Through the 20th Century there were four defining moments in the history of aerospace. Clearly, the Wright Brothers first-powered flight launched the century’s rapid evolution of aviation. World War II—with a new aircraft developed every few months—set the standard of rapid movement of ideas from the drafting board to the factory to the skies. The jet age of the 1950s forever changed the way people come together. And the race for space altered for all times how we view our universe.

Parallel to these remarkable aviation and space achievements, leadership in our industry followed a similar evolutionary path as great leaders left an indelible imprint on innovation and the business of aerospace.

A precise definition of leadership may seem difficult. However, as I look at it, true leaders possess certain inherent values that guide them throughout their careers as well as inspire others. All of us are very fortunate in the fact that North American Aviation began under the guidance of such individuals. We indeed have a rich legacy of leaders that formed a fledgling airplane company and transformed it into greatness. And since it is a heritage that endures today at The Boeing Company, it is good that from time to time we remember these men and their contributions.

James Howard “Dutch” Kindelberger started out at the Glen L. Martin Company in Cleveland before moving to Douglas Aircraft in California, as vice president and chief engineer. In 1934, while immersed on the DC-1 and DC-2 airliner programs, an opportunity arose to head up North American Aviation (NAA), which was then part of General Aviation Corp. in Dundalk, Maryland. Dutch accepted the offer to become president of the Dundalk-based subsidiary, and wisely took along a few top engineers including Lee Atwood and Stan Smithson.

However, aviation sales moved slowly in the east, and Dutch decided to move NAA to Southern California to pursue new business and benefit from year-round good flying weather. It was 1935, and an automobile caravan moved the small NAA group cross-country to Inglewood, California, near Mines Field (now LAX). They were the hearts and brains of a new era of aviation. Today, the “Bald Eagles” organization represents the spirit and memory of this original group.

By January 1936, there were 159,000 square feet of floor space occupied by 150 employees at the new Inglewood plant. Soon, hundreds of BT-9 trainers and O-47 observation planes would be rolling out the door. In addition, the venerable NAA T-6 Texan for the Army Air Corps, and the Naval variant SNJ, went on to train more U.S. and Allied pilots than any other aircraft produced during WWII.

NAA plants at Los Angeles, Dallas and Kansas City ran under the leadership of Ralph Ruud, where critical mass production techniques were developed that set the standard for the industry. Ralph, one of the original “Bald Eagles”, instrumental in developing contouring spar and skin mills to achieve tapers and contours, developed the “erector set” concept for tooling that permitted the use of demountable heads on a wide variety of parts and assemblies, and introduced machine riveting to the industry.

During the height of WWII, an airplane was produced at one of NAA’s factories every 15 minutes. During 1945 alone, 1,200 aircraft per month were being produced at NAA facilities. Ralph’s leadership helped NAA produce an astonishing 42,000 airplanes from 1940-45. This included the famed P-51 Mustang, which provided long range bomber escort, and was credited with nearly half of all enemy aircraft shot down over Europe. Almost 10,000 B-25 Mitchell medium bombers were also produced. Sixteen carrier-launched B-25Bs participated in the “Doolittle Raiders” first attack on the Japanese homeland. America had compiled impressive statistics across the industry that its enemies could not have predicted.

Mass production certainly was important, but innovation also took precedent at NAA. For example, the P-51 featured aeronautical design advances such as a laminar flow
October 2, 1981 that as part of his Strategic Modernization Program, 100 B-1Bs and 132 Advanced Technology Bombers, later designated the B-2, would be built. It would take a determined leader to keep the $20.5B program on track, and Sam did it! Not long after the contract award, four and sometime five of the sleek bombers were rolling out the door every month at the Rockwell Palmdale facility. To put that in perspective, the total parts for the assembly of a single B-1 is equivalent to fifteen F-16 fighters. The 100th B-1B rolled out of the factory on January 20, 1988—all 100 B-1Bs were built and delivered on time and within budget.

During recent operations in the Iraqi theater, B-1Bs dropped more than 70% of the GPS-guided Joint Direct Attack Munition (JDAM). The combination of the B-1B and JDAM weapons were so reliable, they were called on to hit targets missed by other aircraft, and to provide close air support for troops on the ground. Just think about that for a moment—a bomber flying close-air support!

B-1B crews were also capable of re-programming new time-critical target coordinates in flight, as new orders were commanded and approved in unprecedented record time. The B-1B has come into its own and continues to create its own legacy. We owe a great part of that legacy to Sam's leadership and determination to guide this bomber program through its inception, production and delivery to the customer—he delivered results.

As another year of this second century of flight comes to a close, we mark the loss of so many of these pioneering leaders of our heritage company: Ralph Ruud, Sy Rubenstein, Morgan “Mac” Blair, Rocco Petrone, Norm Ryker, Robert Anderson, and NAA test pilots Scott Crossfield and Al White. But their legacy lives on in the skies over the front lines in the wars against terror, in the airwaves traveled by millions of passengers each day, and in the great expanse of space. Their vision and leadership lessons live on, fostering a new generation.

The values that our NAA leaders embraced and led by example, will hold us in good stead as we move into the fifth defining era of aerospace: the intersection of information management and information technology. It is this marriage of platforms and networks that will enable the next great steps in innovation. It is the tradition of leadership handed down to us by these great leaders that will ensure that our industry is there to make it happen.

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The B-1 assumes its rightful position between the B-52 and the B-2 bombers in America's arsenal of strategic weapons.


Under the leadership of Lee Atwood, a company that built airplanes that helped win WWII would now tackle the moon. In a remarkable win, the Apollo contract was awarded to North American on November 28, 1961. Interestingly, only two Mercury flights had taken place at the time. In the heated competition, North American had beaten McDonnell Aircraft for the contract to build the Apollo spacecraft, even though McDonnell had built the Mercury spacecraft and was developing the Gemini spacecraft. NASA was on a fast track and NAA was ready to accept the challenge. At the helm, Harrison Storms who was instrumental in winning the NASA contract now moved swiftly toward the execution phase.

North American also built the second stage of the 363-foot Saturn V rocket, and Rocketdyne (a division of NAA at the time) designed and built all of the engines for the three stages. During its peak in 1966, the Apollo program involved approximately 350,000 dedicated people and 20,000 companies throughout the United States. Today, another one of our accomplishments, the Space Shuttle, continues to carry out scientific missions and assembly of the International Space Station.

In the missile arena North American had developed the Navaho project, a booster and a piggy back missile initially tested as the X-10. This program, underway during the early 1950s, essentially produced the first cruise missile for the U.S. and the largest flight-tested ramjets. This experience would later help Rocketdyne become the world leader in rocket propulsion. In addition, the Downey, California-built air-to-ground Hound Dog missile gave the Strategic Air Command’s B-52s a standoff capability.

For the Navy customer, NAA produced the Mach 2 tactical reconnaissance RA-5C Vigilante and the T-2 Buckeye trainer. The U.S. Marine Corps received the versatile OV-10 Bronco, which is still in service today with several foreign air forces. Each subsequent program whether successful or not, became a stepping-stone to the future. Our leaders garnered the lessons learned, and their gained experience translated into confidence. The odds of succeeding when the next RFI arrived was greatly improved.

Another leader who joined NAA in 1952 at the Fresno, California modification center was Sam Iacobelli. In 1957, he transferred to the company’s Rocketdyne division and held increasingly responsible positions eventually becoming vice president of Advanced Programs. Lee Atwood once commented on Sam, “His attitude of eagerness, and desire to work, desire to help people, his friendliness toward others and his consideration, together with his work ethics made him a very valuable prospect in my mind, and I felt he would contribute strongly wherever he might work, and turns out he did.”

In 1973, Sam was named president of the Atomics International Division which, under his direction, expanded into the Energy Systems Group. I remember seeing Sam riding in the back of a pickup truck greeting the employees at the Hanford, Washington facility. I immediately thought that some day, I would like to work for that gentleman.

In 1981, things really heated up as Sam joined Rockwell International’s North American Aircraft Operations as executive vice president and B-1B program manager. To recover from the ill-advised cancellation of the B-1A by President Jimmy Carter in June 1977, President Ronald Reagan announced on
Postscript to Leadership – Inspiring Others
as related by an Unknown NAA Retiree

A young farmer glanced upward and noticed a biplane descending quickly toward his field with its engine coughing slightly. The aircraft skimmed low over several trees and landed on a dirt road - not bad, the farmer thought. Taxiing, the pilot tried to turn the airplane around, but the road was too narrow and the tail section wound up on the grass shoulder. The farmer, who was fascinated by airplanes, was anxious to meet the pilot and ran over to lend assistance. The distinguished looking aviator, introduced himself as Dutch, and the two of them managed to get the biplane turned around. After a short period of working under the engine cowling, everything seemed ready for a takeoff try. Prior to starting the engine, Dutch told the farmer, “If you’re interested in a job working with airplanes, here’s my address.”

Several years later the aviation-spirited farmer wound up in Inglewood, California and decided to pay Dutch a visit. All he had was a note with an address, and he had no idea he was attempting to visit the president of North American Aviation (NAA). After a slight delay trying to convince security with his wild tale and that he actually knew Mr. Kindelberger, he was allowed to enter the facility. Dutch remembered the young farmer and immediately gave him a job at the NAA factory—such was the dynamics of the leader of NAA - inspiration and a promise kept. ✧