



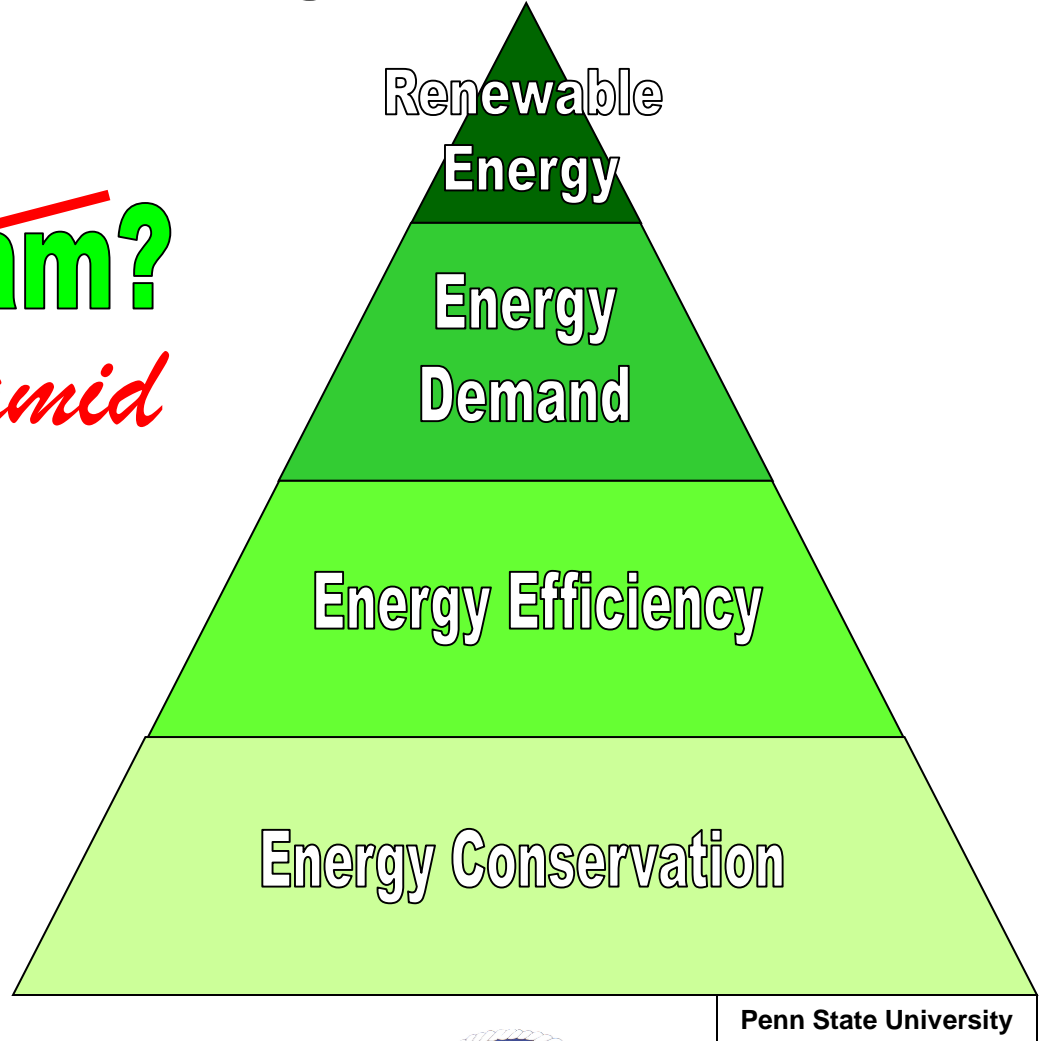
Federal Utility Partnership Working Group
Spring 2012
Jekyll Island, GA

Welcome Aboard

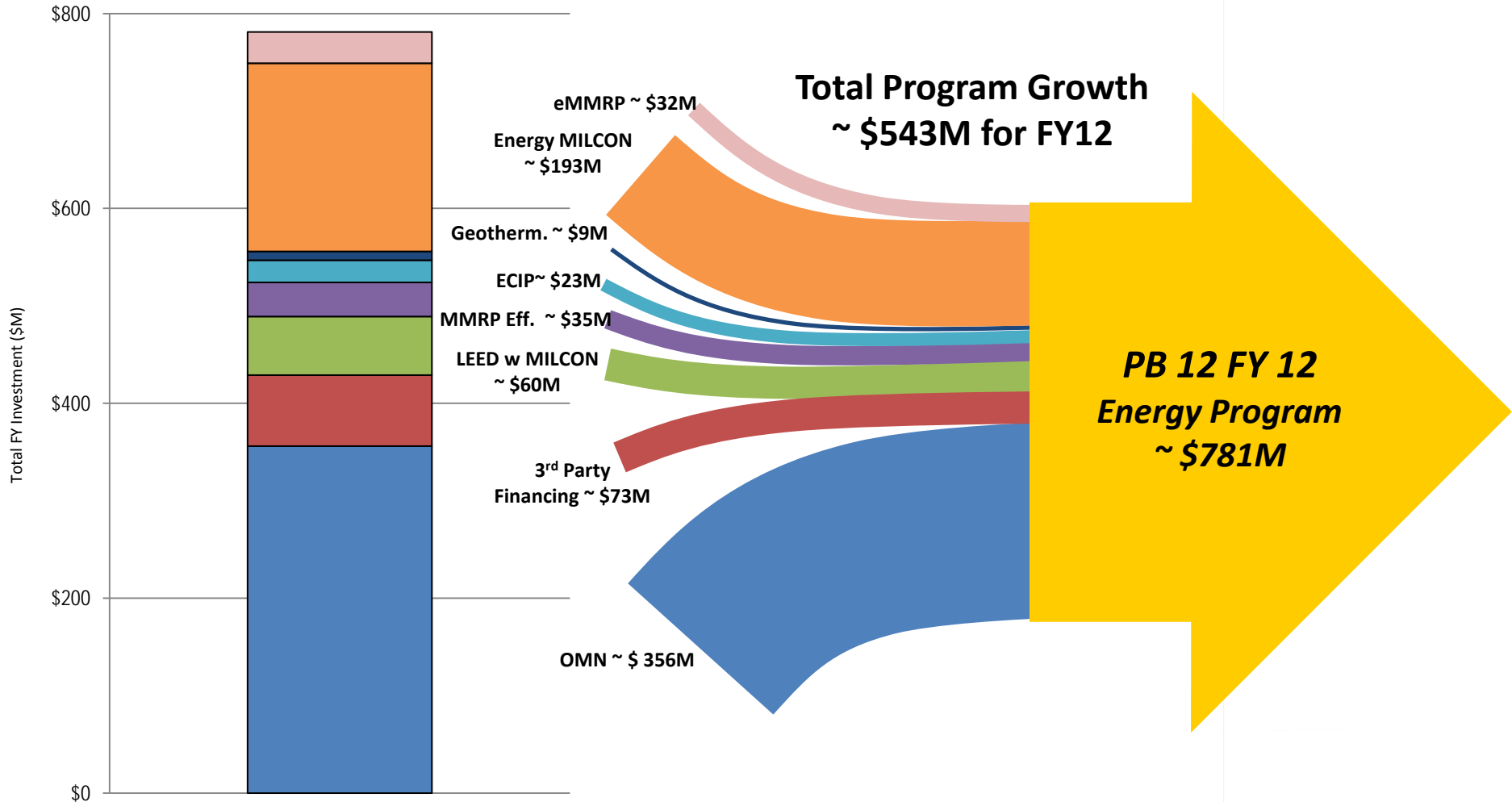


Penn State Energy Pyramid

Energy Program?
Pyramid



FY12 Total Energy Funding



Average Base Goes From ~\$3M/ YR to ~\$11M/ YR in Direct Energy Investment

eROI Tool Overview

What is eROI?

The eROI is the ratio of PV of total benefits over the PV of the total cost. It provides a consistent, quantifiable approach to prioritize energy projects that create value, using criteria that include “hard” benefits, such as cost savings, as well as “soft” benefits, such as meeting federal energy goals and stakeholder expectations.

$$\text{eROI} = \frac{\text{(Present Value of Benefit)}}{\text{(Present Value of Cost)}}$$

Why is eROI useful?

Using a weighted criteria approach, the eROI tool enables the Navy to rank and compare hundreds of energy projects submitted by installations, then invest in projects that will deliver the best ROI.



eROI Tool Overview

What does eROI do?

- Prioritizes Navy projects based on their benefit-to-cost ratios and identifies the highest-value portfolio
- Identifies interdependencies among projects
- Quantifies the time-sensitivity of projects, identifying those projects that decline in value if delayed
- Illustrates an estimated range of project and portfolio benefits based on the uncertainty and risk of each project



eROI Tool Overview

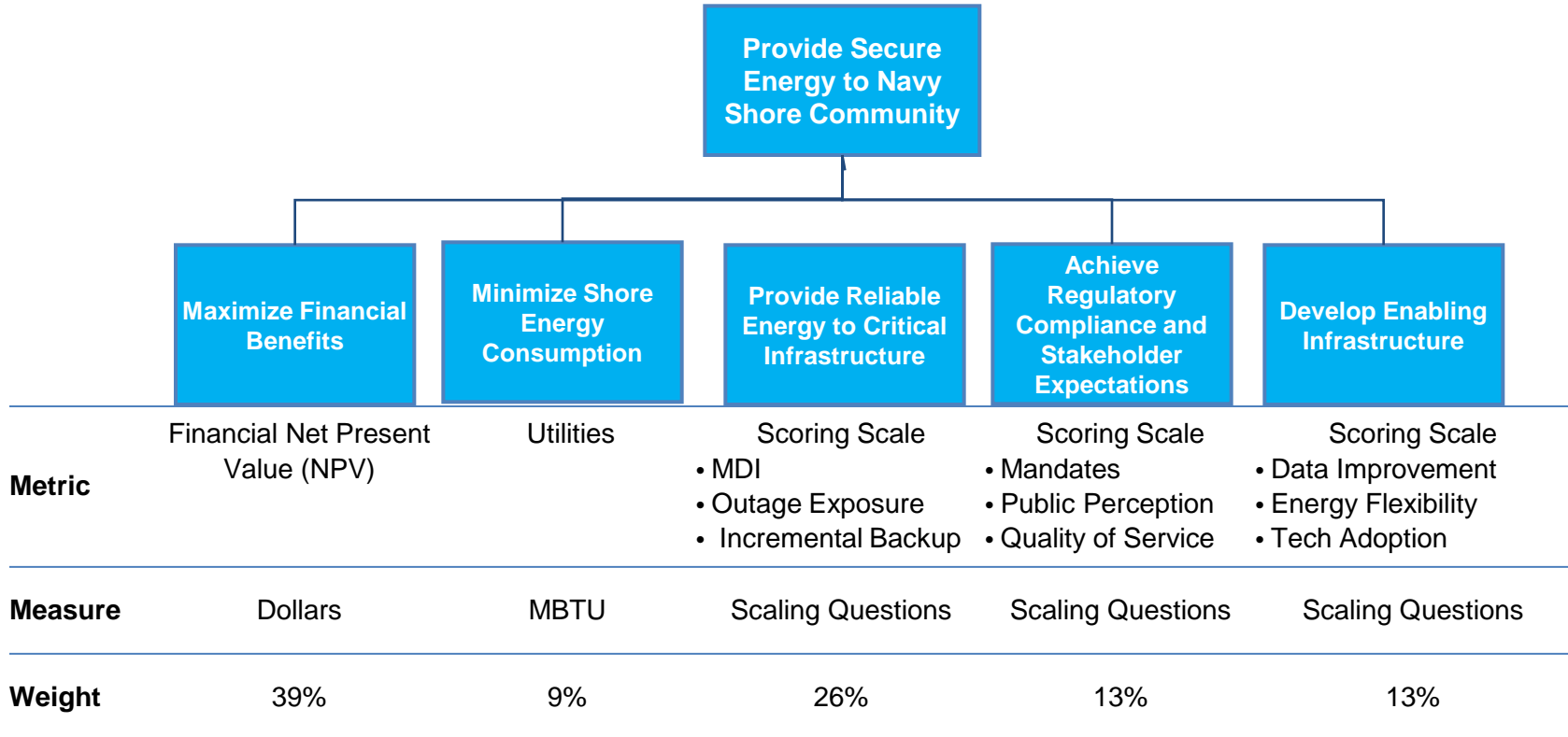
Provide Secure Energy to Navy Shore Community (5 key drivers)

- Maximize Financial Benefits
- Minimize Shore Energy Consumption
- Provide Reliable Energy to Critical Infrastructure
- Achieve Regulatory Compliance and Stakeholder Expectations
- Develop Enabling Infrastructure



eROI Methodology Summary

Five key strategic drivers combine to provide secure energy to the Navy Shore community



Individual inputs for a project are incorporated into each strategic driver and, then, scored, weighted, and aggregated into a single performance metric to provide the project's eROI.

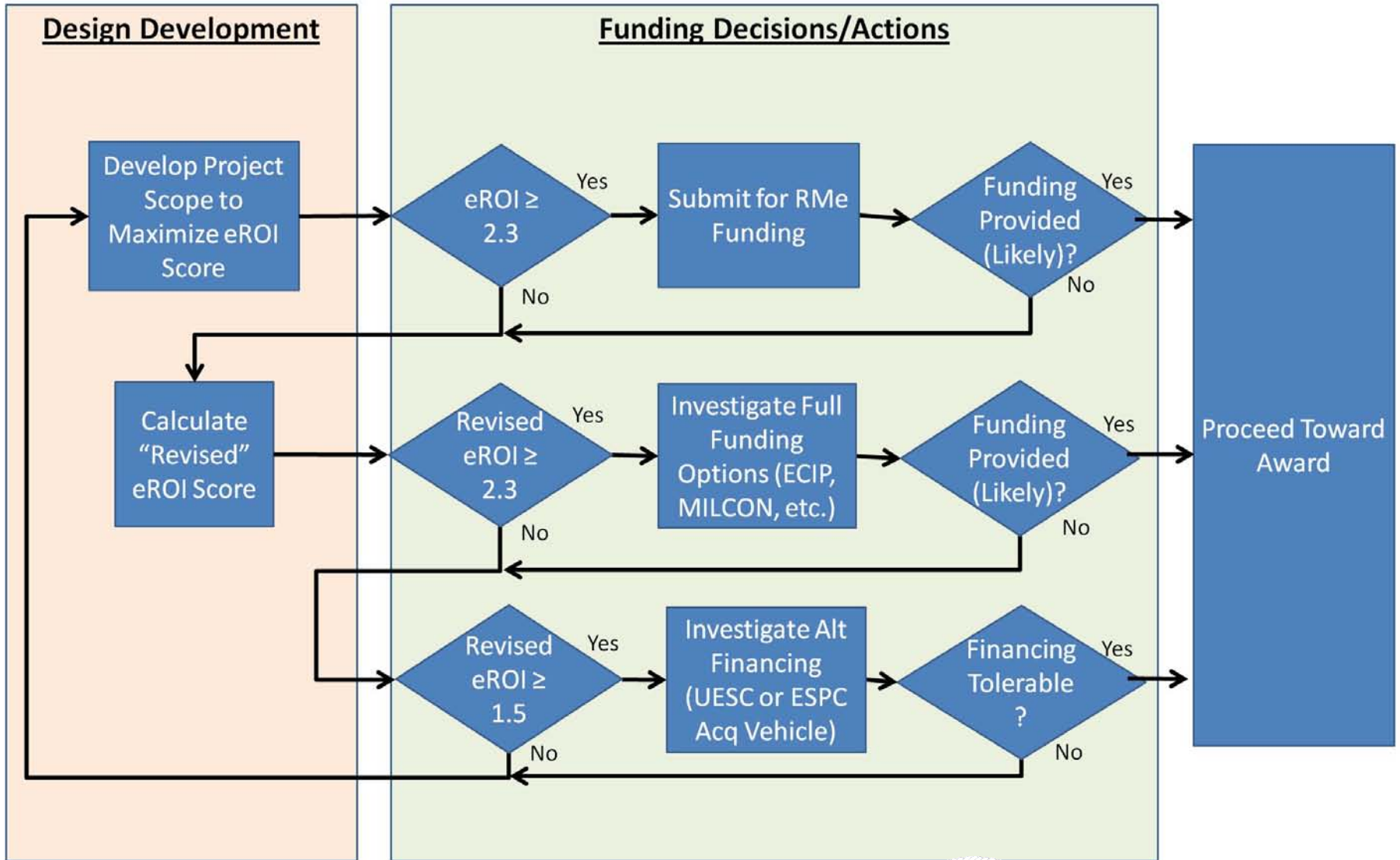


Energy Projects Types and Funding

- RMe – Navy’s Energy Sustainment, Restoration and Modernization Program
 - FY12 \$220M
 - FY13 \$325M
 - FY14 \$270M+ Projected
 - FY15 \$215M+ Projected
 - FY16 \$225M+ Projected
- ECIP – Energy Conservation Investment Program
- UESC and ESPC



CNRSE Energy Investment Policy



Jekyll Island, GA • April 11-12, 2012



UESC Legal Memo – Four Corners

Four “Legal Boxes” must be checked to qualify as a Utility Energy Services Contract (UESC):

- Utility Company
 - Electric or Natural Gas company
 - Currently serving the particular installation
- Cost Effective Project
- Incentive Received from the Utility Company
 - Free energy audit
 - Financing
 - Unique rebate
- Energy Conservation or Demand Side Management



Potential Incentives

- Measurement & Verification (M&V)
- Operations & Maintenance (O&M)
- Guaranteed Savings
- Free or Reduced-Cost Design



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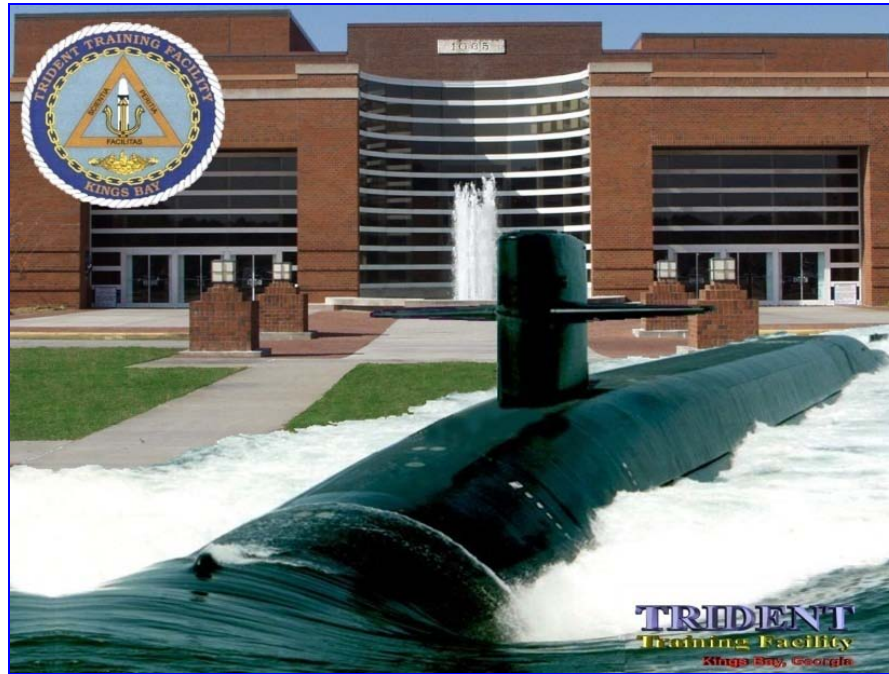


Trident Training Facility



Command Philosophy

TRIDENT Training Facility (TTF), Kings Bay exists to provide the highest quality instruction and training to the men and women who comprise the world's finest Navy. Our ballistic missile submarines are the most powerful warships mankind has ever put to sea, and the recently converted SSGNs provide our national leaders with a combination of capabilities unmatched in scope and flexibility. The crucial link between capability and readiness is a disciplined, well-trained crew. As a staff member of TTF, it is an honor and privilege to play such a prominent role in preparing Sailors to carry out their vital missions.

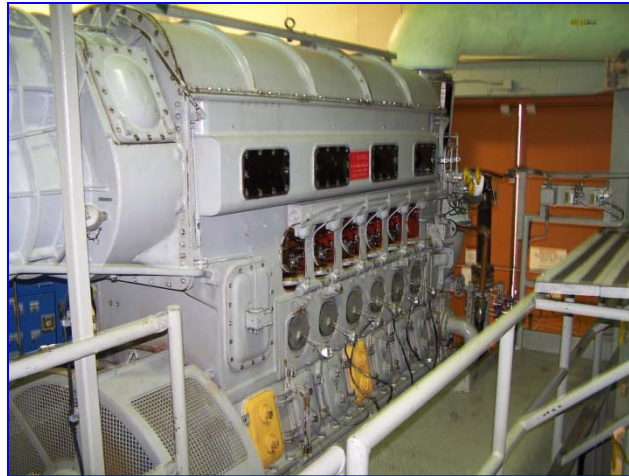


640,000 SQFT

- BLDG 1065 Trident Training Facility
- BLDG1095 Fire Fighting Trainer
- BLDG 1096 Fire Fighting Classroom



Engineering Training Department



Formal Courses and Trainers include:

- Prospective Nuclear Engineering Officer School
- Electronic Technician Maintenance School
- Fire Fighting and Damage Control Wet Trainers



Navigation Operations Training

Navigation Training

Navigation Principles:

- Radar System Operations and Maintenance
- Strategic Weapons Navigation Operations
- Auxiliary Electronic System Maintenance



Forward Electronics

Formal courses include:

- Common Submarine Radio Room Maintenance



Combat Systems Training

Combat Systems Department continuing education emphasizes maintenance and operation of the Navy's newest, high tech gear.

Two Team Tactical Refresher Trainers



SSGN Training

- Missile Technician/Fire Control

Weapons and General Training

- Ship Control Team Trainer
- Weapons Team Trainer Torpedo Supervisor



Strategic Systems Training



Officer Training / Command and Control

Formal courses in this area are designed to strengthen the Strategic Missile Command and Control team from the most junior officers to Prospective Commanding Officers.

Strategic Weapons Formal Training

TRIDENT Training facility, Kings Bay is the Navy's home for Missile Technician Training from initial theory and introductory maintenance to advanced targeting and system troubleshooting.



Energy Conservation Measure (ECM) 1 - Lighting

- Completed in 20 weeks
- Scope included over 7300 fixtures and 30,000 lamps



ECM 2 - Water Conservation

- Completed in 2 weeks
- Scope included 54 faucets, 55 toilet, 32 Urinals, and 6 pedal-valves



ECM 3 - UV Lights

- Completed in 4 weeks
- Scope included 45 air-handlers and 115 lamps



ECM 4 - High Eff. Motors

- Completed in 8 weeks
- Scope included 50 motors from 5 to 75 horsepower



ECM 5 - VFD Installation

- Completed in 12 weeks
- Scope included installation of 76 variable frequency drives



ECM 6 - Frequency Converter Installation

- Completed in 8 weeks (with no training downtime)
- Scope included (3) 400 Hz units



ECM 7 - DDC Controls

- Completed in 20 weeks
- Scope included 45 air-handlers
- To complete this ECM 45 controllers and over 300 actuators were installed.
- Over 66,500 ft (approx. 12.6 miles) of control wire was pulled and terminated with minimal downtime to the air-handlers.



Key Elements in Project Sustainment

- Security – Planning – Logistics – Flexibility
- Security Access and Classified Control are key elements in maintaining forward momentum. Initial coordination from badge access to classified area access during installation



Key Elements Continued

- Logistics-Lay Down and Disposal Areas
- Maintain all EPA and OSHA standards while protecting the facility/command and contracted installers and project managing company
- A secure Lay Down and Disposal area protects all



Key Elements Continued

- Planning Meetings weekly and sometimes daily for updates with coordination and changes for installers and command
- Preparation and contingency plans for installation interruptions
- Have alternate work areas available to move installers
- Always coordinate to keep installers working
- ALL = Sustainment



Contact

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Lighting Retrofits

- Over 7,300 lamp and fixtures were replaced
 - T-12 fluorescent lamps and magnetic ballasts were throughout the facilities. Fixtures were retrofitted and delamped to implement energy efficient 28 watt, T8 fluorescent lamps throughout the facilities
 - There were low wattage high pressure sodium fixtures relamped with CFLs
 - There were 400 watt metal halide fixtures converted to T8 fixtures
 - These fixtures were in an office which was retro-commissioned for current use and made the area visually comfortable for the employees
 - Occupancy sensors were utilized where appropriate
 - All lighting retrofits comply with ASHRAE/IESNA Standard 90.1. Contractor through an EPA approved recycling center with all proper EPA, State and Local required documentation
 - 3,411,223 kWh Reduction \$239,911 Savings



Water Conservation

- Water Conservation
 - Replaced 3.5 – 4.5 gpf fixtures with 1.6 gpf fixtures with 1.28 gpf flush valves
 - Replaced 2.0 – 4.0 gpf urinals with 1.0 gpf urinals
 - Replaced 3.0 – 7.0 gpm Bathroom sinks fitted with 0.5 gpm aerators, and water conserving showerheads
 - ADA compliance for handicapped accessible fixtures was maintained during this project
 - 1,220 Therm and 1,139 kGal Reduction \$10,503 Savings



Mechanical Retrofits

- Mechanical Retrofits
 - Installed UV lights in 45 AHUs to clean coils without chemicals and improve IAQ
 - Installed VFD's on 76 fans and pumps
 - Replaced 50 less efficient motors with high efficient motors
 - Replaced 60 Hz Motor Generator (MG) sets to 400 Hz frequency
Solid state frequency converters perform at a much higher efficiency
Many of the older MG sets have efficiencies of 60 percent while the new electronic equipment can perform >90 percent efficiency
 - 2,025,729 kWh Reduction \$142,472 Savings



DDC Retrofits

- DDC Retrofits
 - Install / upgrade DDC on replaced pneumatic with new electronic actuators and sensors
 - Discharge Air Temperature Reset
 - Scheduled Start / Stop
 - Air Side Economizer
 - Ventilation Reduction
 - Night Setback Controls
 - Demand Controlled Ventilation
 - Provided web based dedicated graphical user interface for monitoring and control of system set points, schedules, trends and alarms
 - The new DDC system will allow for integration into existing monitoring systems through Modbus, BacNet, MSTP or BacNetIP protocols
 - 1,238,010 kWh Reduction \$100,072 Savings





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Conclusion

- The **Federal** facility– TTF at Naval Submarine Base - Kings Bay and
- The **Utility** Atlanta Gas Light Company an AGL Resources Company
- Had a **Partnership** executing a successful Energy Conservation Project
- While **Working** together identified the right team of people and
- This **Group** completed the project on budget and ahead of schedule

- Many thanks to all those involved and especially to Brad and David for their involvement in this project and willingness to participate in this presentation

Questions?



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