



207 Big Springs Avenue  
Tullahoma, TN 37388  
(931) 455-2617

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[www.microcraft.aero](http://www.microcraft.aero)

# Micro Craft, Inc.

## Briefing to NDIA Manufacturing Division



**Dr. Kenneth W. Sullivan, P.E.**  
**Mr. Steve Gleason, CISSP**  
**October 19, 2016**

***“Micro Craft is the “Go To Partner” for tough challenges in creating the Future of Flight and sustaining existing capabilities for Aerospace, Defense and Commercial customers while creating value for our stakeholders.”***

# Micro Craft History



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- Founded in 1958 by craftsman Charles Folk
- Key provider of complex wind tunnel models and other specialty hardware – pioneers in CNC, EDM, etc.



- Rapid expansion in 1990s into space and technology markets



- Prime contractor and vehicle manufacturer and integrator for NASA's X-43A and X-43C Hyper-X Programs



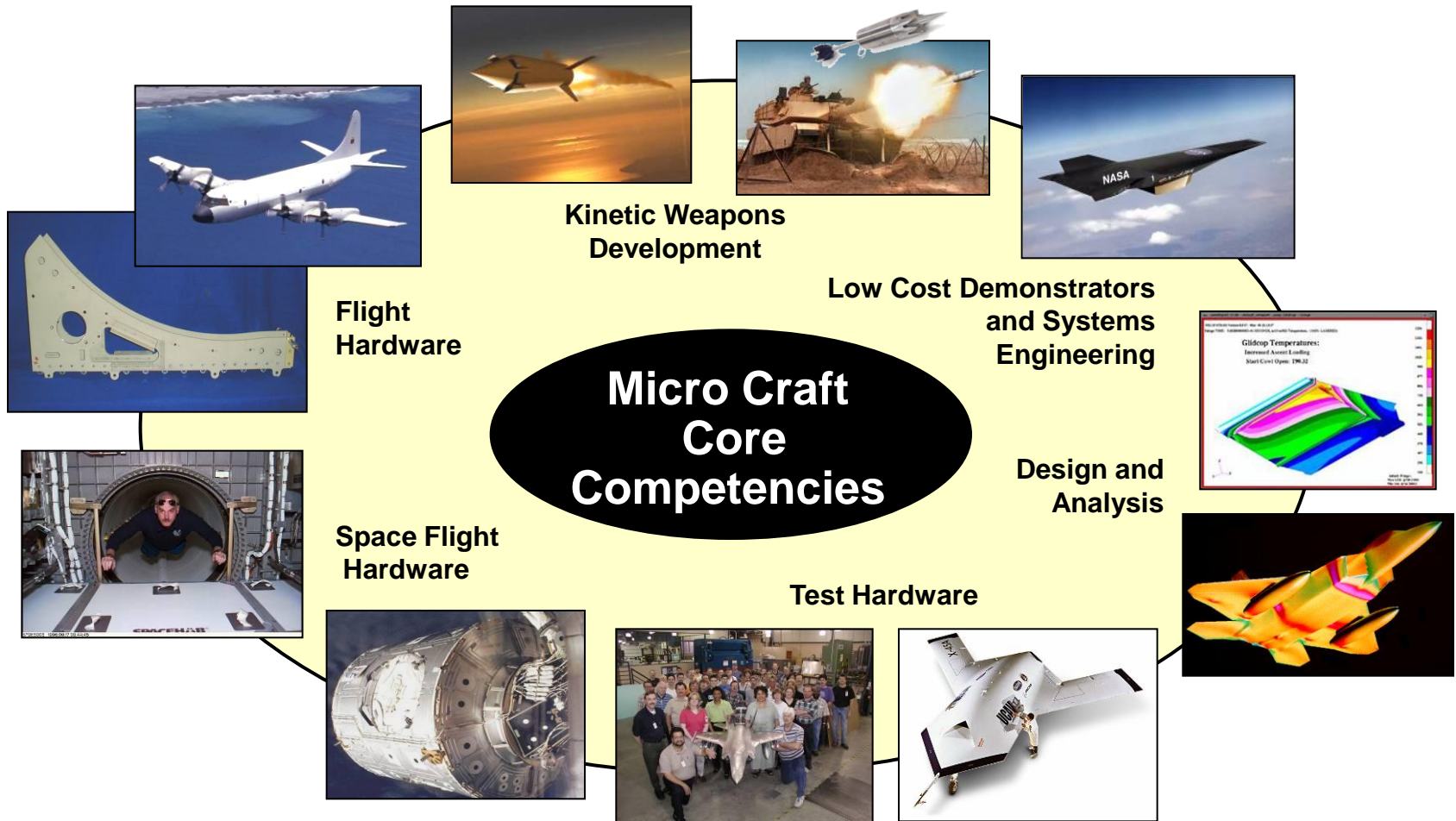
- After a brief period of ownership by an investment group, Micro Craft was acquired by ATK in 2003.
- In 2011, Micro Craft was acquired by its employees and became a **100% Employee-owned Small Business.**



# Micro Craft Core Competencies



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**Development, Engineer, Test, and Manufacture**

# Manufacturing Capabilities



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- **Celebrating 50+ years of experience in providing precision manufacturing to NASA, DoD, and OEMs**
- **Manufacturing**
  - 57,000 sq. ft. facility
  - 3-,4-,and 5-axis milling
  - Large CNC lathe machining
  - Wire EDM, die sink EDM
  - ID/OD grinding
  - Metals, composites, ceramics, and exotic metals
  - Complex components, assemblies and integrated systems
  - Prototype research hardware
  - Electronics Lab and cable harness facilities
- **Quality**
  - AS 9100 Rev C and ISO 9001:2008 Certification
  - 2005 Comet Award for Excellence in Manufacturing
  - DPD (Digital Product Definition) and MBD (Model Base Definition) Boeing Certified
  - Lockheed Martin Quality Select Supplier
  - NASA Small Business Contractor of the Year



**bsi.** 

## Certificate of Registration

QUALITY MANAGEMENT SYSTEM - AS9100 REV C AND ISO 9001:2008

This is to certify that: **Micro Craft Inc.**  
207 Big Springs Avenue  
Tullahoma  
Tennessee  
37388  
USA

Holds Certificate No: **FM 550221**

and operates a Quality Management System which complies with the requirements of AS9100 REV C and ISO 9001:2008. BSI Group America Inc. is accredited under the Aerospace Registration Management Program and the assessment was performed in accordance with the requirements of AS9104 Rev A for the following scope:

**Research, Design, Development, Manufacture, Integration and Testing of Advanced Aerospace and Industrial Systems.**

This certificate is traceable to this company's original registration, Certificate Number 6613 dated January 11, 2007 and issued by aqa International.

For and on behalf of BSI:   
Gary Fenton, Global Assurance Director

Originally Registered: 01/05/2010      Latest Issue: 12/14/2012      Expiry Date: 12/13/2015

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...making excellence a habit.™

- **AS 9100 Rev C and ISO 9001-2008 (Cert. FM 550221)**
- **DPD (Digital Product Definition) and MBD (Model Base Definition) Boeing Certified**
- **ISO 10012-1 Metrological Confirmation System for measuring equipment**
  
- **PC-DMIS software**
- **Inspect to CAD models**
- **Currently an approved flight hardware manufacturer for companies such as Boeing, Gulfstream, Lockheed Martin, Northrop, and Pratt & Whitney**



- Involved in the development of virtually every major domestic and many foreign fixed wing, rotary wing, and missile system programs since the 1950s
- Unique vertically integrated capability: design, analysis, fabrication, instrumentation, assembly, and test support



**Metal and Composite Wind  
Tunnel Models**



**Full-Scale F-22  
Composite  
Radar Cross  
Section Model**



**Components for the X-45  
Unmanned Combat Air  
Vehicle (UCAV)**

# Prototype Manufactured Parts

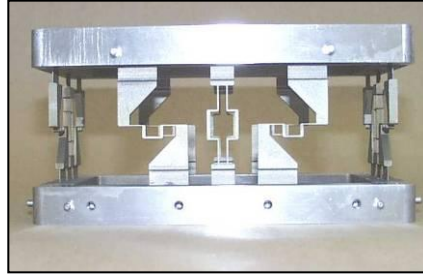


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**Fully Instrumented Nozzles**

**Force and Moment Measuring Balances**



**Fan Blades**



**Large Handling Fixtures and Weldments**



**Nuclear Research Hardware**



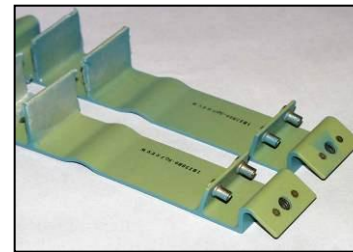
**Cooling Cart for NASA Ames Airborne Observatory**



**Space Flight Hardware**



**Wind Tunnel Model Hardware**



**Sheetmetal Flight Hardware**



**Providing out-of-production flight hardware is one of our core competencies.**

**Micro Craft has expertise and experience with:**

- **The P-3 Orion, S-3 Viking, C-130 Hercules, C-141 Starlifter, F-16 Falcon, F-15 and C-5 Galaxy**
- **Digitizing existing parts for building CAD models “reverse engineering”**
- **Tooling development**
- **Component obsolescence studies**
- **Benefit and trade-off analyses for alternative manufacturing methods and weight reduction**
- **Metal and composites manufacture**
- **Researching old specifications and recommending alternatives for obsolete processes**



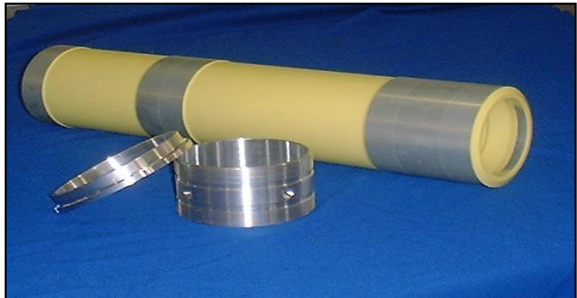
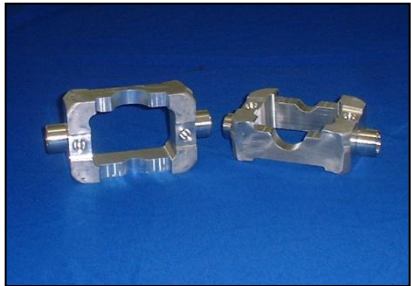


**Landing Gear Lighting Assemblies for Eaton Aerospace and Goodrich Aerospace**

# Limited Production Manufactured Parts



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# Boeing Delta IV Flight Hardware

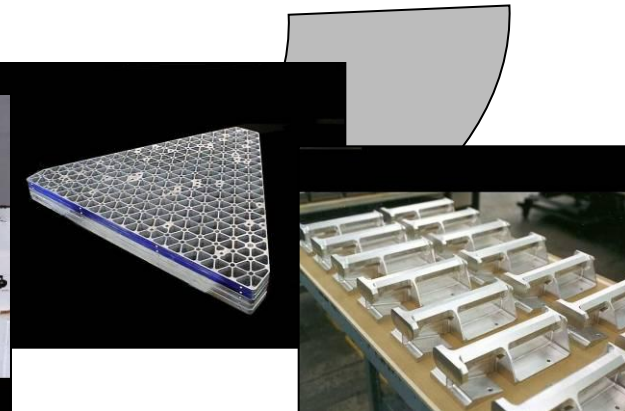


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**ISO 9001  
Processes**

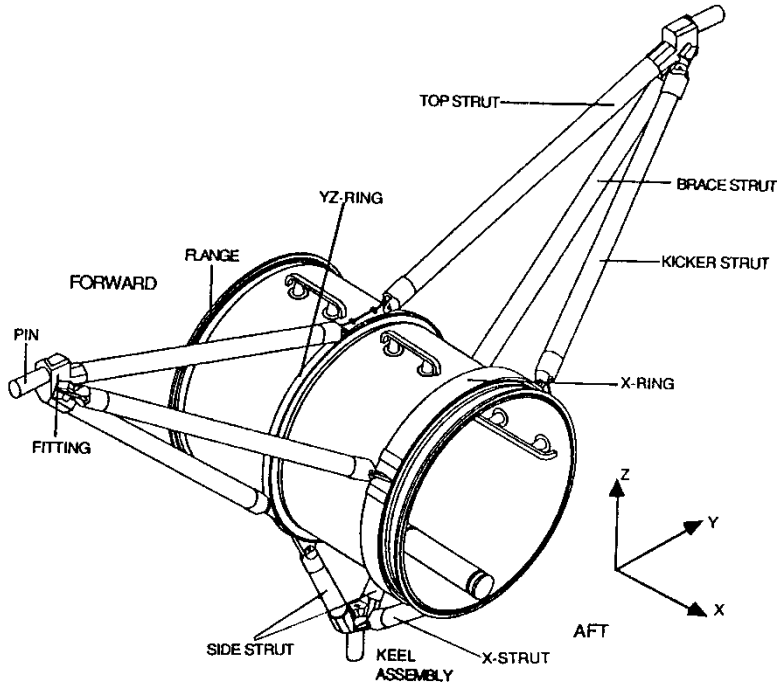
- Boeing preferred supplier for Delta II, III, and IV; rated **gold** for delivery performance
- Multiple ship-sets of complex brackets, isogrids, and other specialized hardware
- Over 400 line items
- Over 22,000 parts delivered with 99% on-time delivery and a discrepancy rate of less than 1%
- Reduced costs on Delta III parts by 30-40%
- Prepared Lean Manufacturing processes to support Decatur, AL, assembly plant



# Shuttle-to-MIR Tunnel Extension



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SPACEHAB TUNNEL AND ITS HARDWARE

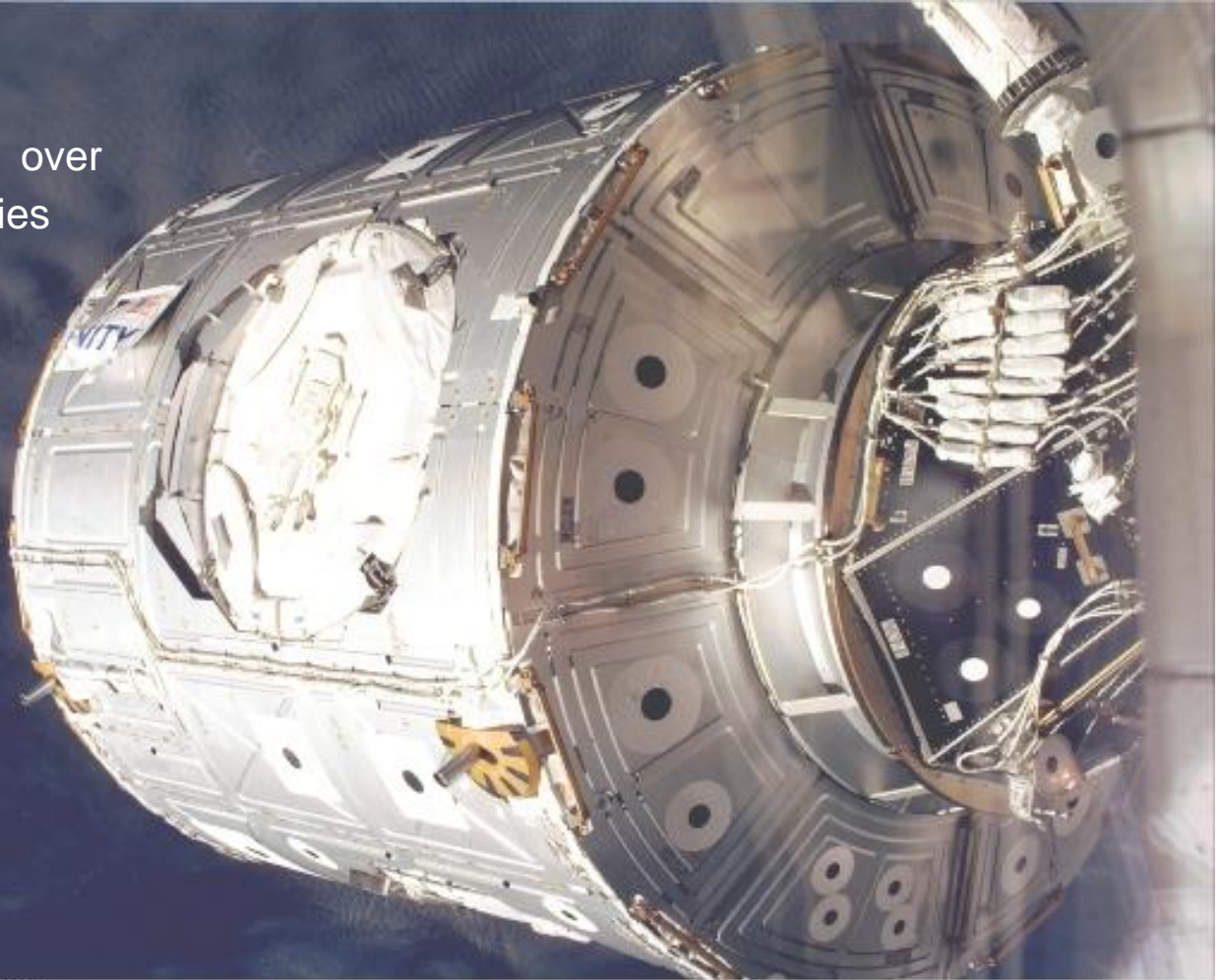


# Unity Node for the ISS



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- Over 7500 parts and over 130 complex assemblies
- Secondary and tertiary structures
- Close-out panels
- ECLSS Ducts
- ISS Lockers
- Excess of \$14.5M of hardware provided in a 2.5 year period

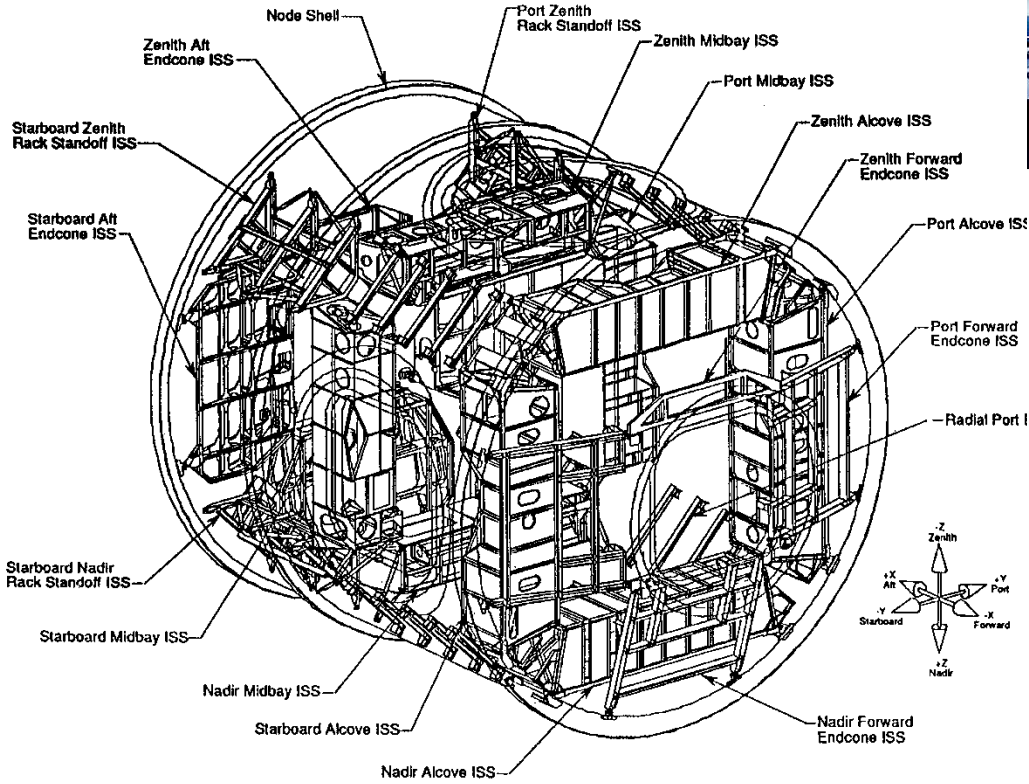


S88E5033 1998:12:05 23:02:33

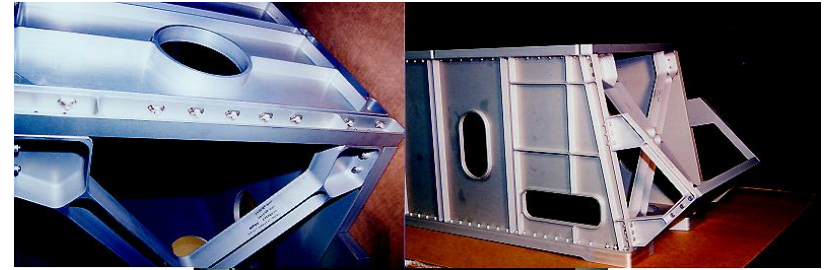
# ISS Secondary Structure



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Space Station Node Internal Outfitting-Secondary Structure



# What makes Micro Craft Different?



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- 1. Provides secure facility that has classified engineering and manufacturing capability**
- 2. Quality department in place to support critical and complex aerospace hardware component manufacture**
- 3. Broad customer base that requires Micro Craft to support “one of a kind” to high production, mix model manufacture in firm-fixed price and cost-plus fixed fee R & D markets**
- 4. Aggressively implementing (“baking in”) Cybersecurity requirements in business processes and management systems**





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# Implementing Cybersecurity at a Small Aerospace and Defense Supplier



**Mr. Steve Gleason, CISSP**

Unfortunately cyber security has come to depict a range of nefarious computer break-ins by shadowy hackers with cryptic names that compromise the credit card accounts of retail store patrons, emails by notable politicians, and the control of cars and unmanned aircraft.

As regulations have emerged, federal contractors have been given little or no insight regarding achieving compliance. December 31, 2017 is the drop dead date. Third party assessment companies even provide a minute by minute count down on their websites, intentions are clear.

- **THREATS AND VULNERABILITIES ARE REAL AND INCALCULABLE**
- **COMPLY OR DIE**

**Compliance  
Countdown**

**444**

**Days**

**19**

**Hours**

**43**

**Minutes**

- **58 employees, 40 of which are owners**
- **Manufacturing Craftsmen and CNC operators, Manufacturing Management, Engineers, Estimators, Accounting, Contracts, Security, IT, Business Development, Executive Management**
- **Unclassified and Classified Programs**
- **Network**
  - 75 workstations
  - 10 servers
  - Wireless guest and internal access
  - CNC controllers
  - Firewall
  - Tablets, Smart Phones

## Categorize

- Administrative
- Physical
- Technical

## Inventory

- Compliant
- Partial
- No
- N/A

## Prioritize

- Risk to Assets
- Cost of Acquisition
- Ease of Implementation

## \*Security vs. Compliance

## **Implement each control based on priority**

## **Identify low hanging fruit along the way\***

## **Prepare and respond to control impact on users**

- Supporting users in a small business is a unique challenge
- Attitudes toward new security controls will not change over night (“this is the kind of thing they did when we were owned by...”)
- Regular group communication either through email or formal training sessions is critical to timely implementation of security controls.
- Most small business users wear multiple hats
- Controls will expose processes that must be altered and improved (document)

## **Use assessment tool to document as you continue to assess and implement**

# Self Assessment - Evidence



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### Evaluate Compliance (NIST 800-171)

Go to Family  Number

Number Family Basic/Derived

Filter For Only (Clear Filter )  
Comply  Partial  No  N/A  No Response

3.1.1 ACCESS CONTROL Basic

Requirement Employ the principle of least privilege, including for specific security functions and privileged accounts.

Suggested Evidence

SUGGESTED EVIDENCE: Access Control Policy, copy of group access structure, privileged user agreements

POTENTIAL ASSESSMENT METHODS AND OBJECTIVES (Derived from 800-53A):  
EXAMINE: Access control policy; procedures addressing least privilege; list of assigned access authorizations (user privileges); information system configuration settings and associated documentation; information system audit records; other relevant documents or records; list of security functions (deployed in hardware, software, and firmware) and security-relevant information for which access must be explicitly authorized; information system audit records; list of system-generated privileged accounts; list of system administration personnel; other relevant documents or records  
INTERVIEW: Organizational personnel with responsibilities for defining least privileges necessary to accomplish specified tasks; system/network administrators; organizational personnel with information security responsibilities;  
TEST: Automated mechanisms implementing least privilege functions

Eval By:  Date:

Compliant Partial No N/A Clear Selection

Comment:  Attachments

Comply  Partial  No  N/A  No Response

Source: 800-171 R, FAR 15

Filter:

View Suggested Evidence View Special Guidance View Questions

Progress

Record: 1 of 109 No Filter Search

# Self Assessment – 800-53 Reference



Proud to be 100% Employee Owned

### Evaluate Compliance (NIST 800-171)

Go to Family  Number

Number Family Basic/Derived

Filter For Only (Clear Filter )  
Comply  Partial  No  N/A  No Response

3.1.1 ACCESS CONTROL Basic

Requirement Employ the principle of least privilege, including for specific security functions and privileged accounts.

Suggested Evidence 800-53 References Special Guidance Questions Remediation Action

AC-02-00 Account Management  
The organization:  
a. Identifies and selects the following types of information system accounts to support organizational missions/business functions:  
[Assignment: organization-defined information system account types];

AC-03-00 Access Enforcement  
The information system enforces approved authorizations for logical access to information and system resources in accordance with applicable access control policies.

Record: 1 of 3 No Filter Search

Eval By:  Date:

Comment:  Attachments

Comply  Partial  No  N/A  No Response

Source: 800-171 R, FAR 15

Filter:

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Record: 1 of 109 No Filter Search

### Evaluate Compliance (NIST 800-171)

Go to Family  Number

Number Family Basic/Derived

3.1.1 ACCESS CONTROL Basic

Requirement Employ the principle of least privilege, including for specific security functions and privileged accounts.

Suggested Evidence 800-53 References Special Guidance Questions Remediation Action

Eval By:  Date:

Comment:

Attachments

Compliant Partial No N/A No Response

Comply  Partial  No  N/A  No Response

Source: 800-171 R, FAR 15

Filter:

View Suggested Evidence View Special Guidance View Questions

Progress

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Record: 1 of 109 No Filter Search



# Self Assessment - Questions



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NIST 800-171 Assessment
✕

## Evaluate Compliance (NIST 800-171)

Go to Family

Number

Filter For Only (Clear Filter )  
 Comply  Partial  No  N/A  No Response

Number Family Basic/Derived

Requirement Limit information system access to authorized users, processes acting on behalf of authorized users, or devices (including other information systems).

Suggested Evidence
800-53 References
✓ Special Guidance
Questions
Remediation Action

Questions	Assessment
▶ Do you employ a consistent, documented process for limiting IS access to authorized users? ▲▼	<input type="radio"/> Comply <input type="radio"/> Partial <input type="radio"/> No <input type="radio"/> N/A <input type="button" value="✕"/> Source: Imprimis
Do you employ a consistent, documented process to control processes executing on the IS?	<input type="radio"/> Comply <input type="radio"/> Partial <input type="radio"/> No <input type="radio"/> N/A <input type="button" value="✕"/> Source: Imprimis
Do you employ a consistent, documented process to control devices that can access the IS?	<input type="radio"/> Comply <input type="radio"/> Partial <input type="radio"/> No <input type="radio"/> N/A <input type="button" value="✕"/> Source: Imprimis

Record: 1 of 3 Unfiltered

Eval By:

Date:

Compliant
Partial
No
N/A
Clear Selection

Comment:

Attachments  

(dbl-click)

⏪
⏩

Comply 
Partial 
No 
N/A 
No Response

Source: 800-171 R, FAR 15

Filter:

View Suggested Evidence
View Special Guidance
View Questions

Progress

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Record: 1 of 109 No Filter

25

# Self Assessment - Remediation



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### Evaluate Compliance (NIST 800-171)

Go to Family  Number

Number Family Basic/Derived

Filter For Only (Clear Filter )  
Comply  Partial  No  N/A  No Response

3.1.1 ACCESS CONTROL Basic

Requirement Employ the principle of least privilege, including for specific security functions and privileged accounts.

Suggested Evidence 800-53 References Special Guidance Questions Remediation Action

Title  Attachment   
(dbl-clk)

Description of Action Required

Estimated Start

Estimated Finish

Eval By:  Date:

Compliant Partial No N/A Clear Selection

Comment:

Attachments

Comply  Partial  No  N/A  No Response

Source: 800-171 R, FAR 15

Filter:

Progress

View Suggested Evidence View Special Guidance View Questions

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Record: 1 of 109 No Filter Search

## Comments:

- A comment should be entered for each control, detailing what the organization is doing or how the control is being met.

## Attachments:

- Existing policy's or developing policies attached here for audit review.

# Self Assessment - Remediation Report



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**Summary**

This assessment was accomplished between 7/27/2016 and 8/10/2016

Assessment done by : Carol Jones, ISSM; D. Warbucks, CIO; Steve Johnson, FSO; T

Assessment done on 109 Requirements, based on NIST 800-171 CUI Controls, NI  
NIST 800-171 Requirements, FAR 15 - 800-171 Equivalents

Requirements Selected 109 Requirements Evaluated 102

Compliant ■ Partial ■ No Compliance ■ Not Applicable ■

0% 20% 40% 60%

NIST 800-171 Requirements

NIST 800-171 Remediation Other NIS

No Compliance 2

Partial 11

Sample Page header

**No Compliance (2)** ← Number in category noted at beginning

3.3.4 D. Warbucks, CIO (7/31/2016)

**Requirement:** Alert in the event of an audit process failure.

**Assessment Comments**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam consectetur tincidunt tellus, sed pretium vehicula odio. Mauris tempus mauris velit, quis accumsan tortor facilisis ac. Pellentesque eget ipsum purus id, rhoncus enim. Sed nec malesuada arcu, nec fribus elit. Maecenas vestibulum ornare faucibus.

**Attachments:**

**Questions** /6

Does the failure of any audit process generate an alert? Comply  Per

Source: Imp

Comply  Per

Source: Imp

**Remediation**

**Remedy Action** Entry in remediation for 3.3.4

**Estimated Start** 8/24/2016 **Estimated Finish** 8/29/2016

**Action Detail** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi eget turpis eget nulla vestibulum congue. Etiam volutpat mauris erat, id pellentesque mauris auctor congue. Nunc mollis odio euismod tellus molestie, sit amet porta nunc viverra. Vivamus sit amet massa sed massa ultricies ultrices. Maecenas tempor ante risus, a aliquam libero egestas sed. Suspendisse feugiat diam vel lectus iaculis, at gravida turpis vulputate. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse potenti.

**Attachments**

Sample Page header

D. Warbucks, CIO (8/10/2016)

**Requirement:** Obscure feedback of authentication information.

**Remediation**

**Remedy Action** Entry in remediation for 3.5.11

**Estimated Start** 8/24/2016 **Estimated Finish** 9/1/2016

**Action Detail** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi eget turpis eget nulla vestibulum congue. Etiam volutpat mauris erat, id pellentesque mauris auctor congue. Nunc mollis odio euismod tellus molestie, sit amet porta nunc viverra. Vivamus sit amet massa sed massa ultricies ultrices. Maecenas tempor ante risus, a aliquam libero egestas sed. Suspendisse feugiat diam vel lectus iaculis, at gravida turpis vulputate. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse potenti.

**Attachments**

**2 No Compliance** ← Number in category noted at end

**Partial (11)**

3.1.19 Carol Jones, ISSM (8/9/2016)

**Requirement:** Encrypt OUI on mobile devices.

**Remediation**

**Remedy Action** Entry in remediation for 3.1.19

**Estimated Start** 8/24/2016 **Estimated Finish** 9/5/2016

**Action Detail** Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi eget turpis eget nulla vestibulum congue. Etiam volutpat mauris erat, id pellentesque mauris auctor congue. Nunc mollis odio euismod tellus molestie, sit amet porta nunc viverra. Vivamus sit amet massa sed massa ultricies ultrices. Maecenas tempor ante risus, a aliquam libero egestas sed. Suspendisse feugiat diam vel lectus iaculis, at gravida turpis vulputate. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse potenti.

**Attachments**

Summary highlights challenges

All sections selected

Only Remediation section selected

Wednesday, August 10, 2016

powered by i2ACT-800

Wednesday, August 10, 2016

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Wednesday, August 10, 2016

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Page 2 of 7

# Self Assessment - POAM



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Remediation Export.xlsx - Excel

FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW DEVELOPER ACROBAT

Clipboard Font Alignment Number Styles Cells Editing

A2 3.1.2

	A	B	C	D	E	F	G	H	I	J
	Requirement/Control	Assessment	Remediation Title	Start Date	Finish Date	Notes	Date Evaluated	Evaluated By	Attachments	
1										
2	3.1.2	Partial	Entry in remediation for 3.1.2	2/23/2016	2/23/2016	Phasellus sagittis mi nec nisi sagittis, id gravida neque faucibus. In pretium lorem faucibus pharetra sodales. Sed mollis ex maximus libero suscipit finibus et aliquam arcu. Vivamus ultricies.	2/8/2016	Carol Jones, ISSM		0
3	3.1.8	Partial	Entry in remediation for 3.1.8	2/23/2016	3/18/2016	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam consectetur tincidunt tellus, sed pretium eros. Nam ut vehicula odio. Mauris tempus mauris velit, quis accumsan tortor facilisis ac. Pellentesque eget ipsum auctor, congue purus id, rhoncus enim. Sed nec malesuada arcu, nec finibus elit. Maecenas vestibulum ornare faucibus. Duis eu.	2/2/2016	Ted Baxter, IT manager		0
4	3.1.21	Partial	Entry in remediation for 3.1.21	2/23/2016	3/17/2016	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam consectetur tincidunt tellus, sed pretium eros. Nam ut vehicula odio. Mauris tempus mauris velit, quis accumsan tortor facilisis ac. Pellentesque eget ipsum auctor, congue purus id, rhoncus enim. Sed nec malesuada arcu, nec finibus elit. Maecenas vestibulum ornare faucibus. Duis eu.	1/30/2016	Ted Baxter, IT manager		0
5	3.3.8	Partial	Entry in remediation for 3.3.8	2/23/2016	2/25/2016	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi eget turpis eget nulla vestibulum congue. Etiam volutpat mauris erat, id pellentesque mauris auctor congue. Nunc mollis odio euismod tellus molestie, sit amet porta nunc viverra. Vivamus sit amet massa sed massa ultricies ultrices. Maecenas tempor ante risus, a aliquam libero egestas sed. Suspendisse feugiat diam vel lectus iaculis, at gravida turpis vulputate. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Suspendisse potenti.	2/3/2016	D. Warbucks, CIO		0
	3.4.4	Partial	Entry in remediation for 3.4.4	2/23/2016	2/23/2016	Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi eget turpis eget nulla vestibulum congue. Etiam volutpat mauris erat, id pellentesque mauris auctor congue. Nunc mollis odio euismod tellus molestie, sit amet porta nunc viverra. Vivamus sit amet massa sed massa ultricies ultrices. Maecenas tempor ante risus, a aliquam libero egestas sed. Suspendisse feugiat diam vel lectus iaculis, at gravida turpis vulputate. Lorem ipsum dolor	2/8/2016	Carol Jones, ISSM		0

- **Gather all existing policy and procedure documents**
- **Utilize SANS templates and attach to each control**
- **If possible to divide and conquer by delegating policy gathering and creation**
- **Don't hesitate to mark No upon first pass evaluation. Progress through the questions as quickly as possible.**
- **From an auditors perspective, a POAM is the most important document produced in IS accreditation.**
- **Utilize SANS SSP Tool**

## **Physical network segmentation**

- Infrastructure in place: wiring, server and desktop hardware in place
- Conducting phased testing

## **Applying “baked-in security” principals to:**

- Lean process improvement projects
- Program management software development

## **“Securing American Manufacturing” Partner**

- ManTech, LANL and Oak Ridge cyber security initiative
- Serving as a test bed model for security assessments
- Participating in penetration testing to demonstrate program effectiveness



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# Questions?