# Airspace Systems Management in Transition


**Presented to:** 2nd National Airspace System Infrastructure Management Conference

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**Date:** June 13, 2006

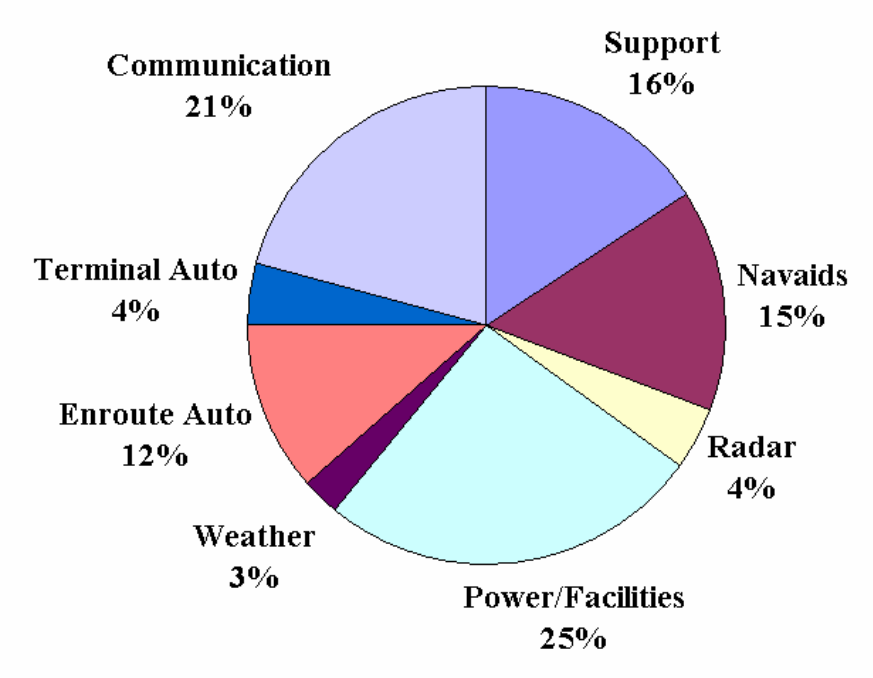
# Technical Operations Workload

- **Budget:  Over $1.86 Billion annually**
- **6100 System Specialists**
- **Over 84000 pieces of Equipment requiring staffing**

**Personnel**

**Workload**

**By System Type**



# Maintenance and Management Philosophy

- **In Tech Ops, our primary maintenance goal is:**
  - *to provide expected levels of service availability with minimal equipment related delays at an acceptable cost to the customer*

- **ATO Management Philosophy supports this goal by:**
  - Focusing on our core functions
  - Establishing customer priorities
  - Helping us define the cost of doing business
  - Utilizing maintenance approaches and operational processes that optimize productivity and efficiency
  - Defining and reporting metrics that are relevant to ATO goals and today's NAS environment

# 2005 Technical Operations Concept of Operations Organization & Process Improvement

- **Maintenance Philosophy**
  - **New Restoration Order – Restoration based on criticality, redundancy, risk analysis, value based, customer need.**
- **Reliability Centered Maintenance**
- **Workforce Structure – 3 Area Offices, no deputies, consolidation of common functions**
- **Control Centers**
- **System & SubSystem Certification**
- **Employee Credentialing and Proficiency**
- **Remote Monitoring and Control**
- **Metrics**

# Reliability-Centered Maintenance (RCM)

**An analytical process used to determine appropriate failure management strategies to ensure safe and cost-effective operations of a physical asset in a specific operating environment.**

**Failure Management strategies**

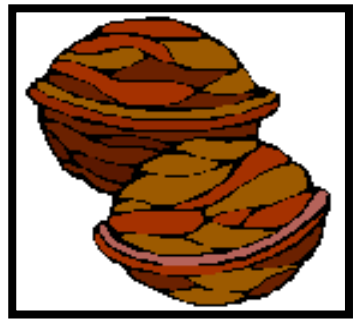
- **Preventive Maintenance (PM) (Clock Based)**
- **Predictive Testing and Inspection (Condition Based)**
- **Repair (Run to Failure)**
- **Proactive Maintenance techniques**

# Reliability-Centered Maintenance (RCM)

- **Goal of RCM**
  - **Avoid or reduce failure *CONSEQUENCES***
  - **Not necessarily to avoid failures**
- ***Failure Consequences are the effects of failure on*:**
  - **Personal and Equipment Safety**
  - **Operations**
  - **Economics**
  - **Environmental Health/Compliance**

# RCM in a Nut Shell

- **In summary, RCM asks:**
  - ✓ **What does an item do?**
  - ✓ **How does it do it?**
  - ✓ **How does it fail?**
  - ✓ **What happens when it fails?**
  - ✓ **Can the failure be prevented or mitigated?**
  - ✓ **Is there value in preventing or mitigating the failure?**
  - ✓ **Does in-service data indicate changes or improvement are needed?**



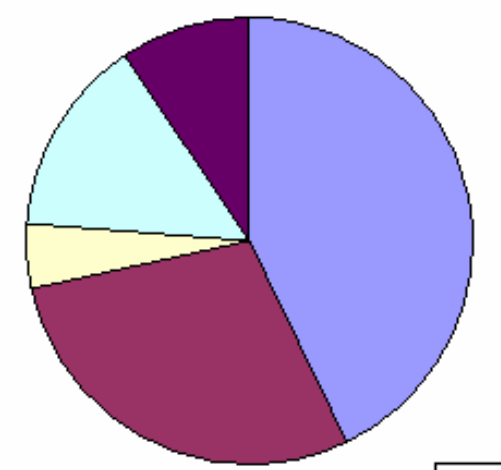
- **Safety, operations, and economic impacts are put into balance**

# System Changes

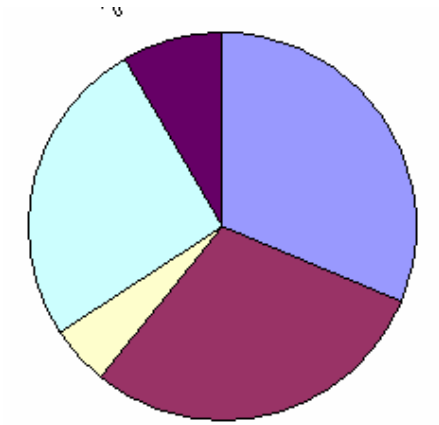
- **Increased Engineering Design Complexity**
  - Increased National OPS Engineering Staffing
  - Increased effort required for system enhancements
- **Increased Maintenance Complexity**
  - Additional Field Support required by National OPS Engineering
- **Increased Maintenance Tasks performed by centralized engineering staff**
  - Optimizations, site adaptations, modification
- **System Performance monitored centrally**
- **Architecture Interdependence**
  - Increased coordination for maintenance & enhancement
- **Increased Communication Requirements**
- **Reliability must be addressed during development**
- **'Right Sizing' the NAS is needed for true cost avoidance**

# Total Cost of Ownership

## Legacy System

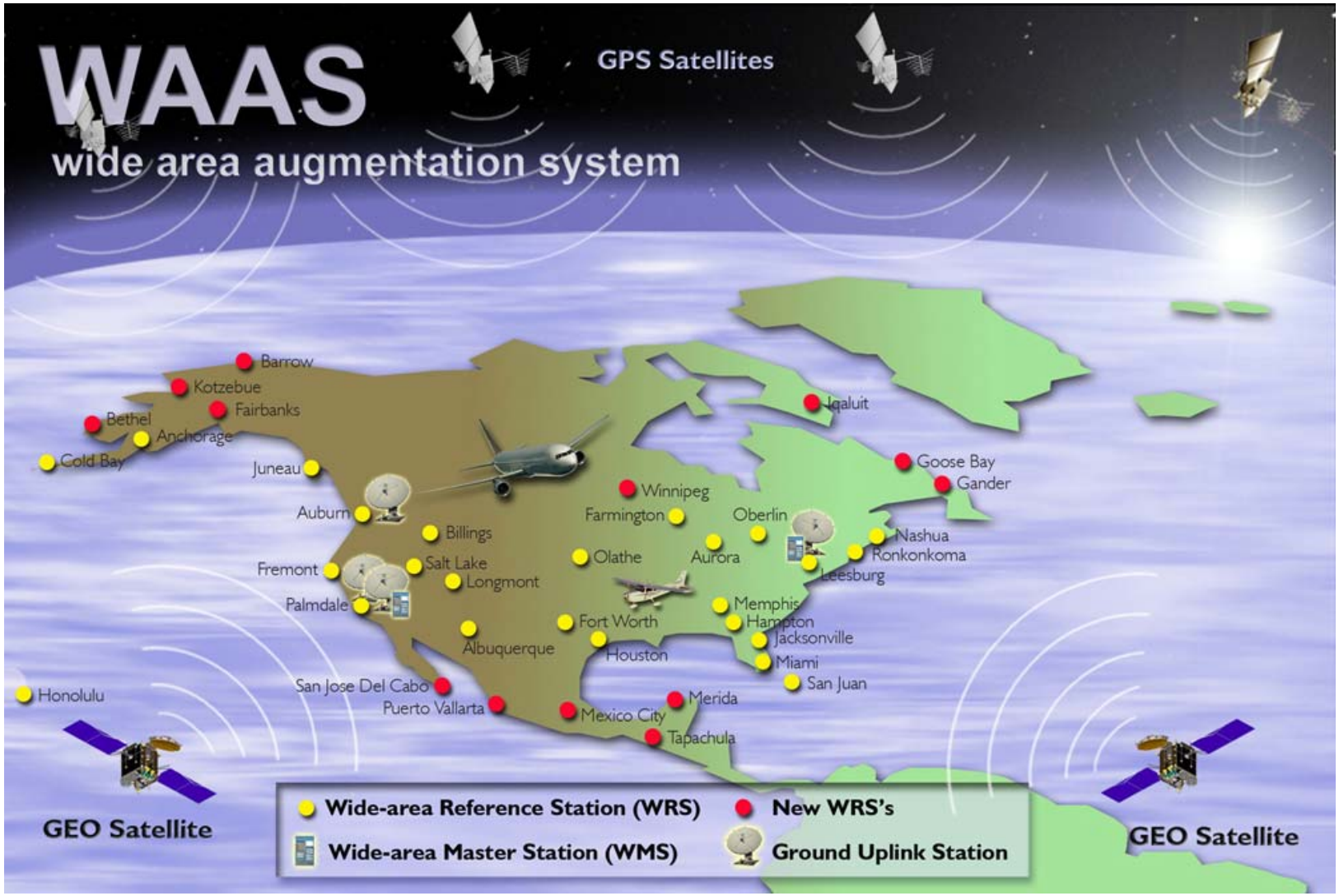


## Newer System



- Maintenance Workforce
- Logistics Support
- Training
- National OPS Engineering
- OCC,NOCC,Area, HQ Support

# Architecture Interdependence

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