

How an Air Force-Industry Team Saved a Critical Asset

Before it could transform into a “Base of the Future,” Tyndall Air Force Base had to recover from Hurricane Michael—one of the most powerful storms to ever hit the mainland





SITREP

Hurricane Michael Slams Tyndall AFB

October 2018 is a time stamped into the collective memory of everyone who lives on the Florida Panhandle. That's when Hurricane Michael churned northward through the Gulf of Mexico and made landfall as the first Category 5 hurricane in history to strike the region. It was the fourth strongest hurricane to ever hit the continental United States. The storm produced sustained winds of 161 mph and a storm surge of 9-14 feet. In total, 74 deaths (including 15 in Central America) and about \$25 billion in damages were attributed to Michael.

In addition to civilian and commercial losses, the Air Force's Tyndall Air Force Base, located 12 miles east of Panama City, took a direct hit. Surrounded by the waters of Saint Andrew Bay and East Bay and only protected from the Gulf by a thin barrier island, Tyndall didn't stand a chance. Pounded by devastating winds and partially flooded by saltwater, the 79-year-old base was virtually destroyed.

In the destruction, the Air Force lost use of one of its most valuable assets: the home to two squadrons of F-22 Raptors and some of the best training airspace in the country. It was imperative that the base was up and running as soon as possible.

The challenges on the ground that fateful October day appeared overwhelming. Nearly half of the approximately 500 base buildings and operational structures

were destroyed or damaged beyond repair. Many buildings were exposed to the elements and in need of reconstruction. Nearly all communications (landlines, mobile communications, and Internet) were knocked out. Food, water, heavy equipment, and materials for the reconstruction effort were urgently needed, but had to be quickly acquired without impacting local communities, which were themselves struggling to recover.

To begin the repairs, thousands of workers had to be rapidly hired and given security checks since the work would be done on a military installation. And there needed to be set aside procurements for small businesses to meet federal disaster recovery requirements.

Fast forward to 2020. With most of the key recovery efforts completed, Tyndall AFB is now ready for its next phase: transformation into a military base of the future, with the latest networking capabilities, "smart buildings," and a modernized infrastructure designed to withstand future, severe storm impacts common to Florida. This is a unique story of how a profound challenge was met by a government-industry partnership between the Air Force and KBR, a global company specializing in government, technology, and logistics solutions.

– **Barry Rosenberg**

Contributing Editor, Breaking Defense



Task Force Talon II airmen rally at Tyndall in November 2018. They are responsible for clearing debris from various parts of Tyndall.

Devastation Abounds at a Critical Air Force Base

Tyndall AFB resembled a war zone after Hurricane Michael. About 50 percent of the 484 buildings on base were destroyed and unusable. Many other buildings were seriously damaged but stable enough for potential reconstruction. Much of Tyndall's vast 29,000 acres of forested land was flattened or denuded, leaving behind an immense tonnage of downed trees, uprooted shrubbery, and other debris scattered everywhere. While 33 of Tyndall's 55 F-22 stealth fighters were flown to other bases for safety, 17 of the F-22s were undergoing maintenance and unable to fly and had to be left behind to meet the storm's wrath. Some were damaged, though fortunately none seriously, and all have since been repaired and dispersed to other bases.

With no electricity, no running water or sanitation, no communications, no drivable roads, no food or potable water, and no ability to conduct missions, standing up the base within a reasonable time seemed a nearly impossible task. However, it was a vital task. Tyndall's most valuable asset—airspace for pilot training spread out over thousands of square miles of uninhabited base property and the Gulf of Mexico—is an essential one. The training area over Gulf waters is one of the largest in the world, stretching west from the base to Alabama and all the way south to the Florida Keys.

"Tyndall AFB is uniquely advantageous to the Air Force due to its geographic position, allowing for largely unrestricted airspace over the Gulf Coast and high-

growth potential, as well as its critical missions for Air Force lethality and readiness," said Col. Brian Laidlaw, commander of the Air Combat Command's 325th Fighter Wing at Tyndall, which trains and prepares F-22 pilots, intelligence officers, and maintainers. "There are things we do here we quite simply cannot do anywhere else. These are not operations that can be easily picked up and moved to another location."

The upshot is that unlike Florida's Homestead AFB, which was destroyed by Hurricane Andrew in 1992 and was on the Pentagon's Base Realignment and Closure list for shutdown but ultimately did reopen as a reserve facility, the Air Force decided to not only rebuild Tyndall but also transform it over the coming five years into what it's calling the "Base of the Future."

But before the Air Force could look forward to this Base of the Future, it needed to address the destruction at hand in the aftermath of Michael. To work alongside its own personnel in the reconstruction of the base, the Air Force turned to KBR for assistance and expertise.

Responding to the Challenge

KBR's Government Solutions U.S., which is KBR's global government services business, was engaged for the Tyndall rebuild under the Air Force Contract Augmentation Program (AFCAP). AFCAP contracts are awarded through task orders that permit the federal government to employ rapid-response contingency support to meet urgent needs, with vendors pre-qualified in civil engineering and logistics.

KBR's task order for Tyndall was awarded as a cost-plus, fixed-fee contract.

"In reality, not even the military has the ability to recover all by itself from an event such as Hurricane Michael," said KBR Senior Vice President Ella Studer. "Because everybody in the military already has a regular job, they're limited in their resources and ability to bring in large quantities of engineers to do disaster recovery. They don't need a big standing force of people to specifically respond to isolated but cataclysmic events like this, so that's where contractors step in. As such, this is a remarkable story about how the government and industry teams came together to accomplish a unique and urgent mission."

KBR personnel began arriving at Tyndall within 48 hours and joined with the Air Force's Task Force Phoenix, comprised mainly of civil engineers along with the Army

Corps of Engineers and the Air Force's Rapid Engineer Deployable Heavy Operational Repair Squadron Engineer (RED HORSE) unit. They immediately began assessing damage, clearing debris, and stabilizing/repairing buildings. KBR also assisted with airfield management to keep the flight line open for additional supply and relief efforts, a critical logistical connection.

In addition to Task Force Phoenix, the Air Force established two other recovery task forces, one to repair the damaged flight line to ensure the F-22s, when repaired, could depart and the other to address personnel issues like housing, schooling, and administrative issues.

"It was like landing on the moon when we arrived," said Studer. "And to compound the problem, our primary Air Force client—the ones responsible for directing the emergency response—were located at Tyndall Air Force Base. The people that we were in direct contact with about the recovery were evacuated themselves, as their offices had been destroyed. So, one of our first orders of business was to begin coordinating with them through satellite communications and several dozen two-way radio handsets that our people brought with them."

Establishing voice and data comms was only an initial challenge that Task Force Phoenix and KBR faced. Another critical challenge was establishing basic life support services by supplying food, water, and ice for the military personnel working the recovery, as well as those responsible for base security. (All families and non-essential personnel were evacuated.) Within days after the storm, KBR had delivered 63,000 meals ready to eat, 21,000 bottles of water, and 40,000 pounds of ice in 10-pound bags. KBR also completed the construction of a dining facility specifically for military personnel nine days after recovery operations began. (KBR also established its own dining operations separate from the military's.)

"We put a commercial kitchen on the backside of the facility and hired a company out of Louisiana that made good Cajun food," said Chris Schulze, KBR's AFCAP deputy program manager and project manager for Tyndall. "In the first three months we served about 100,000 meals, including Thanksgiving and Christmas. That brought some form of normalcy for the military personnel working there who had to be away from their families."

Augmenting KBR's challenge of providing life support services was compliance with the Stafford Disaster Relief and Emergency Assistance Act. The Stafford Act governs

the use of the federal government's disaster aid to state and local governments and stipulates that contractors like KBR cannot compete for supplies with local communities that are themselves struggling to recover and desperate for local supplies.

"Literally every bottle of water needed to be transported in; you couldn't contract for it locally because we couldn't and didn't want to draw resources away from disaster relief in the local community," explained Thomas Lampley, vice president of external affairs at KBR Government Solutions and AFCAP program manager. "This needed to be done on a massive scale without taxing any local capability or resources."

In addition to not diverting resources from surrounding areas, KBR also made sure they supported regional communities by putting money back into their economies. With the airbase connected to Panama City by Highway 98 via the Tyndall-DuPont Bridge, KBR found many jobs for Panama City's workforce to help with the rebuilding effort. Local hotels and restaurants around Tyndall also benefited, housing the response workforce in a way that did not conflict with local relief efforts.

"We found local accommodations that could take our employees and we were able to release the motorhomes we were living in," said Lampley. "Eventually we were even able to discontinue the use of the KBR dining facility. Our dollars were spent in the community and contributed to helping the local economy get back on its feet."

The next primary task after life support was debris removal. That included removal of tangles of trees, mazes of sheet metal, structural rubble, and even wrecked vehicles. Air Force equipment and materials located near the shore in support of their training operations washed inland from the massive storm surge. Winds caused most of the damage, though. Sheet metal, roofing material, trees, and organic



Hurricane Michael—only the fourth Category 5 on record to hit the U.S.—barreled over Tyndall Air Force Base causing devastating damage to the base's infrastructure.



Tyndall debris removal.

rubbish were blown everywhere. Heavy metal I-beams that supported structures were down. Hangar doors dangled from their supports.

Ahead of the storm, dozens of pilots were needed to fly the 33 F-22s and other aircraft to safety and most drove to the base in their personal cars. These cars and other vehicles were left behind and became a mangled mess that blocked access to work areas.

The first order of business was to remove the blockage from the flightline area of the base and open the taxiways and runways so that new supplies could be flown in. After that, hangar areas needed to be cleared out, followed by administrative buildings.

For organic debris, KBR brought in huge grinders with 20-foot maws to grind the material. A dumping area was established to hold all the mulch. Likewise, metal debris was consolidated into another pile and construction debris into another.

Debris removal took 3-4 months and ultimately KBR collected and removed 792,450 cubic yards of material. This included 605,100 cubic yards of trees and organic material, 122,100 cubic yards of metal, and 62,250 cubic yards of construction and demolition debris. In all, the Air Force estimated that the cumulative debris was enough to have filled the U.S. Capitol rotunda almost 17 times over.

Debris removal was also the most hazardous part of the cleanup effort. Dangers abounded in the storm's aftermath, from structures drooping precariously to displaced wildlife such as snakes and a hungry bear that roamed around at night outside the base perimeter where

KBR and its subcontractors had set up their operations. "We had more than 3,000 subcontractors to keep an eye on," said Schulze. "There were hundreds of guys working on roofs, tree grinders operating, and hazards everywhere you turned. Our safety team was constantly driving around watching the crews. If they saw something amiss, they would do a safety stand down and then incorporate lessons learned into the next day's safety briefing."

Added Studer: "A zero-harm safety culture is ingrained in the fabric of KBR and we relied on that daily in this dangerous environment."

With dozens of new people being hired every day, KBR credits its daily safety briefings held every morning in the parking lot with helping to keep everybody safe. In fact, given the circumstances the safety record was remarkable with only one reportable injury for the entirety of the project.

The Road to Recovery

Once the debris was cleared, the final order of business was reconstruction. With the Air Force team determining which buildings needed to be torn down, rebuilt as temporary structures, or permanently reconstructed, KBR set about the job. With the final work to be completed in the end of the second quarter of 2020, the Air Force/KBR team can look back now at an impressive accomplishment: the replacement of 816,157 square feet of roofing (equivalent to about 14 football fields). In addition, 127 facilities were stabilized and permanent repairs were done on 50 buildings to include restoration of five aircraft hangars back to operational status. Everything emanated from a standing start at a time of immense crisis.

Perhaps KBR's most pressing job during the final reconstruction phase was the repair of Tyndall's air traffic control tower, crucial to the operation of an air base. The tower was severely damaged by both the hurricane and a tornado spawned during Michael that traveled down the flight line. The tower structure itself was repairable but windows were blown out causing tremendous damage to the equipment it housed and leaving it functionally inoperable.

The Air Force had to replace all of the technology contained within—but that couldn't happen until KBR replaced the massive, bullet-proof, custom-built windows. Of course, these weren't windows that you could just pick up the phone and call commercially for a replacement.

"Without a control tower it's not much of an airbase," said Schulze, noting that the Air Force installed a temporary,

ground-level control facility with limited capability while the main tower was repaired. “Loss of the tower was a big restrictive factor for the airbase. A real challenge for us was finding a company to manufacture the custom glass, and who also had the specialized lift to install it in windy conditions hundreds of feet up in the air.”

Seven months after Hurricane Michael, in May 2019, the rebuilt air traffic control tower was again back in operation, controlling flights in and out of Tyndall AFB.

In Sync With the Air Force

One of KBR's biggest logistic and management hurdles in the Tyndall rebuild was pulling together all the personnel and expertise necessary to do the work. Ultimately, there were more than 3,200 civilian workers operating under KBR, and virtually all of them were hired under small business rules. As per contract requirements, such small business companies had to receive 35 percent of all dollars spent. KBR almost doubled this required amount, spending close to 70 percent on small businesses.

And due to the sensitive nature of Tyndall's mission and the presence of the grounded F-22s, each worker had to undergo a security background check.

“In the midst of this chaos we had to comply with all the policy formalities of contracting and meet the small business goals of the task order,” said Studer. “For the majority of the work we had to find and hire qualified small businesses, as well as complete security background checks. And we had to oversee second- and third-tier small businesses to make sure they conducted their own background checks properly.”

Recruiting, screening, and managing such a force required KBR to muster its experience gained in prior disaster recovery projects around the world. It began with the use of sophisticated project management software for planning, scheduling, and controlling large-scale programs and individual projects.

The secret sauce for successful management, however, is about having the right people in the right place to accomplish the tasks at hand.

“You have to have the proper software, but the key is having leaders and employees with the experience, practicality, judgement and know-how to run these types of projects,” said Studer, noting that KBR's senior executives, including President and CEO Stuart Bradie,



An empty and damaged air traffic control tower shadows over the flightline at Tyndall Air Force Base, Fla. KBR replaced 12 panes of glass in seven days in the air traffic control tower cab.

all traveled to the base for on-site visits. “Successfully managing such a large force of subcontractors requires close cooperation among schedulers, procurement specialists, project controllers, accounting and finance, operations, and site superintendents. All have to work together to meet the client's requirements.”

That meant close alignment, teamwork and coordination with Tyndall's leadership and contracting officer to prioritize the work effort, control costs, and meet milestones. KBR met with the Air Force project managers two to three times daily for what they called “sync meetings” to make sure everyone was on the same page, with the right information and directives regarding constantly evolving priorities in a fluid recovery situation.

“Cooperation with the Air Force was amazing,” said Schulze. “We worked together as a cohesive team; nobody cared what your background was—Air Force, Army, or contractor. Priorities were always shifting and the best way to keep on top of that was meeting three times a day for sync meetings.”

“The Air Force was extremely supportive, encouraging and motivating. Everyone was working so many hours that we all looked out for each other. It was definitely a family atmosphere, a cohesive, mission-focused team not unlike that in a combat zone such as Iraq or Afghanistan.”



Brig. Gen. Patrice Melançon Discusses the Tyndall Base of the Future

Tyndall Program Management Office Executive Director Brig. Gen. Patrice Melançon and 325th Fighter Wing Commander Col. Brian Laidlaw are leading the \$4.25 billion rebuild and working to build the Base of the Future. The base is currently doing 90% of its missions with 80% of its people in 50% of its buildings. Tyndall is preparing to receive three F-35 fighter squadrons beginning in Sept. 2023.

The reconstruction of Tyndall AFB by the Air Force, Army Engineers, KBR, and other organizations now makes possible a new objective for the facility—a \$3 billion program to transform the base into a model base for the future. On the operational side, the flight line area will be modified to make room for three squadrons of F-35 Lightning II fighter jets comprising 72 aircraft, as well as potentially one squadron of MQ-9s Reaper armed, medium-altitude remotely piloted aircraft.

On the facilities side, the base will become a digitally connected facility with multi-use, smart buildings that will improve data collection and energy efficiency, while being hardened against hurricanes. The base will be a walkable campus, including a community commons equipped with a new chapel, child development center, bowling alley, and other quality of military life facilities. The Florida Department of Transportation is investing \$20 million in a flyover connecting the north and south sides of the base over U.S. Highway 98 to improve traffic flow within the base (directly connecting the north and south sides of the installation to improve productivity) and along a major thoroughfare.

In September 2019, the Air Force awarded the first two military construction contracts under the Base of the Future plan for Tyndall. One was for \$11.8 million to construct a fire station and the other was \$17.6 million for an Air Battle Manager F-15 simulator building.

Overseeing development of the new Tyndall AFB is Brig. Gen. Patrice Melançon, executive director of the Tyndall Air Force Base Reconstruction Program Management Office. She discussed some of the challenges associated with the Tyndall Base of the Future with Breaking Defense.

Breaking Defense:

What are the three main challenges associated with the Base of the Future?

Melançon:

Funding uncertainty, not knowing how much money we would get made it very difficult to plan the overall execution. Some would say that project priorities should be irrespective of the funding flow. To an overall degree that is true, but I would argue that when you get down to the specifics (and) when you will get funding matters a great deal when trying to sequence out all of the requirements.

Building a base of the future presented both a challenge and an opportunity. The Air Force has been working on the base of the future concept for several years, but there is not a specific definition of what that means. It means different things to different people. While there are specific concepts that have been codified, the details have not. So, in many regards, my team is looking at what is available in the commercial sector and engaging with AFWERX at the Air Force's Innovation Hub in Las Vegas to bring the right technologies and techniques to bear as we rebuild Tyndall. (**EDITOR'S NOTE:** AFWERX works across industry, academia, and non-traditional contributors to leverage new technologies and commercial best practices. It was established in 2017 and reports to the Air Force vice chief of staff.)

The third is manpower resources. A typical Air Force base might get one Military Construction (MILCON) project in a year, sometimes none. In this case, there are 42 MILCON projects that will start over the span of a couple of years. The entire Air Force typically gets anywhere between 25 and 50 MILCON projects in

any given year—that's Air Force wide. The base is not manned to manage that much construction, and even with the support of the Air Force Civil Engineer Center, we are having to staff up. We are taking full advantage of contracted support, but you still need a complement of government personnel to oversee those contractors.

Breaking Defense:

Describe your plans for the use of smart systems.

Melançon:

My team is working to put systems in place that will allow us to be much more proactive with our infrastructure maintenance. Most mechanical, electrical, and power equipment systems come with sensors that produce data that can be used to measure how well, or not, a building system is performing. In addition, those sensors can be used to optimize utilities.

Between both of those, my team is moving to set the base up to be able to do condition-based, predictive maintenance on our infrastructure, allowing us to spend less money at the right time and be able to operate our facilities in such a way as to minimize utility expenses. My team is also looking to invest in state of the art technologies related to perimeter security.

Breaking Defense:

Describe how the Air Force will work with industry on the Base of the Future.

Melançon:

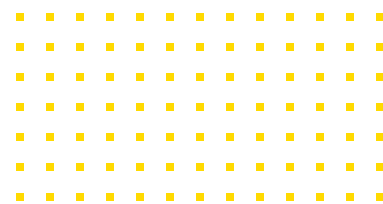
While we are just getting started, we do have the full attention and interest of industry. Tyndall has held three sold-out industry days and the Army Corps of Engineers has held one so far. A project this large and this complex comes with some significant risk.

Just a few of the areas we have discussed with industry are: (1) how do contractors find, hire, and retain enough skilled labor; (2) how is that labor housed and cared for over the course of the construction effort; and (3) how do contractors manage material procurement, storage, and delivery.

That's just the tip of the iceberg. As we continue to craft the overall plan for execution, our industry partners will be one of the keys to our success.



Breaking Defense thanks KBR for their support of this Pathfinder case study.



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