

Marine Corps Air Station New River

The future of installation innovation and logistics

by LtCols Roger Holliday, Jr., Steven Huls, William Oren & Mr. Kirk Kropinack

Marine Corps Air Station New River continuously works to enhance the readiness and deployability of the Marine Corps. Through multiple innovative models, the Air Station has streamlined the response time on the flightline during extreme weather conditions, created realtime dispatching and tracking of aircraft refueling trucks, and instituted autonomous refueling capabilities for hot refueling, which reduced manned hours. Additionally, the Innovation and Readiness Department created a simulation that demonstrates both negative and positive impacts upon functional areas, which in turn communicates risk for our ability to provide vital services to deploying and non-deploying commands. Furthermore, a planned partnership with the North Carolina Department of Natural Resources will build one large stormwater management device, the first of its kind in North Carolina. The partnership and stormwater management project enhance the mission of the Marine Corps by better enabling the construction of modern facility infrastructure.

A routine day aboard Marine Corps Air Station (MCAS) New River took a tragic turn on 11 July 2017, when Cpl Skyler James of Marine Medium Tiltrotor squadron 261 lost his life after a lightning strike while performing routine maintenance on an MV-22B Osprey. State-of-the-art weather radars, precise forecasting, and digital notification systems of the 21st century could not overcome the challenge of communicating in the loud, spacious,

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Daily fueling operations are key to supporting the OpTempo of the nearly 50 percent of 2d MAW aircraft that are based at MCAS New River. (Photo by Cpl Christian Ayers.)

and demanding work environment indicative of a flight line. Even with the technological advantages known to the modern military, the death of Cpl James highlights a requirement to provide our Marines the ability to stay safe during hazardous weather conditions. While ideas and concepts came forth in the discussions that followed the tragic event, a better method of mitigating risk to hazardous weather and communicating over large distances originated

from a Marine officer while staffing a separate infrastructure improvement project.

Upon his assignment as the Director of the MCAS New River Installations and Environmental department in December 2018, LtCol Roger "Doc" Holliday sought to best mitigate future tragedy by developing a cost-effective, timely, and simple method for communicating hazardous conditions to Marines working on the flight line.



This water infiltration basin will provide MCAS New River with 190 acres of impervious area and will be able to handle the first two inches of storm water runoff. This decreases the need for stormwater ponds on the flightline, reducing Bird/Aircraft Strike Hazard (BASH) concerns by eliminating the bird habitat. (Photo by Cpl Christian Ayers.)

While collaborating with the Duke Energy Corporation on a runway lights replacement project, an idea came to LtCol Holliday to use a visual system that could notify Marines of hazardous weather conditions. A lightning system of adequate intensity, shared location, and timely activation could provide further risk mitigation to injury or death to all personnel on the flight line from lightning strikes. In partnering with the Duke Energy staff, LtCol Holliday began designing what came to be known as the Lightning Warning System (LWS) in August of 2019. Because of the nature of the concept, readily accessible resources, and availability of expertise, LtCol Holliday went from design, testing, development, procurement, and installation of the first four systems within eight months. This relatively quick timeline and effectiveness are largely because of the simplicity of its design and employment.

The characteristics of the LWS provide a lightweight, visible, and effective notification method by arraying two rows of four blue lights that continually flash during activation. The activation of the LWS begins with MCAS New River Air Traffic Control tower after receiving a lightning strike notification within five nautical miles from MCAS

New River Weather. Next, the broadcast of a standard message is given by Marine Corps Base Camp Lejeune Provost Marshals Office through a preexisting Public Announcement device aboard MCAS New River. Then, the lights flash continuously, and the audible message plays once every ten minutes after activation, gaining the

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attention of everyone aboard the Air Station. The LWS concept is a result of the critical thinking of LtCol Holliday and his efforts to tailor a solution to the problem. LtCol Holliday and his staff's timely actions truly represent the innovative mindset sought after by leadership and executives throughout the DOD and private industry.

In 2019, MCAS New River initiated another project called the Air Station Readiness Model to increase the readiness of its air station units and increase the readiness of the air station's deploying commands while bringing

the installation into the modern era and beyond. To accomplish this task, the Air Station created an Innovation and Readiness department. This new, small department can potentially impact not only the air station but also the Marine Corps significantly. The department's first task was to interview personnel across the air station staff that provide aspects and define the services to determine the qualitative and quantitative measures of performance. The goal was to prioritize major readiness inhibitors and identify areas that would improve fastest. Following this prioritization, the team integrated available data sources to develop a predictive model of Air Station functional areas. This model, called the Readiness Network, represents all required functional support areas and their relationships and, through a predictive formula, interdependencies between functional areas based upon preset performance levels. The team is currently utilizing Common Output Levels of Service performance ratings as the preset standard of performance. Additionally, the team can change each functional area's performance independently from any other area. Then, a simulation can be run utilizing a Bayesian formula that incorporates

current and past performance data to predict potential second and third order effects to other established Air Station functional areas. This simulation demonstrates both negative and positive impacts upon functional areas, which in turn communicates risk to our ability to provide essential services to deploying and non-deploying commands. Leadership can evaluate these risks to develop resilience plans, assist in limited resource decision making, or as focus areas for innovation.

Through MCAS New River's initial analysis, fuel services were identified as

areas where immediate change could make significant gains. The initial focus was on the general behavior patterns of both refuelers and tenants requesting fuel. During this study, the team determined that some squadrons were repeatedly requesting minute amounts of fuel, resulting in fuel truck delays. The next endeavor was to reduce wait time for refueling aircraft with operating engines, known as “hot refueling.” After a review of more than six months of data, an optimal schedule was developed. The new schedule reduced wait times, resulting in less wear-and-tear on

enence significant growth in infrastructure, which has stressed its ability to meet the requirements for stormwater quality and quantity management under current state and federal rules. Currently, MCAS New River operates under a system regulated by the North Carolina Department of Natural Resources (NCDENR) that requires a distinct permit for each new project where new impervious surface is required. This system has resulted in over 60 stormwater permits and multiple stormwater management devices on an installation that is severely constrained

geese, egrets, and herons—resulting in an elevated Bird/Aircraft Strike Hazard (BASH) risk. In order to provide flexibility in future infrastructure growth and reduce BASH concerns, MCAS New River has developed a plan with NCDENR to build one large stormwater management device: an infiltration basin that will serve as a “stormwater credit bank.”

The infiltration basin is located away from the airfield, adjacent to the installation ammunition supply point, in an area where brick-and-mortar facilities cannot be built due to the associated explosive safety arcs. This location effectively utilizes an unbuildable area, reducing space limitations and places the stormwater management well away from aircraft operations.

The basin will be engineered to manage up to the first two inches of stormwater runoff, as required by NCDENR stormwater rules for coastal counties, and sized to handle 190 acres-worth of impervious area. The basin’s engineered infiltration rate prevents standing water for longer than twelve hours; it is absorbed into the ground within that time, minimizing BASH concerns. Once complete, the “credits in the bank” will

aircraft parts, reduced lost man-hour production, and revealed the potential for more than four million dollars in savings when projected across a year. Following the review of hot refueling, efforts transitioned to refueling aircraft with engines off, known as “cold refueling.” To further improve efficiency, the air station is exploring innovative solutions that include realtime dispatching and tracking of aircraft refueling trucks and autonomous refueling capabilities for hot refueling.

Once the Readiness Model is further developed and validated, the aim is to ensure the model is scalable for other bases and stations across the Marine Corps. While each installation is unique, the core of the model remains true. Tenant commands depend upon hosting installations to provide essential services to generate readiness, including maintenance of buildings, power, fuel, identification center, operations center, and safety. With moderate tailoring, the MCAS New River’s Readiness Model could be developed for any other Marine Corps base or station.

Another example of the innovation aboard MCAS New River is the collaboration for an environmental project. MCAS New River continues to experi-

for buildable space because of flood plains, wetlands, explosive safety arcs, airfield safety regulations, among other considerations. In most cases, the current stormwater management features are ponds, which happen to provide habitat for water birds—gulls, ducks,



The Lightning Warning Panels provide a visual indication to all personnel on the flightline when lightning is detected within five miles of MCAS New River. This provides realtime warnings for observed hazards to protect the Marines, Sailors, and Airmen supporting the ACE mission of II MEF. (Photo by Cpl Christian Ayers.)

be managed under one permit by the MCASNR facilities planners in concert with NCDENR. The advantage to NCDENR is a reduced manpower effort in their management (inspections, permit modifications, etc.) of the 60+ permits. Additionally, from an environmental quality standpoint, the basin will capture and treat stormwater from the bulk of MCAS New River's cantonment area. Because of the age of the infrastructure, it is not currently managed in any way. Most of the cantonment area was constructed before the current stormwater regulations; therefore, it was grandfathered with minimal stormwater management required. This new basin results in improved water quality in the surrounding waters not currently attained. Once in place, the stormwater bank can provide flexibility in infrastructure

growth in space-constrained areas such as the flightline and can be used to "buy areas" where current stormwater management features are simply taking up space. This project provides an additional tool for the Installation Development Program to meet regulatory

abling the construction of modern facility infrastructure—the platforms where we train and maintain and from which II MEF forward deploys.

MCAS New River's innovative models demonstrate the station's commitment to the progress and process improvements of its capabilities to the tenant commands. These efforts provide aviation support, force protection, infrastructure, and community services to promote the readiness, sustainment, and quality of life for II MEF personnel and their families.



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requirements, more effectively utilize buildable space, and improve aviation safety. Bottom line: this supports the mission of the Marine Corps by en-

MAJGEN HAROLD W. CHASE PRIZE ESSAY CONTEST

The annual MajGen Harold W. Chase Prize Essay Contest invites articles that challenge conventional wisdom by proposing change to a current Marine Corps directive, policy, custom, or practice. To qualify, entries must propose and argue for a new and better way of "doing business" in the Marine Corps. Authors must have strength in their convictions and be prepared for criticism from those who would defend the status quo. That is why the prizes are called Boldness and Daring Awards

Prizes include \$3,000 and an engraved plaque for first place, \$1,500 and an engraved plaque for second place, and \$500 for honorable mention. All entries are eligible for publication.

INSTRUCTIONS

The contest is open to all Marines on active duty and to members of the Marine Corps Reserve. Electronically submitted entries are preferred. Attach the entry as a file and send to gazette@mca-marines.org. A cover page should be included, identifying the manuscript as a Chase Prize Essay Contest entry and including the title of the essay and the author's name. Repeat the

title on the first page, but the author's name should not appear anywhere but on the cover page. Manuscripts are accepted, but please include a disk in Microsoft Word format with the manuscript. The *Gazette* Editorial Advisory Panel will judge the contest and notify all entrants as to the outcome shortly thereafter. Multiple entries are allowed; however, only one entry will receive an award.



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