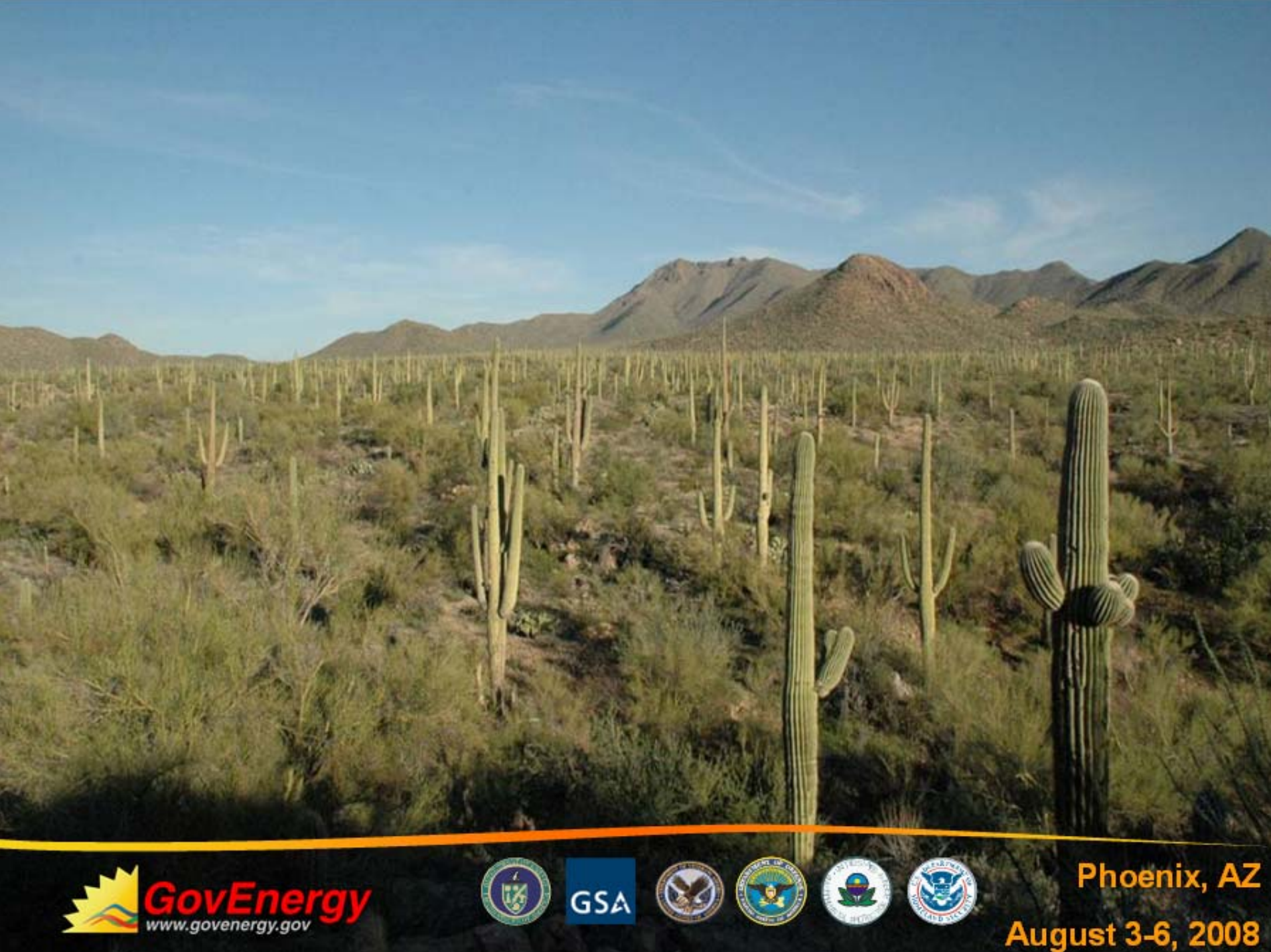
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August 3-6, 2008

Energy Security Through On-Site Generation

San Diego VA Hospital
Cogeneration Project

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Energy Security and the SDVA

- Overview
- Project Drivers
- Possible Alternatives for Energy Security
- Solution
- Key Performance Indicators
- What's new
- Wrap Up Q&A

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Michael Moriarty, PMP

August 3-6, 2008

Project Overview

- Partners:
  - VA San Diego Healthcare System
  - Honeywell Building Solutions SES
  - Department of Energy

Honeywell Building Solutions SES

Michael Moriarty, PMP

Project Overview

Tertiary-care affiliated hospital and clinics serving San Diego and Imperial Counties

Michael Moriarty, PMP

August 3-6, 2008

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Project Overview

- Hospital Information:
  - 53,980 enrolled patients
  - 512,771 annual outpatient visits
  - 238 beds; 6,941 admissions
  - 2,061 FTE
  - $305 million operating budget
  - $62 million Research funding
  - $4 million utilities budget

Project Drivers

- Energy Security
  - Reduce reliance on fossil fuels
  - Distributed Generation
- Improve electrical reliability
- Reduce operating costs
- Physical hedge – electricity costs
- Pollution prevention through reduced emissions of NOX
- Replacement of capital equipment before failure

Possible Energy Alternatives

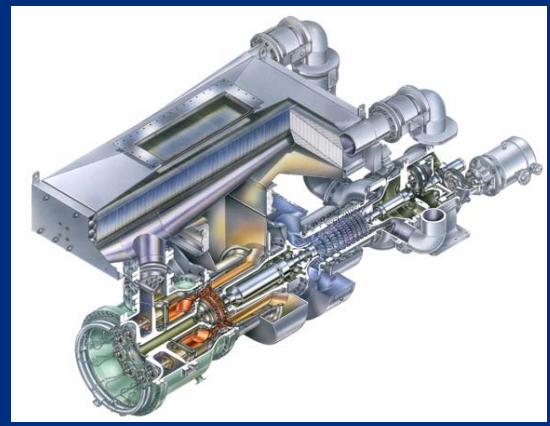
- SDVA Requirements For On-Site Generation
  - Reduce Reliance on Grid
  - Need for High Pressure Steam Production
  - Critical Facility requires System to be operational 24/7
  - Reduction of Current NoX levels

Possible Energy Alternatives

- Selection of generating system:
  - Investigate alternative fuel sources in region
  - Reliability of alternate fuel source ie: Wind or PV
  - Understand the Security needs of the facility
  - Does the System match operational and security needs
  - Gas Turbines Offers :
    - Higher Availability than a Recip
    - Lower Life Cycle Costs
    - 5PPM NoX with no SCR or Urea
    - Steam Production- Absorber and Hospital Environment

Solution

- Equipment Installed:
  - Solar Mercury 50; 4.6MWe Gas Turbine
    - Recuperated gas turbine with Ultra Lean Premix Combustion technology.
    - Controls equipped with Black Start and Islanding functionality
    - Excellent Part-Load Efficiencies including NoX emissions
  - Heat Recovery Steam Generator
    - Production of approx. 13,000 lb/hr steam from turbine exhaust.
  - Trane 500-ton Double Effect Absorber



Solution

- Objectives for New Cogen must align with Facility Needs!
  - On-site generation capacity increased system surety and reliability:
    - Black-start and Islanding are critical.
  - Increased Energy Security from grid
  - Debt Service through Guaranteed Energy Savings
  - Demonstrated multiple State-of-the-Art Technologies
  - CHP will provide 80% of facility's electric and 60% of facility's steam requirements annually
  - Reduced Air Pollutants (NOx) from the Existing Facility CHP

Key Performance Indicators

- Annual Production
  - 2005: 23,493,003 kwh
  - 2006: 23,781,550 kwh
  - 2007: 25,186,430 kwh
- Availability:
  - 2005: 95% Beta Unit
  - 2006: 92% Includes engine swap
  - 2007: 97%

Emissions:

  - NoX < 5PPM no post combustion controls or exhaust scrubbing.

What's New?

- Gas Pricing increase to $0.90/therm
- Utility has created Critical Peak Pricing (CPP)
  - 24 hour notice given by Utility that the following day will be a CPP day.
  - During a CPP, Energy cost escalates from approx $0.14/kwh to $1.06/kwh.
  - The SDVA has created a Low E-Day to coincide with CPP alerts and is changing energy consumption behavior in the hospital.

What's New?

- During a CPP day (Summer Peak) hospital imports approx 1.5MW.
- Through load shed and E-Day alerts the SDVA is reducing that import by almost 500KW.
- VA looking to install Inlet Cooling to offset import from Utility during Summer On Peak.
- On Site Cogeneration allows flexibility to deal with rising utility costs and grid instabilities.

Would you like to know more about this session?

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- Michael.Moriarty@Honeywell.com
- Don’t forget to fill out and drop off your session evaluations.