



The Premier Energy Training Workshop
and Trade Show for Federal Agencies

A River of Energy Solutions

Utility Infrastructure: The Good, the Bad, and the Ugly Ice Storm: Lessons Learned

Chuck Butchee, Altus AFB

Altus AFB Mission

- AF Jet Engine Cargo Schoolhouse
 - C-17 and KC-135R pilots
 - C-17 and KC-135R loadmasters
 - KC-135R boom operators

**Annual student
production –
over 2100**



**80% of training is
accomplished in the
simulator/classroom
– Reliable power is
mission critical**

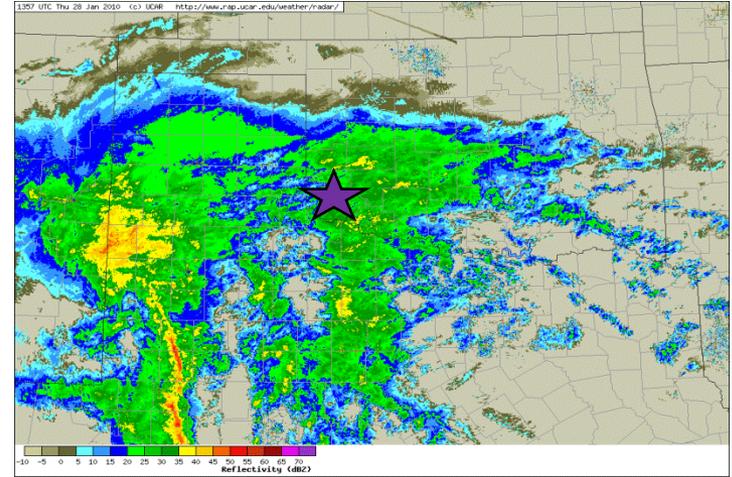
97 Civil Engineer Squadron

- Prime BEEF Squadron
 - 142 Military
 - 140 Civilians
- Maintain training base
 - \$330M land/facilities
 - 2.75M sq/ft facilities
- Train Combat Engineers
 - Civil Engineer craftsmen
 - Readiness response
 - Contingency operations



Ice Storm 2010

- **27 January 2010**
 - Temperature – 60's to 70's
 - Strong Cold Front swept south from plains
 - Front hit in the afternoon
- **28 January 2010**
 - Temperatures fell below freezing approx midnight
 - Due to cold air mass meeting warm, moist air from Gulf, perfect conditions for major icing event
 - Freezing precipitation began in morning – intensified throughout
 - Altus caught right in the middle – flying operations cancelled
 - All City of Altus power lost by late afternoon
 - Main section of Altus AFB power lost mid-evening



First Response

- **Immediate Concerns**
 - No heat or power to 95% of facilities!
 - Generator power only
- **Shelter**
 - Stood up that evening
 - Primary – Fitness Center
 - Secondary – Med Group
- **Food**
 - DFAC opened for all base personnel and dependents
 - Accepted IOU's due to lack of access to money after initial 24 hours



Ice Everywhere



**1.5" of Ice
Accumulated
in 12 hours!**



Save What You Can

- Mobile generators indispensable!
- Assess, plan, repair
- Prioritized repairs by circuit
- 24hr Operations
- In-house technicians essential
- Base grid repair – 6 days
- Commercial power– 9 days



Lessons Learned

- Failure to make infrastructure investments a priority can leave you vulnerable
- Single source of power is a liability
- In house capabilities are a critical factor



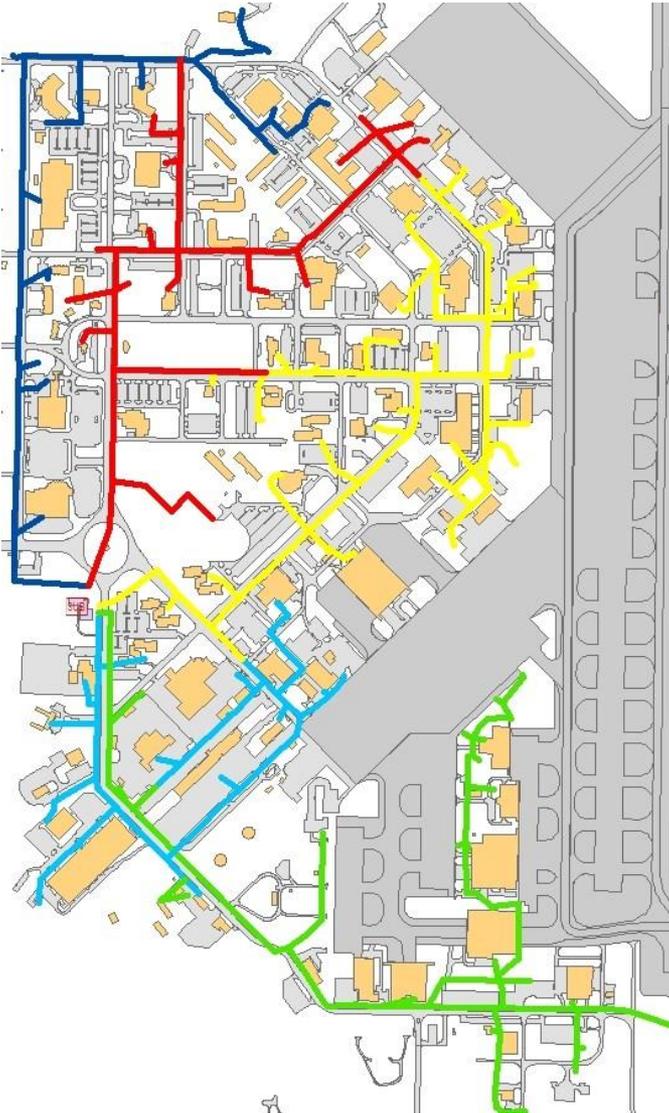
Lessons Learned 1

- Failure to update electrical infrastructure
 - Aged Infrastructure
 - Primary circuits all overhead
 - 25-50 years old
- Replacement projects programmed for years
 - Other priorities always get in the way
 - AF hedged risk in the past / patch vs replace
 - Utility infrastructure projects are not high profile
 - There is always next year – **maybe not**

Infrastructure Upgrades

Bottom Line: \$18M Investment

- Replaces antiquated electrical infrastructure at the end of its design life
- Relocates electrical infrastructure underground increasing both availability and reliability



Electrical Distribution Projects

E-01	*Upgrade Overhead Electrical System Feeder A	\$5,252K
E-02	*Upgrade Overhead Electrical System Feeder B	\$5,252K
E-03	*Upgrade Overhead Electrical System Feeder C	\$2,500K
E-04	*Upgrade Overhead Electrical System Feeder E	\$1,874K
E-05	*Upgrade Overhead Electrical System Feeder F	\$2,782K

Funded Unfunded

How to Get Funding

- Understand the funding process
 - Know the players involved
 - Know the rules of the game – scoring model
 - Know when decision points are made
- Build your case
 - Business Case Analysis
 - Return on Investment
 - Discrepancies rectified – UFC's, FSD's, RAC's, etc...

AF Scoring Model

- HQ AF developed scoring model to prioritize projects
 - Uses score card rating, Facility Investment Matrix, Wing CC priority, Mission Dependency Index, and Facility Condition Index to determine numerical project score
 - Great tool for sorting projects
 - Helps alleviate emotional prioritization
 - Ability to fund infrastructure over more high profile projects

BSC + FIM + Wing/CC Score + MDI*FCI = Project Score

50 + 50 + 100 + 100 = 300

Lesson Learned 2

- Single source power is a liability
 - One line down/blown transformer away from blackout
- Multiple feeds beneficial
 - Utilities are contracted/generally not multiple sources
 - Geographically co-located
- On site generation is optimal
 - AF owned on-site generation is limited by AFI
 - Requires imaginative programming
 - Work with utility provider for options

Elimination of Single Source Feed

- Worked with power provider to explore opportunities
- Looked at options, developed courses of action
- Distributive Generation-selected as best option
 - Provides energy security for base
 - Reduces infrastructure requirements for provider
 - Paid for with savings in “peak demand charges”



Lesson Learned 3

- In-house capabilities are critical factor
 - Base system up in 6 days
- Provides better command and control
 - Institute 24 hr operations if needed
- Provides greater flexibility
 - Dispatch resources where needed
- Trains combat engineers for contingency operations
 - This is our true mission
 - War efforts diminished without this training

Training Combat Engineers



Conclusion

- Failure to make infrastructure investments a priority can leave you vulnerable
- Single source of power is a liability
- In house capabilities are a critical factor

