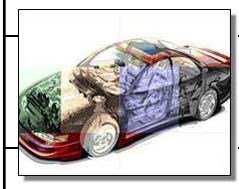


ERGONOMICS

IWH Plenary:

Implementing a Global Ergonomics Program and Metric System at Magna International

Gary Au M.Sc., CPE
Manager, Global Ergonomics Program
Magna International Inc.

October 16, 2012

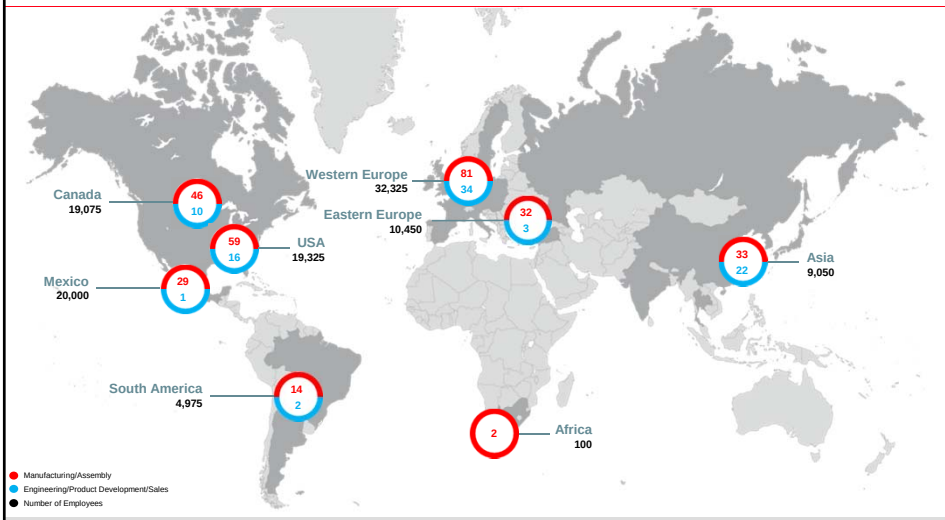
Agenda

1. Company Overview
2. Implementing a Systematic Ergonomics Program
3. Structure of the Metric System & Scoring
4. Specific Ergonomics Program Criteria
5. Results and Statistics (2007 – 2012)
6. Continuous Improvement & Future
7. Global Roll-Out & Summary

Company Overview

Magna International Inc.

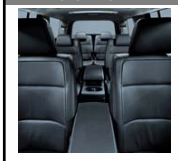
Global Presence



~ 115,000 People | 26 Countries | 296 ● 88 ● | $28.7 Billion (2011 Sales)

(As of Q2 2012)

Product Systems Overview

SEATING SYSTEMS	INTERIOR SYSTEMS	EXTERIOR SYSTEMS	VISION SYSTEMS	CLOSURE SYSTEMS
				
CAPABILITIES				
• complete seating systems • mechanism solutions • seat structures solutions • foam & trim products • design & development services	• sidewall & trim systems • cockpit systems • cargo management systems • overhead systems	• front & rear fascia systems • sealing systems • exterior trim • class A composite panels • modular systems • engineered glass • structural components • under hood & underbody components • sheet molding compound material	• electronic vision systems • mirrors – interior & exterior • electrochromic (self dimming) mirror glass • interior video mirror (reverse aid display) • actuators • door handles & overhead consoles	• door modules • window systems • power closure systems • latching systems • handle assemblies • driver controls • electronics
GLOBAL FOOTPRINT				
• 15,375 employees • 42 mfg/assy facilities • 4 product development/ engineering/sales centers	• 29,225 employees** • 54 mfg/assy facilities* • 16 product development/ engineering/sales centers *including Minority JV facilities **combined Exteriors & Interiors	• 29,225 employees** • 61 mfg/assy facilities* • 17 product development/ engineering/sales centers *including Minority JV **combined Exteriors & Interiors	• 9,075 employees • 28 mfg/assy facilities • 10 product development/ engineering/sales centers	• 5,150 employees • 13 mfg/assy facilities • 8 product development/ engineering/sales centers

Note: Facility numbers include shared facilities.

Product Systems Overview

BODY & CHASSIS SYSTEMS	VEHICLE ENGINEERING & CONTRACT MANUFACTURING	ROOF SYSTEMS	POWERTRAIN SYSTEMS	ELECTRONIC SYSTEMS	HYBRID & ELECTRIC VEHICLES/SYSTEMS
					
CAPABILITIES					**JV**
• body systems • chassis systems • technology, engineering & tooling systems • renewable energy structures	• engineering services • vehicle contract manufacturing • fuel systems • roof systems	• soft tops • modular & textile folding roofs • retractable hard tops	• driveline control systems • fluid pressure & controls • metal-forming solutions • engineering services & system integration	• driver assistance & safety • intelligent power systems • engine electronics & sensors • industrial products • body systems & HMI	• systems, modules & components for hybrid & electric vehicles
GLOBAL FOOTPRINT					
• 25,400 employees • 59 mfg/assy facilities* • 27 product development/ engineering/sales centers *including Minority JVs & In Progress Facilities	• 8,700 employees • 12 mfg/assy facilities • 19 product development/ engineering/sales centers	• 1,425 employees • 9 mfg/assy facilities* • 3 product development/ engineering/sales centers	• 10,900 employees • 36 mfg/assy facilities • 18 product development/ engineering/sales centers	• 1,250 employees • 5 mfg/assy facilities • 9 product development/ engineering/sales centers	• 575 employees • 2 mfg/assy facility • 5 product development/ engineering/sales centers

Note: Facility numbers include shared facilities.

Unique Fair Enterprise Culture

Corporate Constitution

Employee's Charter

Decentralized Management

Employee Empowerment

Reporting Structure

ERGONOMICS

- Magna Corporate: Ergonomics is a part of Health & Safety which is under the umbrella of Human Resources (HR).
- Magna Corporate sets the Global Standards across all plants.
- Plant Managers report to Presidents of each Magna Group.
- Each plant is responsible to meet Global Standards
- Majority of plants are non-unionized.
- Majority of plants do not have an Ergonomist.

Magna Ergonomics Program 2003 - 2005

ERGONOMICS

- Redeveloped Ergonomics Section within H&S Audit
- Conducted Ergonomics Committee Training
- Established Ergonomics Analysis Tools
- Implemented Engineering Design Guidelines
- Facilitated Action Plan Management

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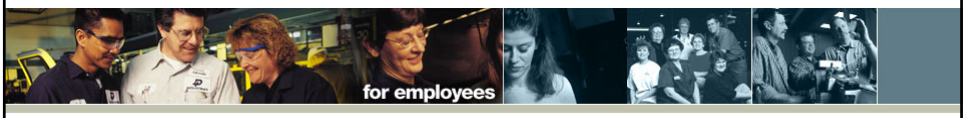
Improvement Areas

ERGONOMICS



What did our program need ?

- Provide a clear ergonomics structure and system.
- Program Management tool controlled by the plant.
- Increase Two-way Interaction and Feedback.
- Increase frequency of Ergonomics reporting.

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Implementing a Systematic Ergonomics Program

Implementation Steps

ERGONOMICS

1. Management Support
2. Pilot Project Success
3. Set Specific Criteria
4. Create On-line Metrics System
5. Provide Templates/Support
6. Continuous Improvement

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Management Support
Pilot Project: 2005 - 2006

ERGONOMICS

- Specific *Magna Group XYZ suffered significant losses in* Worker's Compensation claims for MSDs (i.e. $millions)
- Pilot Project included 11 Magna Plants.
- Developed Quarterly Metrics based on 5 Categories:
  1. Support Infrastructure/ Ergo Committee
  2. Risk Assessments
  3. Top 5 & Prioritization
  4. Engineering Design
  5. Ergo Statistics

- Each category rated on a *Red, Yellow, Green* Scorecard.

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Roll-out to all
Magna North American Plants

ERGONOMICS

- ✓ Magna's goal is to see these changes globally.
- ✓ Worker's Compensation seen as a primary way to cut costs and save money.
- ✓ Support from Group Presidents and the Board of Directors will tremendously help drive ergonomics in the plants.

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Global Ergonomics Program & Metric System

ERGONOMICS

What was required to establish a global metric ?

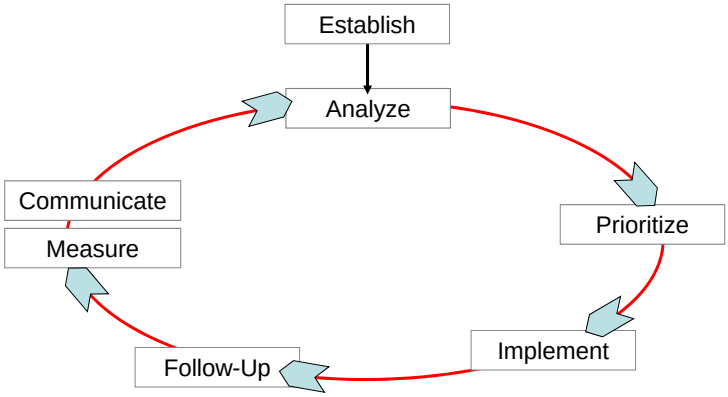
- Start with Canada, USA, and Mexico (Approx. 120 plants)
- Standard set of Criteria Elements
- Robust Scoring Methodology & System
- Fully Customized Ergonomics Database & Website
  - Corporate Requirements (i.e. criteria)
  - Tools/templates
  - Program changes, news, & updates
  - Feedback Mechanism

Metric System Structure & Scoring

SYSTEMATIC APPROACH

ERGONOMICS

- Follow a systematic problem solving methodology or process with clearly defined elements:



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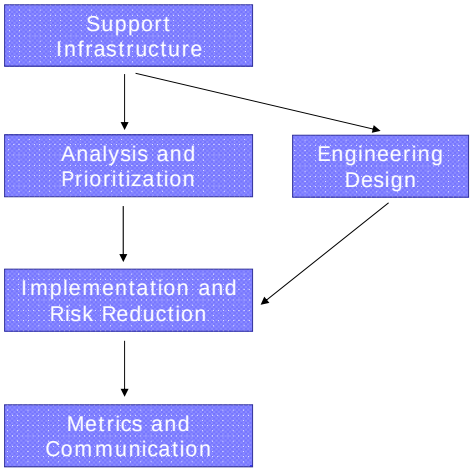
Magna Ergonomics Program 2007 - Present

ERGONOMICS

- 5 Major Categories
- 26 criteria elements
- Self-Evaluation system
- Plants submit supporting documentation
- Magna Corporate Ergonomist review



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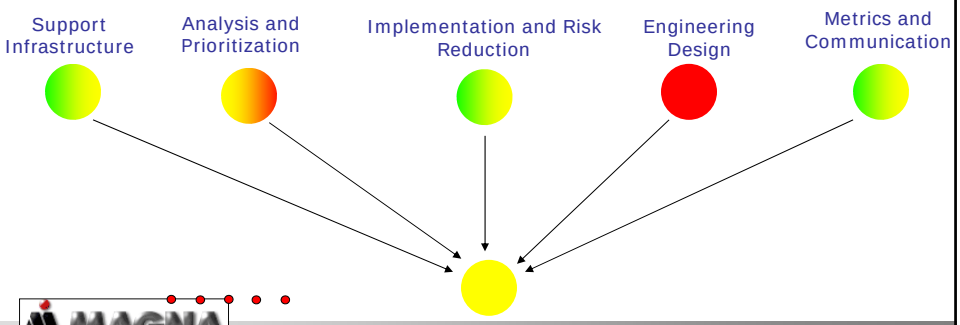
Self Evaluation System

ERGONOMICS

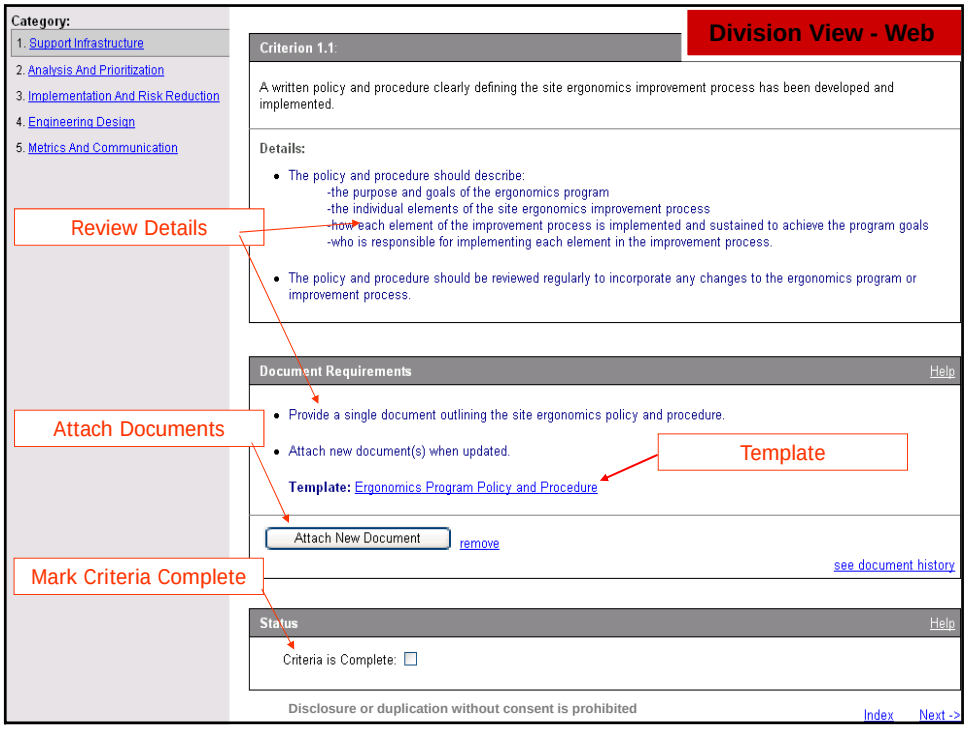
- The number of criteria completed under a particular category determine the performance rating achieved for that category
- Each of the 5 categories contribute to an *Overall Performance Rating* for an individual division



Quarter 1, 2011

Help

Category		Value	Status	Attached Documents
1. Support Infrastructure				
1.1	A written policy and procedure clearly defining the site ergonomics improvement process has been developed and implemented.	*Medium*		15 Mar 07
1.2	A cross-functional ergonomics committee has been fully trained and meets on a biweekly basis.	*High*		10 Mar 11
1.3	The engineering manager leads and directs the activities of the ergonomics committee.	*High*		10 Mar 11
1.4	Management personnel have been trained to effectively support and manage a sustainable ergonomics program and its elements.	*Medium*		8 Mar 11
1.5	Supervisors and operators have been trained to identify and minimize basic ergonomic risk factors.	*Medium*		8 Mar 11
1.6	A suitable budget has been allocated to implement improvements outlined in the Top 5 Action Plan.	*Low*		13 Sep 10
2. Analysis and Prioritization				
2.1	Progress has been made towards the ergonomic evaluation of all plant floor jobs.	*Very High*		7 Mar 11
2.2	An ergonomic design checklist has been completed in conjunction with each ergonomic evaluation.	*Medium*		7 Mar 11
2.3	Based on the results of the ergonomic evaluations and a review of the available loss data, all jobs have been prioritized.	*Medium*		7 Mar 11
2.4	Ergonomic incidents and/or operator reports of discomfort/concern are documented and followed-up within 30 days.	*High*		7 Mar 11
2.5	Body part scores (e.g. from the ERA analysis tool) have been used to determine an effective job rotation schedule.	*Low*		7 Mar 11
3. Implementation and Risk Reduction				
3.1	A cost-benefit analysis has been completed to justify the implementation of at least one Top 5 improvement per quarter.	*Low*		8 Mar 11
3.2	An action plan has been developed to sufficiently reduce ergonomic risk in the Top 5	*High*		


Division View - Web
Category:
1. Support Infrastructure
2. Analysis And Prioritization
3. Implementation And Risk Reduction
4. Engineering Design
5. Metrics And Communication
Criterion 1.1:
A written policy and procedure clearly defining the site ergonomics improvement process has been developed and implemented.
Details:
The policy and procedure should describe:
-the purpose and goals of the ergonomics program
-the individual elements of the site ergonomics improvement process
-how each element of the improvement process is implemented and sustained to achieve the program goals
-who is responsible for implementing each element in the improvement process.
The policy and procedure should be reviewed regularly to incorporate any changes to the ergonomics program or improvement process.
Review Details
Document Requirements
Help
Provide a single document outlining the site ergonomics policy and procedure.
Attach new document(s) when updated.
Attach Documents
Template
Template: Ergonomics Program Policy and Procedure
Attach New Document
remove
see document history
Mark Criteria Complete
Status
Help
Criteria is Complete:
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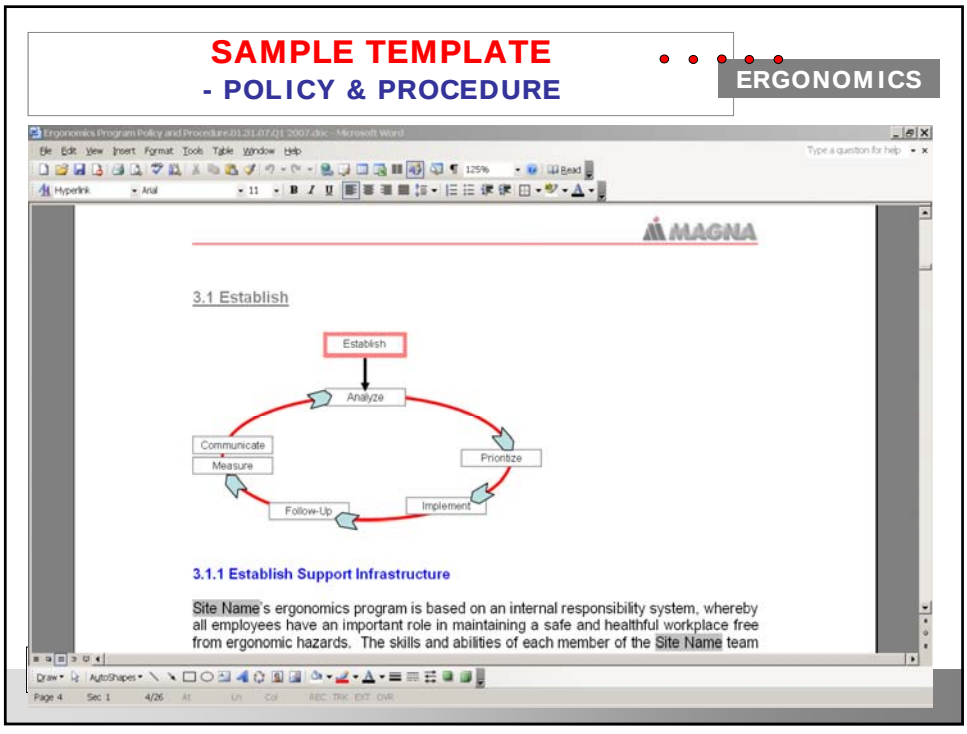
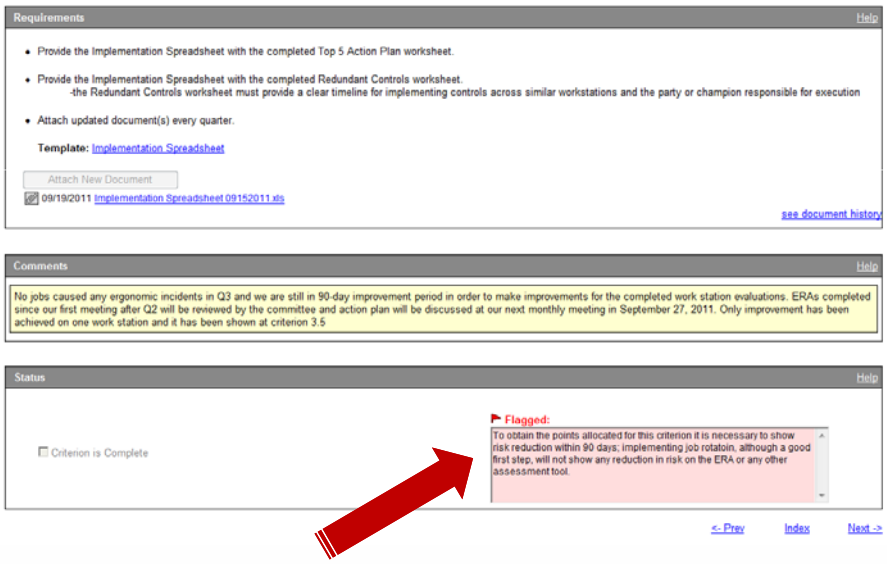
Index
Next ->

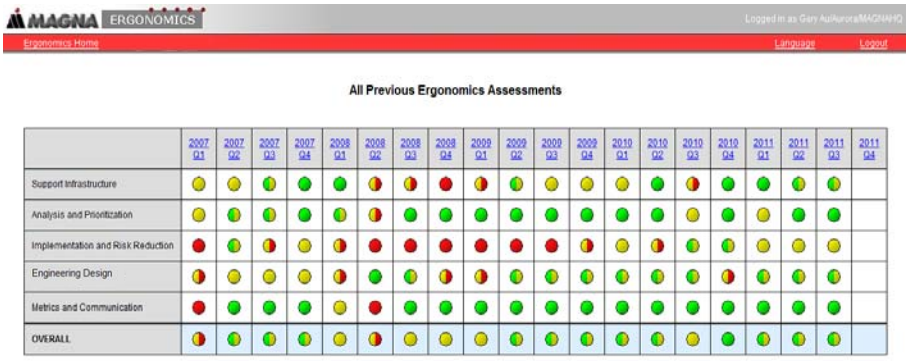

SAMPLE TEMPLATE
- POLICY & PROCEDURE
ERGONOMICS
MAGNA
3.1 Establish
Establish
Analyze
Prioritize
Implement
Follow-Up
Measure
Communicate
3.1.1 Establish Support Infrastructure
Site Name's ergonomics program is based on an internal responsibility system, whereby all employees have an important role in maintaining a safe and healthful workplace free from ergonomic hazards. The skills and abilities of each member of the Site Name team

Corporate Review & Detailed Feedback



REPORT CARD & QUARTERLY PROGRESS

ERGONOMICS



Specific Ergonomics Program Criteria

Support Infrastructure

CATEGORY 1

Category 1

Help

Category		Value	Status	Attached Documents
1. Support Infrastructure				
1.1	A written policy and procedure clearly defining the site ergonomics improvement process has been developed and implemented.	*Medium*	☐	Document Required
1.2	A cross-functional ergonomics committee has been fully trained and meets on a biweekly basis.	*High*	☐	Document Required
1.3	The engineering manager leads and directs the activities of the ergonomics committee.	*High*	☐	Document Required
1.4	Management personnel have been trained to effectively support and manage a sustainable ergonomics program and its elements.	*Medium*	☐	Document Required
1.5	Supervisors and operators have been trained to identify and minimize basic ergonomic risk factors.	*Medium*	☐	Document Required
1.6	A suitable budget has been allocated to implement improvements outlined in the Top 5 Action Plan.	*Low*	☐	Document Required

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Support Infrastructure

CATEGORY 1

Strengths

- Management Web Training was effective by providing consistent information and a platform for questions.
- Engaged Engineering Managers led to effective Ergonomics Committees that implemented solutions.
- Structured Independent Ergonomics Committee Meetings provided suitable time allocation for issues and progress.
- Ergo Coordinators found innovated ways to train their plant workers in the 1-hour Supervisor/Operator training.

Support Infrastructure

CATEGORY 1

Challenges

- Ergonomics Policy & Procedure template was more often used without tailored specific modifications.
- Setting a budget didn't necessarily mean the money was available when needed (e.g. year-end).
- Initial resistance to have the Engineering Manager lead the Ergonomics Committee.

Analysis & Prioritization

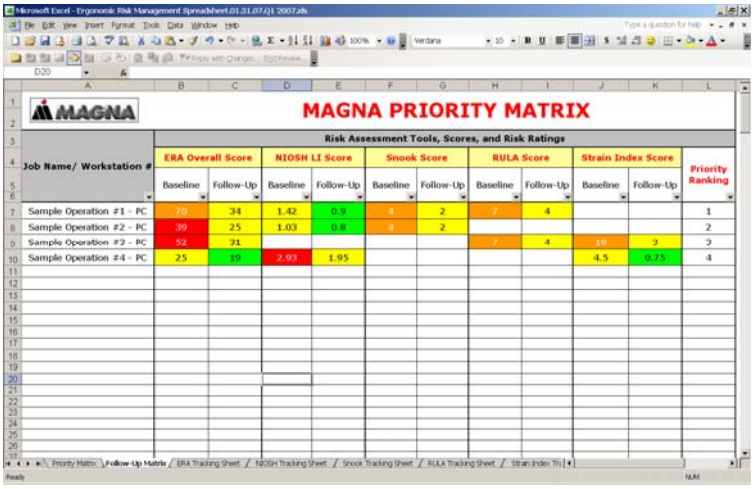
CATEGORY 2

Category 2

2. Analysis and Prioritization				
2.1	Progress has been made towards the ergonomic evaluation of all plant floor jobs.	*Very High*	☐	Document Required
2.2	An ergonomic design checklist has been completed in conjunction with each ergonomic evaluation.	*Medium*	☐	Document Required
2.3	Based on the results of the ergonomic evaluations and a review of the available loss data, all jobs have been prioritized.	*Medium*	☐	Document Required
2.4	Ergonomic incidents and/or operator reports of discomfort/concern are documented and followed-up within 30 days.	*High*	☐	Document Required
2.5	Body part scores from the ERA analysis tool have been used to determine an effective job rotation schedule.	*Low*	☐	Document Required

Ergonomics Risk Management Spreadsheet

ANALYSIS/PRIORITIZATION



MAGNA PRIORITY MATRIX

Job Name/ Workstation #	ERA Overall Score		NIOSH LI Score		Snook Score		RULA Score		Strain Index Score		Priority Ranking
	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up	Baseline	Follow-Up	
Sample Operation #1 - PC	70	34	1.42	0.9	4	2	7	4			1
Sample Operation #2 - PC	39	25	1.03	0.8	4	2					2
Sample Operation #3 - PC	52	31					7	4	18	3	3
Sample Operation #4 - PC	25	19	2.93	1.95					4.5	0.75	4

Analysis & Prioritization

CATEGORY 2

Strengths

- Job Analyses: Focused on progress rather than having the requirement of all jobs evaluated immediately.
- ERM Spreadsheet
  - Tied all information into one area.
  - Macros to reduce redundancy and colour coded cells by risk.
  - Prioritization made easier.
  - Having a place to store and prioritize ergonomic evaluations gives meaning to significant time spent by team and assesors.

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Analysis & Prioritization

CATEGORY 2

Challenges

- Corrupted macros and altered Excel Spreadsheets.
- “One-man shows” doing all of the ergonomic evaluations (remaining team members forget how to use ergo tools)

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Implementation & Risk Reduction

CATEGORY 3

Category 3

3. Implementation and Risk Reduction				
3.1	A cost-benefit analysis has been completed to justify the implementation of at least one Top 5 improvement per quarter.	*Low*	☐	Document Required
3.2	An action plan has been developed to sufficiently reduce ergonomic risk in the Top 5.	*High*	☐	Document Required
3.3	Jobs that fall within the Top 5 or have caused an ergonomic incident (and have been evaluated as high or very high risk) are improved within 90 days.	*Very High*	☐	Document Required
3.4	A follow-up ergonomic evaluation has been conducted on all Top 5 jobs within 30 days of implementing controls.	*High*	☐	Document Required
3.5	Productivity and/or quality improvements have been achieved and documented in at least one Top 5 improvement per quarter.	*Medium*	☐	Document Required

Implementation & Risk Reduction

CATEGORY 3

Strengths

- Risk reduction requirement for solutions implemented ensured impactful changes and follow-up.
- Cost-Benefit analysis and Productivity/Quality Improvement cases started to change the mindset and culture of ergonomics at the plant.

Implementation & Risk Reduction

CATEGORY 3

Challenges

- "Top 5" vs. "Quick Fixes"
- Disorganized action plan spreadsheets
- Difficulty in executing the action plan to completion.
  - Money
  - Support from management/operations

Engineering Design

CATEGORY 4

Category 4

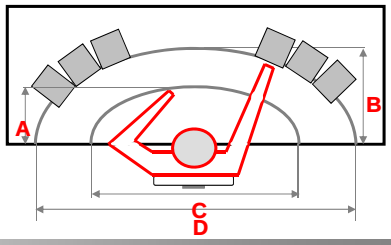
4. Engineering Design				
4.1	An ergonomics design checklist is officially embedded into the engineering design process.	*Low*	☐	Document Required
4.2	Project information related to upcoming launches and major revisions to existing assembly lines or workcells has been submitted.	*Medium*	☐	Document Required
4.3	The ergonomic design checklist is used to evaluate all design projects and is signed off by appropriate personnel.	*Very High*	☐	Document Required
4.4	Jack software has been used to assess new launches and an action plan for implementation has been developed and executed.	*Very High*	☐	Document Required
4.5	At least two engineers and two maintenance/tooling staff have been trained in ergonomics.	*Medium*	☐	Document Required

Engineering Design

CATEGORY 4

Strengths

- Majority of plants did not use or have an ergonomics design checklist in their engineering design process before this criterion 4.1.
- Design Checklist required sign-off by responsible engineer and a member of the Ergonomics Committee.



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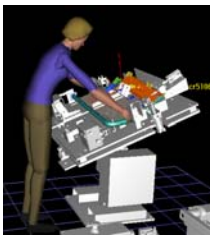
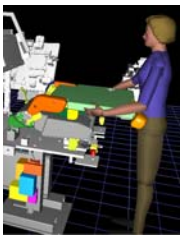
Engineering Design

CATEGORY 4

Challenges

- No accountability on when and how many times the design checklist should be completed.
- Siemen's Jack simulation can only be conducted by corporate ergonomist.
- No consistent design process across all plants due to the nature of a decentralized structured company.





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Metrics & Communication

CATEGORY 5

Category 5

5. Metrics and Communication				
5.1	Short-term measures have been collected, documented, and forwarded to the site management team.	*High*	☐	Document Required
5.2	Annual ergonomic incident & severity reduction targets have been identified and communicated, and are monitored regularly.	*Medium*	☐	Document Required
5.3	Long-term measures have been collected, documented, and forwarded to the site management team.	*Very High*	☐	Document Required
5.4	Long-term/short-term metrics and implemented improvement projects are communicated to all employees.	*Medium*	☐	Document Required
5.5	Employee feedback in regards to the ergonomic conditions of the facility has been collected.	*Medium*	☐	Document Required

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Metrics & Communication

CATEGORY 5

Strengths

- Majority of plants before criterion 5.3 did not statistically track ergonomics-related MSDs.
- Before/After Implementation Document
  - Impactful communication to the rest of the plant.
  - Abundant simple case studies submitted to corporate each quarter.

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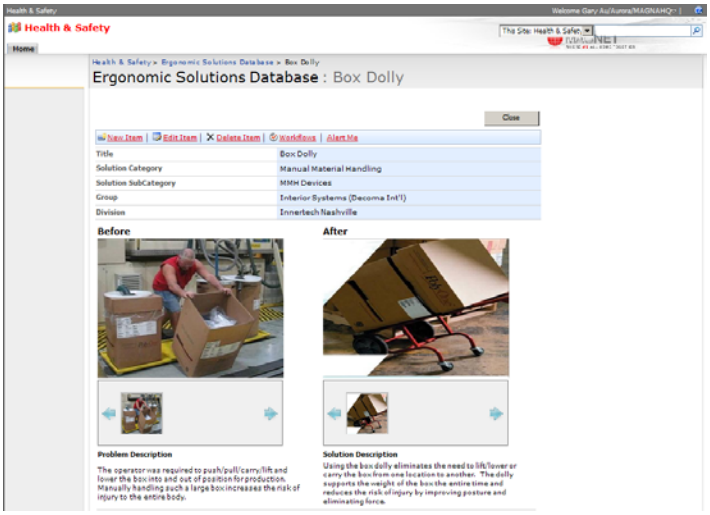
Ergonomics Solutions Database



Metrics & Communication

CATEGORY 5

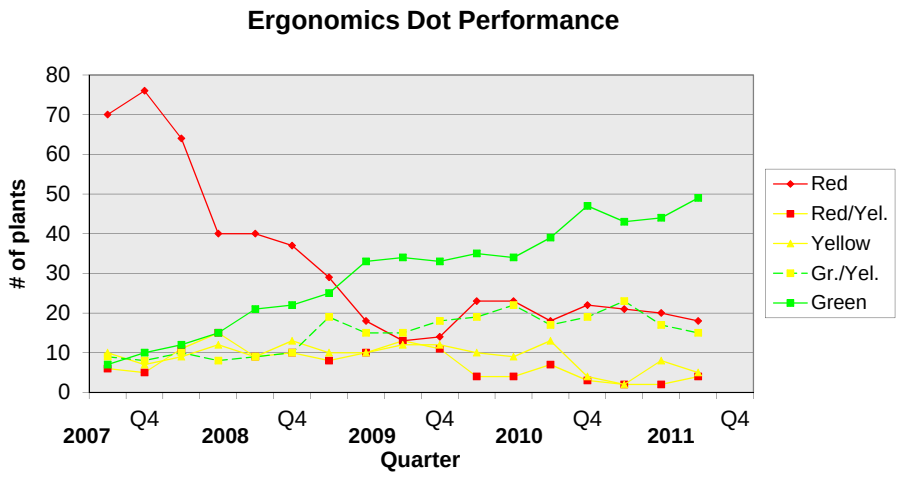
Challenges

- Short-term metrics were somewhat redundant due to accountability of previous criteria.
- Difficult to set targets and maintain accountability.

Results and Statistics

"Overall" Quarterly Scores

ERGONOMICS



Magna Wins Innovation Award

Michigan OSHA (MIOSHA)

The ***Ergonomic Innovation Award*** is presented for implementing ergonomic innovations to reduce job risk factors associated with musculoskeletal disorders (MSDs).

MIOSHA Director Doug Kalinowski:

"Magna is to be commended for their efforts to create a safe and healthy work environment at their Michigan facilities to reduce ergonomic hazards, protect workers and increase productivity."

MIOSHA
Michigan Occupational Safety and Health Administration

Magna Wins Innovation Award

<u>Magna's Innovation</u>: Implementation of the Magna Ergonomics Metrics/Criteria System.

- Drove structure, consistency, and feedback that led to plant floor ergonomic solutions & changes.
- Plant Visit: Fixes, interviewed operators, Ergo & Mgt. team.
- Injury Statistics

Continuous Improvement & Future

Key Changes for 2012

CONTINUOUS IMPROVEMENT

1. Increased weighting on Implementation & Risk Reduction (Category 3).
2. Ergonomics Analysis Tool inputs/data integrated and archived online.
3. Streamline the number of criteria and documentation files.

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1) Increase Weighting on Implementation

CONTINUOUS IMPROVEMENT

- Higher weight on Category 3: *Implementation & Risk Reduction* than other categories.
- 5 risk reduction solutions per quarter (criterion 3.3).
- Plant cannot score overall “Green” without credit on Criterion 3.3 alone.
- “After” solution photo required to close every action item.
- On-line Action Plan website.

Ergonomics Action Plan Module

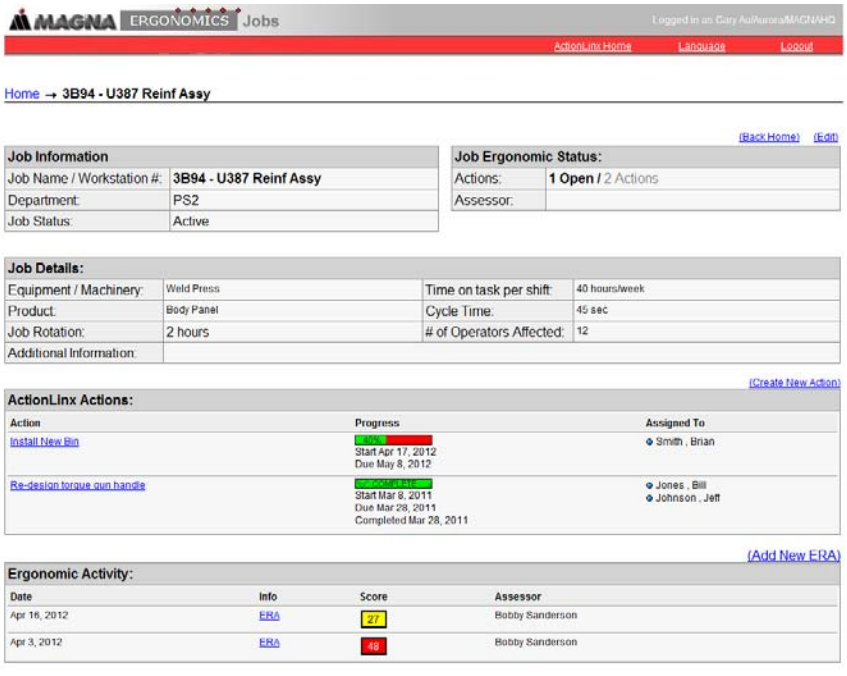
CONTINUOUS IMPROVEMENT

2) Integration of Analysis Tool Inputs

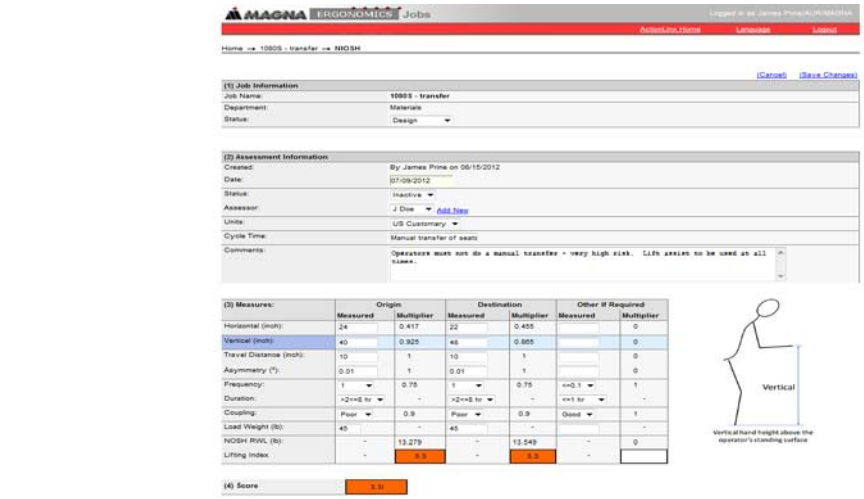
CONTINUOUS IMPROVEMENT

Spreadsheet

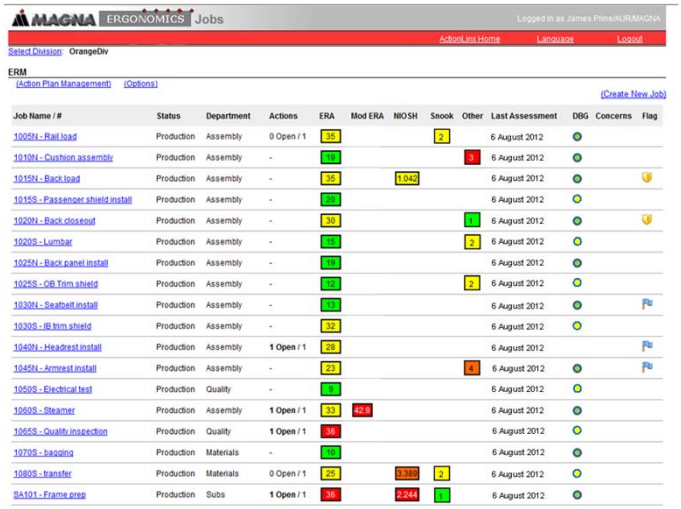
Magna Database



Example: NIOSH LI



Example: Job Summary View

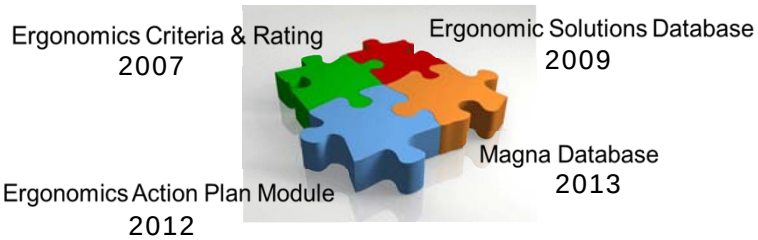


3) Streamline and Reduce Documentation

CONTINUOUS IMPROVEMENT

Ergonomics System Goals

- All ergonomics data has a single point of entry.
- All ergonomics data is saved and archived.
- All elements are integrated within one system.
- Fluid flow of risk data, scores, actions, and reporting.

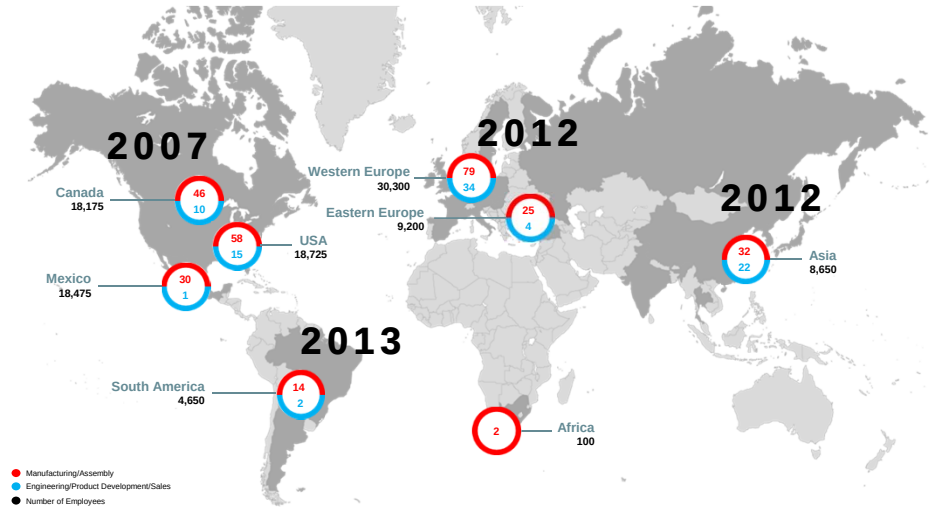


MAGNA

Global Roll-Out & Summary

Global Roll Out

ERGONOMICS



Global Roll-Out

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- Languages (e.g. 14 in Europe)
- Legislation (e.g. confidentiality laws in Austria/Germany)
- Consistent Auditing and Reviews (e.g. over 10 different corporate employees)
- Training (e.g. translators, qualified ergonomists)
- Analysis Tools (e.g. Key Indicators Method - KIM)

Overall Summary

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An effective Global Ergonomics Program and Metric system was achieved by:

- Establishing Management and Engineering support.
- Developing a robust scoring system based on a standard set of criteria.
- Creating a central database website that allowed program management and effective two-way communication.
- Quarterly reporting to ensure progress and accountability.

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QUESTIONS ?

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Thank You

Gary Au M.Sc., CPE
Manager, Global Ergonomics Program
Magna International Inc.
gary.au@magna.com

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