

MV-22 and the CASEVAC Mission

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MV-22 and the CASEVAC Mission  
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To  
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# Report Documentation Page

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The Marine Corps is currently replacing its aging fleet of CH-46E medium-lift helicopters with the revolutionary MV-22 tilt-rotor aircraft, which has increased speed, range, and lift capabilities, but it does have a shortcoming. As the MV-22 assumes the role of the CH-46E, it will be required to execute the Marine Corps' mission of Casualty Evacuation (CASEVAC). The MV-22 "Osprey" cannot perform the CASEVAC mission successfully because the aircraft's design reduces the effectiveness of the crew chief, lacks defensive weapons or a viable escort platform, limits feasible landing zones, and demonstrates problems with aircraft survivability.

### Background

The primary role of the Marine Corps' medium-lift helicopters is the mission of CASEVAC. From Vietnam to Iraq, Marines have used the CH-46 for CASEVAC. During combat, wounded Marines need to be evacuated from hostile zones to rear-area medical facilities quickly and easily. These "point of injury" landing zones (LZs) can range from a man-made LZ cut out of the jungles of Vietnam to the city streets of Al Nasiriyah, Iraq. Historically, CASEVACs have been the most dangerous, intense, and demanding missions

for assault-support aircraft. The successful execution of a CASEVAC requires complete crew coordination and a rugged, reliable aircraft with the ability to land quickly at the "point of injury", defend itself from the enemy, and survive moderate battle damage.

### Role of the Crew Chief

The concept of a helicopter aircrew includes more than just the pilots. It includes the expertise and teamwork provided by the aircrew in the back of the helicopter to perform as a complete crew. In the CH-46E, as with most assault helicopters, the crew chief and aerial gunner compose half of this crew. The aircrew coordination between the pilots and the crew chiefs is absolutely vital in executing a CASEVAC mission.

The conditions of CASEVAC missions are chaotic. The aircrew could be traveling over 120 knots in reduced visibility, in crowded airspace, with enemy tracer fire filling the sky, and trying to communicate with various ground units in contact with the enemy on the ground, all the while trying to find a 75-meter landing zone. In these circumstances, the pilots need the extra eyes and situational awareness of the crew chiefs and aerial gunners to control the aircraft safely and accomplish the mission.

In the CH-46E, the aircrew can see through the crew-door, two gunner's windows, a rear hatch, and seven other side windows. The MV-22 has two small 18-inch windows on each side of the aircraft and a ramp in the rear. "The crew chiefs are buttoned up in the back in airplane mode...they don't open the door until the nacelles are 45 degrees or greater...they won't have the same role as additional side eyes that they did in the CH-46E."<sup>1</sup> This reduced visibility results in low situational awareness for the aircrew in the back. Without the input and coordination from all members of the crew, there is little hope for successfully completing a CASEVAC.



CH-46E



MV-22

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<sup>1</sup> Friesen, Keith, Captain, USMC. MV-22 Pilot, VMM(T)-204, MCAS New River. Interview by author, 27 November 2005.

## Lack of Defensive Measures

An additional role of the crew chiefs in the CH-46E is to man the two defensive .50 caliber machine guns. In a medium-to-high threat environment, a CASEVAC platform must be able to defend itself from enemy combatants.

When the aircraft enters the landing environment, or the objective area, it is susceptible to a variety of enemy fire, including small arms, rocket-propelled grenades (RPGs), ManPads, and anti-aircraft artillery (AAA). The crew chiefs must be able to suppress the threat with defensive fire in order to safely disengage from the enemy.

The MV-22 does not have any organic weapons on the aircraft. In fact, machine guns would not even be effective on the sides of the aircraft due to the engines' and prop-rotors' position on the wings, which would cut off the field of fire of the weapons. The medium to high threat environment provides far too great a risk to send the MV-22 and its aircrew without the capability to defend itself.

In addition to the Osprey's lack of any self-defensive weapons, it does not have a viable escort platform for protection. Due to the Osprey's speed and altitude capability, the AH-1W (Cobra) and UH-1N (Huey) cannot escort it while enroute to the threat areas. A fixed-wing

escort will not provide adequate protection while in the objective area. The MV-22 cannot defend itself, and cannot be adequately defended by another platform. Therefore, the Osprey would not be successful operating in a moderate to high threat objective area.

#### Landing Zone Limitations

The Marine Corps can operate in "any climate and any place," however, there are three landing environments where the MV-22 would not operate adequately for the CASEVAC mission. These environments include urban areas, dusty zones, and zones close to structures/equipment.

Recent history proves that Marines will be forced to fight inside urban environments. The tight landing areas within these populated cities would be very difficult to operate the MV-22. With the prop-rotors turning, the Osprey has a width of 83 feet 4 inches, which is significantly larger than the 50-foot width of the CH-46E, severely restricting the MV-22 from using most urban streets as a landing site.

The MV-22 can land in very dusty zones using some state-of-the-art systems. The equipment onboard will actually hover over a spot more accurately than a pilot could and automatically land by dialing the altitude down

to zero. While these systems are impressive, they are slow and methodical and require a long time to set up.<sup>2</sup> Using these systems in dusty zones will result in very slow profiles in the objective area. These slow approaches will greatly increase the exposure time at the moment when the aircraft is most vulnerable to enemy fire.

Another factor that limits the MV-22's workable landing zones is the extremely powerful and concentrated downwash from the prop-rotors. The downwash has been compared to that of a CH-53E, only more concentrated. This will not limit the Osprey from using most zones, but CASEVAC aircraft are often required to land close to vehicles, tents, or other structures that would be severely damaged by the strong downwash of the MV-22. This illustrates the need for additional coordination and planning not normally involved in running CASEVAC missions.

### Survivability

Although the MV-22 is relatively safe while it flies at high altitudes and speeds, it must come down into the landing environment to execute the CASEVAC mission. Therefore, it is susceptible to enemy fire, and without

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<sup>2</sup> Friesen, Keith, Captain, USMC. MV-22 Pilot, VMM(T)-204, MCAS New River. Interview by author, 27 November 2005.

defensive weapons or escorts, it is even more susceptible. The two huge engines on the wings are totally exposed to enemy fire. Even if the enemy were poorly trained, they would easily be capable of disabling the engines on the MV-22.

In addition to exposed engines, there is no armor on the aircraft to provide greater survivability. The flight controls, computers, engines and every other vital piece of equipment are susceptible to small arms fire. It is unlikely the MV-22 will make it out of the first hot LZ it lands in. "A large part of the tactics for the thing [MV-22]...is going where the enemy isn't...avoiding those areas and flight regimes that would put you in the engagement envelope."<sup>3</sup> The aircraft was designed to operate where the enemy is not, however, the definition of CASEVAC requires the aircraft to land where the enemy is fighting.

In addition, the new tilt-rotor design has a problem recovering from a dual engine failure. It cannot glide as well as a traditional airplane, does not have ejection seats like a jet, and cannot auto-rotate like a helicopter. "The Osprey has no real auto characteristics...the prop-rotors are such that it is hard to let them build turns for

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<sup>3</sup> Friesen, Keith, Captain, USMC. MV-22 Pilot, VMM(T)-204, MCAS New River. Interview by author, 27 November 2005.

a good solid pull at the bottom.”<sup>4</sup> Basically, if the aircraft loses its engines, it will most likely not survive. “While in helicopter-mode, two pilots in the simulator who knew that the engine failures were coming landed only two of nine safely...and they were empty and right over a runway.”<sup>5</sup>



## Conclusion

The MV-22 provides many great advantages to the assault support community. The CH-46E (Phrog) is getting very old and desperately needs to be replaced. The Osprey will do most of the CH-46E’s mission even better than the Phrog ever did, but it cannot adequately fill the role as the CASEVAC platform for the Marine Corps.

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<sup>4</sup> Heidenreich, Trevor, Captain, USMC. MV-22 Pilot, VMM(T)-204, MCAS New River. Interview by author, 30 November 2005.

<sup>5</sup> Friesen, Keith, Captain, USMC. MV-22 Pilot, VMM(T)-204, MCAS New River. Interview by author, 27 November 2005.

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