

Mercer Engineering Research Center Capability Overview

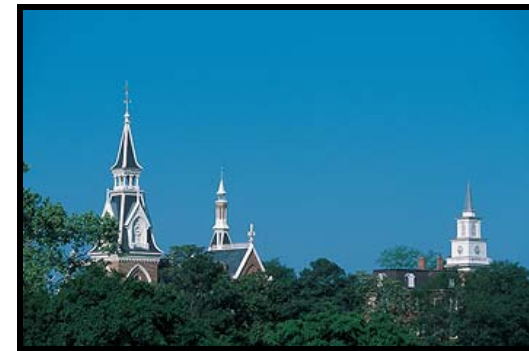


CMMIDEV / 3SM
Exp. 2017-11-07 / Appraisal #22980

“Where real problems meet real solutions”

Overview

- **Operating Unit of Mercer University**
Mercer School of Engineering (1985)
among Medicine, Business, Nursing,
Liberal Arts, Theology Fields of Study
- **MERC at a Glance**
 - Leadership
 - Facilities
 - Staff
- **Reverse Engineering Capabilities**
- **Primary Customers & Partners**
- **Summary**



MERC at a Glance



Operating Unit of Mercer University

- Main facility in Warner Robins, GA
- Non-profit organization
- Established in 1987 with key mission to:
 - Serve as the applied research arm of Mercer University in engineering and the applied sciences



Providing unmatched interdisciplinary engineering & applied scientific expertise and facilities in the Central Georgia area

MERC Leadership



Dr. David T. (Dave) Barwick



Ms. Andi Mitchell



Mr. David C. French
Col, USAF (Ret)



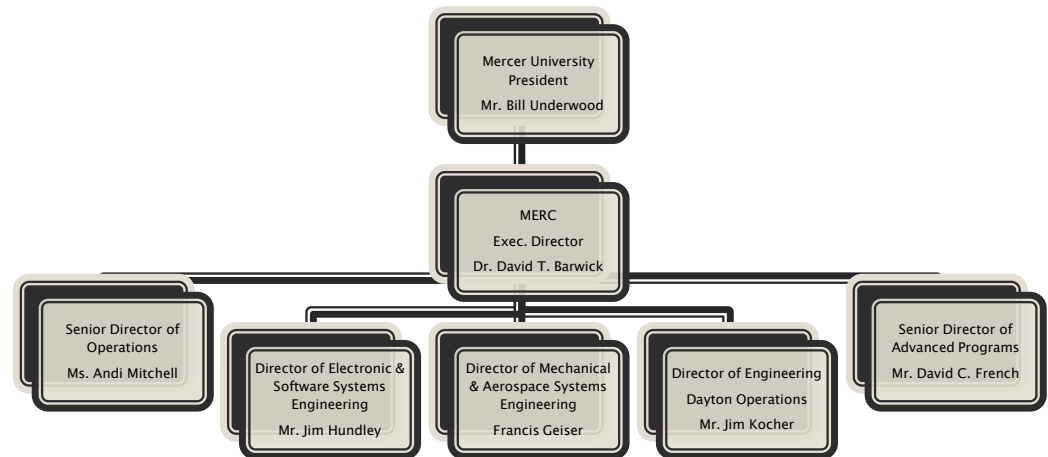
Mr. Jim Hundley



Mr. Francis Geiser



Mr. James A. Kocher



MERC Facility



Located in the Houston County Advanced Technology Park

- Large main facility contains 113,000 Sq Ft
- Combination office, classroom & large conference, lab facilities
- 5,000 Sq Ft Secure space, 600 Sq Ft SCIF

Software Development Lab



Electronics Lab

**Mechanical Test
and Fabrication Labs**



MERC Technical Staff



- **175** Full Time Engineers, Scientists, Analysts, Management Experts, and Support Staff
- Highly Interdisciplinary
- Multiple Engineering & Scientific Professions

- Mechanical Engineers
- Aerospace Engineers
- Electronic Engineers
- Materials Engineers
- Computer Information Systems
- Software Engineers
- Mathematicians
- Physicists
- Business Specialists
- Industrial Engineers
- Rehabilitation Engineers
- Environmental Engineers
- Biomedical Engineers
- Logisticians

MERC Capabilities



- **Interdisciplinary engineering capability**
 - Integrated teams
- **Mature engineering processes**
 - Capability Maturity Model Integration (CMMI) Level 3 processes used across the organization



- **Complete engineering lifecycle support**
 - Concept/Simulation, Analysis, & Design /Development
 - ★ – Testing/Validation/Certification
 - ★ – Prototype/Sustainment/Obsolescence Management

Customer Mission & Vision

"Where real problems meet real solutions"



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Air Force Material Command Mission

- War Winning Capabilities through Asset Life Cycle.
- Leading Edge Combat Capabilities.
- World Class Test and Evaluation



Air Force Sustainment Center

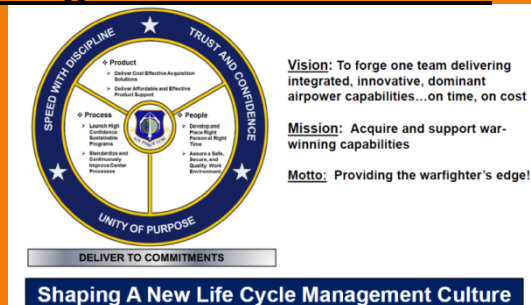
Complex of the Future Attributes

- 100% Parts Availability
- Efficient Depot
- Environmental & Energy Compliance



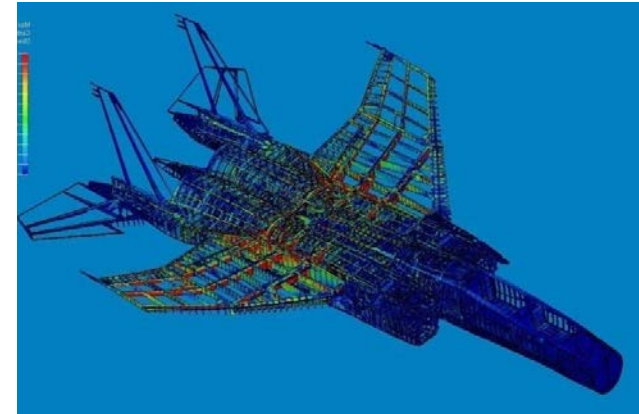
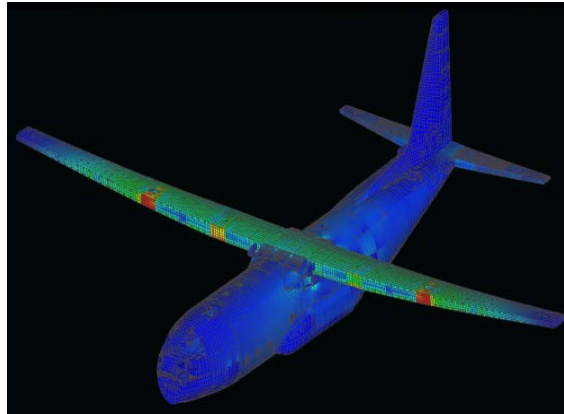
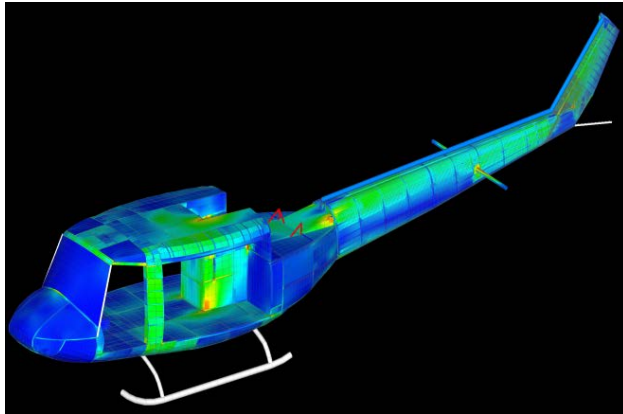
Air Force Life Cycle Management Center Vision

- Cost Effective Acquisition
- Affordable & Effective Product Support
- Continuous Improvement Processes

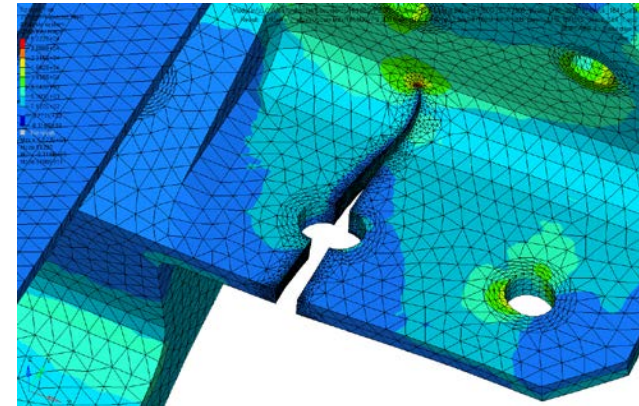
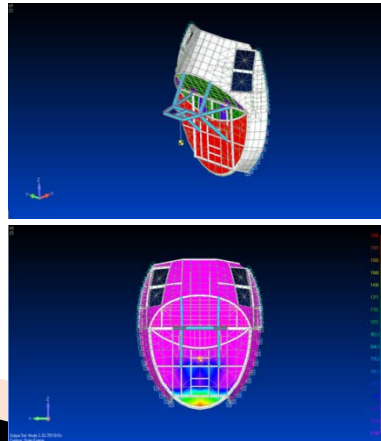
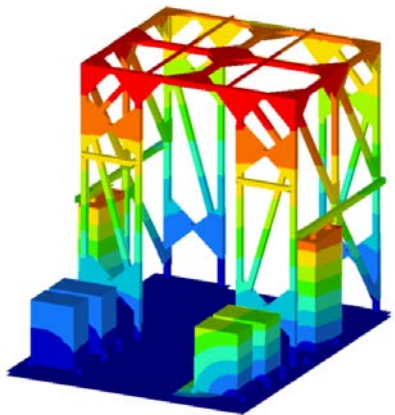


Mechanical Engineering

- Finite Element Modeling/Simulation for Legacy Weapon Systems

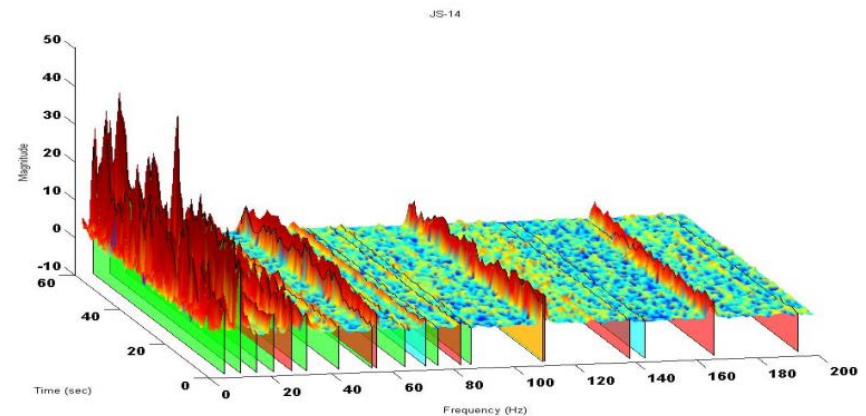
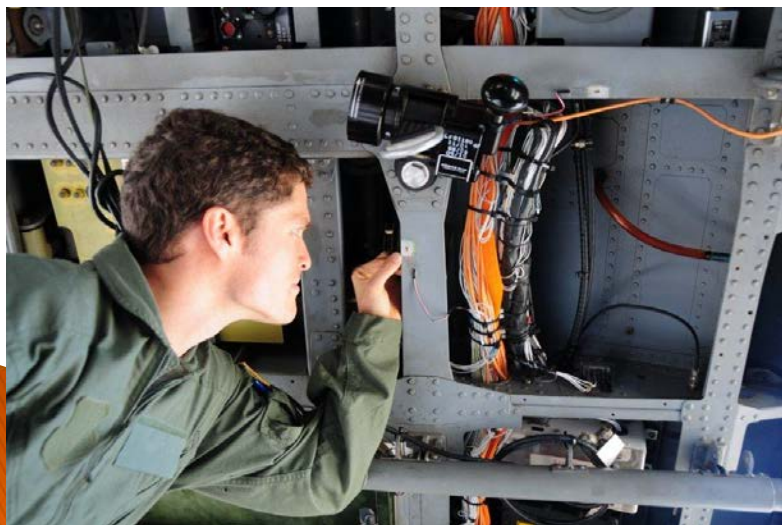
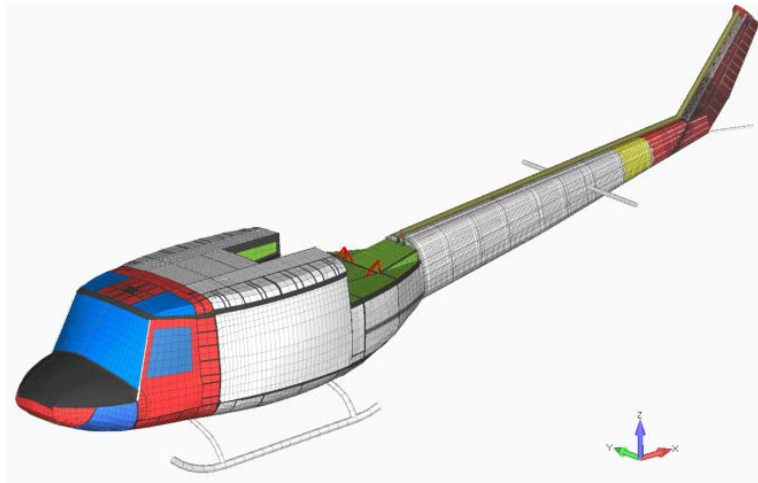


- Aircraft Structural Fatigue Analysis Supporting Mods



Mechanical Engineering

- Instrumented Flight Test and Analysis to Refine FEA Models

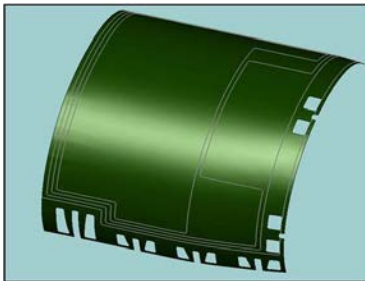


Mechanical Engineering

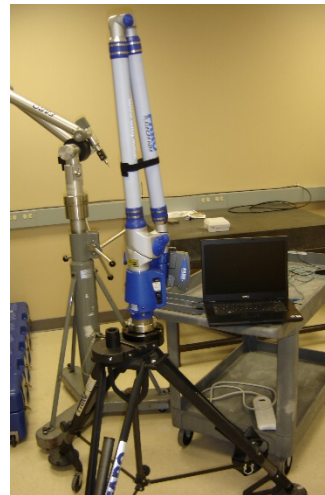
Tool Design

A-10 Fwd and Aft Nacelle Door

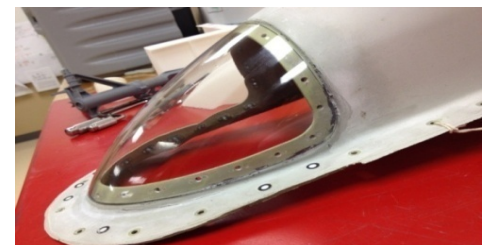
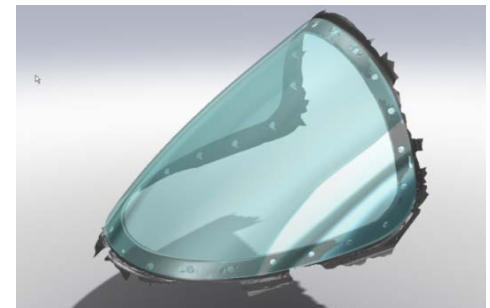
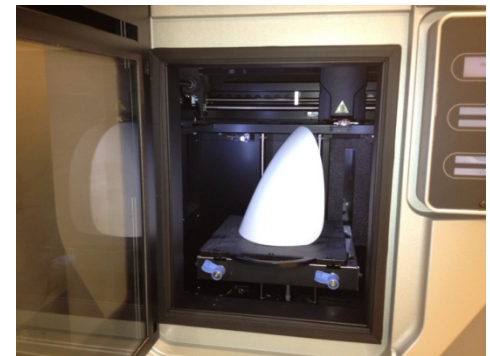
Bond Form Fixture



Mobile Coordinate Measuring Faro System

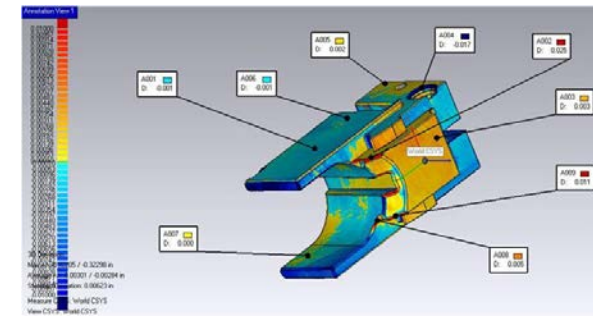
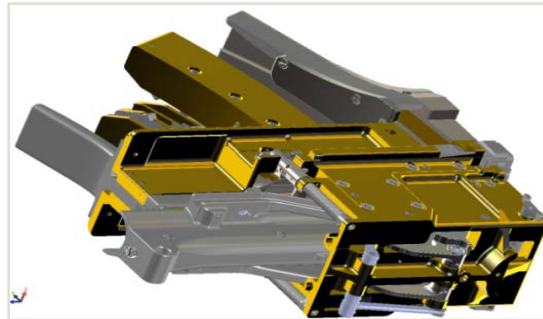
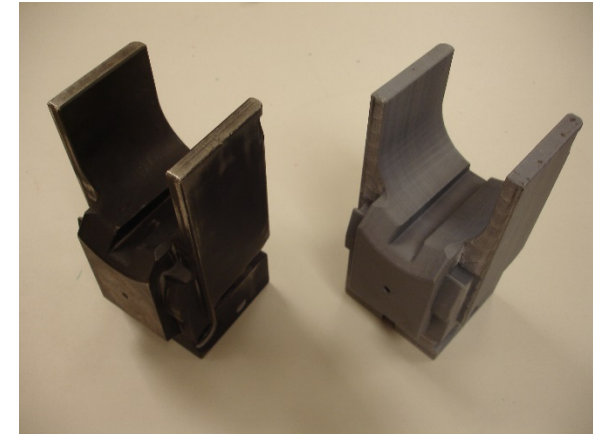
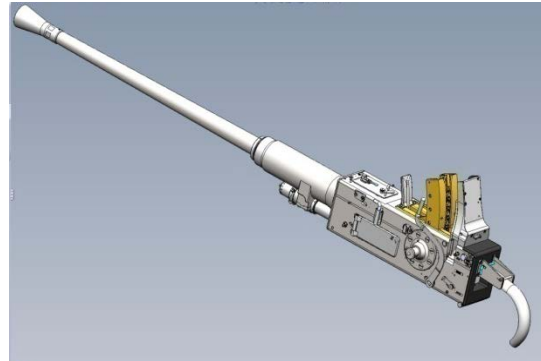


Rapid Prototyping EC-130J TWCLC



MERC MERCER
ENGINEERING
RESEARCH
CENTER
An Operating Unit Of Mercer University

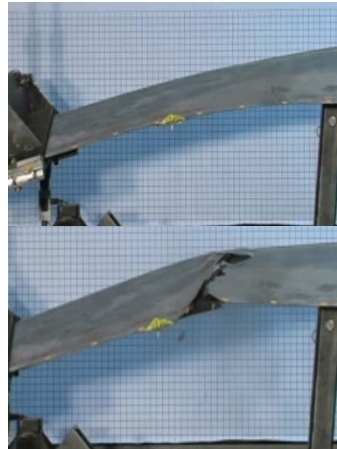
A photograph of a detailed model of a space station or lunar base. The model is constructed from various grey plastic components, including rectangular modules, solar panel arrays, and a large circular structure on the right. It is set against a dark background with some blurred lights, suggesting a night sky or a distant planet. The model is placed on a dark, textured surface.



Mechanical Engineering

Fatigue, Proof, & Ultimate Strength Testing

Speed Brake Proof Load Fixture



Test Items in compression and tension



Fabrication & Testing

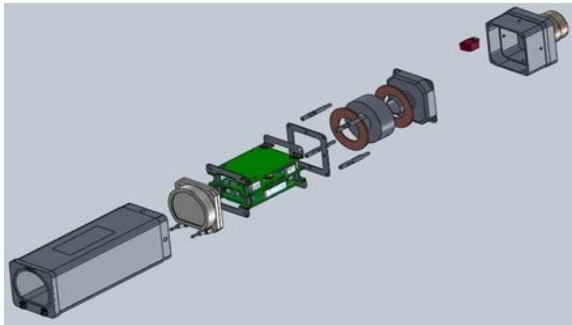


Printer Transport Video

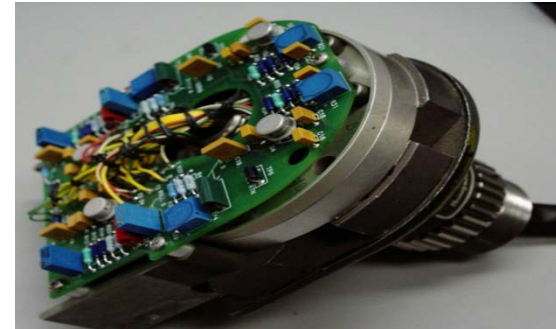


Electronics Engineering

HH-60G Fuel Quantity Indicator



C-5 Hub Force Sensor



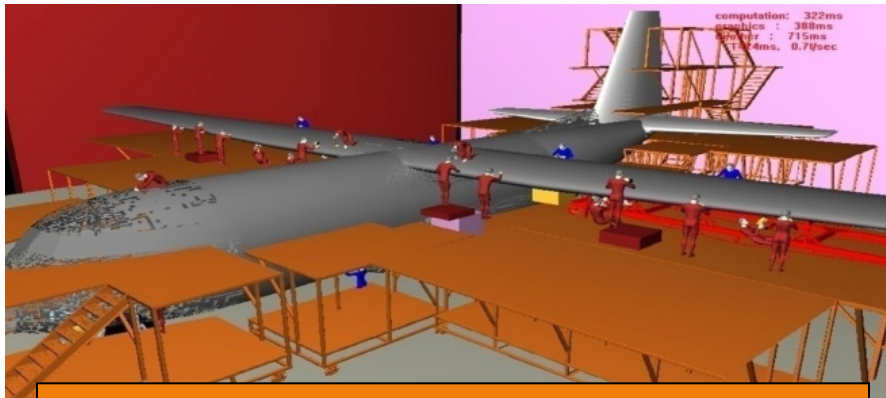
MERC-Other Core Strengths

- **Electronic Warfare**
 - EW Hardware, Software, Test
 - RF Deinterleaving Algorithm Development
 - Mission Data Threat Databases
 - EW Software Toolsets
- **Automatic Test Equipment**
 - Custom Designed Automatic Test Systems for Radar and EW
 - Versatile Depot Automatic Test System (VDATS) Experience
- **Software and Database Development**
 - Pearl, Java, C/C++
 - Manage worldwide AFIRM-M, AIRCAT, ICARR-3D applications for multiple weapons platforms

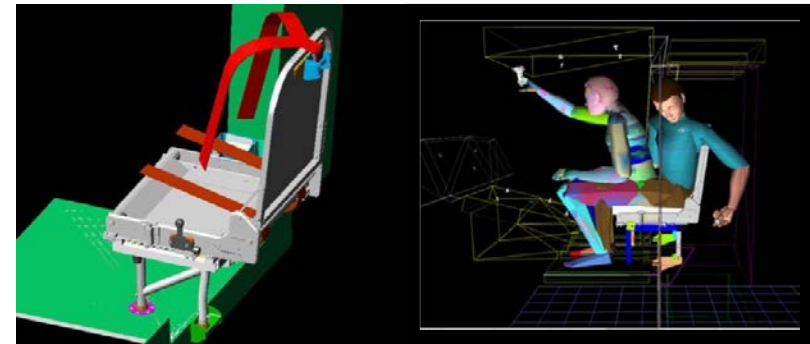


MERC-Other Core Strengths

- **Redesign to Optimize Human Performance**
 - Human Factors Analysis and Biomechanics Design
 - Ergonomic Risk Analysis, Mitigation, and Training
 - Rehabilitation Engineering for Work, Learning, and Independence
- **Optimizing Manpower, Materials, and Tooling for Maintenance**
 - Design the Work for Safety and Efficiency and Verify Through Simulation



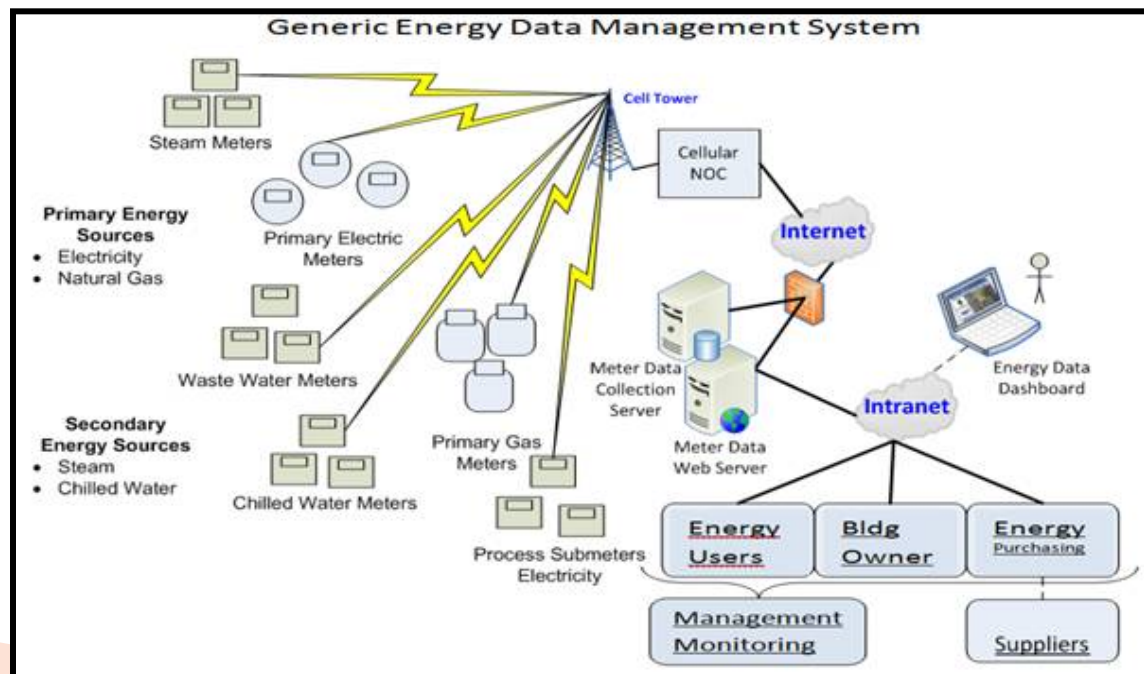
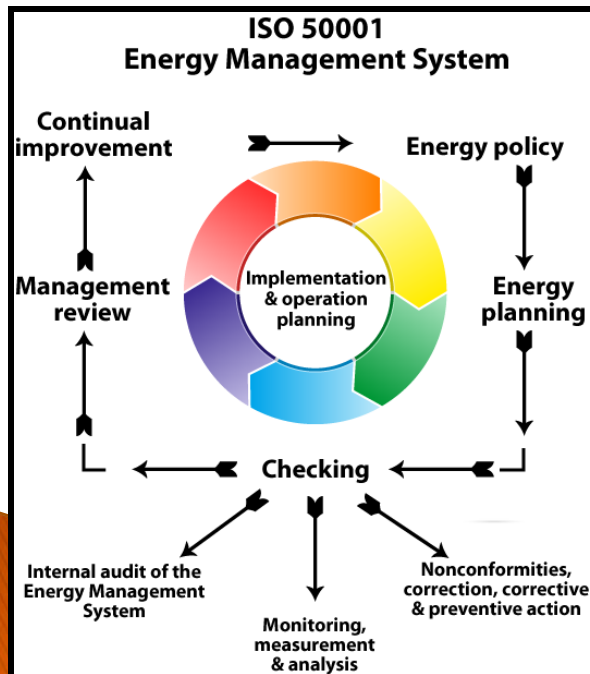
Six Sigma-Lean Mfg-Kaizen



MH-53J/M Flight Engineer Seat Redesign

Energy Management Systems

- ISO50001 Energy Management System & Audit
- Metering and Information System Across ALCs
- Verification/Validation of Energy Savings Programs
- Cyber security
- Renewable and Alternative Energy Sources



Primary Customers & Partners

Government Agencies & Services



Some Key Industry Partners

BAE SYSTEMS

Raytheon

NORTHROP GRUMMAN



BOEING

LOCKHEED MARTIN

MERC Summary



- Been in partnership with DOD for **28** years
- How to get to MERC:
 - Utilize FAR 6.302-3 Exception, MERC BOA, & EEC J & A
- Full-time internal technical and contracting staff
- Recognized source of expertise
 - Engineers, Scientists, Logisticians
- Unmatched facility and equipment in Middle GA with offices in Dayton, OH