



Aviation innovation: the Nordic Dino. Pioneering technology in action

Keeping clean

■ If you are a carrier and you are seeking greater efficiencies, coupled with lower fuel costs, then the answer may lie in aircraft cleaning, writes the Editor.

Although every year we write about aircraft washing, I remain unconvinced that this side of an airline's operation is particularly well documented. I see nothing in print about it – and the subject never seems to crop up in the course of discussion. Is this facility widely practised? I think that we would all like to know; after all, a cleaner aircraft brings with it a slicker operation.

Minimising ground time for exterior washing remains a top priority for those who do get involved in this aspect of a carrier's operation. To that end, any degree of automation is welcome.

Manual and traditional washing requires a lengthy "blocking out" time for the aircraft in question and this represents an inconvenience for the planning and technical staff; above and beyond all this, there is also an economic factor. Many airlines are blocking out their aircraft for a full night, just for washing, when the aircraft could be available for maintenance work or even be ready for aircraft operation after just three or four hours. So what is the solution?

One answer lies in the established and reliable Nordic Dino, which, thanks to its high level of automation, provides a more efficient washing programme. Many airlines should be able to achieve a quick return on investment with this application, not only through shorter washing times and reduced man hours but also thanks to reduced fuel costs that come in the wake (literally) of reduced drag following a frequent and efficient washing programme.

Aviator is the company that designed and developed the Nordic Dino aircraft washing system, remarkably more than 30 years ago – and it continues to successfully develop and manufacture the product today.

Currently there are three versions available. The Nordic Dino II, which was designed for narrow bodies, has a washing reach of 8.5 metres, and so can easily wash up to B757 sized aircraft. The Nordic Dino 777 was introduced in 1997: this has an effective washing reach of 11 metres, with a capacity to wash aircraft such as the B777, the A330 and the B747. Out of this comes

another model, the Nordic Dino 777+, which is equipped with an extended chassis. The third and final member of the group is the Nordic Dino 4380, which was introduced at the end of 2011. This offers a washing height of 12 metres and can service the Airbus A380 as well as all other wide-bodied aircraft. These machines are at their most efficient when working as a pair. For instance, a Nordic Dino II in combination with either a Dino 777+ or Dino 4380 is a useful combination.

Insofar as customers are concerned, Aviator says that recent sales have been mainly in Asia and the Middle East. Thai Airways today represents the largest customer for the company, operating a total of six units at extended wash areas at Suvarnabhumi airport in Thailand.

During the second half of 2014, Aviator took the decision to focus even more on this important area as a separate business section, and so implemented a strategy for the introduction of equipment to new markets and countries.

Latest developments

The big advance insofar as the Dino is concerned has been that of wireless operation, which was introduced during 2014 and is now standard on all new equipment. In connection with this, an upgrade kit to wireless operation is available for most models now, allowing pre-existing users to adopt the benefits of this technology. In addition, the engine compartment now benefits from a completely new design, which has had the effect of significantly reducing the heat build-up in this compartment.

Perhaps most telling of all is the equipment's performance. A Boeing 777 can now be washed in under two hours whilst the giant A380 requires about 3.5 hours. It should be noted that this includes the manual parts and areas that still have to be completed by conventional methods. Clearly, this represents a massive saving when compared to traditional labour and time-intensive methods.

The adoption of such technology paves the way for earlier access to the aircraft for maintenance or other ground activities. Needless to say, the intensive manual work is dramatically reduced, which is good news for the workplace from an environmental health perspective. Manpower savings ought to provide a rapid return on investment and the earlier-mentioned fuel efficiency benefits gained from reduced drag helps to make the equation more palatable from a financial and environmental perspective.



A unique approach to aircraft cleaning



The machine can also be remote controlled

US perspective

In the US, a main proponent of aircraft washing is Riveer. This company's Tactical Rinse System (or TRS) technology comprises an automatic clear water rinse system for aircraft of virtually every configuration and complexity. Fully deployable, the TRS is actually installed above ground, which has the benefit of eliminating the time and expense of infrastructure modification and associated site engineering or environmental considerations. A modular configuration consists of steel pad sections forming the wash rack, together with a complete rinse, wash and filtration system that is housed in special ISO containers. All that is required of the user is the provision of electric power.

There's more to the concept, though. Thanks to automation and the onboard Pilot Activated Rinse facility, the captain is able to activate precision spray nozzles from the cockpit whilst he or she is taxi-ing on to the rinse pad proper. The TRS cycle completes a thorough rinse of dust, salt and corrosive deposits, then reclaims the wash water, filters it and reuses it. Foaming and washing features



Riveer reports good sales to the military sector

can be added to the TRS system. All in all it's a neat solution with an inherently green profile.

According to the company's Jennifer Richmond, 2014 saw a good deal of activity in both fixed and trailer based systems. "Our trailer based systems, the TAWS and the ARC, had orders from both the US military as well as commercial and foreign military customers. The TAWS trailer is a self-contained unit that provides aircraft safe pressure washing, foam delivery and a turbine flush system, as well as compressed air delivery from a trailer based unit. Self-powered and able to run on jet fuel or JP-8, this trailer brings the wash to the aircraft, instead of the aircraft to the wash.

"Our Clearwater Rinse System at

Anderson AFB in Guam was installed at the end of 2013 and saw a full-scale implementation in 2014. This taxi-through system allows a C-17 or B-52 aircraft to be rinsed of corrosive salts and pollution in two minutes, while on taxi to the tarmac after landing. This system recycles water, as well as capturing rainwater, and has saved the island millions of gallons of water during the last year."

In September last, Riveer installed a deployable version of this system for rotor wing aircraft at Hunter Army Airfield in Savannah, Georgia. This system allows helicopters to get a Clear Water Rinse, in a package that is deployable. Water is collected off the rinse pad and the solids and hydrocarbons are then removed for the water to be treated and reused. Helicopters can either taxi on to the steel rinse pad or land (on skid airframes) for an airframe specific rinse. Corrosion is a rather big issue in this context because of the thin skin of the helicopter. By having an automated rinse, the army saves four man hours per flight compared to a manual rinse. The return on this investment is less than one year, says Riveer.

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