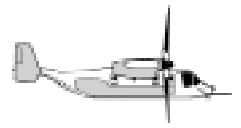




Bell Boeing Tiltrotor Team's Osprey Facts



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MV-22 deemed suitable for shipboard operations

By Headquarters, US Marine Corps

The MV-22 Osprey's improved Blade Fold Wing Stow (BFWS) system has been successfully demonstrated at sea, confirming the tiltrotor aircraft's suitability for shipboard operations and moving it one step closer to full-rate production, Marine Corps officials announced today.

In sea trials conducted aboard the USS Bataan Oct. 31, the Multi-Service Operational Test Team verified that a deficiency in the system designed to fold and stow the aircraft's wings and proprotors was corrected.

With the problem resolved, the Commander, Operational Test and Evaluation Force declared Nov. 8 that the MV-22 is operationally effective and suitable and recommended full fleet introduction.

The successful shipboard evaluation comes one month after a report on the operational evaluation (OPEVAL) of the MV-22 found the aircraft operationally effective and suitable in a land-based environment. The report stopped short of



US Marine Corps

Philip Coyle, the Defense Department's Director of Operational Test and Evaluation, prepares to board an MV-22 tiltrotor aircraft at Albert Ellis Airport in Jacksonville, N.C., Oct. 31 for a ride to the USS Bataan to observe shipboard evaluation of the MV-22's Blade Fold Wing Stow system.

declaring the MV-22 operationally suitable for sea-based operations, recommending additional evaluation of the stowage system.

The shipboard demonstration was observed by Philip Coyle, the Defense Department's Director of Operational Test and Evaluation, who is preparing his own report to Congress on the aircraft's operational effectiveness and suitability.

During the one-day evaluation, the aircraft executed 16 complete BFWS evolutions without failure. The aircraft was put through a timed reconfiguration from a parked and folded position to takeoff, lowered into the hangar bay to demonstrate how it would be positioned for maintenance and moved back up to the flight deck, where it was unfolded and readied for taxi to a designated spot.

After completion of OPEVAL in July, the stowage system that allows the aircraft to be lowered on the ship's elevator and into the hangar bay and also stowed on deck

alongside other aircraft was modified to correct identified deficiencies.

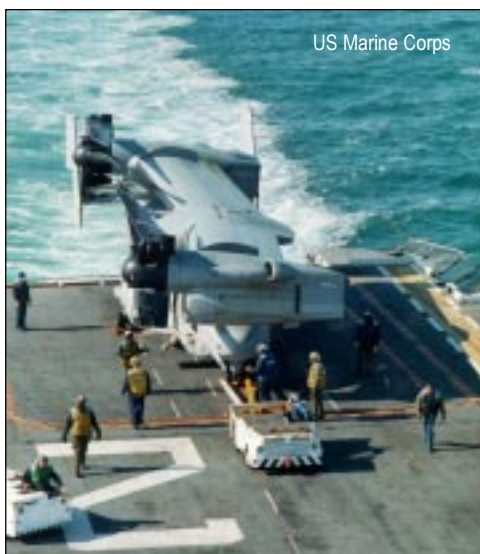
Before the OPEVAL report was released last month, the improved system was successfully demonstrated at the V-22 final-assembly facility in Amarillo, Texas. The just-completed sea trials fully validate the modified system's shipboard performance.

While calling for additional evaluation of the BFWS system, the report confirmed that the MV-22—which is capable of taking off and landing like a helicopter and also flying like a turboprop airplane—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 achieved twice the speed, five times the range and triple the payload capacity.

A decision on whether to enter full-rate production is expected in December.



US Marine Corps

The MV-22 executed 16 complete Blade Fold Wing Stow evaluations without failure during the sea trials held on Oct. 31.

OPERATION JUST CAUSE revisited with V-22

By Norb Josten
USAF and Guard Business Development

The following V-22 scenario is a fictional reenactment of OPERATION JUST CAUSE, an actual operation that occurred in 1989. It illustrates the difference that the V-22 could have made. The graphic to the right illustrates the force's flightline to Panama and its Concept of Operations, while the graphics below compare and contrast the mission with and without the help of a CV-22.

Panama Intervention Synopsis:

- U.S. Force withdraw puts Panama's economy into a recession.
- Panama steeply increases canal fees to raise revenues.

Eglin/Hurlburt Air Force Base to Panama



Strategic Lift:
Air-drop: SOF & ARFOR
Air-land: ARFOR

Marine Expeditionary Unit Objectives:
1. Secure Colon
2. Secure Canal

V-22 Concept of Operations

- Fly MV-22 (48) & CV-22 (20) fully loaded with troops & equipment directly to Panama
- Distance from Eglin: 1350 nautical miles
- Aerial refuel: KC-135
- H-hour Assaults: C² Center, critical objectives, C³I nodes
- Other Missions: Tactical Maneuver, Medical Evacuation, Combat Search and Rescue, Force Protection, Logistics Support
- Armed air support: AC-130U

Special Operations Forces Objectives with CV-22

H- = Before H-hour
H = H-hour
H+ = After H-hour

Objective	Time Line	Assault Platforms	Force
1 Recon/Surveil	H-24	CV-22	
2. Howard AFB	H	C-17/AC-130U	Bn+
3. Bridge of Americas	H	C-22/Raft ¹	2 Plt
4. Pacora Bridge	H	CV-22/AC-130U	2 Plt
5. Modelo Prison	H	CV-22/AC-130U	4 Plt
6. Rio Hato	H	C-17/AC-130U	2 Bn
7. Paitilla Airfield	H	CV-22	2 Plt
8. Flamenco Island	H	CV-22/AC-130U	Co-
9. TV Station	H	CV-22	1 Plt
10. Pres. Palace	H+5	CV-22/AC-130U	Co
11. Pres. Safe House	H+5	CV-22/AC-130U	Co
12. Pres. Safe House	H+6	CV-22/AC-130U	Co

- Economic mismanagement drives investors away.
- Domestic unrest increases as economy worsens.
- Human rights abuses reported.
- Former PCC commissioner and US citizen jailed.
- Panama closes canal for "repairs and dredging operations."
- Canal closure puts world financial markets in tailspin.
- Angry mob storms US Embassy, Marine Guard shot and killed.

Benefits of V-22:

- V-22 has operational flexibility and supports multiple simultaneous assaults.
- Immediate multi-mission vertical lift.
- V-22 can support air assault operations from long-range staging areas.
- V-22 can rapidly deploy from long-ranges and simultaneously assault multiple objectives.
- V-22 fully captures the element of surprise.
- V-22 with AC-130 support has offensive punch of a much heavier force.
- V-22 enables destruction of centers of gravity (C2 and elite forces) and prevents likely enemy courses of action.
- V-22 has half strategic lift requirement of air assault helicopter force.

- CV-22s deploy infiltration teams that provide critical intelligence data
- CV-22s self-deploy loaded with two Ranger companies
- CV-22s enable assault of six strategic objectives at H-hour

Special Operations Forces Objectives without CV-22

H- = Before H-hour
H = H-hour
H+ = After H-hour

Objective	Time Line	Assault Platforms	Force
1 Recon/Surveil	H-24	MH-53J	
2. Howard AFB	H	C-17/AC-130U	Bn+
3. Bdge of Americas	H	MH-47E/MH-53J/Raft	2 Plt
4. Pacora Bridge	H	MH-47E/MH-53J	2 Plt
5. Rio Hato	H	C-17/AC-130U	Bn+
6. Paitilla Airfield	H	MH-47E/MH-53J/Raft	2 Plt
7. Flamenco Island	H	MH-47E/MH-53J/Raft	Co-
8. Modelo Prison	H+15	UH-60L /AC-130U	Co
9. TV Station	H+16	UH-60L /AC-130U	4 Plt
10. Pres. Palace	H+17	UH-60L /AC-130U	Co
11. Pres. Safe House	H+18	UH-60L /AC-130U	Co
12. Pres. Safe House	H+19	UH-60L /AC-130U	Co

- HM-53J deploy reconnaissance teams under cover of darkness
- Naval ships and/or C-130 will need to deploy some H-hour assault forces

If you're interested in this V-22 scenario in its entirety, contact Norb Josten (norb.josten@phl.boeing.com)



The cargo mockup lab is a dimensional replica of the cargo bay found on an MV-22 production aircraft.

NAVAIR Engineering Team designs V-22 cargo mockup lab

By Gidge Dady
NAVAIR V-22 Public Affairs

The NAVAIR Vehicle Subsystems Team (Air 435) has developed a unique V-22 cargo mockup facility which demonstrates a "thinking out of the box" effort that has far reaching benefits, not only to the V-22 program, but to others who need cargo mockup and test capabilities support.

The "cargo laboratory" is located at the South Engineering Building 2187 (NAS, Patuxent River, Md.) where it provides customers with a facility that can be used to design, analyze, manufacture and assemble various kinds of loads, simulate cargo loads, perform cargo tie-down patterns/arrangements and check the fit for vehicles and pallets.

The facility is a dimensional replica of the cargo bay of an MV-22 production aircraft, so any kind of load that could be internally carried by the V-22 can be evaluated for fit and placement in the cargo/troop compartment.

"This is the only facility of its kind that has this type of detailed fidelity for V-22 cargo simulation," said Frank Yellnick, branch head for the NAVAIR vehicle

subsystems branch. "We have replicated the floor plan, the floor tie-downs, as well as the ceiling, height, width and length clearances and any space requirements for seats with respect to positioning cargo. We even have a winch, located in the same dimensional area as on the actual aircraft, to accommodate load on/load off cargo."

"We see this as a warfighter asset. It has really paid off in terms of dollars and time..."—

Frank Yellnick, branch head for the NAVAIR vehicle subsystems branch

The facility was built last fall by technicians and engineers of the vehicle subsystems division and was installed in February of this year.

"Nick Runowich came up with the concept, scrounged the parts, got the funding, helped in the mockup design and made it happen," said Maj. Mike Manzer, V-22 deputy class desk. "It was a superb effort on his part and will be invaluable for future design and evaluation efforts."

The lab consists of parts from one of the

Full Scale Development aircraft, but the flooring and roller rail/guide system used to load and unload cargo replicates the configuration of all the production aircraft starting with MV-22 number 19 and all CV-22s.

"We are experimenting with a prototype guide system that would be a hands-off method of guiding these vehicles into the cabin in a straight and lined-up fashion without actually having to steer them into place. It would be very similar to the way a car moves along the guiding rail in an automatic car wash," said Runowich, lead cargo engineer in AIR 435.

He added that they plan on using this as a test bed for developing tactical and transportable vehicles, such as ones that will be carried by the V-22 and prototyping of future development of wheeled vehicles.

The mockup also will be used for internal transportability assessments. In early August, several pre-production models of high gross weight vehicles were evaluated for a dimensional fit in the V-22.

"We will do a transportability assessment for these vehicles, which includes looking at where people sit in the cabin once the vehicle is in there, egress points, ease of loading the vehicle, tie-down arrangements and where the exhaust pipe exits relative to the crew chief," said Runowich.

Other items tested and evaluated for fit are those that would be placed on a pallet such as air drop loads or cargo containers with parachutes on top, like those used by the Special Operations Forces that require air delivery. This facility also can test and evaluate the fit of organic support equipment, such as a hydraulic ground cart, trailers for these vehicles or any kind of equipment used by a self supporting unit.

Ideas for development of items can be tested in this facility as well. The Schlomer Frame is an example of a device that was evaluated and then used in MV-22 to facilitate fast roping efforts from the aft cargo bay area during one of its operational test and evaluation phases.

Use of this mockup facility eliminates the need to use an aircraft to perform these tests. It also saves time by allowing engineers immediate access to a lab to conduct and evaluate various kinds of cargo tests rather than waiting for an aircraft to become available. The mockup facility has an added benefit so that if damage to the mockup occurs during testing, a valuable fleet aircraft will not be

OPEVAL Photo of the Week



US Marine Corps

V-22 EMD Flight Test Status as of November 19, 2000

A/C #	Total EMD Hours	Total EMD Flights
7 Fort Worth	480.7	244
<i>CV Effort</i>	87	62
8 Pax River	546.7	292
9 Edwards AFB	338.7	152
<i>CV Effort</i>	30	12
10 Pax River	478.8	208
Totals	1844.9	896

Key Performance Achievements

Total V-22 Flight Time with FSD, EMD and OPEVAL Flights	3834 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

Boeing promotes Bruce Oestreich

Dave Moorman, V-22 program manager (Boeing), has announced the promotion of Bruce Oestreich to director of V-22 Program Engineering. In his new position, Bruce will be responsible for the engineering processes associated with all V-22 programs.

During his 15-year career at Boeing, Bruce has served as the V-22 crew station design manager, systems engineering and subcontract manager, deputy director for V-22 systems integration and deputy technical director of the V-22 Bell Boeing Joint Program Office.

He most recently served as the MV-22 Program Manager.

Prior to joining Boeing, Bruce spent eight years in the U.S. Air Force as an F-16 pilot, operations and project officer.



Cargo mockup saves time and money

— Continued from Page 3

down for repairs.

“We see this as a warfighter asset. It really has paid off in terms of dollars and time we have saved by doing these tests in this building and out of the weather and not having to bog down a MV-22 that was needed to conduct flight tests,” said Yellnick.

This permanent multi-purpose facility will service not only the V-22 community and their customers, but third party

customers who may need testing of equipment that would be associated with vehicles or equipment that the V-22 would carry. Yellnick said this facility has been so beneficial to the customers and users associated with the V-22 community that they are considering building similar mockups for other platforms such as the H-53 or CH-60. “We would be able to do this by getting used test articles that are no longer flight worthy and turning them into cargo mock up labs.”

V-22 drop test results

Over the past 75 years, much effort has been directed toward determining the causes of aircraft post-crash fires and practical solutions to prevent their occurrence.

The V-22 team is doing its part by conducting fuel cell drop tests.

The test, which takes approximately five minutes to complete, is a relatively simple process. The fuel cell’s openings are completely sealed and filled with water and purged of all air. The cell is then placed on a platform and raised to a height of 65 feet. The platform is released and allowed to drop freely onto a flat surface. There must be no evidence of leakage for the test to be a success.

Engineered Fabrics Corporation, the manufacturer of the fuel cells, recently went three-for-three on drop tests.

On Oct. 30, the Forward Sponson Fuel Cell was filled with 479 gallons of water and dropped successfully from a height of 65 feet. On Oct. 31, the Aft Sponson Fuel Cell (316.5 gallons) was tested in the same manner and achieved similar success. On Nov. 1, the 820-gallon Auxiliary Fuel Tank bladder was also dropped and received a passing grade.