Offshore Helicopter Safety

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Analysis of Offshore Helicopter Reportable Accidents 1976 – 2012

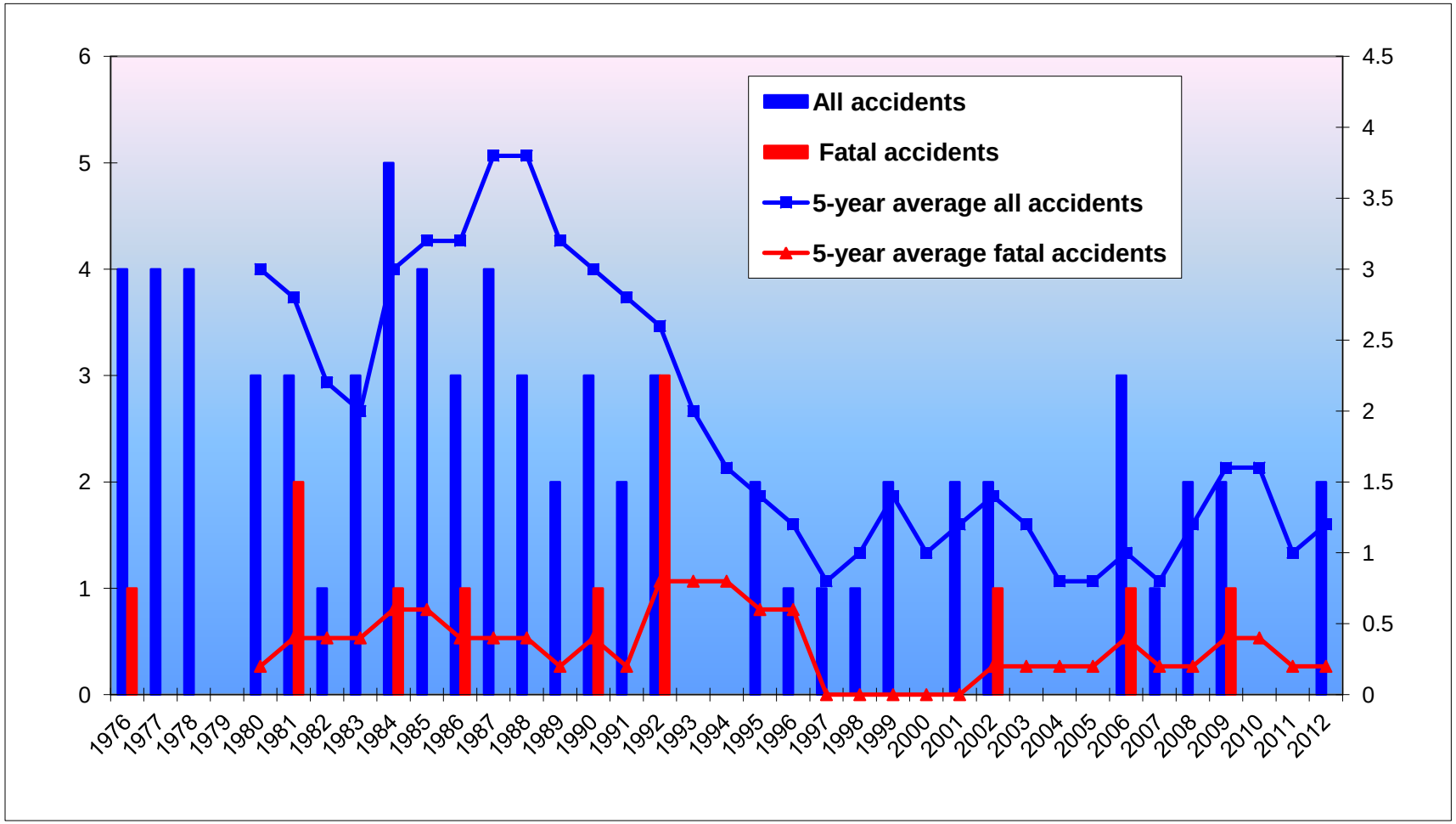
Civil Aviation Authority

Overall Statistics 1976 - 2012

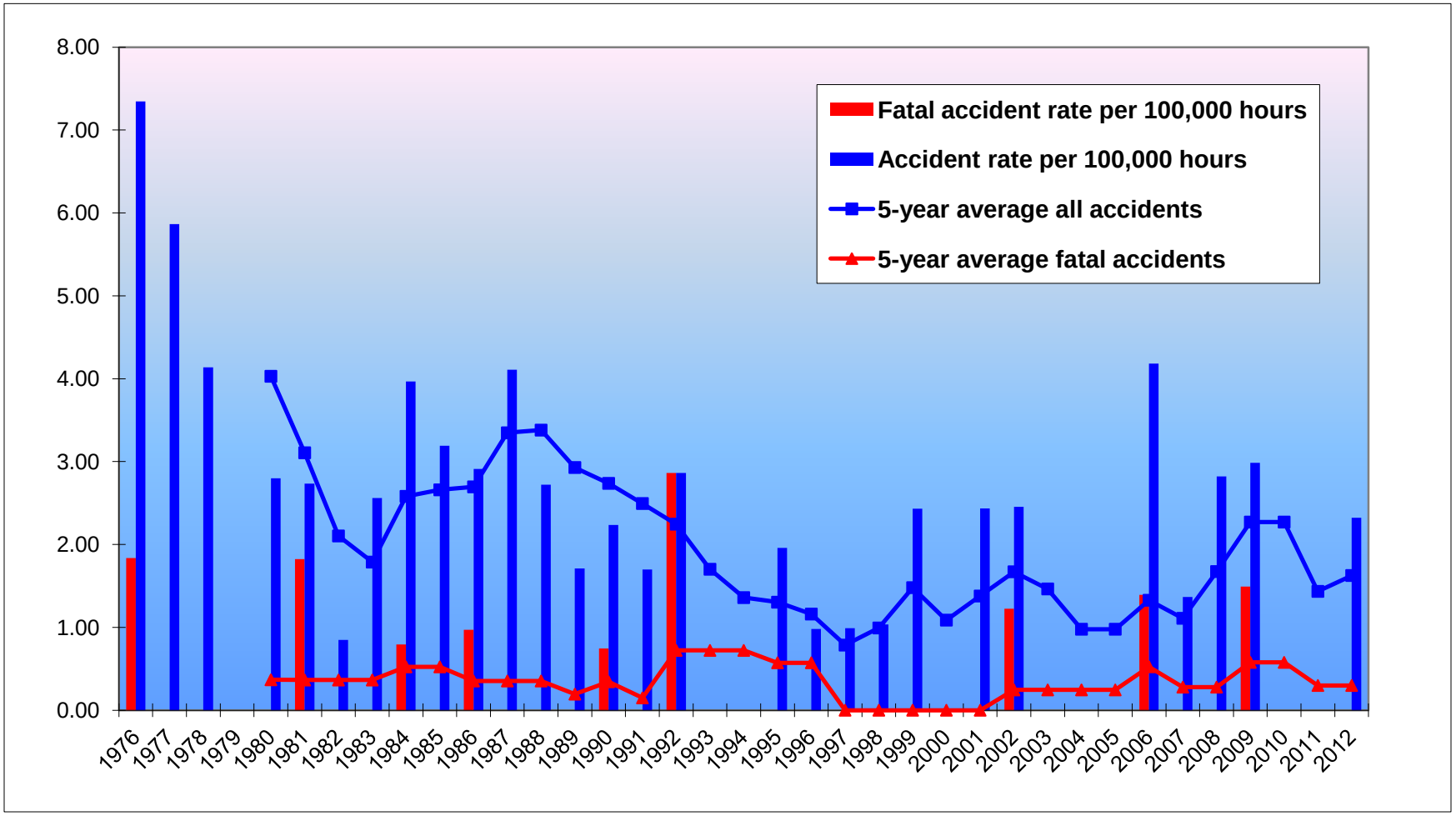
- All accidents:
  - 72 accidents,
  - Approx. 2 per year,
  - 2.1 per 100,000 flight hours.

- Fatal accidents:
  - 12 fatal accidents,
  - 0.32 per year or approx. one every 3 years,
  - 0.36 per 100,000 flight hours.

Chronology of Reportable Accidents



Chronology of Reportable Accidents – Factored by Flying Hours



Coding of Accidents (1)

- CAST/ICAO Common Taxonomy Team (CICTT)
  - Operational:
    - Ground – Aerodrome [ADRM], Evacuation [EVAC], Fire/Smoke (post-impact) [F-POST], Ground Handling [RAMP], Ground Collision [GCOL], Loss of control (ground) [LOC-G], Runway Incursion (vehicle, aircraft or person) [RI-VAP], Undershoot/Overshoot [USOS], Runway Excursion [RE].
    - Flight - Abnormal Runway Contact [ARC], Abrupt Manoeuvre [AMAN], Loss of Separation/Mid-Air Collision [MAC], Air Traffic Management [ATM], Cabin Safety Events [CABIN], Collisions during take-off and landing [CTOL], Controlled Flight Into Terrain [CFIT], Fuel related [FUEL], Loss of Control (in flight) [LOC-I], Unintended flight in IMC [UIMC].

Coding of Accidents (2)

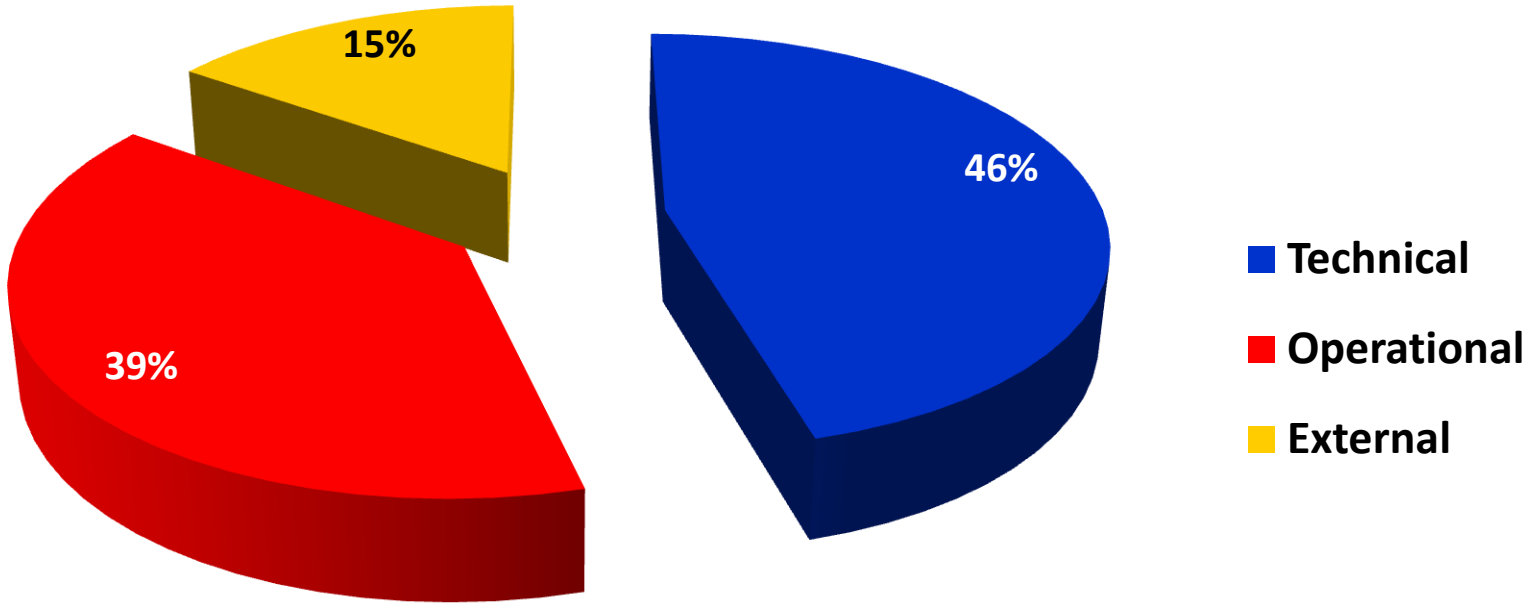
- CAST/ICAO Common Taxonomy Team (CICTT)

  - Technical: Fire/Smoke (non-impact) [F-NI], System/Component Failure/Malfunction (non-powerplant) [SCF-NP], System/Component Failure/Malfunction (powerplant) [SCF-PP].

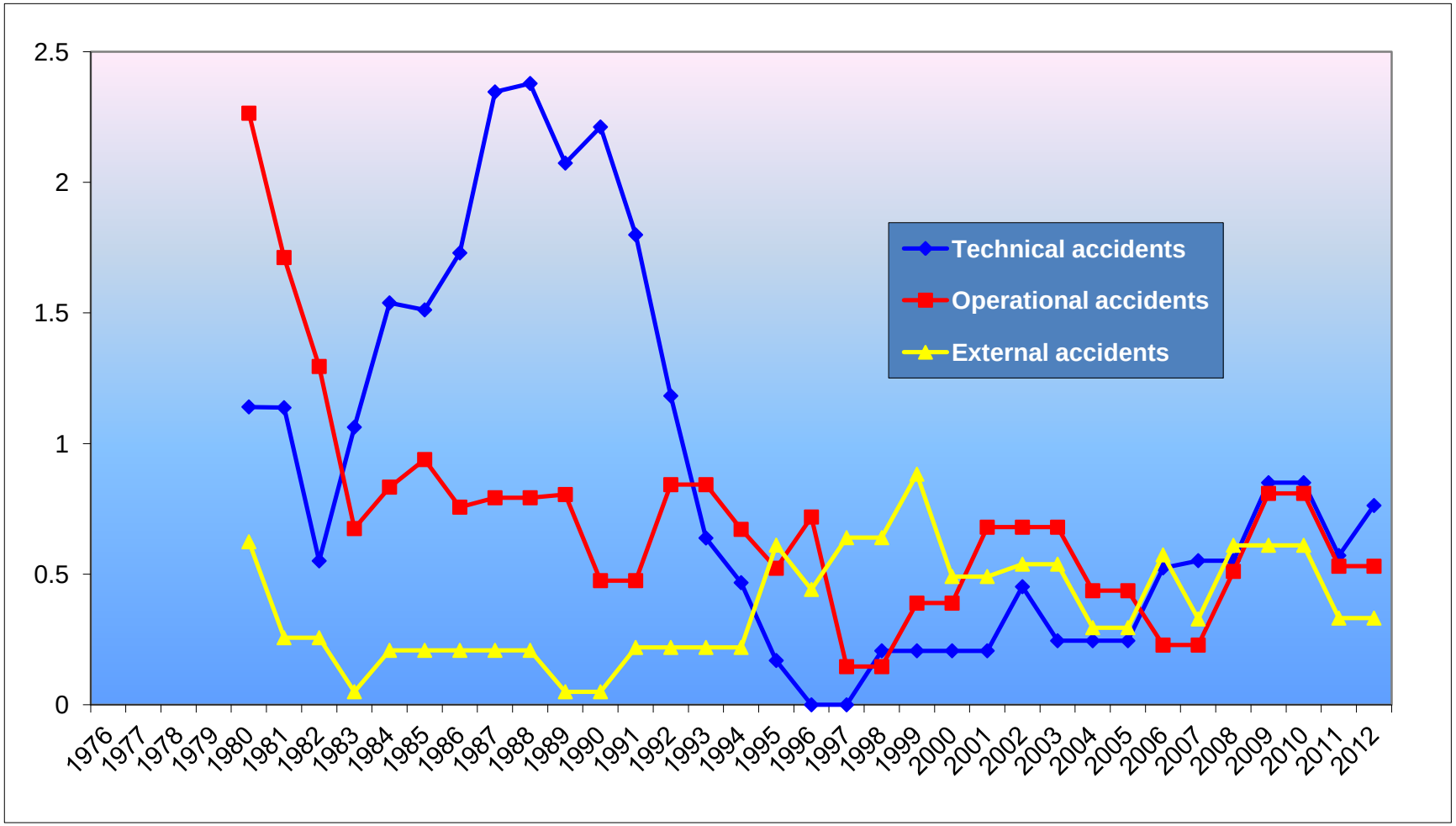
  - External: Bird Strike [BIRD], Icing [ICE], Security [SEC], Turbulence [TURB], Windshear or Thunderstorm [WSTRW].

  - Not applicable: External load related [EXTL], Glider towing related [GTOW], Low altitude operations [LALT], Loss of lifting conditions in flight [LOLI], Runway Incursion (animal) [RI-A], Unknown [UNK], Other [OTHR] .

Breakdown of Accidents by Category 1976 - 2012



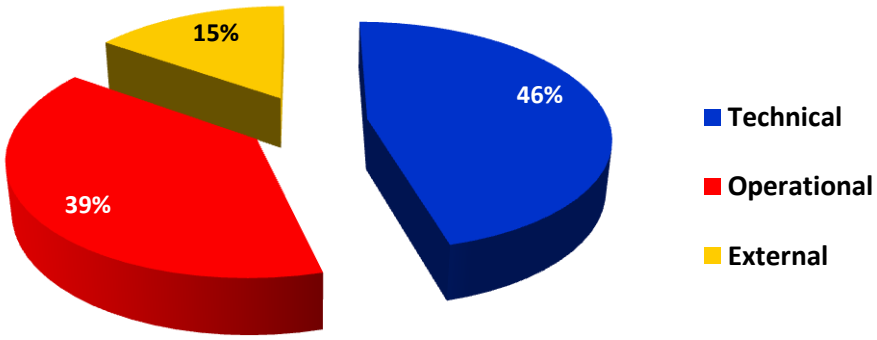
Chronology of Accidents by Category – Rate per 100,000 Flight Hours



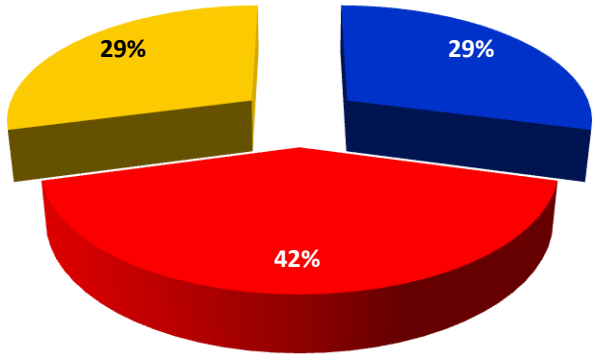
Breakdown of Accidents by Category

Civil Aviation Authority

1976 - 2012



1992 - 2012

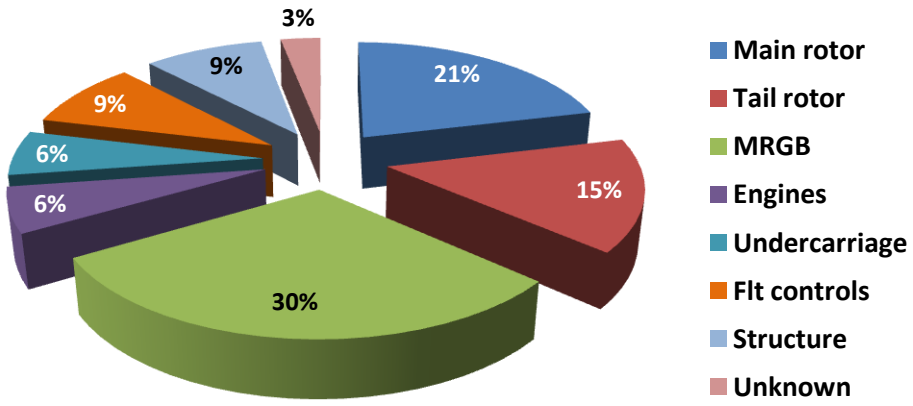


Comparison of Overall Statistics for All Accidents

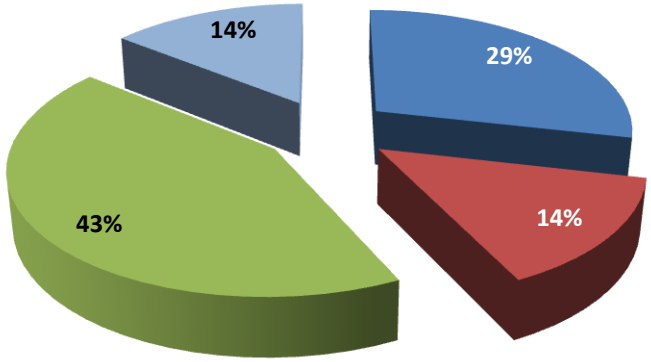
	1976 - 2012	1992 - 2012
Count	72	24
Years	37	21
Annual rate	1.95	1.14
Flying hours	3,452,951	1,754,512
Rate per 100,000 flight hours	2.09	1.37
Sectors	7,499,229	3,667,963
Rate per 100,000 sectors	0.96	0.65

Technical Accidents

1976 - 2012

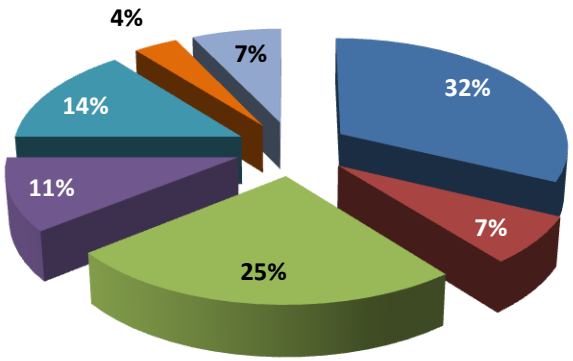


1992 - 2012



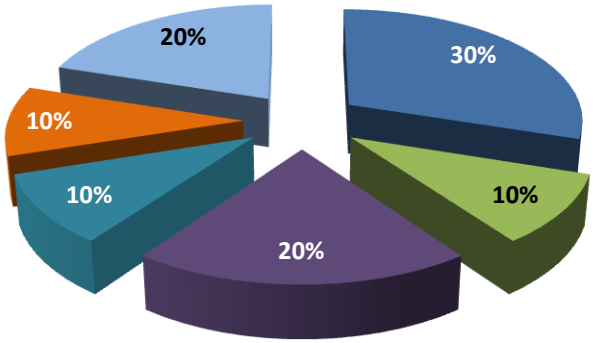
Operational Accidents

1976 - 2012



- Ground handling (RAMP)
- Ground collision (GCOL)
- Collision with obstacle(s) during take-off & landing (CTOL)
- Abnormal runway contact (ARC)
- Loss of control - in flight (LOC-I)
- Loss of control - ground (LOC-G)
- Controlled flight into terrain (CFIT)

1992 - 2012



Operational Accidents
- Pilot Error Accidents (22/28)

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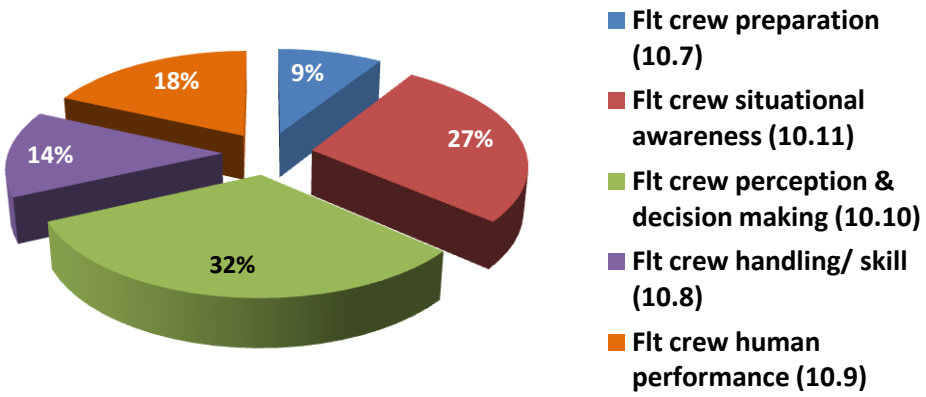
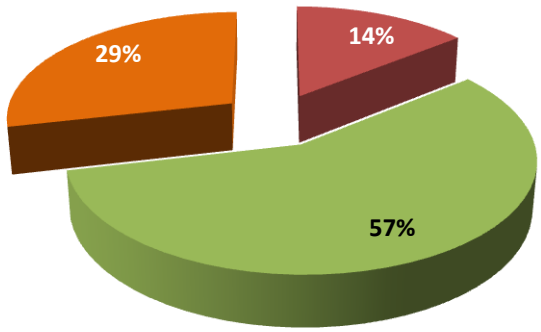
1976 - 2012

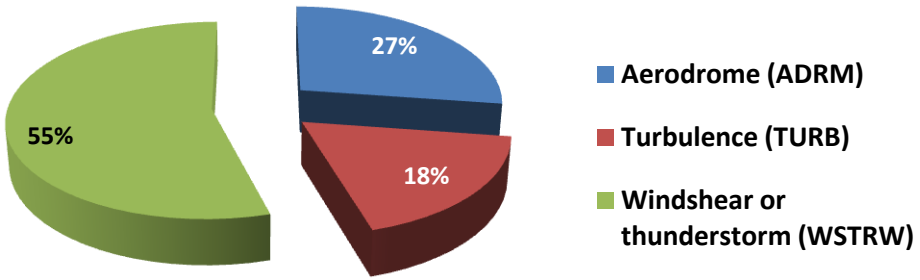


1992 - 2012

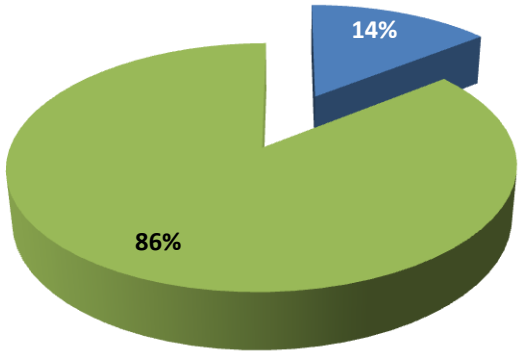


External Accidents

1976 - 2012



1992 - 2012



Comparison of Accident Rates by Category (1992 – 2012)

	Operational	Technical	External
Count	10	7	7
Annual rate	0.48	0.33	0.33
Rate per 100,000 flight hours	0.57	0.4	0.4
Rate per 100,000 sectors	0.27	0.19	0.19

Fatal Accidents

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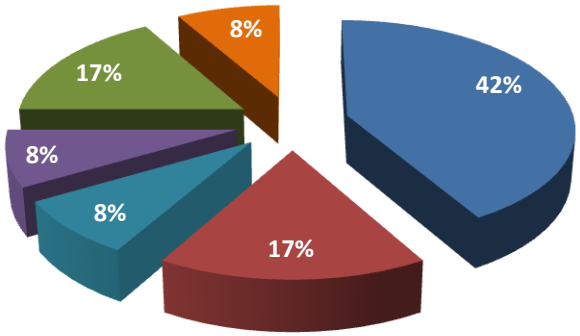
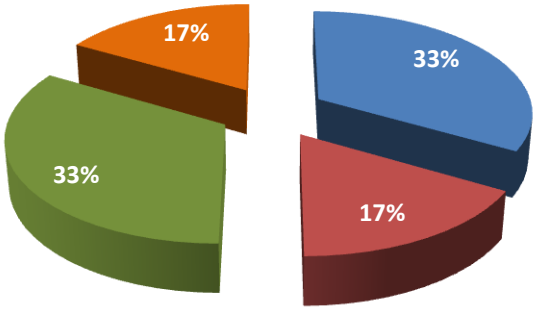
1976 - 2012



- System/component failure - non-powerplant (SCF-NP)
- Loss of control - in flight (LOC-I)
- System/component failure - powerplant (SCF-PP)
- Collision with obstacle(s) during take-off & landing (CTOL)
- Ground handling (RAMP)
- Controlled flight into terrain (CFIT)

1992 - 2012



Comparison of Overall Statistics for Fatal Accidents

	1976 - 2012	1992 - 2012
Count	12	6
Years	37	21
Annual rate	0.32	0.29
Flying hours	3,452,951	1,754,512
Rate per 100,000 flight hours	0.36	0.33
Sectors	7,499,229	3,667,963
Rate per 100,000 sectors	0.16	0.16

Comparison of Overall Statistics for Fatalities

	Cause	1976 - 2012	1992 - 2012
Number of fatalities	Total	124	47
	Technical	97	27
	Operational	27	20
Proportion of occupants killed (%)	Overall	72.4	91.25
	Technical	72.3	100
	Operational*	54.5	82.5

* Excludes two operational accidents each involving a single external (HLO) fatality.

Conclusions – All Accidents (1976 - 2012)

- Total of 72 reportable offshore helicopter accidents (MOR grade A or B) during the period 1976 to 2012.
- Overall accident rate is just under 2 per year or 2.09 per 100,000 flight hours or 0.96 per 100,000 sectors.
- From 1976 to 2012, largest single cause of accidents is Technical (33/72 or 46%), most of which (22/33 or 67%) relate to rotor and transmission failures.
- The second largest cause of accidents is Operational (28/72 or 39%), most of which (22/28 or 79%) relate to pilot error.
- The third largest cause is External (11/72 or 15%), the largest single part of which (5/11 or 46%) were lightning strikes.

Conclusions – All Accidents (1992 – 2012)

- Change in rate and distribution of accidents by category around 1992 mainly due to significant reduction in Technical accidents – coincident with introduction of HUMS.
- Distribution of accidents relatively even across categories and stable from 1992 to 2012.
- From 1992 to 2012, largest single cause of accidents is Operational (10/24 or 42%), most of which (7/10 or 70%) relate to pilot error.
- The remainder of the accidents during the period 1992 to 2012 are equally divided (7/24 or 29% each) between Technical and External causes.
- Most Technical accidents (6/7 or 86%) relate to rotor and transmission failures.
- Most External accidents (5/7 or 71%) are lightning strikes.

Conclusions – Fatal Accidents

- Of the 72 reportable accidents during the period 1976 to 2012, 12 (17%) involved fatalities.
- The fatal accident rate is stable throughout the period at just under one every 3 years or 0.33 per 100,000 flight hours or 0.16 per 100,000 sectors.
- The fatal accidents are evenly distributed between Technical and Operational causes.
- The main cause of Technical fatal accidents (4/6 or 67%) is rotor and transmission failures.
- The main cause of Operational fatal accidents (4/6 or 67%) is pilot error.
- There have been no External cause fatal accidents.

Conclusions – Fatalities

- The 12 fatal accidents during the period 1976 to 2012, resulted in a total of 124 fatalities, representing 72.4% of the occupants.
- The 6 fatal accidents during the period 1992 to 2012, resulted in a total of 47 fatalities, representing 91.25% of the occupants.
- Technical accidents consistently account for a greater number of fatalities than Operational accidents.
- Technical accidents consistently result in a greater number of fatalities as a proportion of total number of occupants than Operational accidents.

Overall Conclusions

- The last 20 years (1992 to 2012) of offshore operations are representative of current operations.
- The accident rate is relatively stable at 1.14 per year or 1.37 per 100,000 flight hours or 0.65 per 100,000 sectors.
- The fatal accident rate over this period is 0.29 per year or 0.33 per 100,000 flight hours or 0.16 per 100,000 sectors.
- The main causal factors of reportable accidents are (in order):

  1st Operational – pilot error.

  =2nd Technical – rotor and transmission failures.

  =2nd External – lightning strikes.
- Fatal accidents follow a similar pattern except that there have been equal numbers of Technical and Operational fatal accidents, and no External cause fatal accidents.
- Technical accidents are consistently more lethal than operational accidents.

Thank you for your attention…

Any questions?