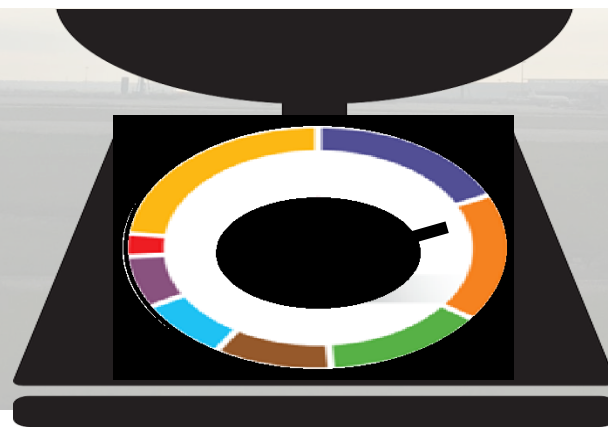
**429,000 Airline Movement**



**70% shipment  
(different Jurisdictions)**

**3,200,000 Tonnes**

**20%  
X-ray  
before  
on-board**



USA & CANADA 18%	TAIWAN 8%
SOUTH EAST ASIA 17%	JAPAN 7%
EUROPE 14%	AUSTRALASIA 3%
MAINLAND 10%	OTHERS 23%

\* Airmail is excluded.

# Solution Beyond Cargo Screening - What's work, and what doesn't

## *How to inspect ?*



Complete the shipment process...

- Within 12 hours
- may have more than 3 parties involve
- Warehouse consolidator is outsource

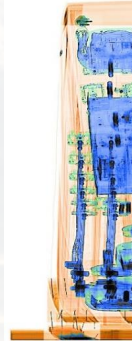
# Solution Beyond Cargo Screening - What's work, and what doesn't

*How to inspect ?*



# Solution Beyond Cargo Screening - What's work, and what doesn't

*How to inspect ?*



*How about this ?*

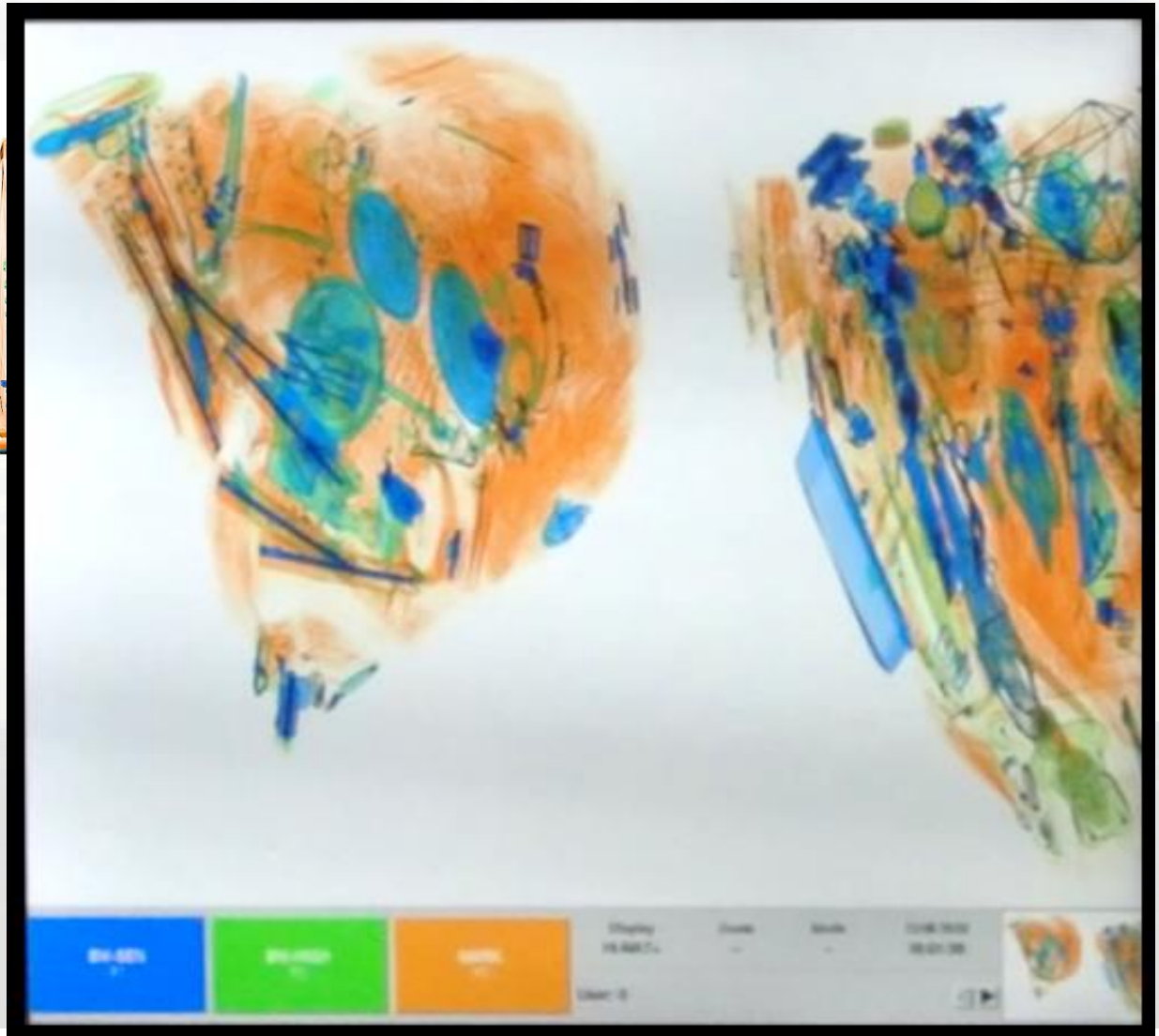


# Solution Beyond Cargo Screening - What's work, and what doesn't

*How to inspect ?*



*How about this ?*



# Solution Beyond Cargo Screening - What's work, and what doesn't

Tradition way may not be sufficient to prevent ...

- Detect problematic before receiving the shipment
- Smart-approach

Check

- Company profile (Who)
- Shipment info (What)

Ask

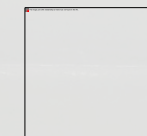
- Further info.
- Photo

Verify

- Physical
- Intelligence



***Able to detect counterfeit battery without open the box***

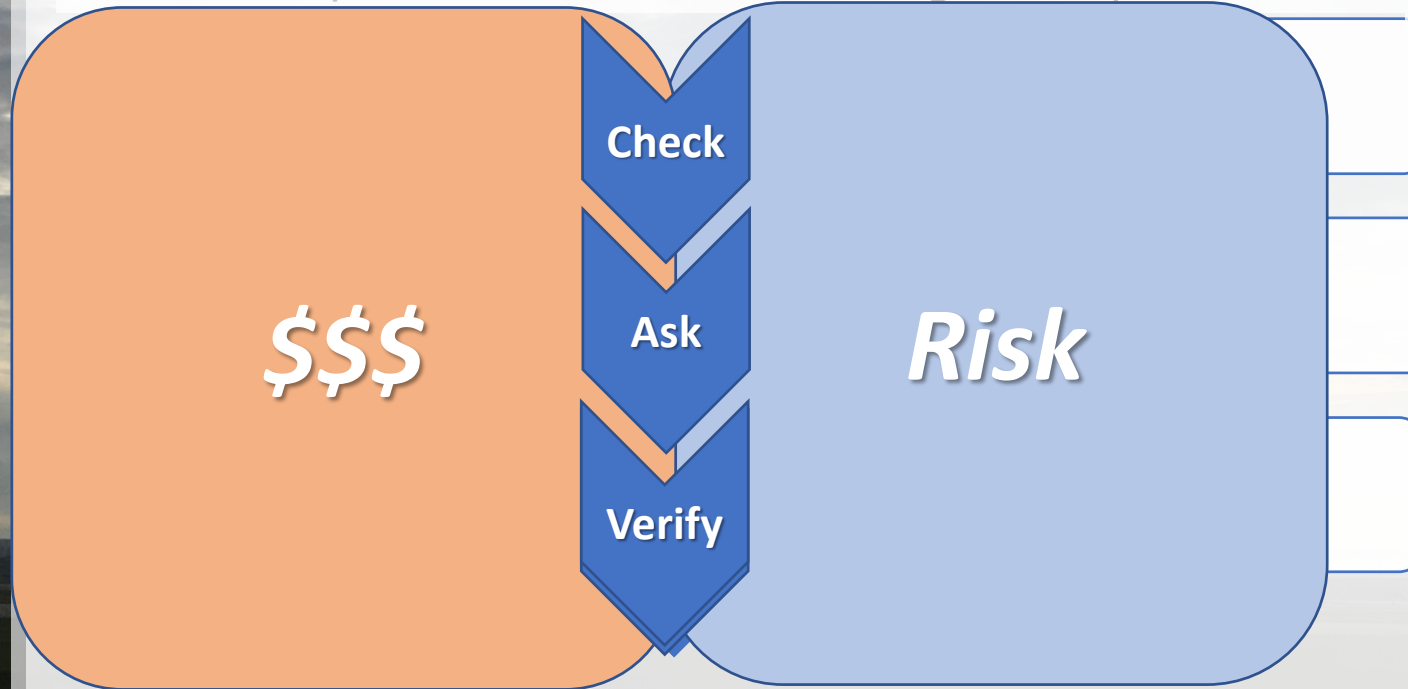


# Solution Beyond Cargo Screening - What's work, and what doesn't

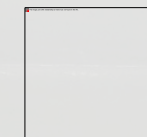
Tradition way may not be sufficient to prevent ...

**Continue up-to-date risk base profit model**

- Detect problematic before receiving the shipment

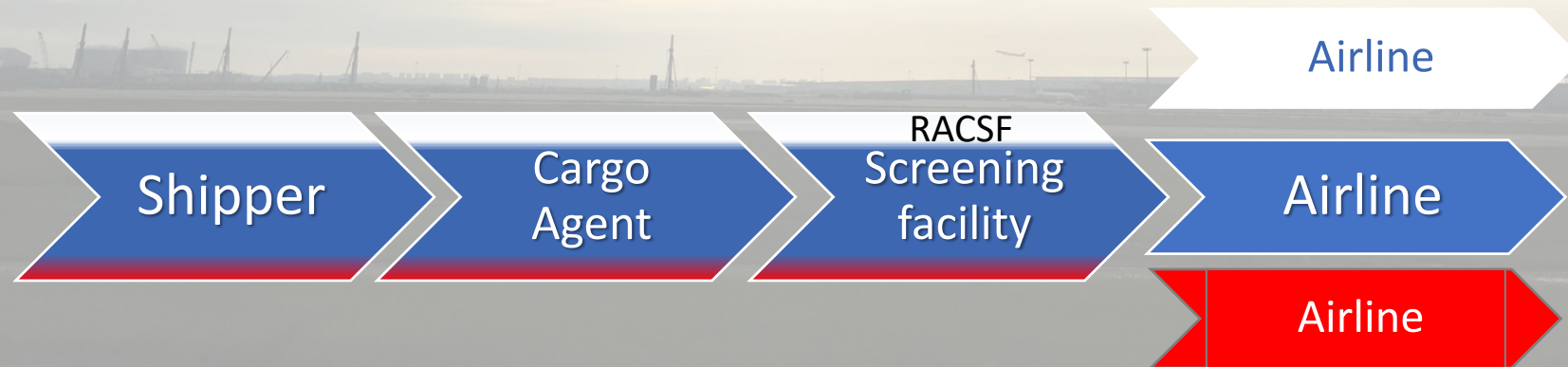


***Able to detect counterfeit battery without open the box***



# Solution Beyond Cargo Screening – Future Movement

1. 100% X-ray screening before Mid of 2021
2. New business infrastructure is coming
  - QC pre-screening at shipper facility process before it pack
  - Supply Link Strategic Partnership - Industry / routing specialised  
(Carrier's agent, booker and screening centre formulating supplier link)
  - Intelligent business solution + flight operations
3. Competency based training x Integrated knowledge





## Conclusion

The movement of supply chain is beyond our controls.

Challenge drive us for new opportunities and better solutions.

Everyone is unique, and I hope our Hong Kong experience can giving inspiration to the world.

Being part of supply chain, being part of the community.

***Let's do better, safe and secure trade together!***

# Joint Session

## Lithium Battery Workshop, Cargo Security & Facilitation Forum and Air Cargo Operations

### Moderator:

Dietmar Jost

Customs & Security Advisor

GEA

### Panelists:

Howard Stone, VP Aviation Security, UPS

Liz Merritt, Managing Director Cargo, A4A

Alex Rodriguez, Compliance Manager, MSA Security

Eric Gillett, Policy Specialist Dangerous Goods, UK CAA

Jimmy Pang, Managing Director, Alliance Knowledge Mngt Ltd

**IATA**  
**CARGO**  
**EVENTS**

Amsterdam, Netherlands  
29-31 October 2019



# Thank you to all our sponsors!



Shaping Europe's smartest cargo hub at Amsterdam Airport



# Welcome Reception 18:00 – 19:30

## Exhibition Hall area

Kindly sponsored by;



**IATA**  
**LITHIUM**  
**BATTERY**  
**WORKSHOP**



Amsterdam, Netherlands  
29-30 October 2019

