

**FOKKER**  
AEROSTRUCTURES



## Welcome to Nadcap

**National Aerospace and Defense Contractors  
Accreditation Program**

Nadcap impact on NDT

**Aircrafting**

FOKKER AEROSTRUCTURES BV is a company of Fokker Technologies



# Agenda

- **What is Nadcap?**
- **Why Nadcap?**
- **The Nadcap members (Primes)**
- **The key steps**
  - Audit criteria
  - Audit content NDT audit
  - Audit process
- **Nadcap impact on NDT**
  - Level 3 responsibilities
  - NDT related procedures
  - Responding to NCR's
- **Lessons learned**
- **The Fokker approach**

## What is Nadcap?

- Nadcap = **N**ational **A**erospace and **D**efense **C**ontractors **A**ccreditation **P**rogram
- The leading, worldwide **cooperative program** of major companies designed to manage a **cost effective consensus approach** to special processes and products and **provide continuous improvement** within the aerospace industry.

## Why Nadcap?

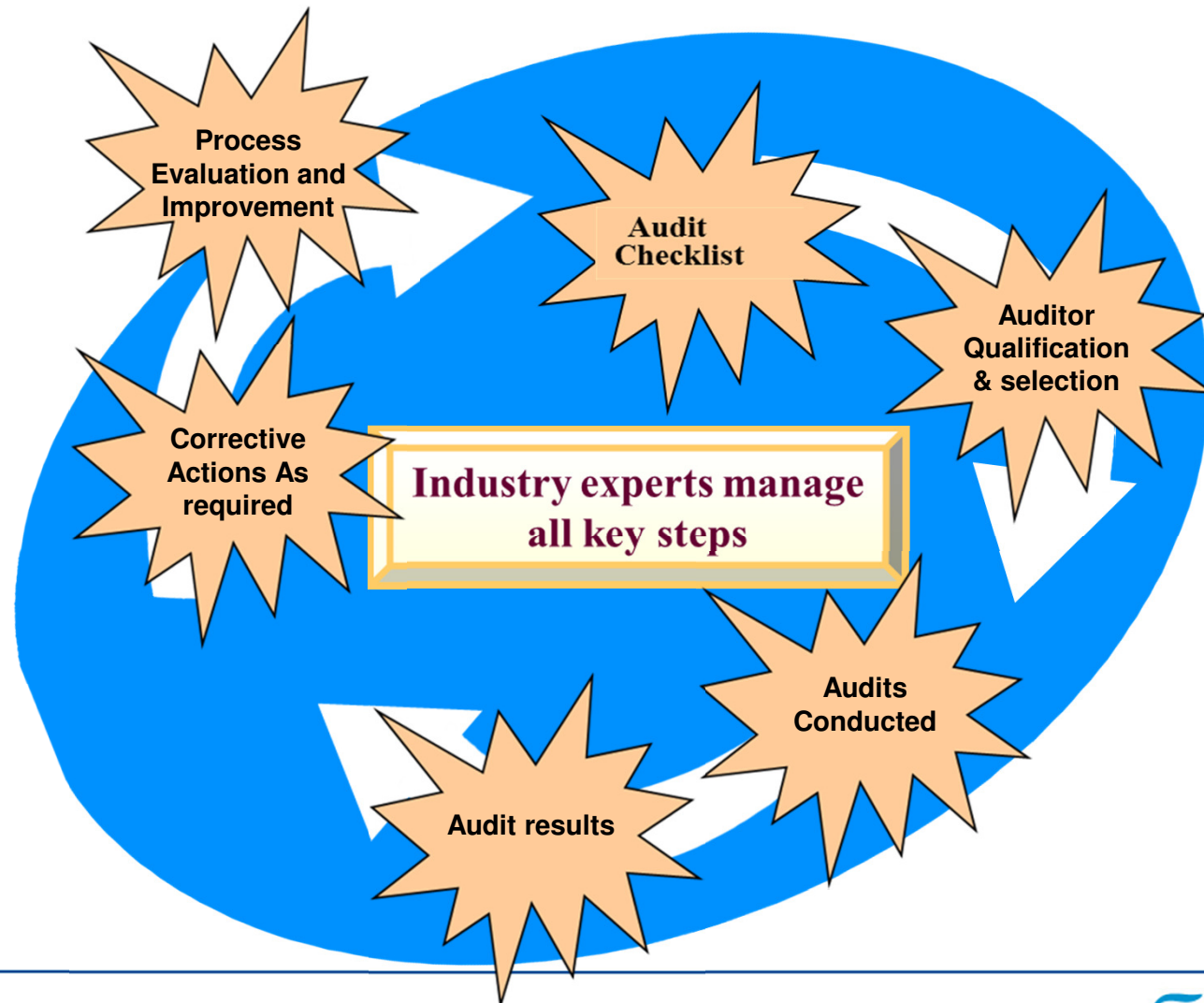
- Nadcap accreditation has become a basic requirement in the Aerospace business
- **All major Aerospace manufacturers (customers), require Nadcap accreditations (customer requirement)**
- Nadcap accredited companies that subcontract “special processes”, shall flow down customer requirements → including Nadcap
- **Fokker is accredited for:**
  - Non Destructive Testing
  - Heat Treating
  - Chemical Processing
  - Composites

# Nadcap members (Primes)

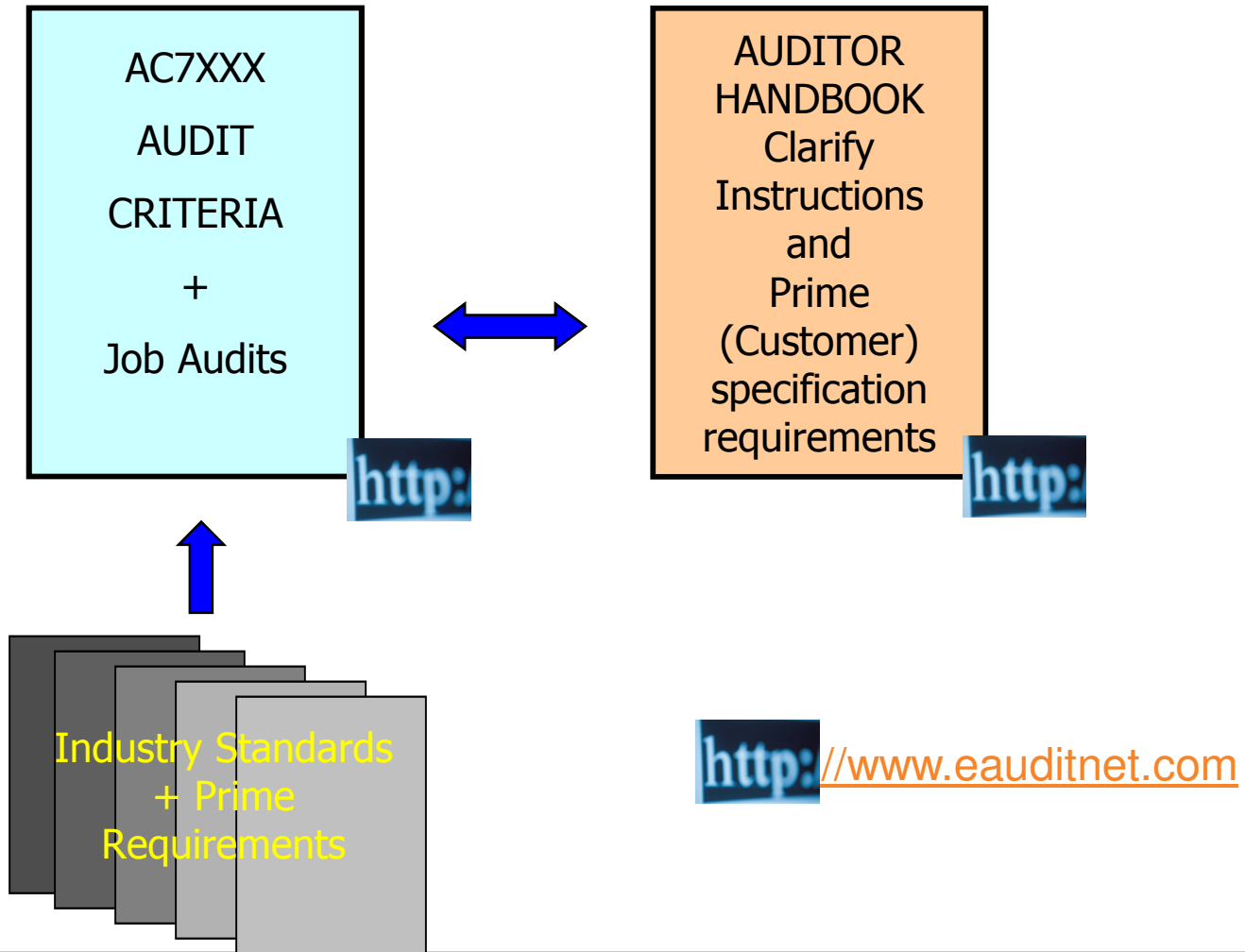
**MTU Aero Engines** **Vought Aircraft**  
**Rolls-Royce plc** **DCMA** **Hamilton Sundstrand** **Latecoere**  
**Pratt & Whitney** **BAE Systems** **Air Force, WPAFB**  
**Raytheon/Beech** **Bombardier** **GSA** **Honeywell ES & S**  
**Rockwell Collins** **EADS Aeronautics**  
**Eaton Aerospace** **EADS Space**  
**The Boeing Company** **EADS Defense & Securities Systems**  
**Rolls-Royce Corporation** **Parker Hannifin Corp**  
**Liebherr-Aerospace SAS** **AIRBUS S.A.S.** **SONACA**  
**AVIO S.p.A** **EADS Military Transport Aircraft Div. (MTAD)**  
**Sikorsky Aircraft** **GE Transportation** **SNECMA Group**  
**Alenia Aeronautica SpA** **Goodrich Corporation**  
**Bell Helicopter** **Cessna Aircraft Company** **ZODIAC**  
**Northrop Grumman Integrated Systems**



# The key steps....



# Relationship between Audit Criteria (AC), Auditor Handbook and Prime Requirements



## Audit Content NDT audit (basic)

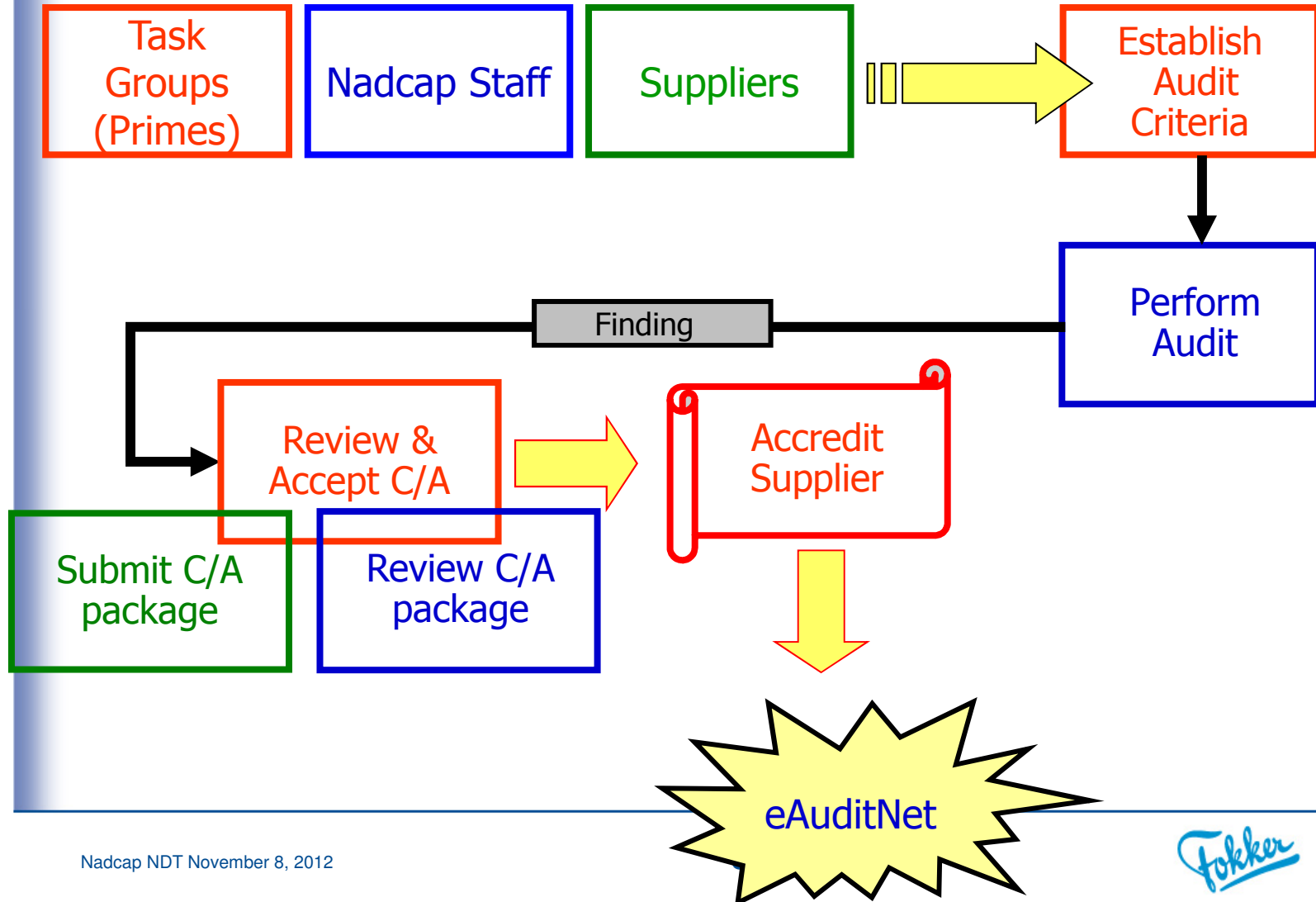
- **The Nadcap NDT Task Group is responsible for the operation of the Nondestructive Testing accreditation program and are currently utilizing the following Nadcap NDT baseline checklists:**
  - AC7114 – Nondestructive Testing
  - AC 7114/1 – Liquid Penetrant
  - AC 7114/2 – Magnetic Particle
  - AC 7114/3 – Ultrasonic
  - AC 7114/4 – Radiography
  - AC 7114/5 – Eddy Current
  - AC 7114/6 – DDA Radiography (Draft)



## Audit Content NDT audit (supplemental)

- **Previous mentioned checklists contain “Compliance Assessment Guidance” where clarification is necessary to confirm the Task Group requirements**
- **In addition to the baseline checklists, the supplier is also audited to Prime User Member requirements , defined in Baseline Supplements:**
  - AC7114S – Supplemental Audit Criteria NDT Testing
  - AC7114/1S – Supplemental Audit Criteria Liquid Penetrant
  - AC7114/2S – Supplemental Audit Criteria Magnetic Particle
  - AC7114/3S – Supplemental Audit Criteria Ultrasonic
  - AC7114/4S – Supplemental Audit Criteria Radiography

# Nadcap – The audit process



## Nadcap Impact on NDT Level 3 responsibilities



- **Level 3; “the Spider in the Nadcap web”**
- **Level 3 needs accountability for identifying and assuring customer NDT requirements for:**
  - Review of NDT requirements
  - Sequence of NDT operations
  - NDT procedure development and approval
  - NDT technique development/review and approval
  - Training of NDT personnel
  - Examination of NDT personnel
  - Approval of NDT internal audit personnel
  - Annual review of processing and inspection of hardware for each certified individual qualified to process hardware
  - Determining/documenting of training adequacy/equivalency
  - Review of calibration certificates

## Nadcap impact on NDT NDT related procedures

- **Each method requires a procedure (general or specific) for processing and inspection**
- **NDT procedures need to indicate**
  - approval by the applicable Level 3
  - Traceability to name and address of the facility
  - Identification number and date of approval
  - A requirement that all personnel are qualified and certified to the required level for the activity undertaken
  - Part number and/or material to be examined
  - All processing parameters
  - Identification of the component or areas within a component to be inspected

## Nadcap impact on NDT NDT related procedures

- Traceability to customer acceptance criteria
  - Requirements for special equipment if different from standard processing
  - Complete pre- and/or post-treatment instructions, including all details in accordance with customer requirements or reference to procedures containing such instructions
  - Description for the method of identifying inspection status
  - Method for control of software or programming used for automated processing equipment as applicable
  - All required process control tests and checks
- 
- **Don't assume – review the information and verify for compliance. Even if you know the system, test the procedure.**

## Nadcap impact on NDT NDT related procedures

- **Nadcap requires a procedure that flows down calibration requirements for NDT related equipment :**
  - Accuracy/Range (number of points to be checked for each instrument and reference to the accuracy per range)
  - Criteria to extend or reduce the calibration frequency

## Nadcap impact on NDT NDT related procedures

- **Nadcap requires a procedure that covers an annual internal audit of NDT system, including:**
  - Review of NDT inspection process
  - Review of associated documents such as travelers, planning documents and inspection reports
  - Review of personnel certifications for existence and completeness
  - Review of NDT process procedure for adequacy and equipment

# Impact on NDT Nadcap NCR's

- **Root Cause Analysis Nadcap style**
  - Immediate corrective action
    - What have you done to stop the bleeding
  - Root Cause of non-conformance
    - Which failure(s) in process / working methods / etc. resulted in nonconformance
  - Impact of all identified causes and the root cause
    - Always review possible impact on parts. Take appropriate actions to correct actual and/or earlier produced parts
  - Action to prevent re-occurrence
    - What actions have been taken to prevent the nonconformance to happen again
  - Objective evidence
    - Mention (and attach) copies of all evidence available to prove the corrective & preventive actions have been implemented
  - Effectivity date



## Lessons learned Common mistakes initial NDT audit...

- Underestimating the impact of Nadcap
- Lack of audit preparation
- Unfamiliarity with Nadcap can result in many NCR's
- Closing NCR's (Root Cause Analyses) requires some skills
- Nadcap baseline requirements not met
- Focusing on own organization instead of customer
- Lots of recording and witnessing issues NDT data
- Incomplete training records
- The “we already work this way for 25 years” approach....

## Lessons learned How to prepare for your audit...

- Take your time (initial audit six months)
- Make it teamwork (all disciplines involved)
- Answer each checklist question
- Assign the checklist questions to responsible departments (teams)
- Refer to internal procedure number(s) and applicable paragraph(s)
- “No” is the wrong answer! Make sure you take appropriate actions to convert “No” into “Yes”
- Use the auditors handbook, it is loaded with additional information for the checklist questions
- Collect objective evidence for each checklist question
- Organize frequent meetings to check progress

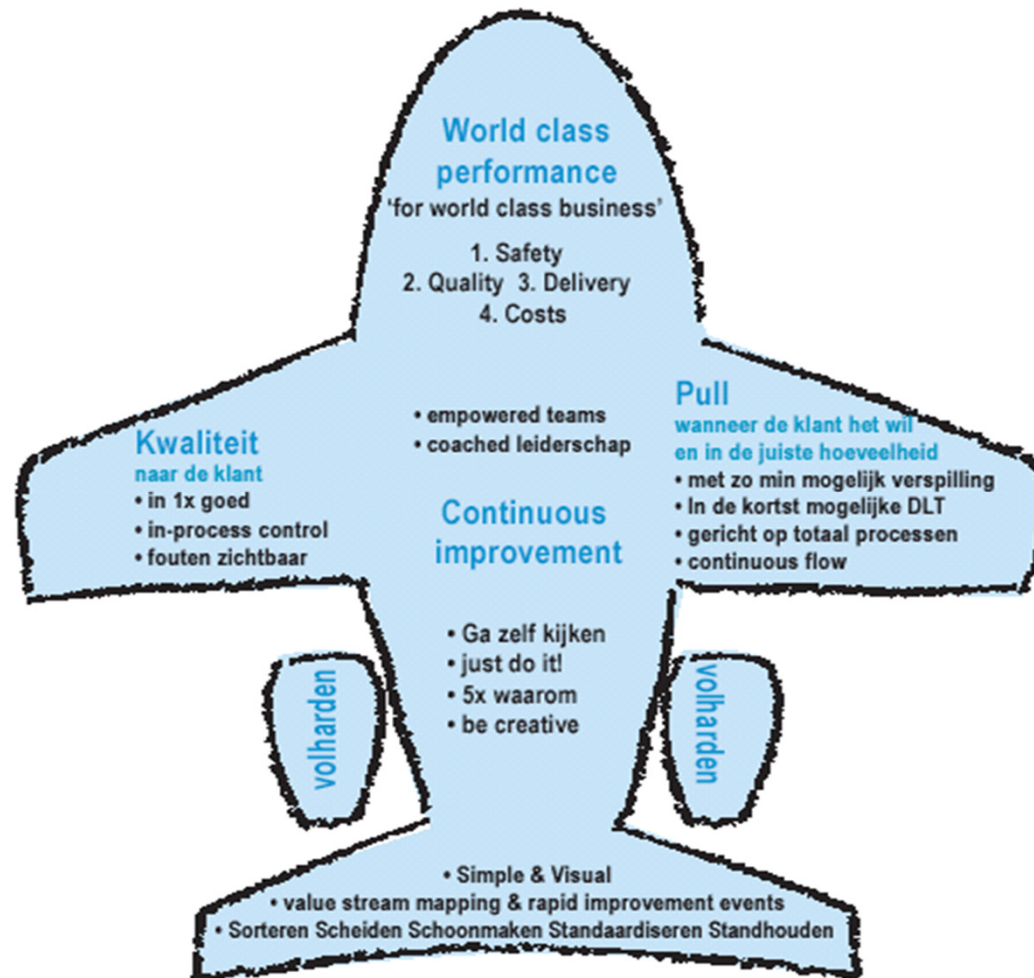
## Lessons learned How to prepare for your audit...

- Perform job audits to check compliancy to Nadcap requirements
- Create an action list to keep track of changes
- Make sure your customer requirements are covered in your internal procedures
- Where the Nadcap baseline requirement is tighter than your customer requirement, the Nadcap baseline requirement shall be fulfilled

## The Fokker approach (continuous improvement)

- Implementation 5S
- Pull system (customer driven production)
- JIT objectives
- First time right (Six Sigma)
- Responsibility transfer to shop floor (empowered teams)
- Visual management ( what and how, visible in one view)
- Continuous improvement (elimination of waste never stops)

# The Fokker approach



## Some helpful Tools

- Nadcap Root Cause Analyses training
- Visit a Nadcap meeting
- Check all information on [www.eauditnet.com](http://www.eauditnet.com)



# Any questions?