



Bell Boeing Tiltrotor Team's Osprey Facts

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OPEVAL Report: Good news for the V-22

Headquarters Marine Corps—The MV-22 Osprey has been judged operationally effective and operationally suitable for land-based operations, validating eight months of comprehensive evaluation and moving the tiltrotor aircraft a major step closer to full-rate production, Marine Corps officials announced Oct. 13.

Marine Corps and Navy leaders were briefed Oct. 11 on the Operational Evaluation Report (OPEVAL), issued by the Navy's Operational Test and Evaluation Command.

The report stopped short of declaring the aircraft suitable for ship-based operations, pending additional evaluation of the Blade Fold Wing Stow system. Since completion of Operational Evaluation, the system designed to fold and stow the prop rotors and wings was modified and successfully evaluated by the Multi-service Operational Test Team (MOTT) in Amarillo, Texas.



The OPEVAL Report revealed that the V-22 is overwhelmingly superior to the aging CH-46E, including twice the speed, five times the range and three times the payload capacity.



The V-22 will undergo additional evaluation of its Blade Fold Wing Stow system Nov. 15.

Follow-on evaluation at sea is expected to be completed by Nov. 15. Successful sea trials will pave the way to full-rate production and multi-year procurement.

While the issue of shipboard compatibility awaits resolution, the report confirmed that the MV-22 met or exceeded all other key performance parameters. In key capabilities, the MV-22 proved its overwhelming superiority to the CH-46E and CH-53D, the aging medium-lift aircraft the Osprey will replace.

In the most telling comparison — to the CH-46E — the MV-22 boasts twice the speed, five times the range and three times the payload capacity. The report concluded that these and other enhancements unique to the MV-22 will revolutionize assault-support operations.

Capable of taking off and landing like a helicopter and also flying like a turboprop

airplane, the MV-22 entered Operational Evaluation in November 1999 with fewer deficiencies than any aircraft in the history of naval aviation. It did so while facing unprecedented reliability standards, exposing more blemishes early on but ultimately resulting in a safer, more reliable aircraft.

During exhaustive evaluation at Marine and Naval facilities throughout the country, the MV-22 logged 805 flight hours in 522 sorties. The Multi-Service Operational Test Team evaluated the aircraft's suitability for use by Marine Corps operating forces through a series of representative missions from amphibious ships, airfields, remote sites, confined areas, ranges and other test facilities.

A decision on whether to proceed with full-rate production is expected later this year.



Employees and program supporters gather for the V-22 production facility groundbreaking in 1998.

Amarillo V-22 site up and running

By Bob Leder
Bell Public Relations

AMARILLO, TEXAS—Highway 287 is a straight shot from Fort Worth, 350 miles northwest to Amarillo. If you leave Cowtown (Ft. Worth) sometime after midnight, you'll eventually link up with Interstate 40 (the same highway that used to be known as Route 66) at the south fence line of the Amarillo International Airport. And if you're particularly lucky, as you merge onto westbound I-40, the sun will be just coming up over the horizon behind you.

Ahead lies an infinitely distant skyline where the vast West Texas landscape and the sky meet. In that flash of a moment when the sun seems to just pop out from behind the earth and into the sky there is a burst of light that, when reflected off the two numbingly huge aircraft hangars just in front of you, gives them, for a brief moment, the appearance of a golden city. But this is no illusion and it's not some mythical Lost City of Gold.

It's the brand new multi-million dollar Amarillo Tiltrotor Operations Center where all Bell Boeing V-22 aircraft are built and make their first flights. This is the real deal—the newest, most modern, most advanced aerospace manufacturing facility in the world.

Following an eight-month nationwide search of over 2,000 airports, Bell Helicopter finally announced on August 3,

1998, it would build its new Tiltrotor Assembly Center on the airport at Amarillo, Texas. At a downtown Amarillo press conference attended by hundreds of civic leaders, Bell Chairman & CEO Terry Stinson proclaimed, "This Tiltrotor Assembly Center will be the first major aircraft manufacturing facility to be built in Texas in decades."

Mr. Stinson was joined at that press conference by U.S. Senators Phil Gramm and Kay Bailey Hutchison as well as U.S. Representative Mac Thornberry, whose Congressional District includes Amarillo. Senator Hutchison, a longtime supporter of the tiltrotor program called the Bell expansion a great day for Texas. "This will ensure Texas will be the world's premiere tiltrotor center for the 21st Century," she stated. Rep. Thornberry said Amarillo will make a great home for tiltrotor technology and thanked Bell for selecting the Panhandle city for the new plant location.

That was August 1998, and the new plant then was nothing more than a 179-acre empty field at the southwest corner of Amarillo Airport adjacent to the taxiway that parallels the main runway.

Something you need to understand about Amarillo International Airport is that it was primarily built to host a B-52 wing for the old Strategic Air Command, which operated a bomber base here for decades during the height of the Cold

War. That means everything is big at the Amarillo Airport. Big runways and big hangars.

With the big runways came a half dozen reinforced pads where large cargo military aircraft can park without sinking or cracking the concrete, no small consideration. This works out well because Boeing builds the V-22 fuselage at its Philadelphia plant. Upon completion, each fuselage is loaded aboard an USAF C-17 or C-5 for transport to Amarillo, where it is mated with the wings, which are manufactured by Bell. The old B-52 hangars came in handy because that is where Ship #13, the first Amarillo built MV-22, was assembled.

Ground breaking for the Tiltrotor Assembly Center came in November 1998, in a shovel swinging ceremony involving hundreds of West Texas residents thrilled to see a new aerospace facility coming to the panhandle.

Bell Executive Vice President and Site Selection Team leader P.D. Shabay said Amarillo clearly provided the best value for our customers. Shabay noted that Amarillo Mayor Kel Seliger and the members of the Amarillo Economic Development Corporation put together such an outstanding proposal that it was impossible to turn it down. Bell and the city of Amarillo were well acquainted. Previously, Bell operated a helicopter overhaul/modification center and produced subassemblies at a series of vacated B-52 hangars at the Amarillo Airport from 1968 through 1989.

Construction of the approximately 450,000 square foot tiltrotor assembly facility began immediately after groundbreaking. After all, first occupancy was scheduled for 1999.

This is where Dwight Byars steps into the picture. Byars is the Vice President of Tiltrotor Operations and the senior executive at the Amarillo facility. A native Tennessean, Byars has over 37 years experience in nearly every aspect of aerospace manufacturing from commercial passenger transport aircraft to helicopters. Byars was responsible for taking the Amarillo site from a green field to designing and creating the most advanced aerospace manufacturing facility in the world.

Before work started, Byars and a team of Bell operations experts traveled coast to coast reviewing the manufacturing techniques and procedures of nearly every aircraft builder in North America. "This

was the opportunity of a lifetime,” Byars said. “To start with a green field is something that most aircraft builders can only dream of,” he added.

Byars has implemented numerous operational systems ensuring Amarillo remains efficient. The assembly line is a straight line flow set up for lean manufacturing so that the line moves with maximum efficiency. In addition, the buildings have been designed so that they can be added to as production rates increase. Furthermore, the factory employees’ workweeks consist of either four 10-hour days or three 12-hour day workweeks resulting in a seven-day operation. “This has had a significant effect on reducing overtime as well as man-hours per aircraft with the net result a genuine savings for the customer in the production costs of each aircraft,” Byars stated.

The first building to be constructed was the Flight Hangar. While the dirt was still flying on this building, the fuselage for Aircraft #13 arrived from Boeing Philadelphia. Not wanting to waste any time, Byars was able to secure an existing hangar at the old Air Force base where assembly began on Aircraft #13. By May 1999, the new Flight Hangar was completed and Aircraft #13 was towed to the hangar where it finished final assembly.

Since the Flight Hangar was completed, a major assembly and manufacturing building was completed. This is where the aircraft are now actually manufactured, with the Flight Hangar now serving its intended function as a final completion and pre-flight center. Both buildings are so spotless, you’d think there was a whole



Final assembly of each MV-22 using lean manufacturing methods saves time, space and money.

team of sprinters with oil pans spring loaded to dash, dive and scoop up any offending oil drops before they ever reach the glossy blue painted floors.

Currently there are over 250 people employed at the facility. By 2004 that figure is expected to reach 1,200 employees.

Another advantage of the Amarillo location is it offers MV-22 production test flight crews the opportunity to fly the aircraft without worrying about disturbing the neighborhoods. There is an almost unbelievable amount of unpopulated space in the Panhandle of Texas for all kinds of military flight operations. There is, however, a nuclear warhead plant east of the airport that remains, naturally, re-

stricted air space. That is a small plot of land to avoid when you consider the flight restrictions over highly populated areas like Dallas/Fort Worth.

In addition to the Amarillo Tiltrotor Assembly Center, Bell is also spending \$300 million on new equipment and facilities at its plants in the Fort Worth/Dallas area to enable the company to move into the production phase of its tiltrotor aircraft product line.

To help with new employee training, the Texas Department of Economic Development and the Texas Workforce Commission pledged nearly \$3 million for training new employees for not only the Amarillo tiltrotor facility but at Bell’s main facilities in the Fort Worth/Dallas metroplex.

From the beginning, a consortium comprising the Texas Workforce Commission, Texas Department of Economic Development, the Amarillo Economic Development Corporation, Amarillo College, and Bell have worked to provide a seamless delivery system of qualified and trained workers. With Bell and TWC teamed in scanning and retrieving the thousands of resumes, providing a rigorous battery of tests and interviews of candidates, the Tiltrotor Operations Center soon had the core of a world class production team. Additionally, Amarillo College’s partnering with Bell in curriculum design and training delivery for these new hires has enabled Bell to perform according to the customer’s expectations.



Lean manufacturing allows the Bell Boeing team to work efficiently, comfortably and safely.



One of the four Lot 1 aircraft used in the V-22 Operations Evaluation (OPEVAL) prepares to undergo the required modifications. Work is expected to be completed within the next six months.

Post OPEVAL modifications to LOT I aircraft begin

By Robert Torgerson
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A Bell Boeing modification team at New River Marine Corps Air Station has started working on the four Lot I aircraft used in the V-22 Operations Evaluation (OPEVAL). Over the next six months, the team will complete work on delivered airplanes, as well as install product enhancements.

The team will perform approximately 30 modifications on each of the Lot I aircraft. The modifications include upgrading rotor tip lights & formation lights for improved night vision goggle (NVG) compatibility, reworking rotor blades and completing system functional tests for cargo hooks & winches.

Although not a primary reason for the

modifications, it is expected that aircraft reliability and maintainability performance will improve.

The modification plan is the result of months of preparation by Bell, Boeing, NAVAIR, PMA 275, Fleet Support Team—Cherry Point, Osprey Support Center at New River, the V-22 Joint Program Office at Patuxent River, VMMT-204 squadron and AIRLANT. All special tools, equipment, parts and personnel are being provided by Bell Boeing to minimize the operational impact.

“This will serve as a really good example of Bell Boeing post delivery modification support, and we intend to make this a standard for future efforts,” said Dave Moorman, Boeing V-22 program manager.

Notable Quote...

“Having the CV-22 means having a significant advantage over the maneuver capabilities of potential future adversaries—cunning, determined, and skillful though they may be.”

Lt. Gen Norton Schwartz, USAF deputy in chief, US Special Operations Command during the CV-22 rollout ceremony in July 2000

V-22 EMD Flight Test Status as of October 16, 2000

A/C #	Total EMD Hours	Total EMD Flights
7 Fort Worth	466	239
<i>CV Effort</i>	87	62
8 Pax River	527	287
9 Edwards AFB	338	152
<i>CV Effort</i>	30	12
10 Pax River	466	205
Totals	1797	883

Key Performance Achievements

Total V-22 Flight Time with FSD, EMD and OPEVAL Flights	3786 hrs*
Max. Airspeed Attained	342 kt
Max. Altitude Attained	25,000 ft
Max. Take-Off Gross Weight	60,500 lb
Max. Load Factor	3.9 Gs

*Does not include VMMT-204 Flight Statistics.

Amarillo: V-22 success story

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On Oct. 30, 1999, less than one year after ground was first broken at the facility, the United States Marine Corps received the first V-22 Osprey produced at Bell Helicopter's Tiltrotor Assembly Center in Amarillo, Texas. The event took place at the Bell facility located at 401 Tiltrotor Drive, on the grounds of the Amarillo Airport.

Bell President John Murphey presented the aircraft to Lt. Gen. Fred McCorkle, Deputy Commandant for Aviation, who accepted the MV-22 on behalf of the Marine Corps.

Since that first Amarillo aircraft was delivered a year ago, another seven MV-22 Ospreys have been delivered to the US Marine Corps. At peak production, beginning in about 2010, the Bell Boeing Tiltrotor Team projects the production of as many as 100 tiltrotor aircraft annually including both military and civilian versions of the aircraft.