After years of delay, the US Air Force is on track to field a new rescue helicopter into its fleet within a decade—the HH-60W combat rescue helicopter or CRH. The program started last June, when Sikorsky won a $1.28 billion contract to provide new helicopters for USAF’s in-demand combat search and rescue (CSAR) forces. The HH-60W Whiskey is to replace the HH-60G Pave Hawk, first fielded in 1982.

The CRH’s presence in USAF’s modernization portfolio was not a foregone conclusion as recently as a year ago. Air Force budget officials revealed the program would be funded last March when it rolled out its Fiscal 2015 spending proposal, after suggesting just days before that they would delay the effort two more years.

Though the CRH comes in just behind the service’s leading procurement priorities—the F-35, the KC-46 tanker, and the Long-Range Strike Bomber—USAF officials have noted the Air Force has a responsibility as the primary service to organize, train, equip, and provide forces for personnel recovery operations, and more specifically the capability to conduct theater combat search and rescue. The existing Pave Hawks have piled up hours and wear-and-tear and in many ways fail to meet mission standards. Despite past hiccups and cancellations, the Air Force cannot delay the program indefinitely.

The Air Force is “committed to ensuring our airmen are equipped to rescue America’s warriors whenever and wherever necessary,” Chief of Staff Gen. Mark A. Welsh III said of the contract announcement. “This contract secures that mission for many years to come.”
In late February, speaking before the House Appropriations subcommittee on defense, Air Force Secretary Deborah Lee James said the program holds high importance, and even if the service had to live with sequestration again, “our best advice would be, do not touch that program.”

**PROJECTED ARRIVAL DATES**

The initial $1.28 billion covers early engineering, manufacturing, and development work, the procurement of the first four airframes, and seven aircrew and maintenance training systems. Should USAF exercise all options to buy 112 HH-60W helicopters, value of the contract could total some $7.9 billion over the duration of the effort, Sikorsky officials declared last year.

In early April, Air Combat Command officials said the systems requirements review for CRH was underway in order to verify and clarify its capabilities and components. By April 2016, the CRH is scheduled for a preliminary design review, to be followed a year later with a critical design review. If all goes well, according to Maj. Joel Soukup—the rotary wing branch chief in ACC’s personnel recovery requirements division—initial testing of the first airframes will begin by Fiscal 2019. Test and production schedules aim for an initial operational capability declaration in 2021. By the time the production line hits its stride after initial testing, Soukup said, USAF anticipates “between 10 and 14” helicopters per year coming into the force to replace legacy Pave Hawks.

The CRH effort gets going at a time USAF is drawing back from a heavy footprint supporting operations for US Central Command and is reinvigorating...
SrA. Ronald Hastings unfolds the tail rotor of a HH-60 Pave Hawk at Joint Base Balad in Iraq in 2010. Constant rotations to the Middle East and other areas for more than a decade have taken their toll on the helicopters and airmen.

USAF pararescuemen from the 57th Rescue Squadron approach a Pave Hawk during a multinational exercise in Scotland in April. Their Guardian Angel squadron stood up at RAF Lakenheath in February.
training for rescue operations in “force-on-force” and contested environments. In these situations rescue airmen could be challenged by modern air defenses, hostile regular military forces, jamming, and electronic warfare. USAF is also modernizing other elements of USAF’s rescue forces—such as its fleet of HC-130 specialized rescue tankers.

The CRH program, though, is a long-awaited sign of relief for USAF’s HH-60 Pave Hawk crews, squeezed by near continuous combat since 2001. The pace of deployment pressures has steadily eaten away at Pave Hawk mission capable rates in this time. While the Air Force has purchased operational loss replacement aircraft, in the form of modified Army UH-60 Black Hawks, the bulk of the fleet is now more than three decades old.

After nonstop rotations to Iraq, Afghanistan, Djibouti, and other locations since 2001, the fleet is not only wearing out but also shrinking from operational and combat losses.

The arrival of the Whiskey will hopefully “offset many of the maintenance issues we’ve had with the aging [HH-60 Pave Hawk] fleet,” said Soukup. As of April, the Pave Hawk mission capable rate hovers around 75 percent, and of USAF’s available 98 Pave Hawk airframes, 59 percent are available for operations at any given time, according to Soukup. “That’s an uptick over the last few years, but not by much,” he said.

USAF has long recognized the need to modernize its rescue helicopters, but plans have come and gone. Soukup noted the first validated requirements for a Pave Hawk replacement go back to 1998 and have since gone through several iterations. The Air Force’s first effort to modernize, the CSAR-X, was first awarded in November 2006. It aimed to put the first of 141 new helicopters on the ramp by 2012. It didn’t happen.

**KILL THE CSAR-X**

In April 2009, then-Secretary of Defense Robert M. Gates killed CSAR-X for good, ordering USAF to scrub the requirements and criticizing it as a “single-service solution” for the personnel recovery mission.

Since then, ACC officials have worked to “downscale” the requirements from CSAR-X into what became the CRH, Soukup said. USAF tried to “hold on to what they could in that effort,” he said, as on paper CSAR-X was a larger, more powerful aircraft with more capabilities, but also more costly and with more potential development risks. The initial winner in the 2006 competition was a Boeing variant of the CH-47 Chinook heavy lift helicopter. This award was later overturned after a protest by losing bidders Sikorsky and Lockheed Martin.

As part of the narrowed requirement, the CRH will be based on the Pave Hawk airframe—and will feature some enhancements to ensure better maintainability, interoperability with other systems, and increased modularity. The Pave Hawk fleet has been modernized over the years, but largely piecemeal, Soukup noted. This has resulted in a lot of “federated systems” on the helicopter that don’t necessarily integrate with each other as well as operators would like.

The lack of a “new-build” development program for the airframe is one of the big reasons why ACC’s programmers are feeling positive about the effort’s time line. “We have a way forward, and there’s nothing very technologically challenging in the way,” said William Young, ACC’s personnel recovery requirements division chief, in an April interview.

Several requirements still need to be “refined,” but this has more to do with bridging the understanding gap between USAF’s program needs and what the contractor can provide than any technical limitations. “It doesn’t mean that the CRH will be the same aircraft as the HH-60. In fact it will be different in many ways,” Young pointed out. Many aspects will be familiar to Pave Hawk crews, such as the T700-GE-701D engines and the Pave Hawk’s .50-caliber and 7.62 mm crew-served weapons. It will also field with composite wide-chord main rotor blades and corrosion-resistant materials to improve maneuverability at high-altitude operations.

But the HH-60W will be a tougher, more modular aircraft. Already widely known as a “flying ambulance” by Pave Hawk crews, one of the most closely watched categories in the program will be payload and weight. A fully loaded HH-60, with patient, crew, armaments, defensive systems, air refueling boom, and other specialized equipment weighs in at 22,000 pounds, all but ensuring the necessity of air refueling on long-duration or high-altitude missions.
ACC programmers plan to field the HH-60W with an additional max gross weight capacity of about 500 pounds, Soukup said. This would allow the ability to pick up two patients simultaneously if needed. Depending on mission profile and factors such as loiter time, altitude, and availability of air refueling, crews must now balance weight and fuel loads versus patient capacity.

Hover performance is also a capability ACC wants to see improved in the HH-60W, to improve capabilities in so-called “higher, hotter hovers.” This is a lesson Pave Hawk crews have gleaned from their experiences in high-altitude Afghanistan, where thin air and dusty, hot conditions combine to sap helicopter performance and contribute to maintenance backups on the ground.

CRH program officials will tweak capacity by decluttering the aircraft and consolidating avionics and subsystems that often have their own displays and take up more space than needed. “What the CRH will do is take a lot of those systems and more, such as Link 16, and get all that into a mission computer, which … will do a lot of that processing.” Young explained. Instead of numerous control heads for separate systems, a flight data management system will streamline the information and give the crew access to it on a set of multifunction displays in the cockpit, giving the crew the ability to declutter information required as the mission evolves.

The CRH, in addition to “glass cockpit” displays and modern avionics, will get some upgraded defensive tools along with its improved data link and communications capabilities. The modernized helicopter will begin arriving in the Air Force inventory as the service is looking to take the extensive combat experience gained in CSAR and PR missions over the last 14 years and adapt it to future scenarios where rescues may take place in more access-limited and highly contested areas. More of the combat air force will have to participate in these scenarios. They will require both capable platforms and highly trained rescue airmen.

“I think what we’re looking to do is refocus our efforts. I don’t see it so much as an adaptation,” said Maj. Michael Kingry, assistant director of operations for the 34th Weapons Squadron at Nellis AFB, Nev.—home of the USAF Weapons School’s HH-60 weapons instructor course.

**THE UNRELenting DEMAND**

Rescue airmen have trained for major combat operation rescues for years, figuring out how to survive surface-to-air missile threats or GPS jamming or electronic warfare threats, for example. But since 2001, “we’ve essentially had a generation of young rescue guys who are very used to doing [counterinsurgency warfare] but not doing a focus on [major combat operations] or force-on-force personnel recovery,” Kingry said. “They’ve got four-to-eight deployments to Iraq or Afghanistan, and they know how to operate in those environments. … We are refocusing those skills.”
Despite the drawdown from Afghanistan, Kingry noted, USAF’s HH-60 crews and rescue airmen are still in high demand from the combatant commanders—one of the reasons USAF does not want to delay the CRH.

Speaking at a Washington, D.C., industry conference in March, Air Combat Command boss Gen. Herbert J. “Hawk” Carlisle highlighted the CRH as “something we have to do, and we have to get it right” because of the unrelenting demand for highly trained PR forces.

Carlisle also noted USAF is modernizing the other legs of the service’s rescue mission—by replacing its HC-130 tankers with modern HC-130J Combat King IIs and also “evolving” how USAF organizes and deploys its pararescuemen (PJs), combat rescue officers, and survival, evasion, resistance, and escape specialists.

In February, USAF stood up its fifth Guardian Angel squadron at RAF Lakenheath, UK, the 57th Rescue Squadron. This process has unfolded since 2001 and splits PJs, CROs, and SERE specialists off from HH-60 squadrons and organizes them as their own entities.

Echoing Kingry’s point, Carlisle noted the combat air force has to work on how it executes some of the more “challenging events” PR forces could be called into in the future. Personnel recovery in the US Pacific Command is different from in Iraq, or in Europe, or in Africa, Carlisle said.

In short, PR and CSAR will touch more of the Air Force in the future—from space forces to cyber to the traditional “triad” of the HC-130, the HH-60, and the Guardian Angel squadrons.

“The big solution is less the materiel...

... but training for the larger ... air force on how to accomplish [challenged and denied PR],” Kingry said. This will involve improved offensive and defensive counterair coordination with PR forces, suppressing air defenses, building awareness on how to perform strikes on enemy forces in rescue scenarios, working out “on-scene commander” duties, and other aspects of the rescue mission.

In addition to replacing the Pave Hawk, the future of the A-10 poses a challenge—”insofar as the Warthog has served as the go-to armed escort and forward observer aircraft, capable of long loiter times needed to recover downed aircrews. Carlisle noted the problem during his March remarks in Washington, D.C., adding that USAF has to get a future “Sandy” aircraft that will be an interoperable part of the Air Force’s rescue capabilities.

With the possibility of the A-10 going away, HH-60 crews are training with more and varied aircraft from all services to accomplish the on-scene commander role, Kingry said. In the Weapons School course, this includes Pave Hawks themselves training in scenarios to take on the role, even working with multiple helicopters, such as with two- and four-ship Pave Hawk formations working with Army AH-64 Apaches or Marine Corps AH-1 Cobras.

Within USAF, at Nellis, there is ongoing testing with both F-15Es and F-16s to see what fighter could better handle Sandy duties if pressed into the task, Kingry noted, and soon the F-35 will be arriving in the Air Force and have to participate in rescue operations as well.

“I think we’re evaluating that right now,” Kingry of the F-35’s potential in rescue missions. “We may lose some capability, but we will gain some. It’s a matter of finding out its strengths” in operations.

Kingry noted that several of the F-35 pilots now flying at the Weapons School are qualified A-10 pilots who have deep knowledge of on-scene commander operations in CSAR missions and are working to adapt those skills for the F-35 force. Broadly speaking, Kingry said, he and his fellow instructors at the Weapons School are “trying to raise the [combat air force’s] level of expertise” in rescue operations.

STRAategic IMplications

Mission planning for personnel recovery events, in the past, was often thought of as a subset or contingency mission in many corners of the Air Force, Kingry observed. But rescue has large and strategic implications for these events, he noted.

The capture and eventual murder of Royal Jordanian Air Force 1st Lt. Moaz al-Kasasbeh by ISIS forces, after his F-16 crashed near Raqqa, Syria, last December, is a bitter illustration of how these events can have enormous repercussions beyond just the immediate operation, he said.

Inside ACC’s personnel recovery requirements shop, Young noted that Air Combat Command is not only keeping the CRH on track, but is responsible for making sure the CRH, the HC-130J, and the Guardian Angels are all able to execute their mission. “The path we are pursuing is not just interoperability” in the personnel recovery triad, but with the combat air forces as well, he said.

CRH is not CSAR-X Part II because the new helicopter will be more capable and better able to conduct operations with some of USAF’s most advanced assets than any previous Air Force rotorcraft. “We recognize the CRH is not a revolutionary leap in technology,” Young said. Still, when fielded, the HH-60W will be “evolutionary” and have more modularity than any of its predecessors.

“When it’s fielded, it is going to most likely [be] the most modern rescue helicopter in the world, with a ton of capability that the Air Force has never had,” he observed.