SAS
NEWSLETTER
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Safety begins in design of maintenance stands

Safe, functional, and reliable aircraft maintenance stands are essential tools in modern aviation maintenance, enabling technicians to perform complex tasks efficiently while minimizing the risk of injury or aircraft damage.

One of the most critical components of a maintenance stand is its step and platform design. Steps must be evenly spaced, appropriately angled, and sized to allow secure footing while technicians ascend or descend—often while carrying tools or wearing bulky personal protective equipment. Non-slip surfaces on steps and platforms are essential, particularly in hangar environments where oil, hydraulic fluid, water, or cleaning chemicals may be present. High-traction grating, serrated tread surfaces, or specialized anti-slip coatings significantly reduce the likelihood of slips and falls, which remain among the most common causes of workplace injuries in aircraft maintenance.

Marcus Kembel, senior design engineer for SAS, says the "happy spot" for step angles is 45 degrees. Ranges go from 30 to just under 50 degrees and over the years that has mentally conditioned us, he explains.

According to Kembel, going up stairs is easier for people because "you see everything in front of you and the feel is comfortable." (This is the case with either shallow or steep angled stairs). But descending a staircase is a different matter. When you're going down everything is dropping away from you, and the risk of falling becomes greater because it doesn't feel as comfortable, especially at elevated and exposed stairs like those on #aircraft access/maintenance stands.

"We run upstairs easily, but we rarely run downstairs," Kembel explained. "It's especially pronounced on steeper staircases. Because your heal is coming down first, you tend to use less of a step and your toes are hanging over the front. **(See page 2)**

AGING FLEETS REQUIRE MORE MAINTENANCE

The U.S. commercial aircraft fleet is aging and that means maintenance needs are ever increasing, as are the risks associated with that work.

Fleets have grown older, especially post-covid, a factor driven by a combination of manufacturing delays, a record backlog of new aircraft orders, and airlines' strategic decisions about fleet renewal. Understanding this trend means looking at the average age of the fleet, why planes are staying in service longer, how delivery backlogs contribute, and what older aircraft mean for maintenance.

Average Age of the U.S. Fleet

Industry data shows that commercial aircraft globally are older than they have been in many years, with the average age climbing to around 15 years as airlines defer retirements and stretch service lives. IATA+1 U.S. government transportation data also indicate that the average age of U.S. commercial carriers increased significantly in recent years—from about 14 years in 2020 to nearly 18 years by 2023. Bureau of Transportation Statistics

A major factor in this aging has been persistent supply chain and production delays in the aerospace industry. During the pandemic and its aftermath, aircraft deliveries fell sharply from earlier projections due to parts shortages, **(continued next page)**

Stair safety begins in design

(Continued) This can give you an unsteady feeling, or result in tipping your foot forward and that adds to the "falling feeling". At SAS we build on a 45-degree angle and 40 is better on higher, exposed surfaces."

Flexibility in design is another key element of a reliable maintenance stand. Aircraft fleets frequently include multiple models or variants, each with different access points, heights, and contours. Adjustable platforms, telescoping stair sections, and modular components allow a single stand to be configured for multiple aircraft types. This adaptability not only improves efficiency and reduces equipment clutter but also ensures technicians can maintain proper working posture, minimizing strain and fatigue during extended maintenance tasks.

Maintenance stands also play a vital role in providing safe access to hard-to-reach aircraft components such as engine nacelles, avionics bays, flight control surfaces, and upper fuselage areas. Integrated tool trays, guardrails, toe boards, and handrails help technicians keep tools secure and maintain three points of contact when working at height. These features reduce the need for improvisation—such as standing on ladders or aircraft structures—which can significantly increase the risk of falls or equipment damage.

The risks associated with inadequate or poorly designed stands are substantial. Falls from height can result in serious injuries to maintenance crew members, including fractures, head injuries, or long-term musculoskeletal damage. Even minor accidents can lead to lost work time, increased insurance costs, and operational delays for airlines and MRO facilities.

Finally, mobility and stability must be carefully balanced. Maintenance stands should be easy to reposition around the aircraft using heavy-duty casters or tow bars, allowing quick setup and efficient workflow. Once in place, positive-locking mechanisms, wheel brakes, and stabilizers are essential to prevent any unintended movement. A stand that shifts during use poses a serious hazard to both personnel and aircraft, underscoring the importance of robust locking and anchoring systems in stand design.

Aging fleets push upkeep

(Continued) certification delays, labor constraints, and bottlenecks in key components like engines. IATA

Airlines typically plan to replace older aircraft with newer, more efficient models as part of normal fleet renewal. But with order backlogs soaring—over 17,000 planes worldwide waiting to be delivered -- the pace of new deliveries hasn't kept up with demand. IATA+1. At current production rates, that backlog equates to more than a decade's worth of deliveries. Forbes

That backlog impacts airlines in two key ways:

- **Delayed Replacement Cycles** Airlines that would have otherwise retired older jets are forced to keep them flying longer, simply because new replacements are not arriving .
- **Operational Costs and Efficiency** Older aircraft tend to be less fuel efficient and lack the latest technology that lowers operating costs. This adds to higher fuel burns and greater emissions , increasing overall airline costs. The STAT Trade Times

As aircraft age, maintenance becomes more intensive and costly. Modern airliners require regular checks—ranging from frequent "A checks" to comprehensive "D checks" that can take weeks and involve millions of maintenance hours and dollars. Reddit That job also requires optimum working conditions, like properly engineered access stands and platforms, to keep mechanics safe and on the job. Older aircraft naturally accumulate more flight cycles and flight hours, which increases wear on structural components and engines.

From a safety standpoint, age alone doesn't equate to risk; aviation safety is built around robust inspection schedules and maintenance practices. But the trend toward older aircraft does highlight industry pressures, such as production backlogs and supply chain challenges, that are influencing operations.