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Resilience Component Plans Target Readiness

Resilience component plans, by building upon previous master plans, seek to assess risks for individual components within military installations while providing a framework by which projects can be prioritized.

By Nadja Turek, P.E., LEED AP, F.SAME, and David Helter, AICP

Holloman AFB in New Mexico used to rely on Bonito Lake for its drinking water supply until June 2012, when the Little Bear wildfire wiped out nearby trees and vegetation. A subsequent monsoonal rain event caused a landslide of ash and debris, silting in more than two-thirds of the lake. The base and its neighboring community, Alamogordo, had to rapidly pivot to a system of groundwater wells for their drinking water. Restoration efforts are currently underway, with anticipation that the lake will return to service by 2022.

The situation at Holloman, while specific to its geographic area in some ways (the Little Bear wildfire was the largest in New Mexico history), is not unique to the Department of Defense on a macro level. As a result, the *National Defense Authorization Act for Fiscal Year 2020*, recognizing the need to plan for resiliency and reduce the risk of mission disruption, contains a new requirement for Installation Resilience Component Plans (RCPs).

RCPs fill a gap in current installation planning by characterizing and addressing future risks and threats to missions, including extreme weather events. The plans place special emphasis on risks to assets or infrastructure critical to missions and they identify projects to mitigate impacts from events—both on installations and in surrounding communities. Because RCPs are concerned with on- and off-base solutions, they are informed by and similar to Joint Land-Use Studies or encroachment plans, which require collaboration with community partners.

Importantly, the 2020 defense act also adds "resilience" as a rationale to justify project funding to Congress.

IDENTIFYING DISRUPTION RISKS

Traditional master planning—the realm of Installation Development Plans (IDPs), Area Development Plans (ADPs), and various component plans—is constantly evolving to better support mission needs. Existing component plans supporting IDPs identify projects driven by mission requirements,

SPECIAL REPORT: RESILIENCE & PREPAREDNESS



sustainment, or financial return. RCPs now ask installation leaders to integrate risk management in planning and to identify projects justified by risk reduction.

The RCP requirement comes as extreme weather events and disruptions are impacting installations, the vital resources they contain, and the crucial missions they support. Master planning and facility design decisions, which affect long-term investments, should no longer be based on the statistical occurrence of past events, as historical patterns can be poor

indicators of the future.

RCPs must be informed by climate projections appropriate to an installation's lifespan, a process started in encroachment planning in the last decade. Climate adaption plans, such as the Michigan National Guard's "Climate Preparedness and Resilience Plan" from 2016, have been developed in pockets. But while such plans have typically characterized climate risks, they have not established the base-specific project priorities and management actions now required by legislation.

RCPs also build upon Installation Energy Plans, which are short- and longrange plans for energy resilience that have been required since May 2018. Some bases have incorporated

Assessing the impacts of extreme weather events to the surrounding community is a key component of Resilience Component Plans. Through events like Community Resilience Planning Roundtables, installation and community stakeholders can collaborate to develop solutions. PHOTO COURTESY WOOLPERT

Hurricane Laura made landfall in southwest Louisiana in August 2020, disrupting utilities and blocking vehicular traffic. Resilience Component Plans aid installation master planning by characterizing the risk that future extreme weather events pose to critical infrastructure and surrounding communities. PHOTO BY GEORGE STRINGHAM, USACE ST. PAUL DISTRICT

Installation Energy and Water Plans (IEWPs), which address both energy and water resilience. Woolpert has developed several IEWPs in the last 18 months and has found they accomplish many, but not all, of the objectives of an RCP. If an installation already has an IEWP, preparing an RCP would be faster and easier. Similarly, if an installation prepared an RCP, it could, and

should, encompass energy and water requirements.

A STEPPED APPROACH

Developing RCPs begin with assessing risks for natural disasters such as floods, droughts, and wildfires using future projections from down-scaled global climate models, in addition to existing vulnerability studies for man-made disruptions. The result will be a set of ranges for future conditions with timetables and probabilities, including sea level rise, storm surge, wildfire risk, drought risk, and extreme temperatures.

This is fundamentally different from the natural constraint mapping that is currently conducted during master planning. Developing down-scaled climate models requires planners to agree on emissions scenarios they want to model and assumptions they wish to adopt. The climate modeling scenarios use representative concentration pathways for simulating and representing future climate data based on global carbon emissions levels. Likely, planners would settle on a few scenarios that constitute a range of reasonable outcomes.

The process of model development will force much-needed discussion of climate scenarios for each installation. The U.S. Army, to streamline this first step across its enterprise, has funded



SPECIAL REPORT: RESILIENCE & PREPAREDNESS

MANY PURPOSES, MANY PLANS

Military installations often have many separate component plans that serve different purposes. And while the plans can be complementary or independent, they all address key sustainability and mission assurance concerns.

- Area Development Plans and Associated Network Plans: A plan to determine project needs driven by normal mission requirements.
- Traditional Energy and Water Plans: A plan to determine project opportunities to reduce energy and water use and cost, typically determined by lifecycle cost and pay-back periods.
- Joint Land Use Studies and Encroachment Plans: A plan to determine project needs driven by mission sustainment.
- Resiliency Component Plans (incorporating Installation Energy Plans): A plan to determine and prioritize projects that buy down risk, then ranked by risk and replaceability scores.

the Climate Assessment Tool, a web-based map of climate-related threats for 118 posts using two emissions scenarios.

Informed by the risk assessment, installation and community stakeholders next must work together to develop resiliency planning scenarios, which should be reduced to a manageable number. It is necessary to whittle the wide scope that a risk analysis identifies down to a handful of agreed-upon, meaningful planning scenarios. This recommendation mimics the methodology adopted in a study released in 2016 by the Strategic Environmental Research & Development Program titled "Regional Sea Level Scenarios for Coastal Risk Management: Managing the Uncertainty of Future Sea Level Change and Extreme Water Levels for Department of Defense Coastal Sites Worldwide." Scenario development is an essential first step to resiliency planning, and this is a fundamental way that it differs from traditional land-use planning.

DETERMINING INSTALLATION NEEDS

Criticality is scenario dependent. Installations will have different critical facilities and infrastructure depending on the type of disruptive event and stage of response and recovery. Determining which facilities are critical will vary depending on the scenario, which demonstrates the need for flexibility. RCP stakeholders will also determine resiliency goals, such as determining how many days to sustain during outages and for which facilities.

In developing solutions, stakeholders should focus on three areas to mitigate or reduce risk under the planning scenarios and work toward the established goals: identify and prioritize resiliency projects to compete for funding; update the base's design guidance, plans, and policies; and identify "outside-the-fence" resiliency projects requiring cooperation from external stakeholders. To determine the cost-effectiveness of risk reduction, it is necessary to compare project costs to how much risk it "buys down." The Department of Defense does not currently have a standardized process for estimating the value of risk reduction. Therefore, a coincident effort is required by the department to develop guidance to standardize the valuation of risk reduction and the prioritization of projects for government funding. It also stands to reason that for the RCPs to have value, a funding stream is required for resiliency projects based on buying down risk.

Resiliency planning will instigate updates to a variety of established policies, guidance, and plans. For example, natural constraint maps using future projections from climate modeling will change land-use and development opportunities in the IDP and ADPs. Design guidelines for critical buildings should include when and

how to incorporate passive survivability and redundancy. A new installation-specific future weather file, used in energy modeling and HVAC system sizing, could be prepared for designers to use for new buildings or major renovations.

Potential resiliency projects that arise outside an installation's boundaries should not be overlooked either. Resources such as medical facilities, transportation systems, and infrastructure for energy and water may be vulnerable and need to be addressed to maintain mission capability or to mitigate their impacts on the resilience of the military installation. New community partnerships, funding mechanisms, and engagement strategies should be included in the RCP.

EMPHASIZING MISSION ASSURANCE

The preparation of an RCP is another step forward in the military's quest for mission assurance.

Resiliency planning will result in a list of projects prioritized based on their potential to reduce risk. RCPs represent a unique set of requirements not currently captured in other installation plans. And those requirements may lead to changes by thoroughly addressing and incorporating resiliency practices into everyday activities. Installation planners and stakeholders will need to engage more with neighboring communities to identify and work on resiliency efforts and projects beneficial to everyone.

By placing special emphasis on risks to mission-critical assets and infrastructure, RCPs can provide a new framework to enable military readiness, and a resilience to foreseeable risks and threats, including extreme weather events.

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