

AVIATION WEEK

& SPACE TECHNOLOGY



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THE WORLD

- 11 **Boeing preparing** to deliver the first 787-9 following the award of U.S. and European type certification
- 12 **Qatar brings** Mirage 2000s to exercises in Turkey, is looking to modernize its fleet with new fighters

BIOFUELS

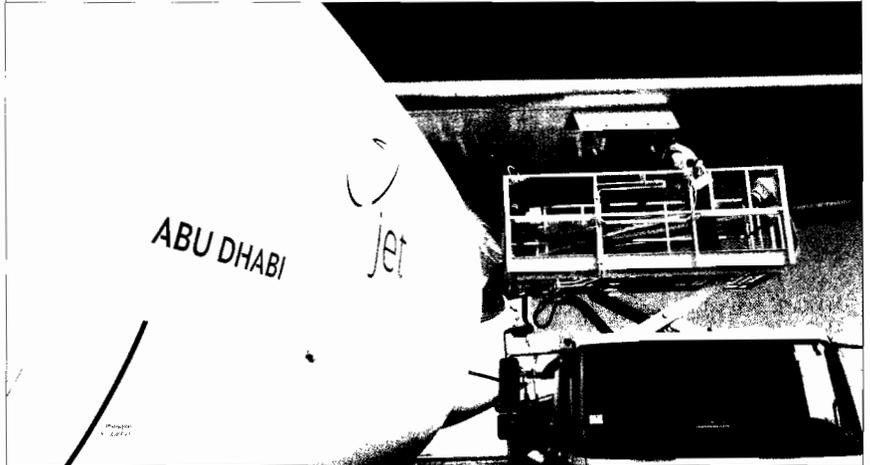
- 20 **Approval of a new** aviation biofuel improves the chances of hitting a target for the use of sustainable fuels

DEFENSE

- 22 **Long-awaited** competition for new USAF bomber is underway amid a cloud of questions
- 23 **Pentagon identifying** most-favored suppliers to highlight leaders eligible for further incentives

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Plant-derived jet fuel developed by energy company Total and renewable products specialist Amyris was demonstrated earlier this year and has become the third method of alternative fuel production to be approved by industry standards developer ASTM International.



- 24 **Kendall looking** essentially to scare firms into being better providers, and reward those who comply
- 25 **U.S. Defense Department** plans to reinvigorate training for and use of performance-based logistics
- 26 **F-35 deployment** to U.K. air shows to help build an understanding of the logistics needed for fighter
- 27 **Ukraine's air force** suffers biggest blow since the beginning of anti-separatist operations
- 28 **India planning** to buy 39 Apache helos to address a long-standing demand for army attack aircraft
- 28 **New Indian head** pushes goal of developing country's defense industry, ending reliance on imported arms

SPACE

- 29 **ISS partners** beginning to discuss expanding its use to test technology for the long trek to Mars
- 30 **European space** joint venture could scrap solid-fueled Ariane 6 design and give Germany larger role
- 31 **NanoRacks**, Astrium North America preparing for commercial payloads outside the ISS

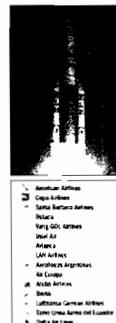
AIR TRANSPORT

- 32 **Lufthansa looks** at launching low-fare platform based on Eurowings into an already crowded market
- 32 **Impending shutdown** of Tigerair Mandala shows deeper problems facing Asian low-cost carriers



ON THE COVER

38 **NASA and its partners** are working to find a way to land humans on Mars, with stops at a "proving ground" near the Moon. In this artist's concept from Lockheed Martin—the prime contractor on the Orion crew capsule that is being developed to take humans to and from deep space—an Orion prepares to capture a spherical planetary sample container that has been brought by the ascent craft in the background. Such an approach would eliminate the need to build a special Earth return-and-reentry vehicle for samples. By making exploration technology "extensible" like this, planners for Mars hope to hold down costs. A special report on exploration begins on page 38. Also in this issue are articles on Pentagon suppliers (page 23) and airline revenues trapped in Venezuela (page 35).



- 30 *Europe's two biggest aerospace companies win French endorsement for combining rocket divisions.*
- 23 *Pentagon is ranking suppliers and looking to highlight leaders and goad laggards.*

26

34 Emergence of new players forcing Changi Airport to come up with new incentives to retain airlines

35 Failure to repatriate airfare funds to international airlines puts Venezuela's connectivity at risk

36 Freight volumes slumping world-wide, but Asian airlines buck the trend with targeted approaches

44 Spacecraft engineers beginning to design hardware for recurring use in different future applications

45 Human space exploration 'rationales' run from the scientific to survival as a 'multiplanet species'

VIEWPOINT

50 Methodology exists to encourage industry to reduce prices for improving materiel readiness

27



37 While cargo operators are parking fuel-hungry freighters, passenger operators are filling their belly holds

MARS EXPLORATION

38 NASA's latest plan for Mars exploration is a product of pragmatism, politics and brilliant engineering

40 Fleet of planetary robots and spacecraft paving the way for humans to Mars, and pushing deeper

41 Spacecraft engineers bending metal and testing designs for the launcher and capsule to take humans to Mars

22



On the Web ✨

A round-up of what you're reading on AviationWeek.com

The one flightworthy Soviet-era space shuttle Buran was destroyed on May 12, 2002,

It crushed the Buran, which was mounted horizontally on a version of the massive Energia launch vehicle that carried it to orbit.

that were posted on social media. ow.ly/ydMC6

EXPLORATION INTERACTIVE, PODCAST

Read the [interactive](#) beginning on page 38, then take an interactive look at human exploration targets in the Solar System by tapping on the icon in the digital edition of *AW&ST*

After that, listen to our Check 6 podcast chat with longtime space editors Frank Moring, Jr., and Jim Asker. ow.ly/ydOgh Check 6 is also available for download and subscription on iTunes. ow.ly/xF33i

RETIRED AT 10

Aviation Week Intelligence Network fleet analyst Nigel Howarth confirmed that a Boeing 737-700 assembled in 2004 is about to be retired for parting out,

Read details at: ow.ly/ye5JX