

The Osprey Takes Off



V-22 Production Rolls into Gear

By LCdr. Rick Burgess, USN (Ret.)

At long last, during the next 12 months, the first production Bell Boeing V-22 *Osprey* tiltrotor assault transport will be assembled and readied for its first flight. The aircraft eventually will join the Marine Corps' V-22 readiness training squadron, preparing crews to fly and maintain the revolutionary aircraft.

The V-22 program reached a significant milestone on 25 February

with the joining of the three fuselage sections of *Osprey* No. 11, the first production V-22, at the Boeing Company facility near Philadelphia, Pa. The installation of the landing gear and electrical and hydraulic systems will be complete in August. The fuselage will then be flown by Air Force transport to the Bell Helicopter Textron plant in Fort Worth, Texas, for attachment of the wing, rotors and empennage, and engines/nacelles, and for pre-delivery flight tests.

According to Boeing officials, the fuselage was "designed for manufacturability from the outset." The hybrid of aluminum and composite materials provides the best combination of weight, structural strength and maintainability. Boeing engineers shifted from using all composite materials to a blend that combined the best of both composites and metals. In the fuselage, Boeing was able to reduce the number of parts by 36 percent, fasteners by 34 percent and the parts rejection rate by

60 percent. Engineers used digital modeling to achieve a 1,352-pound decrease in fuselage weight, saving \$21 million in engineering and manufacturing development (EMD) costs.

Osprey No. 11 is the culmination of a long development process. The V-22 dates back to a 1981 Department of Defense requirement for a joint-services vertical-lift aircraft. The design jointly submitted by Bell and Boeing was selected in April 1983. The Army withdrew from the program because of funding issues and program manager responsibilities shifted to the Navy.

The first MV-22A made its initial test flight on 19 March 1989. *Osprey* No. 1 and the next four MV-22As were full-scale development (FSD) aircraft designed to demonstrate the feasibility of the tilt-rotor concept and the potential of the V-22. A sixth was never completed. Sea trials were conducted by two MV-22As in December 1990 on board *Wasp* (LHD 1).

While acknowledging the great potential of the aircraft, then-Secretary of Defense Dick Cheney proposed cancellation of the program in 1990 because of declining defense budgets. The program survived, however, with support from Congress and with Cheney proposing to continue it by merging development funds from the FY 1992 and 1993 budgets. The requirements that emerged for the V-22 included 360 MV-22B assault transports for the Marine Corps and 50 CV-22B Air Force versions for use by the U.S. Special Operations Command. Also, 48 Navy HV-22Bs for combat search and rescue were proposed; however, no funding has yet been programmed.

Development of the V-22 was slowed by the loss of two FSD MV-22As in 1993 mishaps. Weight reductions and other improvements were recommended, and on 24 March 1994 the Navy awarded a contract to Bell Boeing for the production of four EMD *Ospreys*, designated MV-22Bs. These aircraft were intended to support combined contractor and government developmental testing for the Marine Corps MV-22B and the Air Force CV-22B.

Two remaining MV-22As continued in tests. In June 1995 an *Osprey* and its "ancestor," the Bell XV-15 tilt-rotor demonstrator aircraft, performed daily flight demonstrations at the Paris Air Show. Eventually, the last remaining FSD aircraft was retired.

The first EMD MV-22B made its first flight on 5 February 1997. On 15 March, the aircraft was delivered to the V-22 Integrated Test Team at Naval Air Warfare Center Aircraft Division, Patuxent River, Md. The subsequent EMD aircraft were delivered to Patuxent River over the course of the next 10 months, with *Osprey* No. 10

Plans include the transition of 11 operational CH-46E *Sea Knight* and CH-53D *Sea Stallion* squadrons to the MV-22B.

arriving on 29 January 1998. Of these four, No. 10 is the most representative of a fleet aircraft and will be used primarily for operational testing, which will continue through September 1999.

One EMD *Osprey* is fully instrumented and will be used to complete envelope testing through 1999. Two others will be transferred eventually to the Air Force for CV-22B program testing. One CV-22B is scheduled to fly in October 1999, the other in May 2000.

What the Marine Corps will get in the MV-22B is a tilt-rotor aircraft that can carry a crew of two plus 24 fully equipped troops or 12 litters from ship or shore to a radius of 200 nautical miles, and an external cargo capability. The aircraft's two Allison T406-AD-400 turboshaft engines, each producing over 6,000 shaft horsepower, are able to lift the aircraft and payload vertically and transition to level flight for speeds up to 275 knots. The MV-22B is designed to have cockpit and cabin overpressur-

ization for operating safely in areas contaminated by nuclear, chemical or biological weapons.

No. 11 is scheduled to fly in early 1999 and to be delivered in May 1999 to the Marine Corps for operational evaluation prior to delivery to Marine Medium-Lift Training Squadron (VMMT) 204 at Marine Corps Air Station New River, N.C. VMMT-204 will have been redesignated from Marine Helicopter Training Squadron 204 (HMT-204), which now trains crews to fly and maintain the CH-46E. A *Sea Knight*-equipped Marine Medium Helicopter Squadron (HMM) at New River will be taken out of front-line service to assume CH-46E training.

Ospreys Nos. 12 and 13 will be delivered in August and October 1999, respectively, and used in operational testing along with No. 11 before all three are transferred to VMMT-204 in May 2000. By December 1999, VMMT-204 is scheduled to take delivery of No. 14, followed by No. 15 in February 2000. Deliveries of the next seven MV-22Bs will take place between April 2000 and January 2001.

Future V-22 production plans call for seven in FY 1999, 10 in FY 2000, 16 in FY 2001, 20 in FY 2002 and 27 in FY 2003. The 360 Marine Corps MV-22s are scheduled for delivery by 2014.

Plans include the transition of 11 operational CH-46E *Sea Knight* and CH-53D *Sea Stallion* squadrons to the MV-22B—4 at New River, 4 in southern California and 3 at Marine Corps Air Facility Kaneohe Bay, Hawaii—each to be equipped with 12 MV-22Bs. The Marine Corps currently operates 15 CH-46E-equipped HMM squadrons (plus two reserve squadrons) and four CH-53D-equipped Marine Heavy Helicopter Squadrons.

With production underway, the Marine Corps can now see the "light at the end of the tunnel" for a capable replacement for its retirement-eligible fleet of *Sea Knights* and *Sea Stallions*. 

Rick Burgess is Managing Editor of the Navy League's *Seapower* magazine.