



Research Update

Briefing for 24 February 2016 HSRMC

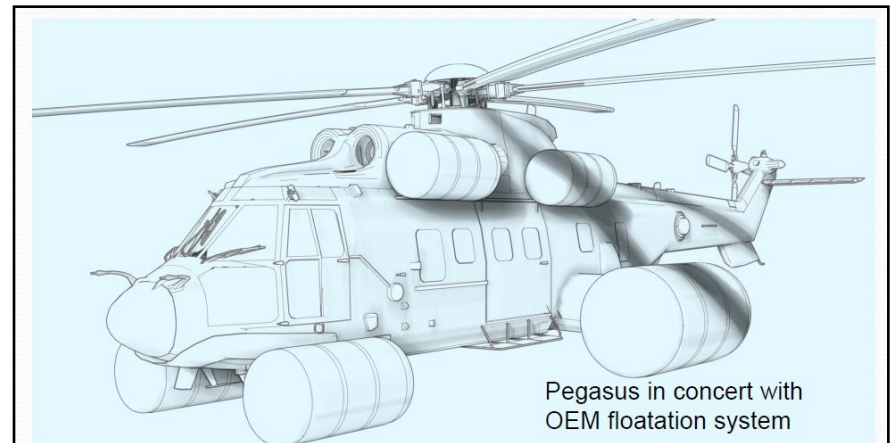
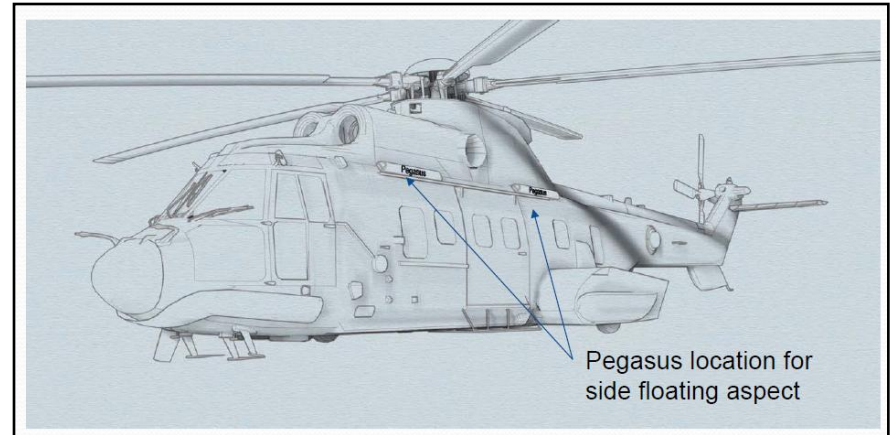
David Howson, 11th February 2016

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- Helideck Environmental Issues
- Helicopter TAWS
- Triggered Lightning Strikes

Helicopter Ditching & Water Impact

- EASA RMT.0120:
 - Publication of NPA for new helicopter designs delayed (expected by end Feb 2016).
 - EASA has agreed to Phase 2 to produce second NPA to cover retrofit.
- CAP 1145 Recommendation R5 needs to be addressed.
- One Atmosphere 'Pegasus' post crash buoyancy system presented to 13 July 2015 HSRMC:
 - Very light (approx. 35kg for S.Puma) and compact.
 - Independent of existing EFS.
 - Battery powered.
 - Water pressure switch activation.



Helicopter Ditching & Water Impact

- Progress on One Atmosphere 'Pegasus' post crash buoyancy system :
 - A109 airframe sourced for capsizing trials.
 - Marine Board approval for trials obtained.
 - CASA support the project and will be involved with the trials.
 - Initial results possibly by May 2016; trials completed around mid-2016.
 - Defence Certification being expedited.
 - Concurrent Australian & European civil certification will follow completion of successful trials.
 - One Atmosphere may be able to attend next HSRMC to present results.



Helicopter Ditching & Water Impact – EBS

- Formal EBS specification (ETSO):
 - ASD-STAN D1S9 working group established to produce formal standard (prEN/EN); first meeting 27 January 2016, next 16/17 March 2016.
 - EASA will cover with an ETSO.
 - CAA representing EASA.
 - Dr Coleshaw (author of CAP1034) involved as an SME.
 - All major equipment manufacturers represented.
 - Agreed for scope to be expanded to include immersion suits, life jackets and life rafts.



Helicopter Ditching & Water Impact – EBS

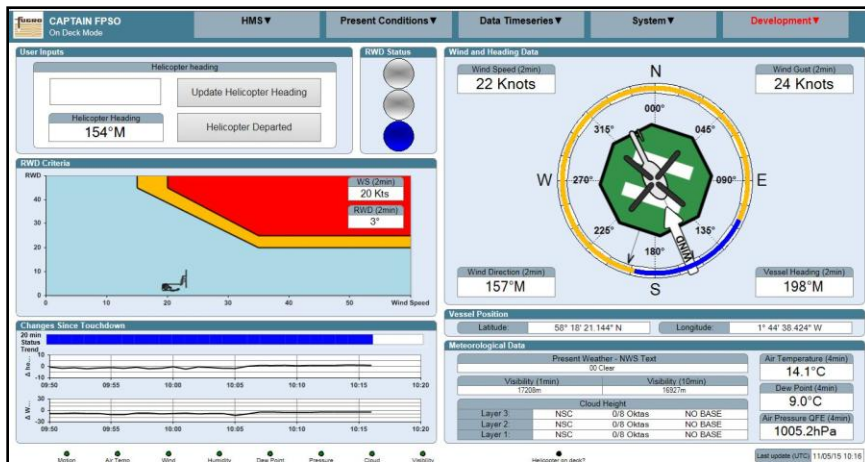
- EBS training:
 - Exemption from DWR issued by HSE; additional medical screening (spirometry) required.
 - OGUK statement issued December 2015:
 - ‘wet’ training with old EBS to be discontinued;
 - ‘dry’ training only with new compressed air EBS;
 - longer term aim is to work towards full ‘wet’ training including HUET.
 - CAA, OGUK, HSE & Step Change all working together to establish way forward:
 - researching data on sport diving statistics;
 - researching results of spirometry;
 - investigating initial shallow water only option.



Operations to Moving Helidecks



Example pre-landing display



Example helicopter on-deck display

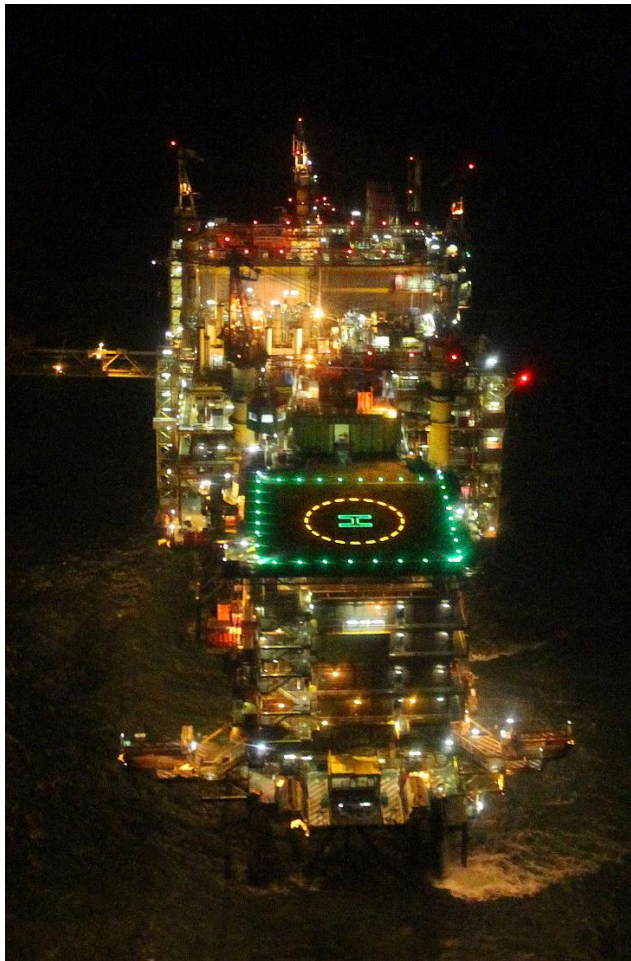
- Trials of new HMS on ‘Captain’ FPSO (Chevron/Bristow/NHV) :
 - Commenced end April 2015.
 - Traffic lights too dim in daylight;
 - Some minor anomalies with HMS functioning.
 - Trial suspended following 9th Sept 2015 review meeting; to be resumed when updated software installed (expected late February 2016).
- Planning to include new HMS in next update (8th Edition) of CAP 437 - CAA/Atkins spec. to be combined with HCA standard.

Helideck motion repeater lights (2)

- Higher intensity lights based on Orga wave-off light produced for onshore evaluation by pilots at Aberdeen.
- 3 settings 200cd, 400cd and 600cd available to try (luminance similar to road traffic lights).
- Each light will:
 - generate all 3 colours
 - control mode (flashing/steady burning)
 - control intensity (day/night)
- Zone 2 certificated units to be produced once required intensity established.



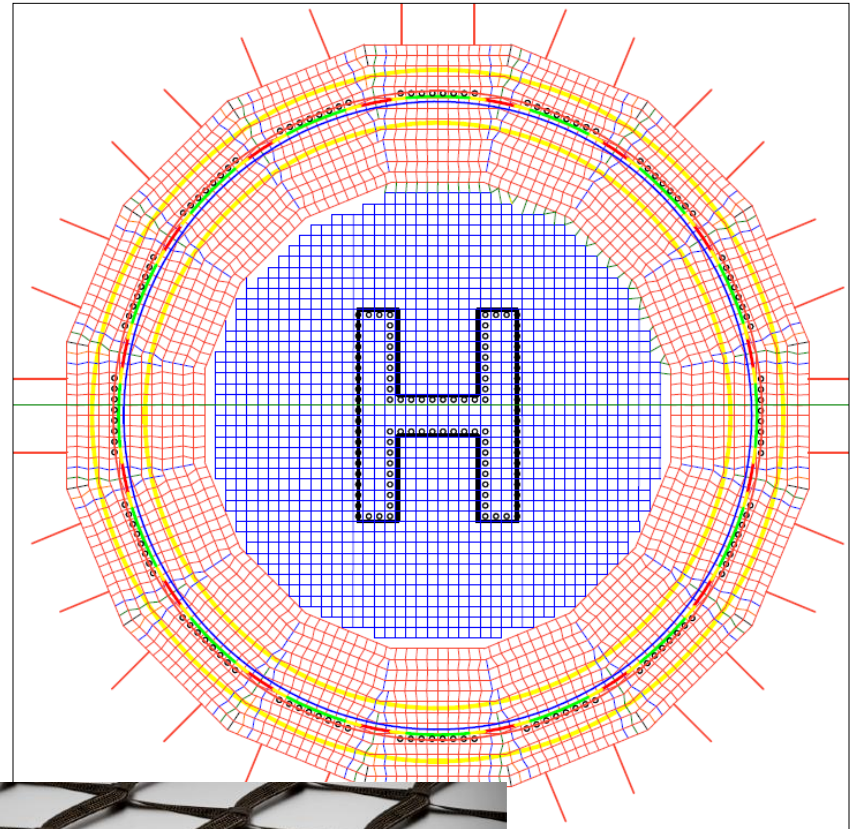
Helideck Lighting – Circle and H



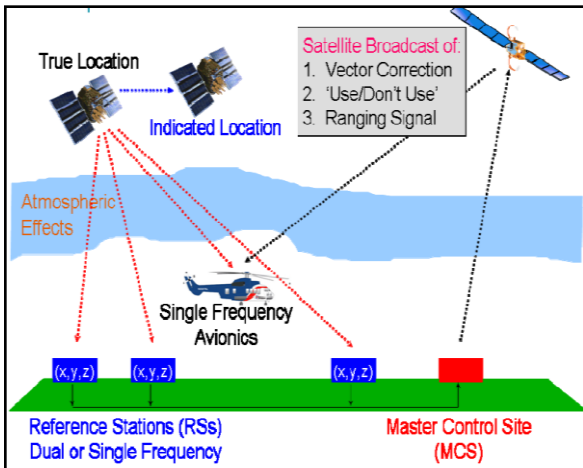
- Update to CAP 437 Appendix C:
 - Tolerances on size and positioning of circle and H lighting introduced.
 - Requirement for drainage quantified.
 - Applicability of general requirements to perimeter lights as well as circle & 'H' clarified.
 - Will be incorporated in next update to CAP 437 (8th Edition) expected mid-2016.
- Approval:
 - All systems must be approved by HCA.
 - Seek confirmation from HCA; do not rely on marketing information.
 - CAA contracted (via CAA International) to approve several systems.
 - HCA will accept CAA approval, but still need to issue a letter.

Helideck Lighting – Circle and H

- FricTape solution - questions/concerns:
 - ‘Pixelation’/ ‘aliasing’ of circle.
 - Accuracy of positioning of circle.
 - Net movement/stretching.
 - Durability of wiring connections.
- Some hopefully addressed by new net design.



GPS- Guided Offshore Approaches



- Dedicated trials:
 - New helideck lighting on Miller platform (since Sept 2014) and Bond AS332L2 trials aircraft accessible.
 - Night trial could now be progressed.
- Introduction into service trials:
 - Could progress in parallel with or instead of night trial.
 - Could use existing OEM system – close enough to SOAP but will need AIS to be added (EFIS software modification).
 - Initial discussions held with JOR, now superseded by HeliOffshore.
- Gap analysis between OEM systems and SOAP needed?

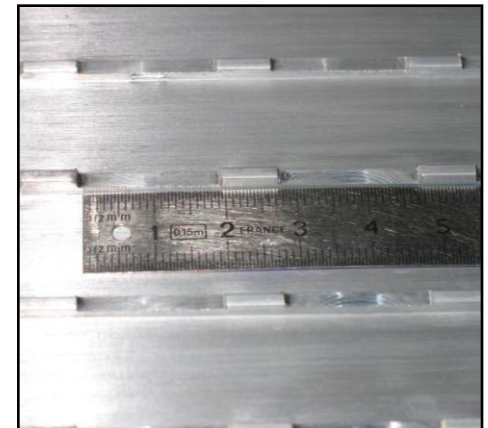
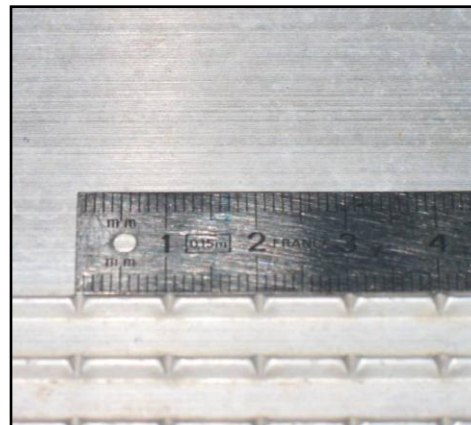
Helideck Friction



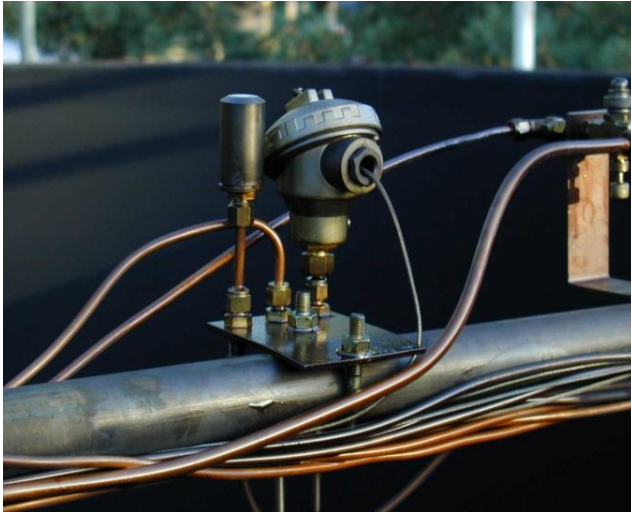
- All research at NLR in The Netherlands completed and reported.
- Proposed new scheme discussed and agreed in principle with HCA Helideck Steering Committee (HSC); also presented at 01 December 2015 OGUK ASTG.
- CAA to produce scheme detail for wider industry consultation.
- New scheme to be implemented in next update to CAP 437 (8th Edition expected mid-2016), backed up by detail published in separate report.

Helideck Friction

- Current anomalies:
 - Need to formalise method of measurement (i.e. define CAP 437 statement “...*test method acceptable to the CAA...*”).
 - Installation of landing net only mitigates low friction inside the circle.
 - Profiled decks (usually extruded aluminium):
 - must be tested at full scale via once-off lab test (i.e. type approved);
 - most do not meet min μ value (typically $< 0.4\mu$).



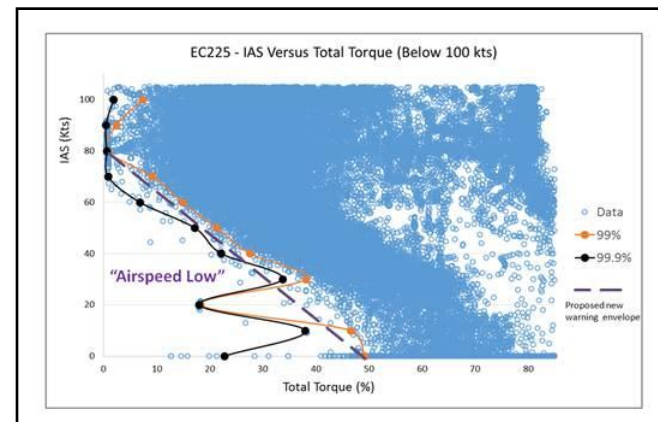
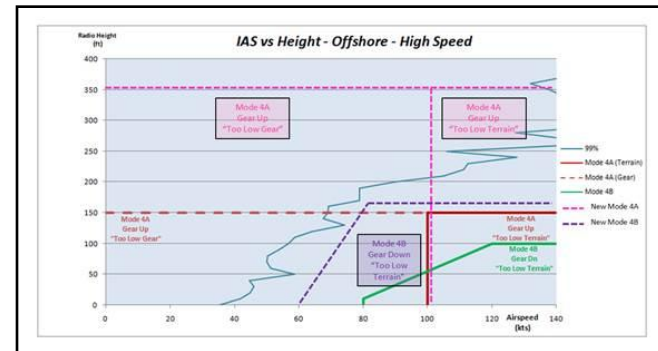
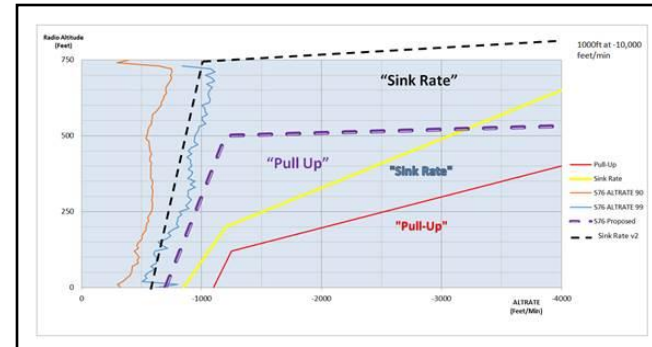
Helideck Environmental Issues



- Norwegian initiative on turbine plumes:
 - Presentation to November 2014 HSRMC.
 - Mapping of location of plumes using CFD good, but...
 - Overlooks main hazard of rate of change of temperature.
 - Not possible to mitigate engine surge/compressor stall due to rate of change of temperature.
 - Response given via HCA HSC.
 - Norway remain content with their approach (08 June email).
- Project to implement turbine exhaust plume visualisation scheme on Ninian Central.

Helicopter TAWS

- Warning Envelopes:
 - Current work on improved and new warning envelopes completed.
 - Project report updated and circulated to industry
 - Need to check all envelopes work for other helicopter types; warning envelopes to be programmed into operators' FDM systems for off-line evaluation.
 - Significant improvement in warning times for all 5 accidents and 3 of the 5 incidents investigated; adjustment of the new Mode 3B envelope could capture remaining 2 incidents but added complexity.



Occurrence	Warning Times			
	Current Equipment		Modified Equipment (EC225)	
	AVAD/ Mode 6 (160ft)	HTAWS (excl Mode 6)	Revised Envelopes	New Envelope (TT/IAS)
G-BEON	24.0	4.0 (4B)	24.0 (4)	0.0
G-TIGH	6.0	1.5 (1)	17.0 (3B)	0.0
G-BLUN	7.0	7.0 (1, 2A & 4A)	8.0 (1 & 2A)	35.0
G-REDU	7.0	1.5 (1)	15.0 (2A)	13.0
G-WNSB	5.0	7.0 (1)	8.0 (1/2)	13.0
OY-HJJ	0.0	5.0 (1)	35.0 (3B)	0.0
C-GQCH	12.0	18.0 (1)	32.0 (3B)	15.5
'920194'	1.0	6.8 (1)	11.4 (1/2)	18.0
'E396423'	0.0	0.0	0.0	0.0
'E416102'	0.0	0.0	0.0	0.0

Best warning time (current)

Best warning time (new)

Helicopter TAWS

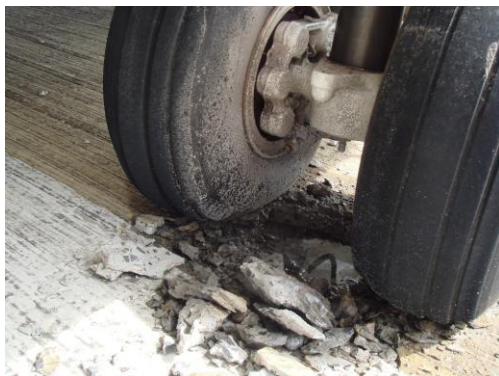
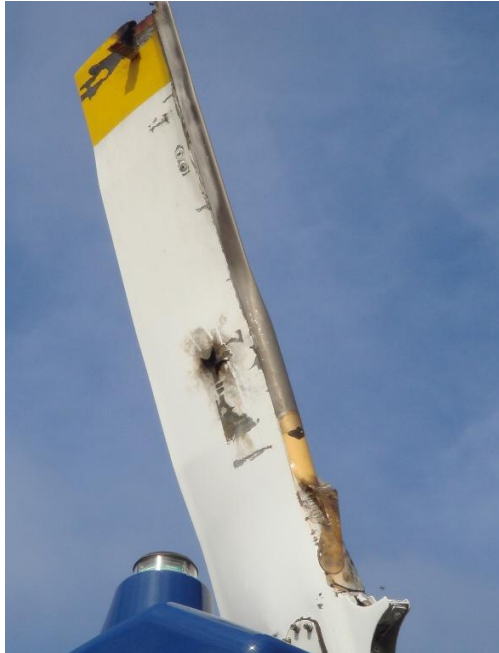
- Work on warning forms/formats:
 - Contract let to Cranfield University working with Royal Holloway, University of London.
 - Work started June 2015; last progress meeting held 27 November 2015; next meeting 10 March 2016.
 - Scheduled to complete June 2016.
- Flight simulator trials:
 - Met with Honeywell held on 17 June to discuss collaboration.
 - Agreed to produce ‘red label’ HTAWS LRU to plug into Bristow flight simulators
 - First set of trials expected Q2 2016 (warning envelopes only).
 - Second set of simulator trails (warning envelopes + warning form/format) expected Q1 2017.



Helicopter TAWS

- Specification:
 - Expect research to be completed around Q2 2017.
 - EASA set to mandate HTAWS for new aircraft from 01 Jan 2019 under new ops rules (SPA.HOFO).
 - Ideally RTCA/EUROCAE specification but insufficient time to meet EASA mandate.
 - Start with CAA specification published in a CAP.
 - Follow up with RTCA/EUROCAE spec.

Triggered Lightning Strikes



- Review of winter 2014/15 season held on 30 April 2015.
- Way forward (UK):
 - Operators have commissioned 3 day planning forecasts.
 - Met office investigating costs of rainfall radar on Scatsta.
 - High risk areas downgraded to medium if over flight at OAT $< -10^{\circ}\text{C}$ acceptable.
 - High risk threshold reduced from 10mm/hr to 6mm/hr.
 - Triggered lightning and wave height forecasts aligned.
- Way forward (Norway):
 - Norway to respond to Met Office quote to integrate Norwegian rainfall radar data.
- Next meeting 2(to review winter 2015/16 'season') 1 April 2016.

Thank you for your attention...

Any questions?