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New drone has no pilot anywhere, so who's accountable?

The Navy is testing an autonomous plane that will land on an aircraft carrier. The prospect of heavily armed aircraft screaming through the skies without direct human control is unnerving to many.

By W.J. Hennigan, Los Angeles Times

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The Navy's new drone being tested near Chesapeake Bay stretches the boundaries of technology: It's designed to land on the deck of an aircraft carrier, one of aviation's most difficult maneuvers.

What's even more remarkable is that it will do that not only without a pilot in the cockpit, but without a pilot at all.

The X-47B marks a paradigm shift in warfare, one that is likely to have far-reaching consequences. With the drone's ability to be flown autonomously by onboard computers, it could usher in an era when death and destruction can be dealt by machines operating semi-independently.

GRAPHIC: How the X-47B lands

Although humans would program an autonomous drone's flight plan and could override its decisions, the prospect of heavily armed aircraft screaming through the skies without direct human control is unnerving to many.

"Lethal actions should have a clear chain of accountability," said Noel Sharkey, a computer scientist and robotics expert. "This is difficult with a robot weapon. The robot cannot be held accountable. So is it the commander who used it? The politician who authorized it? The military's acquisition process? The manufacturer, for faulty equipment?"

Sharkey and others believe that autonomous armed robots should force the kind of dialogue that followed the introduction of mustard gas in World War I and the development of atomic weapons in World War II. The International Committee of the Red Cross, the group tasked by the Geneva Conventions to protect victims in armed conflict, is already examining the issue.

"The deployment of such systems would reflect … a major qualitative change in the conduct of hostilities," committee President Jakob Kellenberger said at a recent conference. "The capacity to

discriminate, as required by [international humanitarian law], will depend entirely on the quality and variety of sensors and programming employed within the system."

Weapons specialists in the military and Congress acknowledge that policymakers must deal with these ethical questions long before these lethal autonomous drones go into active service, which may be a decade or more away.

Rep. Henry Cuellar (D-Texas) said policy probably will first be discussed with the bipartisan drone caucus that he co-chairs with Rep. Howard P. "Buck" McKeon (R-Santa Clarita). Officially known as the Congressional Unmanned Systems Caucus, the panel was formed in 2009 to inform members of Congress on the far-reaching applications of drone technology.

"It's a different world from just a few years ago — we've entered the realm of science fiction in a lot of ways," Cuellar said. "New rules have to be developed as new technology comes about, and this is a big step forward."

Aerial drones now piloted remotely have become a central weapon for the CIA and U.S. military in their campaign against terrorists in the Middle East. The Pentagon has gone from an inventory of a handful of drones before Sept. 11, 2001, to about 7,500 drones, about one-third of all military aircraft.

Despite looming military spending cuts, expenditures on drones are expected to take less of a hit, if any, because they are cheaper to build and operate than piloted aircraft.

All military services are moving toward greater automation with their robotic systems. Robotic armed submarines could one day stalk enemy waters, and automated tanks could engage soldiers on the battlefield.

"More aggressive robotry development could lead to deploying far fewer U.S. military personnel to other countries, achieving greater national security at a much lower cost and most importantly, greatly reduced casualties," aerospace pioneer Simon Ramo, who helped develop the intercontinental ballistic missile, wrote in his new book, "Let Robots Do the Dying."

The Air Force wrote in an 82-page report that outlines the future usage of drones, titled "Unmanned Aircraft Systems Flight Plan 2009-2047," that autonomous drone aircraft are key "to increasing effects while potentially reducing cost, forward footprint and risk." Much like a chess master can outperform proficient chess players, future drones will be able to react faster than human pilots ever could, the report said.

And with that potential comes new concerns about how much control of the battlefield the U.S. is willing to turn over to computers.

There is no plan by the U.S. military — at least in the near term — to turn over the killing of enemy combatants to the X-47B or any other autonomous flying machine. But the Air Force said in the "Flight Plan" that it's only a matter of time before drones have the capability to make life-or-death decisions as they circle the battlefield. Even so, the report notes that officials will still monitor how these drones are being used.

"Increasingly humans will no longer be 'in the loop' but rather 'on the loop' — monitoring the execution of certain decisions," the report said. "Authorizing a machine to make lethal combat decisions is contingent upon political and military leaders resolving legal and ethical questions."

Peter W. Singer, author of "Wired for War," a book about robotic warfare, said automated military targeting systems are under development. But before autonomous aerial drones are sent on seek-and-destroy missions, he said, the military must first prove that it can pull off simpler tasks, such as refueling and reconnaissance missions.

That's where the X-47B comes in.

"Like it or not, autonomy is the future," Singer said. "The X-47 is one of many programs that aim to perfect the technology."

The X-47B is an experimental jet — that's what the X stands for — and is designed to demonstrate new technology, such as automated takeoffs, landings and refueling. The drone also has a fully capable weapons bay with a payload capacity of 4,500 pounds, but the Navy said it has no plans to arm it.

The Navy is now testing two of the aircraft, which were built behind razor-wire fences at Northrop Grumman Corp.'s expansive complex in Palmdale, where the company manufactured the B-2 stealth bomber.

Funded under a $635.8-million contract awarded by the Navy in 2007, the X-47B Unmanned Combat Air System Carrier Demonstration program has grown in cost to an estimated $813 million.

Last February, the first X-47B had its maiden flight from Edwards Air Force Base, where it continued testing until last month when it was carried from the Mojave Desert to Naval Air Station Patuxent River in southern Maryland. It is there that the next stage of the demonstration program begins.

The drone is slated to first land on a carrier by 2013, relying on pinpoint GPS coordinates and advanced avionics. The carrier's computers digitally transmit the carrier's speed, cross-winds and other data to the drone as it approaches from miles away.

The X-47B will not only land itself, but will also know what kind of weapons it is carrying, when and where it needs to refuel with an aerial tanker, and whether there's a nearby threat, said Carl Johnson, Northrop's X-47B program manager. "It will do its own math and decide what it should do next."

william.hennigan@latimes.com