



**NAVAL SUPPORT FACILITY:  
CLEANER AND MORE RELIABLE ENERGY WITH CHP**

IDEA Campus Energy 2016

# PRESENTATION AGENDA

## Naval Support Facility Cleaner and More Reliable Energy with CHP

- Project Overview
- Design Objectives
- Project Features
- System Efficiency
- Emissions Reductions



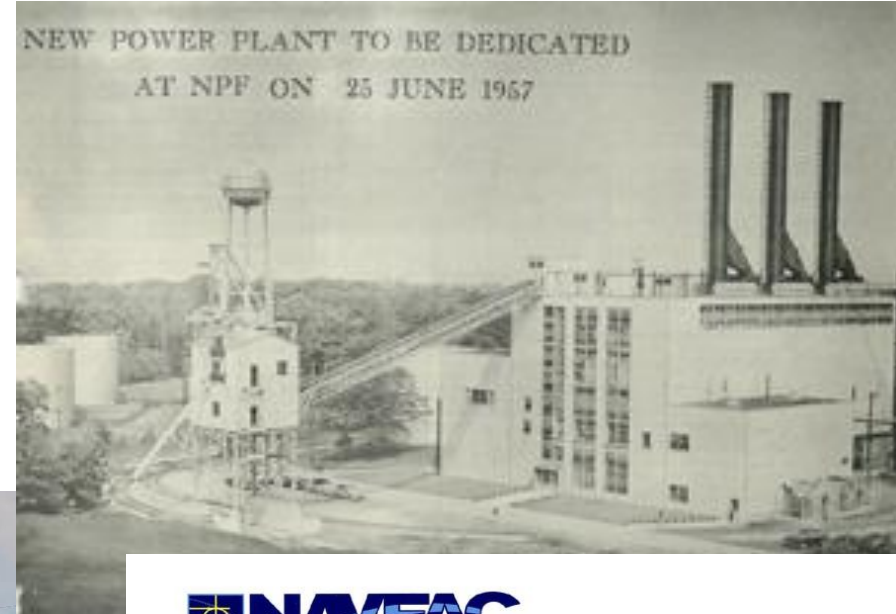
**Andrew Boehm, PE**  
aboehm@wileywilson.com



**Steve Bowman, PE**  
sbowman@wileywilson.com

# PROJECT OVERVIEW

- Demolish Goddard Power Plant
- Modernize Steam Production
- Increase Steam System Efficiency
- Improve Steam System Resiliency
- Modernize Electrical System



NEWS RELEASE FROM THE NAVFAC WASHINGTON PUBLIC AFFAIRS OFFICE

For Immediate Release: October 4, 2012

Contact: James Johnson  
E-mail: james.johnson13@navy.mil  
Voice: (202) 685-0384

1314 Harwood Street S.E., Bldg 212  
Washington Navy Yard, DC 20374-5018

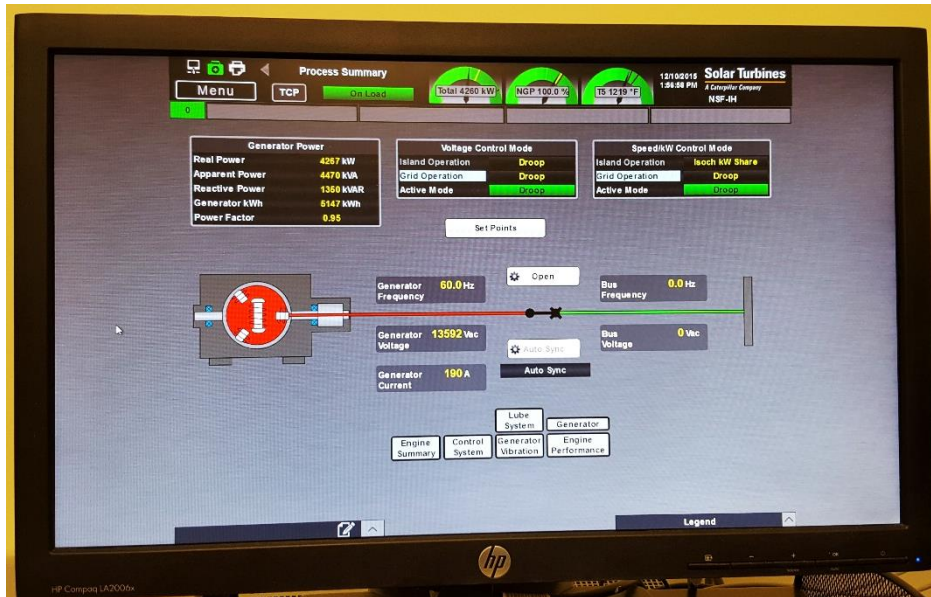
**Goddard Power Plant Complex Set For Demolition**  
Replacement will cut energy and water consumption at NSF Indian Head

*By NAVFAC Washington Public Affairs*

The Navy's last coal-fired power plant is set to close after Naval Facilities Engineering Command Washington awarded a \$68 million contract Sept. 28 to build a more efficient facility.

# DESIGN OBJECTIVES

- Maintain Steam Production
- Maintain Power to Critical Loads
- Performance of CT/HRSG Critical to Both



# PROJECT FEATURES

## Primary Nodal Plant No. 1: Strauss Cogeneration Plant

- One 4.6MW CT/HRSG at Strauss (plus one future)
- Natural Gas Booster Compressor
- One 750 BHP Dual Fuel Boiler w/ Economizer
- River Water Ultra Filtration and Reverse Osmosis System
- 500,000 Gallon RO Water Storage Tank
- 250,000 Gallon Fuel Oil Storage Tank and Circulation



# PROJECT FEATURES

## Primary Nodal Plant No. 1: Strauss Cogeneration Plant

- HRSG with Economizer, 50,000 PPH Total Capacity
- 50,000 PPH Turbine & Duct Burner
- 50,000 PPH Air Fired
- 25,000 PPH Turbine Only
- Dual Fuel



# PROJECT FEATURES

## **Primary Nodal Plant No. 2: Steam B Plant**

- **Designed for Three 750 BHP Dual Fuel Boilers**
- **Redundant Plant to Strauss Plant**
- **River Water Ultra Filtration and Reverse Osmosis System**
- **500,000 Gallon RO Water Storage Tank**
- **250,000 Gallon Fuel Oil Storage Tank and Circulation**
- **Funding Constraints: Alternate Approaches**

# PROJECT FEATURES

## Secondary Nodal Plants (7 Plants Built)

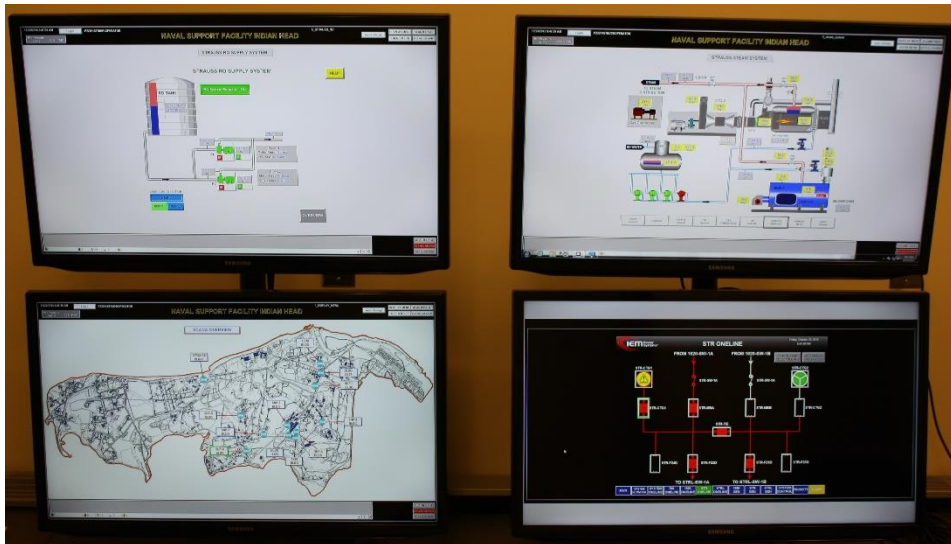
- Redundant Packaged Boilers at Each Plant
- 125 BHP to 500 BHP
- Natural Gas Fired Only
- 4 Use RO Water from B3123/Domestic Back-Up
- 3 Use Domestic Water Make-Up with Dealkalyzer



# PROJECT FEATURES

## Utilities and Energy Monitoring (UEM) Building

- Central Point for Monitoring and Control of Primary and Secondary Nodal Plants
- Alternate Site at Strauss CTG/HRSG Plant
- Central Point for all Site SCADA Systems



# SYSTEM EFFICIENCY

## Reduced Piping Losses

- Existing Radial Distribution from Goddard Plant
- Over 35 Miles of Existing Above Ground High Pressure Steam Piping
- Piping is Energized Year Round
- Due to Critical Loads, Shutdowns for Maintenance are a Challenge
- Project Demolished or Capped and Abandoned High Pressure Above Ground Steam Mains with Line Losses over 6 MMBTUH/8760 Hours Per Year

# SYSTEM EFFICIENCY

## Reduced Piping Losses

- Live Steam Leaks Visible from Space! (Not Really, but Google Saw it)



# SYSTEM EFFICIENCY

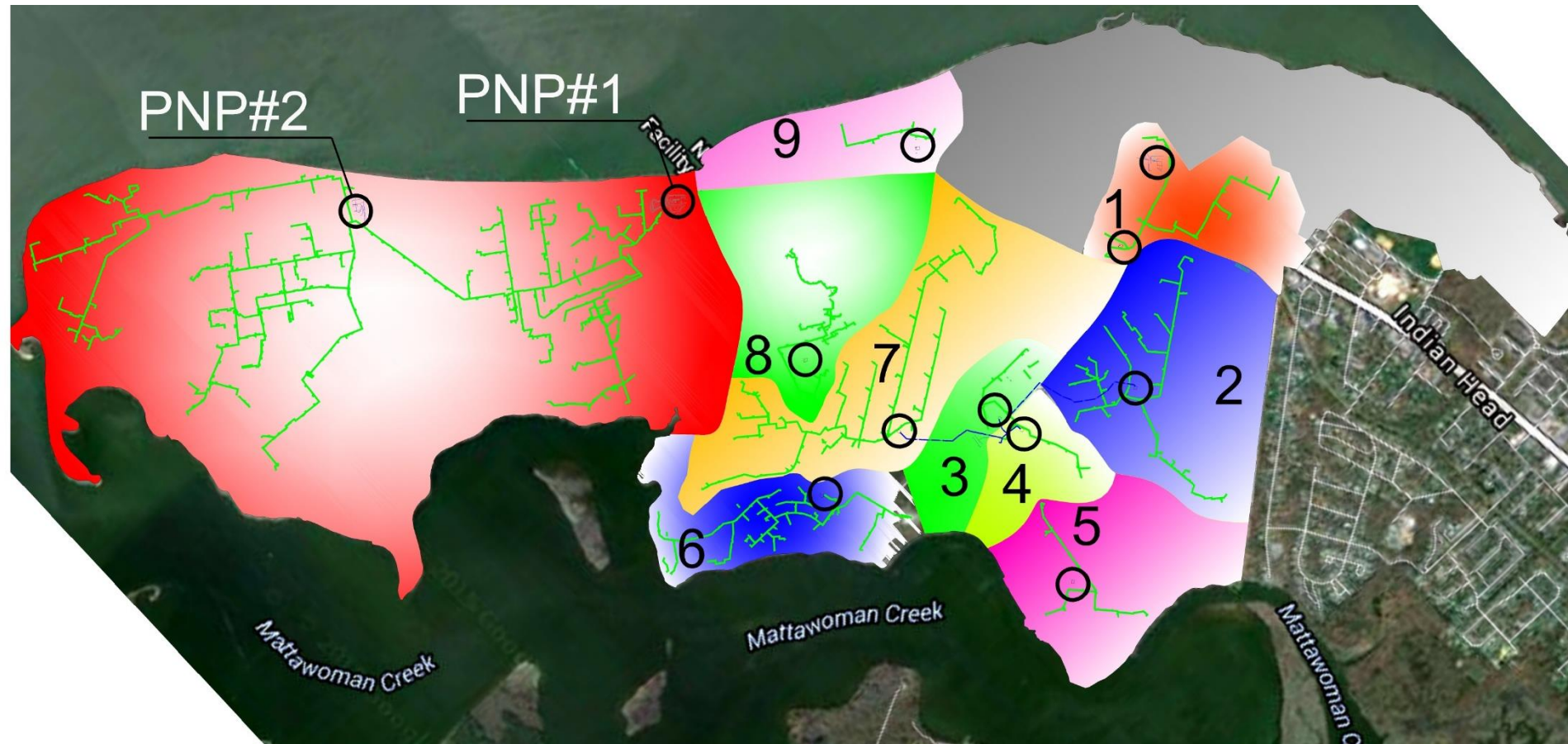
## Reduced Piping Losses

- Over 8 miles of Above Ground High Pressure Steam Piping Demolished or Capped and Abandoned in Place



# SYSTEM EFFICIENCY

## Reduced Piping Losses: PNP and SNP Zones



# PROJECT FEATURES

## New Natural Gas Transmission and Distribution Piping

- Six Miles of High Pressure Main Along Rt 210 to Washington Gas Transmission Line
- Medium Pressure from Pressure Reducing Station Near to PNPs and SNPs



# PROJECT FEATURES

## Reverse Osmosis Water Distribution to SNPs

- Addition of Ultrafiltration and RO Distribution from B3123 to SNP-2, 3, 4, & 7



# EMISSIONS REDUCTIONS

Frequency of Emissions	Activity Source	Existing GHG Emissions (tons CO2e)	Project GHG Emissions (tons CO2e)	Net Change in Emissions (tons CO2e)
Annually Recurring	Steam Generation	149,097	40,948	(108,149)
Annually Recurring	Reduced Electricity from Grid	N/A	(2,509)	(2,509)
Annually Recurring	Emergency Generators	93	308	215
<b>Total</b>		<b>149,190</b>	<b>38,747</b>	<b>(110,443)</b>

# CONCLUSION

## **CHP is Providing the Navy with Cleaner, More Reliable Energy**

- **Elimination of Coal; Use of Natural Gas**
- **Dual Fuel Ability with Onsite Fuel Storage**
- **Replacement of Aging Steam Production Infrastructure**
- **Reduced Steam Distribution System Losses**
- **Upgraded Onsite Electrical Generation**
- **Ability to Operate Electrical System as a Microgrid**
- **Improved Monitoring and Control Facilities**



# Q & A

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