

OIL & GAS

REVIEW OF CURRENT PRACTICES FOR OFFSHORE HELICOPTER OPERATIONS

Tenth EASA Rotorcraft Symposium

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Study Objectives

- Develop a comprehensive knowledge base of current practices for offshore helicopter operations. These practices have mainly been developed in order to manage accident hazards and risks.
- The knowledge base will consist of:
 - Structured documentation of the different practices
 - An evaluation of their benefits and limitations
 - A set of recommended practices for widespread application

Scope Limits

- Passenger transport operations, including associated training flights.
- Offshore operations associated with offshore mineral exploitation, focussing on flights to/from offshore installations with helidecks, but also including flights to marine vessels.
- Operations in EASA Member States, focussing on the North Sea.
- Flight stages covering procedural design, flight planning, flight execution and post-flight analysis.
- Safety management practices covering airworthiness, flight standards, flight planning, flight procedures, helideck operations, pilot training and safety risk management.

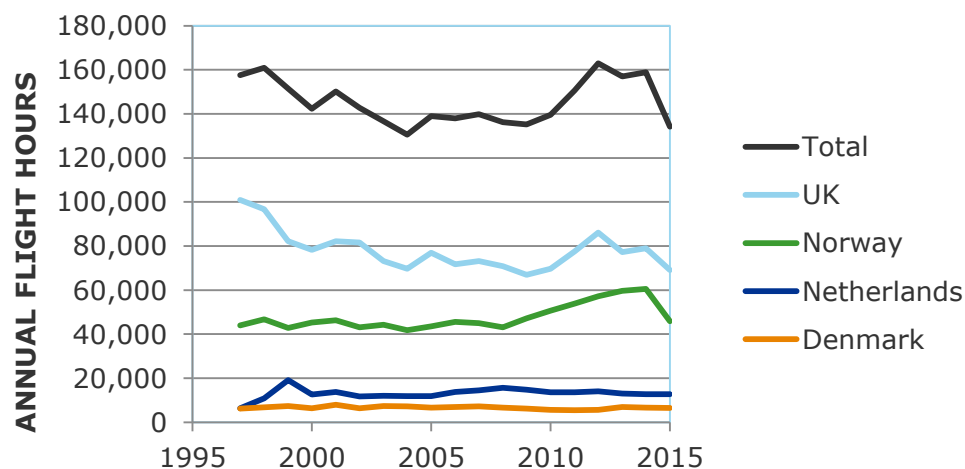
Study Approach

- Definition of operational context.
- Grouping of operational practices.
- Collection of practices - stakeholder survey and workshops.
- Review and evaluation of practices.
- Recommendation of practices.

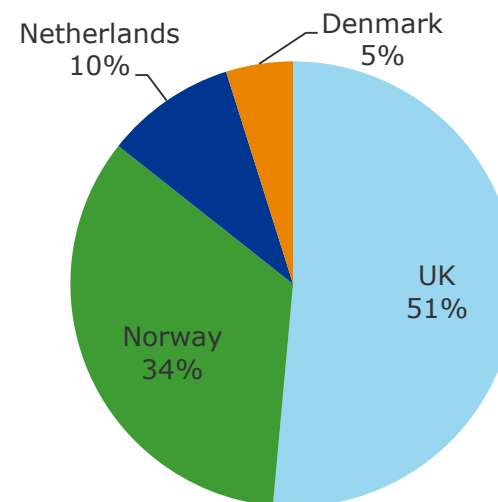
Operational Context

North Sea Helicopter Activity, 2015

Country	Flight stages	Flight hours	Average flight length (min)
Denmark	15,060	6,526	26
Netherlands	38,220	12,740	20
Norway	55,271	45,905	50
UK	115,494	69,052	36
Total	224,045	134,223	36



North Sea Offshore Flight Hours 1997-2015



North Sea Offshore Flight Hours 2015

Relevant Subjects

ANNEX XIII ALPHABETIC LIST OF RELEVANT SUBJECTS FOR THE STUDY

- Actual weather and forecast information systems and procedures
- Additional workload or jobs for flight crew
- Application of procedures and Standard Operating Procedures
- ARA (Airborne radar approach) standardisation
- Assessments, recommendations, competency for upgrades to captain
- Assistance of operations in flight preparation
- Audio systems quality, inflight announcements and messages for passengers related to flight details and safety
- Availability of Satellite communication
- Availability, quality and updates of documentation including Flight Manuals, operation manuals, checklists, flight safety information and hand outs to crews, helicopter deck information
- Canteen and lodging organisation and availability for crews and other personal
- Career plan and respective motivation
- CFIT information, awareness training
- Company frequency, seats, headsets
- Coupled approaches to rigs
- Courses and awareness on automation, automation complacency
- Crew resource management and their instructor courses, multi crew cockpit management and effective inter-crew communication
- CRM, MCC courses, flying and monitoring skills
- Currency requirements for deck operations, night operations, instrument flight procedures.
- Database of frequencies and updates management
- Deck light and obstacle light quality/availability, windsocks, turbine exhaust patterns
- Defined tasks for all crewmembers, to improve training and operating manuals and syllabi and ensure manufacturer recommended practices are produced and adopted
- Derogations from regulation
- DGPS (differential GPS approaches)
- Engagement in national and international working groups around offshore safety
- English proficiency of aviation crew, language standardisation between aircraft and ground crews and inter cockpit
- Experience and training of ground and deck crews
- Experience level instructors, instructor/ examiner instruction and standardisation
- Feedback of passengers on safety and follow-up
- Flashlights for personal
- Flight data monitoring and honest brokers, feedback and follow-up
- Flight path management (manual and auto-control)
- Flight preparation (time, area, task division between crew, interaction with operations department)
- Flight preparation environment
- Flight time limitations, rest and duty times and logging, show-up times, Yearly leave schedules, sickness policy
- FOD control on decks, hangars and aprons
- Follow-up and lessons learned from recommendations by NAA, manufacturers, Investigation boards
- Fuelling installations offshore and procedures
- Fuelling procedures/precautions on ground and on deck
- Gas flaring and procedures in the vicinity of helicopter operations
- GPS/GNSS and SBAS use on situational awareness, other situational awareness systems,
- Harmonisation of procedures, difference in standards
- Headsets quality, Bluetooth head-sets, seating positions
- Heave, roll pitch limitations – moving decks
- Helicopter underwater escape training procedures including training quality and quantity
- Helmets, flight gear, life jackets, gloves
- HTAWS, TCAS
- HUET training (push –out windows, cross cabin or cockpit escape, frequency of training)
- Human body size limitations, handholds for escape
- Identification of trends in common failings and follow up
- Impact on delaying flight due to tech or weather
- Incident reporting and follow-up. Interaction with safety department
- Inflight logging of information such as fuel consumption, take-off and landing times, changes in weight and balance
- Interaction with Air traffic control and related working groups or meetings
- Internal and external audits frequency
- Involvement of crews and personal in working groups
- Last moments changes procedures
- Left right seat operation management
- Lighting and environmental control of working environment
- Limited icing procedures, active anti-icing systems
- Line orientated flight training sessions contents in simulator training
- Maintenance hangars (Lighting, heating, storage, access)
- Maintenance test flight management
- Management of headset cables or Bluetooth for crews
- METEO information from helidecks
- Monitoring of weather in vicinity for lightning strikes and forecasts
- Moving decks versus fixed decks quantity of operations
- Multiple type flying management
- Navigation data management
- Night flight and related training
- NOTAM information and updates
- Number of approaches to platforms per mission, day
- Number of daily , weekly, yearly flight hours
- Number of missions a day
- On land / after crash emergency egress training
- Operating different types and the effect of this activity
- Operational Suitability Data (OSD)/ Operations Evaluation Board (OEB) follow-up and integration
- Operations department organisation
- Passenger embarkation and disembarkation procedures, turnaround procedures on platforms, fuelling procedures on deck
- Performance of helicopters
- Performance of helicopters (understanding of T/O and landing profiles and their related calculations)
- Platform diameters and Deck light quality, obstruction markings
- Possibilities for left or right door access on land and on decks
- Possibility to stay overnight on deck, rigging and tie down procedures
- Pre- and post-flights inspection procedures
- Proficiency checks, line training, line instruction under supervision training, License proficiency checks, standardisation of crews
- Radio communication with technicians during starting and stopping
- Radio procedures for offshore and related standardisation
- Recruitment policy and requirements
- Refresher courses,
- Remote bases and management
- Rescue boats, marine, police search and rescue
- Rescue boats, marine, police search and rescue equipment and organisation
- Safety briefings passengers
- Safety for helicopter operations on platforms
- Safety movies, safety cards
- Safety related feedback of passengers management
- Satellite flight tracking/data transmission
- Sea state and wind limitations
- Sea State limitations (general and versus certification minimums)
- Sheltering of helicopters, towing of helicopters, tie down procedures
- SMS, CMS
- Snow removal procedures on decks and helicopters
- Sound and quality of inflight announcements
- Sport activities, medical checks, social follow-up, family parties, (in the context of team building)
- Stability of contracts, swapping between companies
- Standardisation and training of weather observers offshore
- Standardisation of instructors and examiners
- Sterile cockpit procedures and adherence
- Supervision and trainees in maintenance
- Survival equipment training
- Survival equipment, emergency locator beacons
- Traffic Collision and Avoidance System (TCAS), Helicopter Terrain Awareness and Warning System (HTAWS) use and training
- Teambuilding programme
- Teambuilding programmes
- Technical deficiencies
- Technical logs, review of technical information
- Temperature limitations/conditions for wearing dry suits, gloves, thermal underwear
- Theoretical review of helicopter systems for crews
- Time between flights for flight preparation
- Tool management control for maintenance
- Training and standardisation of fire crew
- Training department organisation
- Training of fire/ deck crews, training of fuelling crews, training and quality of radio operators, Training with survival equipment ,
- Travel policy versus rest and duty times
- Trends in proficiency checks follow-up and their interaction with instructor standardisation, examiner standardisation
- Type of Visual Flight Rules (VFR), Instrument Flight Rules (IFR) charts
- Type rating training management
- Underwater Escape training, emergency egress training on land, ditching training
- Upset recovery training
- Use of Electronic Flight Bag (EFB) and applications
- Use of Flight training devices and full flight simulators
- Use of helmets for crew and passengers
- Use of weather radar and training
- Weather stations
- Weight and balance information , calculations and changes
- WIFI on platforms for METEO and flight related updates
- Workload management

Practice Grouping

- **Key risk issues**

- Control of the helicopter flight path
- Detection, recognition and recovery of deviation from normal operations
- Diagnosis of system failures
- Safe survival and egress

- **Other operational issues**

- Obstacle clearance
- Ground/helideck operations
- Safe landing environment
- Operation in adverse environmental conditions
- Flight planning and preparation
- Fuel management
- Safe forced landings

- **Technical issues**

- Gearbox and transmission system reliability
- Helicopter maintenance

- **Human factors issues**

- Flight crew perception and awareness
- CRM and communication
- Knowledge and competency of individuals
- Personal readiness
- Use of rules and procedures

- **Organisational issues**

- Crew composition and management
- SMS implementation

Based on EASA 2015 Safety Risk Portfolio

Stakeholder Survey

2. Detection, recognition and recovery of deviations from normal operations

This covers effective flight crew detection and recognition of undesirable states aided by systems such as TCAS/GPWS etc.

It includes the HeliOffshore collaborative safety action on operational performance monitoring.

The following subjects are of particular interest:

- CFIT information, awareness training
- TCAS, HTAWS use and training
- Upset recovery training

Please summarise the current practice in your organisation to manage the issues above:

Please summarise any changes that you are planning to make to the practice in your organisation:

Please identify or supply reference documents where available:

Please mention any significant obstacles in implementing the practice:

Please mention any reasons why your practice might differ from practices in other organisations:

Stakeholders Contacted

STAKEHOLDER TYPE	NAME
Industry bodies	HeliOffshore
	International Association of Oil & Gas Producers (IOGP)
	Oil & Gas UK
	Step Change in Safety
	Norsk Olje & Gas (NOROG)
	Co-operation Forum for Helicopter Safety on the Norwegian Continental Shelf
National Authorities	European Helicopter Association (EHA)
	CAA-UK
	CAA-BE
	CAA-DK
	CAA-NO
	Health & Safety Executive (HSE)
Oil & gas companies	Petroleum Safety Authority
	Inspectie Leefomgeving en Transport
	BP Exploration Operating Company Ltd
	BP Norway
	ConocoPhillips
	GDF Suez
Pilot unions	Maersk Oil
	Perenco
	Shell UK
	Shell Aircraft International
	Statoil
	Taqa Bratani
Helicopter operators	TOTAL
	British Airline Pilots Association (BALPA)
	NHAF
	Industri Energi
	European Cockpit Association (ECA)
	Babcock International
Manufacturers	Bel Air Aviation A/S
	Blueway Offshore Norge a/s
	Bond Offshore Helicopters Ltd
	Bristow Helicopters Ltd
	Bristow Norway AS
	CHC Group
Other stakeholders	CHC Helicopters Netherlands
	CHC Norway
	DanCopter AS / NHV Danmark
	Heli Holland BV
	Heli-Union S.A.
	INAER Aviation Italia
	Norsk Helikopterservice (NHS)
	Nordzee Helikopters Vlaanderen (NHV)
	WIKING Helikopter Service GmbH
	Airbus Helicopters
	Leonardo Helicopters
	Sikorsky
	Offshore Petroleum Industry Training Organisation (OPITO)
	Helideck Certification Agency Ltd
	Avinor
	Cranfield University

- 53 stakeholders contacted
- 16 survey responses, including:
 - 13 from individual stakeholders.
 - Combined UK operators.
 - Combined Norwegian stakeholder workshop.
 - Combined UK stakeholder workshop.
- 23 stakeholders represented in responses.
- Overall 43% response rate.

Knowledge Base

- Quantity – 140 pages.
- Quality – precise, informative, helpful.
- Clarity – self-explanatory without need for editing.
- Consistency – broadly complementary, not repetitive or contradictory.
- Engagement – most fitted responses into survey format.
- Coverage of questions – most replied to first question of each group.
- Coverage of issues – combination of response covered all 20 issues.
- Coverage of stakeholders – responses from all types of stakeholders.
- Coverage of countries – mostly UK, with combined Norwegian stakeholder workshop.

Review of Practices

- All 20 issues covered, based on stakeholder inputs and a literature review:
 - Definition of terms
 - Review of practices
 - Evaluation of strengths and weaknesses
 - Currently planned changes
 - Variability in practices
 - Recommended practices

Conclusions about Current Practices

- Certification requirements for large rotorcraft are less mature than equivalent requirements for fixed-wing aircraft.
- Many differences in requirements between different oil & gas companies. Variation in implementation of common standards such as AMG.
- The UK CAA has produced guidance material that is widely followed, and could form the basis for harmonised requirements.
- Some significant differences in operating practices between North Sea countries are not based on differences in risks.
- Stakeholders have different opinions about the impact of the commercial environment, the industry ownership structure and national safety culture on accident risks.
- Regarding occupant survivability in water impact, the industry has already adopted most of the changes mandated by EASA's proposed amendment.

Recommended Practices

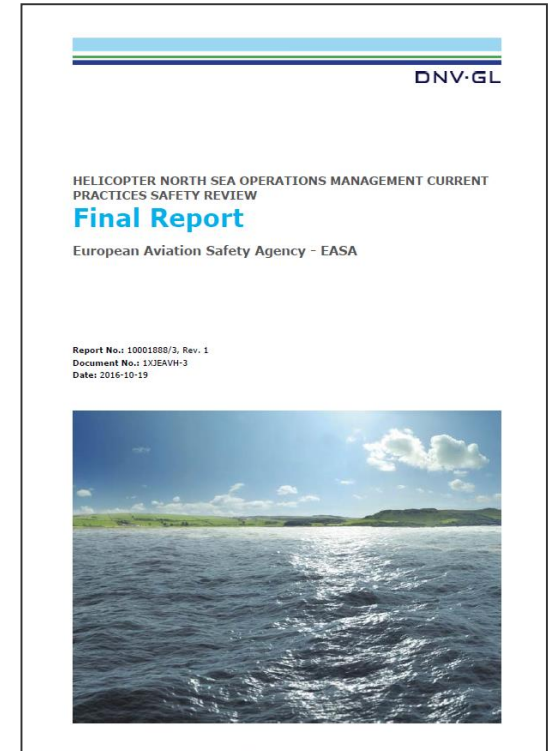
- 76 recommended practices, based on:
 - Current good practices and improvements proposed by individual stakeholders in their survey responses.
 - Current good practices and improvements proposed by groups of stakeholders in the workshops.
 - Recommendations made in the literature review.
 - Recommendations made by DNV GL to fill obvious gaps or work towards common practices in the North Sea.
- Most are already adopted by some stakeholders, and are considered suitable for widespread adoption.

ID	SUBJECT AREA	RECOMMENDED PRACTICE	RESPONSIBLE	CURRENT STATUS
R9.1	Flight planning and preparation	Oil & gas companies should not make last-minute changes in routing, passengers or freight after the flight closing cut-off time, so that the flight crew can concentrate on safe preparation for and conduct of the flight.	OGCs	Practiced by some OGCs.
R9.2		EFBs should be certified to show the helicopter position on the approach plate and NOTAMS on a route map.	Joint industry	Practiced by some operators.
R10.1	Fuel management	Adequate standards should be developed for construction and maintenance of offshore fuelling facilities.	Joint industry led by NAAs	CAP 437 is under development.
R10.2		Offshore fuelling facilities should be certified by a competent body.	OGCs	Current practice in UK.
R10.3		Offshore fuelling practices should be defined in the helideck manual and follow CAP 437 where possible.	OGCs	Widespread practice.
R10.4		Offshore alternates should be restricted as specified by SPA.HOFO.115.	HOs	Current practice in Norway.
R11.1	Forced landings	Sea state limitations should be consistent as far as possible, and reflect the helicopter ditching certification. Any differences should have a risk-based justification.	Joint industry	Current practices vary.
R13.1	Helicopter maintenance	Maintenance intervals should be based on the MSG3 process.	OEMs	Current practice for new helicopters.
R13.2		The maintenance burden should be minimised as far as possible through design improvements and error proofing.	OEMs	Current practices vary.
R13.3		The operating experience of the helicopter should be fed back to OEMs for agreed improvements to the maintenance programmes across the industry.	HOs and OEMs	Not current practice.
R14.1	Flight crew perception and awareness	Offshore helicopters should have capability to track flight stability (e.g. collective pitch against speed) and set thresholds for flight deck warnings as part of HTAWS.	OEMs	Current practice for some new helicopters.
R14.2		OEMs should work towards enhanced vision systems as for fixed-wing aircraft.	OEMs	Not current practice.
R14.3		Commercial operations at night with multi-engine helicopters should be performed with dual-pilot configuration only.	HOs	Widespread practice.
R15.1	CRM and communication	The English language proficiency should be at least level 5 for effective crew communication in North Sea offshore operations.	EASA	Widespread practice.
R15.2		A design requirement should limit noise levels in the cockpit to appropriate levels.	EASA	Current practice needs improvement.
R15.3		The quality of in-flight communication to passengers should be improved.	OEMs	Current practice needs improvement.
R15.4		Flight following should be adopted, as will be required by SPA.HOFO.125.	HOs	Widespread practice.
R16.1	Knowledge and competence	The industry should move away from equating experience to competence by following EBT/CBT.	Joint industry	Not current practice.
R16.2		Adequate time should be allocated for training.	Joint industry, primarily HOs	Current practices vary.
R16.3		There should be improved availability of helicopter performance calculation tools in PMS or EFB, as for large fixed-wing aircraft.	OEMs	Current practices vary.
R17.1	Personnel readiness	Helicopter FTIs should be scientifically based and harmonised to the highest available standard.	Joint industry, primarily HOs and EASA	Current practice in UK is scientifically-based.
R17.2		Sickness reports should not be used to determine suitability for redundancy.	HOs	Current practices vary.
R17.3		Records of false positive tests for drugs and alcohol acquired during random testing should be removed from personal files once upheld by subsequent testing.	HOs. Just culture implies a possible role for EASA	Current practices vary.

(Illustrative extract from the report)

Reporting

- Report to EASA includes:
 - Operational context
 - Survey development
 - Review of practices
 - Recommended practices
 - Full knowledge base (i.e. original survey responses and workshop records)



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