

Overview of NGSS Ergonomics Process

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Overview

- Introduce NGSS plans and progress to implement a sustainable process for workplace ergonomics.
- Illustrate the key elements of the ergonomics process.

Defining the Future

Current Situation

- **40-50% of recordable injuries are sprains & strains.**
- **Goal:**
 - Reduce Injury/Illness Rate
 - Proactive control of risk
 - Integrate with Safety and other existing initiatives and programs.

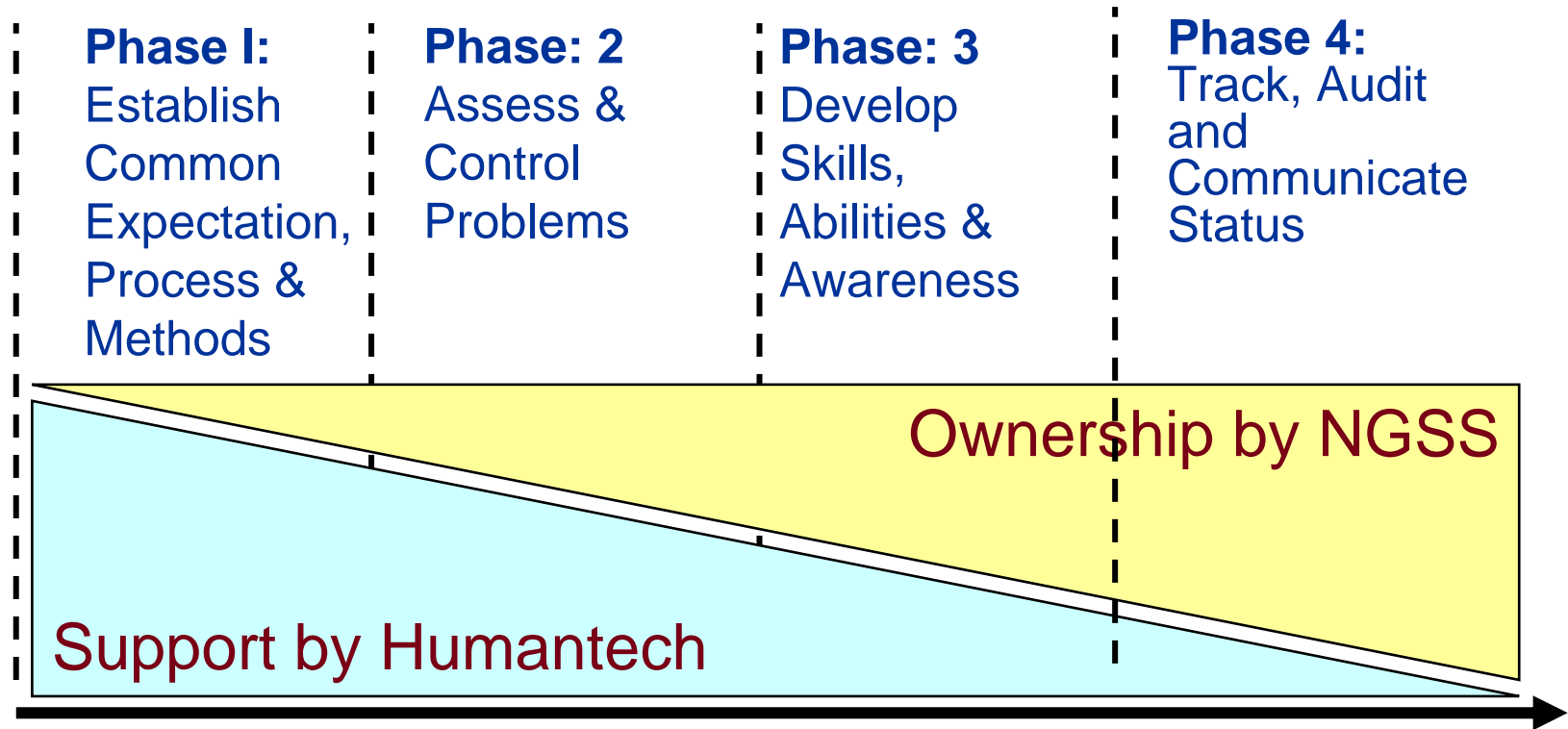
NGSS's Plan For Ergonomics

- **Implement a process;**
 - » Support NGSS EHS Policy: “provide a work environment free of recognized occupational health and safety hazards”
 - » To identify, reduce and prevent conditions that contribute to Work Place Musculoskeletal Disorders (WMSD's)
 - » Through systematic, data driven approach of proactive, effective management of risks
 - » In existing workstations and future designs
 - » Align with and support the NGSS Safety Management System and align with OSHA VPP
- **Goal: “Reduce all job tasks to the lowest level of risk when possible.”**

Elements of Successful Programs

- **Add Value**
- **Systematic Approach**
 - Manage risks not consequences
 - Established goal and plan
 - Address both strategic and tactical elements
 - Integrated into existing processes and operations
 - Uses common language and approach
- **Sustainable**
 - Measurable
 - Visible
 - Continuous improvement
 - Kept in perspective

Process Transition



Deployment Phases

- 1. Establish Common Expectations, Process, and Methods**
 - Ergonomics Standard
 - Ergonomics Procedure
 - Common Tools & Measures - Risk Priority Management (RPM)
- 2. Assess and Control Problems**
- 3. Develop Skills, Abilities and Awareness**
- 4. Track, Audit and Communicate Status**

General (Requirements)

- **Planning**
 - Develop Improvement Goal to Reduce Ergonomic Risks
 - Provide Adequate Resources
 - Identify Trends and Assess Risks in the Workplace
- **Implementation & Operations**
 - Establish a Support Infrastructure
 - Provide Training and hold Accountable for Results
 - Reduce Risks to Lowest Level
 - Ensure New Equipment and Processes are at Low Risk
 - Effectively Manage WMSD Injuries
- **Checking & Corrective Action**
 - Validate Reduction of Risk
 - Conduct Annual Review of Process
- **Management Review**
 - Apply Effective Solutions Controls Elsewhere
 - Management Review and Sustain Process

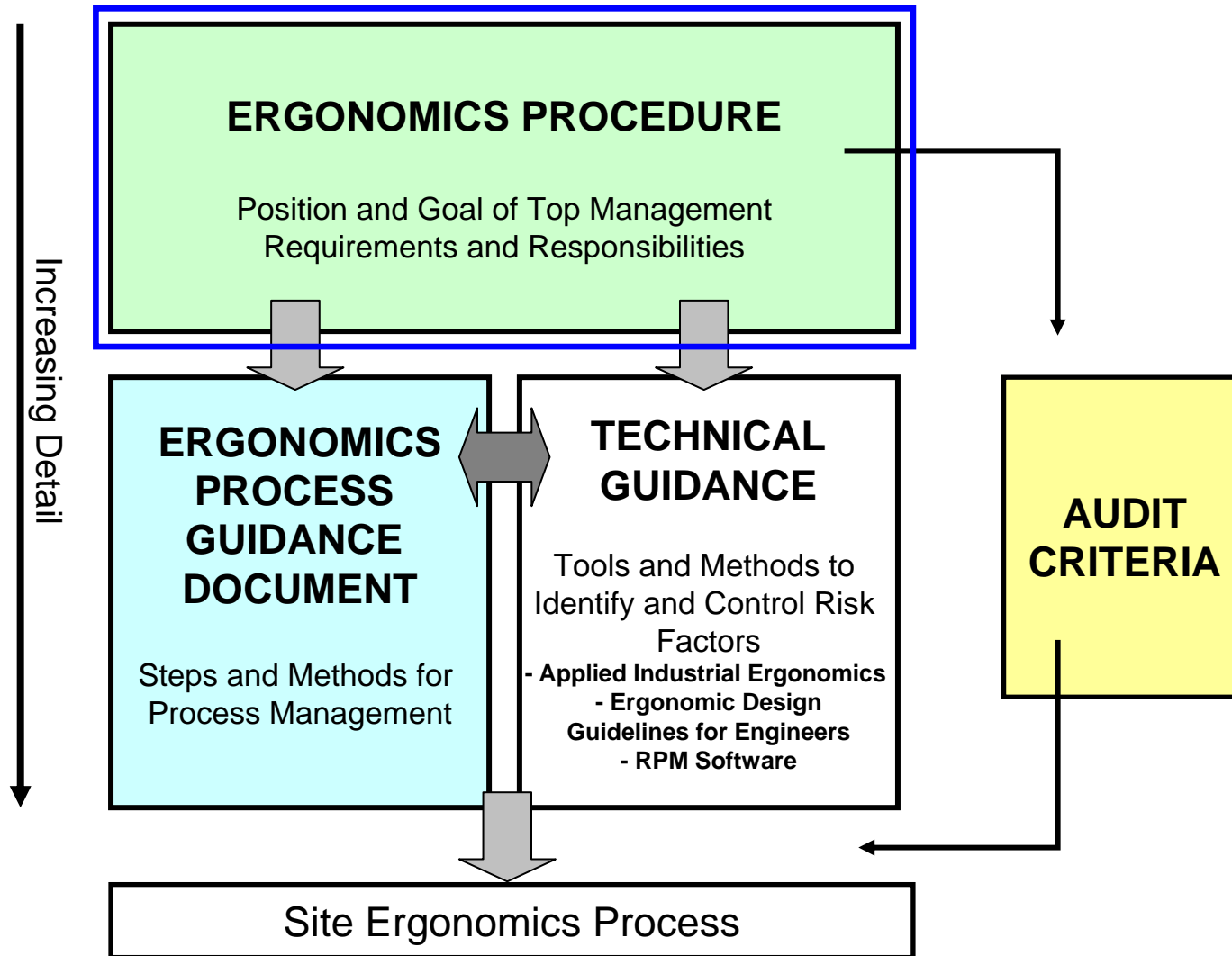
5.0 Responsibilities

- **Sector Business Area/Site Management**
- **Ergonomics Process Lead**
- **Ergonomics Team (Labor Management Safety Committee)**
- **Engineering, Facilities, Maintenance & Operations**
- **Training**
- **Managers & Supervisors**
- **Employees & Temporary Workers**
- **Medical/Workers Compensation Manager**
- **Site Health & Safety**

Sector Business Area/Site Mgrs.

- **Manager responsible for implementation and success of the site ergonomics program**
 - Ensure site improvement goals are established
 - Commit adequate resources (staffing and funding) to support program
 - Review and track progress to goal
 - Identify an Ergonomics Process Lead

Documentation Flow



Technical Guidance

- **Training Manuals**

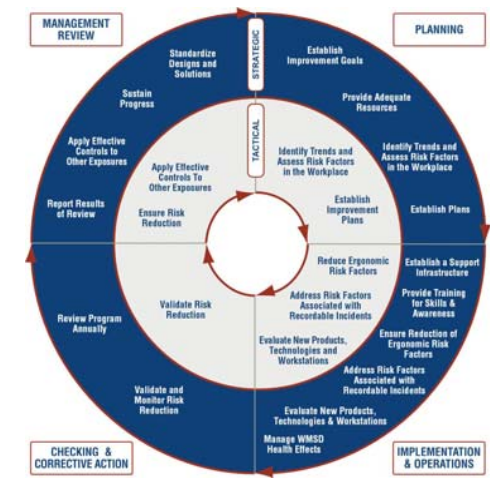
- Applied Industrial Ergonomics Manual
 - Tools and methods for risk assessment and workplace changes.
- Ergonomic Design Guidelines for Engineers
 - Tools and methods for specification and design of workplace, tools and equipment

- **Software Application**

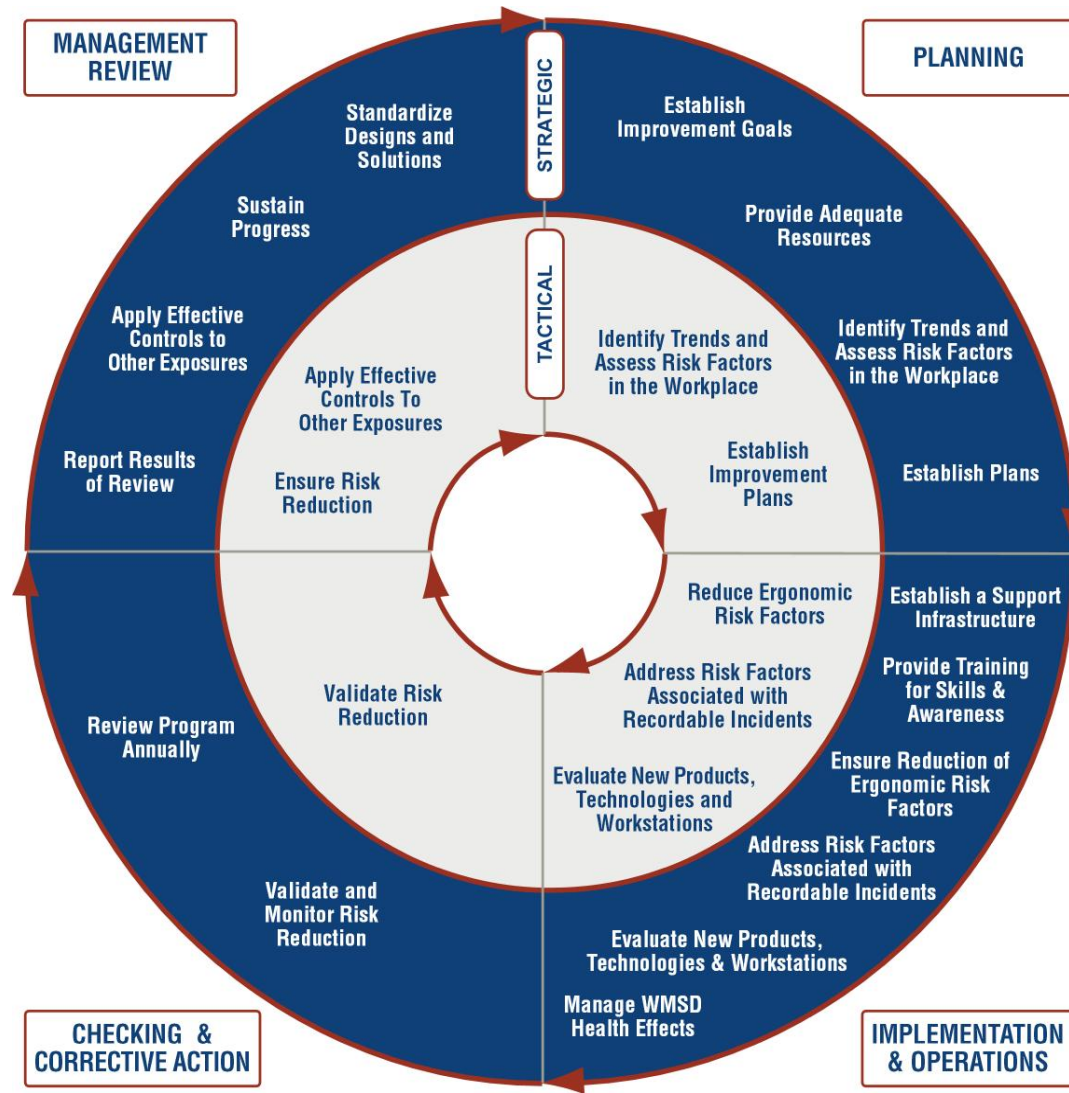
- Risk Priority Management (RPM) Software
 - Central repository for tools, data collection, project management and tracking, sharing solutions, and real-time tracking of process measures

Process Guidance Document

- “How To” manual for program management.
- Two levels of program:
 - **Strategic** Steps to Establish and Maintain a Site Ergonomics Process
 - **Tactical** Activities for Ergonomics Team to Identify, Address and Verify Reduction of Ergonomic Risk Factors



NGSS Ergonomics Process



Fitting People to the Workplace



Fitting the Workplace to People



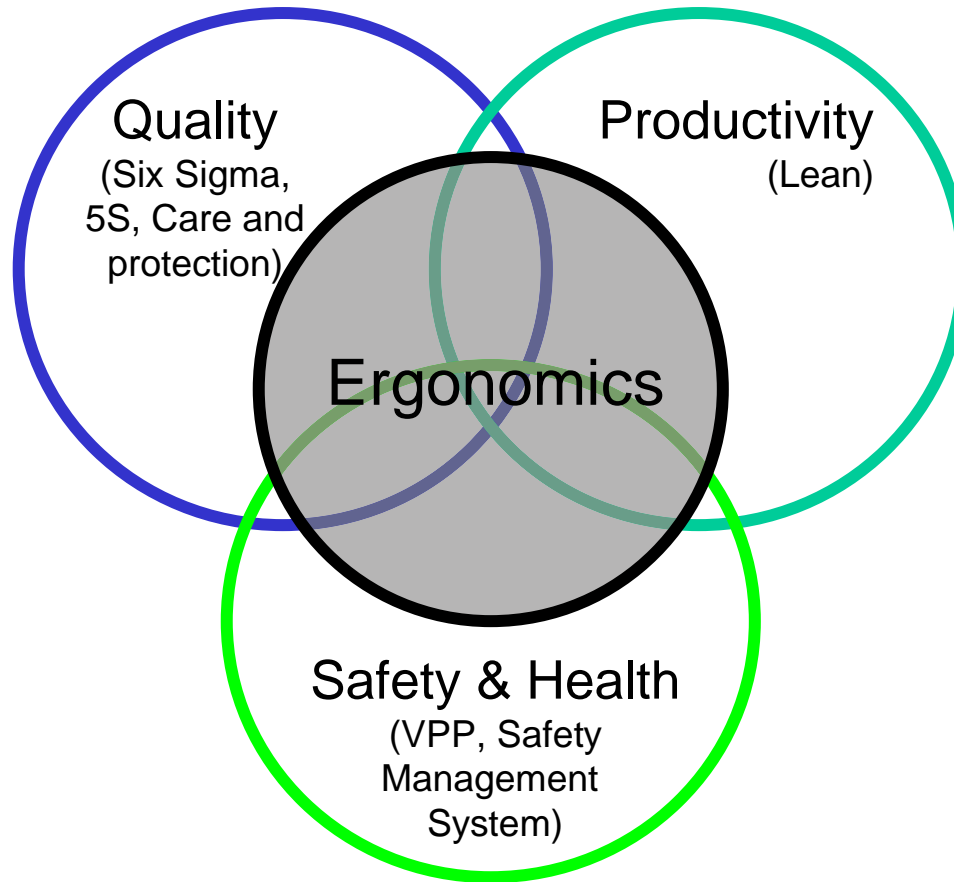
Before

After

Production Enhancement

- **Lean Manufacturing**
- **Six Sigma/Quality**
- **Total Quality Management**
- **Design for Assembly**

Integration Of Existing Initiatives



W. Edwards Deming



“If you can’t describe what you are doing as a process, you don’t know what you are doing.”

Safety Management System*



* ANSI Z-100, OHSAS 18001, ISO 14001

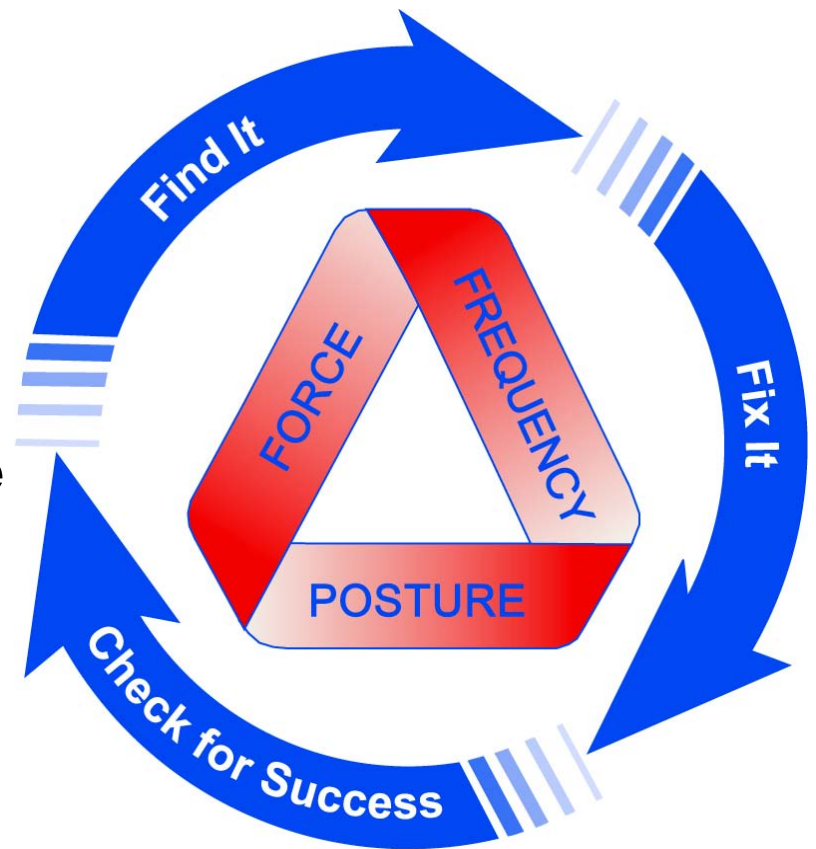
NORTHROP GRUMMAN

Deployment Phases

- ✓ **Establish Common Expectations, Process, and Methods**
 - ✓ Ergonomics Standard
 - ✓ Ergonomics Procedure
 - ✓ Common Tools & Measures (RPM)
- ✓ **Assess and Control Problems – ongoing**
 - ✓ RAPID Events
- ✓ **Develop Skills Abilities and Awareness**
- **Track, Audit and Communicate Status**

RAPID Events

- **Based on Kaizen**
- **Simple, rules based approach**
 - **Find It**
 - **Fix It**
 - **Check for Success**
- **Cross functional team leveraging existing roles and abilities**
- **Maintain a quick but accurate pace**

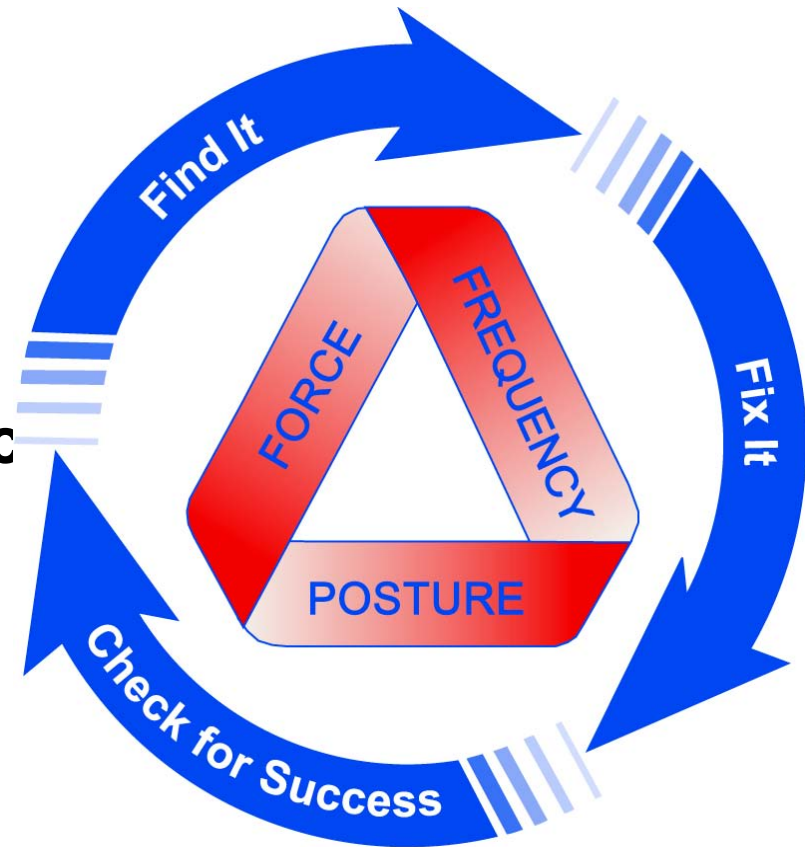


RAPID - Risk And Performance Improvement Deployment

RAPID Events

Purpose:

- Engage employees and increase their awareness of ergonomics.
- Improve the workplace.
- Establish foundation for the sustainable NGSS Ergonomic Process



Results

- **11** RAPID Events at **3** NGSS sites
- **98** people participated
- **618** workplace solutions identified
 - **457** (74%) implemented by the end of 2006
- **Follow-up visits conducted at each site**
- **Positive approval rating of 76% by operators**

Tools Used





Risk
And
Performance
Improvement
Deployment











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Find it	Fix it
<ul style="list-style-type: none"> • Wash Rag • Elbows Out • Shoulder Too High/Low • Hungry Head • Butts Up • Twist and Shout • Horizontal Distance • Sit vs. Stand • Bad Vibes • Contact 	<ul style="list-style-type: none"> • Keep it straight • Keep elbows at sides • Keep it in the comfort zone • Keep it in sight • Keep it above knees • Keep it in line with the spine • Keep it close • Is it right for the task? • Don't hold it • Don't lean on the machine



Improvement Accelerated™

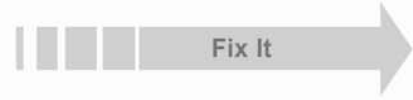




- Introduce yourself and your teammates
- Describe the reason you are visiting the workstation
 - Improve ergonomics
 - Make the job easier and safer
- Describe the activities you will be performing
 - Short interview
 - Observation and note taking
 - Photographs of the process
- Complete the operator interview
- Thank the operator

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RAPID HIT LIST™



CHECK FOR SUCCESS

ITEM	PRESENT?	ROOT CAUSE (5 WHYs)	Improvement Ideas*	PLAN							
				Immediate	30 Days	60 Days	90 Days	Who	Maintenance	Support	Material Required
WASH RAG Keep it straight	<input type="checkbox"/> Y <input type="checkbox"/> N			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
ELBOWS OUT Keep elbows at sides	<input type="checkbox"/> Y <input type="checkbox"/> N										
SHOULDER TOO HIGH/LOW Keep it in the comfort zone	<input type="checkbox"/> Y <input type="checkbox"/> N										
HUNGRY HEAD Keep it in sight	<input type="checkbox"/> Y <input type="checkbox"/> N										
BUTTS UP Keep it above knees	<input type="checkbox"/> Y <input type="checkbox"/> N										
TWIST AND SHOUT Keep it in line with the spine	<input type="checkbox"/> Y <input type="checkbox"/> N										
HORIZONTAL DISTANCE Keep it close	<input type="checkbox"/> Y <input type="checkbox"/> N										
SIT VS. STAND Is it right for the task?	<input type="checkbox"/> Y <input type="checkbox"/> N										
BAD VIBES Don't hold it	<input type="checkbox"/> Y <input type="checkbox"/> N										
CONTACT Don't lean on the machine	<input type="checkbox"/> Y <input type="checkbox"/> N										
<input type="text"/> TOTAL OF YES				TOTAL FIXES COMPLETE <input type="text"/>							

These recommendations may require further review to determine feasibility of implementation.

TOTAL OF YES

TOTAL FIXES COMPLETE

Find the POSTURE

- Washrag
- Elbows Out
- Shoulders too High/Low
- Hungry Head
- Butts Up
- Horizontal Distance
- Sit vs. Stand
- Twist and Shout
- Contact
- Bad Vibes



Find It

Apply the appropriate RULE

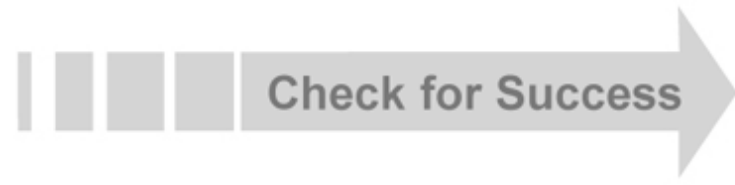
- Keep it straight
- Keep elbows at sides
- Keep it in the comfort zone
- Keep it in sight
- Keep it above the knees
- Keep it close
- Is it right for the task
- Keep it in line with the spine
- Don't lean on the machine
- Don't hold it



Fix It

Document It

- Completed Improvements
- Within 30 days
- Within 60 days
- Within 90 days



Check for Success

Improvement Accelerated

Insulators

BEFORE



- Operators must bend over to measure and cut the insulation.

AFTER



- Built portable, lightweight work bench to eliminate bent back.

Maintenance Shop

BEFORE



- Reaching and stooping postures due to cable are stacked too high and too low.

AFTER



- Built cable rack to store cables within comfortable reach. Eliminated reaching and bent back

Insulators

BEFORE



AFTER



- High force to bent wrist when Operator used hand to locate stud then use knife to cut insulation

- Built punching tool to locate and punch hole for stud.
- **Eliminated compression of the hand and bent wrist postures.**

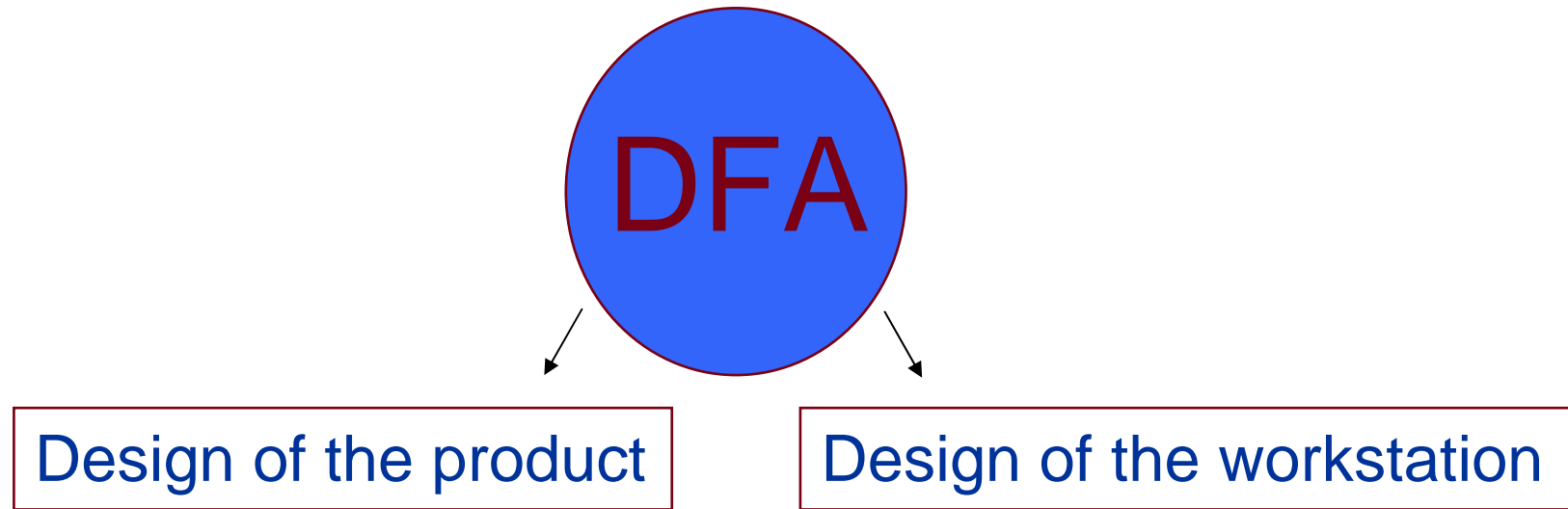
Training for Skills & Awareness

Topic	Who	Objectives
Ergonomics Process Lead Training	Ergonomics Process Lead	<ul style="list-style-type: none"> • Understand Procedure and process. • Establish plans for site. • Identify site participants.
Ergonomics for Ergonomics Team Members	Ergonomics Team Members	<ul style="list-style-type: none"> • Conduct risk assessments. • Identify solutions. • Lead improvements.
Ergonomics for Engineers	Engineers, Facilities & Operations	<ul style="list-style-type: none"> • Apply design criteria in selection, design, and modification of equipment.
Train the Trainer	Trainers	<ul style="list-style-type: none"> • Deliver awareness training for managers and Employees.
Ergonomics For Managers & Supervisors	Managers & Supervisors	<ul style="list-style-type: none"> • Understand the ergonomics process. • Influence improvements that reduce risk. • Reinforce work practices.
Ergonomics For Employees	All Employees	<ul style="list-style-type: none"> • Understand and apply ergonomic principles. • Identify and control risks. • Improve work practices.

Training for Skills & Awareness

Topic	Who	2007 Training Schedule
Ergonomics Process Lead Training	Ergonomics Process Lead	<ul style="list-style-type: none"> • February 13- Sr. Management • February 14 – Ergonomic Process Leads
Ergonomics for Ergonomics Team Members	Ergonomics Team Members	<ul style="list-style-type: none"> • March 20-22 - Avondale • April 24-26 - Pascagoula
Ergonomics for Engineers	Engineers, Facilities & Operations	<ul style="list-style-type: none"> • March 28-29 – Pascagoula • Sept 25-26 – Pascagoula (Product Design Engineers)
Train the Trainer	Trainers	<ul style="list-style-type: none"> • May 1 - Pascagoula
Ergonomics For Managers & Supervisors	Managers & Supervisors	<ul style="list-style-type: none"> • Q1 2008- Pascagoula (Co-teaching) • Q1 2008- Avondale. (Co-teaching)
Ergonomics For Employees	All Employees	

What is Design for Assembly?



The ergonomic analysis of products and product concepts for the simplification of the design and the assembly process.

Ergonomic Design Class

Agenda (1.5 day class)

- **Product engineers are given a basic working knowledge of ergonomics**
- **Engineers go “in-the-field” for 2.5 hours to experience their designs**
 - Cable pulling in steering room and engine room
 - Fuel lube oil pump installation
 - Combine shop applications
- **Practice using quantitative ergonomics design tools (DFEA Hit List, IDEA) on NGSS applications**
- **Each engineer generates 1 to 3 ergonomic design rules that can apply to current and future NGSS designs**

Design Activities

- **Design for assembly pushes ergonomics earlier into product development process**
- **Fewer Fasteners, Fewer Tools and Fixtures**
- **Stable and Self-Aligning Parts and Assemblies**
- **Communication and Coordination across crafts**

Audit Process

- **Based on requirements listed in Ergonomics Procedure**

- Interviews, Observation & Review of Program Records

- **Purpose:**

- Identify what is being done well
- Identify areas for improvement
- Provide recommendations to improve process

- **Results**

- Written report summarizing results
- To Site Senior Management

- **Timing: October 2007**

Leading the Charge

Sr. Management/Leaders:

- **Empower**
 - Management Sponsor
 - Ergonomics Process Lead
- **Establish Improvement Goal (s)**
 - Risk reduction
- **Track and Monitor Metrics**
- **Review Process and Progress at Least Quarterly**
 - Progress to plan
 - Progress to goal
- **Hold People Accountable for Results and Meeting Responsibilities**
- **Communicate Plans and Progress to organization**