



Research Update
Briefing for 01 November 2017 HSRMC

David Howson, 20 October 2017

Contents:

- **Survivability**
 - Equipment standards
 - Training
 - Ditching & water impact
- **Operational Issues**
 - Helicopter TAWS
 - Triggered lightning strike forecasting
 - Offshore approaches
- **Helidecks**
 - Operations to moving helidecks
 - Helideck lighting

SURVIVABILITY

Survivability - Equipment Standards (1)

ASD-STAN Working Group D1 WG9 - Ditching Equipment



- EBS:
 - Work on new standard completed and prEN 4856 submitted to CEN / CENELEC for formal vote (= conversion to 'full' EN).
 - prEN 4856 published by ASD-STAN in September 2017; EN expected to be published by CEN / CENELEC by June 2018.
 - EASA expected to issue prEN / EN under cover of a new ETSO and used to support the new air operating rules (SPA.HOFO.165(c)) applicable from 1st July 2018.
 - EASA to determine what action may be required for existing CAP 1034 approved equipment (differences are minor).



Survivability - Equipment Standards (2)

- Immersion suits:
 - Work on revised standard (prEN 4863) approx. 50% complete; expected to be completed by mid 2018.
 - There will only be one standard (currently have separate standards for integrated and non-integrated suits); integrated / non-integrated is a design solution not a requirement.
 - Four levels of thermal insulation proposed (uninsulated, modified Class C (5°C, 4 hrs), Class B (2°C, 4 hrs) & Class A (<2°C, 6 hrs)) to provide better trade-off between:
 - level of insulation – depends on sea temperature and expected rescue time;
 - self-righting capability of lifejacket – becomes more difficult with increasing level of suit insulation;
 - thermal stress – mainly a flight crew issue.
 - Expecting manufacturers to produce a single ‘shell’ with a range of liners.



Survivability - Equipment Standards (3)

- Life jackets:

- Work on revised standard (prEN 4862) approx. 50% complete; expected to be completed by mid 2018.
- Main issue to be addressed is improvement/provision of self-righting capability.
 - Difficult to achieve with heavily insulated immersion suits – need large lobes.
 - Large lobes cause difficulties in life raft boarding.
 - Suggestion to use additional chambers that can be deflated (and re-inflated if required) for boarding and/or improvements to life raft boarding provisions.



- Life rafts:

- Work to start in early 2018.
- Main issue is to address the lack of a standard for externally mounted life rafts.



Survivability - Training

- CAP 1145 Recommendation R6 and UK AAIB Safety Recommendation 2016-024:

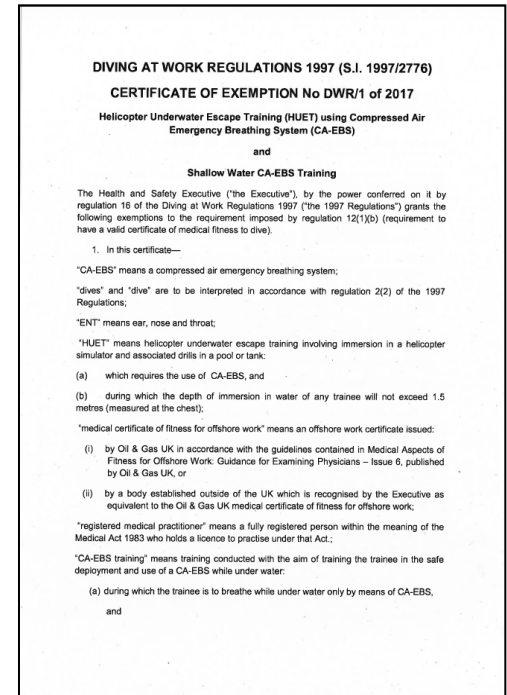
EASA to mandate safety & survival training – expected to be rejected.

- CAP 1145 Recommendation R7:

OPITO to review and enhance (frequency and fidelity) safety and survival training – EBS training upgraded, but no other changes likely in the short to medium term.

- EBS training:

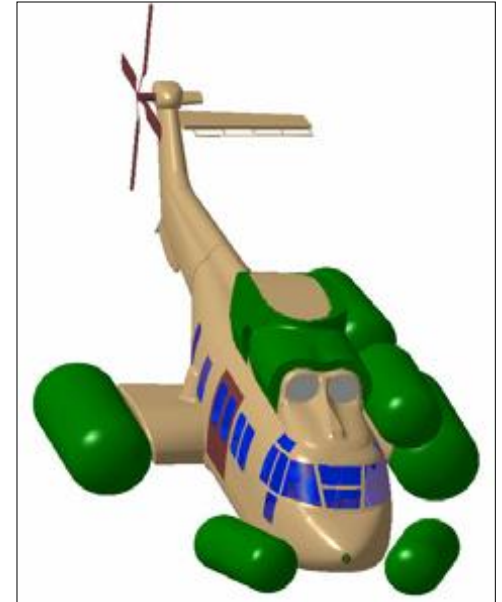
- Update to HSE exemption against Diving At Work Regulations (DAWR) issued 05 April 2017:
- shallow water training now allowed without additional medical examination;
- new syllabus for ‘wet’ training being finalised by OGUK / OPITO, roll-out expected early 2018.
- ‘Road map’ to eventual extension of Cat A EBS training to HUET to be developed.
- Training in HUET implemented in Canada in June 2016. 2,218 persons trained to date with no safety issues/incidents.



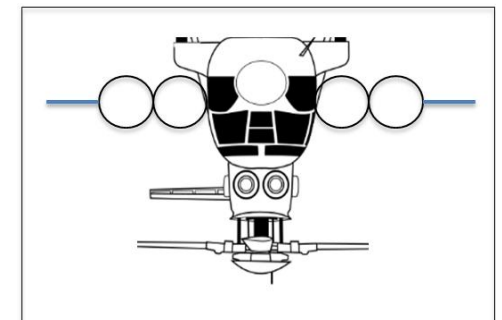
Survivability – Ditching & Water Impact

EASA Rule Making Task RMT.0120

- Notice of Proposed Amendment NPA 2016-01 issued for comment March 2016.
- Most significant issue was helicopter manufacturer's objections to the 'air pocket' (= side-floating helicopter) scheme.
 - No evidence provided to support the assertions made.
 - Precedents exist which address all of the issues raised.
 - None of the points made apply to the alternative 'raised floats' solution.
- Ultimately, the EASA Safety Committee determined that air pocket scheme (side-floating helicopter scheme) is not sufficiently mature:
 - Air pocket scheme removed from AMC.
 - Research to determine feasibility of air pocket scheme to be commissioned and funded by EASA (almost one year has passed with virtually no progress).



Side-floating scheme



Raised floats scheme

Survivability – Ditching & Water Impact



- However, the associated objective rule has also been removed:

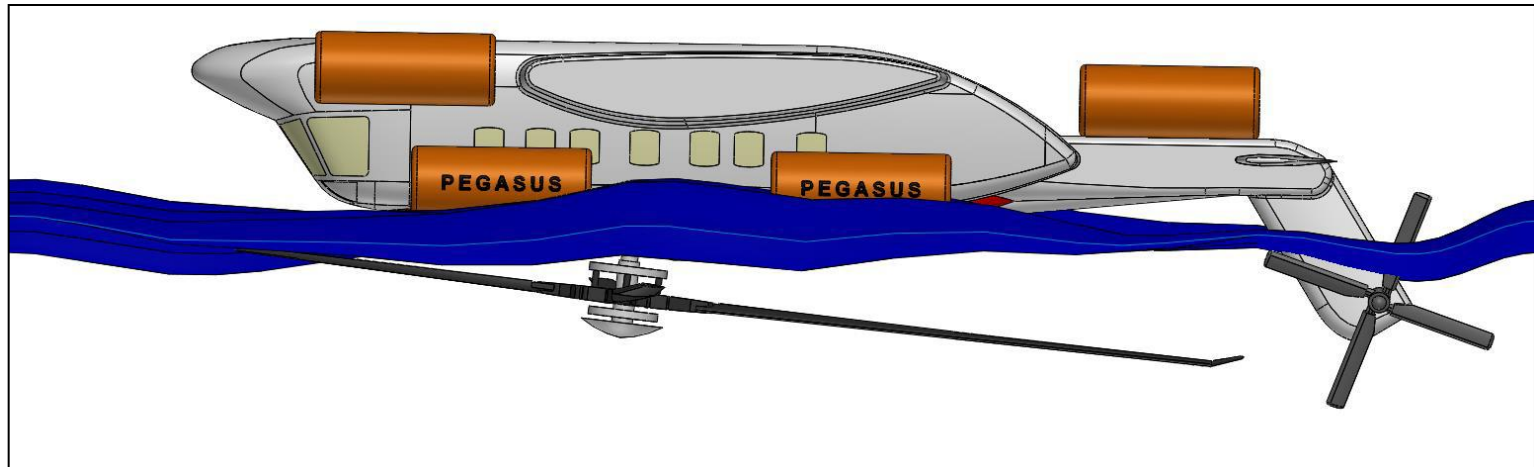
“CS 29.801(i): The rotorcraft design must incorporate appropriate post-capsize survivability features to enable all passenger cabin occupants to safely egress the rotorcraft, taking into account the human breath hold capability.”

- This means that:

- **The main cause of fatalities in survivable water impacts has been totally ignored in the new rules.**
 - According to EASA’s regulatory impact assessment in NPA 2016-01, the potential lives saved under the new rules has been reduced by 70%, significantly weakening the safety benefit.
 - If / when the air pocket scheme is considered sufficiently mature by EASA it will require a new Rule Making Task exercise to add it, i.e. it will take many years.
- In summary, as a direct consequence of EASA’s decisions the new rules will do little beyond that already required by the new air operating rules (SPA.HOFO) or the UK CAA Safety Directive (SD-2015/005), or voluntarily implemented by the industry.
 - In other words, the RMT.0120 exercise has effectively been reduced to a ‘catch-up’ and not the ‘bar raising’ step forward heralded by EASA.

Survivability – Ditching & Water Impact

- Next steps:
 - Industry can develop / implement the scheme voluntarily:
 - This is what happened with auto float deployment post Cormorant A – and lives have been saved.
 - Recommended under CAP 1145 Recommendation R5 – no action to date.
 - Recommended by UK AAIB Safety Recommendation 2016-019 (including retrospective installation).
 - The scheme was included by HeliOffshore in the proposals tabled at their 2017 annual conference.
 - One Atmosphere in Australia have applied to EASA for certification of a retrofit system for the S92.



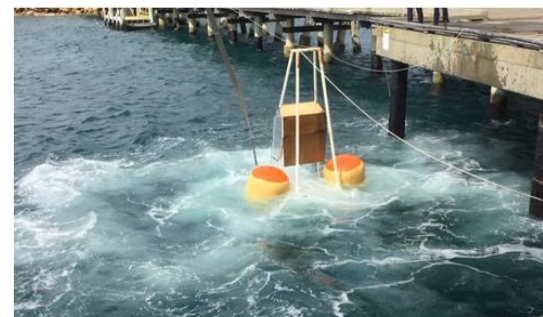
2017: Capsize test & evaluation in confined and open water



Unit attached above main cabin door



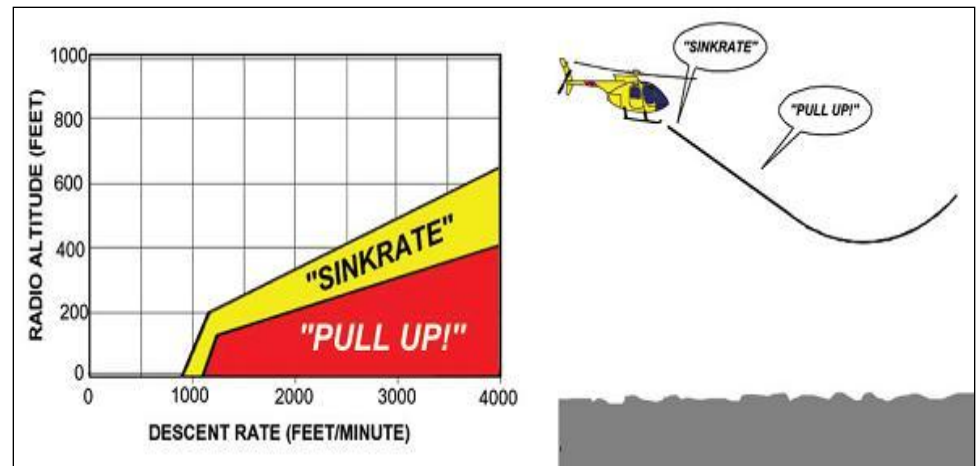
2018 Civil Aims: Wharf impact test & evaluation with Tiger programme & complete Certification



OPERATIONAL ISSUES

Helicopter TAWS (1)

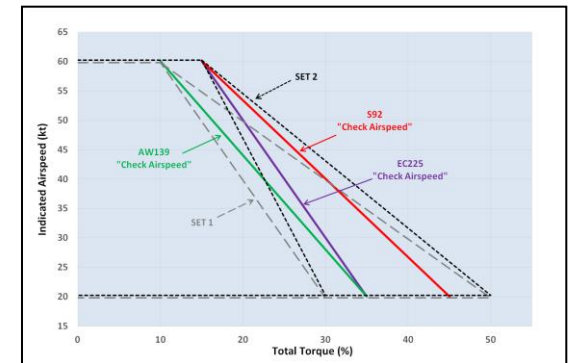
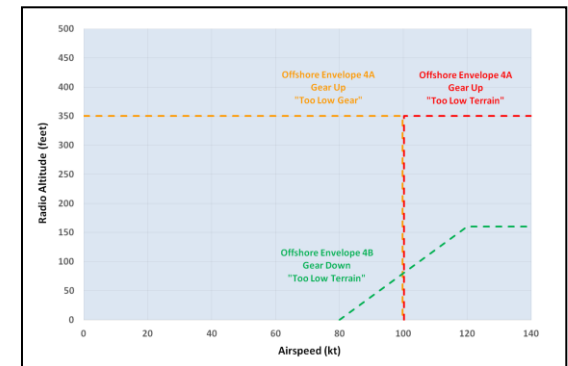
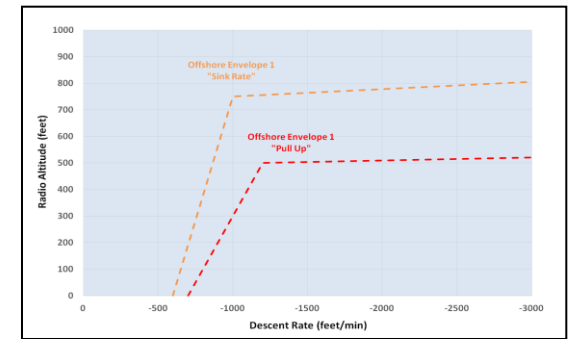
- Helicopter Terrain Awareness & Warning System (HTAWS) – helicopter version of system fitted to all airliners to provide advance warning of impending collision with terrain (including the sea).
- Improvement in effectiveness needed to:
 - Reduce the ‘nuisance’ alert rate, and
 - Improve (= increase) warning time.
- AAIB Safety Recommendations from G-REDU (ETAP, February 2009) and G-WNSB (Sumburgh, August 2013) refer.
- Two phase improvement plan in progress:
 - Phase 1 – improvements possible by software update to HTAWS ‘box’ only.
 - Phase 2 – improvements impacting integration with helicopter systems and/or helicopter modifications.



Helicopter TAWS (2)

Phase 1 Progress:

- New set of alert envelopes tailored for offshore operations developed and tested.
- Specification published in CAP 1519; supporting research published in CAP 1538.
- All parties have pledged support to implement Phase 1.
- 26 October 2017 EASA meeting.
- HTAWS manufacturers will develop equipment modifications and produce equipment service bulletins.
 - NB: Honeywell have scheduled flight simulator trials for November 2017.
- Helicopter manufacturers will cover introduction of modified HTAWS with aircraft service bulletins (major modification as HTAWS Flight Manual supplement affected).
- Fully supported by HeliOffshore and IOGP.
- Target date for completion of voluntary retrofit is mid 2018.
- Could be adopted by EASA for the operating rule mandate (applicable to new a/c registrations from 01 January 2019).



Occurrence	Warning Times					
	Current Equipment		Modified Equipment		Improvement (Best to Best)	
	AVAD (set to 160ft)	HTAWS (excl. AVAD = Mode 6A)	Existing/ 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	6.0	17.0	11.0	183
Morecambe Bay, 2006	7.0	7.5	8.0	35.0	27.5	367
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	9.0	35.0	30.0	600
Sea Rose, 2011	12.5	18.0	31.0	32.0	14.0	78
'920194'	1.0	6.8	11.4	18.0	11.2	165

Best warning time (current)

Best warning time (new)

Helicopter TAWS (4)



Phase 2:

- Research by Cranfield University / Royal Holloway University of London investigating:
 - improved auditory warnings,
 - improved visual warnings,
 - use of tactile warnings.

Any resulting improvements will be included in Phase 2.

- Will include changes to alert envelopes omitted from Phase 1 (to speed implementation), and any new ideas arising.
- EUROCAE working group activity planned to produce formal specification (MOPS) – start-up 2018.
- May include EASA Rule Making Task activity to extend scope of EASA operating rule mandate (SPA.HOFO.160(c)).

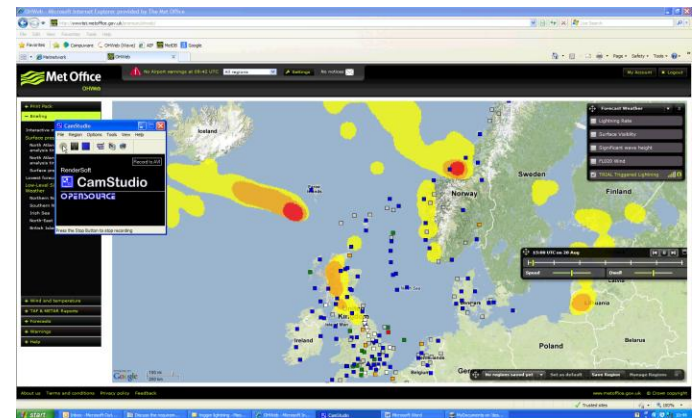
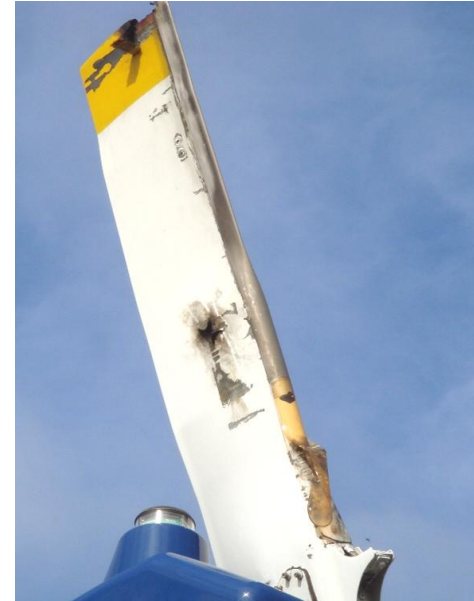


HeliOffshore
Safety Through Collaboration



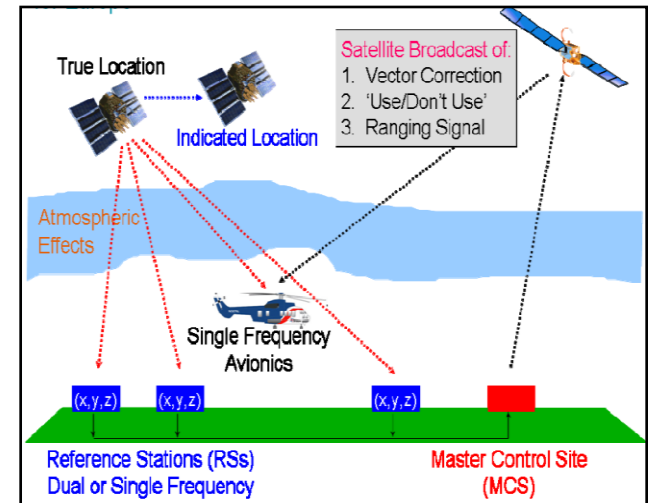
Triggered Lightning Strike Forecasting

- System performance reviewed at Met Office Offshore Helicopter User Forum in February 2017. All representatives were content that the system is stable and operating as designed.
- Disruption to operations in line with expectations, and mitigated through provision of 3-day advance warnings.
- Research now considered complete – final report will be published by CAA in a CAP (expected by end 2017).
- Further improvement needed at Scatsta but will require the provision of a rainfall radar - similar issue in Norwegian sector now resolved.
- Further improvements to UK system expected:
 - Higher resolution met model (1.5km vs 4km).
 - Incorporation of predicted hail quantity.
 - Additional synoptic properties (e.g. cloud depth).



GPS- Guided Offshore Approaches

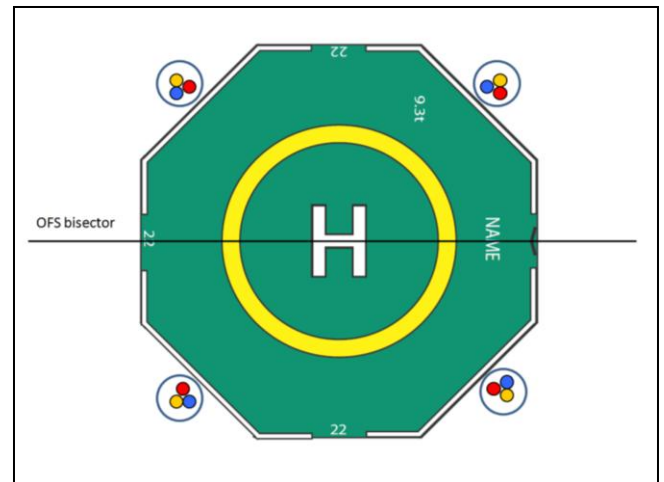
- Research on SBAS Offshore Approach Procedure (SOAP) essentially completed.
- Next logical step should be introduction into service trials to validate / road-test new AMC / GM for operating rules (SPA.HOFO).
- Helicopter manufacturers (OEMs) have systems available.
- Could use an existing OEM system as a vehicle for trials if close enough or better than SOAP.
- Project to investigate OEM systems and perform gap analysis launched January 2017.
- Analysis and reporting of preliminary information (Phase 1) completed and presented to May 2017 HSRMC.
- Differences to SOAP have been identified which are to be investigated / discussed with the respective OEMs under Phase 2.



HELIDECKS

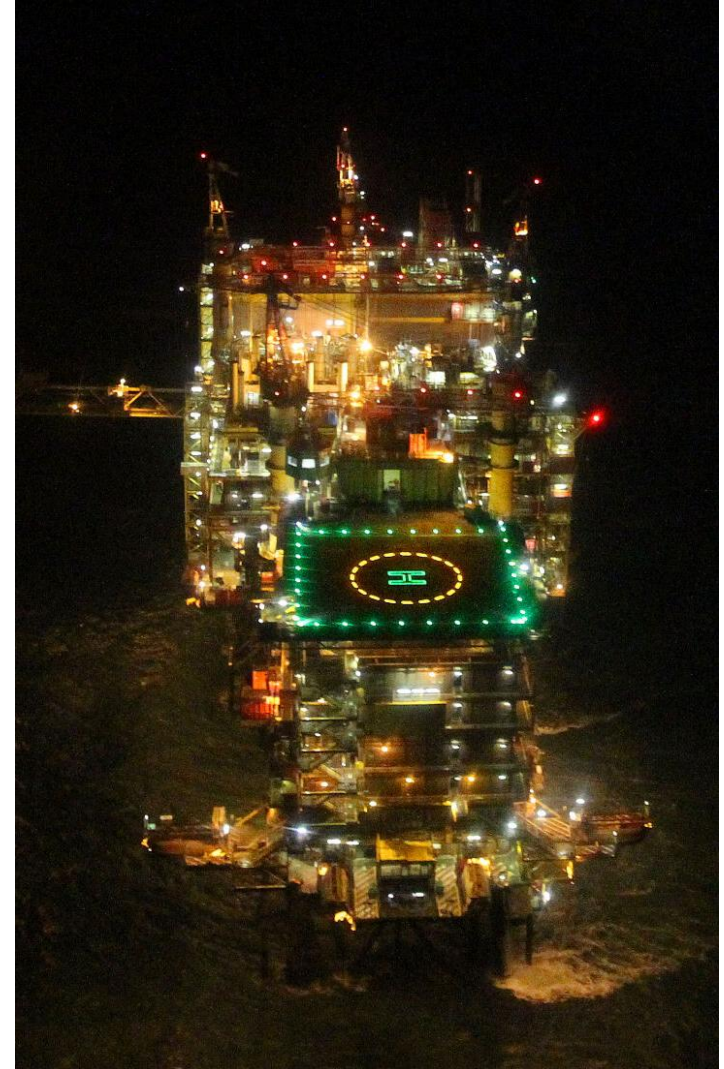
Operations to Moving Helidecks

- Helideck Monitoring System (HMS) specification:
 - New functionality addressing on-deck stability added to existing HCA specification.
 - Circulated to HMS providers; responses being addressed.
 - Updated specification to be published by HCA by end 2017.
- In-service trials:
 - Latest systems installed on Chevron ‘Captain’ and ‘Alba FSU’ vessels.
 - Final trials await installation of upgraded ‘traffic lights’ – expected by end 2017.
 - Main / only unresolved issue is intensity of ‘traffic lights’ (increased from 10cd to 400cd).
- Implementation:
 - To be added to CAP 437 early 2018.
 - Lead-in time TBA but less than the 5 years allowed for the circle and H lighting.
 - Apart from traffic lights, retrofit should comprise a software upgrade to existing HMS + MRU alignment only for most vessels.



Helideck Lighting

- **Status of approvals:**
 - Orga, IMT, FricTape and Tranberg systems approved by HCA.
 - Orga (Gen1 & Gen2), IMT (Mk1) and FricTape systems approved by CAAi.
 - Further systems ‘in progress’ with CAAi.
- **CAP 437 8th Edition Update:**
 - Added tolerances for size and location of the ‘H’ marking.
 - Added tolerances on the radius of the TDPM circle.
 - Clarified requirements in respect of strength of mountings and drainage.
- **Safety Directive SD-2016/005:**
 - Mandated the circle & H lighting for night operations post 31 March 2018.
 - Gave credit for circle & H lighting from 01 January 2017 in NUI fire-fighting scheme.



Thank you for your attention...

Any questions?