Industry Action Plan

International Association of Oil & Gas Producers

Night Deck Landing Practice

Opportunities identified for systemic improvement

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1 Executive Summary

An operator had an accident during a routine night deck landing practice. Thankfully, only minor injuries were sustained, although the aircraft was written-off.

The national safety investigation agency initiated an investigation to analyse the cause and generate learnings from the accident. While the national investigation may take years to report, the operator involved was keen to see more immediate industry lessons and improvements.

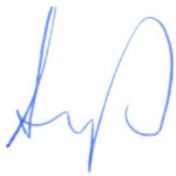
The operator logged the accident with HeliOffshore. HeliOffshore convened a meeting to analyse the operator's initial internal investigation into the accident, supplemented by an additional human factors report. HeliOffshore noted similarities to a previously reported event and, with permission of that operator, aggregated the analyses from both events to reveal issues common across the offshore aviation system.

Fifteen factors were identified as being common to both events, which naturally fall into 6 broad themes, leading to 21 improvement opportunities. In the majority of cases, these opportunities require a collaborative approach between multiple stakeholders to gain the maximum benefit to industry safety performance.

The approach proposed in this plan is NOT designed to replace existing industry and organisational investigation protocols, but we must always go beyond minimum regulation to hold what can be difficult conversations. These conversations ensure we share data, strategies and solutions to improve our collective safety performance.

This Industry Action Plan is an important step towards a safer frontline, by illustrating the benefits – principally, learning opportunities – that are achievable through an increasingly open and responsive industry.

Tim Rolfe
CEO, HeliOffshore Limited



Tony Cramp
Chair, IOGP Safety Committee

2 Background

2.1 How did this Industry Action Plan evolve?

2.1.1 Inspirational initiative with a commitment to make a step change in learning

During the investigation of a non-fatal accident in 2021, the operator involved recognised an opportunity to maximise the learning opportunity for themselves and for the industry. As a result, the operator approached HeliOffshore and asked for support and wider industry information. Once it was recognised that other events had occurred with similar causal themes, it was determined that combining the knowledge of multiple events opened the door to increased openness, ensuring industry-level involvement and subsequent learning.

2.1.2 What is an Industry Action Plan?

The goal of any safety initiative following an accident is to prevent recurrence.

The term Industry Action Plan, in this instance, refers to an outcome-focused approach where multiple stakeholders are able to: learn from events; identify any systemic failings, and; agree on collaborative mitigation actions that address those failings to deliver a high probability of success.

2.1.3 How does this differ to an accident or incident investigation?

For good reason, formal accident investigations are conducted under protocols defined in ICAO Annex 13. This can have a tendency to 'cloak' an investigation, and, even though an operator may conduct a parallel internal investigation, it may mean significant learnings are delayed until the final publication of the official report. Industry trends suggest that, in many regions, the time for an investigation to report can exceed 3 years, by which time priorities have been reset and motivation to act has been lost.

An accident or incident investigation focuses on a single event. The agency conducting the investigation may or may not have access to details of similar events that have occurred historically outside of their region, which may lift the level of any safety recommendations from the operator and supervisory level to an organisational, systems or industry level.

The approach taken in this report is to take learnings from multiple events, elevate them above an organisational level to identify systemic issues, and prioritise the need for action from multiple stakeholders who provide collaborative solutions. This will ensure that robust mitigations against recurrence are delivered in a shorter timeframe.

2.2 Event synopses

To optimise learning whilst protecting the operators involved and respecting the protocols of any ongoing formal investigation, the synopses below are presented in bulleted summary form. The key elements are elaborated as far as is necessary to make the connection between occurrence and proposed mitigation. Both operators involved have shared more detailed information with other member operators in a managed 'InfoShare' forum and have committed to providing further information on a 'request' basis.

Both events occurred on non-passenger flights to offshore locations for the purpose of achieving night recency. Crews on-board included a commander nominated for the purpose of assessing the competency of additional crew members in the performance of offshore night operations. In both cases, the crews involved were at or just outside the recency requirements for night landings. Both flights resulted in a loss of control episode.

Both operators involved have conducted substantial internal safety investigations and have taken actions internally to update their own standard operating procedures, training practices, and information to crews.

2.2.1 Event #1

2.2.1.1 Summary of flight (based on information shared by the operator)

- The purpose of the flight was to route to an offshore location to achieve night currency/recency of the crew, including the Commander nominated for assessment of 2 additional crew members.
- Requests made to a client for a helideck to facilitate night deck training flights had been denied for several days, resulting in repeat rescheduling, impacting the timing of flight and crew composition.
- While a rig was in the process of arriving, new to the region, the request for the training flight was granted and combined with a rig familiarisation exercise. A day-time familiarisation flight had not been achieved.
- The crew was allocated based on availability. The P1/ training role was allocated based on experience and seniority.
- A local road traffic situation significantly delayed crew arrival at the airport, compromising pre-flight briefing and delaying departure. At this stage the crew had no information on the obstacle environment around the helideck.
- The outbound leg was from an onshore airport to a rig approximately 80nm offshore with a helideck height of ~70ft asl.
- Weather conditions were light to moderate wind (13kts) with good visibility.
- The first approach was conducted in night visual conditions with the aircraft flown using coupled AFCS functions to align with a pre-planned approach path with P1 (in RHS) intending to perform the landing as pilot flying (PF).
- After the last position report provided provided to the crew, the rig had moved location and deck orientation had changed to a position favouring a LHS landing.
- The rig was identified visually and at approximately 2nm from the destination, the PF disengaged coupled AFCS modes and reverted to manual flight.
- During final approach, an inadvertent descent below 200ft asl resulted in HTAWS warnings which were recognised by PM and recovered by the PF after several tentative callout interventions.
- Final manoeuvring to the rig required PF to position alongside the deck and manoeuvre sideways and rearwards towards the helideck.
- Helideck lighting did not conform to latest CAP 437 requirements. While there was cultural lighting, there was no lit 'H' or aiming circle.
- The PM had no visual reference to the helideck and surrounding structure but through monitoring recognised low speed/power configuration and called for a 'go-around'.
- PF was fully focused on continuing the landing manoeuvre and did not respond to PM's assertions to 'go-around'.
- The crew's spatial awareness was significantly compromised, the main rotor blades struck a raised structure adjacent to the helideck and control of the aircraft was lost. The aircraft crashed and rolled over on the helideck.
- There were no significant injuries sustained by crew or third parties.
- Prior to the accident occurring, no mechanical deficiencies were identified on the aircraft.

2.2.1.2 Key learnings

As is the case in many parts of the world, routine night flying offshore is generally forbidden by the state involved, but the local regulator does allow for night flying for the purpose of conducting medivac flights or, under certain circumstances, training for the purpose of maintaining night currency. Planning for such exercises presents scheduling challenges and, combined with a **general industry reluctance to support non-passenger-carrying flights solely for the purpose of night deck landing practice**, the opportunity to train in live conditions is rare and unpredictable. Operators have access to simulators which may or may not be situated in the state (depending on type), but contractual requirements and, indeed, good practice suggests that crews **should be observed landing on a real helideck** as part of **initial training and recency** requirements. It is noted that **regular access to hi-fidelity simulators that accurately recreate the night offshore helideck environment** is a sound mitigation for maintaining night deck recency, but this was not easily achievable in this case.

The operator's contract did not include provision for night deck landing recency flights. It is understood that, without regular access to helidecks, operators are increasingly finding alternative solutions to achieving night competency and maintaining recency, including the use of airport runway thresholds as a proxy for an offshore helideck.

Culture plays a huge part in influencing workplace behaviour. In male-dominated workforces, certain behavioural characteristics can proliferate, including machoism and invulnerability. If there is also a regional or national culture that inherently resists the questioning or challenging of authority, then a dynamic may emerge which can be characterised positively as 'inventive solutioning', or negatively as 'normalising deviation' from intended procedure and process. Such cultural dynamics feature in many environments and requires a balanced and common communication to frontline workers that operational efficiency must constantly be achieved **against a backdrop of safe practice**, and where elements emerge with the potential to influence frontline safety performance, it is the shared expectation of the customer and the operator that **work will be paused** until a safe solution can be found. The root of 'self-imposed' pressure is often an inherited belief that to stop operations for any reason would have an unacceptable impact on management and customer alike, with potential consequences for the individual(s) involved.

Aviation is a dynamic environment, and when systemic and organisational controls are not tested for effectiveness, the frontline often become the **last line of defence**. More work must be done to give confidence to frontline staff that they will be recognised and respected for 'raising concerns' when operational safety margins have been eroded.

Following an initial internal safety investigation, the operator involved commissioned a Human Factors Investigation (HFI) from a qualified third party. The output of the HFI delivered as many learnings for the operator as their internal investigation, largely because the internal investigation focused on the immediate circumstances around the event, whereas the **HFI extended the scope to look at supervisory, organisational and systemic circumstances** influencing the outcome. In the operator's own words, "…the system set the crew up for failure…"

2.2.2 Event #2

2.2.2.1 Summary of flight (based on information shared by the operator)

- The purpose of the flight was to conduct a training flight planned for the purpose of maintaining night currency of all crew members.
- The P1/training role was allocated to a Line Training Captain approved by the operator.
- The flight was planned with due attention to pre-flight briefing, although the consideration of threats specifically associated with night flight were not covered in detail.
- The outbound leg was flown by the P2 (RHS) from an onshore airport to a known FPSO, approximately 110nm offshore with a helideck at the stern of the installation at a height of ~60ft asl.
- Weather conditions were light to moderate wind (10kts), partial cloud cover at medium level with good visibility.
- Approaching the destination, the PF briefed for an Airborne Radar Approach (ARA) and considering the deck orientation (favouring a RHS landing) handed control to P1 (LHS) for the instrument approach pattern in accordance with company SOPs.
- P1 (LHS) flew the ARA with P2 (RHS) in the PM role.
- The ARA was conducted in night visual conditions with the aircraft flown using coupled AFCS functions to align with a pre-planned final approach path into wind.
- The FPSO deck orientation allowed for a slightly offset straight-in approach, placing the FPSO infrastructure directly behind the helideck.
- The destination was identified visually and at approximately 1nm range, control was transferred back from P1 to P2 and P2 (now PF) disengaged coupled AFCS modes and reverted to manual flight.
- At approximately 200ft asl, shortly after PM called 'LDP', with airspeed reducing, a rapid rate of descent built up which was called out by PM. ROD peaked at ~700fpm (indicated) and ~1500fpm (recorded on FDR).
- Following the callout by PM, PF made a significant collective input (generating 300+% total torque) to recover the rate of descent, initially inducing a yaw to the right. Minimum height registered by the RadAlt during the event was 17ft asl.
- The aircraft was subsequently stabilised and manoeuvred to the FPSO helideck, with control being passed to the P1 initially prior to transferring back to P2 for the landing.
- A go-around manoeuvre was not called for by either crew member at any point during the stable portion of the final approach, the loss of control episode, or the subsequent recovery.
- XMSN OVTQ, indicating a transmission overtorque, was illuminated on the caution panel due to the power demanded during recovery from high ROD.
- Following crew discussion, the night deck landing exercise was terminated and the aircraft returned to base. There was no direct communication or interaction with technical or operational support teams.
- There were no injuries sustained by crew or third parties.
- Prior to the incident occurring, no mechanical deficiencies were identified on the aircraft.

2.2.2.2 Key learnings

The pre-flight briefing did incorporate considerations for night flight but **did not explicitly cover the causes of, and mitigations against, the 'blackhole effect'**, which the operator determined to be a primary casual factor. The separation of a targeted training briefing from the routine flight planning exercise may have given an opportunity for a more complete briefing to be completed. Equally, the use of a Threat and Error Management Checklist might have highlighted the issue for combined crew member awareness at the pre-flight stage.

Whilst the helideck on the destination rig was well-lit, the investigation brought out a recognition that the **helideck lighting was not significantly distinct** (in terms of colour and brightness) from the cultural lighting on the infrastructure surrounding the helideck. Therefore, the conditions supporting detection and maintenance of the visual cues required to manage speed, approach angle and rate of descent were not optimal.

The operator recognised that there was **variance in understanding of the term 'LDP'** between the crew in relation to helideck operations, in terms of both the recognition of the nominal LDP being reached and in terms of the actions required should a non-normal situation arise.

The investigation uncovered differences in understanding of the **appropriate use and execution of a go-around manoeuvre** in relation to non-normal situations arising during the final stages of approach, and how decision-making would vary based on the nature of any technical fault vs a loss of situational awareness.

One major learning for the operator was the promotion of guidance on how to react to a significant technical event – recognising that effectively 'pausing operations' immediately after the event enables personal recovery and gives the opportunity for the sharing of relevant information with other parties in support of effective decision-making.

2.2.3 Consideration of similar events

During the course of the analysis of the two events above, it was recognised that factors common to both events had also been seen in other events involving HeliOffshore members and non-members alike, some reported in the HeliOffshore InfoShare system, but several not reported.

It appears that few contracts, if any, include provision for regular night deck landing recency flights. Operators report that provision is often denied because of the impact to the helideck crews' other duties, a lack of understanding of the need for the training, or a misperception of an increased safety risk to the offshore asset through the conduct of the exercise.

The theme of loss of control leading to temporary or sustained deviation from the intended flightpath in degraded visual environments (DVE) is common to events occurring at night or during the day in reduced visibility. In 2021, HeliOffshore held an operator seminar in which several incidents were openly discussed – in each case the lack of a discernible horizon was a common factor.

Given the challenges of night flying (lack of visual horizon, reduced peripheral vision, and limited surface textural references), night flying when visual meteorological conditions (VMC) prevail should not be thought of simply as 'flying visually'. It should be thought of and managed in the same way as **operating in instrument conditions**, with appropriate procedures, training and instructional standards built into operators' training and recency programmes.

Whilst it is understood that pressures are applied to operators from many stakeholders to report information after an accident or serious incident, the centralised reporting of the occurrence of accidents and serious incidents (and subsequent follow-up with information of lessons-learned), particularly for events involving **sustained or temporary loss of control**, or near loss of control, would provide the basis for a consistent approach to addressing issues requiring an industry response. All operators and customers are asked to **encourage the sharing of events through HeliOffshore** in the first instance, to ensure the development and distribution of lessons-learned to the broader community. **Systemic change can only occur when a common will to make the necessary changes exists** amongst a significant proportion of stakeholders. In a similar vein, contribution to HeliOffshore's **InfoRate** programme will potentially enable deeper industry learning.

Analysis of the subject events in this report, in addition to other events known in the industry, suggest that it is **unclear whether the identification of HTAWS cockpit alerts is transparent** through operators' FDM programmes. Identification of HTAWS alerts was achieved in both cases through full FDR download, yet it would be a valuable tool to have visibility of callouts during the monitoring of routine line operations.

3 Identification of key themes and best practices

3.1 Common factors analysis

Initial analysis of the two events highlighted in section 2 led to discovery of issues (or factors) common to both events:

Issue highlighted in investigation	Factor in event #1	Factor in event #2	Factor in other events
Helideck availability for NDL(P)	✔	-	✔
Helideck and environmental lighting	✔	✔	✔
Pre-flight briefing / operational Risk Assessment	✔	✔ (partial)	✔
Use of automation in late-stage FPM	✔	✔	✔
'Startle effect' / temp incapacitation	✔	✔	✔
NDL competency	✔	✔	✔
(Line) Training Captain competency	✔	✔	✔
CRM training competency	✔	✔	✔
Crewing qualification and experience for NDL(P)	✔	✔	✔
Self-imposed (SI) pressure	✔	Possibly	✔
Lack of HFDM identification of unstable approach	✔	✔	✔
Lack of HFDM detection of 'HTAWS' alerts	✔	✔	✔

Table 1: Indicating factors common to multiple reported events

3.2 Expansion of key themes

Several key themes arise from the discovery of factors common to both events and can be usefully highlighted and expanded to determine appropriate actions to be taken to address them when developing or creating documentation.

3.2.1 Night flying

Night flying, particularly in the offshore environment, is a specialist task that requires robust initial training, frequent recency practice and regular oversight to ensure the required competency is maintained to a high standard. Furthermore, the responsibility for oversight of night competency should fall to nominated individuals who have demonstrated not only their own skill to fly at night, but also the competency to assess the performance of others completing the same task.

The operators involved in the two events at the core of this report have recognized that it is a considerable challenge to keep all pilots competent for night flying given the limited operational requirement and have now adopted a programme of **maintaining night competency for a specialist group of pilots only**. This has an impact on pilot rostering efficiencies and is a good example of how the **assurance of safe practices necessarily adds expense** to a business.

3.2.2 Helidecks and associated operations

Access to helidecks for training
(Action HD1 in Table 2 refers)

Whilst some training for night deck landing practice can be conducted in simulators, it is critical that helicopter crews are given **ample opportunity to conduct live training on real helidecks**. This is especially true for initial training crews prior to conducting night operations for the first time, as well as periodic training conducted for the purpose of maintaining night competency. It has been recognised that operators find it difficult to secure helidecks for night deck landing practice globally. Achieving the required **access to helidecks for training must be a priority activity**, particularly where client contracts demand night emergency/medevac cover.

A consideration for industry is the regional provision of a dedicated night deck training facility, which can be located at a convenient location and manned in accordance with an agreed training schedule.

Critical helideck information for flight planning
(Action HD2 in Table 2 refers)

A list of **standard information that is required by crews** to assist with the pre-flight planning process should be created and shared with the expectation that a lack of information being provided will potentially result in a delay in departure.

Helideck familiarisation
(Action HD3 in Table 2 refers)

When new decks are built or arrive in a region, it is essential that **a familiarisation process** is followed to capture the essential safety information relating to helideck operations. In some regions this is conducted by a third-party agency, often responsible for also providing helideck owners with a certificate of conformance to an agreed set of helideck standards. A crucial function provided by such agencies is the **centralised database of obstructions** and operational limitations. Where such information is not available centrally, an expectation should be set for a **daytime familiarisation flight** prior to the commencement of commercial operations, by day or night, **by each operator likely to utilise the helideck**.

Helideck lighting standards
(Action HD4 in Table 2 refers)

Helideck lighting is critical in assuring that crews have the best visual cues to perform safe offshore landings at night. Guidance on **several helideck lighting standards** exist, but the UK CAA's CAP 437 and HSAC's Recommended Practice #161 refer to minimum standards which are commonly applied in multiple regions.

For any contract where night operations are required, for either routine crew transfer, but more crucially, where night medevac services are required, the helideck must be lit to an **agreed helideck lighting standard referenced in the contract**. Where elements of any lighting system are unserviceable, the relevant guidance in HeliOffshore's Master Minimum Helideck Equipment List (MMHEL) should be followed, including the communication of this status to helicopter operators.

3.2.3 Flightpath Management
Threat and Error Management processes
(Actions FP1 and FP2 in Table 2 refer)

Robust flightpath management is rooted not just in the execution of the flight itself, but equally in the **pre-flight planning stage**. Every flight should be planned with due consideration for the threats that might impact a safe transit between departure point and destination and a useful tool to assist the planning process is a **Threat and Error Management (TEM) checklist** designed to highlight and re-emphasise key elements for consideration and potential mitigation. Commonplace tools described as Operational Risk Assessments or Pre-flight Risk Assessment Tools contain many of the considerations that should be included in a TEM checklist, but take the analysis of the risk one stage further to define thresholds where flights can continue with or without additional oversight and release authority. The **TEM philosophy** can be applied pre-and post-flight, as well as for **briefing key phases of flight** – including take-off, approach and landing – so the development of a comprehensive template for a TEM checklist and in-flight TEM procedures presents an obvious opportunity for collaboration with potential benefits for all operators.

Successful flightpath management is achieved through **well-practised manual flying skills**, considered and **knowledgeable use of AFCS functions**, and **deliberate monitoring** of the pilot flying and/or AFCS when either or both are controlling the helicopter. A particular area of vulnerability is in the period surrounding the **transition from automated (or coupled) flight to the start of the manually flown phase of flight** during an approach – this vulnerability is exacerbated in conditions where no discernible horizon exists and peripheral vision is compromised.

A theme common to both events is the **required emphasis of assertive interventions** by monitoring pilots when flight path deviations are detected. Based on CRM training principles, respectful but assertive callouts are an essential element in safe flight path management. Establishment of, and adherence to **sterile cockpit**, **deviation monitoring** and **intervention policies** are critical in assuring a safe flight path.

HeliOffshore's own Recommended Practice on Flightpath Management already covers the basic approach profiles **including monitoring guidance**, but could usefully be expanded to be more explicit around the transition between coupled and manual flight, as well providing clear guidance on the successful management of the **last half mile of the approach** path to helidecks, including optimising helicopter performance alongside obstacle avoidance and connecting back to the threats that are specific to night operations.

3.2.4 Crew competency and experience
Competency of line pilots for night flying
(Action CC1 in Table 2 refers)

Competency for night flying is neither demonstrated nor proven through a given level of experience (expressed in seniority or flying hours). It is **demonstrated through the evidence of being robustly trained** and **routinely assessed by qualified personnel**.

These requirements fall broadly under the heading of **Line Training** which develops the application of the knowledge and skills of how to fly a given aircraft type in circumstances specific to a particular mission and environment. Line Training can cover a broad range of missions and environments, and as a result, aviation **regulations rarely call out specific requirements for Line Training** programmes. Some, but not all regulators, call for the need for a Line Training programme but leave it to individual operators to define the programme and the associated assurance. Significantly, client contractual requirements are similarly vague in defining the requirements for Line Training. Consequently, there is **considerable variation in Line Training standards** across the industry, exposing certain regions, operations and operators to unnecessary risk.

This variation can be addressed through **the establishment of Recommended Practices for Line Training** which can be referred to in contracts and adopted by operators.

Competency of those who train line pilots
(Action CC2 in Table 2 refers)

Pilots nominated to conduct Line Training are not subject to regulatory or client requirements. Best practice would be for an operator to establish a framework for selection, training and regular assessment of pilots nominated for Line Training responsibilities. A robust framework would mirror the existing framework in regulation for the selection, training, approval and assessment of Type Rating/Instrument Rating Examiners or Check Airmen. Regardless of whether Line Training is considered a function of the Training department or Flight Operations department, an agreed framework can be applied to ensure the consistency of training delivery within any operation.

Competency of those instructing in Crew Resource Management
(Action CC3 in Table 2 refers)

Variations in regulatory requirements for CRM training mean that CRM **training standards vary considerably**. CRM is a topic that was developed considerably in the 1990s and early 2000s, resulting in a large body of learning being developed and delivered across the industry. CRM training addresses the application of pilot competencies in the context of real-life examples and was, for a period, conducted discursively in a classroom environment allowing for deeper analysis of topics like somatogravic illusion and 'blackhole effect'. CRM philosophies and the assessment of competency was gradually incorporated into simulator training with those delivering training being assessed in their CRM instructional skills in addition to their type and operational knowledge. This has, in effect, watered down CRM instructional skills across industry and consideration should be given to the establishment of a competency assessment framework for all personnel involved in training and assessing CRM skills.

Minimum qualification/experience for night operations including NDLP
(Action CC4 in Table 2 refers)

The concept of minimum combined crew qualification and experience requirements exists for general operations to provide a level of control to risks associated with specific operational situations, such as the introduction of new aircraft types, or operations in extreme environmental conditions or on specialist missions. Consideration should be given to the development of a minimum combined crew qualification/experience matrix for night operations and, additionally, night deck landing practice operations. This is an extension of the establishment of the competency and experience framework outlined in previous paragraphs and would provide an additional layer of mitigation where night flying activities are restricted to the maintenance of operational recency.

3.2.5 Human Performance

Cultural impact of communication and oversight
(Action HP1 in Table 2 refers)

Balance is required where a response to prevailing expectations, often packaged and celebrated as a 'can-do' attitude, must be offset with the more significant priority of assuring operational outcomes are delivered safely. Professionals in most disciplines, particularly experienced professionals, are very adept at finding solutions to problems arising in daily operations. Direct and indirect messaging (mostly through spoken communication) influences the frontline attitude to everyday problem-solving, and a thin line separates the celebration of novel solutioning that 'saves the day' and the establishment of accepted and unreported 'work-arounds'. Regular, deliberate frontline communication exercises allow for open conversation about problems arising to be surfaced. Equally, the adoption of managed observational programmes, for instance LOSA, give insight into frontline challenges and performance, allowing management teams to reset operational and cultural expectations through updated procedures and effective reporting processes.

'Startle' effect
(Action HP2 in Table 2 refers)

Much is known about this phenomenon and its effect on human performance, yet little material has been openly shared across the offshore helicopter sector. 'Startle' relates to a temporary disabling effect for the cognitive and physical functions of any individual experiencing it. Those experiencing 'startle' are unable to orient themselves in a given situation and apparently lose situational awareness, the capacity to operate, and the ability to communicate clearly. Greater awareness of this effect, the potential mitigations and the required interventions is required and can easily be sourced from other aviation knowledge bases for wider learning.

Start Work vs Stop Work philosophies
(Action HP3 in Table 2 refers)

A common and well-intended approach to safety management has been to encourage and, indeed, to oblige individuals to *Stop Work* when an unacceptable risk threshold has been observed. Whilst this responsibility to intervene to prevent a potential incident or accident should remain as a core tenet of safety culture and management, **risk is open to subjective interpretation**, so it must be balanced with an equally promoted approach to *Start Work* safely. This balance ensures that frontline personnel have the right and obligation to progress down a path **only when positive safety outcomes are predictably likely** and is in line with developing stronger, psychologically safe working environments.

3.2.6 Helicopter Flight Data Monitoring Capabilities

Detection of unstable approaches
(Action FD1 in Table 2 refers)

Traditional approaches to Flight Data Monitoring established event sets that detected operations outside of acceptable parameters and identify opportunities to intervene and correct unacceptable behaviour. It remains a constant challenge for industry to define the parameters indicating the boundary between stable and unstable approach profiles. This problem is further exacerbated with the utility and flexibility of the helicopter resulting in multiple acceptable approach profiles with variances seen onshore/offshore, IMC/VMC, with approaches conducted to elevated or ground level helipads, or to runways/landing strips; but boundaries can be defined for particular specific types when considering an operator's SOPs.

Whilst certain parameters for 'stable approaches' can be defined, an additional benefit of FDM datasets is to review aggregated flight data to determine what normal operations look like and give insight to the range of variation in operational performance. This will allow targeted analysis of offshore approaches, which can be separated from analysis of onshore approaches following a distinctly different profile. Sharing of FDM data (under appropriate protection protocols) will give visibility to operational variances on a global level and potentially provides novel insights to contributing operators, OEMs and regulators.

FDM Modelling of enhanced HTAWS thresholds
(Actions FD2 and FD3 in Table 2 refer)

Both events referenced in this report involved the aircraft descending to lower than intended heights over water. The safety benefit of HTAWS cautions and warnings during live operations is well understood. The reaction to such warnings is, however, a critical element in the avoidance of CFIT (and is highlighted in the Flightpath Management section above).

FDM systems are a useful part of the pilot training toolkit and it would undoubtedly be beneficial if operators could routinely identify the triggering of HTAWS cautions and warnings on routine line operations to determine individual or organisational learning opportunities. However, it is not clear if HTAWS triggers and the relevant triggering mode are universally visible in FDM programmes.

Research into the development of FDM algorithms which identify proximity to the enhanced HTAWS thresholds outlined in ED-285 is ongoing and potentially provides novel insight to organisational performance around low-level operations. This insight would allow operators to identify any useful changes to be made to their SOPs, overcome any potential deficiency in visibility of HTAWS triggers, and will possibly reinforce the case for the fitment of enhanced HTAWS equipment as it becomes available.

3.2.7 Safety Investigations

Identifying Human Factors in safety investigations
(Action IN1 in Table 2 refers)

Human Factors is a much-used term in aviation – and is one open to varied interpretation – but the concept of incorporating human factors principles into investigation processes has only recently been brought into focus. Frameworks for human factors analysis exist (HFACS is a well-known example often used for these events) but are not consistently applied, with investigations often focusing on the factors most proximal to the event itself (ie the actions of the individuals involved in the final moments leading up to the accident or incident). Both operators involved in the events outlined in this report attest to the benefits of a human factors-based investigation to supplement the technical investigation, and provide clear understanding of the organisational and systemic factors influencing the actions of the crews involved.

Expanding an inclusive approach to investigations
(Action IN2 in Table 2 refers)

Experience has shown that where individual stakeholders embark on independent investigations of the same event, findings and learnings are rarely developed, shared or acted upon. Whilst the protocols of formal investigation processes must be respected, a shift in attitude is required to encourage open and inclusive approaches to safety investigation where trust, respect and a focus on shared learning are central to the stakeholders' involvement. This report, borne out of these goals, has arguably already demonstrated the benefits of such an approach to all industry stakeholders, where openness, vulnerability and the desire for access to diverse perspectives has created significant learning potential.

4 Industry Action Plan Summary

The table below lists the issues outlined in previous sections and identifies the specific outputs required to provide robust mitigation at a systemic level. Each improvement opportunity has been numbered for ease of reference.

HeliOffshore and the IOGP's Aviation Sub-Committee have the opportunity to fill gaps in regulation and address regional variations by defining and endorsing best practice through a clear link between IOGP Report 690 (the contract standard for aviation activities) and HeliOffshore's operational Recommended Practices.

Where Report 690 outlines the requirement, HeliOffshore's Recommended Practice documentation can provide an agreed means of compliance.

Consistent application of the requirements of Report 690 and the adoption of Recommended Practices will 'level up' safety performance across the industry.

Table 2: Summarizing key opportunities for improvement identified in this report

Ref.	Theme	Issue Identified	Required actions and outputs to mitigate	Related Doc(s)
HD1	**Helidecks**	**Helideck availability for NDLP**	Establish contract expectation and requirement for deck availability for NDLP where contracts require routine or emergency night offshore operations.	**R690**
HD2			Establish measurement of NDLP requests made versus requests denied captured as part of Leading Indicators project.	**HSIP**
HD3		**Helideck information to helicopter operators**	Create new Recommended Practice on minimum helideck equipment standards for safe operations (day and night) in MMHEL, including minimum information required to be communicated to operators.	**R690 refers to HMP RP**
HD4			Develop a template interface document capturing operational helideck management responsibilities shared and delegated between helicopter operator and asset owner, with guidance on alleviation / mitigation.	**R690 refers to HMP RP**
HD5		**Helideck familiarisation**	Develop requirements and guidance for deck assessment and familiarisation for helidecks new to region.	**R690 refers to HMP RP**
HD6		**Helideck lighting standards**	Promotion of compliance and contractual expectation of minimum helideck standards for night operations (as per CAP437 and HSAC Helideck RP161) where contracts require routine or emergency night offshore operations.	**R690**
FP1	**Flightpath Management**	**Pre-flight briefing / Operational TEM Checklist**	Develop requirements and guidance on Threat and Error Management framework and use of TEM philosophy in pre- and post-flight briefings, and at critical phases of flight.	**R690 refers to FPM RP**
FP2		**Optimising flightpath management in 'last half-mile'**	Enhance guidance for final stage of approach including LDP identification, go-around decision-making and execution, PM monitoring and intervention responsibilities, 'night approach' considerations, and optimised use of automation, particularly during managed transition from coupled to manual flight.	**FPM RP**

Ref.	Theme	Issue Identified	Required actions and outputs to mitigate	Related Doc(s)
CC1	**Crew Competency & Experience**	**Night Deck Landing competency**	Develop requirements and guidance on NDL competency pathway for line pilots including initial, recurrency and renewal training/ experience.	**R690 refers to LTS RP**
CC2			Enhance requirements and guidance on competency/recency for night operations.	**R690**
CC3		**Training Captain / Check Airman and Line Training competency**	Develop recommended pathway for Training Captain (TC) / Line Training Captain (LTC) authorisation for the conduct of night deck landing practice operations.	**R690 refers to LTS RP**
CC4		**Crew Resource Management Instructor competency**	Develop recommended pathway for CRMI approval within operator training programmes.	**Brf Sht**
CC5		**Minimum crew qualification / experience levels for NDLP**	Develop recommended minimum qualification and experience levels for crew composition during night operations, including initial and recurrent night deck landing practice.	**R690 refers to LTS RP**
HP1	**Human Performance**	**'Startle effect' and temporary incapacitation**	Reinforce SOPs designed to create the environment for optimal crew performance including Sterile Cockpit, Active Monitoring and Two Communication Rule policies. Develop guidance on recognition and mitigation of 'Startle' effect for incorporation into operator training programmes.	**Brf Sht**
HP2		**Self-imposed pressure**	Develop guidance on recognition and mitigation of 'self-imposed' pressure to be incorporated into joint IOGP and HeliOffshore communication for incorporation incorporated into operator CRM/ MRM training.	**Brf Sht**
HP3		**Planning for safe outcomes**	Promote 'Start Work safe' concept in addition to 'Stop Work' obligation in combined HeliOffshore and IOGP communication.	**TBD**
FD1	**Flight Data Monitoring**	**HFDM identification of unstable approach**	Enhance requirements and guidance in HFDM Recommended Practices for unstable approach detection and monitoring.	**R690 refers to FDM RP**
FD2		**HFDM detection of HTAWS alerts**	Develop research and guidance to ensure visibility of cockpit HTAWS alerts triggers and modes within operator programmes.	**FDM RP**
FD3			Development of algorithms for operator HFDM systems to replicate enhanced HTAWS envelopes (modes 1-7 as defined in ED-285).	**FDM RP**
IN1	**Investigations Investigations**	**Investigative process**	Promotion of a Human Factors-based investigation framework to be applied in internal and external investigations.	**R690**
IN2		**Stakeholder inclusion**	Promotion of 'open and inclusive' investigation processes including all primary stakeholders working together and use of HeliOffshore InfoShare programme for initial and follow-up notifications of accidents.	**R690 and HSIP**

The references to related doc(s) are decoded as:

R690 IOGP **Report 690 – Oil & Gas Aviation Recommended Practices (OGARP)** document (and subs)

HSIP HeliOffshore Safety Intelligence Programme outputs (incl. safety surveys, InfoShare and InfoRate)

FPM RP HeliOffshore **Flightpath Management Recommended Practice** document

FDM RP HeliOffshore **Flight Data Monitoring Recommended Practice** document

HMP RP HeliOffshore **Helideck Operations Management and Procedures Recommended Practice** document (to be developed)

LTS RP HeliOffshore **Line Training System Recommended Practice** document (to be developed)

Brf Sht HeliOffshore Briefing Sheet targeted to specific topic (to be developed)

TBD Output format to be determined

5 Conclusion

In this report, use of the term 'recommendation' has been resisted as it implies a degree of optionality to stakeholders. The strength of this report will be in achieving agreement on the necessity for the actions outlined in section 4 and securing commitment for prioritisation and execution.

The approach taken to identifying key themes to be addressed has effectively raised 21 potential improvement opportunities, each of which require multi-stakeholder collaboration to deliver consistent, far-reaching and robust operational safety performance improvement at an industry level.

The majority of the mitigatory actions identified in this report are closely connected to priorities outlined in HeliOffshore's Safety Performance Model and are natural extensions of existing workstream activities. They are equally aligned with the aims of the IOGP's Aviation Sub-Committee's activities, particularly the further development and refinement of Report 690 and the related document suite.

Resetting the contractual relationship between helicopter operators and customers to ensure that helidecks and their associated operations are managed robustly, since this is a responsibility shared by both stakeholder groups, will directly lead to improved operational safety, but also to the alignment of the required training for those personnel involved in helideck operations management.

It is critical that where contracts call for night support for routine air transportation, or for medevac standby, offshore asset duty holders are obliged to provide helideck access to helicopter operators to allow them to complete Night Deck Landing Practice exercises on a contractually agreed basis.

A further key improvement opportunity identified is the importance of a robust Line Training system. New work is required to define best and recommended practice of this essential element of aviation safety that is currently inadequately addressed in regulatory or contractual requirements, resulting in considerable variances in operational practice.

Enhancement of guidance to cover the 'last half-mile' segment during offshore approaches is the next appropriate iteration of HeliOffshore's Flightpath Management (FPM) Recommended Practices. An important thread to pick up on from HeliOffshore's Pilot Monitoring research is the adaptive skills evidenced in some pilots who fly the aircraft in full or partial instrument conditions without reference to the attitude indicator, which has been shown to increase operational risk exposure. Further research is required to develop an understanding of the roots of this phenomenon and how to mitigate against it.

Deeper analysis of existing scientific research into night flying practices is also warranted to ensure that learnings from previous research are brought into the public domain. Risks identified in previous research and highlighted in this report should be addressed in operators' Safety Management Systems to identify areas requiring appropriate mitigation.

HeliOffshore and IOGP commit to addressing the mitigations outlined in this report through their respective organisational safety strategies and activities.