How to put aircraft to bed

Preserving grounded planes, to get them up and flying at short notice, is a challenging task. **Ashwini Phadnis** captures the process

Nuts and bolts of safety This is how Brussels Airlines goes about its aircraft parking and storage process COPYRIGHT: BRUSSELS AIRLINES

With all passenger flights in India being cancelled from March 25 till at least May 3, and most international airlines operating at less than their capacity, thousands of aircraft across the world are grounded.

Airlines in India have a combined fleet strength of over 650 aircraft. These aircraft have to be preserved and looked after so that they are ready to fly as and when the lockdowns are lifted.

Preserving aircraft while they are grounded is not a simple task like covering them with tarpaulin. Instead, both the interiors and exteriors of the aircraft need to be looked after. The preservation requires manpower, specific equipment, materials and tools. Different types of general and specific protection covers are available, which may require use of different trestles, scissor lifts and cherry pickers for installation.

Some tender loving care

John Walker, Head Maintenance, Qantas, in a statement, says that all aircraft are given some TLC (tender loving care) before being put to bed. "And even while they are asleep there is a lot of work to do," he adds.

According to D Anand Bhaskar, Managing Director and Chief Executive Officer, Air Works, a company in the Maintenance, Repair and Overhaul (MRO) space for over seven decades, the preservation steps to be taken differ between the narrow-body and wide-body aircraft and also the duration of the grounding.

He adds that preservation of aircraft also depends on whether an aircraft is inside the hangar or on the ramp. If parked outside, the exteriors need to be protected against high winds and adverse weather conditions. Given that most airports are not built for holding aircraft (for extended periods of time) they are also parked on the ramp, making this aspect important.

Cleaning the interiors

A team of cleaners gives the interior of an aircraft an extensive "deep clean" that involves using high-grade disinfectant to wipe down surfaces, including in-flight entertainment screens, arm rests, tray tables as well as giving the carpets a good hoover, Qantas says.

The outside gets a good wash. Water systems in the aircraft are protected to avoid contamination; toilet systems are maintained for hygiene/cleanliness and also to avoid corrosion, say airlines.

Ahmed Safa, Divisional Senior Vice-President, Engineering, Emirates, told *BusinessLine*, "All apertures and openings on an aircraft and the engines, including air data probes — such as pitot-static, temperature, angle of attack sensors — engine intakes and exhausts and APU intake and exhausts need to be preserved. This includes all apertures from where external environmental factors such as sand, dirt, water ingestion or birds and insects can find their way in. These can have a detrimental effect on the aircraft and engine systems if left unprotected."

According to Qantas, to keep the inside of the engine moisture-free, giant versions of silica moisture absorption sachets are inserted. "One A-380 requires over a hundred kilos of these moisture absorbers to maintain humidity levels in the cabin and engines," Qantas says.

Preserving other key areas

Other key areas in an aircraft too need to be preserved with utmost care. According to Anand, engines and auxillary power units must be covered to protect external surfaces from climatic conditions and engine fuel system inhibitions. "Similarly, fuel systems need to be covered to avoid fuel microbiological contamination of fuel tanks," he says.

Then there are the tyres. Walker says that whether it be a narrow-body Boeing 737 or the A-380 (the largest commercial jet), they need to have their wheels rotated every seven to 14 days while parked, either by being towed around the tarmac or by using a jack to hoist them in the air to spin the wheels.

Besides, the landing gear too needs to be covered to prevent corrosion, and for its smooth operations.

It is also recommended that the cockpit windshield and windows be covered with film and a sunscreen to prevent discolouration by the sun during long parking when it is also necessary to cover the cockpit seats and floor carpet.

Aircraft manufacturers' to-do lists

Aircraft manufacturers give a list of things to do in their Aircraft Maintenance Manuals, which all airlines are meant to follow.

Safa says that this an elaborate process that requires Emirates to deactivate various aircraft systems, including batteries, pitot-static systems (for air data measurement), potable water systems, aircraft fuel tanks, engine and APU preservation. It also involves the greasing, cleaning and preservation of landing gear and flight control systems.

Once these steps have been taken, the aircraft need to be visited regularly for specific and periodic checks. Adds Safa, "This needs to be done at seven-, 15- and 30-day intervals across the fleet. These checks can include simple tasks such as a walk-around inspection to ensure all covers are in place, there is no visible damage to the aircraft and there are no signs of external leaks (typical seven-day check) to more complex checks (typically at the 30-day mark) where the covers have to be removed and the aircraft systems re-activated," he says.

The process involves idling the engines and testing engine bleed air and flight control systems. The covers are re-installed after these checks, a mandatory regulatory requirement any time an aircraft is taken out of operation for more than 48 hours.

How long does the preservation take?

Anand adds that typically, if flight-ready condition procedures are followed, it may take a team of 2-4 people 5-6 man-hours per aircraft to complete the preservation. "In case a long-term preservation procedure is to be followed, the time taken may stretch up to 50-60 man-hours per aircraft," he says.

For long parking up to and more than one year, it is also mandated to cover the interiors with plastic film, such as all the passenger and cockpit seats, carpets and cabin aisles, cockpit and galley areas. According to Safa, all the cockpit switches are turned off and batteries disconnected. Emirates has also installed control lever locks and window blinds on the cockpit windows.

Needless to say, all this takes manpower and time. According to a statement from Brussels Airlines, which has all its planes parked at Brussels airport, "Storing an Airbus A330 takes about 400 man hours, as our Maintenance & Engineering teams meticulously follow Airbus manufacturer instructions to make sure our birds are stored safely."

Others like Emirates maintain that it takes 4-6 employees working a 12-hour shift to cover any one of its aircraft, as it has wide-body aircraft in its fleet.

Getting the planes flying ready

Of course, the task does not end with just preserving the aircraft. Getting them back into service is another aspect to keep in mind. There are varying views on how long it will take to get an aircraft in preservation back into service. While Shipra Jaipuria, Manager, and Piyush Bansal, India Operations Lead, ICF, say that it takes up to 24-36 hours to carry out de-preservation of an aircraft, Safa adds that the airline will need at least 18-24 hours to put an aircraft back in service.