

**SAFETY
COMMITMENT**

**BE
PART**

**REPORTING
and SHARING**

**SAFETY
AWARENESS and
ALERTNESS**

**Accident/Incident
Investigations:
An opportunity for the
Manufacturer to enhance
the Product Safety.**

**The Airbus DS
experience**

MA SI 2017 – San Diego (USA)
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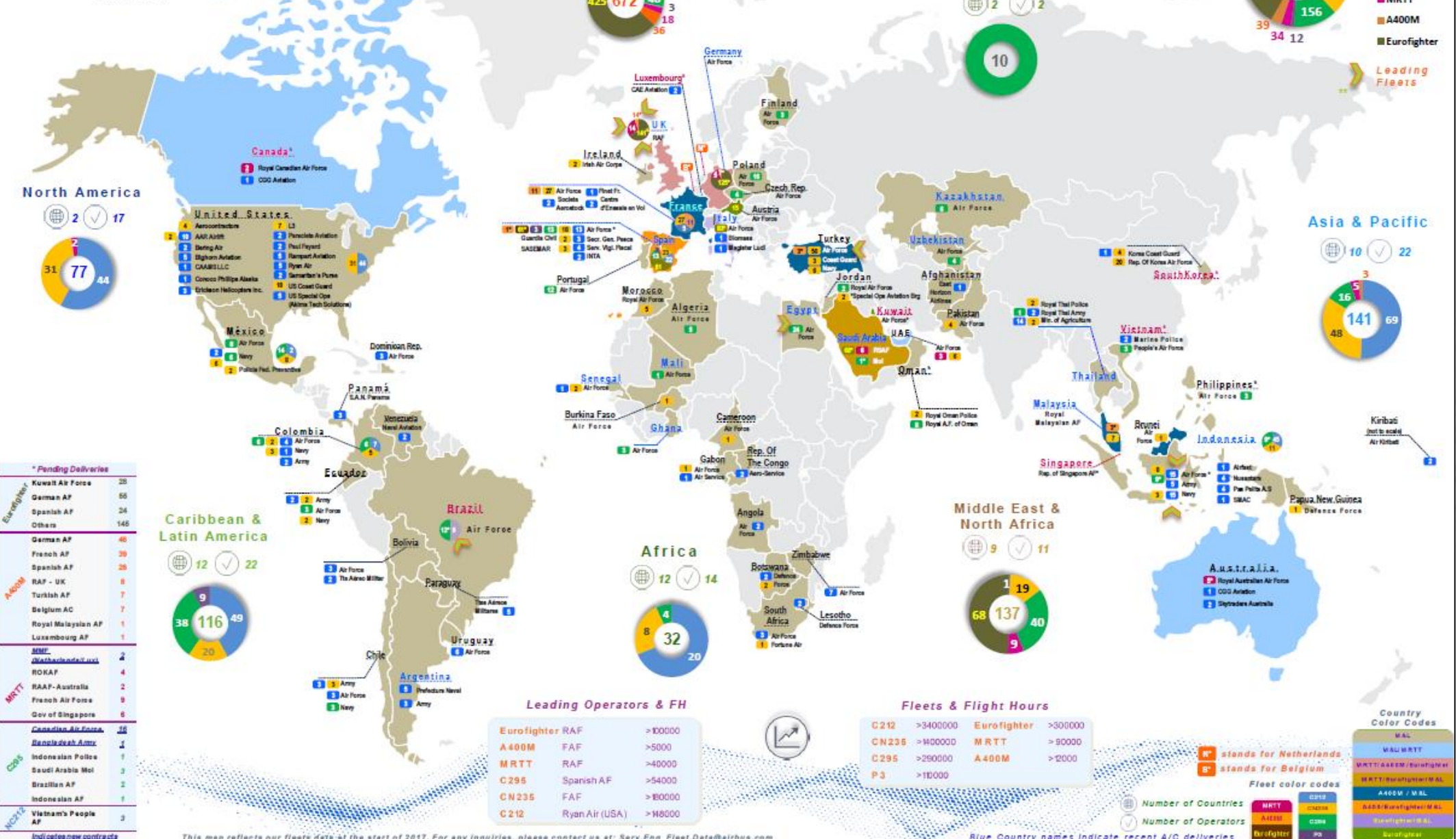
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Airbus DS/Military Aircraft portfolio

Product Safety
Be Part

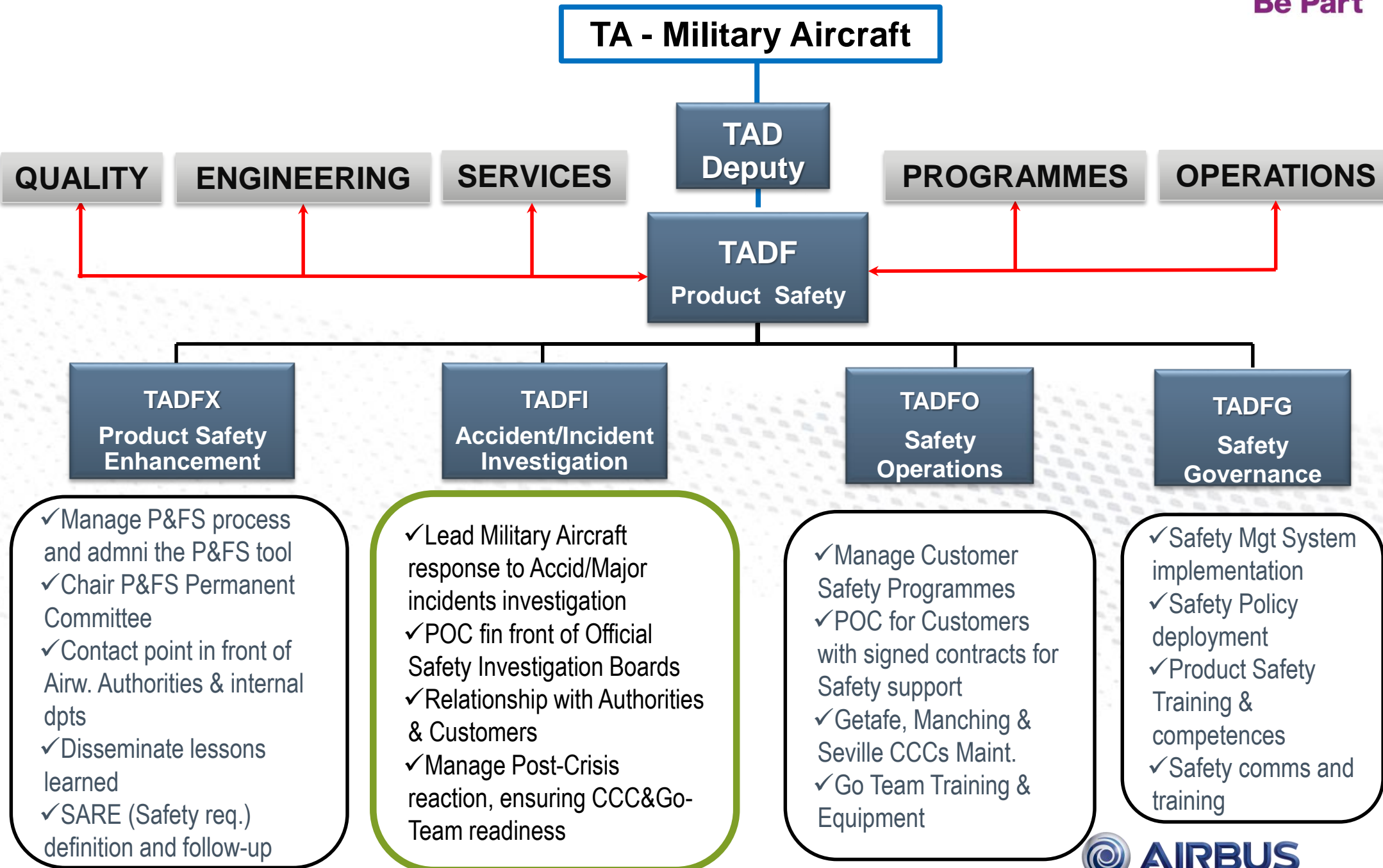
Military & Transport Aircraft

113 Operators
493 Combat
692 Transport
& Mission



Airbus DS P&FS organization overview

Product Safety
Be Part



AIRBUS
DEFENCE & SPACE

Accident/Major Incident Management Process

Accident & Incident Investigation (PG-144)

Crisis Management Group

To manage the initial hours from the Crisis Control Center: Support to operator; Collection of initial facts; Authorities contact; Customers Information, Media relations
Your Single Point of Contact / FULL CONFIDENTIALITY

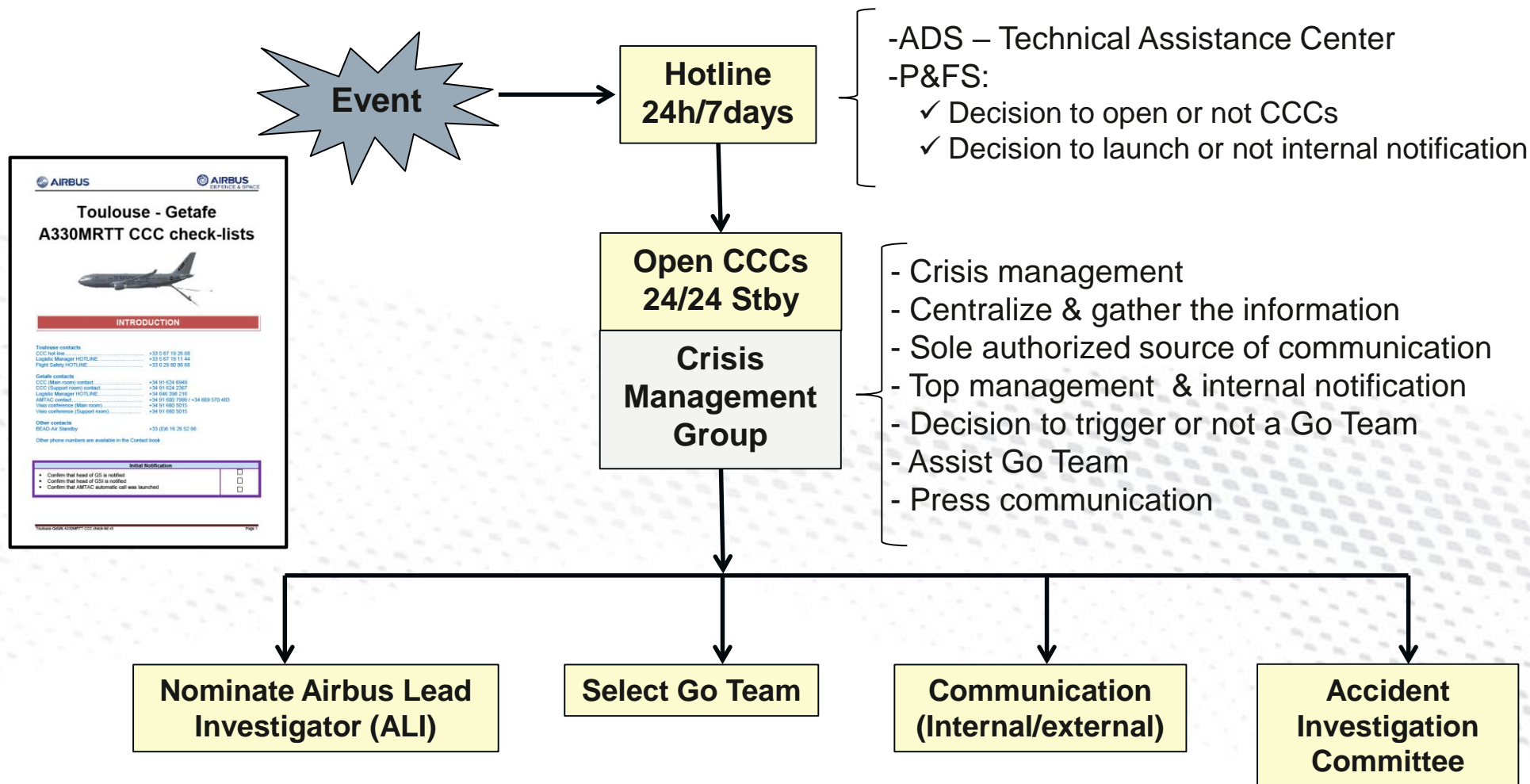
Go Team

Small Group (4-6) to be detached to crash site, for collecting evidences to be used in the further investigation.
Reaction time 4 – 6 hours
Support to the Official Investigation Board.

Accident investigation team

Group of Specialists to perform all investigation activities until full explanation of the events. Identification of findings and safety recommendations. Final report (as technical advisor) released only to affected customer under main principles of mutual trust and full confidentiality.

Acc./Inc. Management Process



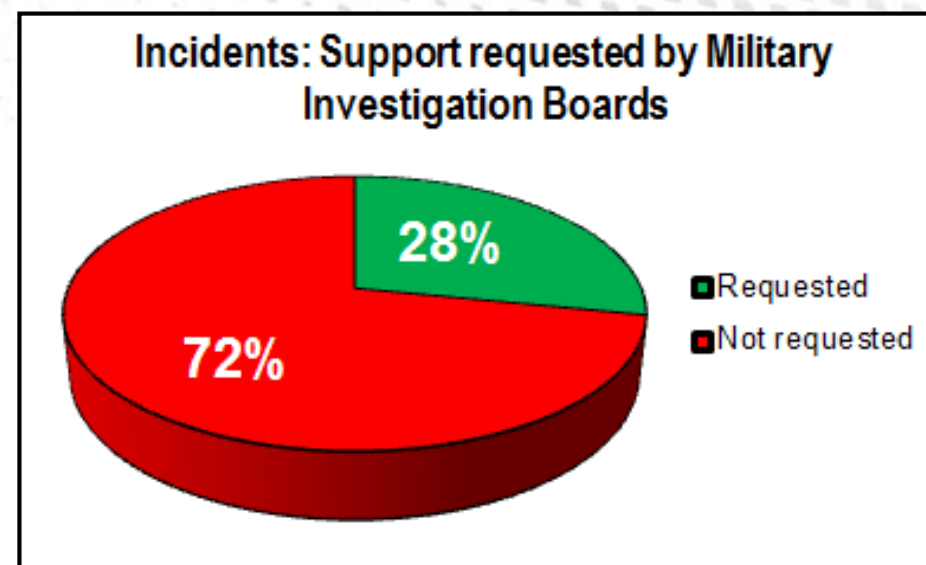
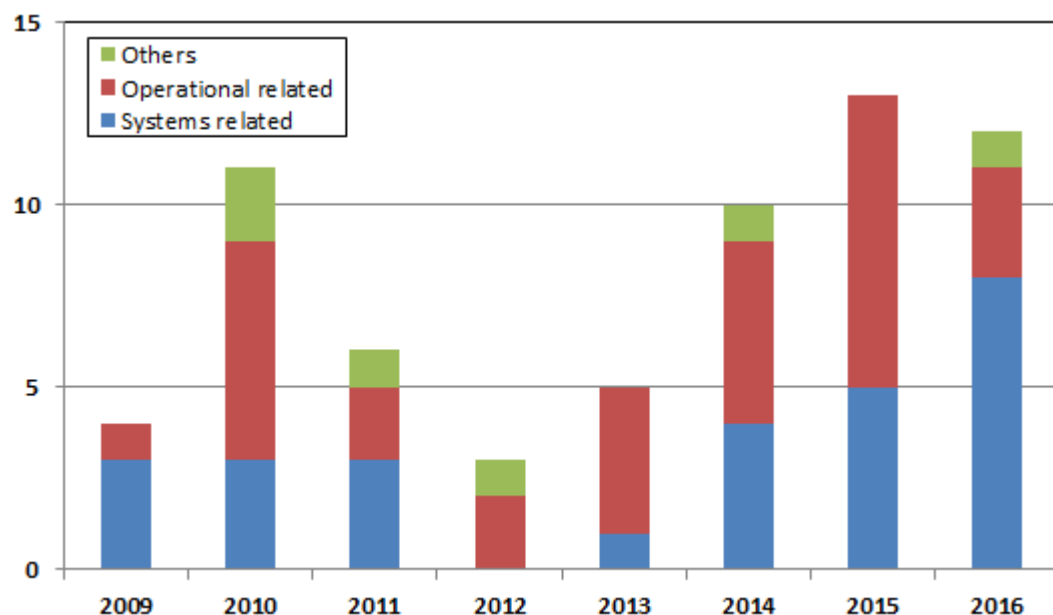
2009-2016: Incident and Accident overview (1/4)

INCIDENTS

Year	Incidents	Systems related	Operational related	Others [Wx, B]	Support requested by InvBoard
2009	4	3	1	0	0
2010	11	3	6	2	1
2011	6	3	2	1	2
2012	3	0	2	1	3
2013	5	1	4	0	0
2014	10	4	5	1	2
2015	13	5	8	0	4
2016	12	8	3	1	6
TOTAL	64	27	31	6	18

COUNTRIES WHICH REQUESTED SUPPORT (all Mil Investigation Boards):

2010: Chequia
2011: Equator , Spain
2012: Equator, Spain, UAE
2013: N/A
2014: UK, Spain
2015: France (x2), Jordania, Brasil
2016: Spain, Jordania, Brasil, Saudi Arabia, Australia



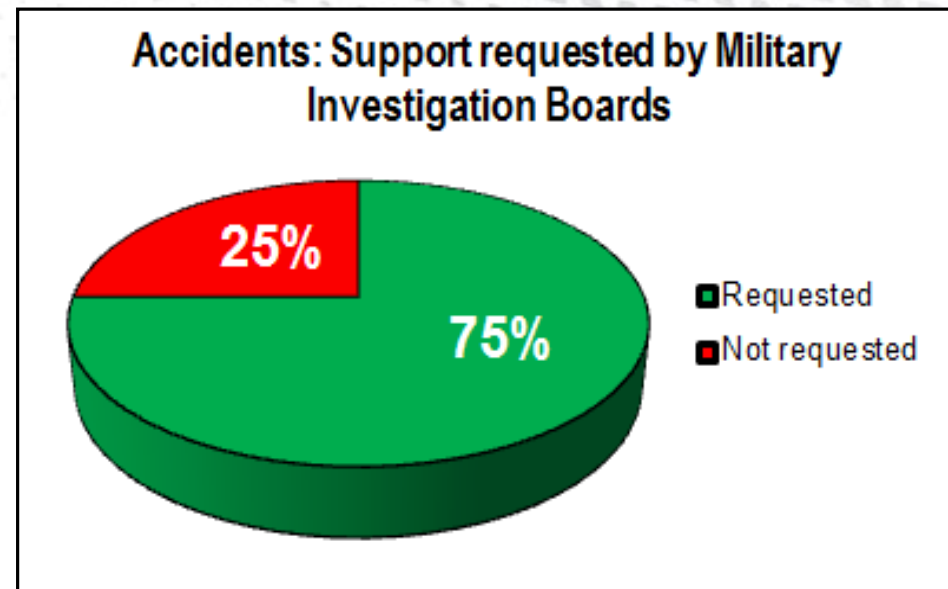
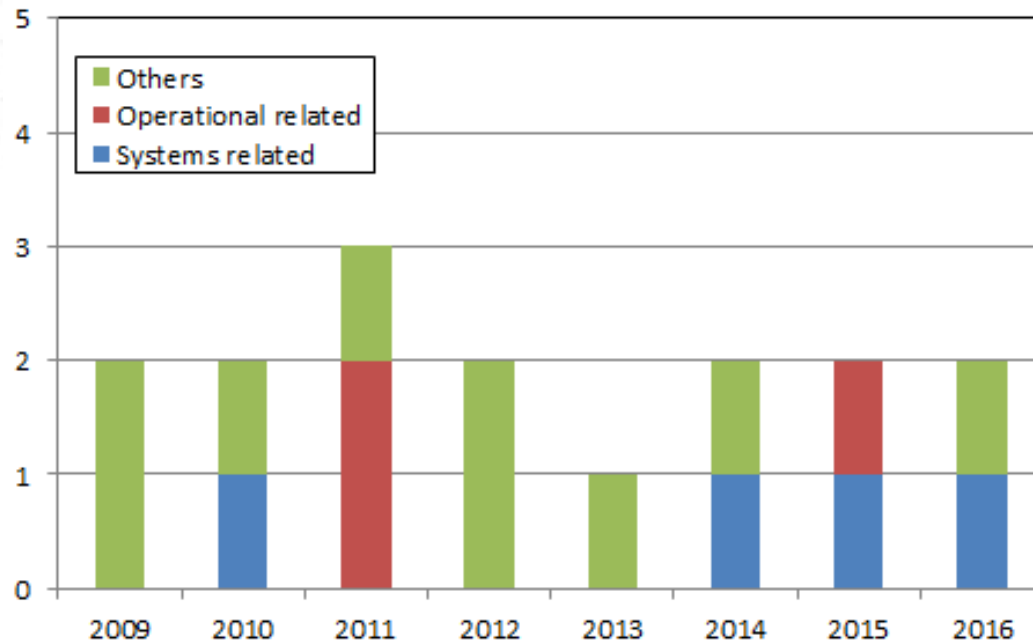
2009-2016: Incident and Accident overview (2/4)

ACCIDENTS

Year	Accidents	Systems related	Operational related	Others [Wx, B]	Support requested by InvBoard
2009	2	0	0	2	0
2010	2	1	0	1	2
2011	3	0	2	1	3
2012	2	0	0	2	1
2013	1	0	0	1	0
2014	3	1	0	1	2
2015	2	1	1	0	2
2016	3	1	0	1	2
TOTAL	16	4	3	9	12

COUNTRIES WHICH REQUESTED SUPPORT (all Mil Investigation Boards):

2010: Congo, Spain
 2011: Canada, Chile, Indonesia
 2012: Argelia
 2013: N/A
 2014: Germany, Spain
 2015: Colombia, Spain
 2016: Vietnam, Jordania

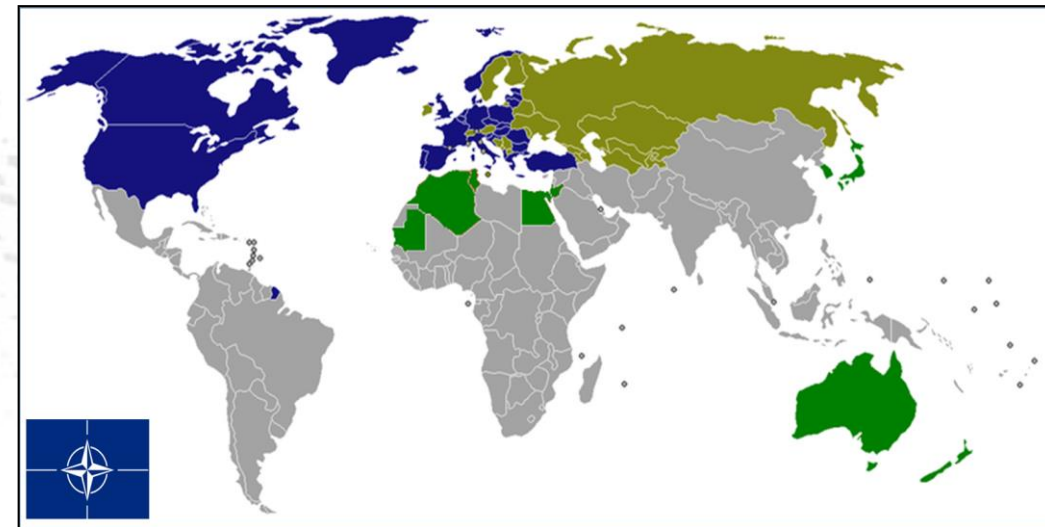


2009-2016: Incident and Accident overview (3/4)

LESSONS LEARNED AND AIRBUS DS EXPERIENCE - 1

- ✓ ICAO Annex 13 does not apply !!, although in some cases is used as a valid reference.
- ✓ Something similar established in NATO countries by STANAG 3531, although explicit Manufacturer role is not stated.

ICAO Annex 13 (191 countries).



NATO countries (28) and associated (22+15)

2009-2016: Incident and Accident overview (4/4)

LESSONS learned AND AIRBUS DS EXPERIENCE - 2

- ✓ As a general rule, Armed Forces are reluctant to accept immediate technical support. When accepted, official request usually comes after days or even weeks since the accident/incident occurrence.
 - ❖ Confidentiality issues involved: Mission, sensitive geographical location, etc.
 - ❖ Initial intention to keep the investigation 'in-house' with own resources.
 - ❖ Unfamiliarity with Airbus DS Accident/Incident management process.
- ✓ As a consequence of the above, high risk of losing key evidences for detailed investigation (wreckage removal, parts missing, recorded data loss, etc).
- ✓ With the exception of some nations (UK-MilAAIB, France-BEAD, Spain-CITAAM, etc), not a dedicated Mil Accident/Incident Investigation Organization is established.
- ✓ Support request for incidents low (28% against 75% for accidents)

Full involvement as TA: Examples

(1/4) *Product Safety*
Be Part

Incident 27 February 16: C-295 Brazilian AF MLG collapse - 1

- ✓ *Incident occurred in Surucucu (Estado de Roraima, Brasil)*
- ✓ *Challenging runway, asphalt, poorly maintained: 1080x30 mts, outstanding slope (20° RWY30 along 300 mts to decrease down to 5° at the end).*
- ✓ *MLG collapse at touchdown/ No fatalities*



Full involvement as TA: Examples

Incident 29 March 15: C-295 Brazilian AF RMLG collapse - 2

- ✓ Historic background: Three (3) similar events
 - ❖ 30 January 2007, Palmeras do Javari
 - ❖ 13 January 2011 and March 2015, both in Surucucu
- ✓ Although no GoTeam sent, full Airbus DS involvement as Technical Advisor in front of the FAB since first event.
- ✓ Operational contributing factors identified: Landings on challenging runways which lead to touchdowns at loads levels beyond the certified limits.
- ✓ Specific understanding about FAB operations led to foster a MLG improvement to be offered to C295 operators.
- ✓ A major design change process was approved in 2011. In the mean time, operational recommendations were addressed to help crews to handle challenging landings.
- ✓ An SB to strengthen the MLG is already avail.

Full involvement as TA: Examples

Accident 31 July 15: CN-235 Colombian AF crash - 1

- ✓ *Accident occurred around 20:30 UTC (15:30 LT Colombia)*
- ✓ *Poor local weather conditions at the time of the accident*
- ✓ *The Colombian Air Force stated that the pilot reported an engine failure prior to the accident*
- ✓ *Crash: Departm. del César (NE Colombia), close to Venezuela*
- ✓ *Hull loss / 11 fatalities*



Full involvement as TA: Examples

Accident 31 July 15: CN-235 Colombian AF crash - 2

- ✓ Airbus DS Accid/Incid Management Process activated on August 1st
- ✓ Following clearance from FAC, Airbus DS Investigation Team detached to Bogotá from 10th to 20th August (2xP&FS Investigators, 1xStructure +1xPowerplant specialist and 1xInstructor Pilot)
- ✓ Information available: FDR, CVR, aircraft documentation, wreckage pictures and some parts (engines, props and some panels).
- ✓ Airbus DS Investigation Report issued on September 4th.
- ✓ Most probable cause: Inadvertent ice accretion. Contributing factors:
 - ❖ Crew failure to manage WING OVERHEAT emergency procedure while flying in icing conditions.
 - ❖ Sustained flight in icing accretion conditions even with stall warning active.
- ✓ **Safety Improvement:** Specific SB to implement an advanced stall warning when flying in icing conditions

Conclusions

1. Early Manufacturer involvement in an Accident/Incident investigation is highly beneficial for both parties: Operator and Manufacturer.
 - ❖ On Operator side, by:
 - Increasing the Safety of the fleet through the improvement of Procedures and Enhancement of the Product.
 - Gaining confidence in the Product after an Accident or an Incident.
 - Having access to advanced investigation resources
 - ❖ On Manufacturer side, by:
 - Understanding the customer way of operating the Product.
 - Setting a mutual confidence which leads to enhance the Product.
2. Confidentiality and mutual trust are key issues.
3. Not only accident investigations contribute to enhance the Product. Incidents become accident anticipators if they are not fully understood since the beginning. Manufacturer contribution to this understanding can be also key.

Thank you

