



**New London Nuclear Submarine Base**  
**Retro commissioning Project**



New London CT

USN Project# N4008513C4620

Scope: Retro commissioning Project

**Overview:**

Following the execution of a retro commissioning study for 18 buildings, NAVFAC (Naval Facilities) NLON (New London) received funding for design / build recommissioning and upgrade projects at 8 of the buildings in 2013. The project was awarded to Coastal Environmental Group an 8A company, and VS Energy was selected as the primary design, project management and commissioning firm by Coastal. The scope of work for the projects included comprehensive controls upgrades including new control strategies, repair and upgrade of mechanical systems for ventilation, pumping and electrical upgrades for lighting systems and lighting controls.

**Stated Objectives / Problems:**

Based on the results of the previous retro commissioning study performed by VS Energy, the target objective was 9,300 mmbtu per year of annual energy avoidance for the 8 buildings after completion of work.

Work to be completed within 450 calendar days of award with a one year M&V period post construction.

Measurement and Verification to be performed per the IPMVP options A and B.

**VS Energy Process:**

- Design:
  - Prior to receipt of formal contracts, and based on the compressed design / build schedule, VS Energy began design of the mechanical retrofits including replacement of an air cooled chiller with new magnetic bearing water cooled chiller for B560, native BACnet controls retrofits for all 8 buildings, final calculations for DCV implementation, and identification of potential lighting retrofits.
  - Upon receipt of contract, designs including plans and specifications were submitted for approval for controls retrofits, mechanical retrofits and lighting retrofit to LED for 8 buildings. Mechanical designs and controls designs were immediately reviewed, and lighting retrofits sent to MIDLANT for review based on the introduction of new technology (LED tube retrofit of existing fluorescent fixtures).
- Subcontractor scope and selection
  - VS Energy prepared scope and bid documents for mechanical contracts and controls contracts, and air and water balancing to supplement plans and specifications .

- Formal review / evaluation and selection criteria documents were prepared by VS Energy
- Post receipt of proposals, pricing and interviews subcontractors were selected.
- Construction Management
  - Construction Administration and Site Safety Officer staffing was performed by Coastal Environmental
  - VS Energy maintained a QA manager, commissioning agent and project manager on site for the duration of construction.
    - VSE Responsibilities included daily contractor coordination, weekly project meetings, review of field changes, contract modifications.
  - During construction numerous mechanical deficiencies were discovered at three of the buildings which required reallocation of \$1.3 million capital funds to provide sustained building operation. A building outside the scope of the project was added to replace an existing building control system in it's entirety under the umbrella of the Coastal project.
    - VS Energy provided design and scope documents for contractors to facilitate completion of the additional work by the contract completion date. Funds were reallocated from the lighting portion of the contract to complete the repairs and sustainability projects required.
- Commissioning
  - VS Energy developed comprehensive commissioning plans for mechanical and control systems for 8 buildings.
  - VS Energy supervised prefunctional testing using NIST reference devices, reviewed air and water balance reports, and performed functional testing of mechanical and control systems in 8 buildings.
  - Final commissioning reports were submitted to NAVFAC in paper and an interactive electronic copy which provides navigation from the site map to directly access balance reports, as built drawings, sequences of operation, submittals and commissioning reports for each building.
- Training
  - VS Energy reviewed training plans and assisted with training including video recording of training sessions and inclusion on interactive DVD of close out documentation, including as built drawings, commissioning reports, tab reports, and trend and alarm lists.

## **Results:**

- Measurement and Verification
  - VS Energy provided transparent M&V analyses with a per building, per project breakdown, on a quarterly basis for the four quarters post completion of construction and commissioning.
  - Energy avoidance exceeded estimate by 7.3% unadjusted, and 11.1% weather adjusted basis. The energy avoidance target was reached even though the lighting portion of the project was not performed, and all work was mechanical and controls related.
  - Coastal and VS Energy received the highest Contractors Performance Assessment Reporting System from (CPARS) overall rating attainable from NAVFAC - Exceptional.