Newport News Shipbuilding
A Division of Huntington Ingalls Industries

Strategic Sourcing
Supplier Development

FORWARD **Grow The Business Base**

Presenters: Kim Humphrey/Quinn Williams
Supplier Development Program Manager

Strategic Sourcing - Overview

Supplier Data

- Over 55,000 purchase orders issued each year.
- NNS purchases from 48 States
- 62% of active suppliers are considered Small Businesses
- Approximately 40% of annual spend comes from commercial procurements.
  - Facilities & Infrastructure
  - Tools
  - Capital Projects
  - Benefits and other Human Resource functions
  - IT systems and support
  - Utilities
  - Travel
  - Freight

2019 Supply Base Goals

- Cost Reductions
- Improved Material Availability
- Set Future Path for Outsourcing

Supply Base Capability and Capacity is Key to success in Shipbuilding

Supply Base/ Supplier Development Program

The Supply Base/ Supplier Development Program is the process of collaborating with suppliers to improve processes and product manufacturing capabilities.

- Supply Base Development
- Supplier Development
- Market Intelligence
- Training
- On-Line Training
- Supply Base Assessment / Integrated Enterprise Plan
- Project Management
- Risk Management

Lean Tools are Used to Drive Improvements and Eliminate Waste in the Value Stream

Supply Base Development – Why is it needed?

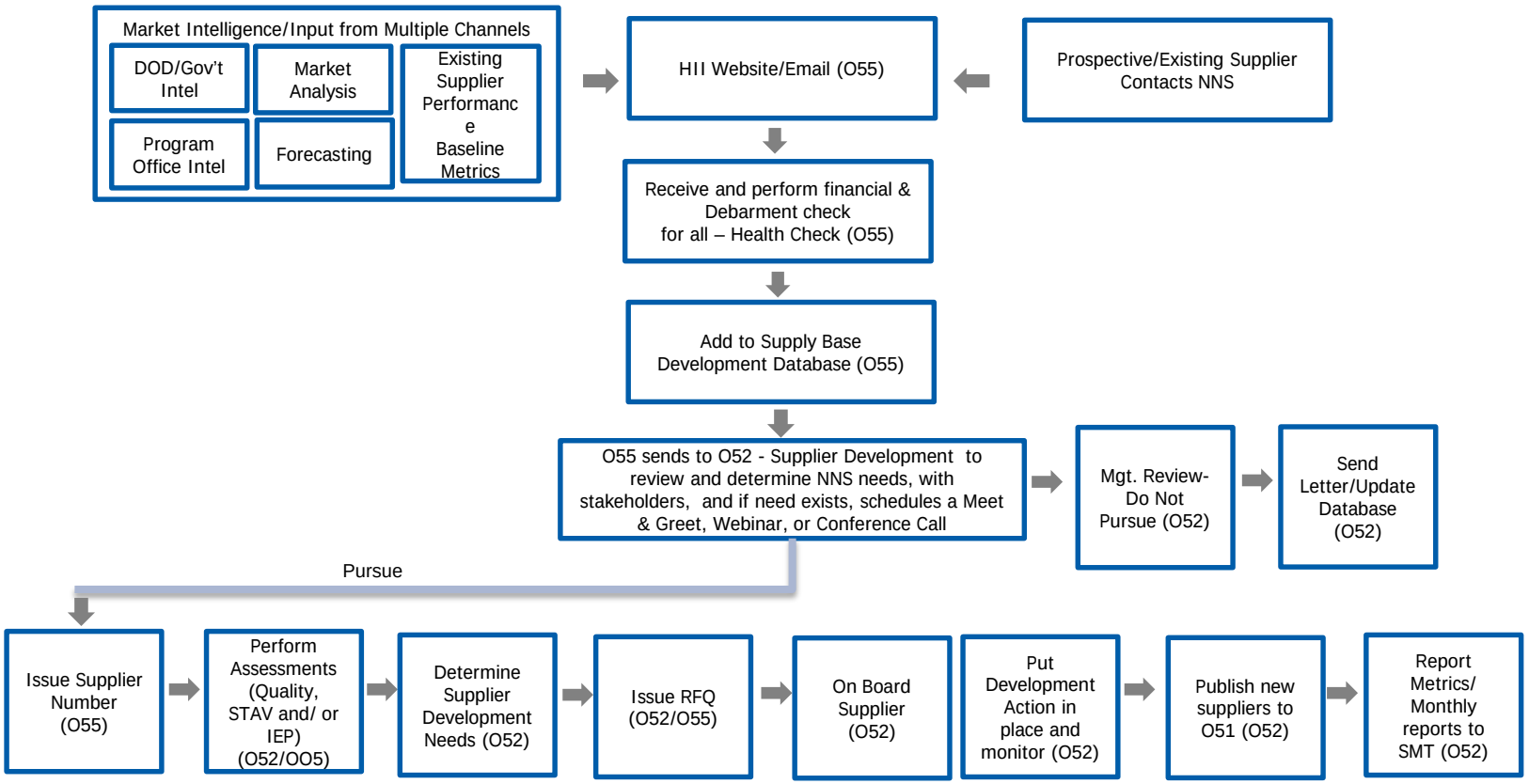
The goal of Supply Base Development is to (1) identify the right suppliers and (2) develop a partnership with these suppliers that will drive innovation and improvements that benefit both organizations

NNS benchmarks best practices with professional organizations including the Association for Manufacturing Excellence (AME). These practices are shared with the supply base to:

- Reduce Cost
- Increase Capability and Capacity
- Reduce Lead-times
- Improve Quality

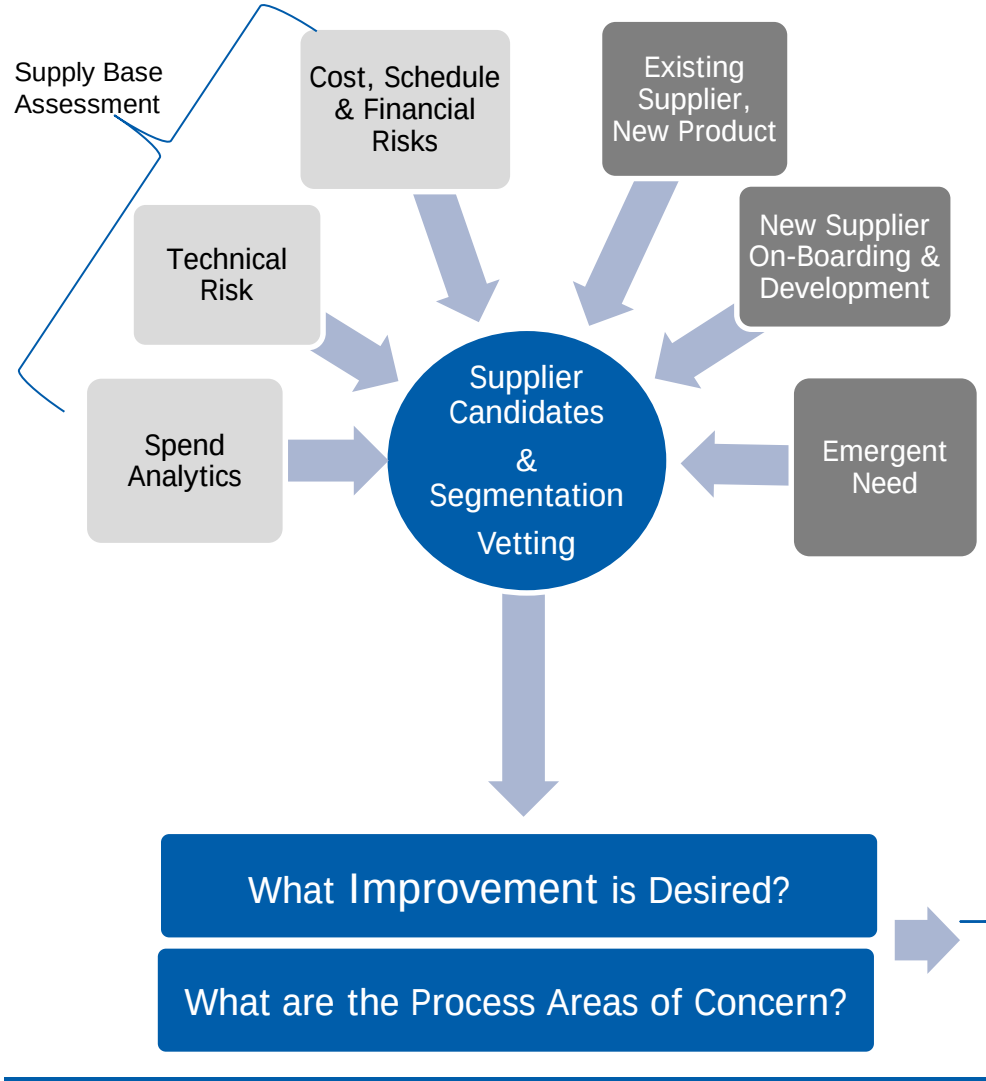
Partner With Our Supply Base to Help Drive Innovation and Improvements

Supply Base Development - Process



A Streamlined Process for Supplier Onboarding Helps Reduce Time and Ensure Integrity

Supplier Development



Tool Sets

Technical Assessment & Development

- Supplier Management Team (SMT) determine supplier development
- Supplier Technical Assessment and Validation (STAV)
- Supplier Engineering Advocates

Operational Process Assessment & Development

- Approach & Commitment to Continuous Improvement
- Review & Improve Shared Business Processes Workshop
- Assess & Develop a Lean Operation
- Root Cause Analysis

Business Management & Education

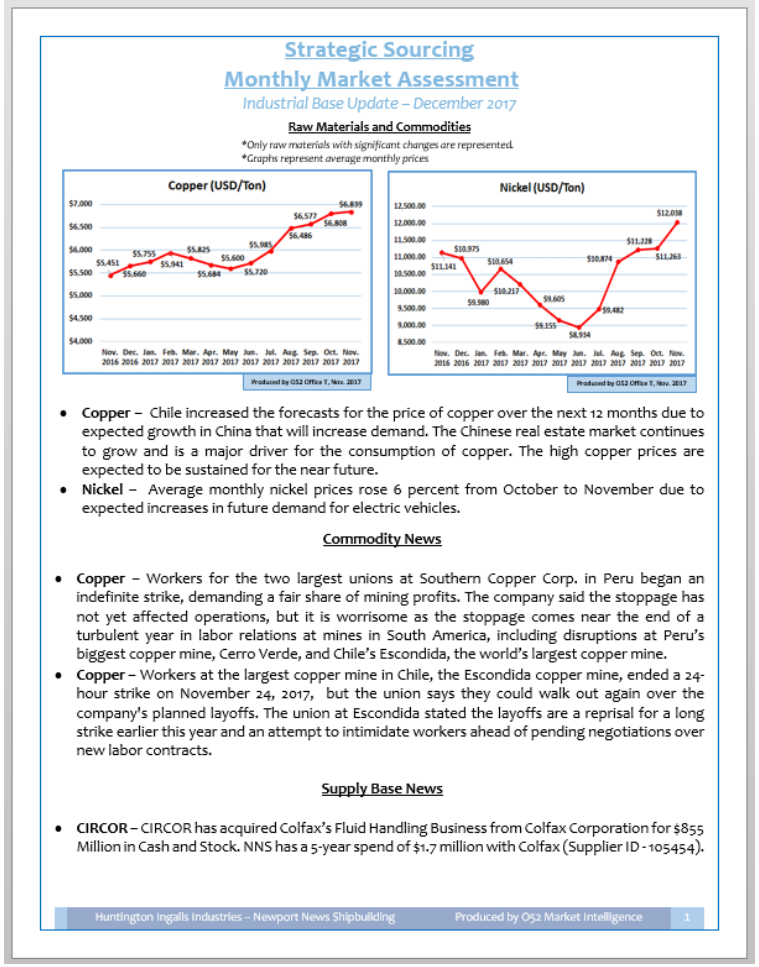
- On-line Training (NNS website)
- Supplier Development personnel coordinate in-person Training at supplier facility
- Webinars & Conferences

Qualification Initiative

- Supplier Systems, Component and Deliverables Qualification

Supplier Vetting and Development Helps Quality

Market Intelligence



Strategic Sourcing

Monthly Market Assessment

Industrial Base Update – December 2017

Raw Materials and Commodities

**Only raw materials with significant changes are represented.*
**Graphs represent average monthly prices*

- **Copper** – Chile increased the forecasts for the price of copper over the next 12 months due to expected growth in China that will increase demand. The Chinese real estate market continues to grow and is a major driver for the consumption of copper. The high copper prices are expected to be sustained for the near future.
- **Nickel** – Average monthly nickel prices rose 6 percent from October to November due to expected increases in future demand for electric vehicles.

Commodity News

- **Copper** – Workers for the two largest unions at Southern Copper Corp. in Peru began an indefinite strike, demanding a fair share of mining profits. The company said the stoppage has not yet affected operations, but it is worrisome as the stoppage comes near the end of a turbulent year in labor relations at mines in South America, including disruptions at Peru's biggest copper mine, Cerro Verde, and Chile's Escondida, the world's largest copper mine.
- **Copper** – Workers at the largest copper mine in Chile, the Escondida copper mine, ended a 24-hour strike on November 24, 2017, but the union says they could walk out again over the company's planned layoffs. The union at Escondida stated the layoffs are a reprisal for a long strike earlier this year and an attempt to intimidate workers ahead of pending negotiations over new labor contracts.

Supply Base News

- **CIRCOR** – CIRCOR has acquired Colfax's Fluid Handling Business from Colfax Corporation for $855 Million in Cash and Stock. NNS has a 5-year spend of $1.7 million with Colfax (Supplier ID - 105454).

Huntington Ingalls Industries – Newport News Shipbuilding | Produced by O52 Market Intelligence | 1

The Market Intelligence (MI) group monitors global Macro Economic markets and produces intelligence for the buying community.

The MI group also monitors Geo-Political events that have the potential to impact our material deliverables, such as mining strikes, coups, or other armed conflicts.

The Global Market Impacts the Defense Supply Chain

Online Training

- Introduction to the Purchasing Process
- RFQ I – The Format and How to Review It
- RFQ II – Coded Notes, Appendices and Forms
- RFQ III – Specifications, Vendor Questions and Previously Qualified Material
- Purchase Order and Work Release
- Coded Notes and Standard Clauses
- Flow-down
- NDT – Non-Destructive Testing
- Welding and Brazing Procedure Submittal
- Welding Program
- Actual Total Cost vs. Price
- Appendices
- Capacity and Resource Loading
- Certificate of Compliance
- Contract Delivery Date
- Drawing Requirements
- EMI - Electromagnetic Interference I, The Introduction
- EMI - Electromagnetic Interference II, The Requirements and Controls
- EMI - Electromagnetic Interference III, MIL-STD-461
- Exostar - Information Manager
- Exostar - The Supply Chain Platform
- Form CPAR - Corrective and Preventive Action Request
- Form PORA - Purchase Order Refresh Action
- Form VDER - Vendor Drawing and Engineering Review
- Form VIR - Vendor Information Request
- Form VPAR - Vendor Procedure Approval Request
- Global 8D Problem Solving and Corrective Action Template
- Hardware and Software Inspection Overview
- How To Deliver Material to NNS
- Lean Introduction for the Skeptic
- Level I Over-stamping Requirements
- Material Control Level
- Material Marking and Labeling Overview
- Newport News Shipbuilding - Supplier Survey
- Root Cause Analysis
- Supplier Performance Scorecard
- SDI - Supplier Delegated Inspection
- Shock Requirements
- Shock Test and Shock Extension Basics
- Source Inspection
- SPARS - Shipbuilding Partners and Suppliers
- Steam Plant Cleanliness - NNS Purchase Order Requirements
- Steam Plant Cleanliness – The use of Covers, Caps, Seals (Shop Floor Personnel)
- Supply Chain Procurement Proposal Review
- Understanding the New NNS PO

Online Training and Webinars Exist to Assist Suppliers in Key Processes

Project Management

- The Project Management team focuses on the management of NNS' Supply Base that are deemed critical to the company's performance that are in need of additional surveillance and oversight.
- Project Managers (PM) are involved with suppliers that are considered high risk because of the particular commodity or components that are procured and/or overall impact to construction.
- PM Functions:
  - Manage all work contracted with the supplier to help gage overall supplier health
  - Support the Procurement Office and Programs
  - Establish a presence at the supplier's facilities
  - Provide assistance in the development of project plans and schedules
  - Monitor/Report progress on the delivery of hardware and software
  - Identify risks and develop mitigation strategies
  - Hold supplier's accountable to commitments
  - Cross-program management and on-site schedule validation.

The Project Management Team Monitors High Risk Project and Suppliers

Risk Management

Risk Manager identify risks:

- As a possible mitigation strategy, develop new suppliers to provide competition in the supply base due to poor delivery, quality or capacity performance
- Identified in the IEP/POAM/STAV assessments.
- Related to new suppliers who have not done previous business with NNS and are providing complex, critical equipment or first time work which could inversely impact program schedule, cost, safety or quality.
- Schedule STAVs and manage opportunities for improvement from STAV reports.
- Based upon a segment of the supply base that has an insufficient number of capable suppliers.
- Based upon market intelligence in regards to material projected cost increases, shortages.

NNS Facilitates and Manages the Supplier, Supply Base and Shipbuilding Market Risks

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Supplier Technical Assessment and Validation (STAV) Program

Improvement Through Collaboration

Presenter: Craig Garland
Program Manager

Supplier Technical Assessment and Validation (STAV) Program – What is it?

The STAV Program is an NNS initiative established in 2014 to better align procurements with our supplier capabilities and core competencies.

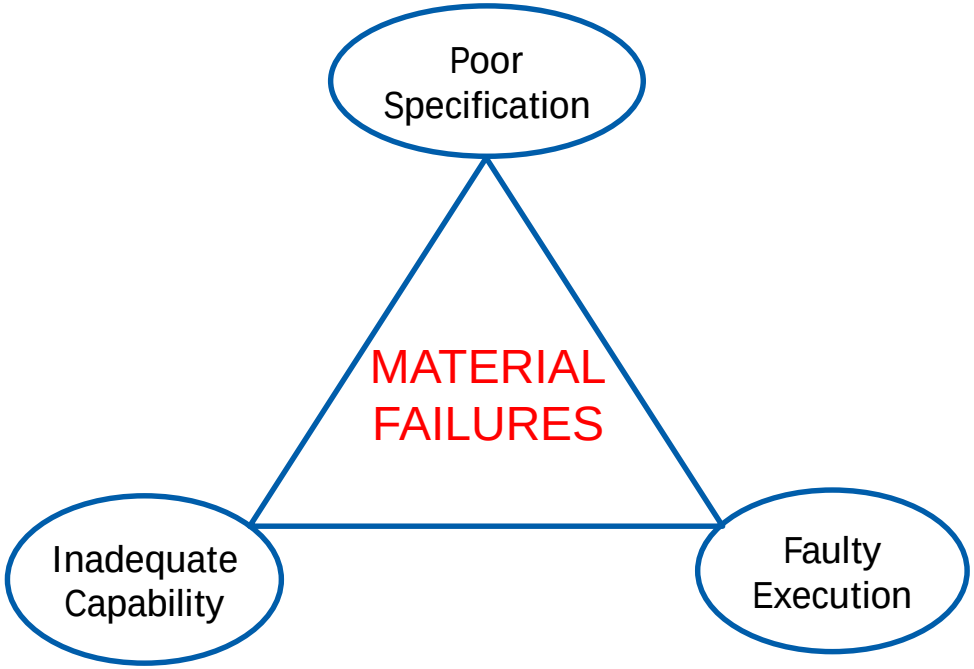
- Bridges the gaps between part requirements, manufacturing capabilities and demonstrated execution
- Introduces NNS to additional supplier capabilities
- Shifts NNS technical support from reactive, problem-solving to proactive, risk-mitigation
- Reduces the costs and schedule impacts associated with after-the-fact material investigations

STAV benefits NNS and Supplier

Supplier Technical Assessment and Validation (STAV) Program – Why is it needed?

NNS conducted over 150 formal material investigations over the past year

- Some directly resulted in delay of delivering our warships to the Navy
- Many directly impacted the ship's cost
- Causes shared by NNS and suppliers



Material Failures are Multi-Faceted

Supplier Technical Assessment and Validation (STAV) Program – How is it conducted?

- On-site evaluation focused on observing operations, reviewing procedures, and having open discussions with craftsmen and management
- Conducted through a pairing of NNS SMEs with Supplier representatives to allow for one-on-one discussions.
- Conducted over the course of one or two days, depending on the size of the Supplier, complexity of the part(s), and number of SMEs required
- Typically includes a brief presentation by the Supplier of core competencies/capabilities and a facility tour, followed by breakout sessions for the SME pairings.
- Concludes with an Assessment Report identifying observed strengths, weaknesses, and risks and recommended (or required) mitigation actions.
- After the on-site visit, NNS will brief the supplier on the STAV report and establish a risk mitigation or development plan, as needed

Comprehensive – Focused – Collaborative

Lessons Learned

- NNS has conducted STAVs at 40 suppliers since 2014
- Common weaknesses/risks being Identified include the following:
  - Inadequate/noncompliant NDT program (Level 3 certs, Written Practice, fab documents)
  - Inadequate/noncompliant welding programs (procedures, WWT, filler metal control, preheat/interpass, etc)
  - Handling nonconforming material (instructions, storage, records)
  - Inadequate subtier supplier management (flowdown, surveillance)
  - Poor understanding of Geometrical Dimensioning and Tolerancing
  - Inadequate technical bench strength
  - Inadequate assembly instructions (assembly steps, fasteners, anaerobic compound, lockwire, etc)

Our Navy Depends on Us to Get It Right the First Time

NDT Program

- NDT Level III Examiners at prime contracted suppliers and their NDT sub-tier suppliers recertify using a point system instead of recertifying by taking NDT examinations every 5 years as required by Navy specifications (i.e., NAVSEA Technical Publication T9074-AS-GIB-010/271).
- NDT Level III Examiners allow NDT Level IIs to use certificates in lieu of taking all 3 recertification examinations required every 3 year as prescribed by NAVSEA Technical Publication T9074-AS-GIB-010/271.
- NDT Level III Examiners (prime contracted suppliers and their NDT sub-tier suppliers) not performing oversight of their NDT Level II personnel as required by Navy specifications.
- Prime contracted suppliers' NDT Level III Examiners not performing oversight of their NDT sub-tier NDT programs.
- NDT supplier's written practice (personnel qualification document) procedures written to aerospace or commercial specifications instead of to NAVSEA Technical Publication T9074-AS-GIB-010/271/ASNT SNT-TC-1A which is required for contracts where the following NAVSEA Fabrication specifications for structure and piping/pressure vessel/machinery are invoked: NAVSEA Technical Publications: T9074-AD-GIB-010/1688 (structure) and S9074-AR-GIB-010/278 (piping/pressure vessel/machinery).
- NDT Level III Examiner approval signatures missing on the NDT Written Practice procedures and Welder Workmanship Training procedures as required by NAVSEA Technical Publication T9074-AS-GIB-010/271 and NAVSEA Technical Publication S9074-AQ-GIB-010/248.
- MT procedures not qualified (1/16" notch) and PT pre-cleaners not qualified in accordance with NAVSEA Technical Publication T9074-AS-GIB-010/271.

Welding Program

- Welding procedure not NNS approved, applied to the correct products, or followed by the welder.
- Unqualified welders due to misunderstanding elements of Welder Workmanship Training, vision testing, joint type, welding position, material type or thickness, and other process limitations.
- Filler metal not procured or verified to MIL-SPEC requirements, and improperly stored or controlled in production.
- Welders with inadequate understanding of how to control preheat and interpass temperature, and heat input.
- Welded components being heated improperly; e.g. not qualified by welding procedures or ovens not properly controlled.

Nonconforming Material (NCM)

- NCM is clearly identified and segregated from conforming material.
- Identification & segregation ensures that material cannot be used.
- A procedure exists that explains how NCM is handled, identified & adjudicated with responsibilities assigned to specific individuals (such as the QA manager).
- If adjudication includes acceptance of non-conformances, that the supplier has sought customer approval, or has been given prior MRB authority.
- Adjudication is accomplished in a timely manner.
- Non-conformance measurements, with Corrective And Preventive Actions or Root Cause Analysis, is regularly reviewed by Staff management.

Subtier Supplier Management

- NNS Purchase Order requirements are clearly flowed down to subtiers and a process for verifying that subtiers understand is in place.
- A process exists for evaluating suppliers at the entry level and on a continuing basis.
- A list of approved suppliers of critical material is maintained and utilized by purchasing. There is a regular, and planned, review process of the list of approved suppliers.
- If Level I material is purchased, that a QC representative reviews the PO prior to release and acknowledges the supplier will be compliant to the NNS contract requirements.
- If specific testing data is a deliverable, that there is a formal review of the data provided against the associated specification or requirement. There is a record of the review with pass/fail clearly indicated.
- Critical material is inspected at receipt of material with clear inspection criteria.
- Supplier performance measurements includes first time quality data.
- On site surveillance of critical suppliers (heat treatment, welding, NDT, acceptance testing) is performed on a regular basis, or as needed based on poor performance.
- Supplier performance data is regularly reviewed by Staff management.

Geometrical Dimensioning & Tolerancing

- ASME Y14.5 Geometric Dimensioning and Tolerancing (GD&T) is a method of applying dimensions and tolerances; furthermore, it is used to interpret requirements.
- GD&T is utilized in New Construction Submarine and Aircraft Carrier Programs' drawings/models, especially in mechanical applications.
- The ability to interpret GD&T on drawings is imperative for any company to accurately verify specification requirements.
- Mechanical Engineers, CNC Programmers, Supervision and Quality Control must be knowledgeable of GD&T. It is also beneficial for shop floor operations that work to these drawings have a basic understanding of GD&T.

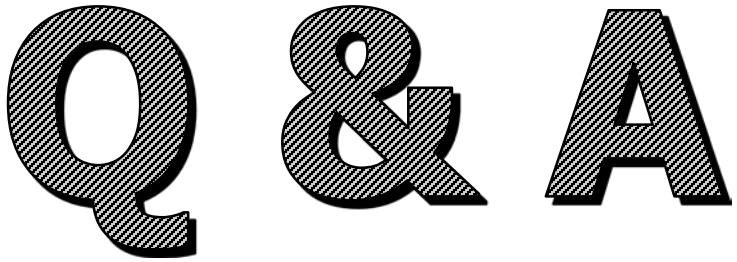
Technical Bench Strength

- NNS expects that suppliers will have a training matrix in place that ensures that their technical staff is fully qualified to perform the work they are assigned.
    - The majority of suppliers assessed lack a formal training matrix for their technical staff.

Assembly Instructions

- NNS expects suppliers of complex/critical components (e.g. hydraulic cylinders, accumulators, and valves) to have detailed written procedures and OQE signoffs for assembly of those components.
    - A number of suppliers lack written procedures governing the assembly of complex/critical components; instead, they rely on component drawings which do not provide adequate instruction. In many cases, there is also no formal training on the assembly of these critical components.
- NNS expects suppliers of complex/critical components (e.g. hydraulic cylinders, accumulators, and valves) to have an understanding of the tooling/instrument use requirements for building bolted assemblies and are appropriately trained.
    - A number of complex/critical component suppliers lack an understanding of the tooling process requirements for building bolted assemblies (e.g. use of self locking fasteners, temporary fasteners, lock-wire installation, anaerobic compound installation, bolted joint torqueing, and hydraulic seal installation).

Questions and Answers



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