Australian Government
Australian Transport Safety Bureau

Helicopter winching incident involving Eurocopter AS365, VH-WPX

Near Swanbourne, Western Australia, on 29 September 2020

ATSB Transport Safety Report
Aviation Occurrence Investigation (Defined)
AO-2020-053
Final – 22 September 2021

Cover photo: Western Australia Police Force

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, ACT 2601
Telephone: 1800 020 616, from overseas +61 2 6257 2463
Accident and incident notification: 1800 011 034 (24 hours)
Email: atsbinfo@atsb.gov.au
Website: www.atsb.gov.au

Addendum

Page	Change	Date

Safety summary

What happened

On 29 September 2020, the crew of a Eurocopter AS365 'Dauphin' helicopter, registered VH-WPX and operated by the Western Australia Police Air Wing, were conducting water winching training exercises near Swanbourne, Western Australia. While conducting winching to a small vessel, a rescue crewman attached to the aircraft winch cable was pulled overboard and dragged through the water. The rescue crewman was recovered a short time later without injury and the helicopter was undamaged.

What the ATSB found

The ATSB found that the winching recovery sequence was interrupted when the rescue crewman lost footing on the deck of the vessel. The interruption, although communicated by the winch operator, was not recognised by the pilot, who expected the usual sequence to continue as had previously occurred on numerous occasions. As a result, the pilot instinctively increased the distance between the helicopter and vessel, and the rescue crewman was dragged overboard by the winch cable.

Further investigation found that crewman overboard drills were not regularly briefed or practiced, contributing to a breakdown in communication. This reduced the crew's preparedness to respond effectively to such an event.

Finally, and though not a factor contributing directly to this event, the ATSB found that changes to sea state limitations contained within the Western Australia Police Air Wing Rotary Wing Operations Manual, were approved without the required review by the operator's Safety Action Group. The absence of that review reduced the opportunity to identify any increased risk associated with the change.

What has been done as a result

Following an internal safety review, the Western Australia Police Air Wing amended training and pre-flight briefings to include a crewman overboard scenario, and implemented crewman overboard drills during winch simulation training.

Furthermore, the Police Air Wing has introduced an alternative approach to open water vessel winching, that eliminates the risk while still maintaining the same level of rescue capability to the community.

With respect to easing of sea state limitations, the Police Air Wing has reinforced the importance of following change management principles and formal reviews to mitigate future foreseeable risks.

Safety message

Effective communication between pilots and crewmen is critical when undertaking helicopter winching as the pilot is required to safely manoeuvre the aircraft while unable to visually monitor the progress of the activity.

This incident demonstrates that even during highly trained and well-rehearsed operations, human performance limitations such as expectancy and reduced attention associated with a familiar task, together with deviations from standard phraseology, can have undesired outcomes.

Contents

The occurrence

Overview

On 29 September 2020, the crew of a Eurocopter AS365 'Dauphin' helicopter, registered VH-WPX and operated by the Western Australian Police Air Wing, were conducting water winching training exercises to a vessel in waters off the Perth coastal suburb of Swanbourne, Western Australia. During the training, a rescue crewman was pulled overboard while attached to the aircraft winch and dragged through the water. The rescue crewman was recovered a short time later without injury and the helicopter was undamaged.

Pre-incident flights

The crew for the training exercises comprised the pilot, four tactical flight officers (TFOs) and one TFO instructor. The day's training involved the TFOs rotating through the positions of winch operator, rescue crewman and diver. The plan was to conduct an initial vessel winching operator proficiency check for one of the TFOs, as well as recency flights for two of the other crewmembers. The training was conducted with a volunteer marine rescue vessel, *Stacy Hall.*

The crew commenced duty at 0700 Western Standard Time[1] at the operator's base at Jandakot, before completing the daily briefing and pre-flight preparation. Data from the onboard GPS unit showed VH-WPX departed Jandakot at 0933 and travelled to the designated training staging area at Rous Head, Fremantle, landing at about 0950.

At 0953, VH-WPX departed for the first training sortie, which was a familiarisation exercise for a novice winch operator in preparation for the planned initial winch training. This exercise was conducted close to shore at a nearby beach.

At 1032, VH-WPX took off on the second training sortie and travelled about 17 km from Rous Head to rendezvous with *Stacy Hall*, about 1 km offshore from Scarborough. The wind was north-westerly with a westerly swell, and the vessel tracked north through the water to provide a headwind component for VH-WPX.

During the second sortie, the crew onboard the helicopter remarked that the conditions were windy and observed the *Stacy Hall* was moving around significantly in the water. In response, the TFO instructor requested that the crew of *Stacy Hall* establish a speed of 10 kt, in order to make a flatter path through the waves. On the advice of the pilot, the vessel's course was also altered to 330°, to make a more oblique approach to the swell.

The TFO Instructor conducted a demonstration winch cycle then requested the crew of *Stacy Hall* increase speed to 12 kt to further assess conditions for initial winch training. At the conclusion of the alterations to the vessel's speed and course, the TFO instructor proposed cancelling the planned initial winch training, because the conditions were perceived as rougher than it looked. The pilot asked whether the remaining qualified crew could undertake the training and the TFO instructor agreed that was possible, but a group discussion/assessment should be conducted first. Consequently, the helicopter returned to Rous Head.

After landing about 1054, the crew discussed the conditions and whether they should continue training with the qualified crew who required operator proficiency checks and recency training. A joint decision was made to assess the sea state from the air and with the vessel underway. While the helicopter was on the ground at Rous Head, the wind had backed to a more westerly direction, and it was agreed that may have created more suitable conditions for continuation of the training with the experienced crew.

---

[1] Western Standard Time (WST): Coordinated Universal Time (UTC) + 8 hours.

At 1131, VH-WPX departed for the third training sortie. The crew contacted the crew of the *Stacy Hall* en route and requested they alter course to 300° and maintain a speed of 10 kt. During a dummy run to the vessel the winch operator observed that the *Stacy Hall* was bouncing in the waves, so the crew requested further course and speed changes.

With the *Stacy Hall* maintaining 12 kt at 320°, the crew conducted the next phase of the training, which was a winch to the vessel with the rescue crewman remaining attached to the winch hook. The exercise progressed to completion, though as the rescue crewman was winched clear of the deck, they swung towards the canopy on the forward end of the deck and required the use of their arms to fend off. The rescue crewman was then safely winched into the helicopter, with the winch operator commenting to the crew that the sequence '…was pretty hairy'.

The crew then conducted the third and fourth phases of the training, which were a vessel winching involving the rescue crewman disconnecting from the winch hook and then a helocast and water winch recovery exercise.[2] There were no issues encountered in either exercise, after which the helicopter returned to Rous Head.

The incident flight

At 1203, the helicopter landed at Rous Head and the TFOs rotated roles. For the incident flight, the operational crew consisted of the pilot, the TFO instructor observing the exercise, and three TFOs, one observing and two undertaking the respective roles of winch operator and rescue crewman.

At 1210, VH-WPX took off to rendezvous with the *Stacy Hall*, which was located about 8 km north of the Rous Head landing area and between 1 and 2 km offshore, west of Swanbourne. After take-off, the crew completed fly-away checks, pre-landing checks, pilot brief and winch checks. The pilot brief confirmed the crew would undertake two winches onto the vessel, and the vessel would be travelling on a course of 300° at a speed of 12 kt.

The helicopter approached the *Stacy Hall* and the pilot established the helicopter at the datum position.[3] The crew then conducted a dummy approach run, during which the pilot reported having a good visual hover reference of the vessel. At the completion of the dummy run, the pilot terminated the helicopter at the on-station position.[4]

Onboard winch video recordings showed that at about 1215, the helicopter had moved from the on-station position to the transfer position[5] and the winch operator commenced lowering the rescue crewman to the deck of the vessel. At 1216, the rescue crewman landed on the aft deck of the rescue vessel and completed simulated checks. Within 2 seconds of landing on the deck, the rescue crewman gave the thumbs-up signal to indicate they were positioned, had completed checks and were ready to be winched up.

The winch operator acknowledged that the rescue crewman had signalled they were clear to be recovered and reported to the pilot 'one thumb up' and 'taking up the slack'. The winch operator then winched in slack in the cable and reported that he and the rescue crewman were 'ready to winch'. The pilot gave clearance to winch and the winch operator commenced winching.

At the same, the vessel's interaction with the swell resulted in its deck pitching higher as it travelled over a wave. As a result, the rescue crewman lost their footing and moved down and

---

2 Helocast and water winch recovery describes the rescue crewman exiting the aircraft unattached and entering the water once safe altitude and airspeed above the water's surface has been achieved, then recovered using water winching techniques.

3 Aircraft maintaining reference and pace with the vessel at a distance of approximately 100 m.

4 Aircraft maintaining station and no closer than three rotor diameters to the vessel, providing the pilot and winch operator with the best view of the vessel.

5 Aircraft maintaining hover reference with the vessel at adequate height clearance to allow for changes in swell, where the rescue crewman can be lowered to the deck with minimal risk of injury or likelihood of cable being fouled.

backwards onto their back as the vessel's aft deck rose on the swell. The winch operator reported 'crewman has fallen' and immediately payed out cable to prevent it from becoming taut.

As the winch operator reported the rescue crewman was 'adjusting his feet', the pilot moved the aircraft back and left, increasing separation between the aircraft and the vessel. In response to that movement, the winch operator advised the pilot to move the helicopter 'forward two' (see the section titled *Winching procedures*), then with increased urgency in his tone 'forward two, forward two'.

Despite those instructions from the winch operator, the separation between the helicopter and vessel increased. As a result, the winch cable became taut and the rescue crewman was dragged aft along the deck, into the transom and overboard into the water (Figure 1). The following then occurred in quick succession:

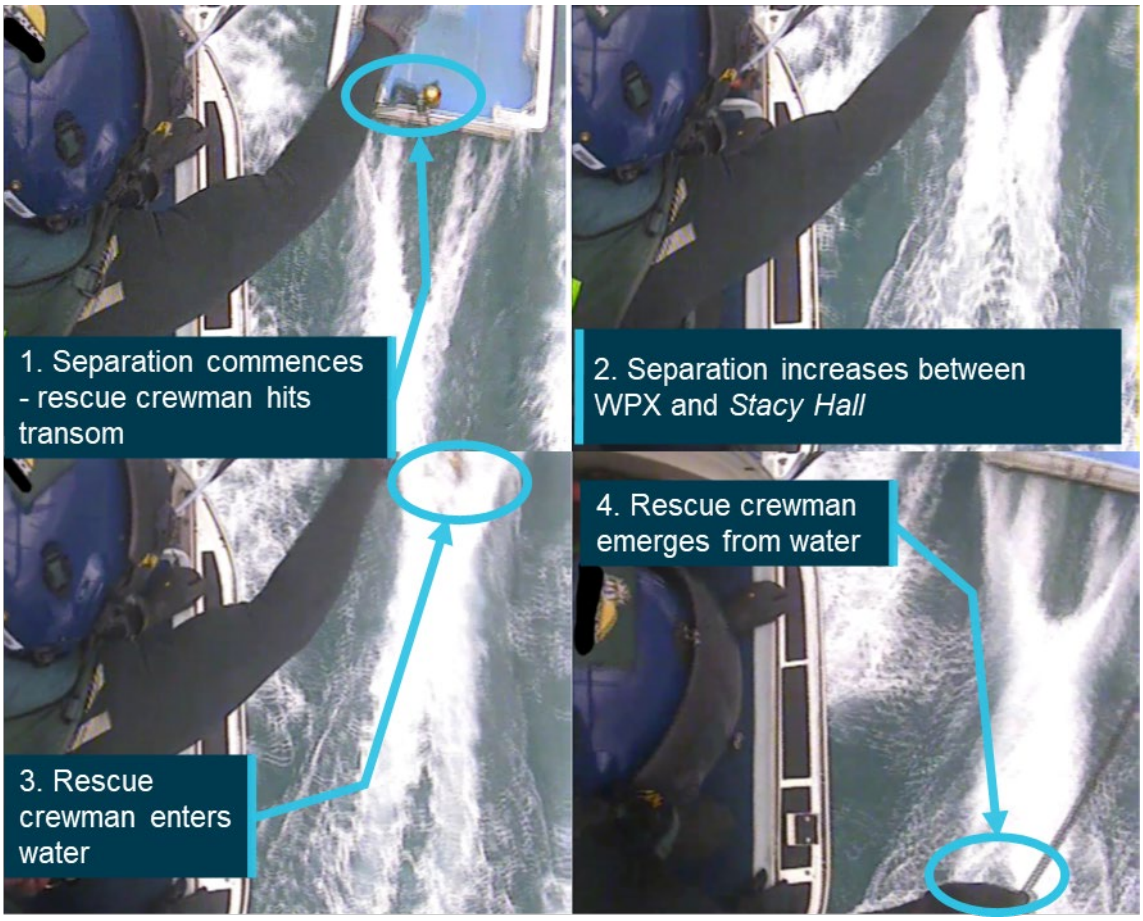
- The winch operator instructed the pilot 'back, hold, hold, hold, hold' with increasing urgency.
- The pilot responded, 'I am holding'.
- The aircraft ceased moving away from the vessel and started moving forward as the pilot attempted to maintain position in vicinity of the vessel's aft deck. The forward movement of the helicopter caused the rescue crewman to be dragged forward through the water towards the vessel.
- The winch operator commenced winching in, and the onboard video showed the rescue crewman emerge from the water.
- The pilot asked, 'where is he?', with the winch operator responding, 'he's just here underneath me'.

About 6 seconds elapsed between the crewman falling from the vessel, and emerging clear of the water. Due to the forward momentum of the helicopter, there was a slight swing to the cable as the rescue crewman left the water, which the winch operator controlled by hand. The rescue crewman was then winched into the helicopter, and once inside, confirmed they were uninjured.

The pilot, winch operator and TFO instructor then discussed whether the training should continue. They decided to conduct another dummy run and briefly discussed their observations regarding the incident. The review of the incident did not include discussion of the helicopter movement. However, the TFO instructor provided feedback that in the event of a crewmember falling from the vessel, the correct response was for the winch operator to call 'crewman overboard' and 'hold'.

About 1218 the crew conducted another dummy run, then decided to continue with the original planned training exercises. The crew conducted two further planned vessel winching evolutions followed by a helocast and water winch recovery. Having completed the training sorties, the aircraft returned to Jandakot, landing at 1243.

Figure 1: Rescue crewman overboard



A series of still images captured from on-board video highlighting the commencement of separation and rescue crewman going overboard.
Source: Western Australia Police Force annotated by the ATSB

Context

Environmental conditions

Weather

The Bureau of Meteorology (BoM) forecast for 29 September 2020 was for winds west to north-westerly at 10 kt, increasing to 10 to 15 kt during the morning and reaching westerly 15 to 20 kt in the afternoon.

The weather at the time of the incident was overcast with clear visibility (Figure 2). The temperature was about 19°C with wind from the north-west at 21 km/h (11 kt) gusting to 30 km/h (16 kt).

Sea state

Seas were forecast to be below 1 m, increasing 1 to 1.5 m during the morning with a west to south-westerly swell 1 m to 1.5 m increasing to 1.5 m to 2 m.

Recorded wave data indicated a combined wave height of 0.89 m consisting of a swell height of 0.37 m from 228° (south-west) and sea height 0.81 m from 264° (west).[6]

Figure 2: Western Australia Department of Transport Swanbourne Beach camera

Source: Western Australia Department of Transport

Flight crew information

The flight crew for the day's training comprised the pilot, four tactical flight officers (TFOs) and a TFO instructor. Two TFOs drove a vehicle towing a refuelling trailer to the Rous Head staging area while the remainder flew in VH-WPX. The TFOs rotated through roles on the aircraft according to the training, proficiency and recency requirements of each individual.

While the TFO instructor was onboard observing at the time, only the following crew were directly involved and relevant to the incident.

---

[6] Recorded at 1149 by the Western Australia Department of Transport Cottesloe wave buoy, 6 km offshore west-south-west of the incident location.

The pilot

The pilot joined the Australian Army as a Blackhawk pilot in 2008 and commenced with the Western Australia (WA) Police Air Wing as a helicopter line pilot in September 2019. At the time of the incident the pilot had accumulated 3,566 flight hours, including 497 hours of helicopter winching - 53 hours of which were water winching. About 320 of their flight hours had been accumulated on VH-WPX.

The winch operator

The winch operator had been with the WA Police Force for almost 20 years and at the Air Wing for just over 10 years, commencing as a TFO in June 2010. At the time of the incident the winch operator had accumulated 1,596 crewman flight hours including 560 winch operator hours. Within this time, the crewman had filled the role of winch operator for 110 cycles of water winching. The winch operator qualified as a TFO instructor in September 2017 but was not performing that role at the time of the incident.

The rescue crewman

The rescue crewman had been with the WA Police Force since 2011, before commencing as an aeroplane TFO in June 2017. After about 12 months in that role, the rescue crewman moved into helicopter operations and had accumulated 864 crewman flight hours. This included 74 cycles filling the role of rescue crewman.

Aircraft information

VH-WPX is a Eurocopter (subsequently Airbus Helicopters) AS365N3+ Dauphin 2 helicopter, configured for single-pilot operation and equipped with a rescue winch fitted behind the pilot on the right side (Figure 3). It was manufactured in 2011 and operated by the Western Australia Police Air Wing. At the time of the incident, the aircraft had accumulated a total of 4,237 flight hours and 5,671 landings.

After the incident, aircrew viewed onboard winch boom video imagery and identified potential cable shock loading during the recovery of the rescue crewman. WA Police Technical Log records showed that on 1 October 2021, a full cable inspection was conducted in accordance with the Goodrich Rescue Hoist Component Maintenance Manual, with no defects identified.

Figure 3: VH-WPX rescue winch

Source: Western Australia Police Force annotated by the ATSB

Vessel information

The *Stacy Hall*, callsign 'Green 1', is a 12 m aluminium vessel manufactured by Legend Boats (Figure 4). It was powered by twin 450 hp Caterpillar diesel motors capable of sustained operations for up to 24 hours. The vessel was fitted with integrated chart-plotter, sounder and radar, 27MHz, VHF and HF marine radios, radio direction finders and a FLIR infrared camera.

The *Stacy Hall* had about a 4 m beam with open aft deck, towing post on the fore-aft centreline and folding transom. The vessel was considered to have a large enough aft deck for water winching operations and was regularly utilised when WA Police Force vessels were unavailable.

Figure 4: Volunteer sea rescue vessel *Stacey Hall*.

Source: Western Australia Police Force

Operator procedures

Operations manual

The WA Police Air Wing Rotary Wing Operations Manual contained six volumes encompassing administration, aircraft operations, training and checking, airworthiness and special operations. Volume 4 provided guidance and requirements for all training and checking whilst volume 6 provided the guidance and instructions for special operations. Volume 6B1 *Winching Operations*, was accepted by the Civil Aviation Safety Authority in April 2020. The volume detailed aircraft winching training, equipment requirements, guidance, and standard operating procedures.

Planning

Pre-flight planning was conducted in accordance with the Rotary Wing Operations Manual and utilised the Bureau of Meteorology (BoM) combined sea state lookup table (Table 1). BoM sea state tables provide a projected combined sea state based on the forecast sea and swell height.

Table 1: Bureau of Meteorology total wave height lookup table

		SWELL HEIGHT (metres)									
		0	0.5	1.0	1.5	2.0	2.5	3.0	4.0	5.0	6.0
SEAS or WIND WAVE HEIGHT (metres)	0.5	0.5	0.7	1.1	1.6	2.1	2.6	3.0	4.0	5.0	6.0
	1.0	1.0	1.2	1.4	1.8	2.2	2.7	3.2	4.1	5.1	6.1
	1.5	1.5	1.6	1.8	2.1	2.5	2.9	3.4	4.3	5.2	6.2
	2.0	2.0	2.1	2.2	2.5	2.8	3.2	3.6	4.5	5.4	6.3
	2.5	2.5	2.6	2.7	2.9	3.2	3.5	3.9	4.7	5.6	6.5
	3.0	3.0	3.0	3.2	3.4	3.6	3.9	4.2	5.0	5.8	6.7
	4.0	4.0	4.0	4.1	4.3	4.5	4.7	5.0	5.7	6.4	7.2
	5.0	5.0	5.0	5.1	5.2	5.4	5.6	5.8	6.4	7.1	7.8
	6.0	6.0	6.0	6.1	6.2	6.3	6.5	6.7	7.2	7.8	8.5

Source: Bureau of Meteorology

Volume 6, *Winching Operations,* section 6B1.55.6 *Winching to Vessels – Training* stated that:

> All training that requires live vessel transfers will only be done:
>
> - In calm to slight sea conditions not exceeding a sea of 1.0m or swell of 1.0m and a combined sea state of 1.4 m (see BOM sea state lookup table on the Bureau of Meteorology website). If conditions are greater than above then consideration should be given to conducting operations in protected waterways where calm to slight conditions prevail.
> - To appropriately sized vessels when underway: an appropriately sized vessel is one where the pilot can be confident of easily maintaining an uninterrupted hover reference from the most overhead winching position, noting that as a minimum there must be at least 10 feet of clearance above the highest obstruction within the immediate aircraft operating area on the vessel.
> - To vessels where the winch transfer area is free of obstructions likely to foul the cable or endanger any person during the winching exercises.
> - For vessels underway it is acceptable to conduct the transfer to a soft dinghy or raft being towed behind the vessel. The pilots hover reference then can be the vessel towing the soft dinghy or raft.

On 22 September 2020, Operations Manual Bulletin No' 7-2020, noted that live vessel training sea state conditions were very restrictive for training with fully qualified crews. As a result, the operator's head of flight operations (HOFO) approved a change to sea state limitations for training of fully qualified crew. The approval increased the nominal conditions for water winch training and live vessel transfer to:

- Seas 2.5 m or less
- Swell 2.5 m or less
- Combined sea and swell 2.5 m or less.

According to Volume 1, *Administration, Policy and Procedures,* section 1A2.1.1 of the Western Australia Police Air Wing Rotary Wing Operations Manual, the head of flight operations or their delegates, were the only persons who could authorise revisions to the Rotary Wing Operations Manual after such changes have been formally reviewed by the Safety Action Group. On this occasion, no such review by the Safety Action Group was undertaken.

For the training undertaken on 29 September 2020, planning considered information issued by BoM for that day, forecasting a sea height of 1.5 m and a swell height of 1.5 m, resulting in a combined forecasted wave height of 2.1 m (obtained from Table 1). Consequently, training for a fully qualified crew was approved under the operator's updated procedures.

Winching procedures

The primary source of helicopter winching procedures was volume 6, part 6B1 of the WA Police Air Wing Operations Manual. The procedures for vessel winching included that the helicopter crew were to approach the vessel and conduct an assessment from a reference datum, prior to the transfer of the con[7] to the winch operator. The procedures were then for the winch operator to con the helicopter pilot to the final winch position, before winching the rescue crewman onto the deck of the vessel.

During the conning phase of winch operations, the winch operator issues commands to the helicopter pilot to manoeuvre the helicopter into position, while maintaining clearance from hazards. Conning commands include a numerical indication of the distance to run to the target location, line corrections, rate of closure and rate of descent. While the winch operator has the con, the pilot is generally expected to only manoeuvre the helicopter in response to the winch operator's commands.

The ATSB reviewed footage from the helicopter winch camera during the incident flight. There were no indications of any issues with how the pilot or the other crew conducted the approach to the vessel, during the conning of the helicopter to the vessel, or during the winch of the rescue crewman onto the vessel.

Procedures for winching in rescue crewmen

Once the rescue crewman has conducted the required tasks onboard the vessel, the winch operator and the pilot must then conduct the winching in procedure. According to the operations manual, the sequence of commands and steps for this procedure were as follows:

- The winch operator calls:
  - 'crewman has the hook in hand' to indicate the rescue crewman had hold of the rescue hook
  - 'hook connected, conducting checks' to indicate the rescue crewman had connected the hook and was confirming the connection and equipment before winching
  - 'one thumb up' to indicate they had seen the rescue crewman give the hand signal indicating the rescue crewman was ready to be winched
  - 'taking up the slack' to indicate they were winching in the slack cable to prepare for the winch
  - 'ready to winch' to indicate the winch operator was ready to lift the rescue crewman from the deck.
- The pilot calls 'clear to winch' to indicate they had a good hover reference and were ready for the winch operator to commence winching in
- The winch operator calls:
  - 'winching in' to indicate they were winching in

[7] To direct the steering of a vessel or aircraft

- ‘clear of the deck’. The Winching Operations Manual stated that this call indicated that the rescue crewman had been winched from the deck of vessel and ‘…is in a position where if they were to drift rearward relative to the vessel they would clear all rails and obstacles’.
- ‘move back and right/left’ to indicate the aircraft was clear to move away from the vessel.

During the incident flight, the crew conducted all calls and steps up to and including the winch operator calling ‘winching in’. Immediately after the winch operator made that call, the winch operator saw that the rescue crewman had fallen on the deck and called ‘crewman has fallen’. The winch operator did not call ‘clear of the deck’.

The pilot advised the ATSB that they commenced moving the helicopter away from the vessel in response to hearing the ‘winching in’ call from the winch operator. The pilot acknowledged that this was not consistent with the procedure, which was to wait until the winch operator called ‘clear to move back and left’.

The pilot believed that they instinctively separated from the vessel because that was the expected sequence of events, based on the procedure and their previous experiences in many similar exercises. The pilot identified that training vessel winch exercises were normally conducted quickly, and they were therefore expecting to commence separating from the vessel immediately after hearing ‘winching in’.

Crewman overboard procedures

Crewman overboard emergency procedures were detailed in the winching operations section of the helicopter operations manual 6B1.48 *Winching Emergencies.* With regards to ‘rescue crewman overboard – vessel transfers’, the operations manual stated that:

- The winch operator shall announce ‘CREWMAN OVERBOARD’
- The winch operator should take appropriate action to ensure the rescue crewman’s safety. The pilot will manoeuvre the aircraft under direction from the winch operator.
- Once the rescue crewman is clear of the water, the winch operator should give appropriate clearances from the vessel to the pilot.

On this occasion, the winch operator did not announce ‘crewman overboard’, instead they said ‘back’ and ‘hold, hold’ repeatedly with increasing urgency.

Safety analysis

Introduction

The days training on VH-WPX was to include initial winch operator training for a novice winch operator and several operator proficiency checks and operator recency checks for other qualified tactical flight officers (TFOs). A combination of the swell direction coming from the west, and the wind direction coming from the north-west, resulted in conditions that were moderately challenging but within the operator's requirements.

The incident flight was the fourth sortie of the day and several operator recency and proficiency checks had been completed during the earlier flights.

The following analysis will discuss the rescue crewman's fall and the responses and actions of the helicopter crew after the rescue crewman was dragged overboard by the winch cable. The analysis also considers the operators change to sea state limitations for water winch training approvals.

Rescue crewman fall

After completing a dummy approach, the rescue crewman was winched to the aft deck of the vessel and completed safety checks. They then signalled they were ready to be winched up with one raised thumb. Following the winch operator's communication that they were ready to winch the pilot gave clearance to winch and the winch operator commenced winching.

At about the same time, the vessel experienced increased swell and the deck pitched higher as it travelled over a wave. As a result of that increased movement, the rescue crewman lost their footing and moved down and backwards onto their back as the vessel's aft deck rose on the swell.

In response to the rescue crewman's fall, the winch operator stopped the winching recovery and payed out winch cable to enable the rescue crewman to safely regain their footing without the cable becoming taut.

Pilot response

After the winch operator called 'winching in', the normal sequence of events involved the pilot promptly being given clearance to separate from the vessel. On this occasion, the winching sequence was interrupted by the crewmember's fall, during which the winch operator stopped winching in. However, the pilot instinctively continued with the usual winching sequence and separated from the vessel without the rescue crewmember being clear of the deck.

Studies show there will be an inevitable reduction in intentional effort and vigilance as procedural tasks become routine and habitual. As described by Dismukes (2008):

> for experienced pilots, execution presumably becomes largely automatic and does not require deliberate search of memory to know what to do next. Pilots do not need to form an episodic intention to perform each task and each action step—rather the intention is implicit in the action schema for the task, stored as procedural memory.

Because of this, when routines are interrupted or changed there is an increased likelihood of errors. Reason (1990) described such phenomena as *strong habit intrusions*, noting that slips of action are most likely to be committed during the performance of highly automatised tasks, in familiar surroundings while experiencing some form of preoccupation or distraction. Dismukes (2008) summarises that:

> cues that normally trigger the habitual action are so strongly associated that the habitual action is often retrieved and executed automatically instead of the intended action if the individual does not consciously supervise the process.

Most motor vehicle drivers will appreciate this concept, with the familiar experience of intending to make a stop on our daily commute and instead driving all the way home. The power of such well-rehearsed routines is that we learn to conduct them without a high level of attention or cognitive effort, making it more difficult to identify when they are changed.

For the pilot of VH-WPX, the vessel winch procedure was frequently practiced. On the day of the incident the pilot had conducted over a dozen manoeuvres overhead and then away from the vessel as planned, and therefore the routines associated with these manoeuvres were particularly well rehearsed at the time. As a result, the pilot probably allocated a lower level of conscious attention to each and every aspect of the vessel winching procedure, including when to commence separating from the vessel.

Expectancy also has a powerful influence on attention and perception, and people are much less likely to notice information they are not expecting – particularly in the context of challenging work. When the pilot heard the winch operator call ‘ready to winch’, they likely expected to continue with the normal procedure and move the helicopter away from the vessel. Consequently, the pilot was less likely to identify that the winch sequence had been interrupted and they needed to maintain position with the vessel.

In summary, reduced attention due to the conduct of a frequently practiced task and low expectation of any interruption probably led to the pilot moving the helicopter away from the vessel without the rescue crewman being clear of the deck.

Communication breakdown

The pilot’s reaction, moving the helicopter back and left, resulted in the rescue crewman being unexpectedly dragged overboard by the winch cable. In response to the initial helicopter movement the winch operator said ‘forward two, forward two’ attempting to con the aircraft back towards the moving vessel. After the rescue crewman fell into the water, the winch operator did not use accepted phraseology in accordance with the operations manual. Instead, they focussed on bringing the helicopter to the hover to prevent the crewman being dragged through the water by telling the pilot to ‘hold’ repeatedly with increasing urgency.

The pilot, unable to directly observe the crewman, did not understand the developing situation or the position of the rescue crewman, who at that time was in the water. As a result, the pilot took the meaning of ‘hold’ to mean maintain a constant position with respect to the moving vessel. The rescue crewman was subsequently dragged through the water, following the moving vessel.

The winch operator’s attention remained focussed on the rescue crewman in the water and consequently their level of communication reduced. This in turn required the pilot to ask ‘where is he’ in an attempt to increase their own situation awareness and mental picture of the developing situation.

The winch operator told the ATSB that ‘crewman overboard’ was a drill and phraseology that, while taught, was not expected to be used. By contrast, all other emergencies were regularly drilled in recency and proficiency checks, including cable fouling, runaway cable, and communications failure and included in briefings.

Responding effectively to a ‘crewman overboard’ emergency is a critical risk control when conducting water winching operations. Regular training, drills and briefings form an integral part of emergency preparedness increasing competence and confidence of crew. The absence of such briefings and drills was a missed opportunity to ensure the crew would respond appropriately.

Additionally, while the crew reviewed the incident immediately after it occurred, the discussion focussed on the actions and phraseology of the winch operator rather than the pilot’s movement of the helicopter as the rescue crewman attempted to regain their footing. Discussion of that element would have provided an opportunity to confirm that the required level of communication/coordination between the pilot and winch operator was in place before the winching activity re-commenced.

Sea state limitation change

On 22 September 2020, Operations Manual Bulletin No' 7-2020, detailed a change to the operator's procedure 6B1.55, *Winching to Vessels – Training.* The change, approved by the Head of Flight Operations, permitted training in a combined sea state up to 2.5 m, an increase from 1.4 m.

The operator's internal review of this occurrence identified that the easing of sea state tolerances was not tabled for review by the operator's Safety Action Group in accordance with their change management requirements. However, there was no evidence that a review would have resulted in other thresholds or influenced this event. According to Western Australia Department of Transport data the sea state about the time of the event was observed to be within the revised tolerances. Although conditions were challenging because wind and sea were travelling from different directions, the conditions were not the most difficult previously experienced by the crew.

While the absence of a formal review did not contribute to this incident, it reduced the opportunity to identify any change-related increase in risk.

Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include 'contributing factors' and 'other factors that increased risk' (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety). In addition 'other findings' may be included to provide important information about topics other than safety factors.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the helicopter winching incident involving Eurocopter AS365, registered VH-WPX, that occurred on 29 September 2020 near Swanbourne, Western Australia.

Contributing factors

- After signalling they were ready to be winched from the aft deck of the vessel, the rescue crewman slipped and lost footing. This interrupted the usual sequential flow of water winching recovery from a vessel.
- With the rescue crewman still on the deck, the pilot reacted to a verbal communication from the winch operator and moved the aircraft away from the vessel, dragging the rescue crewman overboard.
- Having provided the 'clear to winch' call and received the 'winching in' response, the pilot had a high level of expectancy that they would shortly be given clearance to separate from the vessel. This expectancy probably led to the pilot instinctively applying the well-rehearsed actions to separate and not identifying that the winch sequence had been interrupted.

Other factors that increased risk

- After the rescue crewman fell into the water, the winch operator did not use the standard phraseology of 'crewman overboard'. Because of this, the pilot did not have an understanding of the position of the rescue crewman.
- Crewman overboard drills were not regularly conducted or briefed prior to the conduct of vessel winching training. This reduced the crew's preparedness to respond appropriately to such an incident.
- The operator increased the tolerances of sea state tables for training without conducting a formal safety review in accordance with their change management procedures. This reduced the opportunity to identify any increased risk associated with the change.

Safety action

Safety action not associated with an identified safety issue

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

In response to an internal investigation into the incident, the Western Australia Police Air Wing advised the ATSB that:

- crewman overboard phraseology and response actions have been introduced into Western Australia Police Air Wing Flight Operations and Tactical Flight Officer:
  - operator proficiency check annual and biannual recency exams.
  - winch operator training emergency response.
  - winch simulator training.
  - open water vessel winching briefs.
- Operations Bulletin No. 7-2020, detailing the easing of sea state restrictions, not being reviewed by the Air Wing Safety Action Group prior to distribution was tabled for discussion by the senior management group during the formal investigation review. That discussion emphasised the importance of change management principles to mitigate any foreseeable risks.
- Western Australia Police Psychology department is working with Police Air Wing Safety and Quality to develop and introduce mindfulness guidance and training to the Air Wing non-technical training syllabus.
- Police Air Wing have subsequently reviewed open water vessel winching and concluded the inherent risk of open water vessel winching outweighed the operational reward. The Air Wing has consequently removed open water vessel winching to small vessels underway from the Air Wing operational capability and is introducing the process of deploying a rescue raft while winching or helocasting a rescue crewman to the water when required for emergency response purposes. This response method eliminates the risk of transferring persons to small vessels underway while still maintaining the same level of rescue capability to the community when required.

General details

Occurrence details

Date and time:	29 September 2020 – 1215 WST	
Occurrence category:	Incident	
Primary occurrence type:	Miscellaneous - Other	
Location:	near Perth, Western Australia	
	Latitude: 31° 56.4180' S	Longitude: 115° 58.0200' E

Aircraft details

Manufacturer and model:	Eurocopter AS.365N3	
Registration:	VH-WPX	
Operator:	State of Western Australia - represented by the Commissioner of Police	
Serial number:	6936	
Type of operation:	Aerial work- check and training	
Activity:	General aviation / Recreational - Instructional Flying - Other	
Departure:	Rous Head, Western Australia	
Destination:	Offshore training area	
Persons on board:	Crew – 5	Passengers – 0
Injuries:	Crew – 0	Passengers – 0
Aircraft damage:	None	

Glossary

BoM	Bureau of Meteorology
TFO	Tactical flight officer

Sources and submissions

Sources of information

The sources of information during the investigation included the:

- crew
- onboard video and audio recordings
- Western Australia Police Air Wing
- Civil Aviation Safety Authority.

References

Dismukes RK (2008) 'Prospective memory in aviation and everyday settings', in Kliegel M, McDaniel MA and Einstein GO (eds) *Prospective memory: Cognitive, neuroscience, developmental, and applied perspectives*, Taylor & Francis Group LLC, New York.

Reason J (1990) *Human error*, Cambridge University Press, Cambridge UK.

Western Australia (WA) Police, *Western Australia Police Air Wing Rotary Wing Operations Manual*, Issue 2, revision 5, April 2020.

Submissions

Under section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. That section allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to the following directly involved parties:

- the crew
- the Western Australian Police Air Wing
- the helicopter manufacturer (Airbus Helicopters) and the French Bureau d'Enquêtes et d'Analyses pour la sécurité de l'aviation civile (BEA)
- the Civil Aviation Safety Authority.

No submissions were received on the draft report.

Australian Transport Safety Bureau

About the ATSB

The ATSB is an independent Commonwealth Government statutory agency. It is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers.

The ATSB's purpose is to improve the safety of, and public confidence in, aviation, rail and marine transport through:

- independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis and research
- fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia, as well as participating in overseas investigations involving Australian-registered aircraft and ships. It prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, international agreements.

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner. The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

Terminology

An explanation of terminology used in ATSB investigation reports is available on the ATSB website. This includes terms such as occurrence, contributing factor, other factor that increased risk, and safety issue.