

FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

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MCAS Yuma/APS Project Case Study

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Hosted by:





Innovation is the Road to Resilience

Where we were...

The Marine Corps has always looked at all funding options along with possible hybrid approaches to provide backup and/or continued power after an event that causes us to lose external power

Where we are going...

Recent direction from our Commanding General is to provide a 14 day off-grid solution



Testing your Aviation Knowledge

**Who can tell me the type of aircraft
on the next slide?**



F-35B Joint Strike Fighter (JSF)





Down-Time Is Not an Option in Flight and Facility Operations

- ***Missions*** are impacted by:
 - Voltage fluctuation
 - Surges
 - Harmonics
 - Frequency variations
 - Low power factor
- These impacts, also known as “dirty” power, can:
 - Knock computer programs offline
 - Affect mechanical systems, like shutting down A/Cs



What Are the Average Temps in Yuma, AZ?





Addressing Mission Impacts

- In 2014, MCAS Yuma and Arizona Public Service (APS) began discussing an agreement that would benefit both APS and Marine Corps
- About the same time, the SECNAV's goal was to increase renewable energy generation, so the Navy established the Renewable Energy Program Office (now called the Resilient Energy Program Office)

Innovation is the Road to Resilience



Project Overview

- State-of-the-art microgrid combined with 25 MW of traditional generation (ten, 2.5 MW generator blocks)
- Capable of integrating other power sources (e.g. solar, storage) — currently working on a storage opportunity
- Provides enough backup power to cover 100% of the base and future requirements
- Located on approximately one acre of MCAS Yuma land
- APS handles all the operations and maintenance

The microgrid forecasts outages or events and starts up if it senses something that would harm the base



Project Benefits

Anticipated:

- **Guaranteed base-wide backup power for any duration**
- **Improved quality of life for all personnel on base**
 - HVAC won't go down in heat during an outage
- **Reduced number of building-level generators**

Unanticipated:

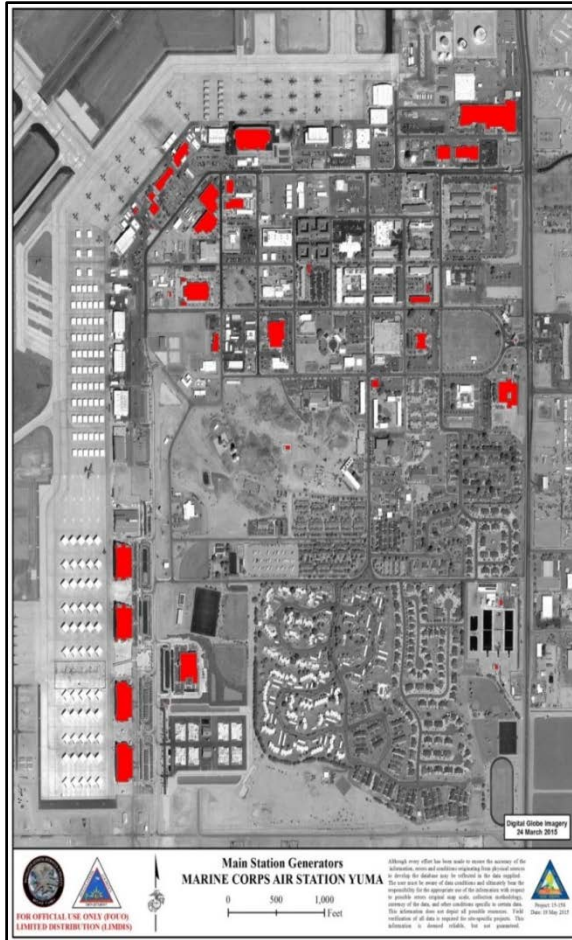
- **"Clean" power to the base reduces overall burden on facilities and maintenance**
 - Saving >\$300K annually in maintenance
- **Investigating mission impact**
 - First look >\$M

How Did We Get Here?





Energy Resilience: It's All About the Mission



Before



After



Moving In





Modular Design



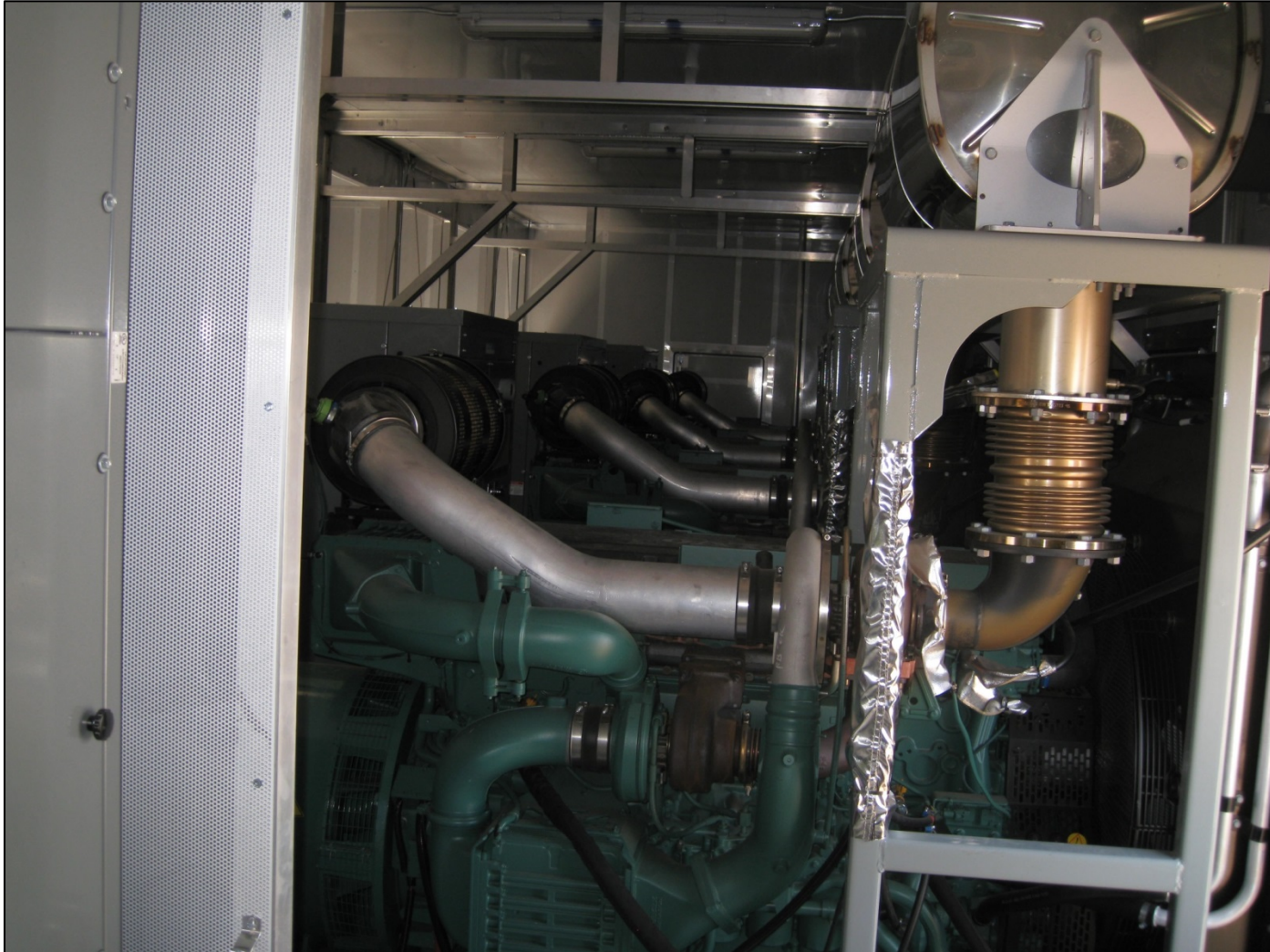


Power Block Installation





Four Generators Installed





Microgrid Operation

- Individual generators can be replaced quickly
- Loss of communication will not effect autonomous response modes of the microgrid
- Constantly monitors the commercial grid and forecasts both outages and frequency events
- Will start up autonomously, providing guaranteed base-wide backup power for duration of outage
- Can be monitored 24/7



...And Now the Rest of the Story





MARINE CORPS ENERGY

Innovation is the Road to Resilience