

PILATUS AIRCRAFT LTD

ANNUAL REPORT 2021



PILATUS

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FACTS AND FIGURES

KEY FIGURES AT A GLANCE

TOTAL SALES



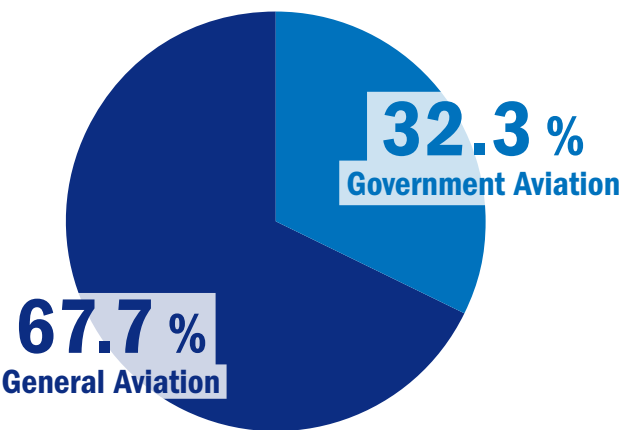
1,333 CHF million

EBIT

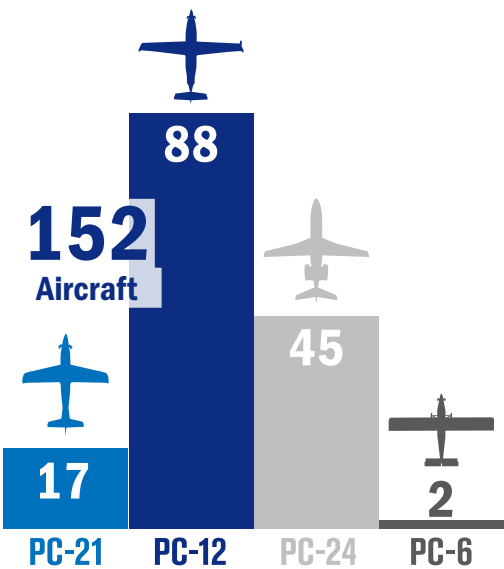


210 CHF million

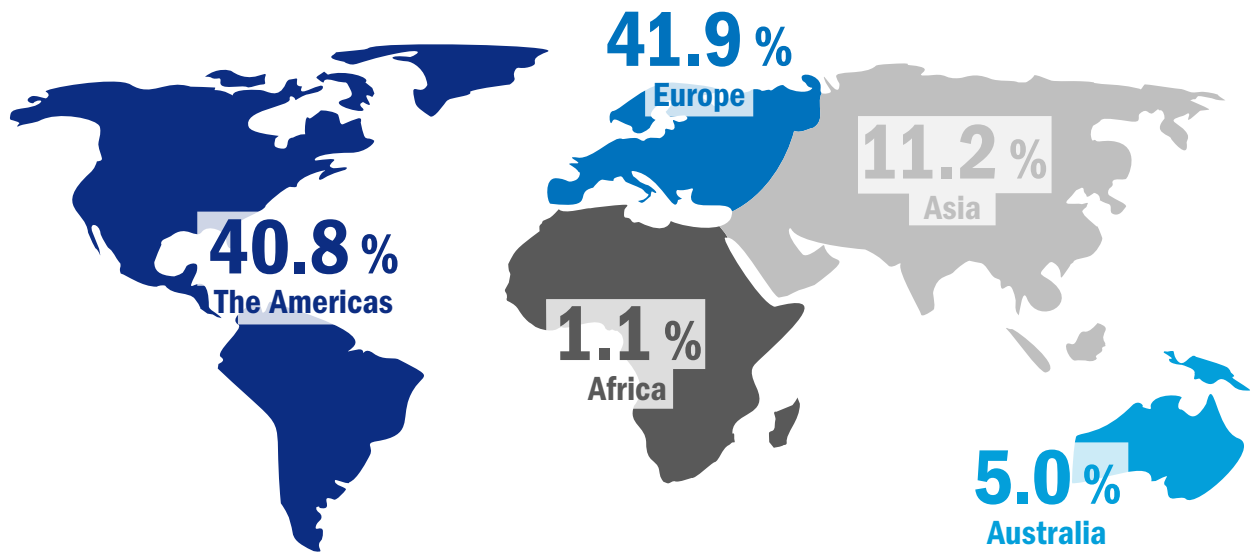
SALES BY BUSINESS UNITS



AIRCRAFT IN NET SALES



SALES BY REGION



ORDERS RECEIVED



1,734 CHF million

ORDER BOOK VALUE



EMPLOYEES



 **16.5 %**
Women

 **53**
Nations

 **9.4**
Years of service

 **55.4 %**
in Production

 **143**
Apprentices

 **92.4 %**
in Switzerland

EDITORIAL

A FINANCIALLY GOOD YEAR WITH CHALLENGES



Pilatus achieved a very good result in the 2021 financial year – turnover was even higher than in 2014, previously our best year so far! The outlook is positive. The current boom in global business aviation markets is unprecedented. Our company is ready to meet this demand with a portfolio of products and services which have been perfected and expanded even further, and we continue to push ahead with the development of various technologies. But the challenges on this flight will not be easy to master: it is increasingly difficult to recruit skilled staff and disruptions to supply chains have caused, and continue to cause, additional turbulence. At the same time we must remain focused, firmly resisting the temptation to venture into spheres which are entirely new to us. Our success is based on our qualities, and we will uphold them. We will stick to our strengths: we aim to be the best in our niche in everything we do.

We achieved very good results in terms of both turnover (1,333 CHF million) and EBIT (210 CHF million). This represents significant growth compared to the previous year: turnover increased by 19 percent on 2020 and operating income by 35 percent. All members of the current workforce of 2,316 employees may be justifiably proud of this. The fact that we successfully provided exactly the right offering of products and services is entirely due to our usual diligent, precise, passionate work and attitude. The total number of aircraft delivered from our works over the year proves this: 45 PC-24s, 88 PC-12 NGXs, 17 PC-21s and 2 PC-6s, i.e., a total of 152 aircraft.

We embark upon the new business year at full capacity, with well-filled order books!

GROWTH IN EUROPEAN GOVERNMENT AVIATION

We also note positive signals from Government Aviation – a business sector subject to very long-term planning. In 2021 we succeeded in concluding another contract with France for nine PC-21s. We are already engaged in the delivery process for Spain, where a total of 24 PC-21s from our production facilities are expected. The 14th September was doubtless one of the most satisfying moments of the year, when we handed over the first two PC-21s to the Spanish Air Force in San Javier, south of Alicante in Spain.

And we hold more trump cards in our hands. The effort we have invested in the PC-7 MKX, our brand-new smart Basic Trainer, will pay off. The positive reaction to the unveiling of the aircraft, with its completely new cockpit and all-new digital “Learning Environment”, at the Air Show in Dubai last November bodes well.

SUCCESS BRINGS CHALLENGES

Notwithstanding, we were not entirely able to avoid challenges impacting the world at a global level. Supply chain disruption gave us much to think about. Supply shortages of raw materials and complex components have plagued us since the end of 2020. Issues with quality and reliability have compounded these supply chain disruptions. Following massive personnel reductions during the first and second waves of the pandemic, we are now finding that some suppliers are lagging behind in returning to normal operations. A labour shortage is apparent worldwide, knowledge of and loyalty to companies and their products are lacking. We see this reflected in our production operations, in that we often have to take corrective actions about the quality of supplier

materials, find ever more faults and simply have to put up with delays. We have always managed to avoid production stoppages, despite these difficult situations. But the efficiency of our work processes suffers, resulting in higher costs. There are signs, however, that we will see fewer delivery delays over the coming year, accompanied by an improvement in the quality of the materials and products supplied to us.

The outstanding flexibility demonstrated by our staff will be essential until then. We are fortunate in that we have – and will continue to need – good employees who think and act for themselves and help us in shaping our future growth path. That is not to be taken for granted at a time when the competition to recruit talented employees is fiercer than ever before. The pace of change has increased here at Pilatus, too. Qualified employees are in high demand. Nevertheless, we intend to add further employees in the current year, having attracted around 120 more talented people to our company last year.

Pilatus has good cards to play on the labour market, where non-industry companies and administrations now rival us as direct competitors. We are extremely well positioned as a successful high-tech industrial company with Swiss origins, a down-to-earth approach and an innovative focus on the future. We feel that every day. Nevertheless, Pilatus must continue its efforts to make itself even more attractive as an employer. With that in mind, Pilatus has developed an enhanced package of benefits that are offered to prospective employees. We will also open other satellite offices in Switzerland so that we can move closer to talented professionals and specialists.

ALWAYS MOVING FORWARD!

2021 was not only a very good year, it was also a year of change at the top, continuous development of company structures and further work on new technologies. Change and continuity go hand-in-hand – a farewell to Oscar J. Schwenk in June 2021, long-standing Chairman of the Board of Directors, and a handing over of the baton to Hansueli Loosli. The transition was a complete success, and our thanks are due to our new Honorary Chairman, Oscar J. Schwenk, who was responsible for arranging the succession.

The fact that IT, for example, is now a separate Unit in its own right, is the direct result and logical continuation of the digitalisation seen in recent years. The company's enduring business success will require increased investment in innovation and technological developments. We have long viewed that as essential. Without revealing any company secrets, we can confirm that we are currently focusing our efforts on composite materials, engine technology, digitalisation and other areas too. Predictive maintenance is an important topic for us, for example, as is improving robustness in design. That is another reason why we have decided to update our IT core system, the "Enterprise-Resource-Planning System", for which we completed the preliminary work last year and also reviewed all process flows. The planned infrastructure

investments fit with this strategy of moving forward: at our subsidiary in Denver in the USA we are building an in-house aircraft painting facility to reduce capacity bottlenecks, improve quality and ensure sustainable processes. We are doing the same with our projects in Switzerland: in Stans, a lot of energy is going into the planned construction of a new hall for Maintenance, which we would like to combine with the airfield building at Buochs. We continue to invest in canton Nidwalden as a hub of new ideas, employment and training, and we aim to remain the clear global leader in our market niches.

We always attach great importance to sustainability and environmental issues, focusing on a variety of areas. They include, for example, our third, extremely large photovoltaic system, heating with renewable energy and heat recovery from in-house production plant. Last year, the PC-12 and PC-24 were also certified to fly on sustainable fuel.

And we will always remain true to ourselves: we focus on our strengths, on Swiss craftsmanship and high-tech. These qualities run like a connecting thread through the following pages of our Annual Report as we show you the technology and expertise that go into our products and the people who give of their best every day to create the world's unique Pilatus aircraft!



Hansueli Loosli
Chairman



Markus Bucher
Chief Executive Officer

PURE TENSION

The primary control surfaces of Pilatus aircraft are actioned by a purely mechanical system. It is an extremely simple system: the pilot control inputs move the control surfaces via cables, push-pull rods and torque tubes. If the aircraft is small, unpressurised and does not fly too high, it is enough to ensure that the mechanical system, for actioning the control surfaces, is entirely free of slack. The situation is rather different with the PC-24: the control cables are longer, the cabin is pressurised, and the jet is intended to fly efficiently at altitude. This is where things get more complicated, as one has to bear in mind the various coefficients of thermal expansion of the steel cables relative to the aluminium structure of the fuselage. The coefficient of aluminium is about twice that of steel. If the PC-24 flies at high altitudes in cold conditions, aluminium will contract more, which would lead to slack cables. One also has to take into account the change in the length of the cabin due to pressurisation. At the PC-24's service ceiling of 13,716 metres (45,000 feet), we are talking about cable expansion of several millimetres.

Without a sophisticated cable tension regulator, the control cables would be too taut in cruise flight and too slack during take-off and landing, making precise inputs impossible. That is why the PC-24 designers came up with mechanical tension regulators for integration under the fuselage underbody. They ensure that cable tension remains the same at all times, irrespective of altitude, pressure and external and internal temperatures. Truly a technical masterpiece designed to provide precisely the right degree of tension!



Philipp Ambauen

Philipp Ambauen
Team Leader Systems Integration



« CalTech Software Systems INC has flown a PC-12 NG for over seven years. We took delivery of a PC-24 in October 2021 with the intention of expanding our operations. With corporate offices located in rural West Texas, CalTech makes extensive use of Pilatus aircraft for travel among our seven company offices located throughout the South Central USA. The PC-24 reduces overall travel time for our managers and executives, allowing them to spend more time with their families. Our managers nicknamed it «the Rocketship» right after the first take-off!

Brent W. McCasland, President CalTech Software Systems



35°42'16"N | 85°38'42"W

BUSINESS UNIT GENERAL AVIATION

DEMAND AND ORDER BOOK ARE AT HIGH LEVELS

It is rare that something turns out completely good, and equally rare that something turns out completely bad. We have grown accustomed to this over the years. The two sides of the equation doubtless go together, as all staff of the Pilatus Group in Switzerland, the USA and Australia experienced again last year. With our products in high demand on the markets, we found ourselves almost submerged with work and orders: in these happy circumstances, we faced considerable difficulties in meeting the needs of our production operations. 2021 will go down in the annals as an outstandingly successful business year, but also as an extremely challenging one.

SOCIETY IN UPHEAVAL

A pandemic always changes people's habits. Behaviour adapts to new risks and new preferences emerge. And that is certainly the case with COVID-19. In terms of business, the changes are by no means entirely negative – on the contrary, they have actually been good for business in General Aviation. For various reasons: many new customers have discovered or rediscovered private flying, for example. They appreciate the privacy and not being exposed to crowds at large airports. Many aircraft operators also report that they fly their PC-12s and PC-24s much more often. These are all signs of change.

All this has been positive for the company. As of the end of 2021, incoming orders and orders in hand were higher than ever before. Pilatus could sell substantially more aircraft if we could only produce them! The delivery figures for the individual aircraft types speak for themselves: 45 PC-24s and 88 PC-12 NGXs. As for the PC-6, the new production programme is now definitely drawing to a close. In 2021, two new PC-6s were produced and delivered to Indonesia. The last three Pilatus Porters will be produced over the coming financial year.

NEW PAINT SHOP IN THE USA

Another success story continues in Denver, Colorado, where the Pilatus subsidiary in the USA celebrated its 25th anniversary and organised the annual customer meet-up of the "Pilatus Owners and Pilots Association" (POPA). Pilatus also decided to invest in the construction of an in-house aircraft paint shop. This will take some of the pressure off the facility in Stans in the future.

Some important air shows for the company also took place in 2021: the NBAA-BACE in Las Vegas and EAA AirVenture in Oshkosh can both be considered a success, the response to the PC-12 NGX and PC-24 was consistently positive.

A Foothold in Kazakhstan

2021 saw the delivery of a first PC-24 to Kazakhstan. A certain number of aircraft were also able to be delivered to countries closed due to Covid-19, which was another success. Australia was one such example in 2021. But Pilatus was unable to make any impact on locked-down markets in Asia, for example. It was simply not possible to arrange aircraft deliveries to all destinations, as we were able to do for Australia. Planned PC-12 deliveries to China did not take place. Ongoing prospects there are difficult to assess.

Focus on Reliability

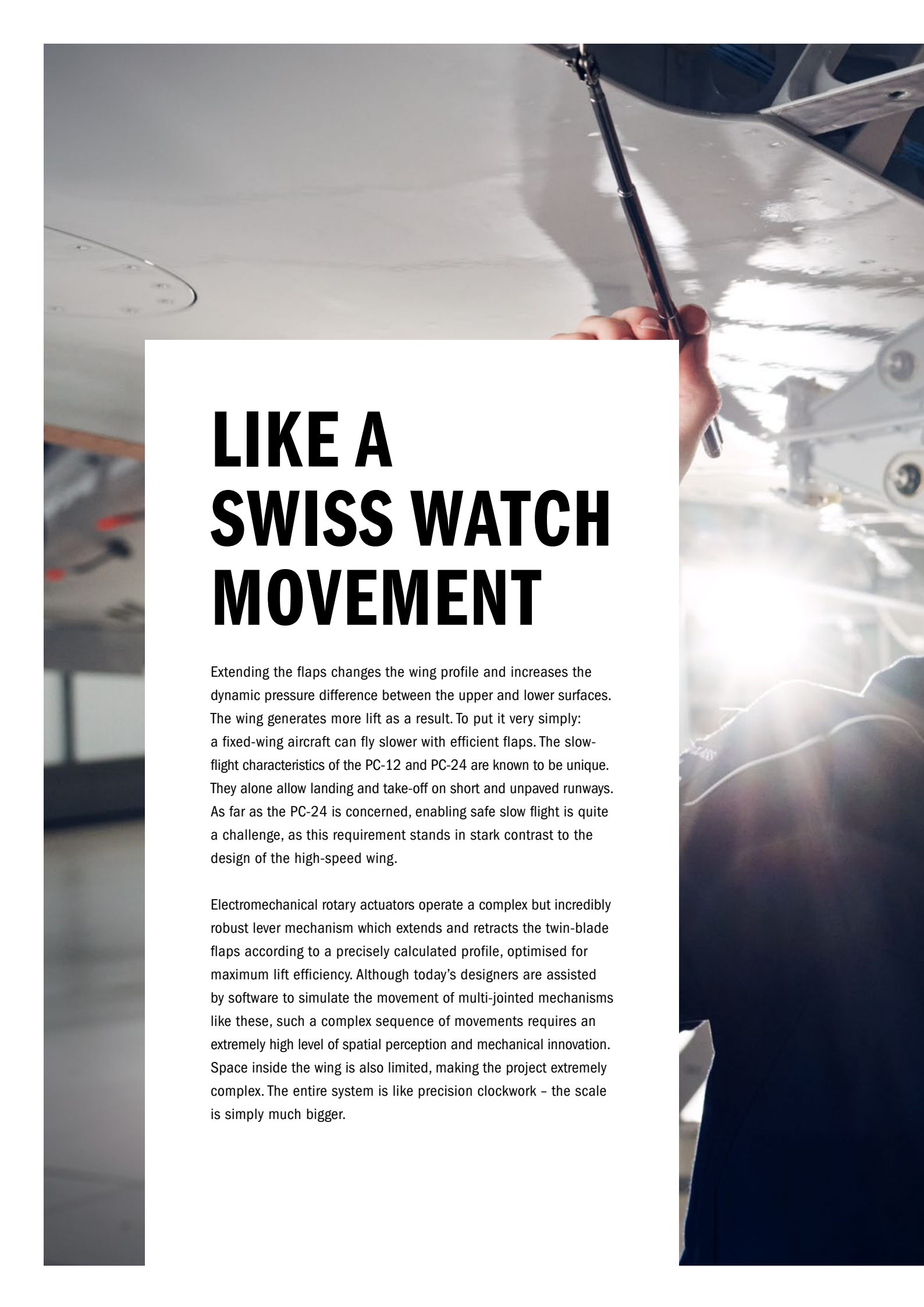
Pilatus is working with all available experts to avoid errors in the future and significantly improve the reliability of the PC-24 and PC-12 NGX. Suppliers, members of the Authorised Pilatus Service Centre network and our own staff are all involved in this process, working hard to reduce errors and restore the necessary reliability. Operating at full capacity and with excellent business prospects, Pilatus will continue to handle challenging situations and find answers to these issues.

« As an owner pilot, my relationship with Pilatus began when I bought a PC-12 NG in 2017. I did my class rating in Stans and flew this exceptional aircraft for four years. In 2021, I was delighted to take delivery of a brand new PC-24 at the Pilatus factory. It will replace my PC-12, which has performed very well on the pre-owned market. I'm looking forward to the PC-24 being operated out of Stockholm on a commercial basis as well, and I'm convinced that its beautiful design, large cabin and versatility will much be appreciated by Swedish customers.

Björn Algvist, Entrepreneur, Pilot and Skier



45°48'24"N | 84°41'36"W



LIKE A SWISS WATCH MOVEMENT

Extending the flaps changes the wing profile and increases the dynamic pressure difference between the upper and lower surfaces. The wing generates more lift as a result. To put it very simply: a fixed-wing aircraft can fly slower with efficient flaps. The slow-flight characteristics of the PC-12 and PC-24 are known to be unique. They alone allow landing and take-off on short and unpaved runways. As far as the PC-24 is concerned, enabling safe slow flight is quite a challenge, as this requirement stands in stark contrast to the design of the high-speed wing.

Electromechanical rotary actuators operate a complex but incredibly robust lever mechanism which extends and retracts the twin-blade flaps according to a precisely calculated profile, optimised for maximum lift efficiency. Although today's designers are assisted by software to simulate the movement of multi-jointed mechanisms like these, such a complex sequence of movements requires an extremely high level of spatial perception and mechanical innovation. Space inside the wing is also limited, making the project extremely complex. The entire system is like precision clockwork – the scale is simply much bigger.



F. Lüthy
Florina Lüthy
Apprentice Polymechanic



« 2021 was a busy year with key milestones in our programme, including training for pilots, technicians and engineers. 13 PC-21s had already been delivered to the Air Force Academy by the end of the year, plus the important Ground Based Training System and initial provisioning of spares and other essential logistics elements. The programme is now well on track and all stakeholders are fully committed to achieving the goal of a new course with the PC-21 in September 2022.

TCol. Antonio Miralles Querol, Jefe de Programa Avión Entrenador Ejército del Aire – Spanish Air Force

46°37'20"N | 8°1'50"E

BUSINESS UNIT GOVERNMENT AVIATION

GROWTH IN EUROPE

In the Government Aviation Business Unit the financial year brought so many highlights and good moments that challenges and concerns faded somewhat into the background.

If there was one day last year which was representative of the entire business year, it was surely the 14th September, when Pilatus delivered the first two PC-21s to the “Ejército del Aire” in San Javier, Spain. The PC-21s were handed over to the Spanish Air Force during an emotional ceremony attended by the cadets. That particular moment, and the pride we saw in our customer, were compensation for all the hard work invested in this project. 13 PC-21s were subsequently delivered to Spain between September and December. The remaining eleven PC-21s will follow according to schedule in 2022. Overall, the project is proceeding as planned. Regarding teamwork, the feedback from everyone involved is exceptionally positive – and this was clearly expressed at the aforementioned ceremony marking the two initial deliveries.

VIVE LA FRANCE #2!

Besides the major order from the Spanish Air Force, France also confirmed the PC-21's qualities with another order for nine additional PC-21s in early July. This sends a powerful signal. France had already ordered 17 aircraft of this type in 2017 and has successfully

trained its pilots on our products since then. Pilatus is now extremely well placed in the European Government Aviation market. The fact that an air force with the prestige of the French “Armée de l'air et de l'espace” places a repeat order is testimony to the PC-21's capabilities and will provide good arguments for further orders from other potential customers worldwide.

In Australia, final acceptance was achieved for the “Air 5428” project for the initial delivery of 49 PC-21s plus ground-based training system. The Royal Australian Air Force was thus able to celebrate its 100th anniversary with a successfully established PC-21 training programme for its aspiring pilots.

FIRST MEDEVAC PC-24S NOW FLYING IN SWEDEN

Between August and November, six PC-24 Medevacs were delivered to Komunalförbundet Svenskt Ambulansflyg (KSA), Europe's number one ambulance operator. The delivery of the first two aircraft in early September in Umeå, Sweden, was the occasion for a celebratory handover attended by many media representatives and government officials. With the help of continuing support provided by Pilatus, the PC-24s have been successfully operated since November, supporting the provision of medical care to residents in Sweden on a daily basis.

SUCCESSFUL PC-7 MKX LAUNCH

Do nothing, gain nothing. That is what motivates Pilatus to get out and see potential customers, even in this period of Covid-19. Participation at air shows and trade fairs, for example in Belgium, Madrid and at the Dubai Air Show in November, are all testimony to this. The PC-7 MKX, the world's first smart Basic Trainer, was presented to the public for the first time at this trade fair in November. The response was simply outstanding!

Direct contact with customers also included demo flights to highlight the capabilities of Pilatus aircraft.

Support contracts were extended in Bulgaria, Botswana and Slovenia, for example, and we also saw a significant increase in the number of requests for quotations. In addition, the first four PC-21s with upgraded avionics systems were successfully delivered to the Swiss Air Force as part of the ongoing value retention programme.

GREATER CUSTOMER CONTACT WANTED

Ongoing travel restrictions are having a negative impact in many areas, and this is especially true of personal customer contact, which has suffered over the past two years. Nothing can replace close, direct, local contact. Despite digital solutions, this unusual situation has proven a challenge for both Pilatus and our customers.

And so we have little choice but to accept frequent customer delays to major programmes. These delays all lie beyond the control or influence of Pilatus, and are based on political or financial decisions as a consequence of the pandemic. What can be done? That is the difficult question. The answers are simple: carry on believing in our products and services, and in the "Pilatus Class", and make sure we stand behind them moving forward.

The PC-24 continues to create a sensation, generating new customer potential in the Government Aviation sector. In addition, the Business Unit continues to invest in new technologies: virtual and augmented reality are areas of great opportunity in the training sector of the future.



Learn more about the PC-7 MKX
pilatus-aircraft.com/videos





Evazali Nazari
Licensed Aircraft Mechanic



AN ORCHESTRA DESIGNED TO ENSURE PEACE OF MIND

Have you ever wondered why an aircraft makes so many audible noises during the approach to land? The engines are idling at this point, so they're really very quiet. Much of the noise heard on the ground is actually due to air turbulence, caused in part by the extended landing gear and flaps.

The open landing gear bays also have a major impact on aerodynamic noise development. For that reason, plus a number of other technical reasons, the PC-24 development team decided to design the nose gear doors to open during retraction and extension, then shut again immediately afterwards, once the gear is fully retracted or extended. This means that even with the nose gear extended, the forward doors are closed, keeping most of the nose gear bay closed too. In the PC-24, the coordinated movements between nose gear and doors are purely mechanical and require only one drive motor. The challenge lies in ensuring that the doors open quickly as soon as the nose gear starts moving, and close again equally quickly just before the nose gear reaches its end stop. The system can be compared to a symphonic orchestra where everything is seamlessly coordinated.

OPERATIONS

TEAMWORK OVERCOMES ALL HURDLES

The five areas grouped together under Operations again faced significant challenges over the past business year. The Covid-19 pandemic kept everyone on their toes, ready for action. The five Operations areas are Research & Development, Production, Aircraft Assembly & Maintenance, Logistics & ICT, and Quality & Safety.

RESEARCH & DEVELOPMENT

The Research & Development Unit was active over the past year in developing new options and improved functionalities. Several foreign certification processes were successfully completed for both the PC-12 NGX and the PC-24.

In this regard, it is worth taking a closer look at the PC-24 and specific individual improvements. The Super Versatile Jet was approved for so-called “CAT II” landings in November 2021. It is now the first “Part 23” category aircraft certified for all-weather operations with greatly reduced visibility. A new lithium-ion battery was also introduced as an additional option. This battery increases the payload of the PC-24 and offers improved engine starts in cold climates. There have also been new system software updates to enhance aircraft functionality and reliability. The European Union Aviation Safety Agency (EASA) approved a reduction in the PC-24’s minimum required landing distance, allowing customers operating under commercial conditions to land at even more airports. Together with further validations for other countries (Guernsey, Brazil, Kazakhstan), this

was another important milestone in the still young PC-24 programme. Against those achievements, certification for new PC-24 options such as a coffee machine, a microwave oven and other catering units look almost trivial! The PC-24 has also been given a new carbon interior and the colours and material options have been updated to offer our customers even more choice.

The PC-12 NGX and the PC-21 also passed milestones: the PC-12 gained country approvals for South Africa and San Marino. The trainer received military type certification from the Spanish military authorities on 25th August.

PRODUCTION

Over 590 employees and 98 apprentices worked a total of more than 830,000 production hours. Some 280,000 machine hours were recorded in addition, with over 64,880 production orders for more than 1.9 million components. Procurement handled production hours and raw materials purchases worth over 73 million Swiss francs. Over 55 percent of the order volume was placed with Swiss companies.

An important contribution to cost savings was made in Production. Internal improvements resulted in a further increase in services and quality. The implementation of “Shop Floor Management” at all managerial levels and “Lean Projects” led to continually improved processes. Basically, the Unit’s main focus is on increasing efficiency, automation and digitalisation. Major progress was made



Final painting of the PC-24 in the paint shop at Stans

with projects such as blind rivet automation and automated component labelling using artificial intelligence. Work also went ahead on preliminary planning for a new plastics production facility and the outlook for this project is promising.

AIRCRAFT ASSEMBLY & MAINTENANCE

Aircraft assembly and maintenance is the last step in the process before the product is handed over to the customer. That means it is highly dependent on the supply chain and delivery quality of the upstream entities. The exceptional commitment and flexibility of our workforce ensured that all production goals were met despite the extremely challenging environment.

The maintenance business recorded a very high workload over the entire year. The timely provision of support to

aircraft in the field was made more difficult by constantly changing travel rules and insufficient availability of materials.

Assembly and maintenance operations require skilled specialists, and further targeted investment went into the training and development of personnel tasked with these responsibilities. Simpler, repetitive tasks can be carried out by new recruits who complete several months' training before working on the assembly line.

We consistently strive for continuous improvement. Order processing was continually optimised and work documents are now available to all via a digital platform. Machine processing was introduced to replace some labour-intensive process steps, e.g. cutting leather in the saddlery.



Wing and production in the structures assembly hall

A preliminary project relating to the construction of a new maintenance hall at Buochs Airport was developed over the course of the year. In the meantime, this building is intended to bundle maintenance competence locally and replace the current, older structures.

LOGISTICS & ICT

The pandemic and its repercussions have, among other things, disrupted global supply chains or damaged them to such an extent that they now function only partially and sporadically. For Pilatus, this poses a difficult challenge for different reasons. On the one hand, legislators tend to react to the pandemic in very different ways, with constantly changing rules and regulations. The shifting regulatory framework considerably increases the planning and coordination required for globally networked companies. In addition, suppliers have reduced skilled personnel and specialists at many locations in reaction

to the pandemic, and their absence is keenly felt now that the recovery phase appears to be underway. State aid often clouds the picture still further with the wrong type of incentives, so that specialists no longer want to return to their original professions or positions. The results are well known and painful for Pilatus: supplier deliveries are less reliable than ever, quality and timing are often unsatisfactory. That calls for extra effort on Pilatus' side – as well as steady nerves and good plans for dealing with these situations.

Procurement goals were largely met in 2021 notwithstanding, and the supply chain was maintained with few exceptions, despite major impacts. The difficulties have already been mentioned: the lack of prompt material supplies during the second quarter was a particular problem. This situation arose as a result of the large number of defect parts, unplanned absences and higher-

than-usual failure rate of the automated storage facilities. There were also major difficulties due to delayed deliveries by suppliers. That resulted in a shortage of in-house resources, a constantly high workload and daily micro-management of suppliers. Worldwide problems with the procurement of microchips led to supply bottlenecks with a negative impact on the acquisition of hardware and strategic projects such as the internal next-generation IT network. But there were many highlights, too: the SAP “Go Live” for the riveting robot, the evaluation of new warehouse management software with a final decision for “SAP Extended Warehouse Management” and updating of the “MyPilatus” customer portal are all worth mentioning. The installation of a third shuttle for supplying materials in the structure assembly hall is certainly worth mentioning too.

QUALITY & SAFETY MANAGEMENT

EN 9100 and ISO 14001 certifications and all regulatory approvals were maintained, and inspection visits were also made to selected suppliers. This will continue, because supplier quality must be improved. Targeted measures include the planning and implementation of additional quality resources in the USA and the development of supplier representatives at Pilatus itself, for example. In-house monitoring will also be reinforced, and cooperation with our subsidiary in the USA further expanded. In future, the Quality department will be involved in the evaluation of new suppliers at an earlier stage. These measures and the joint, Unit-wide definition of common priorities mark a big step forward in achieving a substantial reduction in quality problems in the future.

SUSTAINABILITY

SUSTAINABLE FUEL FOR THE COMPANY

Pilatus consistently supports infrastructure projects which are beneficial to the environment and sustainability. The roof of Pilatus' newest timber hall, which is located right beside the A2 motorway, has a surface area equal to just under two football pitches, allowing for the installation of 4,996 solar modules. The power station's maximum output is 1.973 megawatts-peak (MWp). That means it produces some 1,700,000 kilowatt hours of electricity per year – enough to cover the

annual power requirements of over 300 single-family homes, to give an example of the plant's capacity. This solar power plant is by far the largest in canton Nidwalden and is also one of the largest in central Switzerland.

Further construction-related initiatives include the renewed compressed air station with heat recovery and sound insulation measures inside buildings – just one aspect of the company's activities in this area. It goes without



saying that manufacturing processes and the products themselves should also incorporate sustainable ideas and actions. Both the PC-12 and the PC-24 obtained certification for sustainable fuel in 2021. By far the best way to reduce emissions, however, is to use less fuel in general. That is the philosophy the company pursues in the design of its PC-21, PC-7 MKX and PC-12 NGX single-engine turboprop aircraft.

The PC-24 too, is lighter, very aerodynamic and hence more fuel-efficient than older jets. Over and over again, that point proves a winning argument in sales negotiations. Operators of big jets could often carry out most of their flights with smaller units and a mix of PC-12s and PC-24s. That sort of fleet mix would enable essential fuel savings. These facts are increasingly pertinent in today's market.



ALL MADE FROM ONE PIECE

Every wing design strives to achieve an optimum compromise between high lift and low drag. Drag can be minimised by ensuring there are as few irregularities as possible on the upper and lower surfaces of the wing. Even the smallest of bumps caused by rivet and bolt joints will disturb the laminar air flow. Such joints are undesirable, especially when positioned crosswise to the direction of the air flow. Due to high aerodynamic requirements, it was clear during the development of the PC-24 wing that there was more to consider than simply structural and aeroelastic loads. An appropriate production technique had to be developed featuring an integrally reinforced upper and lower skin with as few connecting elements as possible. The solution is based on four panels – top and bottom, one piece at left and right, milled from an aluminium block a good 50 millimetres thick as a flat projection of the aerodynamically curved shape. The technique involved immediate incorporation of the reinforcing elements, known as stringers. Together with the spars, the stringers ensure the flexural strength of the wing. This eliminates the need to connect the stringers with the skins using rivets or bolts. Bolt connections along the span direction are only required at the connection with the front and rear spars.

A special method is used to give the flat, integrally milled skins their curved shape. Thousands and thousands of tiny steel particles are shot at controlled speed onto precisely defined zones of the skin's surface. This causes residual compressive stresses directly underneath the surface of the material and leads to the desired curvature. This process is called shot peening and has been in use for a long time. But never yet for such a complex, multi-curved, integrally reinforced panel – pure high tech!

A close-up photograph of a person's hand, wearing a white shirt cuff, gently touching the smooth, curved surface of an aircraft wing. The wing's surface is dark and metallic, showing the aerodynamic curvature. In the background, a row of rivets is visible on another part of the wing structure.

P. Wassmer

Philip Wassmer
Materials & Process Engineer



HUMAN RESOURCES

SKILLED WORKERS WANTED!

Both the pandemic and the massive increase in jobs continued to pose significant problems for the HR department. Covid-19 imposed a modified format for the apprentice graduation ceremony, but so many smiling faces were testimony to the fact that for most of our apprentices, this was the best moment of 2021 and a reward for several years of hard work and effort. There were 32 successful graduations to celebrate – and an outstanding average grade of 5.07! Incidentally, 21 of the apprentices immediately accepted jobs with Pilatus. They are all part of the employee expansion programme, which included some 120 people over the past business year.

Prompted by high demand for even more skilled workers and this year's plans for further expansion, April saw a general reinforcement of recruitment efforts. An average of 800 applications and up to 130 interviews per month had to be handled. Some 10,000 applications had been received by November 2021, an all-time record.

But there are always two sides to the coin, and good skilled workers – in high demand in every branch – continued to leave us. Identifying replacement candidates for important positions is demanding and requires great patience and professional know-how on the part of line

managers and recruitment agents hired especially to assist with this task. The pandemic continued to dominate work in Human Resources. There were many questions to be answered in connection with health issues as well as the uncertainties and restrictions in relation to the pandemic.

EMPLOYEE PROFIT-SHARING

Various activities were initiated in response to the growing difficulty of retaining talented staff and specialists in the company, or even finding them at all. Potential management was introduced in all Units in the first quarter of 2021. Around 50 talented staff were validated and individual development plans were drawn up for them. Identifying, developing and retaining high-potential employees is increasingly becoming a key strategic task. In addition, it is crucial to increase overall employer attractiveness at the same time, thereby facilitating the retention, recruitment and development of the talent that is so important for the future. Initial measures include at least five weeks' holiday for everyone and the complete abolition of core working hours, ensuring more flexibility for employees. Profit-sharing is a further plus point which should not be forgotten. Once again, employees in Stans will receive a bonus worth an average of 1.5 monthly salaries for their efforts over the past year.





46°58'39"N | 8°24'21"E

THE OUTLOOK REMAINS OPTIMISTIC

Airport Buochs AG (ABAG) looks back on a business year in which operations returned to pre-pandemic levels. Owned half by canton Nidwalden and half by Pilatus, ABAG reported a good set of financial results compared to 2020.

A close look at the figures shows that flight operations increased from 11,549 movements in 2020 to 14,475 in 2021. Statistically, a flight movement is defined as one take-off or one landing. There was an increase in the number of Pilatus flight movements in particular: 6,353 in 2021 compared to 4,000 in 2020. The Nidwalden gliding group and various ABAG customers also recorded more flight movements compared to the same period in the previous year.

MOVING FORWARD, BUT HALTINGLY

Regarding the infrastructure renewal at ABAG, last year saw some movement in a situation which had ground to a halt. A start can now be made on the project to improve safety on Herdern Street, which runs across the airfield. And the preliminary project for the renewal of the airfield infrastructure has been prepared. A delay

has occurred again, nevertheless: an appeal was filed with the Federal Administrative Court against the Federal Office of Civil Aviation's (FOCA) ruling on the change of use, with the risk of a long and costly appeal process. An unfortunate financial factor has also clouded the picture: fixed deposits for the renewal of the airfield infrastructure will, in future, incur negative charged.

The outlook remains optimistic notwithstanding: the planning approval application for the renewal of the airfield infrastructure is due for submission in 2022. This marks the beginning of the final phase of the outstanding cooperation with all persons and organisations involved in the preliminary "Airfield Infrastructure Renewal" project. In addition, the new safety installations at Herdern and Flurhof Street will be commissioned. Financially, things seem to be taking a turn for the better too. A motion by Benedikt Würth, member of the Council of States of Switzerland, was accepted and the Swiss federal government must now seek a long-term solution for the financing of air traffic control at regional airports, which will also affect ABAG's infrastructure.

FLIGHT MOVEMENTS AIRPORT BUOCHS	2017	2018	2019	2020	2021
Pilatus Aircraft Ltd	8,190	7,719	5,690	4,000	6,353
Airport Buochs Ltd	4,353	4,180	4,150	3,660	5,007
Nidwalden Gliding Club	3,734	3,307	3,191	2,812	3,115
Swiss Air Force	1,844	928	914	1,077	896
Total	18,121	16,134	13,945	11,549	14,475



Lara Meier

Lara Meier
Apprentice Design Engineer



EVEN WORKS INVERTED

Have you ever thought about how the PC-21 can fly inverted without the fuel flow being interrupted? In most aircraft, the fuel tanks are located in the wings. The wing tips are slightly elevated relative to the wing root, creating a gentle incline between the tip and the root. In a normal flight attitude, this gradient causes the fuel to flow to the lowest point in the direction of the wing root, from where a fuel pump draws it in and feeds it to the engine. In inverted flight, however, the lowest point suddenly becomes the highest point of the tank, and the fuel pump would therefore inevitably suck in air.

The solution lies in a cleverly designed acro tank. The tank system includes a cylinder between the main tank and the engine. Inside the cylinder there is a simple but effective mechanism that makes use of gravity. The mechanism comprises a simple Y-shaped branched tube, with one branch pointing down and the other pointing up. Both ends of the tube are fitted with a lid. The two lids are connected to each other via a linkage. Using the force of gravity, this linkage ensures that the lid of the downward pointing tube end remains open and the other closed irrespective of the aircraft flight attitude. In normal flight, the acro tank is always kept completely filled with fuel. During an inverted manoeuvre, the acro tank begins to empty. Inverted manoeuvres do not usually last more than a few seconds. The acro tank is designed for a maximum duration of 45 seconds. It ensures an uninterrupted fuel supply – in all positions!

FACTS AND FIGURES

PILATUS GROUP

KEY INDICATORS FOR THE PILATUS GROUP	2017	2018	2019	2020	2021
Total Sales (CHF million)	986	1,092	1,170	1,116	1,333
Aircraft in Net Sales	115	128	134	129	152
Orders Received (CHF million)	1,422	1,015	1,132	836	1,734
Order Book Value (CHF million)	2,167	2,089	2,037	1,704	2,120
EBIT (CHF million)	135	157	153	155	210
EBIT as % of Sales	13.7	14.3	13.1	13.9	15.7
Investments in R&D (CHF million)	107	51	50	54	59
EBIT before R&D (CHF million)	242	208	203	209	269
EBIT before R&D as % of Sales	24.5	19.0	17.4	18.7	20.1
Cash Flow (net profit plus depreciation, CHF million)	133	156	165	153	247
Cash Flow as % of Sales	13.5	14.2	14.1	13.7	18.5
Net Assets (CHF million)	534	606	579	639	602
Inventories (CHF million)	647	479	495	475	475
Customer Advances (CHF million)	238	256	219	118	155
Number of Full-time Equivalents	2,113	2,283	2,289	2,196	2,316
BALANCE SHEET EXTRACT	2017	2018	2019	2020	2021
Current Assets (CHF million)	1,255	1,290	1,318	1,251	1,513
Long-term Assets (CHF million)	349	419	453	428	389
Total Assets (CHF million)	1,604	1,709	1,771	1,679	1,902
Liabilities (CHF million)	541	599	571	420	452
Equity (CHF million)	1,063	1,110	1,200	1,259	1,450
Total Liabilities and Equity (CHF million)	1,604	1,709	1,771	1,679	1,902
Equity Ratio in %	66.3	65.0	67.8	75.0	76.3

	2020		2021	
TOTAL SALES	%	CHFm	%	CHFm
Pilatus Aircraft Ltd, Stans, Switzerland ¹	57.1	638	59.5	794
Pilatus Business Aircraft Ltd, Broomfield, USA	40.2	449	38.9	518
Pilatus Australia Pty Ltd, Adelaide, Australia	2.7	29.4	1.6	21
Total	100.0	1,116	100.0	1,333

¹ Consolidated via Pilatus Stans

US dollar exchange rates 2021: 0.9142 / 2020: 0.9389

Australian dollar exchange rates 2021: 0.6867 / 2020: 0.6471

SALES BY REGION	%	CHFm	%	CHFm
Europe	38.3	427	41.9	559
The Americas	40.5	452	40.8	544
Asia	13.5	151	11.2	149
Australia	6.2	69	5.0	66
Africa	1.5	17	1.1	15
Total	100.0	1,116	100.0	1,333

SALES BY BUSINESS UNIT	%	CHFm	%	CHFm
General Aviation	74.7	834	67.7	902
Government Aviation (Trainer)	25.3	282	32.3	431
Total	100.0	1,116	100.0	1,333

AIRCRAFT IN NET SALES²	Number of aircraft	
PC-12	82	88
PC-24	41	45
PC-21	6	17
PC-6	0	2
Total	129	152

² Delivered aircraft and accrued aircraft based on the PoC method (PoC = Percentage of Completion; net sales of trainer is considered based on the production progress)

FACTS AND FIGURES

EMPLOYEES BY FUNCTION	2020		2021	
	%	Employees	%	Employees
Production	54.9	1,206	55.4	1,281
Sales and Services	15.8	348	15.4	357
Research & Development	14.1	310	13.5	314
Logistics (incl. ICT)	9.7	212	10.2	236
Administration	5.5	120	5.5	128
Total	100.0	2,196	100.0	2,316
EMPLOYEES BY COMPANY	2020		2021	
	%	Employees	%	Employees
Pilatus Aircraft Ltd, Stans, Switzerland	92.1	2,022	92.4	2,141
Pilatus Business Aircraft Ltd, Broomfield, USA	5.5	120	5.3	122
Pilatus Defence Solutions Pty Ltd, Sale, Australia	1.7	38	1.5	34
Pilatus Australia Pty Ltd, Adelaide, Australia	0.7	16	0.8	19
Total	100.0	2,196	100.0	2,316

PILATUS ORGANISATION

MANAGEMENT



MANAGEMENT OF PILATUS AIRCRAFT LTD

1	Markus Bucher	CEO
2	Bruno Cervia	VP Research & Development, Deputy CEO
3	Ignaz Gretener	VP General Aviation
4	André Zimmermann	VP Government Aviation

5	Daniel Geiser	VP Aircraft Assembly & MRO
6	Roger Hess	VP Supply Chain & ICT
7	Thomas Ochsenbein	VP Business Support & CFO
8	Roman Emmenegger	VP Manufacturing



43°59'34"N | 103°45'33"W

PILATUS ORGANISATION

BOARD OF DIRECTORS



BOARD OF DIRECTORS OF PILATUS AIRCRAFT LTD

1	Hansueli Loosli	Chairman (since mid-2021)
2	Gratian Anda	Vice Chairman
3	Lukas Gähwiler	Member
4	Mario Rossi	Member (since mid-2021)
5	Martin P. Furrer	Member (since mid-2021)

SUBSIDIARIES

PILATUS BUSINESS AIRCRAFT LTD, BROOMFIELD, USA

Markus Bucher	Chairman
Thomas Bosshard	CEO

PILATUS AUSTRALIA PTY LTD, ADELAIDE, AUSTRALIA

Oscar J. Schwenk	Chairman
Sebastian Lip	CEO

PILATUS DEFENCE SOLUTIONS PTY LTD, SALE, AUSTRALIA

Markus Bucher	Chairman
Jennifer Marshall	CEO

2021

HIGHLIGHTS



DECEMBER

- For the first time, **152 aircraft delivered** in one year

NOVEMBER

- **Launch** of the **PC-7 MKX** Smart Basic Trainer

SEPTEMBER

- The **Spanish Air Force** takes delivery of its first **PC-21**
- **KSA**, the Swedish ambulance organisation, receives its first **PC-24**

AUGUST

- US subsidiary **Pilatus Business Aircraft Ltd** celebrates its **25th anniversary**

JULY

- **New features** for the **PC-24** Super Versatile Jet
- The **French Air Force** buys a further nine **PC-21s**

JUNE

- **Hansueli Loosli** is elected as the new **Chairman** of the Board of Directors
- **Mario Rossi** and **Martin P. Furrer** are newly elected onto the **Board of Directors**
- **Oscar J. Schwenk** is appointed **Honorary Chairman**

MAY

- The **1800th PC-12** is **delivered**

APRIL

- A **PC-24** completes **first landing** on a **grass runway** in Venice, Italy

FEBRUARY

- Pilatus offers **PC-24** with new **10-seat interior**

« Helping us deliver optimum efficiency and maximum quality for our students, we're pleased to be working in partnership with Pilatus, the aircraft manufacturer behind the next generation PC-21 trainer. Through this collaboration, the Empire Test Pilot's School continues to deliver versatile learning on systems-rich aircraft.

Steve Kimmitt, Nominated Person Continuing Airworthiness QinetiQ Civil Flying Organisation



50°39'32"N | 1°35'24"W

Founded in 1939, Pilatus Aircraft Ltd develops and produces the world's most unique aircraft: from the legendary PC-12, the best-selling single-engine turboprop in its class, to the PC-7 MKX and PC-21 and associated simulators, the market-leading systems for pilot training. The brand-new PC-24 is the world's first ever business jet designed for use on short unprepared runways. The Pilatus team consists of over 2,300 exceptional employees who make the company, which is domiciled in Stans, one of the largest and most innovative employers in Central Switzerland. The Pilatus Group also includes independent subsidiaries in the USA and Australia. Pilatus provides training for over 140 apprentices in various professions – job training for young people has always been a very high priority. Pilatus remains committed to Switzerland as a hub for work and new ideas, and acts in a sustainable and environmentally-conscious manner at all times.

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