The Brackish Groundwater National Desalination Research Facility - BBFA

Randy Shaw, PE
Facility Manager

Steve Holland
Electronics Technician
What Is BBFA?

It is an acronym for the Better Buildings Federal Award. It recognizes the Federal Government's highest-performing buildings through a competition to reduce annual energy use intensity (Btu per square foot of facility space) on a year-over-year basis. The Federal building that achieves the greatest percentage of energy intensity savings for that year wins.
2012 Competition

The 2012 BBFA competition winner, is the Brackish Groundwater National Desalination Research Facility (BGNDRF)!

This was the first year for the BBFA.
Track the Competition

Energy Use Intensity

Brackish Groundwater National Desalination Research Facility (-53.6%)
Boatwright Maintenance Park Building 2770 (-43.8%)
Neal Smith Federal Building (-35.7%)
Sandia National Laboratories Building 753 (-18.7%)
Frank Carlson Federal Building & Courthouse (-15.1%)
Bureau of Public Debt Avery Street Building (+18.1%)
Army & Air Force Exchange Service (-20.2%)
Sam Nunn Atlanta Federal Center (-20.2%)
What was the cost of all Energy Modifications?

$783.90

- $0.05 per Square Foot Invested
- $2.29 per Square Foot Saved
- Cost paid for itself in 9 days
A Little About BGNDRF

• Opened in 2007
• It is a Department of Interior federal research facility
• Operated and maintained by the Bureau of Reclamation
• Clients consist of Private Sector, Universities & Other Agencies
• Enhance research & development of desalination technologies using brackish water sources
The Facility

- Well #4 (740 ft north of ponds)
- Evaporation Ponds
- BGNDRF Boundary
- Well #3
- Agricultural Test Area
- Outdoor Test Pads
- Renewable Energy Test Area
- Central Research Building with Indoor Test Bays
- Large Scale Test Area
- Well #1
- Storage Tanks
- Well #2
Source Water System
6 Indoor Test Bays
Challenges

• Outdoor energy usage counted with building square footage
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• Outdoor energy usage counted with building square footage

• Record number of clients
How We Won

- Reduced 24 hour lighting
- Reprogrammed HVAC control software
- Made use of wasted heat
- Made use of the sun
Current Facility Night Lighting
Parking Lot Night Lighting
Current Bay Night Lighting
VAV Name: Office 113  
Active Mode: Occupy  
Present Value: Occupied  
Space Temperature: 72.6 Deg  
Unoccupied Cooling Setpoint: 90.0 Deg  
Occupied Cooling Setpoint: 90.0 Deg  
Occupied Heating Setpoint: 74.0 Deg  
Unoccupied Heating Setpoint: 67.0 Deg  
Active Cooling Setpoint: 84.0 Deg  
Active Heating Setpoint: 68.0 Deg  

Damper Position: 0 %  
Air Flow: 0 Cfm  
Damper Control Action: Heating
Transformer Room
HVAC For Transformer & Server Rooms

4 Months A Year

8 Months A Year
4 Months A Year

Outdoors

Indoor Test Bays

Server & Electrical Rooms

Transformers

Heat

AC

AH
8 Months A Year

Outdoors

Indoor Test Bays

Server & Electrical Rooms

Transformers

heat
Solar Heating
Next Steps

• Continue To Save Energy

• We Have Saved 17%

• PVRO
Next Steps

• Led Lighting in Test Bays
Lessons Learned

• Keep an open mind, always look for a way to save

• The impossible may very well be possible

• If exceptional is 10% don’t save 53.6%
Next Steps Update – May 2015

• An analysis of BGNDRF’s suitability for using solar energy to offset its reliance on conventional electrical service was performed by the National Renewable Energy Laboratory (NREL).

• A 120 kW photovoltaic array is in the process of being purchased.