2015
J. C. Hunsaker Award for
Aeronautical Engineering

For his distinguished leadership in commercial
aviation as exemplified by the development
and commercialization of the Boeing 777.

Alan R. Mulally

President and Chief Executive Officer
Ford Motor Company (retired)

NATIONAL ACADEMY OF SCIENCES

In the two decades since its first commercial flight, the Boeing 777, the world's largest twinjet, has become the most popular wide-body plane, flown by dozens of airlines. More than 1,100 Boeing 777 planes now soar the skies, taking people and cargo on some of the world's longest flights. One of the most reliable and safest airplanes, the 777 was first noted for its original designs, for which Mulally, as President and CEO of Boeing Commercial Airplanes, played a key role in their adoption. The 777, for instance, was the first Boeing plane to use a full-fledged "fly-by-wire" system, replacing conventional manual flight controls—which transmit the pilot's movements in the cockpit to the rest of the plane via a system of cables, pulleys and other devices—with electronic signals conveyed over wires. Early fly-by-wire systems relied on separate computers to manage the various parts of the plane; the Boeing system instead wired everything into a central "brain," which weighed less and was more efficient but also required new feats of computer design and programming.

The complex design of the 777 was made possible with the CATIA digital design system, which let Boeing model and tinker with the plane's millions of parts before their creation. For the first time, engineers and designers could put together an entire plane on the computer and ensure that everything would fit together and look right prior to the production of parts. Before the aircraft could fly long distances, it needed to be certified to fly far from an emergency landing airport, and the Boeing 777 was the first twinjet to receive such certification from government safety regulators immediately after being put into service in 1994. Since then, the plane has proven its long-distance capabilities and holds the record for the longest non-stop flight, 11,664 nautical miles, from Hong Kong to London.