



NASA ASRS: Reports of HazMat Incidents

InfoShare – Ground Operations

Bellevue, WA

Becky Hooley, PhD

ASRS Program Director

NASA Ames Research Center

Becky.L.Hooley@nasa.gov

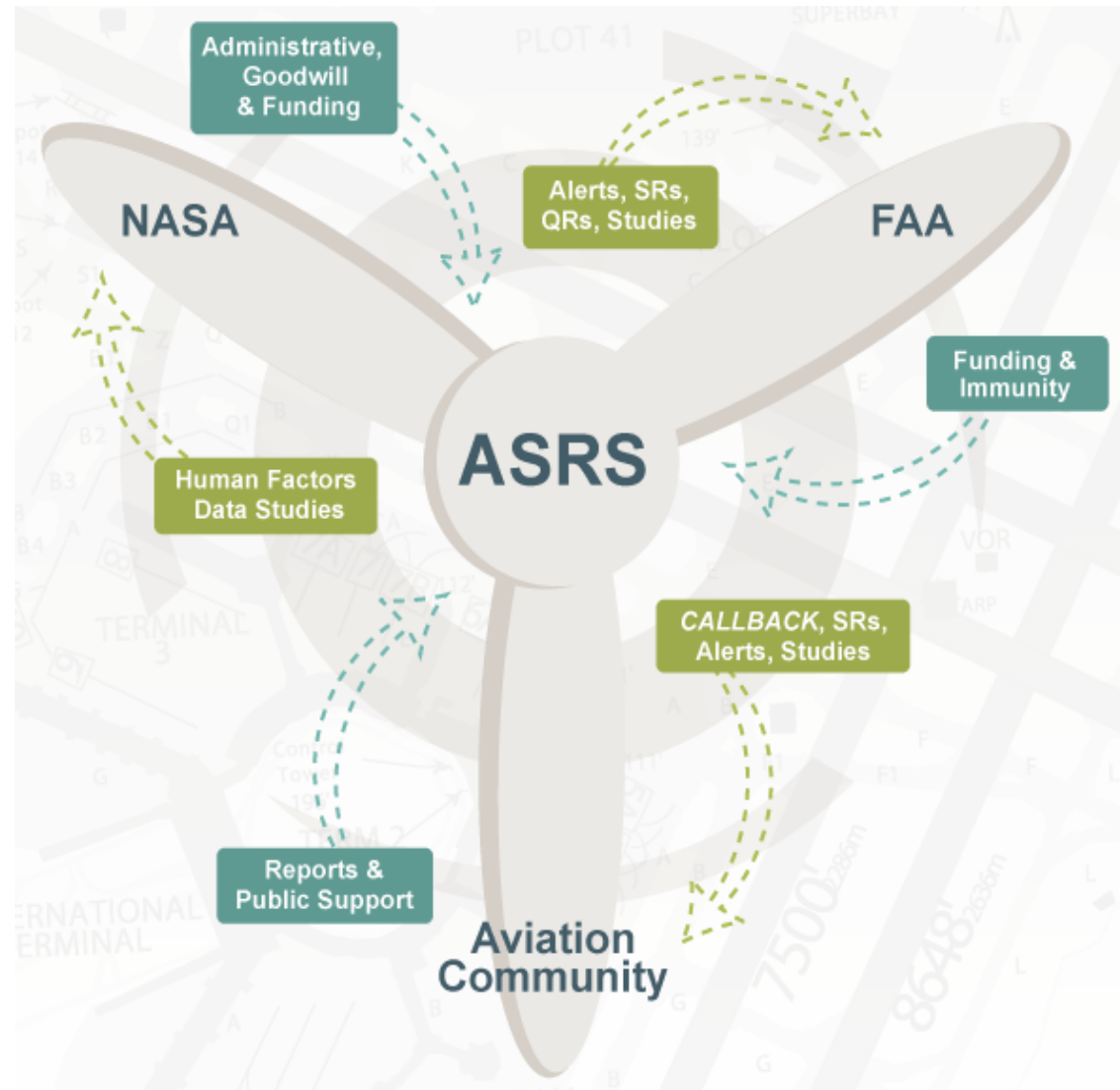
Fall 2019

**AVIATION SAFETY
REPORTING SYSTEM**



ASRS Government /Industry Partnership

- FAA provides funding to NASA for ASRS operations and report processing
 - **AVP**: ASRS operations
 - **ASH**: HazMat report processing
- NASA manages ASRS operations and provides research and analysis capabilities
- The Aviation Community provides support through advocacy for reporting, feedback, and communications



AVP = Accident Investigation and Prevention
ASH = Security and Hazardous Materials Safety



ASRS Principles

VOLUNTARY PARTICIPATION

Aviation personnel voluntarily submit reports concerning events related to safety for the purpose of system alerting, understanding and learning

CONFIDENTIALITY PROTECTION

Protection of identity is provided by NASA through de-identification of persons, companies, and any other identifying information

INDEPENDENT

Necessary for trust building and unbiased dissemination of safety information

NON-PUNITIVE

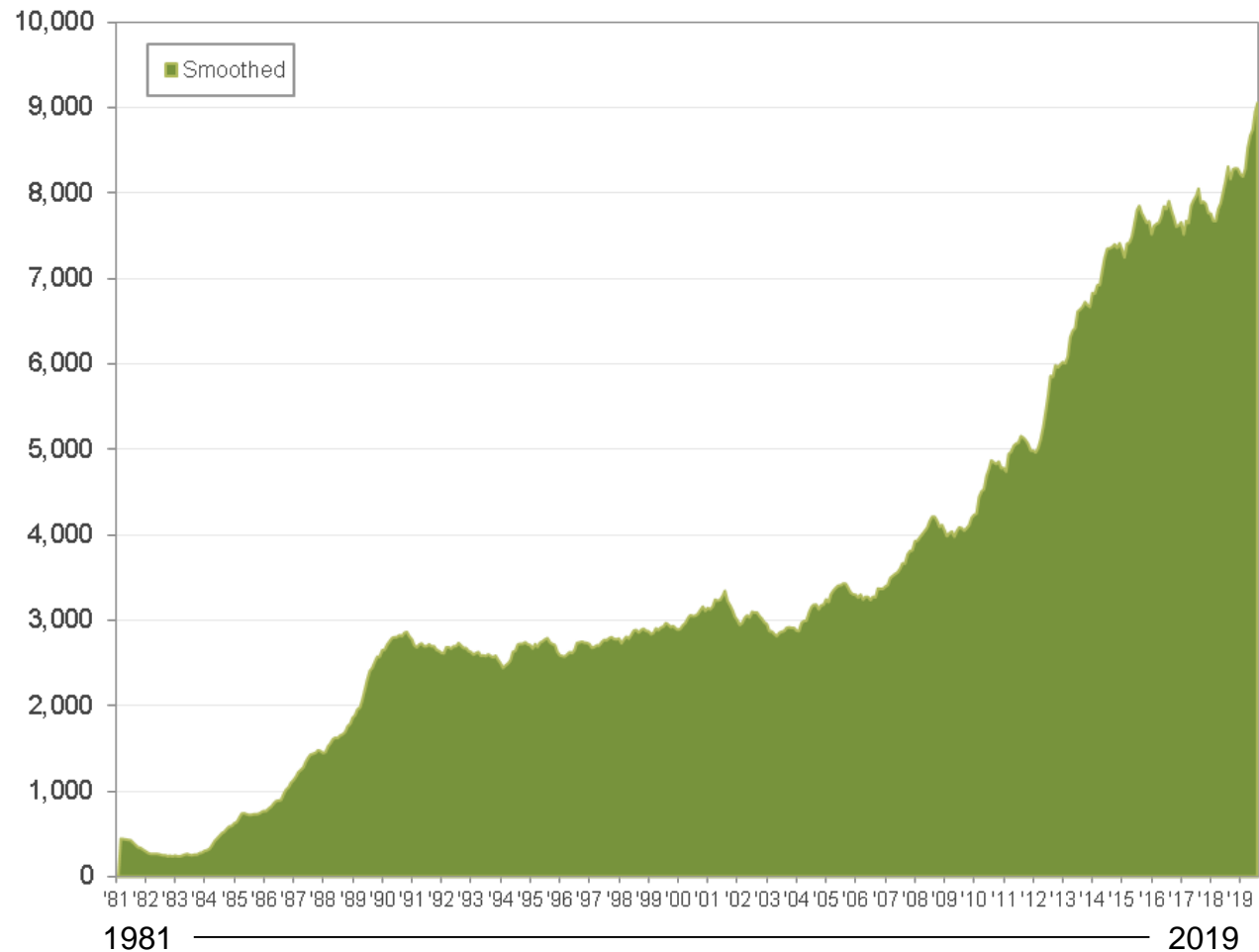
FAA will not use, nor will NASA provide, any report submitted for inclusion under ASRS guidelines or information derived therein for use in any disciplinary or other adverse action (14 CFR 91.25 & AC 00-46E)



ASRS Report Volume Profile

- Over 43 years of confidential safety reporting
- ASRS receives over 8,887 reports per month, or 431 per working day
- Current intake estimate for 2019 is over 108,000

Monthly Intake January 1981 – August 2019

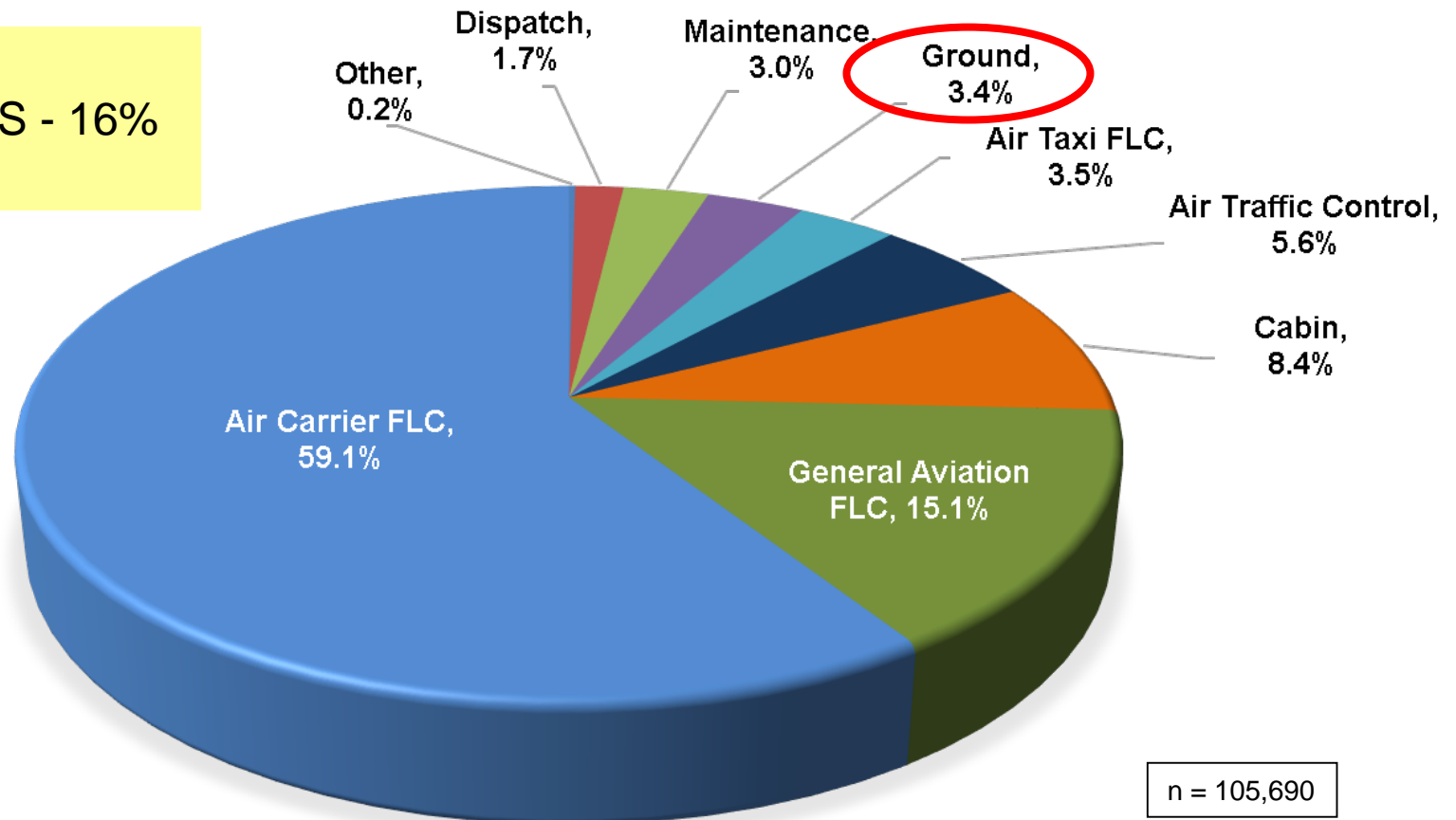


Incident Reporter Distribution

September 2018 – August 2019

Report source:

- Direct to ASRS - 16%
- ASAP - 84%



We want your safety reports!

Individual reports can be submitted directly to ASRS at:

<http://asrs.arc.nasa.gov>

or

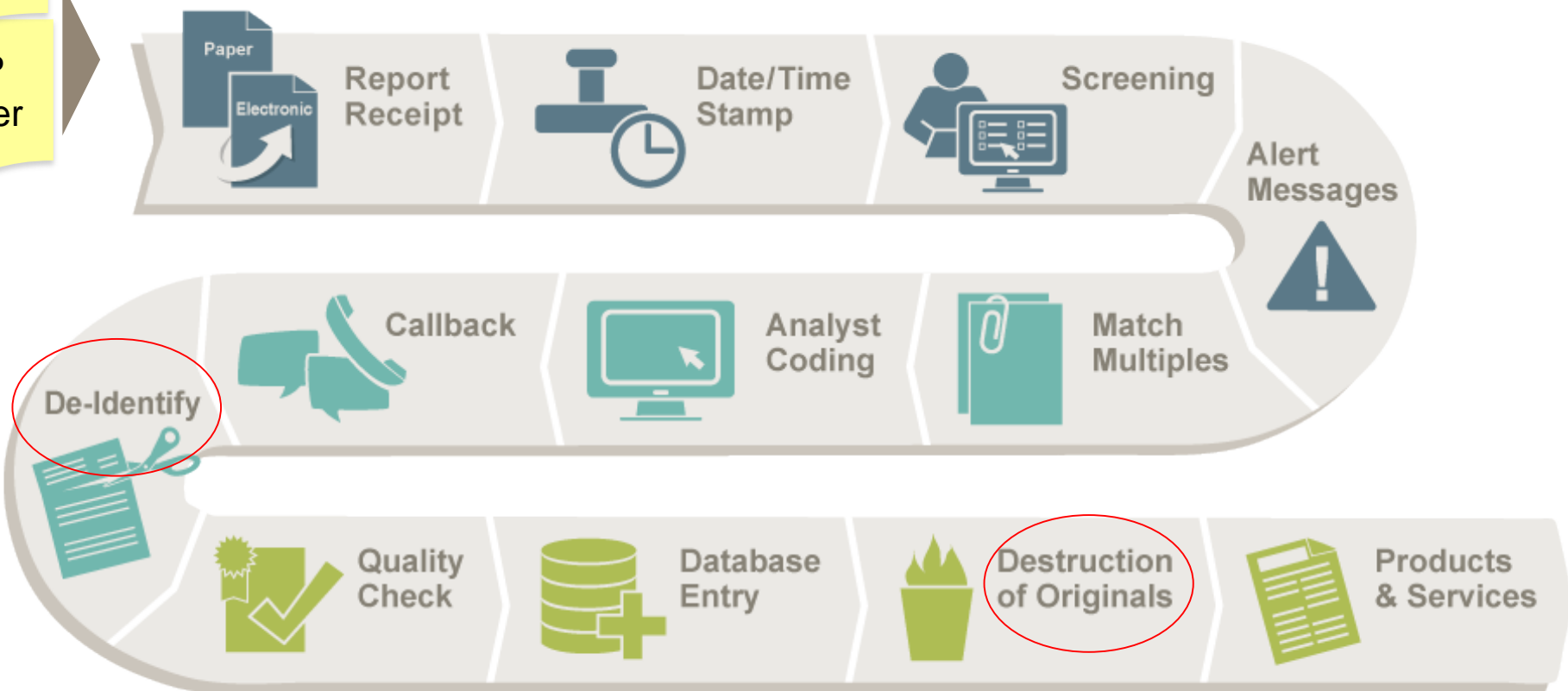
ASAP programs can use our
secure electronic transmission protocol



ASRS Report Processing Flow

ASRS Website or Mail

ASAP Transfer



Aviation Safety Reporting System
<http://asrs.arc.nasa.gov>



ASRS Safety Products

These products and services fulfill the program's mission to disseminate safety data



ALERT MESSAGES

Safety information issued to organizations in positions of authority for evaluation and possible corrective actions.



QUICK RESPONSES

Rapid data analysis by ASRS staff on safety issues with immediate operational importance generally limited to government agencies.



ASRS DATABASE

The public ASRS Database Online and data available in Database Report Sets or Search Requests full filled by ASRS staff.



CALLBACK NEWSLETTER

Monthly newsletter with a lessons learned format, available via website and email.



SPECIAL STUDIES

Studies/Research conducted on safety topics of interest in cooperation with aviation organizations.

Alerts and FAA telecons

- ASRS has issued 129 total alerts from Sep 1, 2018 to Aug 31, 2019
- Hazmat Alert Examples (2013 – 2019)
 - Dispatching Aircraft with Cell Phones Lost in Cabin
 - Hazardous Material Improperly Boarded
 - Dangerous Goods Labels Covered By USPS Stickers
 - Lithium Battery Shipment via U.S. Mail on Passenger Aircraft
 - Li-Ion Battery Shipment Packaging
 - E-Cigarette Cabin Fire Hazard
 - Hazmat Procedure
 - Lithium Battery Shipping and Fire Suppression Equipment



ASRS Monthly Publication CALLBACK

CALLBACK

From NASA's Aviation Safety Reporting System



Issue 476

September 2019



Hazardous Materials (HAZMAT)



Dangerous Goods (DGs) are items that may endanger the safety of an aircraft or persons on board the aircraft. They are also known as restricted articles, hazardous materials (HAZMAT), and dangerous cargo. The International Civil Aviation Organization (ICAO) and local Civil Aviation Authority govern their carriage onboard aircraft, and in the United States, Title 49 of the Code of Federal Regulations regulates their transportation.^{1,2}

Many common items can be considered dangerous goods for the purpose of air transport.³ Nine classes, or divisions, of HAZMAT are designated, and each is unique in regulatory requirements. Regulations are complex. Unfamiliarity and noncompliance can result in many types of infractions. Problems can exist in shipping and handling documentation, chain of custody obligations, loading segregation and quantity limitations, article placement and tie down restrictions, and in communication between flight crews, dispatchers, and load planners. Flight and cabin crews often are the last line of defense when transporting HAZMAT.

This month *CALLBACK* shares reports of HAZMAT incidents that describe some common, but serious, infractions. Lessons learned and wisdom gleaned may afford flight crews some operational insight when mitigating future threats posed by HAZMAT.

Carry On

A Ramp Agent and a Captain identified a HAZMAT threat that may occur when time is typically compressed just prior to pushback. The Captain prescribed retraining and periodic performance monitoring to mitigate the threat.

From the Ramp Agent's report:

- Often flight attendants will stop allowing carry-on baggage when the bins are full and then require the passenger to leave their bag at the aircraft door. The passenger is then allowed to continue boarding after the bag is left. The Flight Attendant will then put a note with their seat number on the bag so the agent can then tag the bag correctly, or sometimes a hand written tag is filled out and given to the Flight Attendant to pass back to the customer. The issue is that, in all the haste to get the door closed at the end of boarding, the Customer Service Agent has not asked the customer about hazardous materials, smart bags, or e-cigarettes, etc.

From the Captain's report:

- The flight operated without incident. Shortly after deplaning, one of the ramp agents informed me that one of the gate-checked bags he just removed from our aircraft was a smart bag, and the battery had not been removed. The ramp agent said that he informed the passenger that, in the future, she must remove the battery from her smart bag before checking it. I notified the Company of the situation. As the passenger had already been corrected, there was no further action required.
- As I and the flight crew have preflight duties to perform, we are unable to directly supervise the ramp/gate agents as they receive the gate-checked bags. The only way to ensure that this does not happen again is to retrain the ground operation on how to handle smart bags, as well as periodic monitoring of their performance.

Bipolar Batteries

Although cellphones are not, themselves, classified as HAZMAT, legitimate concerns with their batteries can exist in some circumstances. This B777 First Officer described potential safety concerns of operating the aircraft with a lost cellphone onboard.

- I was one of the relief pilots on Flight XXX. During our preflight paperwork review, all four pilots noted a strange carry-forward write-up in the [logbook]. The write-up ... read, "Passenger ... at seat XXI lost a mobile phone under the seat. Mobile phone rang but couldn't be located." Along with the write-up, the following maintenance action was included: "Unable to locate cell phone."
- Our discussion centered on the potential safety concerns with flying with a lost phone in the aircraft, and in this case, lost under or near a business class seat, with all of the moving parts that could damage the phone and start a thermal runaway.
- The Captain asked each pilot if they were comfortable flying the aircraft with this issue, and the consensus was that we were not comfortable, and that the phone had to be found before we would take the aircraft on a 10 hour, Extended-range Twin-engine Operations (ETOPS) segment.
- The Captain initiated a phone call with Dispatch, informing them of our intent to refuse the aircraft until the phone





Hazardous Materials Special Study

Fullform processing of all
HazMat-related reports

April 2018 – Current

Report Processing funded by FAA Security and Hazardous Materials Safety (ASH)

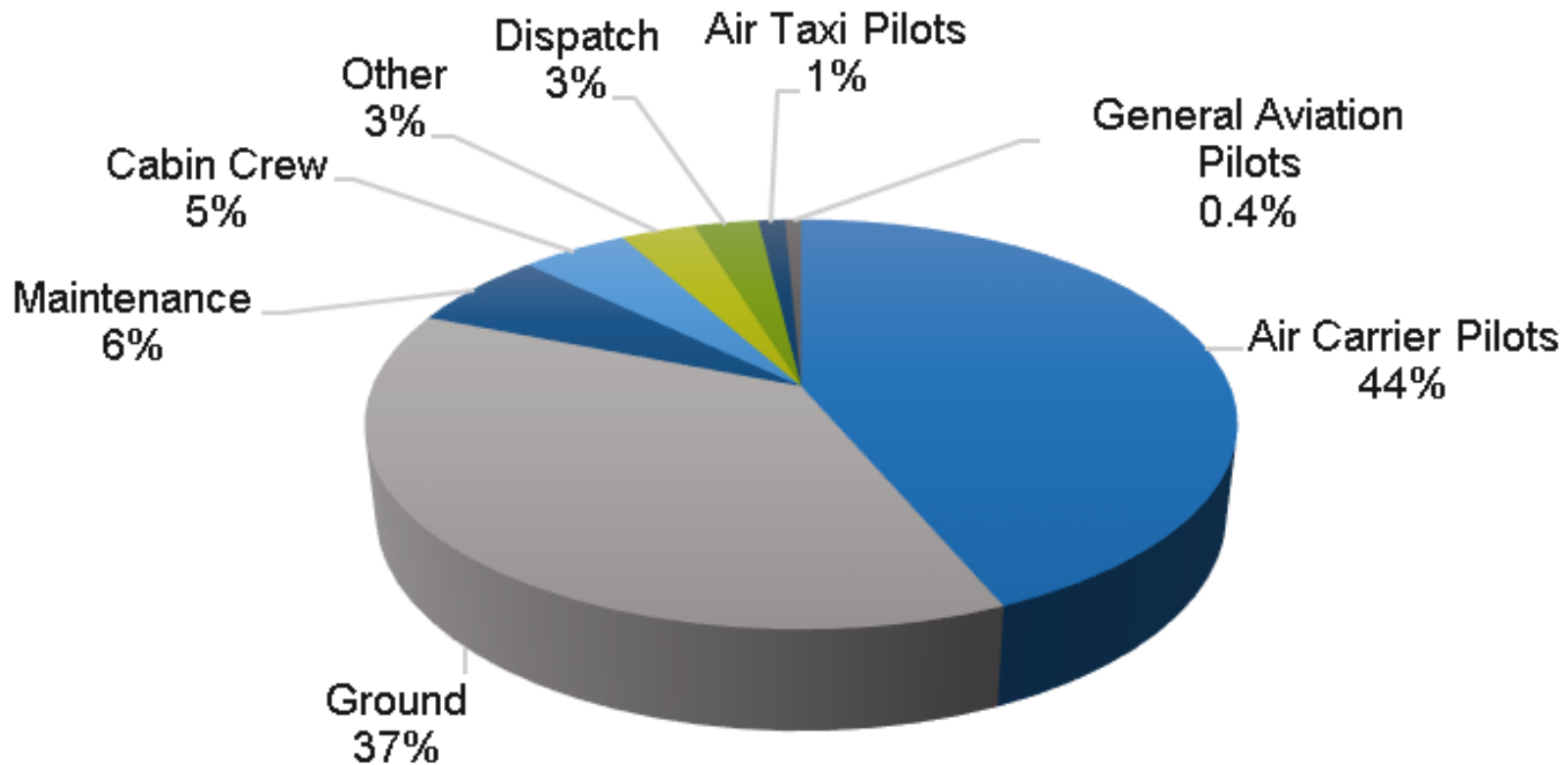


HazMat Special Study

April 2018 – August 2019

422 reports identified as “HazMat” since April 2018

Reporter Function (n = 422 Reports)



HazMat Secondary Coding Effort

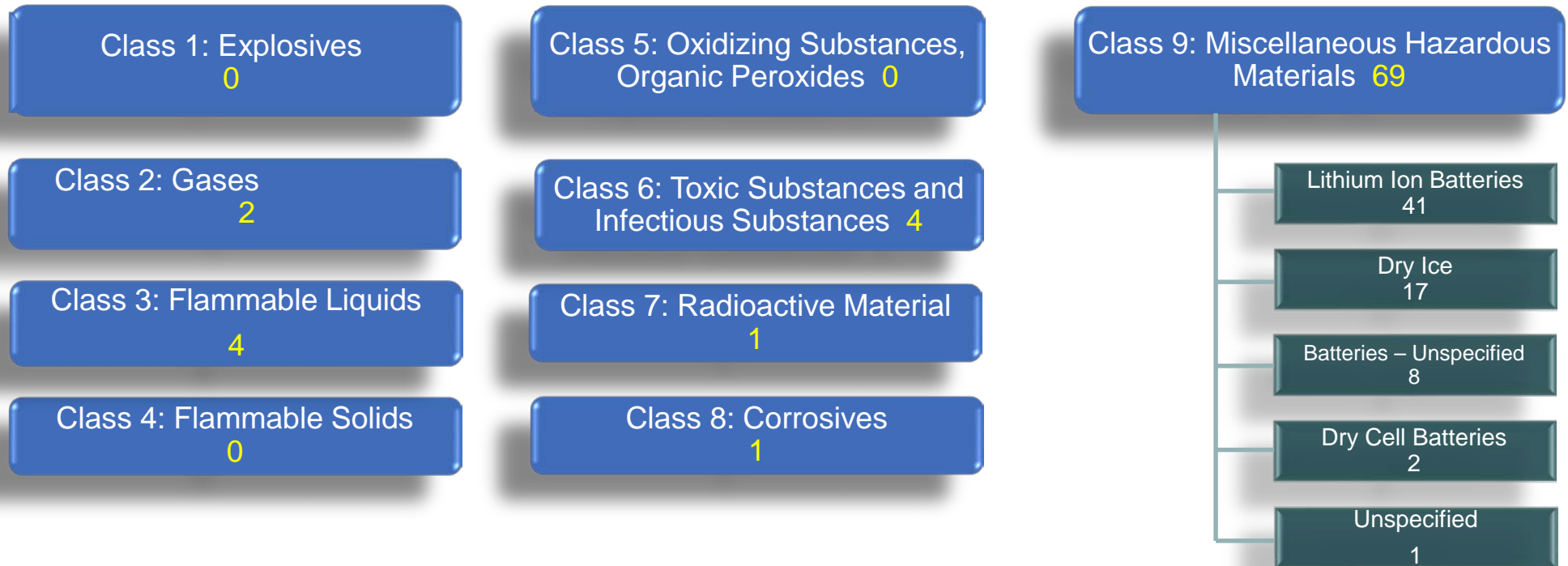
Jan 2019 – June 2019

ASRS Expert Analysts coded **144 records** (from Jan to June 2019) utilizing a Supplemental Question Set which included the following questions:

- What was the HazMat Class Type and Description if available?
- Where was the HazMat located?
- Who first detected the HazMat issue/event?
- When was the HazMat issue/event identified?
- What were the HazMat Reported issues?
- What was the reported result or impact of the HazMat Issue?
- What factors contributed to the HazMat issue/event?



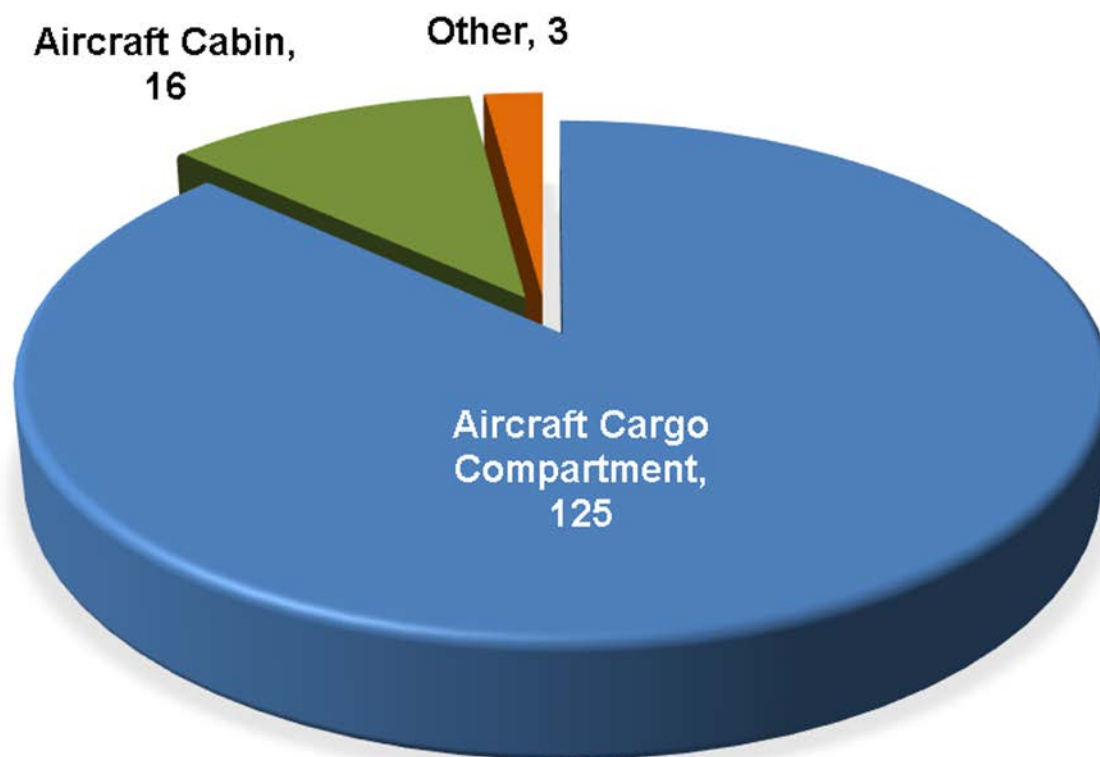
What was the HazMat Class Type and Description if available?



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019

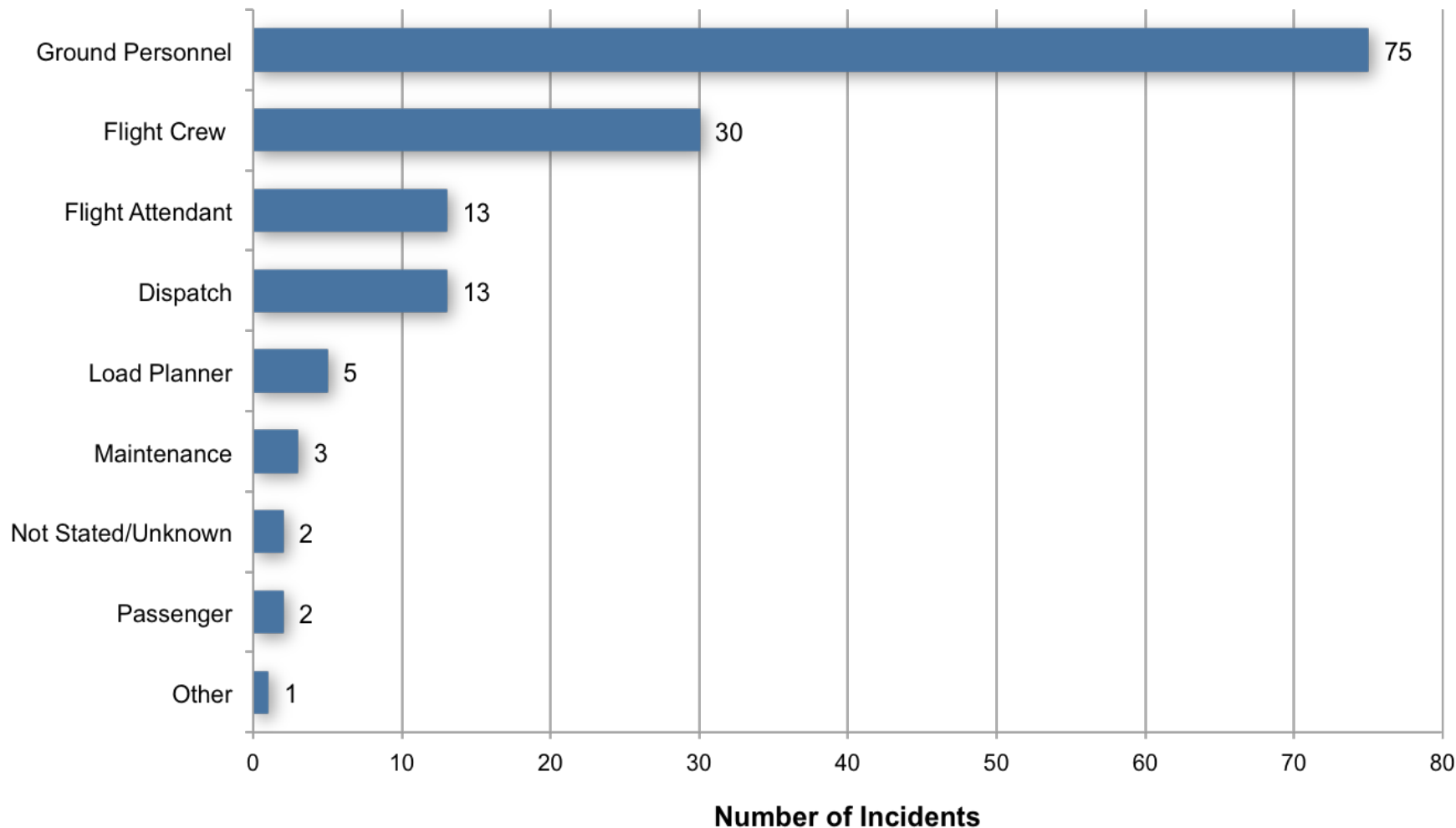
Where was the HazMat located?



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019

Who first detected the HazMat issue/event?



n=144 records

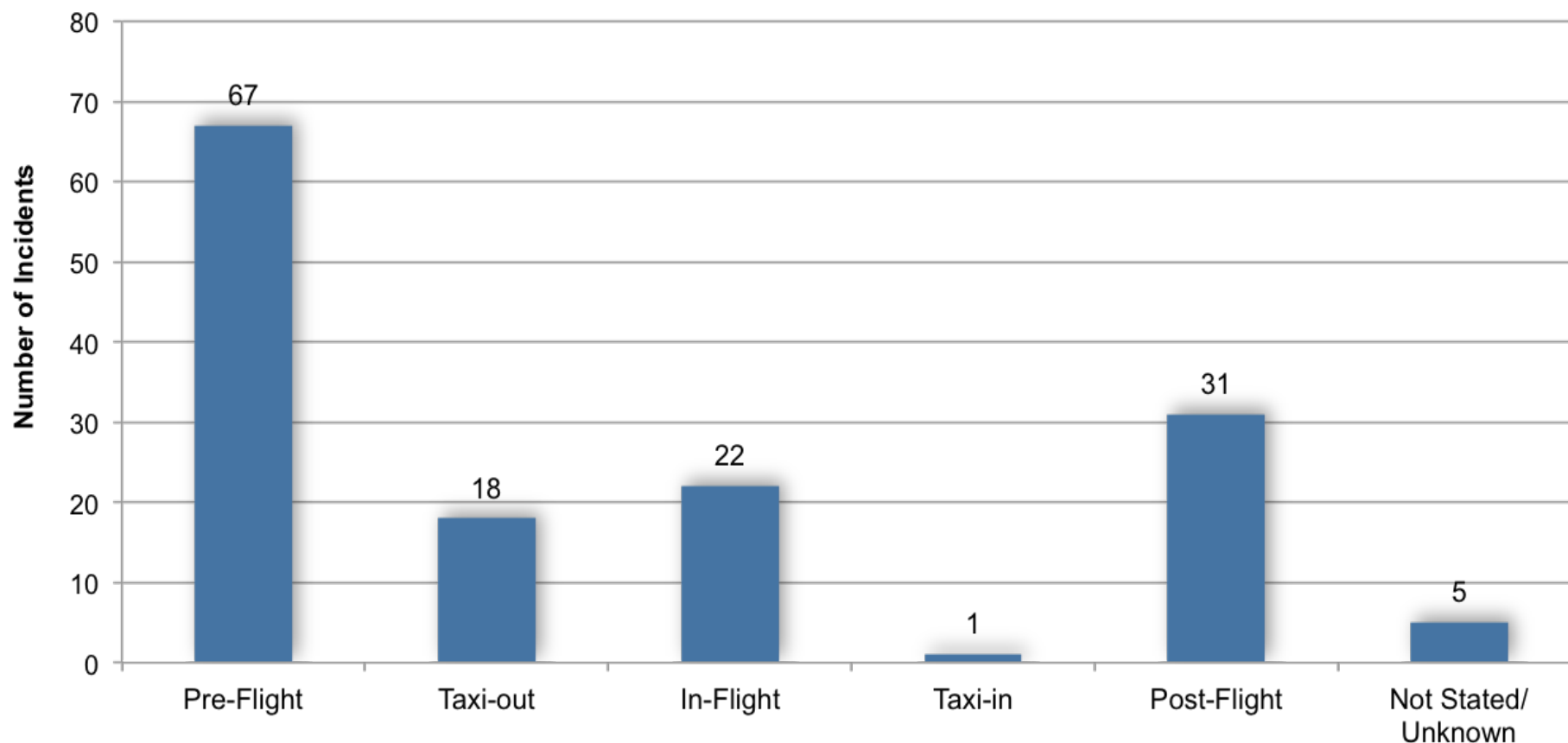
15



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019 (n = 144 records)

When was the HazMat issue/event identified?



n=144 records



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019

What were the reported HazMat issues?

Issue Type	Description*	Count
Documentation (59)	Documentation Error	24
	Missing Documentation	23
	Crew Not Notified	7
	Incomplete Documentation	5
Loading (69)	Loading Configuration Issue	50
	Hazmat Placement and Tie Down	12
	Loading Compatibility Issue	6
	Loading Segregation Issue	1
Packaging (17)	Labeling/Marking Issues	9
	Packaging Issue	8
Other (45)	Other	26
	Non-Removal of Lithium Batteries	17
	Chain of Hazmat Custody Obligations	2

*Categories are not mutually exclusive.

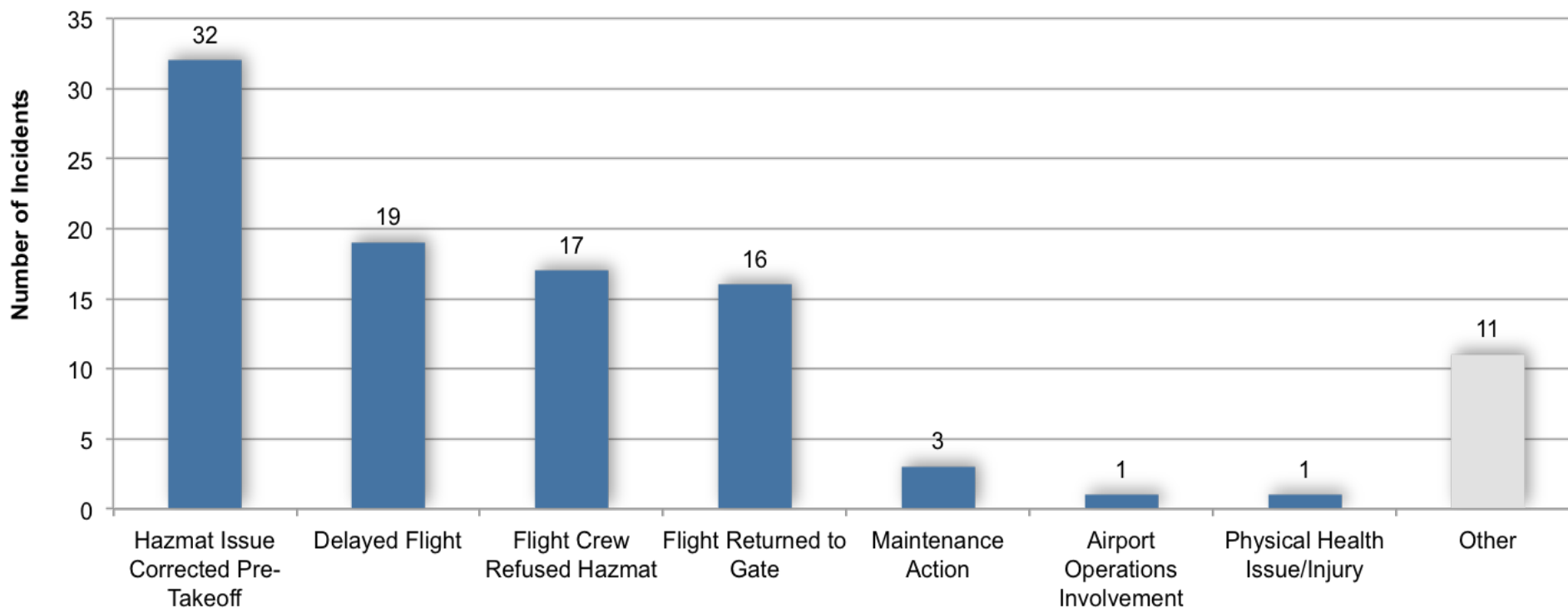
n=144 records



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019

What was the reported result or impact of the HazMat Issue?



65 records were coded as None Reported.

*Categories are not mutually exclusive.



n=144 records



HazMat Records – Secondary Coding

Reports Received Jan 2019 - June 2019

What factors contributed to the HazMat Event?

- Inadequate Training
- Confusing, Inadequate, Non-Existent Procedures
- Communication Breakdown



HazMat Handling: Training Issues

- Smart Bag Batteries

Captain Reported: “Shortly after deplaning, one of the ramp agents informed me that one of the gate-checked bags he just removed from our aircraft was a smart bag, and the battery had not been removed.. As I and the flight crew have preflight duties to perform, we are unable to directly supervise the ramp/gate agents as they receive the gate checked bags. The only way to ensure that this does not happen again is to retrain the ground operation [crew] on how to handle smart bags, as well as periodic monitoring...”.

(ACN 1629428)



HazMat Handling: Training Issues

- **Flight Attendant Reported:** The current CBT [Computer Based Training] has a slide that reads in part "... Spare lithium batteries are any rechargeable batteries that are not installed in an electronic device." Does this mean that when an FA commutes, and our bag is checked (or gate checked) that it is ok if our work tablet remains in the checked bag as the battery is installed inside? Or does this mean that it is not-ok? And it would not qualify to remain in the check bag? I am asking as a result of my recent interaction with the Flight Attendant Official social media group. **The clarity provided does not line up with what is in the Continuing Qualification ...**
- Suggestions: Enhance the clarity of text on [company website] and applicable FA [Flight Attendant] manual guidance. (ACN 1621660)



HazMat Handling: Procedural Issues

- **SMART BAGS:** “When a Ramp Service Employee (RSE) identifies a smart bag there is no process that informs the RSE if the bag was inspected, who inspected the bag and if powered by lithium was the lithium battery removed.” (ACN 1654030)
- **LITHIUM BATTERY STOWAGE:** “I think a universal procedure between different work groups to identify and understand the proper stowage of lithium batteries would help to prevent this confusion and misunderstanding.” (ACN 1634785)
- **SCOOTER AND WHEELCHAIRS:** “[Airline] must immediately establish procedures monitored by FAA oversight to deal with the handling of electric scooters and wheelchairs ... a form should be created in triplicate that notifies the [pilots] of their presence and that the ground staff has properly verified their power source is approved to be carried aboard our aircraft.” (ACN 1609809)



HazMat Handling: Procedural Issues

- **DRY ICE:** “Dry ice must be loaded in a separate compartment from live animals regardless of the origin of the shipment. **There is an acceptance process when customers have dry ice in their check-in luggage. That process has several failures that may contribute to safety failures as follows:**
 1. **Lack of customer awareness** of the safety concern may prevent customers from being forthright in an effort to avoid having the luggage restricted.
 2. The **acceptance process at the ticket counter does not coincide with hazardous material acceptance** so requirements may fall through the cracks. (i.e., packaging may not have the correct ventilation).
 3. **The acceptance does not have a [code]** so ramp employees do NOT have knowledge of dry ice through the scanning process.
 4. The **special handling tag may come off the bag** so this awareness tool may fail.” (ACN 1681383)



HazMat Communication Breakdown

Captain reported: "...I was given a Dangerous Goods (DG) summary showing "miscellaneous hazmat" loaded on aircraft. I was curious to know exactly what the miscellaneous hazmat was, and called Dispatch for clarification. ... Dispatch was busy working several issues with other flights so I offered to call dangerous goods hot-line.

Dangerous Goods Specialist was unable to give further description of shipment. When I asked what drill code "XL" represented, Dangerous Goods Specialist said "You'll have to look that up in your pilot manual" and was unable to provide any further assistance.

I called Dispatch back as well as Station Operations trying to find out what exactly the hazardous material shipment was ... At some point in this process, it was decided, not by me, that the shipment would be pulled from the aircraft."

(ACN 1655095)





Aviation Safety Reporting System

Home

Contact Us

Program Information

Report to ASRS

Search ASRS Database

Publications/Studies

International

Online Resources

- ASRS Database Online ←
- ASRS Database Report Sets
- Requesting ASRS Data



Confidential. Voluntary

ASRS captures confidential reports, analyzes the resulting aviation safety data, and disseminates vital information to the aviation community.

CALLBACK
 Receive FREE monthly newsletter by email! [\(Please Read\)](#)
[Subscribe to CALLBACK](#)

NOTAM Issues
 July 2015, Issue 426
[HTML](#) | [PDF](#)

Select a Form To Submit a Report

- ▶ [General](#) - Pilots, Dispatchers, Others
- ▶ [Air Traffic Control](#) - Air Traffic Controllers
- ▶ [Maintenance](#) - Mechanics
- ▶ [Cabin](#) - Cabin Crew

How to Report Online ▶

- Review proper browser settings, security tips, and provisions.
- ▶ [FAQ for Electronic Report Submission](#)
 - ▶ [Online Security Tips](#)
 - ▶ [Immunity Policy](#)

View Program Briefing ▶

Learn more about ASRS such as report processing and reporting metrics.



<https://asrs.arc.nasa.gov/>

CONTACT INFO

Becky Hooey, PhD
NASA ASRS Program Director
Becky.L.Hooey@nasa.gov
(408) 541-2827

Jorge Moya
NASA ASRS Research Coordinator
Jorge.B.Moya@nasa.gov
(408) 541-2816

