

# Boeing 757 Vertical Tail

## Active Flow Control Technology testing at NFAC



Boeing and the National Aeronautics and Space Administration (NASA) have completed wind tunnel testing of a full-scale 757 vertical tail model equipped with active flow control technology at Arnold Engineering Development Complex's 40x80 foot wind tunnel.

The wind tunnel is located at the National Full-Scale Aerodynamics Complex at the NASA Ames Research Center in Moffett Field, Calif.

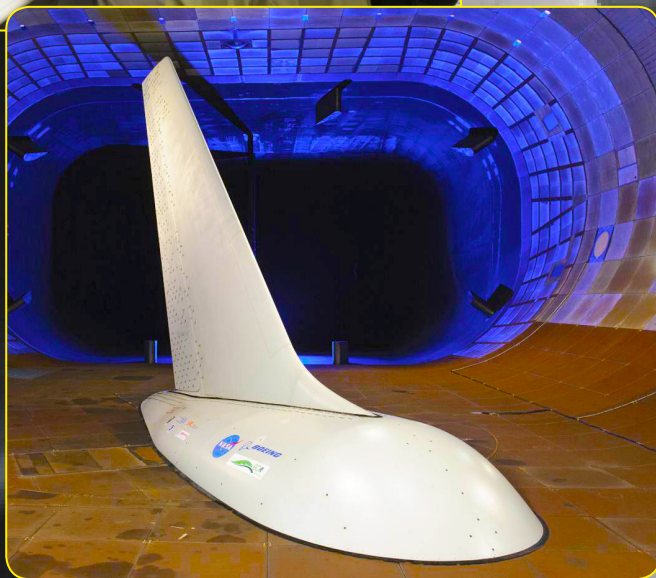
Testing began in early September and concluded in November 2013. A major objective of

the tests is to show that active flow control can enhance the performance of a vertical tail enough to enable future designers to reduce the size of the structure for a whole family of airplanes. That could reduce the penalties that the vertical tail aircraft currently pay in drag and weight.

AEDC's 40x80 is the only wind tunnel in the world that can meet both the scale and speed range required for a full-scale ground test of this nature.

The flow control on the 757 vertical tail model comes from sweeping jet actuators, which are devices that essentially blow air in a sweeping motion along the span of the tail. The actuators are provided by NASA as part of a collaborative agreement under the NASA Environmentally Responsible Aviation Project.

As the actuators blow air over the rudder, they help to redirect and reattach the air flow over the rudder that would otherwise be separated at some of the higher rudder angles. Eliminating separation on the rudder benefits performance.



### Key Points

- ✓ Technology could reduce fuel consumption by 0.5%
- ✓ As much as 20% increase in side force generated by baseline vertical tail
- ✓ 26' tall full-scale test article; cleared opening over model access doors by less than a foot
- ✓ Simultaneous acoustic and aero-performance data acquired

See a Boeing 757 Vertical Tail test video at NFAC, use the QR code below

