National Aeronautics and Space Administration (NASA)
Ames Research Center, Moffett Field

The National Advisory Committee for Aeronautics (NACA) became a U. S. federal agency to undertake, promote and institutionalize aeronautic research. The enabling legislation for NACA slipped through Congress almost unnoticed as a rider attached to the Naval Appropriation Bill on March 3, 1915. The Assistant Secretary of the Navy, Franklin D. Roosevelt and the Smithsonian Institute's Charles Walcott were instrumental in suggesting this approach to NACA initial funding.

Note: *NACA* is pronounced as individual letters, rather than as an acronym.

Ames Research Center (ARC) was founded on December 20, 1939 as the second NACA laboratory and became part of NASA in 1958 as part of the turnover from NACA. The center was named after Joseph S. Ames, a founding member and longtime chairman (1919-1939) of the NACA.

Historically, Ames was founded to do wind-tunnel research on the aerodynamics of propeller-driven aircraft; however, the research center has expanded its role to conducting research and technology in aeronautics, spaceflight and information technology.

The first research project assigned to the newly established Ames Research Center was the development of an effective means of preventing ice formation on aircraft structures. By 1940, civilian and military aviation had the need to operate in severe weather conditions and had the aircraft capable of operating in such conditions if icing could be defeated. The NACA felt that it was possible to use engine heat to prevent ice formation on the critical parts of an aircraft.

The icing project arrived at Ames in the fall of 1940. By the end of January, 1941, the NACA was flying a specially-modified Lockheed Model 12A *Electra Junior* into known icing conditions to test their theories. Testing was so successful that by the end of 1942, heat-deicing systems had been tested in the B-17 *Flying Fortress*, B-24 *Liberator* and PBY *Catalina*.

In addition to the testing of the deicing hardware, much work was done to understand the physics of ice formation and the effects of heat transfer in aircraft structures. This project was considered to be an outstanding success by the military, industry and the NACA.

The wind tunnels at ARC are known for only for their immense size but also for their diverse characteristics that enable various kinds of scientific and engineering research. The 40 x 80 and 80 x 120 foot wind tunnels are part of the National Full-Scale Aerodynamics Complex (NFAC) and are large enough to test full-sized planes rather than scale models.

The 40 x 80 foot wind tunnel circuit was originally constructed in the 1940s and is now capable of providing test velocities up to 300 knots. It is primarily used for determining

the low- and medium-speed aerodynamic characteristics of high-performance aircraft, rotorcraft and fixed-wing, powered-lift V/STOL aircraft.

The Unitary Plan Wind Tunnel (UPWT) was completed in 1956 at a cost of $27 million under the Unitary Plan Act of 1949. It has been the most heavily-used NASA wind tunnel, with every major commercial transport and almost every military jet built in the United States over the last 40 years has been tested in this facility, along with NASA's Mercury, Gemini and Apollo space capsules and the Space Shuttle. This facility represents a unique national asset of vital importance to the nation's defense and its competitive position in the world aerospace market.

The 80 x 120 foot wind tunnel holds the distinction of being the largest wind tunnel test section in the world. This open circuit leg was added and a new fan drive system was installed in the 1980s. This tunnel is used to support an active research program in aerodynamics, dynamics, model noise and a full-scale aircraft.

Although decommissioned by NASA in 2003, the NFAC is now being operated by the U. S. Air Force as a satellite facility of the Arnold Engineering Development Center (AEDC).

Today, Ames plays a role in many NASA missions in support of America's space and aeronautics programs. It provides leadership in astrobiology, small satellites, robotic lunar exploration, technologies for the Constellation Program, the search for habitable planets, supercomputing, intelligent/adaptive systems, advanced thermal protection and airborne astronomy.