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# Holistic Building Management

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The NASA – George C. Marshall Space Flight Center is located near Huntsville, Alabama. Its mission is to provide R&D in propulsion for space travel. The campus is located on 1,800 acres with 4.7 million sf. of building area. Approximately 11% is sustainable buildings (LEED NC, or EBOM), 15% is presently being constructed or upgraded for certification (LEED NC, EBOM, or Labs). The remaining 74% is approximately 50 years old and costly to operate. Annual utilities are ~ \$24M - and meeting the established energy-goals seem unattainable.



**Building 4600  
(LEED Silver Certified 2006)  
Marshall Space Flight Center  
Huntsville, Alabama  
NASA's First LEED Building**



**Building 4346  
Child Development Center  
(LEED Certified 2008)  
Marshall Space Flight Center  
Huntsville, Alabama**



**Building 4601  
(LEED Gold Certified 2009)  
Marshall Space Flight Center  
Huntsville, Alabama**



**Building 4203**  
**Constructed 1992**  
**Registered as LEED EBOM 2008**  
**(Existing Building Operations and Maintenance)**  
**Marshall Space Flight Center**  
**Huntsville, Alabama**

# Reasons for this Approach

- EISA 2007
- GovEnergy 2008
- NASA's First LEED EBOM Project
- LEED EBOM Rating System requires an energy & water audit; retro-commissioning or re-commissioning; and a LEED EBOM Screening for project feasibility
- Total Campus Improvements Rather Than Just Meeting Required Energy-Efficiency Goals (Holistic Building Management)

# TRI-FOLD AUDIT

# The Tri-Fold Audit

- The Tri-Fold consists of:
- An ASHRAE Level-1 Comprehensive Energy & Water Audit
- A LEED EBOM Initial Screening
- An Initial Retro-Commissioning (RCx) Assessment
- Capital Investment Recommendation
- An exit presentation to management and engineering

# The ASHRAE Level-1 Audit

The energy & water audit provides:

- ECM's & WCM's with significant opportunity of paying for themselves in a set time period
- The overall reductions that can be expected if a bundled package is implemented
- A basis for making the decision to proceed forward

# The RCx Initial Assessment

Statistics show an approximate savings of 15% is seen in most successful RCx

The RCx Initial Assessment provides:

- The feasibility of entering the RCx process
- Specific benefits of retro-commissioning
- Enough detail for the owner to understand the expectations and the provider of the assessment or other commissioning agents to present a proposal for implementation

# The LEED EBOM Screening

The LEED EBOM Screening provides:

- A checklist of key elements of the LEED EBOM Rating System including prerequisites, possible credits, improbable credits, and general registration requirements
- The feasibility of certification
- The potential rating to expect
- The expected timeline for completing the certification process

# Capital Investment Recommendation

## The capital investment recommendation:

- Provides a “Big Picture” of needed changes, above and beyond the audit, how utilities can be reduced, expected utility reductions, and operations improved
- Provides a tool for sound management decisions for capital investment (ECM's/WCM's, renovate, repair by replacement...)

The **TRI-FOLD** Energy & Water Audit has proven to be a valuable tool for supporting every aspect of a good energy management program and getting the campus on the right path of sustainability

# Questions?



# Contact Information

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