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A Case Study in Multi-tiered Distributed Environmental Compliance Information Management in the Air Force

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Overview

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- Presentation will examine challenges faced by our customer at the Air Force Civil Engineer Center (AFCEC) and how their Air Program Information Management System (APIMS) has been evolving to meet their complex information management requirements at multiple tiers of the Air Force enterprise.

Introduction

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- Air Program Information Management System (APIMS)
  - Developed/maintained by Northrop Grumman since inception in 1996
  - Modern Java web application w/Oracle 11g Database
  - Used by DoD, DOE and VA
  - >1,500 regular users at over 250 installations; 200,000 transitory users
  - DoD offering hosted at DISA; Commercial SaaS offering available on Amazon Web Services
  - Current DoD security accreditation
  - FedRAMP certification in work

DISA
Defense Information Systems Agency
Department of Defense

amazon web services™

Enterprise-centric environmental compliance solution used by multiple federal agencies

Customer Challenges

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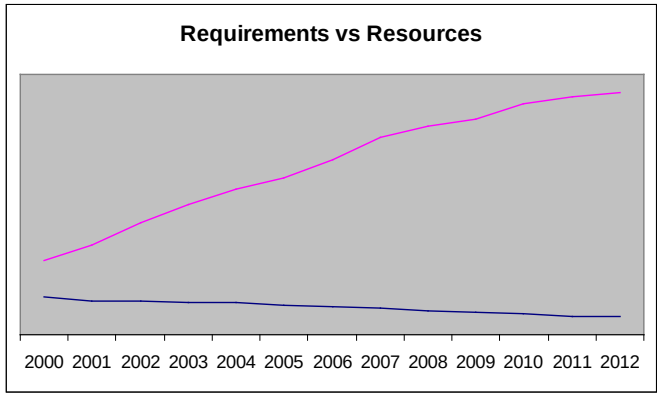
- Environmental compliance requirements increasing while available resources are declining
  - Most notices of violation traceable to lack of proper information management
  - Lack of automation
  - Lack of uniform approach
- Sustainment of single-faceted legacy systems is cost prohibitive
  - Largely due to increasing system security requirements



Compliance requirements are increasing while available resources are declining

Program Vision Statement

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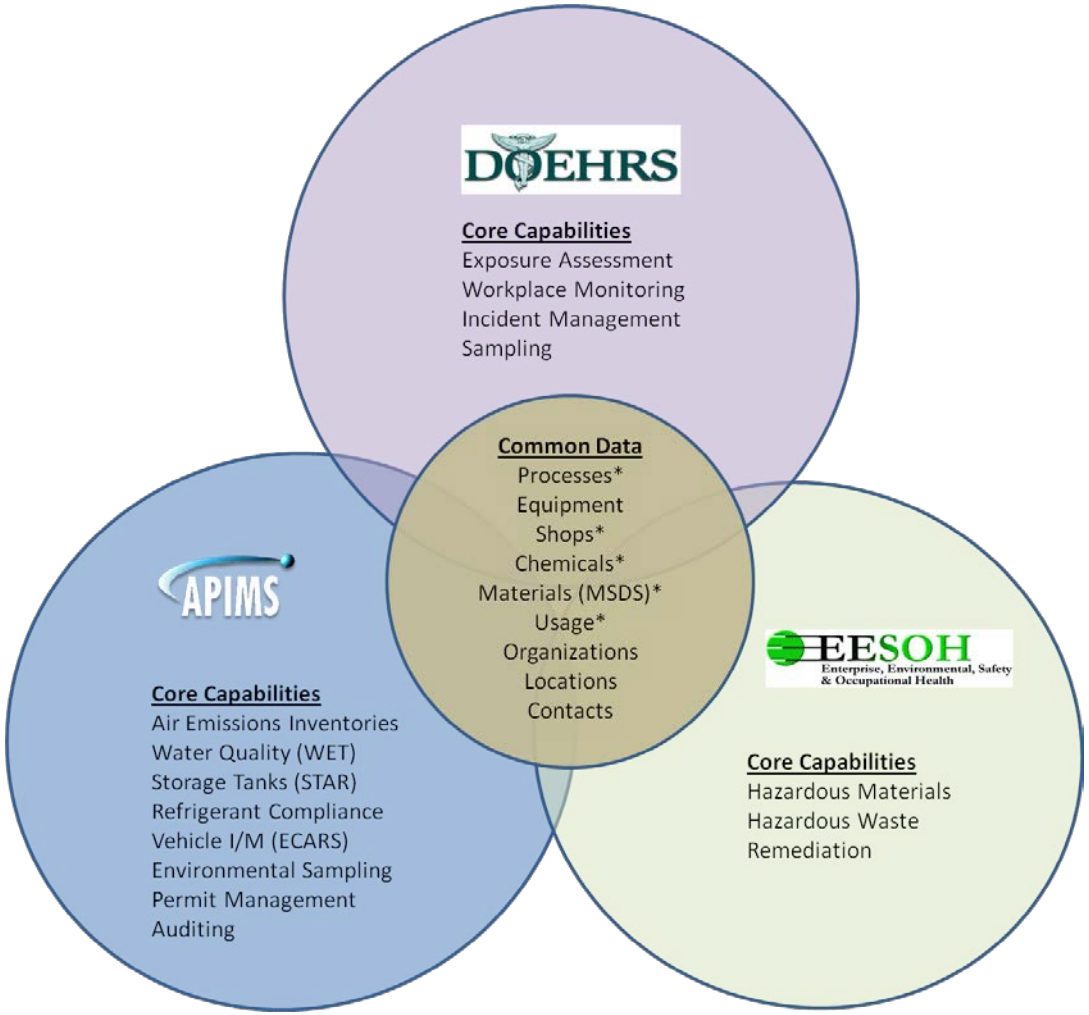
"APIMS is the system of choice for the civil engineering workforce at all levels of the enterprise. It is unequaled in its ability to support users in meeting the data management, record retention, reporting, and compliance demonstration requirements of local, state and federal agencies."

- ***"system of choice"***
  - **Ease of use**
  - **Promotes process efficiencies**
  - **Users want to use it (mobile technology)**
  - **Instant access to meaningful data**
- ***"civil engineering workforce"***
  - **Reduce reliance on single-faceted or duplicative systems**
  - **Development/sustainment costs shared with other users (i.e. VA, DOE, commercial)**
  - **Interoperable with other enterprise systems**
  - **Drive uniformity and best practices**
- ***"all levels of the enterprise"***
  - **Provides value to shop users, installation level managers and corporate managers**
- ***"meeting data management, record retention, reporting, and compliance demonstration requirements of local, state and federal agencies."***
  - **Single data repository for many information management needs**

Vision statement established to remain focused on addressing current challenges

Interoperability



Interoperability with other related enterprise systems

Data Availability

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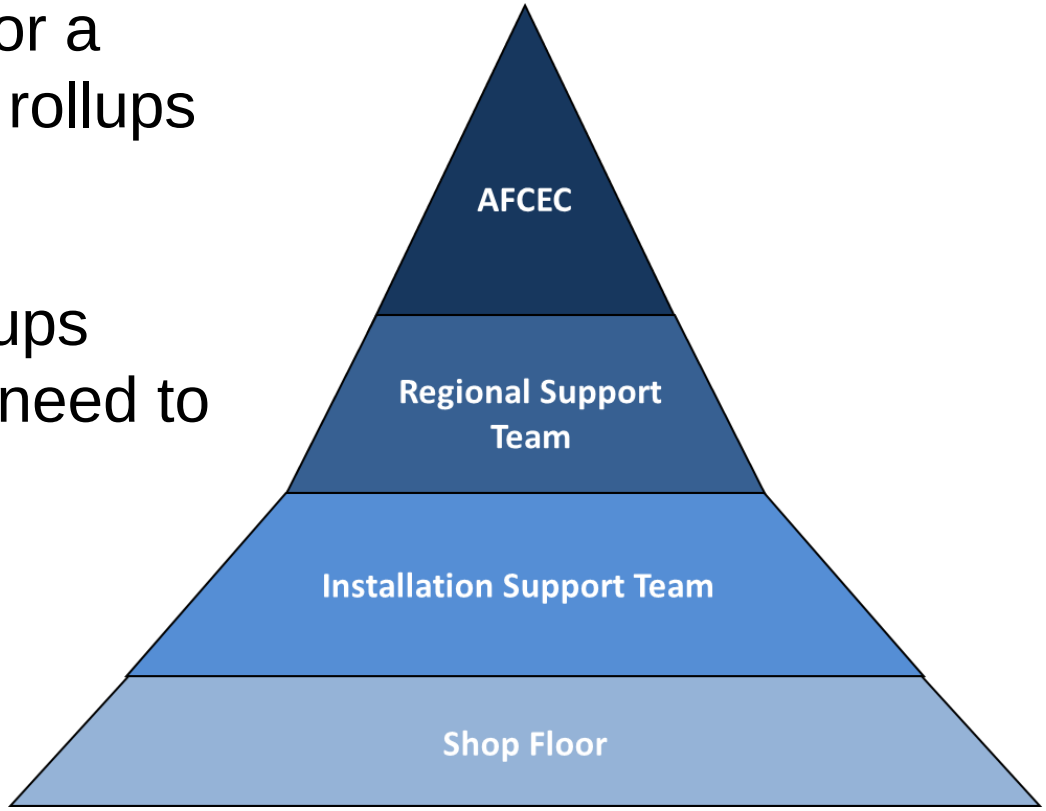
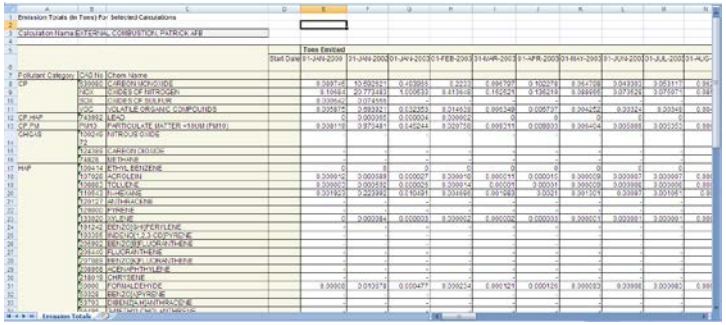
- Tier assignment allows users to easily access/view data for a single installation or data rollups for groups of installations
- Access to data views/rollups restricted to those with a need to know



Enterprise decision makers able to quickly access real-time data across entire enterprise

Enterprise Reporting

- Multi-Tier Enterprise Reporting
  - Fixed format reports
  - Ad-hoc reports engine provides flexibility to instantly access all data
  - Drill-down dashboards and stoplights provide ability to quickly identify risks and drill down to root cause



Media managers are able to easily access data stored in APIMS

Ease of Use - Tailored User Experience

- Media-centric and relevant shared functions organized into custom homes and landing pages

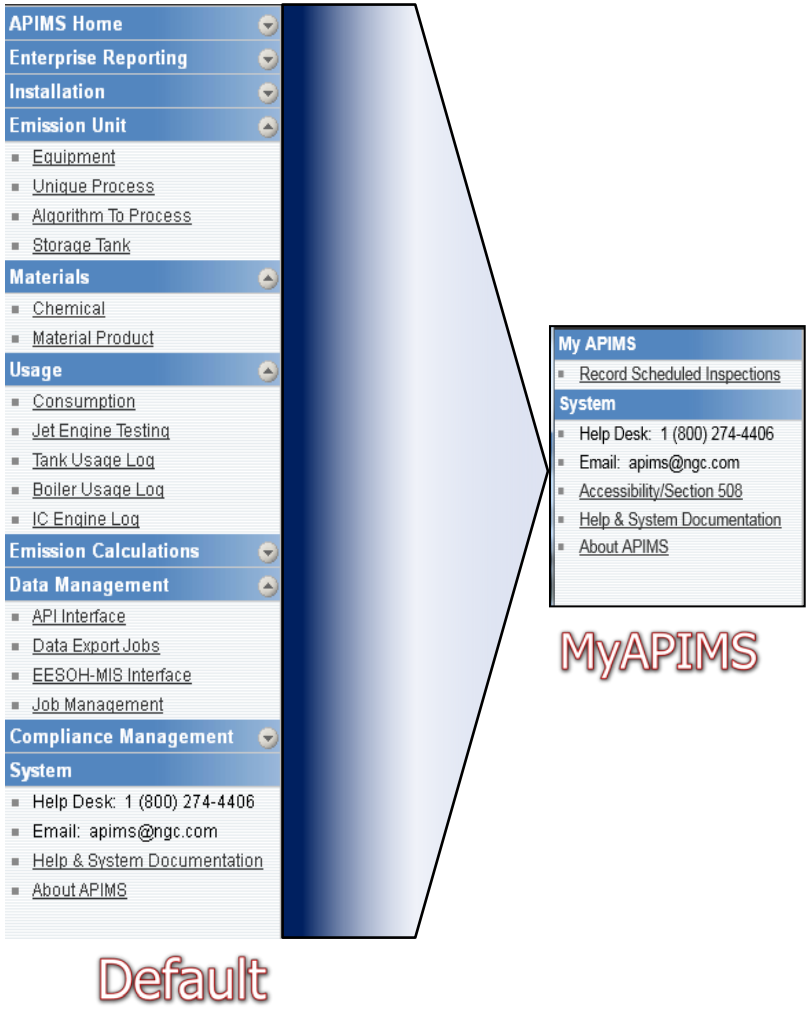
Homes

Landing Pages

APIMS offers a media-centric user experience within a single enterprise platform

Ease of Use - MyAPIMS

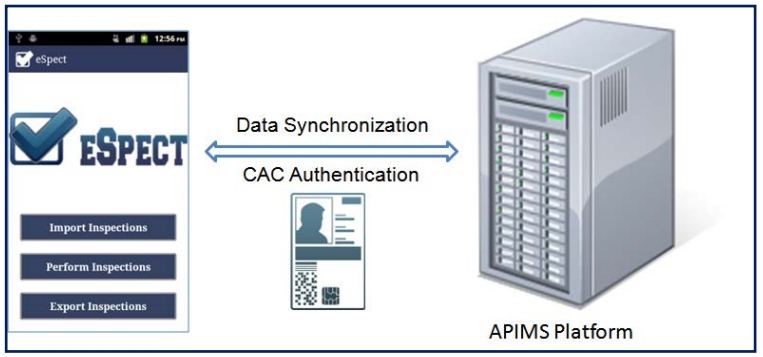
- Customizable Menu
  - Tailored to user specific responsibilities
  - Simplifies user experience
  - Supports scalability for users/installations that don't require all system functions

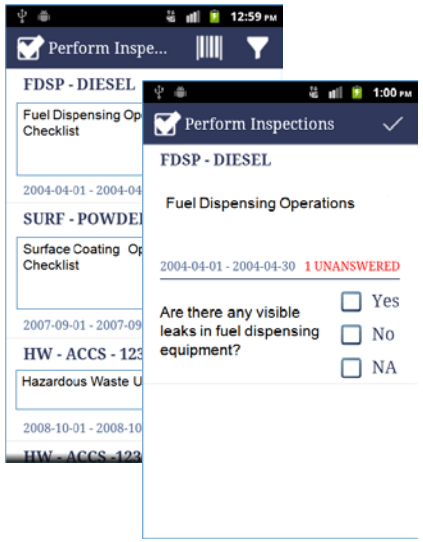


MyAPIMS customizes users' experience to their specific responsibilities

Efficiencies - Mobile Capabilities

- eSpect Module
  - Mobile app for inspections
  - Integrated with native barcode and camera functions
  - Allows offline-use when no wireless network is available
  - On-demand synchronization with enterprise database when wireless signal is present
  - Smart Card authentication or username/password
- Apps available in iOS and Android

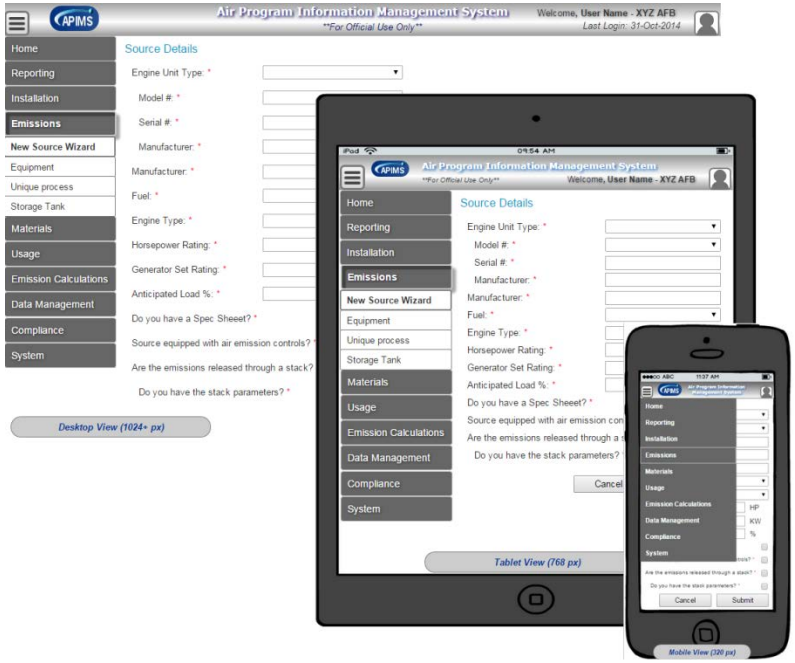




Mobile capabilities eliminate re-keying of data gathered in the field on paper forms

Efficiencies - Mobile Capabilities

- Responsive Design
  - New pages designed to render optimally on PC monitors, tablets or phone-sized devices
  - Legacy pages to be retroactively converted as design is refined



Forward thinking/vision has kept APIMS technologically viable for nearly 20 years

Case Study #1 – Air Emissions Inventories (AEIs)

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Problem	Actions Taken	Outcome
200+ different formats and lack of uniformity make data nearly **impossible to consolidate** into a single format usable by enterprise managers. Thousands of pages of data in hardcopy.	**APIMS developed** and refined to provide a uniform solution.	The entire Air Force enterprise consisting of 200+ installations now all using the same system. Data instantly available to enterprise managers in a **single electronic repository** for upward reporting and analysis.
AEIs **error prone** due to complexity of emissions models/algorithms and data entry errors. Many **NOVs** due to inaccurate results published to regulatory agencies.	A single **uniform emissions calculation package** developed and maintained for all common sources. User friendly **electronic shop logs** created to encourage direct entry at shop floor rather; replacing paper logs that have to be re-keyed.	Model-related emission result **errors now nearly non-existent**. Data entry errors reduced significantly. Overall quality of AEI reports much higher.
Cost to generate AEIs to high	Uniform and user friendly **solution** provided that supports ability to **generate reports in-house**. Shop logs facilitate data entry at shop floor.	Reliance on contractors greatly reduced. Shops entering much of the data directly. Average **cost** required to generate an AEI report **decreased** on average by **>50%**.

AEI reporting is the most mature module in APIMS

Case Study #1 – Summary

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- Data entry and shop floor and automation of report generation has reduced AEI costs by more than 50%
  - No more paper
- Reduction in NOVs related to inaccurate emission reporting
- Enterprise managers at all tiers able to instantly access AEI data and better manage programs
  - Cost of compliance assessments
  - Mission relocation impacts

AEI automation yielding significant results

Case Study #2 – Compliance Assessment

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Problem	Actions Taken	Outcome
Required compliance documentation often not available during regulatory agency audits resulting in **excessive documentation-related notices of violation**	Provided electronic **compliance assessment module** that consolidates all compliance records in single and readily accessible electronic repository	**NOVs** due to documentation issues expected to **decline**. **Maintenance** of documented requirements as permits change proving to be **overly burdensome**. Refinement of module underway to address usability issues.
Compliance managers often **unaware of** source-specific compliance **requirements** contained in voluminous permits	Provided ability to decompose permits into online **required** actions and **inspection checklists**	Requirements **readily visible** to all stakeholders and incorporated into checklists. Transition of responsibilities to new managers much easier.
Internal compliance audits often **not performed** at optimal or required frequency due to overburdened installation-level compliance managers	Provided automated **scheduling mechanism**, notifications and ability for shop-level stakeholders to access APIMS and perform inspections and log results themselves	Shop supervisors beginning to use the system and self-monitor for compliance and log results. Appears to be **very effective** where properly implemented. Some struggles with **culture change**.
Enterprise managers unable to perform onsite installation level audits at effective frequency due to **resource constraints**	Provided enterprise stoplight-based **risk dashboard** that mines installation inspection data and identifies high-risk installations	Risk dashboard appears to be effective but **change** in enterprise audit strategy/policy **will take time**.
Re-keying of inspection results from paper checklists results in **errors** and **inefficiency**	Provided **mobile app** that can be used in the field and synchronized to the enterprise database	Activation of stand-alone mobile application in Air Force pending successful navigation of **security** review **process**.

Manage risk by focusing limited resources on high risk installations

Case Study #2 – Summary

- Deployment to shop floor largely successful
  - Reducing burden on installation level managers
  - Placing ownership of compliance on the operators
- Usability issues identified and being addressed
  - Must be simple for non-tech savvy users!
- Fielding of mobile technology needed to achieve optimal return on investment
- Some installation level users resisting
  - Doing something instead of nothing can be a hard sell
- Policy changes and cultural shifts is slow but steady

Compliance Assessment module implementation largely successful

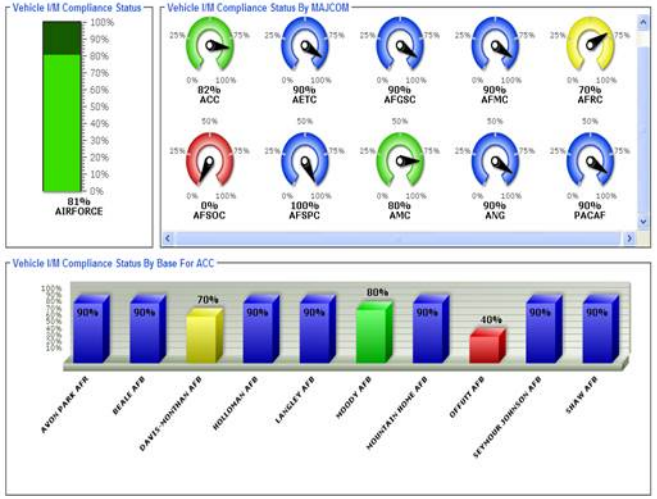
Case Study #3 – Vehicle I/M

Problem	Actions Taken	Outcome
Screening for current smog checks discontinued when **vehicle decal program ended** – but federal smog check requirement continues in Clean Air Act §118(d).	**ECARS developed** to provide a single automated and uniform self-certification solution.	Affected employees **automatically** notified and complete self-certification within 2-3 minutes once every 1-2 years. **Saves estimated 100,000+ man-hours per year** as compared to manual registration process.
Must **identify and communicate with** and effectively provide compliance instructions to **200,000 affected employees** who must have current smog checks on personal vehicles driven on base.	**Interface with Air Force Directory Services (AFDS)** developed to identify and automatically email self-certification URL and instructions to employees.	Interface with **AFDS not as accurate as desired** in identifying work location of every employee – researching more effective alternative.
Monitoring **compliance status** at 60+ installations difficult	APIMS platform data rollup capabilities and **stoplight metrics** leveraged to provide instant visibility	Air Force able to **easily identify** installations with lower than desired **compliance rates** and provide targeted support.

ECARS saves Air Force over 100,000 man-hours of productivity per year

Case Study #3 – Summary

- Automatically identifies and notifies 200,000 affected employees of requirement
- Eliminates former in-person manual registration process
  - Estimated to save >100,000 man-hours annually
- Uniform solution eliminates cost for each installation to develop unique approaches
- Provides instant visibility to installations that require assistance in meeting metric
- AFDS personnel feed not as accurate as desired in identifying exact employee work locations (i.e., 90-95% accurate)



ECARS largely automates a formerly manual process

Current Initiatives

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- RICE NESHAP compliance within Power Production organization
  - Antiquated process of inventorying and logging monthly emergency generator inspections and maintenance activities on Air Force Form 487
  - Routine maintenance activities and regulatory compliance requirements largely overlap
  - With minor modifications to APIMS and through data configuration, both stakeholder communities' needs can be satisfied
    - APIMS already has an inspection module
    - APIMS already contains an inventory of all Air Force emergency generators used to meet AEI reporting requirements
  - Enterprise managers will now have real time visibility to their global power production capacity and better manage their assets
  - Many Power Production shop users are already using APIMS so implementation should be simple

Existing capabilities able to service other needs

Summary

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- Requirements increasing while available resources declining
  - Automation is the key!
  - AFCEC largely successful in efforts to use APIMS to automate and reduce compliance risk
- APIMS is architected to easily expand to affordably meet emerging requirements for automation and information management
  - Single-faceted systems legacy systems or manual processes being sun-downed in favor of multi-purpose enterprise capabilities
- Mobile technologies key to long-term viability
  - Navigation of in-flux security framework challenging - conversion from DIACAP to RMF is currently the only priority
- Providing value to all tiers of the enterprise key to the ongoing success of APIMS

AFCEC is leveraging in-place systems to reduce cost and address previously unmet needs

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Questions?