



Double De-Fuelling Incident Blackhawk 104 & Blackhawk 205 Gold Coast Airport 7 Jun 05

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Headquarters Air Command, Australia*

Marcus Who?

- DHC6/B200 – 32SQN, Tindal
 - *Unit Flying Safety Officer*
- C130E/H – 36SQN, Richmond
 - *Group Flying Safety Officer*
 - *Base Flying Safety Officer*
- SO2 Ops Air Command, Glenbrook
 - *Command Aviation Safety Officer*
- B737 AEW&C – 2SQN, Williamtown ??

Scope

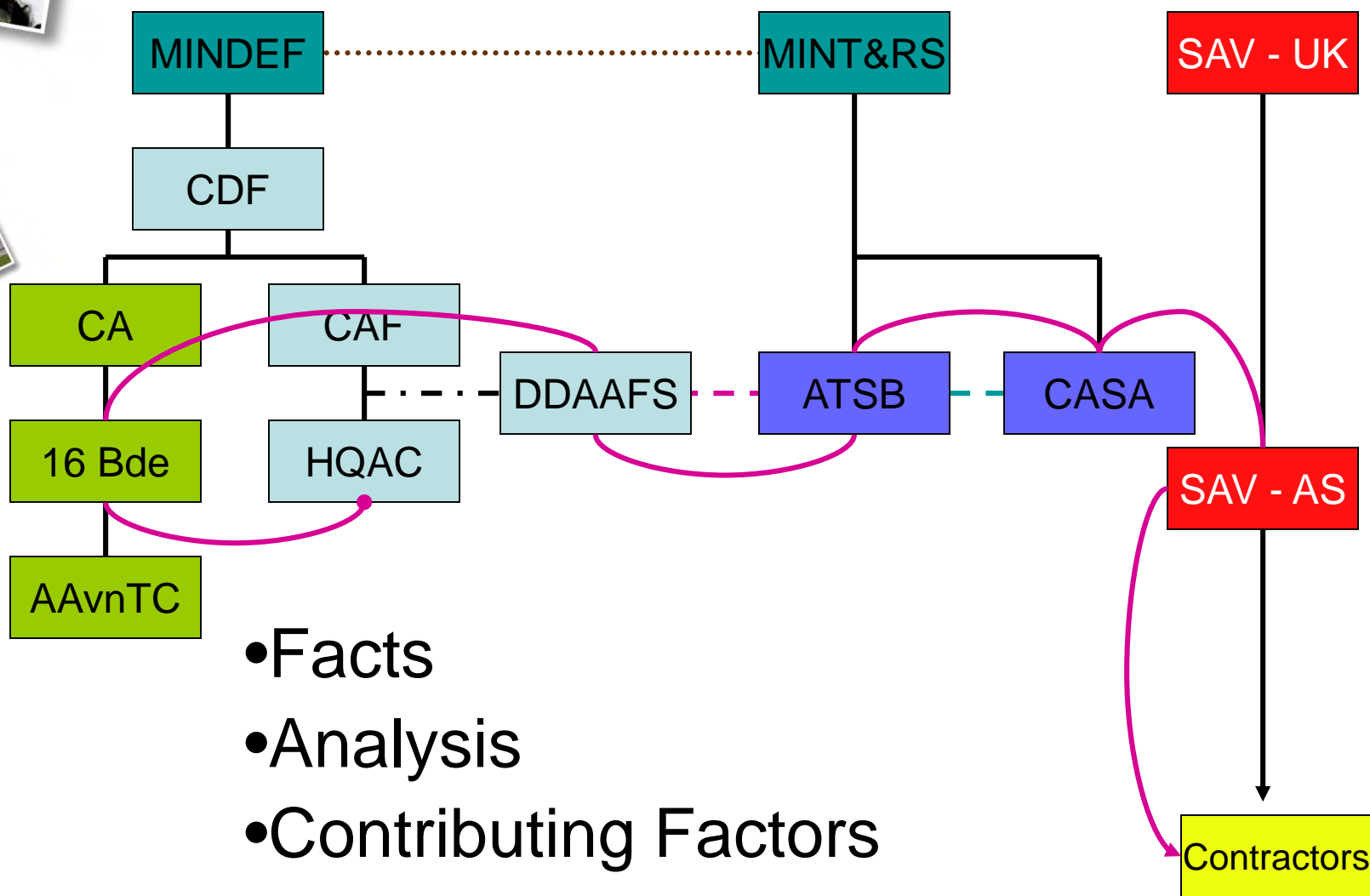
- Bringing it all together
 - *ICAO Annex 13*
 - *Looking at the Whole System*
 - *Don't highlight the obvious, Highlight the obscure!!*
 - *Authority for Investigation (or is that an interpretation...)*
 - *Safety Investigation is not a Turf War*
 - *Subject Matter Experts & Lessons for Free*
 - *Interviewing and collection of evidence*
 - *Using SHELL & The Cheese!*
 - ***Team approach, BUT never get stuck with the report!***

DISCLAIMER





The Zoo



Facts – Incident

- ➔ 7 Jun 05 (1300) – Blackhawk 104 requested a refuel from a civil refueller at Bay 16 at the Gold Coast Airport following a standard training mission.
- ➔ Following the refuel the gauges read 20lbs, despite indications that 856L was transferred
- ➔ Blackhawk 205 was despatched to provide maintenance support, and 749L were transferred
- ➔ APU Blackhawk 104 flamed out



Air Command

Facts – Sequence of Events (Crew)

- ➔ Task: Blackhawk 104 to conduct an IFR navigation sortie, whilst performing a series of basic, emergency, and IF procedures.
- ➔ Simulator mission flown with the QFI on 06 Jun 05.
- ➔ Crew commenced pre-flight planning, departing with full tanks (2300lbs).
- ➔ Arrival fuel at the Gold Coast was expected to be just under half (800lbs)
- ➔ Routine refuel, conduct a crew debrief and lunch then RTB
- ➔ Aircraft captain self-authorized the sortie, and prior to departure used his mobile phone:
 - ➔ to confirm parking on Bay 16,
 - ➔ to request the SHELL Refueller at 1200hrs



Air Command



Facts – Sequence of Events (Refuel)

- ➔ Daily quality-control (QC) checks were completed
- ➔ Commenced refuels on civil aircraft using openline/overwing refuelling
- ➔ Waited for Blackhawk 104 at Bay 16



Air Command

Facts – Sequence of Events

- Commenced refuels on Blackhawk 104 using closed line / single point refuelling



Air Command

Facts – Sequence of Events (Post refuel)

- ➔ AC Power prior to main engine start via the APU.
- ➔ Aircraft captain noted:
 - ➔ 20 pounds of fuel were showing on the fuel indicator;
 - ➔ both fuel low lights flashing;
 - ➔ two associated master caution warning lights.
- ➔ Aircraft captain conducted a FUEL IND TEST – norm
- ➔ Crew consensus that the aircraft had been refuelled to full internals, and the previously documented electrical history associated with the aircraft, suggested a fuel indication problem was probable.
- ➔ Shut down APU and contact maintenance.



Facts – Sequence of Events (Post refuel)

- Blackhawk 205 arrived & Blackhawk 104 was released.
- Maintenance personnel removed the Miscellaneous Switch Panel and some sound proofing before requesting the aircrew start the APU
- Approximately 4-5 minutes under APU power, the APU flamed out.
- The No.1 fuel tank was visually inspected
- Refuelling of Blackhawk 205 was terminated and the quantity of Jet A-1 in the truck was visually inspected by the duty refueller.
- The duty refueller recalled that he had refuelled other aircraft during the course of his shift (ie. Metroliner/Citation).
- Both aircraft captains discussed the issue of contaminated fuel, but did not raise the issue of contamination with the contractor.
- Both Blackhawk 104 and Blackhawk 205 were then refuelled by a second contractor using a separate fuel source - Blackhawk 104 took a total of 1310L (2331lbs)



Air Command

Facts – Personnel

- ➔ Blackhawk 104
 - ➔ QFI Captain
 - ➔ Co Pilot
 - ➔ Loadmaster
- ➔ Blackhawk 205
 - ➔ Crew
 - ➔ Maintenance
- ➔ Duty Refueller – GCFF
- ➔ Refuelling Manager - GCFF



Air Command

Aircraft Incident Investigation

✈ Why did a double defuel occur?



Air Command

Aircraft Incident Investigation



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Aircraft Incident Investigation



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Aircraft Incident Investigation



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Aircraft Incident Investigation



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Aircraft Incident Investigation

Time (Approx)	Customer	Aircraft	Registration	Meter Start	Meter Finish	Sales		Refueller
						O/W	SPR	
0930	Jetcraft	Metro III	VH-VZA	7688945	7689745	800		Duty
1300	AAvnTC	BH-104	A25-104	48502008	48502864		856	Duty
1500	Aeromil Pacific	Cessna CJ	N114CJ	7689745	7690545	800		Mgr/Duty
1600	AAvnTC	BH-205	A25-205	48502864	48503613		749	Duty
1700	Sunjet Airways	Cessna CJ	VH-VLZ	7690545	7692480	1935		Mgr

2005-06-07 **23:29** METARAWS YBCG 1330Z 20007G09KT //// 16.6/15.0 Q1024.4 RMK
RF00.0/010.8 CLD:SCT019 BKN074 OVC091 VIS:9999 BV:13.5 IT:25.4

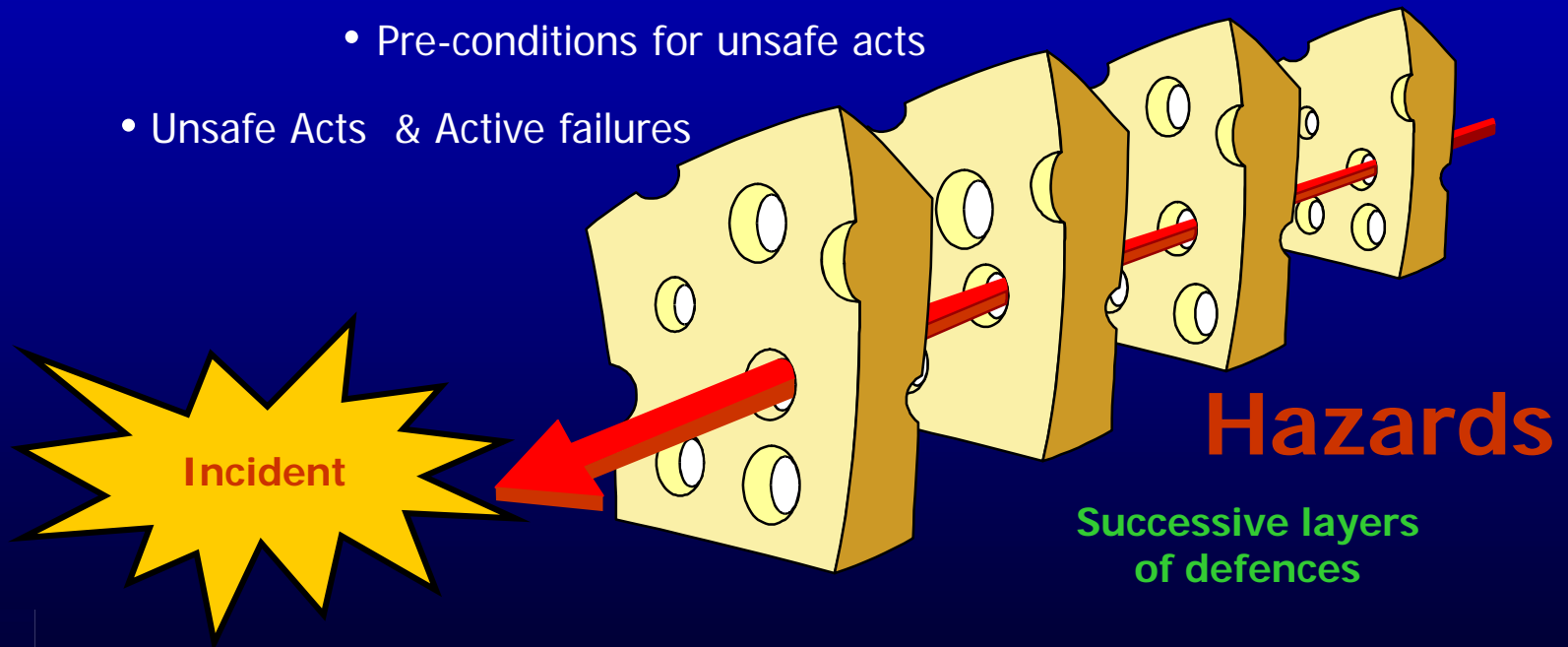


Air Command

Aircraft Incident Investigation

James Reason Accident Causation Model

- Organisational Influences
- Unsafe supervision
- Pre-conditions for unsafe acts
- Unsafe Acts & Active failures

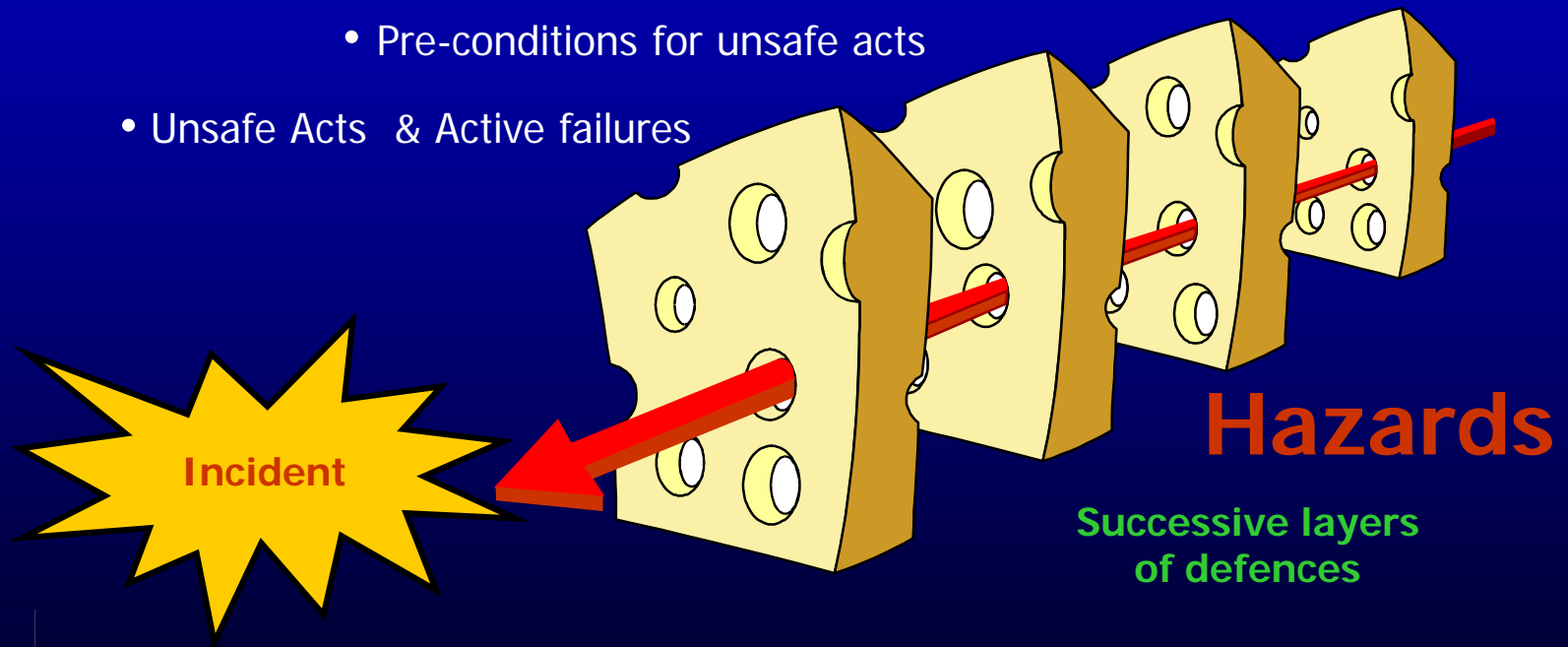


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Aircraft Incident Investigation

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Air Command

Contributing Factors

➔ Unsafe Acts



Air Command

Contributing Factors

→ Unsafe Acts

- Duty Refueller switch selection
- Captain selection of incorrect refueller
- Fuel quarantine procedures violated

→ Defences

- Aircrew Checklist Discipline
- Shell Water Detection Kit



Air Command

Contributing Factors

➔ Preconditions for Unsafe Acts



Air Command

Contributing Factors

- ➔ Preconditions for Unsafe Acts
 - ➔ Aircrew Situational Awareness
 - ➔ Refuel Switch Selector
 - ➔ Refueller Training



Air Command

Contributing Factors

➔ Unsafe Supervision



Air Command

Contributing Factors

- Unsafe Supervision
 - Refueller Training



Air Command

Contributing Factors

→ Organisational Influence



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Contributing Factors

- Organisational Influence
 - GCFF Audit Compliance & Operating Procedures
 - JFLA audit omissions



Air Command

Findings

→ UNSAFE ACTS

- The captain of Blackhawk 104 selected the incorrect contract refueller
- The duty refueller at GCFF selected the 'defuel' pump setting on the refuel/defuel master switch
- GCFF management failed to quarantine contaminated fuel

→ PRECONDITIONS FOR UNSAFE ACTS

- The loadmaster of Blackhawk 104 received both visual and aural cues
- The selector switch was mounted against a plain unmarked silver disc, with no lock wire or label protection.
- The duty refueller received substandard training on the Jet A-1 truck

→ UNSAFE SUPERVISION

- Limited number of SPR operations conducted by the duty refueller

→ ORGANISATIONAL INFLUENCES

- GCFF had not remedied repeated non-conformance events
- JFLA audit omissions



Air Command

Safety Recommendations

✈ Total of 19 recommendations:

✈ GCFF

✈ SAV

✈ JFLA

✈ 16 Bde



Air Command

In Review

- **Bringing it all together**

- *Construct of an ICAO Annex 13 investigation*
- *Looking at the Whole System, not just a part*
- *Don't highlight the obvious, Highlight the obscure!!*
- *Legal authority for investigation*
- *Good relationships between safety professionals*
- *Learn lessons and implement recommendations*
- *Perishable skills (interviewing/evidence)*
- *Common models, common understanding*
- *Taxonomy*
- ***Never get stuck with the report (I did)!!***