TCAS II on Helicopters?

“Can it be done?”

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Scope

History - why we got here

TCAS I or TCAS II?

How do we operate?

The route to the STC

The trial proper

The results
Why did we get here?

Airprox
Scatsta
Norwich
Nigeria
Aberdeen
TCAS I or TCAS II?

For
- Cost

Against
- Misleading
- Unregulated
- VFR Only
- Linus Blanket

TCAS II
- Regulated
- Standardised
- IFR/VFR
- Positive
- Cost
How do we operate?
(To where and with what)

In simple terms, just like the A319 which brought me here today!!!
Where do we go?

JACK-UP DRILLING UNIT
Where do we go?

SEMI-SUB DRILLING UNIT
Where do we go?

PRODUCTION PLATFORM
Where do we go?

ACCOMMODATION FLOTEL
Where do we go?

FPSO and TANKER
Where do we go?

CRANE BARGE
**AS332L (SUPER PUMA)**
- Normal cruise speed 120 knots
- Seating up to 19 passengers & 2 crew
- 2 engines
- Standard range 490NM
- 29 in EH fleet

**SIKORSKY S76**
- Normal cruise speed 140 knots
- Seating up to 12 passengers & 2 crew
- 2 engines
- Standard range 335NM
- 36 in EH fleet
The new one!

EC225
Cruise speed – 150Kts
Seating – 19 passengers + 2 Crew
Range – 400nm with full IFR reserves
How do we operate?

Flight BHL62A to the Britannia
35 kts
Aberdeen
Britannia
Sumburgh
0h 52m
0h 50m
Inverness
Aberdeen
35 kts
Aberdeen
Britannia
Inverness
0h 52m
0h 50m
Air Traffic Control (ATC) Services

Radar Advisory Service up to 80 nm

Flight Information Service over 80 nm
‘Airborne Radar Approach’

- Overhead the beacon
- Initial descent and then turn
- Final descent
- Offset turn
- Decision point
‘Airborne Radar Approach’

Minima – 200ft & 3/4 nm
**ILS (Instrument Landing System)**

- Radar vectors
- Intercept localiser
- Intercept glideslope
- Double check height
- Decision height
**ILS** (Instrument Landing System)

Minima – 200ft & 500m
Questions so far?
To summarise….

- N Sea ‘heavy’ helicopters;
  - Plan and Fly IFR
    - SIDs
    - En Route ATS
    - STARs
  - Carry ‘charter’ passengers;
    - Trajectories are similar to FW operations

Thus TCAS II rather than TCAS I is appropriate
The route to the STC

• c2001
  – BALPA HSG raised the question; why not fit TCAS to helicopters – refined later to ‘TCAS II’ because of operational limitations of TCAS I.
    • Discovered ACJ OPS 3.398
      – Minimum closure rate blo F100 480Kts
      – Minimum ROCD 1500fpm
  • 2002/3
    – Discussions, research and yet more discussions confirmed that ‘it MUST be TCAS II’ and serious doubt on the JAR OPS 3 statement.
  • 2004
    – More ‘formal’ proposals made to manufacturers for a possible ‘joint’ trial. Rockwell Collins offered loan of equipment and engineering expertise.
    – Formed unofficial ‘team of three’ to progress the project ‘in the shadows’.
      • Self – Co-ordination
      • Capt Mark Prior – Test Pilot.
      • Mr Grant Ireland – Design Office Manager.
The route to the STC (2)

• 2005
  – Discussions with Shell Aircraft to sponsor the design costs – agreed June.
  – Formal presentation to Airline Senior Management for approval to proceed – given.
  – Briefing/Discussions with Eurocontrol.
  – Briefing/Discussions with UK IFF/SSR Policy Board.
  – Training of crews discussed – plan agreed.
  – Visit from Rockwell Collins aerial expert, advice given and accepted by our design office.
  – Application for STC to EASA 15 Nov.
The route to the STC (3)

• 2006
  – EASA certification passed to UKCAA 23 Jan.
  – Aircraft nominated (G-TIGE). Work to be completed during ‘D’ check mid-January to end February.
  – Due engineering pressures, aircraft emerges with only approx 50% of work complete.
  – Further work requires removal from the ‘line’ – difficult!
  – Application for ‘Permit to Fly’ under test conditions specified in STC application made 9 April.
  – 16 May. ‘Permit to Fly’ arrives from UKCAA.
  – May - Test points for airflow interference upper Æ vs tail rotor flown – satis.
The route to the STC

• 2006
  – What is left?
    • Ground Tests  (by 16 Jun)
    • Crew Training (if ground tests satis)  (by mid Jul)
    • Complete Agreed Flight Test Schedule  (by end Jun)
    • Apply for/receive STC from EASA  (Mid Jul/Mid Sep)
  – Confidence factor of Timeframes?
    • Depends on aircraft availability and UKCAA engineers.
    • 75%
To Summarise

Idea

Spring 05

Line Aircraft Fit

Autumn 06

- RC, SAL & BHL Mgt Buy-in
- Aircraft Mod Designed
- STC Proposal & acceptance of Process - EASA
- Process Completed, report submitted, STC Applied for
- STC Granted
The Route to the STC (5)

G-TIGE paint stripped, cleaned and awaiting transfer to the maintenance hangar.
The Route to the STC (6)

The ‘D’ check

Yes, there is an aircraft in there somewhere!
The Route to the STC

Senior avionics engineer working on the mode ‘S’ txpndr/TCAS interface panel during the ‘D’ check.
The Route to the STC (8)

Baggage bay location of TCAS Computer.
The Route to the STC

Installation of feeders for upper AE
The Route to the STC (10)

Upper Æ
The Route to the STC (11)

Lower Æ
The Route to the STC (12)

The business end!
Questions so far?
The Trial Proper

- Flight Test Schedule BHL/FTD/332/06/02 is part of the EASA agreed certification to clear carriage and correct functioning of the Rockwell Collins TCAS System.
- The modification is classified as a ‘Major Change’ and iaw Part 21A101 the change is ‘Non-Significant’
- Basis of Certification – CS29.
The Trial Proper

- Flight Test plan strongly influenced by UKCAA Paper 92011 – Report on UK Operational Trial of TCAS II (Mr Dave Howson)
  - Will answer all the points raised in the conclusions of Mr K Carpenter’s paper ‘Fitting ACAS to helicopters’ dated 2003.
  - Will, for the first time, provide a practical answer to the question – ‘Will TCAS II work on helicopters?’
So then, will it work?

To be honest – I think it will (But then, I’m just a pilot!)
And if it does?

It should be fitted on ‘heavy’ helicopters in ‘airline’ service under the same rules as for Turboprop Aeroplanes – The same ‘net safety benefit’ would be realised.
Thank You for your time.