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HELICOPTER EXPO & CONFERENCE
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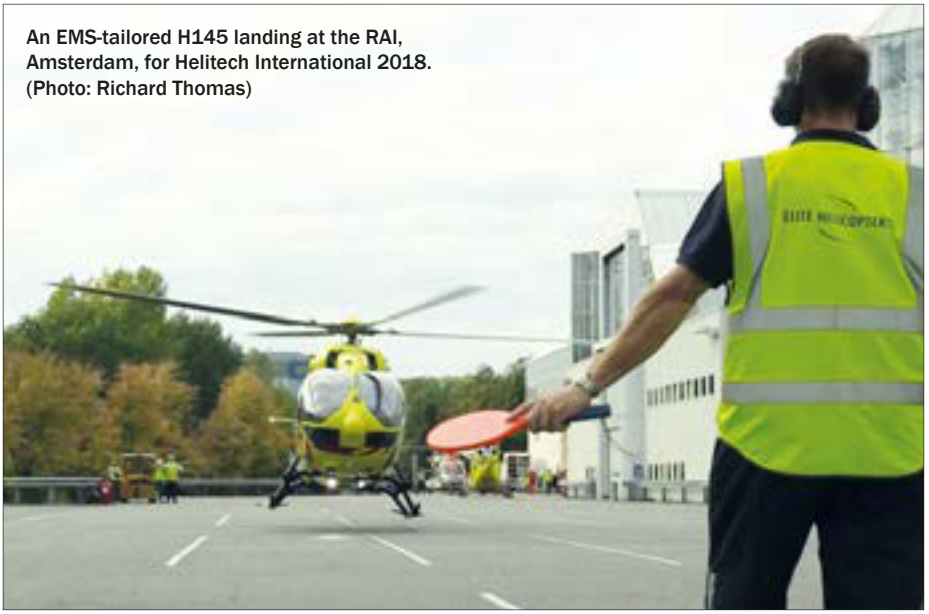
DAILY NEWS
THE EUROPEAN ROTORCRAFT TECHNOLOGY LAUNCHPAD

Off to a flying start



An EMS-tailored H145 landing at the RAI, Amsterdam, for Helitech International 2018. (Photo: Richard Thomas)

Helitech International returns to the RAI in Amsterdam for the third time, and this year's show is set to be 10% larger than the last iteration in the Netherlands in 2016.

The event features 29 new exhibitors, including major player Thales, which is exhibiting its latest SATCOM solution, FlytLink (see p3). In addition, around nine helicopters are being displayed, including Kopter's SH09 in a new customer livery (see p3).

The organisers also anticipate that there will be an increase of between 30-40% in the number of attendees compared with the last Amsterdam show.

'In terms of the programme and the focus of the show, it is on technology and particularly on unmanned technology,' said Teresa Heitor, event manager at Reed Exhibitions. 'This comes following a few years in which operators have begun to adopt the technology. The exhibitors, more and more, and the OEMs in particular, are starting to lead the way in bringing unmanned vehicles [into the marketplace]. This year, we've focused on the educational part of this.'

As well as a focus on challenges for operators and technology-driven seminars, Heitor told *Helitech International Daily News* that this year's show is really focused on what exhibitors and visitors have requested from previous editions.

One of the newest additions to the exhibition is a series of manufacturers' updates, which will take place across Day Three on 18 October and will feature sessions with Leonardo, Lord, Rolls-Royce and Sikorsky.

'We're going to have a manufacturers' update, so this is something new that's quite big where the OEMs do updates. Each session will be one hour, with updates on what's going on with their products,' Heitor explained.

Sikorsky is returning to the show this year. David Martin, VP of oil and gas at the OEM, discussed with *Helitech International Daily News* why now is the time for the company's comeback. 'While we are still in a constrained environment as an industry, we felt it was appropriate to join the Helitech event and have a presence there,' he said.

Franck Saudo, CEO of Safran Helicopter Engines, commented: 'Helitech is the perfect opportunity to connect with the European, and even international, helicopter community. With a focus on European customers... people will be coming from everywhere outside of Europe.'

Reiterating the value of the event, an Airbus spokesperson said that the show focuses on 'the European market, which is the key market for Airbus Helicopters'.

By Helen Haxell

DAY ONE

16 OCT 2018

HIGHLIGHTS

Earth, wind and fire

Page 12

The increasing use of wind farms and the challenges inherent in combatting wild fires are presenting new opportunities for lessors.

Happily single

Page 28

OEMs are pushing the single-engine helicopter for training, law enforcement and EMS in the civil sector.

NEWS

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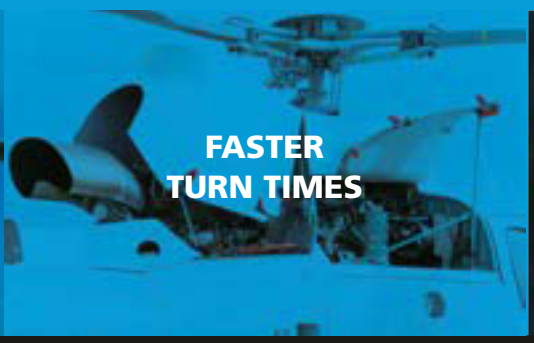

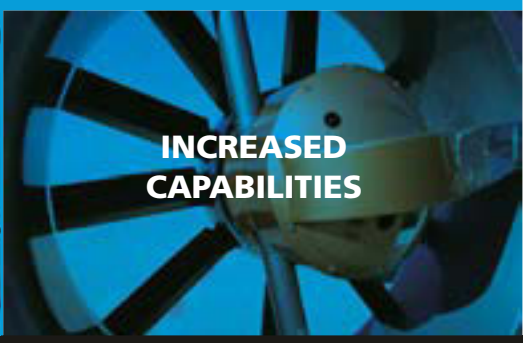

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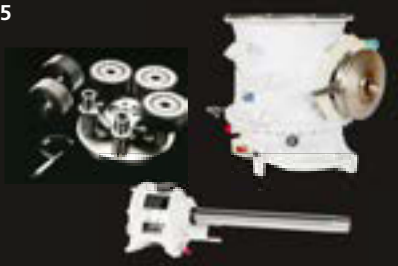

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Thales offers global SATCOM coverage

STAND L14

First-time Helitech International exhibitor Thales is demonstrating its latest SATCOM solution FlytLink, which has origins in the company's LiveAero airborne connectivity system and is enhanced through its use of the Iridium Certus constellation.

This means that FlytLink will eventually operate through the 66 satellites of the Iridium Certus, providing global coverage that extends to the poles and oceans, a feat that Thales believes has not yet been matched by its competitors.

No match

Robert Squire, director of Thales Certus at Thales, told *Helitech International Show Daily*: 'Very few helicopters are equipped with anything that is close to broadband. A lot operate in areas where there are little or no terrestrial communications [with] no 4G available.

'The solution we're bringing to market is quite unique in that it responds to all of the needs of helicopters insofar as it's small; it's very lightweight,' he continued.

'Our solution maintains the maximum amount of flight time because we're very light. We're also proving a broadband solution – it's available anywhere in the world,' Squire explained.

'It's based around the Iridium constellation, a fully worldwide constellation of 66 satellites, so you have coverage wherever you are. You don't have the constraints like [you do] with geostationary satellites, which have a large coverage but limited coverage.'

He went on further to say that Iridium allows the SATCOM technology to deliver data and information underneath the rotor blades. This redundancy in packet loss is through the positioning of the satellites, which, according to Squire, is 80° to the horizon.

He added: 'We have visibility, wherever you are, of at least three satellites, and the further north/south you go, you get more visibility on more satellites. So, you pretty much have, I'd say 90% of the time, a visibility of satellites beneath the rotor blades.

'Even when the communications go through the rotor blades, the way that the communications work is based around GSM. As such, the impact of the rotor blades is very slight.'

The solution is currently in the process of being delivered to three non-disclosed customers for ground testing.

Flight testing is expected to continue into next year, and Thales anticipates that certification will be received in Q1/Q2 of 2019.

FlytLink is the next generation of the company's portfolio of SATCOM solutions, building on the development of incumbent solution LiveAero.

'We have a legacy product which is based around Iridium, which is equipped on British SAR [Leonardo AW139/AW189] aircraft. Around 12 helicopters are equipped with LiveAero. [FlytLink] is the upgrade,' Squire confirmed.

Clear focus

Squire believes that the segments of the civil rotary market most likely to benefit from this type of SATCOM solution are those involving critical missions such as EMS, policing and SAR.

Whilst the solution acquires flight testing hours, Squire suggested that long-term development of the product would be focused on enhancing the quality of HD video and/or live streaming. The team is looking into 'compression techniques' to enable this capability further.

FlytLink has already been certified for land and maritime applications. 'Our motivation is to open up the market for our product as much as we can, and obviously helicopters is a big one,' Squire said.

By Helen Haxell

FlytLink is a global connectivity platform across the airborne sectors. (Photo: Thales)

Kopter displays SH09 for Asia

Photo: Kopter

STAND H20

Kopter Group is showcasing its first prototype of the SH09 single-turbine helicopter at Helitech International 2018 in the livery of its newest customer.

Systematic Aviation Services (SAS) has signed a firm order for one of the type, which will be at the show in its passenger transport configuration.

This is Kopter's first order from Malaysia. The aircraft will be based out of Sultan Abdul Aziz Shah Airport in Kuala Lumpur.

Currently, SAS's diverse fleet conducts a variety of missions, including corporate and private charter, medevac, land survey, aerial photography and flying doctor services.

In a company release, Kopter stated: 'The order is perfectly timed, with recent outlooks indicating that the region offers tremendous untapped touristic potential for flights and adventures, where the SH09 will stand out with its large cabin and exceptional field of view.'

In a bold play in the midst of SH09 trials and platform testing, the OEM has opted to change the location of its flight testing. 'We have taken the decision, and this has been lengthily prepared in the company, to switch from a Switzerland-based flight-testing operation to an Italy-based flight-testing operation,' confirmed Andreas Löwenstein, CEO of Kopter Group.

He added that this move will accelerate the testing process and subsequently the certification programme. 'Prototype Three [P3] will be joined by P4 sometime at the beginning of next year, and the two aircraft together will do the certification flight, ' Löwenstein said.

By Helen Haxell

HeliOffshore focused on gathering intel

STAND M40

The international safety association HeliOffshore is continuing to build up a catalogue of data for the second phase of its Safety Intelligence Programme.

One of the main targets of the project is to gather accurate findings of accident rates across the offshore helicopter industry worldwide, according to Dr Matthew Greaves, safety intelligence project manager at HeliOffshore.

To this end, usage data from members is currently being collated, adding to a number of studies into return-to-base events and flight data monitoring. The studies have been established 'to show proof of concept' and validate the organisation's ability to analyse and present data anonymously and securely.

'By analysing the reported return-to-base events, we were able to correlate a change in reported events with a change in flight hours, meaning that the rate was unchanged. Without that underlying data rate, we would have been guessing about the cause of the change,' Greaves told *Helitech International Daily News*.

'We generally produce two types of output: wholly aggregated output and then individual versus industry output so operators can see where they sit in comparison to the industry,' he explained.

With the data registered in a common database, Greaves is confident that future analysis will begin to produce 'deeper and more interesting results'.

An open-ended approach was encouraged during Phase One of the project, known as InfoShare, with operators invited to release data which they felt would be of benefit to others, including lessons learned and early warning indicators.

As is common practice with data sharing, good governance is essential, and HeliOffshore has implemented a comprehensive series of steps to ensure data confidentiality is maintained.

Quantitative data is being collected from operators as part of HeliOffshore's research into accident rates (Photo: CHC Helicopter)

For example, incident reports are placed on the HeliOffshore Space secure network, which limits access to approved members only, Greaves said.

Data governance parameters also extend to the type of data that can be collected, how it is analysed and which results can be published. 'This is laid out in an MoU that two-thirds of our operator members have already signed,' confirmed Greaves.

'These member companies operate about 80% of our members' fleet.'

Beyond the data management aspect of HeliOffshore's work, the company is developing industry-based research as part of a comprehensive report that is scheduled for publication at the start of 2019.

Data subsets over the last five years, including 'hours, sectors [and] accidents' are set to be released. 'This will hopefully be the start of a regular industry publication,' Greaves added.

By Tim Martin

Switlik granted survival kit certification

Photo: Switlik

STAND H21

Inflatable safety and survival kit manufacturer Switlik has received UK CAA certification for its new life vest, anti-exposure suit and compressed-air emergency breathing system product lines.

The ensemble was specifically designed for the helicopter offshore market in the North Sea and is jointly approved under European Technical Standard Order (ETSO)-2C502 and CAP1034 for use in helicopter missions to and from helidecks found in dangerous sea terrains.

'Switlik is targeting some of the largest offshore operators in the North Sea region and has already won several competitive bids with this vest in other parts of the world,' Sarah Switlik, VP of sales and marketing at the manufacturer, told *Helitech International Daily News*.

According to the OEM, the X-Back MOLLE+ [Modular Lightweight Load-carrying Equipment] life vest is ETSO-2C504-compliant and 'features the same low-profile, ergonomic fit of the widely popular X-Back MOLLE'.

Strong demand is anticipated for the product, based on the success of the company's HV-35C X-Back model, 'several thousand' of which were sold in 2017, Switlik said.

The company's anti-exposure suit also meets ETSO-2C503 requirements. Its modernised design is based on the Switlik U-Zip-IT dry suit currently worn by USCG helicopter crews.

The anti-exposure suit features 'stretch socks', which can be attached if necessary; a neoprene hood and glove kit; reflective panels for visibility; and pockets for storage on the arms and legs.

Originally manufactured by Aqua Lung, the compressed-air emergency breathing system is now part of Switlik's inventory following the company's three-way collaboration with Aqua Lung America and aerospace engineering specialist Capewell Aerial Systems.

Prior to UK CAA certification, Switklik's three new products completed a rigorous series of pool and ergonomic tests 'in a variety of aircraft types, for both front and rear crews', Switlik added.

By Tim Martin

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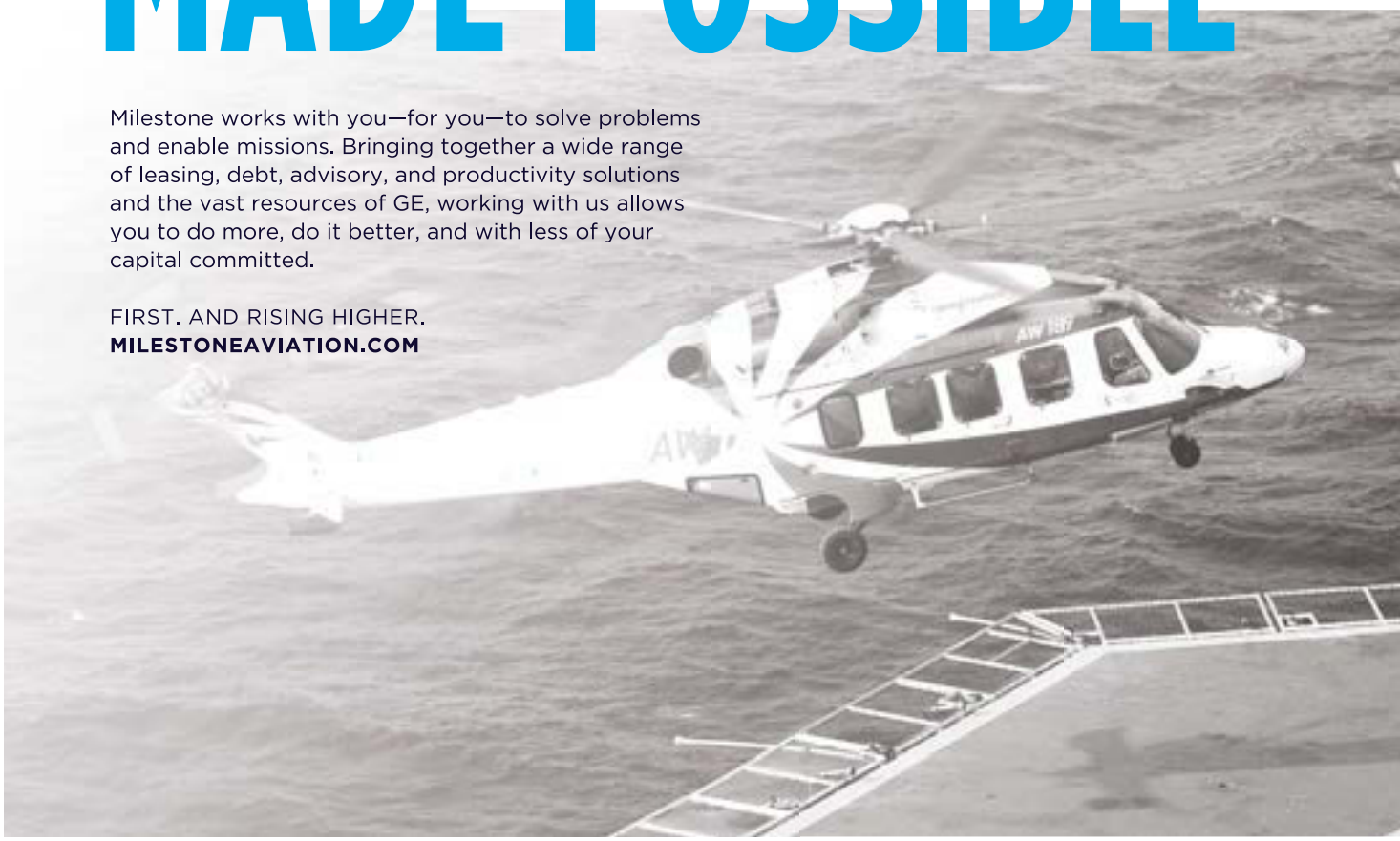

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Librestream takes leap of faith on augmented reality market

STAND G30

It seems that remote maintenance software developer Librestream Technologies is hoping to generate new business at Helitech International, based on its display of a range of services offered by its augmented reality platform Onsight.

Three solutions – Onsight Connect, Cube and Flow – will be showcased during the event, with attendees able to test out the software through live demonstrations.

Explaining the functionality of each, Reyna Olivares, marketing specialist at Librestream, told *Helitech International Daily News* that Connect is designed with interactive tools including 'a two-way telestation, video, audio, image sharing and augmented content', whilst the Cube wearable technology has been developed 'for safe operation in ex-certified and rugged environments'.

Librestream is hopeful that more companies like Heligo and Rotortech will adopt its safety offerings. (Photo: Librestream Technologies)

Flow, a service that digitises work instructions, has a number of reporting dashboards. It is being marketed by the company as able to analyse live data and monitor the status of outstanding jobs.

For MRO providers, Onsight offers inspectors and engineers the capability to share live video with remote specialists directly, a concept which engine OEM Safran Helicopter Engines has been using since February.

An expert link, described as a 'remote video technical assistance service' powered by Onsight, is deployed by Safran to allow helicopter operators to reach the company's maintenance staff and let them assist with diagnostic and technical work.

Safran announced that Heli Austria, Heligo and Rotortech Services were the first customers of the new service.

In addition, Onsight features HD picture capture, recording and multi-party calling, while also enabling 'broad support' for smart phones, tablets, smart glasses, computers and inspection devices such as borescopes.

According to Olivares, the MRO market is changing towards prioritising remote assistance as operators continue to focus on solutions that can reduce helicopter downtime.

'With all the different things happening in the market, it is expected that engine manufacturers are able to help resolve issues immediately, [rather than] saying: "I can only be there in three or four weeks." That's almost unheard of nowadays,' she explained.

Olivares suggested that remote maintenance capabilities also minimise the need for MRO operators to detach engines, 'because [when that happens], it means they're not getting paid'.

A customer being able to call their maintenance provider and receive remote assistance is therefore becoming an increasingly desirable capability.

By Tim Martin

Helitune's healthy remedy for helicopters

STAND J50

Helitune's latest health monitoring solution, IVHM-Evolve, has successfully completed multiple flight trials and demonstrations, *Helitech International Daily News* has learned.

The IVHM-Evolve project is a collaborative effort with Bristol University, Queen Mary University and a company called XMOS that provides microcontrollers and audio processors.

The technology on display at Helitech International 2018 is closely based around the RotorTuner 6 (RT-6) portfolio.

Helitune's RT-6 is a system built for rotor track and balance – it measures vibration and the rotor blade track split.

Peter Morrish, technology manager at Helitune, explained further how the RT-6 and Evolve are related: 'The RT-6 is a carry-on piece of equipment. With the Evolve technology, we have taken the RT-6 product to the next level to an onboard solution where we can monitor the rotor track and balance state (as well as the vibration state) and monitor the health of the helicopter. The IVHM-Evolve technologies enable Helitune to advance its RT-6 product.'

He added that a number of flight trials and demonstrations of the IVHM-Evolve project have been completed this year for some key customers.

This agnostic and bespoke solution can be tailored to end users' needs, to meet the demands of operators of medium-size, twin-engine aircraft.

'The system can start off with a relatively simple solution – just monitor the main rotor and the engines. The approach we've taken is that you can add additional modules and build up the system as you have new requirements. It's built for harsh environments,' Morrish said.

The system can be used in conjunction with incumbent and pre-existing HUMS solutions on helicopters.

By Helen Haxell

Photo: Helitune

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Safran's Saudo projects success

STAND H50

Six months into his role, Franck Saudo, CEO of Safran Helicopter Engines, is bullish about the manufacturer's portfolio and production projections for the forthcoming year.

Speaking to *Helitech International Daily News* ahead of the 2018 edition, Saudo relayed that the company has seen an increase of 23% over the course of the last two years in its production of helicopter engines.

'We are to produce, in 2019, close to 900 engines compared to 730 last year. So, market-wise, [in a] slow recovery scenario [there is] an increase in market share for us,' he said. 'On top of this, we are optimistic in our medium- to long-term prospects because of the growing market in equipping emerging countries, which is an underlying driver of the sector,' he explained.

In addition to the influence of new markets, Saudo is adamant that this success is also due to the company's wide portfolio of rotorcraft-centric products.

'We are the only helicopter engine manufacturer 100% dedicated to the market for one thing. We have the broadest range of helicopter engines. We cover from the single-engine to the heavies,' he said.

Safran launched its latest engine, the Aneto-1K, at Helitech International 2017. Explaining that development is progressing, Saudo shared that the company is moving forward with over 4,000h of ground tests and over 90h of flight tests. 'We are on track to receive a certification in early 2019,' he added.

The Aneto engine family is targeted at the super-medium and heavy end of the market, with a 2,500-3,000+shp range.

By Helen Haxell

Airbus sees EMS helis as key to European region

STAND E60, S3

With operators looking to replace legacy EMS helicopters across the European region, Airbus Helicopters is seeking to position aircraft from its light and medium portfolio as the solution to medical crews' demands.

In March, the UK-based Midlands Air Ambulance Charity received a new upgraded H145 EMS helicopter.

David Prevor, senior marketing executive at Airbus, told *Helitech International Daily News* that the H145 and H160, whilst different in size, could complement each other when it comes to EMS missions.

The H135 and H145 can operate as the initial responder to an accident, whilst the H160 would then function as the transportation aircraft between hospitals.

Prevor emphasised the versatility of both aircraft: 'The H145 and H135 are really addressing... the primary mission: if you have an accident and you need to go straight to the point of the accident.

'The H160 is more equipped to address the secondary market of the EMS... the transportation of people from one hospital to the other,' he continued.

However, Prevor stressed that it was not just about the platforms themselves but maximising the technologies on board the aircraft to ensure efficient maintenance techniques and availability through 'connected services' when operating the helicopter.

The H145 is in EMS configuration and on display at Helitech International at the RAI in Amsterdam.

By Helen Haxell

Lord provides strong tails

STAND B71

Lord, a rotary components supplier, is seeking to break into the European market with its Bell 206 elastomeric tail rotor trunnion kit, which is being displayed for the first time at Helitech International 2018 in Amsterdam.

Designed for a helicopter's tail rotor, the solution provides a life extension of three years or up to 2,500 flight hours.

'We are going to show the trunnion bearing that we make out of elastomeric bearings,' confirmed Rodolphe Leroy, marketing, sales and business development manager at Lord.

He continued: 'It's a smooth ride for the pilot, and it also extends the life of the blade in the tail rotor.'

In the US, Lord has converted more than 1,000 Bell 206s with this kit, and Leroy is hoping that exhibiting the technology in Europe will have a strong pickup by regional operators of this model.

'It's an STC, so it doesn't come standard on the Bell platform. It's a similar design to the 407, so people that are operating that are familiar with this,' he commented.

Lord is providing training sessions at Helitech International on how to alleviate stresses and strains to platforms and to educate crews on how best to inspect elastomeric components.

By Helen Haxell

Leonardo undaunted by super-medium competition


Photo: Leonardo

STAND H60

As optimism returns to the oil and gas sector, a market leader of the super-medium class, Leonardo, is fully confident its AW189 aircraft will continue to dominate industry competitors.

According to the company, orders, deliveries and flight hours of the 8t category helicopter outstrip those of Airbus and Bell, which are considered the Leonardo's main competitors.

'The production rate is significant in its category,' a Leonardo spokesperson told *Helitech International Daily News*, in a statement.

'We have received orders (including options) for around 160 units to date and delivered over 60 to customers worldwide, logging a total of approximately 45,000 flight hours across the fleet in operations,' the spokesperson added.

By Tim Martin


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Taking stock

The imminent arrival of new platforms to the market, as well as high numbers of recent purchasing and leasing orders, can provide comfort that positivity is returning to the market. (Photo: Tony Skinner)

The main headlines of 2018 have focused on a more stable oil price, the redressing of key safety issues and the growth of the leasing market. *Helitech International Daily News* reviews the ups and downs of the civil rotorcraft sector in Europe. **By Helen Haxell**

For all intents and purposes, it has been a quiet year in the civil helicopter market. However, the great scene-setter for now and going forward into 2019 is the consistency of the price of oil.

Two years ago, when Helitech International was last held at the RAI in Amsterdam, this cost was $52 per barrel, a slight increase on previous years that saw a black cloud hanging over low oil prices.

However, the recent stabilisation of this value in the range of $70-80 per barrel represents not just a comeback for the civil rotorcraft industry but a solid basis from which it can grow.

Safety first

This year saw the release of two reports detailing the fatal accidents involving the Airbus H225 in April 2016 and the Bell 525 Relentless on 6 July the same year.

In January 2018, six months on from the Bell 525's return to flight, the US National Transportation Safety Board published its report on the fatal crash of the first flight test vehicle (FTV-1).

The accident study states that 11s into a routine test flight, the crew are understood to have experienced an unexpected vibration that resulted in the breakup of the aircraft.

The vibration of 6Hz took place when FTV-1 was undertaking one engine inoperative tests at a speed of 185kt.

Bell has taken corrective actions to ensure this does not happen again and has also implemented 'further enhancement' of the filtering system on the pilot's side-stick controller 'so that vibrations of the pilot stick are not passed to the rotor system'.

The aircraft's type certification is anticipated to take place at the end of 2018, with deliveries to begin in early 2019.

Fighting fatigue

Regarding the H225, the Accident Investigation Board Norway released its findings of the LN-OJF's 2016 crash.

The report comes almost a year after the UK's CAA and Norwegian Aviation Authority agreed to lift the no-flying ban on AS332 L2 and H225 aircraft.

The fatal incident stemmed from the main gearbox (MGB) and was a consequence of a fatigue fracture in a second-stage planet gear in the epicyclic module.

According to the report, the actions taken by Airbus Helicopters and EASA were not sufficient to prevent another main rotor loss.

In a statement at the time, Airbus noted that neither aviation authorities nor industry had ever seen that type of crack in the MGB that led to the LN-OJF accident.

The OEM said it was continuing to work on incremental improvements to the H225 and that it had introduced new measures to ensure the aircraft 'meets the most stringent, global airworthiness standards'.

In its response to the final report, EASA also argued that the decisions it took were 'based on the knowledge available at the time', and actions put in place were 'justified and commonly agreed'.

On the up

Instead of large order books dominating rotary headlines, it appears that leasing is playing a major part in the recovery of the civil helicopter market, which has been demonstrated in the first half of 2018.

There have been a wealth of key leasing arrangements and platform announcements this year: Milestone Aviation started the year strongly, announcing in January that eight AW139 aircraft are being leased to Shanghai Kingwing Aviation; Waypoint Leasing revealed in April that it has made a deal for one H135 helicopter for ADAC Luftfahrt Technik in Germany; and three Leonardo AW139s and three AW169s were leased into the Asia-Pacific region in the summer.

As of 5 October, more than 500 helicopters have been ordered in 2018, which – when compared to this time last year – is an increase of around 75 aircraft, an uplift in sales of 18% on average.

Furthermore, first deliveries of the Airbus H160 are expected next year, with EASA certification anticipated for June 2019. The debut version to enter service will be configured for passenger transport, mainly for oil and gas or commercial transport, followed by an EMS version. Orders are coming in for the platform from Brazil, Europe and North America.

Two more platforms looking to bolster orders in the next 12 months are the Kopter SH09, with EASA certification earmarked for the second half of 2019, and the Bell 525, whose certification has been pushed to next year due to the company pausing flight testing to work on avionics and flight control software upgrades.

We can finally do away with phrases such as 'cautious optimism' or 'green shoots of stability' that have been used frequently to refer to the civil market in recent times. Industry is embracing the well-earned boost in orders, deliveries and programme developments. It is time to let the good times roll. ■


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The AW189 received EASA certification in February 2014. (Photo: Lobo Leasing)

Earth, wind and fire

Leasing companies are seeing a raft of new opportunities presented by the stability of oil prices, the increasing use of wind farms and the challenges inherent in combatting wild fires. **By Gerrard Cowan**

The fall in oil prices in 2014 fuelled a tough few years for the helicopter sector, including the lessors. However, the leasing sector is now seeing a number of positive signs, which are expected to feature prominently in discussions at this year's Helitech International event.

Lease Corporation International (LCI) is seeing more activity in the oil and gas market now than it has for some time, said CEO Mike Platt. The company is currently tracking about a dozen tenders in the offshore space, he said, ranging from Australia to Brazil and Africa to the North Sea.

'There's definitely more activity, and we expect to see some placements,' Platt told *Helitech International Daily News*.

Happy medium

Platt expects the super-medium market to experience an uptick over the next year or so, with the AW189, H175 and other platforms likely to see more interest from operators.

'These platforms have now been on the market for some time and have accumulated some experience,' he said.

'I think operators are now looking at the capabilities of these aircraft versus the heavies, along with the different costs. It's taken a while, but I think we're starting to see a lot more interest in the super-medium category.'

Con Barber, head of global sales at Waypoint Leasing, agreed that there has been a modest pickup in activity in the oil and gas segment. He believes that a broader recovery in the offshore market could gain pace over the next year.

'I think we'll be in the midst of it before we even notice it's really happening,' he said. 'The market is picking up in certain segments, as we are seeing market demand strengthening for particular helicopter types.'

Barber also pointed to demand for mediums, although he said the heavier helicopter space was more challenging. 'That is to be expected, because the segment that the heavy helicopters serve is typically the long-range, deepwater, oil and gas segment, which is associated with higher costs of production,' he explained.

'That will probably be the last part of the market to benefit from a broad-based recovery. However, it is inevitable that the new super-medium segment will have an impact on heavy demand.'

While a recovery appears to be under way, it is happening very gradually, confirmed Mark Kelly, MD and chief commercial officer at Lobo Leasing.

Oil and gas companies are increasing their drilling activities, which is boosting demand for helicopters, 'but the pace at which that's happening is quite slow', Kelly said.

The price of oil has remained stable in the high $60s or low $70s per barrel for some time now, which Kelly said is clearly a positive thing and means that conditions are in place for the oil majors to put their capital to work again and increase their exploration activity.

'But the recovery is not dramatic,' he cautioned. 'There's still a lot of idle equipment within the oil and gas space that the operators, the lessors and the OEMs have to get through. It's a market that needs continued discipline from all stakeholders to ensure it doesn't overheat as it recovers.'

Accident and emergency

While each lessor has varying interests in different markets, the industry as a whole has increased its focus outside of ▶

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Lessors are starting to see an uptick in the oil and gas market. (Photo: Airbus Helicopters)

energy in recent years, notably in EMS and SAR.

Barber said that EMS is a key target for Waypoint, with the company recently delivering three new AW169s to Emerald Pacific Airlines in Taiwan for use in this activity. This was the lessor's first foray into Taiwan and the first time it has leased AW169s in the EMS role.

Barber also highlighted SAR, where opportunities have arisen thanks to the privatisation of services in a number of countries.

'This is a very exciting part of the market, thanks to the privatisation of search and rescue services that were previously provided by state operators or by the military,' he said. 'However, the opportunities there are finite.'

In July this year, LCI secured its first helicopter lease in China, through a deal to provide three new AW139 aircraft to Shanghai Kingwing Aviation, configured for EMS operations.

In its announcement of the deal, LCI said it reinforced the company's strategy of 'curating a balanced and diverse portfolio, with a majority of leases in the EMS market'. This has long been the lessor's strategy, with oil and gas accounting for about a quarter of its fleet overall.

Small but mighty

There are also a number of small though growing markets, notably the wind farm space. LCI has several aircraft that serve this market, said Platt, adding that he expects wind to continue to grow, although from a very small base when compared to oil and gas or EMS.

'We like the wind market and believe there will certainly be opportunities there, but it's a relatively small market,' he noted.

While the Northern European region dominates offshore wind, it is now spreading to other parts of the world, Platt added.

'It's a long development process, but it's proven itself to be pretty effective,' he confirmed. 'The technology on wind farms has gotten so much better and they produce so much more electricity that it's starting to become very cost-effective. I think we're going to see more and more of it.'

Europe, where Helitech International takes place, is a very mature market for the helicopter industry, said Kelly. 'There's a replacement cycle of aircraft, but there's not a huge amount of expansion,' he said. 'However, the market is performing well.'

Barber also highlighted the maturity of the European market. He pointed to good growth in the North Sea for oil and gas, and enduring growth outside energy, particularly in EMS, which is 'a much less cyclical or volatile segment'.

Barber told *Helitech International Daily News* EMS operators are demonstrating an emerging preference for newer technologies which could be supported through the leasing industry.

European attraction

Helitech International attracts operators and suppliers from across the world, Platt said. European operators at the event will also be interested in the potential of regional markets like Africa or the Middle East.

Platt believes that the show is particularly useful in providing opportunities to meet current or prospective customers. LCI is expecting to run back-to-back meetings for three days. He expects that the company will meet with around 25 operators, as well as OEMs, suppliers, financiers and others.

Kelly echoed this, saying: 'The main reason we go to the shows is to meet our customers'. Helitech International provides an opportunity to meet them in one place over a few days, 'so it is very efficient', he said.

Waypoint will have a large presence at the show, Barber said, with the aim of meeting clients, OEMs and other participants in the industry.

Helitech International is particularly useful for meeting customers from the Europe, Middle East and Africa region, he said. 'That's a key region for us, and one where we're seeing good, solid growth,' Barber explained. 'We want to have the opportunity to meet with our clients and with the other participants in the industry.'

Kelly expects the major themes at the show to reflect the dominant stories of the past year, notably the stabilisation of the offshore oil and gas sector, expansion in EMS and SAR, and the growth of relatively small markets like the wind sector.

'Wind is a very small market, but it's continuing to expand,' he told *Helitech International Daily News*. 'In SAR, there's a little bit of activity at the moment, with some tenders out there on the market, although nothing dramatic.'

Hot topic

Platt suggested that there could be a focus on fire-fighting at the show. 'I think fire-fighting is getting a lot more attention from local governments,' he said.

'That's an area that the lessors are not participating in as yet. We've had conversations with various parties about how we could assist and we would like to get into that business,' he revealed.

Leasing could be useful in fire-fighting because of its ability to provide new technology without requiring a large capital payment, Platt explained.

'People are realising that newer technology with more capabilities is critical, along with having more aircraft to protect property and lives,' he said. 'I think if there's any trend for this show and other shows over the next year or two, it will be a greater focus on fire-fighting.' ■

LCI secured its first helicopter lease in China in July 2018. (Photo: LCI)

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Symbiosis in the sky

The interaction between UAVs and helicopters is set to be a key market driver in both unmanned and rotary domains over the next decade. **By Gerard Cowan**

The Bell 525 has development potential to be optionally piloted, so crews can rest on long offshore missions. (Photo: Bell)

The UAV/rotary relationship is complex: while UAVs could replace helicopters in some roles, regulations and other demands are likely to sustain manned flight elsewhere. There are also grey areas that combine the best of both worlds.

The rise of UAVs will be a major focus at this year's Helitech International, with a number of speakers addressing the topic over the three days. For example, Hannah Nobbs, innovation scout at the Royal National Lifeboat Institution (RNLI) – a charity that works to save lives at sea – is presenting 'What we learned from exploring the potential of drones for maritime SAR', alongside Phil Hanson, aviation technical assurance manager at the UK Maritime and Coastguard Agency.

Safety at sea

The RNLI and HM Coastguard recently held a series of demonstrations and challenges in South Wales called UK Search and Rescue in the Third Dimension, which explored the potential benefits of UAVs in a life-saving environment.

Ahead of the publication of the results, Nobbs said there are likely to be a number of benefits that UAVs can provide in a life-saving role at sea in the future.

For example, drones could be used to boost local situational awareness in the areas around lifeboats. This could be particularly useful for the organisation's smaller, in-shore vessels, which are relatively low in the water, making it difficult to see over waves in higher sea states.

'The idea is that we could help by having some awareness away from the boat,' Nobbs told *Helitech International Daily News*, adding that these systems would have to be largely autonomous because there would not be the space or capacity to remotely operate UAVs from on board the lifeboats. The technology is not yet available for this, she added, but it could be feasible in future.

Nobbs pointed out that it is possible that helicopters and UAVs could complement one another in the life-saving role in the coming years. While rotary-wing platforms and lifeboats would serve as rescue vehicles, UAVs could be used to support searches over large areas of water.

'The quicker you can cover an area, the better,' Nobbs said. 'If you've got a helicopter platform that is flanked by drones, then that could allow you to make a much better and quicker assessment of an area, but you would still need the helicopter to pick someone up when needed.'

Gale of opportunity

UAVs could also play a major role in the offshore wind farm sector, said Dr Khalid Kamhawi, lead of advanced engineering at Offshore Wind Consultants (OWC), who will also be presenting on the subject at the show.

Technological development and industry expectations point to a future in which UAVs 'are the basic state of affairs' in this area, he noted.

'In the future, we will likely have the ability to control UAVs more easily and effectively,' Kamhawi explained. 'There is no pilot on board, so there is less operational risk, and [drones] are also likely to become cheaper, while regulatory change will mean they can be used in a wider range of roles.'

UAVs are currently used in a limited number of missions in offshore wind farms, Kamhawi

said. They are mainly deployed as inspection vehicles to check for damage or wear and tear on the blades.

However, such platforms could eventually be utilised in a range of other tasks. Inspecting other parts of the turbine, such as the tower and the nacelles, and searching the surrounding area to ensure vessels, aircraft or migrating birds are not coming too close to the turbines are some possible uses.

In the longer term, UAVs could potentially be helpful in construction and maintenance, to transport light objects and spare parts, for example.

Helicopters are currently used to transport people to turbines, Kamhawi said – mainly engineers who work on the equipment.

While the offshore oil and gas industry relies on manned platforms, this is not the case in the wind sector, which is largely unmanned as there is naturally less of a need to transport people back and forth.

However, that could change in the coming decades, Kamhawi suggested, with the development of 'mega fields' of turbines, which will likely include 'islands' staffed by engineers and other personnel who will conduct operations and maintenance work on the fields.

This concept would also require means of staff transportation, with helicopters being an obvious choice. However, UAVs may one day even be used in this role, said Kamhawi.

'The major obstacle now is obviously legislation and regulations around the use of UAVs,' he pointed out. 'There is also the need for more experience – the technology is still not mature enough to do all the work that helicopters do.'

Innovative goals

There is also potential for elements of unmanned technology to be incorporated into rotorcraft.

The Kopter SH09 will feature a four-axis autopilot, said Michele Riccobono, executive VP of technology at the OEM.

The interplay between UAVs and rotorcraft looks to be a major influencer in both sectors in the near future. (Photo: Boeing)

While Kopter is not considering developing a fully unmanned version of the platform, the aircraft's architecture – particularly the autopilot – 'will easily allow it to transform into an optionally piloted/remotely piloted or unmanned version'.

The company is displaying the first prototype – known as P1 – of the SH09 at Helitech International, wrapped in the colour scheme of a new customer (see p6).

Bell is considering the possibility of incorporating optionally piloted helicopters into its own fleet, said Scott Drennan, VP of innovation at Bell, who identified this as one of his goals for the company's innovation future.

Fly-by-wire is a starting point to remove tasks from pilots. (Photo: Bell)

'We're seeing opportunities and desire from our customers to have the choice between a piloted mission and an unmanned or more autonomous mission,' Drennan told *Helitech International Daily News*.

He added that this demand is being driven by a diverse set of opportunities for optionally piloted helicopters. 'One day, you might need to take 16 of your people out to an oil rig,' he explained. 'That is a mission where you would need a great pilot and other officers. But, then, another day, you might need to take some maintenance tools out to the same rig, so you might want to run the mission as unmanned.'

As well as reducing costs, Drennan suggested that this concept could also be beneficial from a safety and risk standpoint, as it would allow operators to rest their pilot and crew for another mission. He said Bell's most modern helicopters could both be adapted to this role.

These are the single-engine Bell 505 Jet Ranger X and the Bell 525 Relentless, a twin-engine super-medium platform. The 505 has been certified, while the plan is to have the 525 certified by the end of 2019, Drennan confirmed.

'I think about the potential for optionally piloted across the entire fleet, whether it's a small helicopter like the 505 or a big helicopter like the 525,' he said.

Down to the wire

Drennan explained that the 525 will use fly-by-wire controls, which lend the platform to being optionally piloted.

'We look at autonomy as a spectrum of capabilities, and we start it at fly-by-wire... to take some of the tasking away from the pilot and towards the computer in order to enhance safety and provide other advantages, depending on the vehicle.'

He said that the vision of a future in which people could climb into a vehicle, type in the co-ordinates and be transported to their destination 'has fly-by-wire threaded through it... The gamechanger is to have fly-by-wire as the backbone of these systems.'

Optionally piloted vehicles sit somewhere between manned helicopters and these futuristic platforms, Drennan added. 'Between those bookends you can imagine optionally piloted vehicles, a mix of manned and unmanned.'

Autonomous systems are also increasingly being used on board manned systems, Drennan added, supporting flight controls and situational awareness.

'With rotorcraft in particular, the workload for the human pilot can get quite intense on some of the really challenging missions we operate in,' he said. 'Computers can do the dull, dirty and dangerous tasks very well.' ■

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Vertical city limits

Rapid technological innovation and a growing acceptance of autonomous modes of transport are driving increasing interest in the concept of urban air taxis. (Photo: Airbus)

The dichotomy over the readiness of automated urban transportation is vast. While platform manufacturers believe the technology is ready for take-off in the coming years, some engine companies and the general public are yet to be convinced. Are competing OEMs being overzealous about the question of 'when' and not 'if' urban air taxis will enter the market? **By Helen Haxell and Tim Martin**

Urban transportation by helicopter is not a new concept, and a range of business models can already be seen globally in densely populated areas, such as in Brazil and the Middle East.

One such service that has been snapped up by Airbus Helicopters is Voom, an on-demand helicopter booking platform. 'We believe the helicopter provides an uncontested advantage to urban mobility, and Airbus is already ahead of the game with maturing new technologies, [including] electric-powered batteries and new architecture,' said Luc Bentolila, head of marketing and sales development at Airbus.

Va-va-Voom

As a strategic initiative of A^3 (Airbus' Silicon Valley outpost), Voom is one of a number of companies striving to make urban air travel economical and accessible for commuters through the use of 'pooling' technology and an on-demand business model, which is also employed by the likes of Lyft and Uber.

In a statement to *Helitech International Daily News* last year, a Voom spokesperson said: 'It is important to work with local regulators to establish conditions for on-demand air travel, ensuring helipad infrastructure is in place... and nurturing an ecosystem that will help enable vertical cities of the future.'

Voom currently utilises a diverse fleet of Airbus, Bell and Robinson helicopters. When *Helitech International Daily News* enquired if this assortment would remain under the business model going forward, Bentolila replied: 'We understand it's a developing business market, and we are developing this model – it's a mixed model.'

In March, the service expanded from São Paulo to Mexico City.

Power struggle

What is now becoming more compelling for industry is the role of autonomy and the engine technologies that will enable safe, environmental and economically conscious vehicles.

While these 'vertical cities of the future' may be an attractive prospect, the issue of noise pollution caused by increasing numbers of aircraft operating in residential areas remains a bone of contention among the residents situated below their flight paths.

Innovation in VTOL capabilities, and quieter electric and hybrid helicopter propulsion systems could provide the answer by reducing noise pollution.

However, some engine manufacturers are expressing concern about these technologies being available in time for the urban taxi movement, which OEMs are claiming universally will be in a few years' time. ▶

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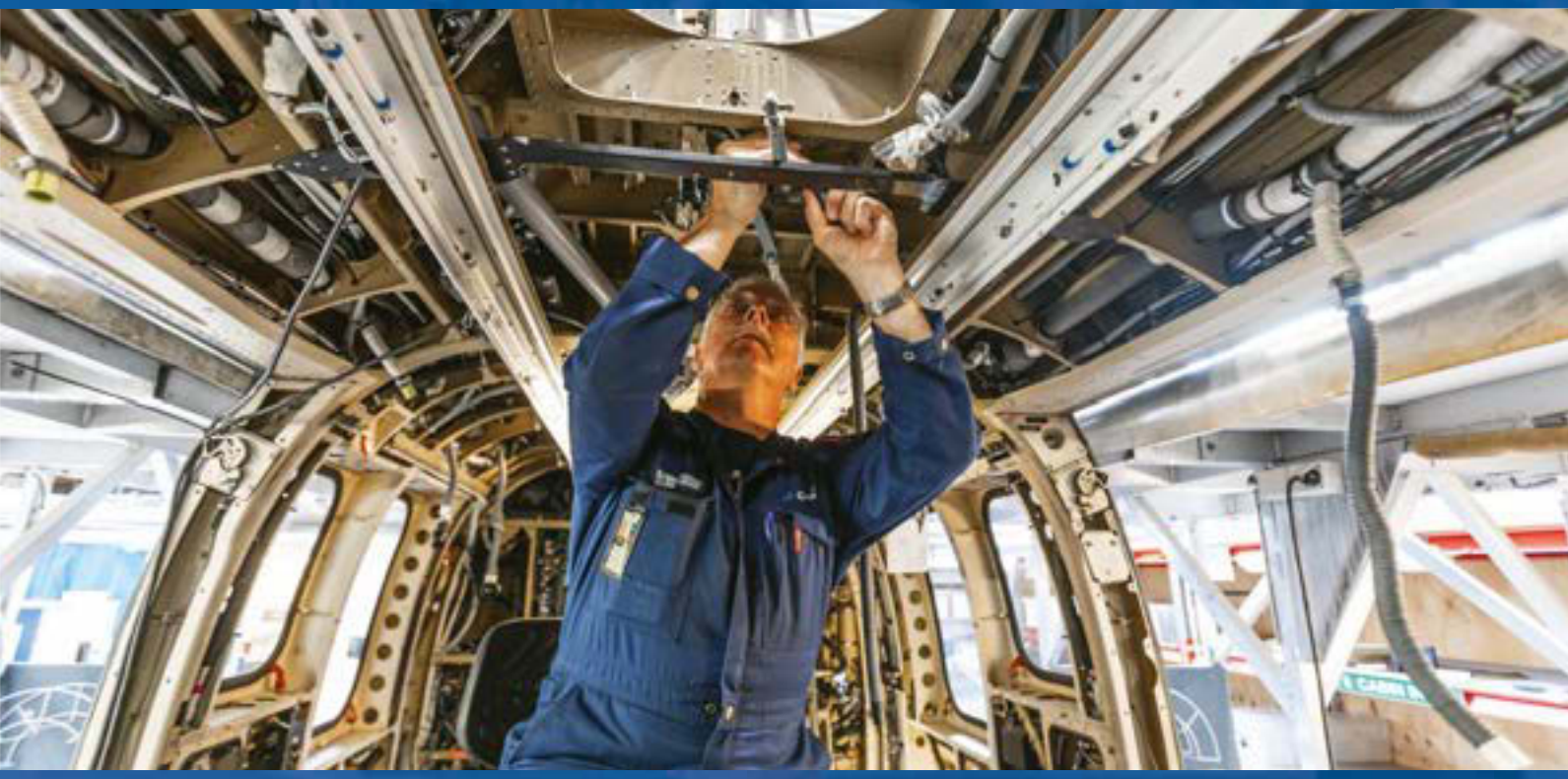

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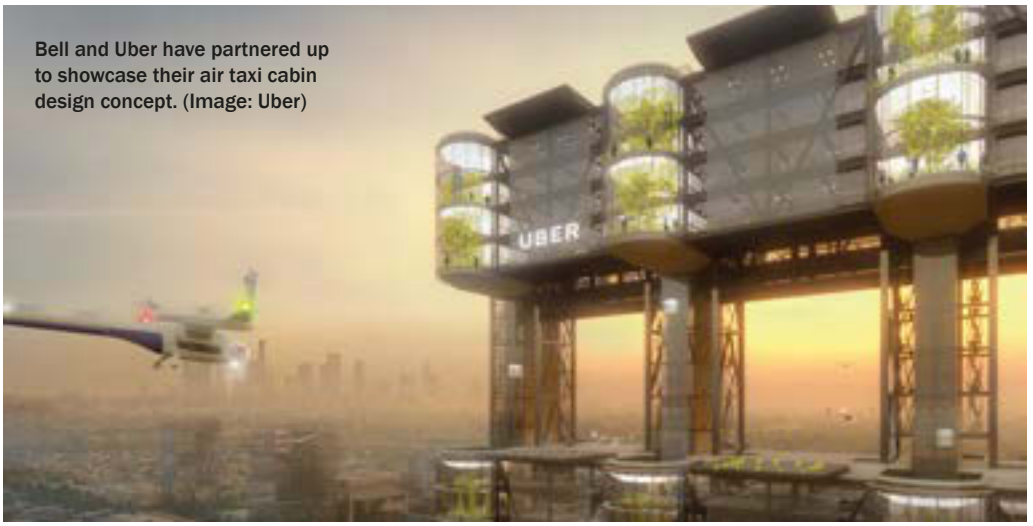
The engine industry is in firm disagreement about when exactly an electric powerplant capable of supporting air taxi flight will enter the eVTOL market.

During February's HAI Heli-Expo in Las Vegas, tier one engine developers, including Safran Helicopter Engines and Rolls-Royce, put forward their perspectives on the topic, which quickly exposed a major gulf between their respective air taxi visions.

Taking up the case that the advanced technology required to create an electric engine is not presently available from industry, Bruno Bellanger, executive VP of programmes at Safran, went so far as to say that it would take two decades before a payload of 100kg could be powered electrically for a 30-minute period of flight.

In contrast, Mike Mekhiche, global head at Rolls-Royce Electrical, told *Helitech International Daily News* that current electric technologies could support modern air taxi programmes like Bell's FCX-001 and CityAirbus. 'There's nothing that would stop an air taxi or the eVTOL type of platforms from flying today,' he said.

Of those two projects, only Airbus has formally released a design specification for the engine. The CityAirbus concept utilises eight pitched propellers 'powered by direct-drive engines' alongside eight 100kW (operating power) electric motors manufactured by Siemens. Four 140kW batteries, all with 110kWh energy, power these motors and will enable the aircraft to have a cruise speed of 120km/h.



Bell and Uber have partnered up to showcase their air taxi cabin design concept. (Image: Uber)

Certainly, these plans suggest that Airbus has constructed a highly capable eVTOL platform and the feasibility of air taxi flight is in little doubt. A supply-chain perspective complicates this picture, however, or at the very least points to a tension between aircraft OEMs and engine component subcontractors.

Electric energy

Siemens, for example, do not currently have lead times for the CityAirbus 100kW electric motors, as the components are prototypes rather than being available for industry-wide consideration.

'We do not currently manufacture batteries for air taxis, but we are actively developing and testing batteries in our eFusion airplanes,' a Siemens spokesperson confirmed. 'We foresee that for certain types of applications, a more integrated approach between the airframe manufacturer and the propulsion system provider is required.

'With respect to market development, once more and more electrified aircraft are being demanded, the sales for electric engine components is bound to increase,' he explained.

Whilst market demand is likely to be driven by adjustments made to prototypes and rigorous testing of vehicle demonstrators, work to educate both industry and the public on the advantages of electrification is being carried out.

Mekhiche provided a comprehensive analysis of these benefits, listing efficiency, capability, fault management and reliability among the main differences that separate electric engines from traditional helicopter turbines.

'The value of electrification starts with efficiency. Electric systems are inherently more efficient in terms of accomplishing a specific pathway compared to the same system on the mechanical side,' he said. 'Due to that efficiency, you're able to save on fuel consumption. You're also able to direct the energy that you use on your system, where it matters, when it matters.'

On the subject of capability, he focused on computer intelligence and the ability of operators to 'reconfigure a power propulsion system' to improve aircraft performance.

Addressing fault management, Mekhiche pointed to electric systems allowing operators to 'redirect power to mission-critical loads and shut down others in order to mitigate safe fault scenarios'.

Finally, reliability is said to be increased because fewer parts are being used (and mechanical pumps are eliminated) and there

Bell's Air Taxi cabin mock-up has been on display at various trade events, although the company is yet to disclose major component details. (Image: Bell)

is a reduction of 'wear and tear' due to the engine operating at 'an optimum point'.

Industry impact

One other particularly interesting issue raised by Mekhiche is the prospect of greater disruptive technologies taking hold of the marketplace. In his estimation, evolution of partially and fully constructed electrical systems will soon have a 'radical impact' across industry, not only through the reshaping of aircraft and engine OEMs but also changing the value of older technologies and by default raising the value of new ones.

'The scope of supply will change going forward. The conventional airframers will have a different type of role to play. But there will also be newcomers offering all kinds of flying platforms that are not necessarily conventionally designed or conventionally managed,' he explained.

'That market dynamic is going to drive companies like Rolls-Royce to look at the role we need to play and how we adjust our scope of work and scope of supply, so we are actually providing value to the market and our customers.'

The CityAirbus is expected to determine its eVTOL technological capabilities in an inflight demonstration this year. (Image: Airbus)

The inference from such analysis is that industry will soon find itself in a landscape heavily influenced by the power of propulsion and hybrid technologies. Extending that logic, those that decide to take advantage of these new market conditions will prosper and others will potentially languish or lose out on new business.

Such a theoretical perspective is critical to evaluating the full spectrum of possibilities that exist with respect to electrification. However, Mekhiche declined to specify which eVTOL platforms are currently able to demonstrate the capacity to carry a payload equivalent of one to two passengers. 'There are several, which are a matter of public record,' he said. ▶

In this sense, when theory is set against practice, it is difficult to see a future unfolding in exactly the way Rolls-Royce envisages. Take the comparative perspective of Pratt and Whitney Canada (P&WC), which remains at a crossroads with respect to its plans for the manufacture of electric engines.

'Hybrid technology is an area we are looking at, but there's still parts of the equation that need to be resolved before we can reveal more details publicly,' said Nicolas Chabée, VP of sales and marketing for helicopter engines at P&WC. 'One issue that needs to be resolved is what size of engine would be ideally suited to an air taxi.'

The very fact that other engine developers are acknowledging they are grappling with more basic questions associated with electrical architecture is evidence that industry is not going to be flooded with market-ready concepts any time soon.

It is this kind of disparity between engine manufacturers that makes it decidedly difficult to predict when an eVTOL revolution will truly begin. What does not appear to be in dispute is that eventually air taxis of some description – whether fully electric or a hybrid construct – will be able to transport passengers over relatively short distances, but the debate as to when this will happen is set to run and run.

Playing it safe

One major concern over the evolution of rotary-wing taxis is safety.

In a survey published on 3 April by the International Helicopter Safety Team on global safety initiatives, it was found that out of 13 civil helicopter sectors – including EMS, law enforcement and sightseeing tours – air taxi/charter operators were ranked seventh in adhering to best safety practices, a worthy benchmark from which to improve going forward with autonomous technologies.

Safety practices are met through training, maintenance, HUMS, night vision and many other measurables.

That said, helicopters unfortunately fall under a jaded perception of not being an entirely safe mode of transportation, despite the perseverance of the rotary industry along the supply chain in tackling this issue.

Aviation accidents are affecting progress, particularly with the heavy publicisation of recent tourist helicopter crashes in New York and Nevada, alongside the fatal collision of Uber's autonomous car with a pedestrian in Arizona in March. The taxi company has since halted all testing with no details on when it will begin again.

Whenever crashes do take place, OEMs and the FAA/EASA and other regulatory bodies work together to identify causes and prevent future incidents. However, with such dangers in the collective consciousness, industry's ambitions to be flying over cities with autonomous technology in the next few years seems slightly hedonistic.

The Bell Air Taxi can accommodate up to four passengers, and its cabin has a variety of connected capabilities, including Wi-Fi coverage, wireless charging and video conferencing. (Photo: Bell)

How will manufacturers reach out to the public to understand and address concerns about safety without sacrificing the progress of technological developments?

The answer may be for them to work closely with regulators and aviation authorities like the FAA to ensure robust and safe strategies that are further enhanced by existing policies and establish the routes and infrastructure that will support these platforms.

Mark Moore, director of aviation engineering at Uber, is confident about public acceptance of the emerging move towards automated eVTOL platforms. 'Not only are these vehicles going to be inherently different and more capable in terms of safety, they will be designed in ways so that a single part failure cannot bring the aircraft down,' he said.

'The inherent redundancy across the propulsion, the energy, the control [and] all the systems is a unique differentiator which we feel will make the vehicles much, much safer.'

According to the Vertical Flight Society, around 80% of helicopter accidents are caused by human error, so with the automated systems in place,

The CityAirbus is set for take-off before the end of the year (Image: Airbus)

they will be enhancing the safety issues which commonly occur in crashes or incidents, whether that is through avionics, controls or propulsion.

Greg Bowles, VP for global innovation and policy at General Aviation Manufacturers Association, agreed. 'If you look at traditional aviation, the vast majority of our safety issues come because of human error in the cockpit. This is where most of our problems occur,' he said.

'Some of that's during system failures... The current policy and rules have been to shut down automation as the pilot takes over – that's a high task-load point [and] that's where a lot of errors occur,' he continued.

Moore added that it is also about the parameters, the logistics and the journey from A to B being designed specifically for this type of aircraft. 'The safety burden can't be just on the vehicle; it's on the operational context, on how they're used, and that's why you won't see us talking about flying into people's backyards,' he explained.

'We are flying from skyport to skyport because that's an operational context where we can ensure very high levels of safety. It's a very well-known area. It's very well controlled. It has specific routes to each one of these skyport nodes. There's no question that to achieve the highest level of safety, you would design a network with controlled skyports,' Moore said.

> "The safety burden can't just be on the vehicle; it's on the operational context, on how they're used."

With fixed routes to skyports and short journeys, the margin of error should be reduced substantially, in addition to automation eliminating common issues of workload and fatigue.

The involvement of regulators such as the FAA ensures that regulations surrounding current safety measures are in place and that manufacturers and operators adhere to them, and this in turn will help move the eVTOL aircraft forward to safer skies.

'There are a lot of traditional policies and processes we use in aviation. We use things to verify software, for example, and we have a lot of confidence that... the vehicles are extremely safe, but there are ways that safety is hindered by [red tape],' Bowles confirmed.

While the implementation and proving of safety measures can be cumbersome and bureaucratic, Bowles stated that the FAA is taking an observed and acceptable approach to applications that enhance safety for autonomous technology in an urban environment.

'The FAA has been very open-minded in approaching new apps that would allow technology to instruct to fill some of those stop gaps, and so potentially these new approaches will enable these technologies that will really be the key to safety issues, which is what we are really all after,' he said. ▶

The Airbus-manufactured eVTOL CityAirbus measures around 8m² and, according to the company's development team, will be smaller than any other helicopter on the market. (Image: Airbus)

Inevitable introduction

The vertical flight market can be considered against the automotive industry, a sector it closely mirrors.

'Aviation is really changing. Vertical flight is becoming more like a car and fixed-wing [transport] – it's coming to the masses,' said Mike Hirschberg, executive director at the Vertical Flight Society. One of the society's survey found that 59% of industry participants envisage that eVTOL platforms will be operational in the next five to ten years. 'It's not "if", it's "when". The question is: "Who will be the first to market?"' Hirschberg commented. 'There's a lot of investment in this brave new frontier.'

He explained that more than 50 companies are developing eVTOL concepts in order to 'revolutionise flight', from the urban air mobility project by Airbus Vahana with its A³, to Joby Aviation with its S4 platform, a four-seat, six-propeller tiltrotor that can fly up to 320km/h.

CityAirbus is readying for take-off by the end of the year. 'There is a public need for urban air transportation in cities, even with conventional helicopters, which are a bit more noisy and higher in costs than CityAirbus will be,' said Marius Bebesel, head of urban air mobility at Airbus.

'With this concept and the right approach, you can deliver an opportunity in cities. This is the first step for us showing that the business models are working. Then the next steps, I would say, would be the technical milestones such as electrification to reduce the costs,' he explained.

> "There is a public need for urban air transportation in cities, even with conventional helicopters, which are a bit more noisy and higher in costs."

The team is also considering noise and its impact. 'If we manage to have a very silent concept [with CityAirbus], I think this will be essential. The other point, of course, is that we don't want to have a VIP [only] vehicle – in the beginning it will be more expensive, but we are looking to make it democratic,' Bebesel commented.

Airbus is not alone with its ambitious timelines. Last year, Bell launched the FCX-001 technological demonstrator to show the near-future utilisation of autonomous technology for urban transportation.

Further to this, the company has been showcasing its urban air taxi cabin design, a concept that could be chosen for the Uber aircraft taxi service, which is anticipated to fly in 2020.

Moore explained Uber's model: 'We are doing extensive demand modelling based on Uber data and cell phone data, which is publicly available through... AirSage and other companies.

'As we look at [urban eVTOL aircraft] to be a meaningful transportation solution and to get to the economies of scale so that this is affordable to mainstream markets, we are talking about any city having many hundreds, and evolving to many thousands, of aircraft.'

Moore told *Helitech International Daily News* that the idea is to initially begin with 50 aircraft in a city and two years later to grow that city into having anything between 300 and 500 aircraft, 'with the intent to get to over 1,000 per city over another few years'.

While competition heats up on being the first to market, the narrative remains focused on safety. Individual projects need to be collective on championing and ensuring safer flights in urban areas. ■

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The single-engine H125, part of the Squirrel portfolio, has accumulated more than 32 million flight hours worldwide. (Photo: Airbus Helicopters)

Happily single

The single-engine helicopter is a versatile platform that can be utilised for an extensive variety of missions, including training, law enforcement and EMS, to name a few. As such, OEMS are continuously pushing innovation of this aircraft type in the civil sector. **By Helen Haxell**

The single-engine market is being invigorated by the introduction of upgraded and next-generation platforms by both new and existing manufacturers. This is providing zest and healthy competition to excite a sector which has been too long in the doldrums of the oil and gas price downturn.

As testing efforts ramp up to meet certification requirements, the light single-engine market is spoilt for choice.

Old guard

Although Enstrom Helicopter Corporation is niche in its role within the single-engine market, the US-based company has become a major player that is seeing a lot of interest in its offerings, particularly from Eastern Europe.

Six Enstrom 480B-G aircraft are in the process of being delivered to the Czech Republic.

The four military and two civilian rotorcraft will replace a similar number of Russian Helicopters Mil Mi-2s that Lom Praha's flight training centre has been using since it was set up in 2004 to train Czech Air Force personnel.

The civil-registered platforms will enable Lom Praha to carry out more general flying training missions while avoiding the restrictions that are placed on military helicopter operations.

Dennis Martin, director of sales and marketing at Enstrom Helicopter, explained to *Helitech International Daily News* that this deal is creating interest in the OEM's portfolio across the European region.

'We're just finishing up delivery of six aircraft to the Czech Republic, four of which are going to the Czech Army. That's creating quite a lot of buzz in the region. A lot of people are taking a new look at the 480. We've also sold a new 280 to France – the first we've sold there in quite a while,' he said.

'We're starting to see more and more interest out of Europe, and these things tend to build and multiply. For a while, that market was pretty quiet for us, but it's becoming more and more of a focus for Enstrom,' Martin added.

One of the major focuses for the manufacturer is its next-generation platform, the TH-180, a twin-seat helicopter aimed at the training market. The first of the type flew in 2015, but Enstrom suffered a setback when a prototype crashed in February 2016.

The company has been relatively tight lipped on its progress with certification, although Martin confirmed that testing is now under way. Noise and structural testing took place in August.

Whilst Martin was firm that there is no third prototype planned, he did share that Enstrom is happy with the current two TH-180s. 'We had four [examples, including]

This year, the Leonardo AW119Kx has been delivered to Chile, South Africa and the US. (Photo: Leonardo Helicopters)

The Bell 505 Jet Ranger X is a derivative of the OEM's 206L-4 LongRanger. (Photo: Bell)

The twin-seat TH180 helicopter is aimed at the training market. (Photo: Enstrom Helicopter)

> "Here in Europe, I think people are watching the helicopter because they see that after 40 years of alternative offers, something new is coming."

one proof of concept, which has been retired, and one which was damaged in the incident. The two [remaining aircraft] should cover all our requirements,' he said.

New player

Another manufacturer in the throes of its testing and certification programme is Kopter, with its SH09.

The single-engine turbine helicopter is claimed by the OEM to be the only rotorcraft in its weight category to combine a full-composite fuselage, bearing-free rotor system with five blades, an electronically governed engine and a glass cockpit.

With more than 26 global orders spanning the Americas, Europe and now Africa – two are soon to be delivered to South Africa – prospects are looking fruitful.

However, the company's CEO, Andreas Löwenstein, told *Helitech International Daily News* that the platform has the potential to impact the leasing market in the European region in particular. 'Here in Europe, I think people are watching the helicopter because they see that after 40 years of alternative offers, something new is coming,' he said. 'So, it's difficult to say today what kind of effect this will create on the market, but there are [different] elements.

'We are told by leasing operators, for instance, that they see that our helicopter will be impacting residual values of the existing fleets and that this might lead to major switches,' he explained.

During September this year, prototype three was in the middle of conducting ground runs, and Löwenstein had expectations that it would be flying before the middle of October.

This comes after the test phase of the SH09 was delayed by three months in May, following the discovery of a quality-assurance issue with a dynamic component.

Addressing this, Löwenstein said: 'We have resolved our dynamic component issue. The way we have done it is very simple: We have totally changed the supplier. I will not accept suppliers who are not delivering what we expect in terms of quality. We have shown this clearly in this case; the supplier was changed overnight.'

Similar to Enstrom, Kopter remains tight-lipped on scheduled dates after the impact of delays to testing programmes, but Löwenstein offered: 'What I can say today is that we are still on track. I do not expect major slippage, major problems, to come.

'We might lose some weeks or months here and there in the development process, so this is always possible, but the company's target is still to get the [SH09] certification before the end of 2019,' he confirmed.

The majors

Major OEMs like Airbus, Bell and Leonardo continue to diversify their portfolios across helicopter sizes and types, but still have strong footprints in the single-engine sphere.

Two of Airbus' global successes in this field are the H125 and H130. Both models are equipped with a Safran Arriel 2D engine, including triple-engine control with a dual-channel FADEC unit, and a third independent and automatic back-up channel for automatic start-up sequences and engine handling.

According to company literature, over 1,000 Arriel 2D-equipped H125 and H130

helicopters are in service worldwide, and have collectively logged over 1 million flight hours.

David Prevor, senior marketing executive at Airbus Helicopters, laid out the global catchment of the respective helicopters to *Helitech International Daily News*: 'In 2017, we achieved 71% market share in this category [single-engine], with both the H125 and H130. The situation is not so different in Europe; we are dominant as well.'

Prevor explained that the reason for this 'dominance' is that the H125 is particularly adept at performing aerial work, public services and passenger transportation missions, whilst the H130 is more geared towards private aviation and tourism.

He also pointed out that the H125's cost-effectiveness was significant when compared with competitors like the Bell 407. 'We are 13% cheaper than a Bell 407 in terms of operational costs. If you want to transport, let's say, 1t of payload, it will cost you 13% less than the Bell 407. Performance and [extra payload] of the H125 are the key selling factors,' Prevor explained.

Flying the flag

The Bell 407 is relatively omnipresent, with strongholds in Asia-Pacific, Europe and South Africa.

The 407 is the flagship aircraft for Bell's service provider, NAC Helicopter Operations, in South Africa. This is largely due to the platform's speed and seat capacity, as well as the available support offered by the OEM, said Alister Brown, division head and partner at NAC.

Throughout Africa, the type has been used for roles such as border patrols and VIP transportation, as well as being utilised by private operators. 'We have four 407s waiting to go to Madagascar. They will be dispatched until the end of December and will be used for the [forthcoming] election [campaigns],' Brown commented.

Orders for the SH09 are coming in from far and wide, from Guatemala to Norway. (Photo: Kopter)

Turning to Leonardo, the company confirmed in April 2018 that highly competitive conditions and a 'low-margin market' were the main causes behind its decision to freeze the AW009 programme, although it still sees great prospects for its light single helicopters, particularly the AW119 variants.

The AW119Kx is the latest evolution of the AW119 single-engine helicopter. It features the Garmin G1000H glass integrated flight deck system and new avionics.

Although the platform is mainly operated outside of Europe, it is likely that Leonardo will seek opportunities within the region as the company narrows its focus on its single-engine portfolio. ■

SINGLE-ENGINE ROTORCRAFT

	AW119Kx	Bell 407	Bell 505	H125	H130	SH09	TH180
SUMMARY							
Supplier:	Leonardo Helicopters	Bell	Bell	Airbus Helicopters	Airbus Helicopters	Kopter	Enstrom Helicopter
Engine	1x Pratt & Whitney PT6B-37A	1x Rolls-Royce M250-C47B/8	1x Safran Arrius 2R	1x Safran Arriel 2D	1x Safran Arriel 2D	1x HTS900	1x 210hp Lycoming HIO-390
First Delivery Date:	2013	1996	2017	2010	2003	-	-
Out Of Service Date	2038	2036	2042	2035	2028	-	-
Status	In production	In production	In production	In production	In production	Developmental	Developmental
ATTRIBUTES							
Length (m)	12.9	12.6	10.5	12.9	12.6	13	8.9
Rotor diameter (m)	10.8	10.7	11.3	10.7	10.7	11.1	8.6
MTOW (t)	3.15	2.38	1.67	2.8	2.5	2.65	1.02
Empty weight (t)	1.48	1.22	0.99	1.24	1.43	1.3	0.6
Max speed (kt)	-	140	-	155	155	140	-
Cruise speed (kt)	131	133	125	133	128	140	-
Range (km)	954	624	566	650	616	800	-
HOGE (ft)	7,300	10,450	10,460	9,450	9,700	-	-
HIGE (ft)	10,990	12,200	14,450	11,650	11,250	-	-
Crew	2	1	1	1	1	1	1
Passengers	7	6	4	6	7	7	1

AW119Kx

The AW119Kx, the latest evolution of the AW119 single-engine helicopter, has the Garmin G1000H glass integrated flight deck system and new avionics, including synthetic vision, moving map, 'highway in the sky' and obstacle/terrain avoidance systems. The AW119Kx was officially presented in October 2012.

Bell 407

The 407 is an outgrowth of the 206L-4 LongRanger design, outfitted with a four-bladed main rotor with a composite hub. It was unveiled in 1995 and since 2000 Bell has delivered more than 1,000 aircraft, making it one of the company's best-selling product lines.

Bell 505 Jet Ranger X

The Bell 505 Jet Ranger X is a light single-engine helicopter designed for the utility, executive/passenger and law enforcement markets. The 505 is designed with a flat floor, increased cabin volume and clamshell doors to undertake a variety of missions.

H125

The H125, designated the AS350 B3e Ecureuil/AStar until March 2015, is the high-performance version of the single-engine Ecureuil family. On 14 May 2005, it established a world record for the highest altitude landing and take-off, on Mount Everest at 29,029ft. The H125 is designed for use in hot-and-high and environments.

H130

The H130, designated the EC130 until March 2015, is a light single-engine helicopter in the Squirrel family, with a modular cabin that can accommodate one pilot and up to six/seven passengers. Its Fenestron tail rotor (H135 type) and automatic variable rotor speed control result in a reduced external sound level.

SH09

The Kopter SH09 is a single-engine turbine helicopter featuring a large cabin that provides increased visibility. It is equipped with a modern turbine for hot-and-high performance. The new-generation dual-channel FADEC, with a manual backup provision, secures flying procedures and facilitates engine maintenance, planning and troubleshooting.

TH180

Enstrom Helicopter unveiled a mock-up of its new TH180 two-seat, piston-powered training helicopter at Heli-Expo in February 2014. Although designed as a trainer, the TH180 can also be used for missions such as patrol and surveillance. It is a scaled-down version of the three-seat 280FX, with an energy-absorbing landing gear and weighing 225kg less.

Untapped potential

Calling for greater cooperation between companies in the helicopter leasing market to boost profitability, Hooman Yazhari, CEO of Waypoint Leasing, spoke to *Helitech International Daily News* about the lessor's presence and priorities in the rotary-wing sector. **By Gerrard Cowan**

Waypoint Leasing is continuing to diversify its business, with EMS utility work, SAR and offshore wind its major areas of focus outside of oil and gas. (Photo: via *Shephard* library)

Yazhari believes that by working together in certain areas, different players in the aircraft leasing sector could 'think through how we can increase profitability in this market'.

For example, lessors, operators and OEMs could collaborate to identify and establish 'second and third asset lives, as well as new uses, markets and opportunities' for particular helicopter types 'that may be under-utilised in existing sectors – some aircraft are available at lease rates that will make them competitive in previously untested markets'.

Yazhari said that companies across the industry could also cooperate to standardise asset configurations, 'making their use more efficient and financing-friendly'.

In addition, different parts of the supply chain 'should work to better allocate risk across the industry, acknowledging the cost of capital for industry participants and the timespan required for returns after the deployment of that capital'. He added that OEMs have successfully focused on supply discipline relating to offshore helicopters over the past two years.

> "The difficulties that we've seen in the oil and gas market make leasing companies more of a necessity when it comes to financing this business."

Experience matters

Waypoint is continuing to diversify its business, with EMS utility work, SAR and offshore wind the major areas it focuses on outside of oil and gas.

However, Yazhari said that while he sees 'a tremendous amount of opportunities' in these areas, the lessor still views the energy sector as holding potential.

'We will continue to invest our time, effort and resources in nurturing our oil and gas customers and our oil and gas assets,' he told *Helitech International Daily News*. 'By no means are we going to move away from our customers in that sector.

'It's a cyclical business, and we can see a recovery in other parts of the oil and gas world. The shale and the onshore sectors are doing well, and we are heartened by the recent stability in the oil price.'

In the medium term, there could even be increased opportunities for lessors in the offshore sector, he said, as leasing means operators do not have to hold capital-intensive assets like helicopters on their balance sheets beyond the contracted and revenue-generating lives of the platforms.

"We will look at all the potential avenues in China – it's definitely in our medium-term plan to grow there."

'You can be much more clinical and much more precise with your capital allocation as an operator,' Yazhari explained. 'The difficulties that we've seen in the oil and gas market make leasing companies more of a necessity when it comes to financing this business.'

He has worked in the sector before, serving as senior VP and general counsel of International Lease Finance Corporation (ILFC) from 2012 to 2014. ILFC focuses on leasing commercial jet aircraft to the airline industry.

More recently, Yazhari was general counsel and chief administrative officer with responsibilities for the fleet at operator CHC. He believes his experience in leasing, albeit fixed-wing, combined with his years as a customer of helicopter lessors gives him a unique insight into the market.

'I think the experience I gained at CHC means that I am able to understand the realities of being a helicopter operator and now better understand the opportunities that are available to both our businesses,' he said.

'Hopefully that makes me a better partner to our operator customers – somebody who can understand their business and see the world through their eyes and be helpful, rather than through the eyes of an outsider who may not have been exposed to the nuances and the complexities of running a complicated business like a helicopter operation.'

Reaching out

Waypoint currently has 37 customers in 34 countries. It owns a fleet of 160 helicopters valued at $1.6 billion, with orders or options for an additional 70 platforms valued at $750 million.

Yazhari said that there is still a large segment of the global industry that lessors have yet to penetrate, with leasing yet to touch even 15% of the addressable market.

'Latin America is a big potential growth market, and Asia is the same way,' he said. 'There are a decent number of helicopters flying, but lessor penetration is still in its infancy.'

Waypoint has had a presence in the Chinese market for about a year now. Yazhari revealed that the company has 'high hopes for that market, and we will invest the time and resource required to craft the best strategy to penetrate it'.

This could be through JVs, other partnerships with local companies or working on building a network of its own relationships. The latter would take longer but has been Waypoint's approach in most of its markets, Yazhari said.

'We will look at all the potential avenues in China – it's definitely in our medium-term plan to grow there,' he confirmed.

Yazhari is seeing leasing opportunities populate in South America and across Asia. (Photo: Waypoint Leasing)

Throughout 2018, the company has seen a flurry of announcements, partnerships and deals. In July, Waypoint completed a lease transaction for three new Leonardo AW169 helicopters to Emerald Pacific Airlines in Taiwan.

The aircraft will be used for EMS operations, amongst other missions. The deal is the lessor's first in the country.

A few months earlier, Waypoint finalised a lease for one Airbus H135 to ADAC Luftfahrt Technik (ALT) in Germany, which was announced on 25 April.

ALT provides aviation engineering, EMS and pilot training. The H135 helicopter will be deployed for pilot training.

In February, a JV between Waypoint and Leonardo launched a maintenance and training services offering in support of the lessor's medium utility helicopter reconfiguration programme.

The aim is to repurpose AW139 aircraft that have been utilised in oil and gas operations for a variety of utility missions. ■

Making strides

Vector Aerospace, now under the charge of StandardAero, is bringing increased expertise to a venture that has the potential to break new ground across Europe and beyond. **Manny Atwal**, VP of sales, marketing and business development for commercial helicopter services, discussed with *Helitech International Daily News* how the company plans on increasing its market share across the continent.

The formal acquisition of maintenance specialist Vector Aerospace by StandardAero in November 2017 caught the eye of industry and stood to consolidate the parent company's strong global market position within the helicopter MRO space.

The transformative takeover has allowed the company to establish a number of centres of excellence, including one of its premiere facilities based in Langley, British Colombia, set up to 'support all aspects of airframe MRO, including structures and composites, dynamic components, avionics and STC solutions', according to Atwal.

Aiming to expand

Outside of North American restructuring, based on 'recent analysis' StandardAero has determined that the European marketplace now accounts for 25% of annual MRO spend. This is expected to increase at a 'rate of nearly 3%' year on year.

'We are always looking ahead, so with this anticipated growth in mind, we are already laying the groundwork to strengthen our position in the region to support customer demand,' Atwal said.

The plan to widen the European footprint of StandardAero's rests on expansion of its UK Fleetlands facility, where it works on MRO projects across a variety of civil and military programmes, including the Airbus Helicopters H215 Super Puma and H225, the Boeing CH-47 Chinook and the Sikorsky S-76.

The company also intends on 'better leveraging' its Almondbank facility as a means to 'support and exchange assets' across its international customer base, beyond the Americas. Before the end of the year, the site is due to receive a host of new Airbus components and plans are also in place to add 'select Rolls-Royce M-250 accessories' to the base's growing inventory.

This powerplant is used on the MD Helicopters MD 530F and the legacy Bell 206A Jet Ranger, and, according to Rolls-Royce literature, close to 33,000 examples of the type have been produced in total, 'powering 125 different airframe applications all over the world.'

The programme's longevity seems to have sparked a number of technological breakthroughs. For example, StandardAero has rolled out a 'PowerCheck' mobile application to 'proactively enhance the customer interface' of those operating the engine.

As Atwal explained, the main purpose of the solution is to provide maintenance departments and support teams with the ability to monitor engine performance metrics and recommend preventative maintenance as appropriate.

A separate repair development technology, the EnduroCoat 3500 solution, has also assisted on the programme to withstand the impact of 'case plastic breakout' on the engines. This type of degradation typically occurs through wear and tear, but a combination of 'innovative engineering and rigorous testing' has led to implementation of the highly specialised coating process, which has been proven to reduce plastic cracks and corrosion, according to the OEM.

'In the 18 months since we introduced this new coating, we have not seen any product warranties related to cracking plastic, indicating that it is already making a noticeable impact on our customers' operations,' Atwal confirmed.

> "We are already laying the groundwork to strengthen our position in Europe to support customer demand."

Finger on the pulse

StandardAero's modern business approach pushes far beyond the traditional and often cumbersome practices which have tended to inhibit the work of MRO providers.

Part of this development includes an eShop order system which produces digital instructions for engineers and has led to an acceleration of inspection processes for incoming engines.

'This completely electronic production management and shop order system is approved by Transport Canada, the FAA and EASA, and, to our knowledge, is the only system like this within the MRO arena,' Atwal commented.

The primary benefits of less labour-intensive processes – including a reduction in human error and increased efficiency – are paying dividends and seem to have laid the basis for the company to create a genuine competitive edge in the MRO sector.

Furthermore, StandardAero has expansion plans and is focused on 'increasing support for helicopter operators globally'. Atwal did not disclose which companies might be in the frame to form future partnerships, but insisted that the company will continue to 'cultivate our partnerships with engine and airframe OEMs, as our alignment with these industry leaders is at the foundation of our business'.

Reflecting on the MRO market more generally and the main issues the organisation is having to confront at the moment, he said: 'We believe it is incumbent on us to take a leading role in the development and introduction of new, safer technologies and solutions.

'With the amount of time, effort and resources involved in working such complex safety initiatives with the various airworthiness authorities, challenges are bound to arise,' he continued. 'We are encouraged by the great successes we have recently experienced in the introduction of our AS350/EC130 [H130] crash-resistant fuel tank, developed in partnership with Robertson Fuel Systems.'

The proactive nature of the company's safety drive is underlined by its investment of capital resources to the wider crash-resistant fuel tank programme. 'Throughout the process, we worked directly with operators to identify their needs, which we believe has led to many of the [AS350/H130 crash-resistant fuel tanks] agreements we have in place today,' Atwal concluded.

Atwal spoke to Tim Martin

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Helitech International 2018 Conference Programme

Day	Time	Mary Jennings Hegar Theatre (Theatre 1)	Winkle Brown Theatre (Theatre 2)	Technology Showcase Theatre
Day 1 16 Oct	09:30-11:00	**Global Market Overview**	**Piloted & UnPiloted Vehicles** (09:30-10:30)	**New Technology Showcase** Presentations from: • Librestream Technologies Inc. • Apple International Inc Ltd • SKYTRAC Systems • BAE Systems • Jet Support Services Inc. • DART Aerospace • Leonardo Helicopters
	11:30-13:00	**Market Sectors: Opportunities**	**R&D Activities for Rotorcraft Airspace Users** (11:00-12:30)	
	13:30-15:00	**Business Leaders Forum**	**EHA Rotorcraft Seminar** *Hosted by the EHA* (13:00-17:00)	
	15:30-17:00	**Offshore Oil & Gas**		
Day 2 17 Oct	09:30-11:00	**Air Ambulances & HEMS**	**ESPN-R Safety Workshop** *Organised by NLR on behalf of ESPN-R and IHST* (10:00-16:30)	**New Technology Showcase** Presentations from: • Carcoon America • Helinetwork International • Flightcell International • Airborne Technologies GmbH • Sparfell & Partners • Essex Industries Inc. • Universal Avionics Systems Corp.
	11:30-13:00	**Fire-fighting: Case Studies & New Technologies**		
	13:30-15:00	**Police, Search & Rescue**		
	15:30-17:00	**Offshore Wind Market**		
Day 3 18 Oct	09:30-11:00	**Planning for Climate Change**	**Training – Pilots & Maintainers** (09:30-11:15)	**Manufacturers' Technical Update** Presentations from: • Rolls-Royce • Sikorsky Aircraft Corporation • LORD Corporation • Leonardo Helicopters
	11:30-13:00	**The Future of Rotorcraft: Hybrid, Electric & Autonomous Flight**	**Using Data to Improve Operations** (11:45-13:00)	
	13:30-15:00	**Airframes: Bringing New Technology to Older Craft**	**Connectivity & Big Data**	

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Helitech Connect

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Helitech Connect is a new matchmaking and networking platform available to all registered visitors. It will help you find new potential business partners or suppliers by name, sector or job title and arrange meetings at the show, either at the Helitech Connect Lounge or at the exhibitor stands.

Beside relevant contacts, Helitech Connect will recommend relevant conference sessions to you that you will be able to easily add to your calendar.

Helitech Connect is a bespoke tool for getting the most out of your time at the show.

If you would like to take advantage of the tool at the show, please visit the Helitech Connect Lounge on Stand M60, and the team will be happy to help you.

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When: Wednesday 17th October - 17:00-19:00

Where: The Mountain House (2 min walk from Hall 8).

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Hosted Operator Programme

Successfully launched earlier this year, the Hosted Operator Programme allowed Helitech International exhibitors to nominate those potential operators they would like to meet at the event.

As a result, nine operators that are new to the show will be visiting Helitech International and meeting various exhibitors throughout the three days at the Helitech Connect Lounge.

We welcome on this first edition representatives from Atlas Helicopter, Heliline, Airlift, Lionsair, Everjets, NHV, HeliPortugal, Superior Air and Heliconia.

If you would like to meet them, please visit the Helitech Connect Lounge on Stand M60.

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