
Civil Aviation Authority

# Research Update

## Briefing for 29 September 2016 HSRMC

David Howson, 24th September 2016

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- Helicopter TAWS

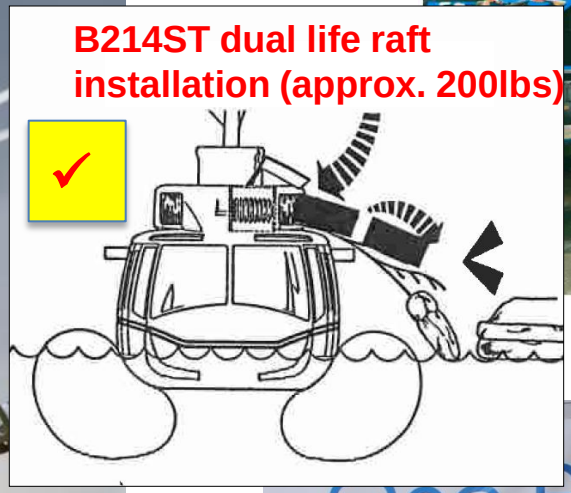
# Helicopter Ditching & Water Impact EFS (1)

- EASA rule and AMC changes may not include air pocket scheme (side-floating helicopter scheme):
  - Downgraded from rule to AMC in NPA 2016-01;
  - Objections to AMC content;
  - No consensus in RMT.0120;
  - To be referred to internal EASA resolution process.
- Air pocket scheme accounts for most (approx. 2/3$^{rds}$) of the lives saved in EASA NPA 2016-01 Regulatory Impact Assessment.

# Helicopter Ditching & Water Impact – EFS (2)

- Issues raised include:
  - Additional weight high on fuselage;
  - Aerodynamic effects in critical area.






# Helicopter Ditching & Water Impact –EFS (3)

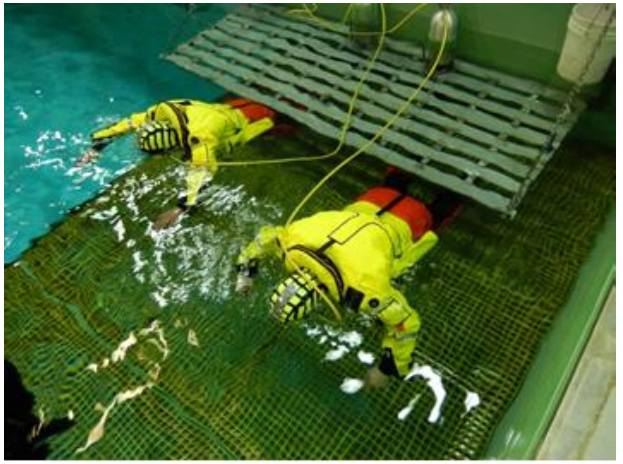
- Other issues raised include:
  - High temperature environment due to exhaust wash:
    - Pegasus float bags fabricated from Kevlar.
  - Inadvertent deployment in flight:
    - Systems can be designed that are sufficiently reliable. e.g. Bristow AFDS (failure rate approx. 1 x $10^{-7}$ per flight hour), Airbus Helicopters auto life raft deployment.
  - Damage following deployment due to main rotor:
    - Pegasus deployed post capsize (i.e. after rotor has struck the sea) using water pressure switch.
    - Other possible solutions are to trigger upper float(s) using tilt switch (e.g. > 90° roll); inhibit deployment of upper float(s) based on Nr.

# Helicopter Ditching & Water Impact – EBS (1)

- ASD-STAN Working Group D1S9 - Ditching Equipment:
  - Initially formed to produce standard (prEN 8.7009) for EBS.
  - Agreed to extend scope to include immersion suits, life jackets and life rafts (all items identified for review by EASA RMT.0120).
  - Work on EBS standard nearing completion – no significant changes from UK CAA CAP 1034 standard used to approve current Cat A EBS.
- Air Operating Rules (SPA.HOFO):
  - SPA.HOFO.165(c) – all occupants to carry and be instructed in the use of EBS.
  - AMC1 SPA.HOFO.165(c) – must be capable of rapid underwater deployment (= Cat A).

# Helicopter Ditching & Water Impact – EBS (2)

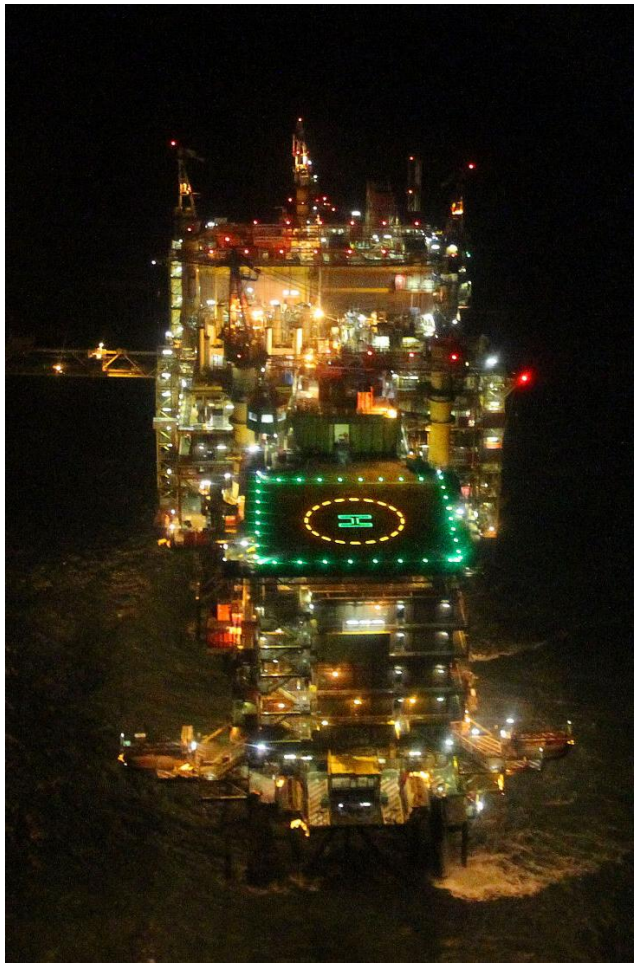
- CAT A EBS Training:
  - Work on introducing wet training for Cat A EBS progressing.
  - Main issue has been application of Diving At Work Regulations (DAWR) by HSE.
  - Evidence provided by in-water training experience in Canada using compressed air EBS has been taken into account by HSE's diving and medical teams.
  - Sept 2015 DAWR exemption remains extant, work ongoing to use Canadian evidence to revise exemption and identify a shallow-water training package that has the appropriate risk controls in place.
  - 'Road map' to eventual extension of Cat A EBS training to HUET to be developed.



# Operations to Moving Helidecks

- In-service trial ‘parked’ pending installation of upgraded ‘traffic lights’.
- Higher intensity prototype lights evaluated by pilots at Aberdeen.
- 400cd main beam daylight intensity agreed.
- Cost and delivery estimate for two sets of four Zone 2 certificated lights (one each for Chevron Captain and Alba) received from Orga.
- Each light will:
  - generate all 3 colours
  - control mode (flashing/steady burning)
  - control intensity (day/night)
- Expecting installation around Q2 2017.
- Refinement of generic MSI/WSI limit prior to implementation.

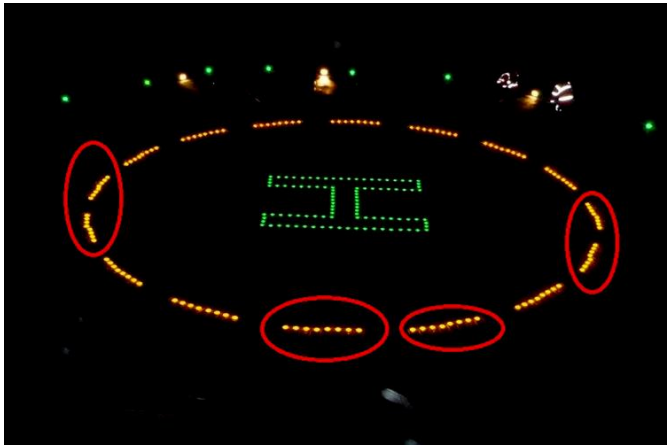
# Helideck Lighting – Circle and H (1)

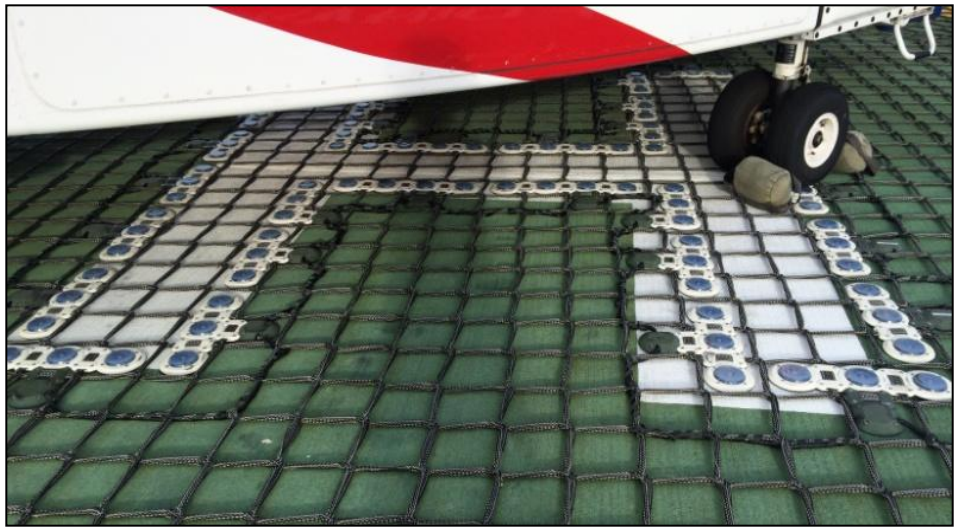


- Status of approvals:
  - Orga, IMT and Tranberg systems approved by HCA.
  - Orga system approved by CAAi.
- In-service issues so far:
  - Lens cracking on IMT system – suspect due to polycarbonate lenses not coated.
  - Alleged tyre damage caused by Orga system; not confirmed by independent testing at NLR, but fixing nuts to be modified anyway.
  - Detachment of H mounting plate – rivets used by installers too weak; CAP 437 material will be enhanced.
  - Minor slide off lights at lift off.

# Helideck Lighting – Circle and H (2)

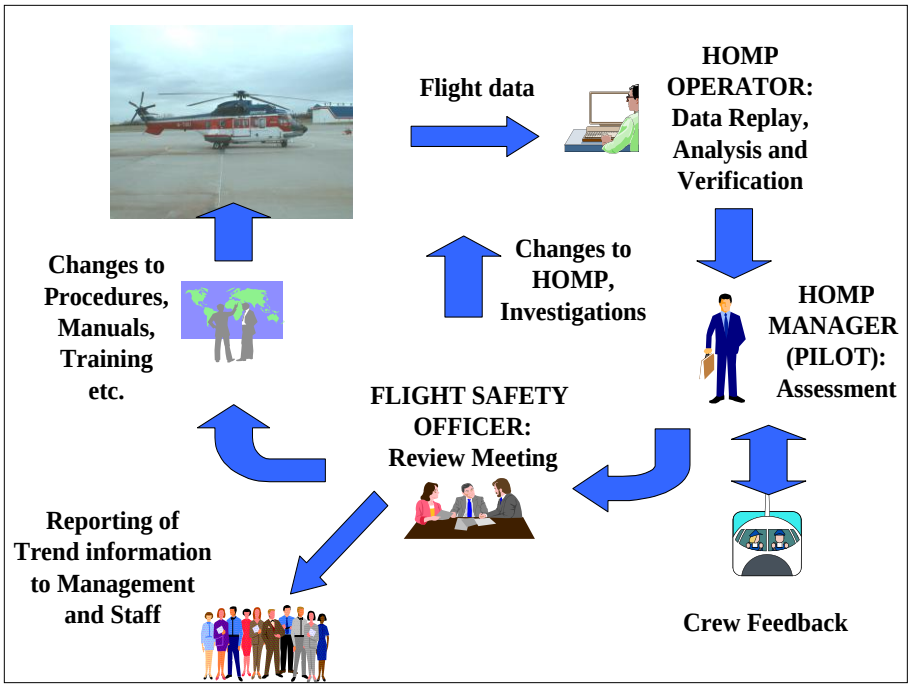
- FricTape Solution:
  - Issues with circle:
    - Some ‘aliasing’ of circle.
    - Shape of segments – due to incorrect position of tensioning straps – now fixed.
  - Issues with H:
    - Positioning/movement – narrower H proposed to increase margin.



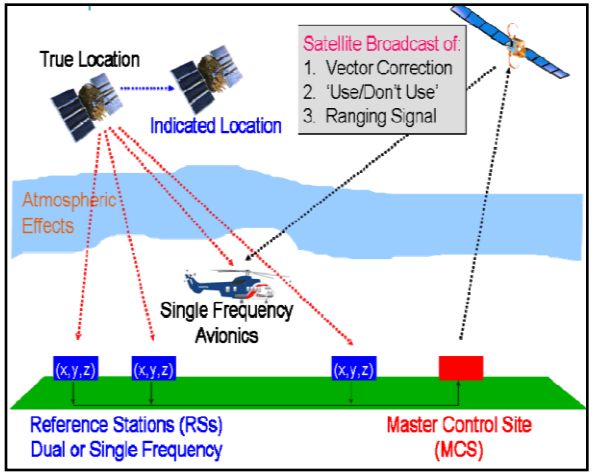


# Helicopter Flight Data Monitoring

- HFDM guidance material to be produced by CAA working with the helicopter operators, EASA and HeliOffshore.
- Objective is to generate HFDM best practice material specifically targeted at offshore helicopter operations to:
  - Address issues arising from CAA Offshore Review (CAP 1145);
  - Address UK AAIB Safety Recommendations in Sumburgh accident report.
  - Support the EASA (SPA.HOFO) HFDM mandate (effective from 01 July 2018).
- Will complement HeliOffshore 'big data' project.



# GPS- Guided Offshore Approaches



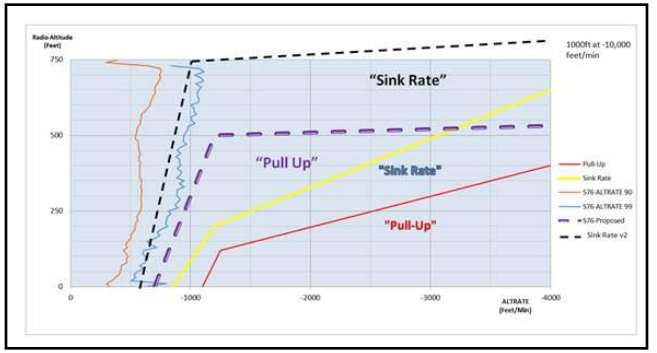

- Research (SOAP) completed apart from night trial.
- Next logical step could be introduction into service trials.
- OEMs have systems available (e.g. S92 'rig approach').
- Could use existing OEM system as a vehicle for trials if close enough to SOAP or better than SOAP.
- Need to investigate OEM systems and perform gap analysis.
- Preliminary proposal obtained from contractor (Helios Technology).
- Currently liaising with HeliOffshore.
- Seeking HSRMC agreement/approval.

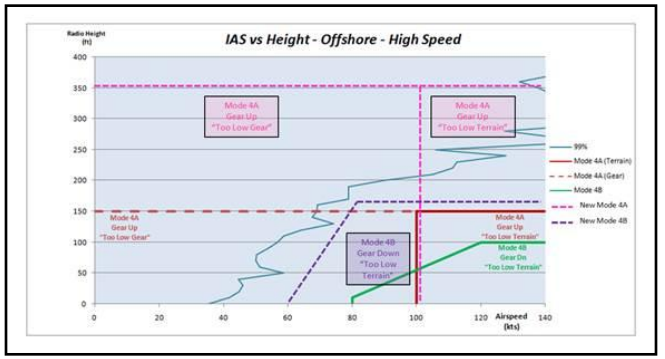
# Helicopter TAWS

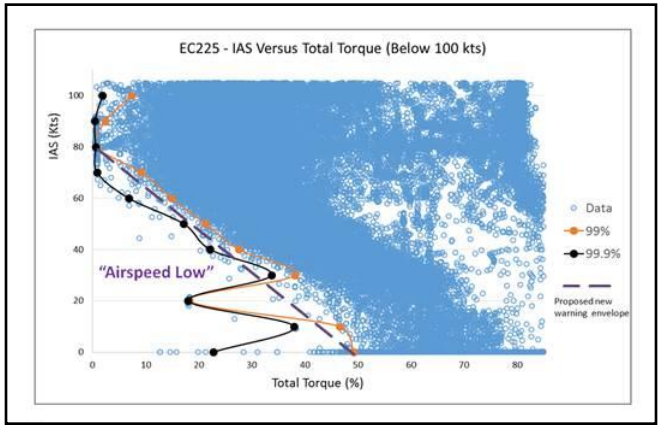
- Two-phase implementation programme agreed with HeliOffshore:
  - Phase 1:
    - New/improved warning envelopes.
    - Essentially limited to HTAWS unit changes; minimal integration with aircraft (button label change only).
    - Specification to be published in UK CAA CAP by end 2016.
    - HTAWS manufacturers will produce equipment service bulletins.
    - Helicopter manufacturers will cover introduction of modified HTAWS with aircraft service bulletins (major modification as HTAWS Flight Manual supplement affected).
    - Target date for completion of voluntary retrofit is end 2017.
    - HTAWS mandated for new helicopter registrations from 01 January 2019 by EASA.

# Helicopter TAWS

- Phase 2:
  - Pending completion of Cranfield University research on warning form/format.
  - Will include all modifications to HTAWS and any aircraft modifications.
  - Will pursue formal specification (RTCA MOPS).
- Progress:
  - All parties pledged support at April 2016 HeliOffshore conference.
  - Work on Phase 1 specification under way.
  - Validation against S92 and AW139 HFDM data in progress.
  - Honeywell fully briefed (produced engineering prototype for flight simulator trials).
  - Meeting with Rockwell-Collins & Leonardo Helicopters held on 27 September 2016.



| Occurrence | Warning Times | | | | | |
|---|---|---|---|---|---|---|
| | Current Equipment | | Modified Equipment (EC225) | | Improvement | |
| | AVAD | HTAWS | Revised Envelopes | New Envelopes | Seconds | % |
| Scilly Isles, 1983 | 24.0 | 4.0 | 24.0 | 0.0 | **0.0** | **0** |
| Cormorant 'A', 1992 | 6.0 | 1.5 | 17.0 | 0.0 | **11.0** | **183** |
| Morecambe Bay, 2006 | 7.0 | 7.0 | 8.0 | 35.0 | **28.0** | **400** |
| ETAP, 2009 | 7.0 | 1.5 | 15.0 | 13.0 | **8.0** | **114** |
| Sumburgh, 2013 | 5.0 | 7.0 | 8.0 | 13.0 | **6.0** | **86** |
| Clipper, 2013 | 0.0 | 5.0 | 35.0 | 0.0 | **30.0** | **600** |
| Sea Rose, 2011 | 12.0 | 18.0 | 32.0 | 15.5 | **14.0** | **78** |
| '920194' | 1.0 | 6.8 | 11.4 | 18.0 | **11.2** | **165** |

**Best warning time (current)**

**Best warning time (new)**

Civil Aviation Authority

Thank you for your attention…

# Any questions?