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# Initiating an Ergonomics Process – Tips, Tricks and Traps. Commentary from Focus Groups and Case Studies

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## **Initiating an Ergonomics Process - Tips, Tricks and Traps. Commentary from Focus Groups and Case studies**

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*Establishing a new ergonomics process in a company poses a special challenge to the ergonomics practitioner. The aim of this paper is to identify barriers and assists to the initiation of an ergonomics process and to raise awareness of these issues for both practitioners and researchers trying to initiate ergonomics intervention activities. We report on results from focus group sessions held with industrial personnel focussing on the initiation of ergonomics processes. Two cases of ergonomics process initiation are then presented and interpreted in light of these findings. Critical aspects for start up may include the point of entry into the organisation as well as both the base of support for ergonomics and the chain of authority in the organisation. Awareness of these factors will allow a growth strategy to be applied so that credibility, support, and activity expand from small but visible first ergonomics initiatives. Gaining support of top and middle managers is a key first objective.*

### **Keywords**

Ergonomics Process, Initiation stage, Case Study, Focus Group, Intervention

## **1 Introduction**

While much information exists about ergonomics tools and risk factor measurement approaches, much less is written about the ergonomics process in which the tool is used. Nevertheless good advice regarding ideal ergonomics processes exists (e.g. Cohen et al. 1997, General Accounting Office 1997, Macleod 1998, Alexander and Orr 1999). There is also growing awareness of the role of organisational structures in ergonomics (Hendrick and Kleiner 2001) and the potential of participatory ergonomics approaches (e.g. Haines et al. 2002). Less advice is available to assist with the initiation phase of ergonomics programs. Ergonomists however are not the only group trying to implement change – some advice is available from those implementing TQM for example (e.g. Ghobadian and Gallear 2001) and experiences from the health promotion sector,

identifying individual stages of behaviour change, are starting to be applied to ergonomics (Haslam 2002). The intent of this paper is to explore contextual and procedural factors related to the successful initiation of ergonomics activity in industry. Since the contextual factors in every ergonomics start-up can vary widely it is helpful to have a collection of approaches to help grow each new ergonomics process to suit the specific site. We explored ergonomics process initiation in two ways, firstly by drawing on the collective experiences of industrial personnel using a focus group approach. Secondly two case studies of ergonomics process initiation were examined. While both cases were from ergonomics intervention research this paper will focus on aspects relating specifically to the initiation of ergonomics activity inside the participating companies.

## **2 Focus Groups**

Two focus group sessions were run in 1999 involving a total of 18 individuals from different operations of 3 companies. Participants included workers, engineers, union representatives, managers, ergonomists, health and safety personnel, and human resources personnel. Results presented represent a distillation of participant experience and opinion on this topic.

Three aspects of initiating an ergonomics process emerged from this workshop. These included 1) Establishing management support, 2) Formation of the ergonomics team, and 3) Initiating improvement activities with small visible steps.

### **2.1 Step 1: Gaining Support**

Gaining the support of top management was identified as the most critical component in a successful ergonomics program without which any local ergonomics program would be “dead in the water”. Building the case for ergonomics was also discussed including education for managers, cost analyses, emphasis of long term benefits, emphasis of available research evidence, various forms of worker complaints, and (controversially) work-refusals and the incorporation of ergonomics into collective agreements.

*TRAPS:* Unsuccessful ergonomics attempts were attributed to a lack of financial and time resources required. Problems arise when managers were reluctant to give workers the responsibility for changes, a component believed to considerably increase worker buy-in to the process (Participatory Ergonomics).

*TRICKS:* Success was associated with having a clear mandate and lines of responsibility from managers requiring ergonomics be integrated into their daily operations. Establishing a budget specifically for ergonomics so that meaningful improvements can be achieved is also advisable. Managers must also put ergonomics on the priority list to ensure that ergonomic objectives are met.

### **2.2 Step 2: Forming a team**

The roles and responsibilities of various industrial stakeholders has been discussed previously (Neumann et al. 1999). In this workshop involvement of all stakeholders was recommended including: workers, management, health and safety, purchasing and engineering. All team members must have ongoing training in ergonomics, specific to their individual role in the ergonomics process. While ergonomics cannot be the responsibility of just one person, a facilitator who provides leadership and communications within the organization is necessary. All workshop members

recognised the importance of worker involvement in the ergonomics process consistent with the practice of participatory ergonomics.

*TRAPS:* Sites with troubled ergonomics processes found that, in the face of failed changes, fear of job-loss, or poor communications, workers dropped out of the process. This reaction established a cycle of failure for the program. Purchasing was one group recognized as having a role to play in ergonomics but who were not included in most operations. Engineering was also perceived as a road-block by some reporting a lack of ‘buy-in’ from this group, overriding issues from short development times, and lack of a specific mandate were all seen as barriers for embedding ergonomics considerations in design processes.

*TRICKS:* Participants reported that listening and responding promptly to worker suggestions built credibility and generated more worker participation. Assigning workers some responsibility for the improvements was seen as another way to build worker buy-in.

*TRICKS:* It was suggested that a relationship with engineering staff be built over time with informal interaction and discussion in order to gain credibility. Training, requiring engineers to conduct their own ergonomics assessments, and holding engineers responsible for the ergonomics of their designs (a management intervention) were cited as possible approaches to improving performance in this area.

### **2.3 Step 3: Start Small**

The first efforts of a new ergonomics team can be particularly challenging. Participants recommended starting with a small, simple change that creates a “win-win solution” to a specific problem. This type of intervention can be implemented with minimal resistance and help gain credibility among workers and others. Make sure that this change does not result in a job elimination! A growth strategy for ergonomics was recommended since it takes time to gain support and credibility among engineers and other groups; a slow start should be expected. Visits to other plants were recommended since they may have already solved similar problems and be able to provide assistance with solution development.

## **3 Case Studies**

We will now describe two case studies, which serve to illustrate and confirm comments made in the workshop. In both cases researchers were attempting to engage the corporation in a participatory approach to ergonomics in which the company would learn to identify and solve ergonomics problems in a continuous improvement mode.

### **3.1 CASE 1: Canadian Foam Manufacturing Plant – Ontario Site**

Plant 1 produced energy absorbing foam, primarily for automotive applications. The company was Canadian owned and had been engaged for a number of years in an “ergonomics initiative” which was partially funded by head office. The plant was a relatively new design in a growth product sector and had a number of ergonomics complaints associated with it. The research team was contacted and a ‘fast and dirty’ quantification of mechanical loading was conducted. The division vice-president (VP) was very interested in the quantified exposure data presented. He agreed to support a participatory ergonomics intervention process and participated in the initial announcements of the project and remained on the distribution list for minutes from the plant ergonomics team (PET) throughout the project.

This attention from a senior executive was helped in securing support from managers within the plant. While managers were in favour introducing an ergonomics program they faced many other demands on their time and energy. The PET was formed including managers representing production, human resources, maintenance, and the tooling department manager. Workers were represented on the PET but direct participation was encouraged through the testing of interventions, a suggestion box, and through interaction with PET members. The ergonomics team was able to make a number of improvements to the existing system and continued activities, although with reduced intensity, after the withdrawal of the research team 1 year later.

Ergonomic ‘spill-over’ (activity outside the immediate PET team’s work) was observed in a number of instances after the initiation of the ergonomics process. The machine shop initiated a re-design project to improve the working conditions for the skilled trades workers there. We believe support for this initiative was achieved due to credibility gains of the PET, even though this was not directly a PET initiative. About a year after the formation of the PET the engineering team from corporate headquarters approached the researchers for assistance in developing a design improvement for the latest version of this production system to be built at a new site. This project improved upon the design of the existing system, which the PET was currently unable to address due to cost constraints. These two examples demonstrate how an ergonomics program can, with appropriate management support, ‘grow’ out of an initial process to be incorporated into other areas of the companies’ activities.

It is interesting to note that a factory at the very same site declined to participate in this process. This second factory was part of a different company division, was not under the same VP, and was an older more mature facility with more difficult industrial relations. In this case both the management support and worker/union support structure were different – although the company was the same.

### **3.2 CASE 2: Multinational Electronics Assembly Company – Swedish Site**

The Swedish union Metall approached researchers due to high rates of musculoskeletal disorders among members. The union selected ‘Case 2’ a Swedish based manufacturing facility from an American multinational company with head-offices in Singapore. The company has implemented a standard production system design approach for all facilities world-wide. The local plant manager agreed to participate in the ergonomics intervention project with a stated goal to generate necessary ergonomics competencies inside the organisation. This goal was communicated in written form by e-mail but not reinforced by participation at any of the start-up meetings. There was initial resistance from the engineering representative and the production supervisor who felt the plant already had a process in place to deal with ergonomics. Comments from the management team suggested that previous intervention attempts, conducted outside of a participatory approach, were not successful and that ‘some kind of attitude change’ among operators was necessary. Nevertheless a participatory ergonomics improvement program was initiated and the engineer’s support seemed strong once his supervisor (the production manager) had agreed to proceed with the project.

Then complications prompted the production supervisor to terminate the process. The obstacle was related to possible use of video analysis as part of the ergonomics assessment process, which might compromise product confidentiality. A

more fundamental problem however appeared to be related to an unwillingness to initiate a participatory program since worker time could not be billed to a particular customer – no resources had been specifically allocated to ergonomics. Further issues were related to a lack of understanding or will to invest in a process that actively engaged the work force. In a subsequent meeting the plant manager decided to suspend the ergonomics process reacting to the production supervisor's strong resistance and citing the unfavourable economic climate at that time, which had necessitated recent layoffs in the white-collar workforce and might lead to layoffs among the production operators.

In Case 2 only the plant-level management, with quarterly performance responsibilities, were engaged. In this case the prospect of identifying possible problems with the production system model, a design dictated from corporate offices elsewhere, acted as a barrier. Furthermore in Case 2 the initiating drive came from the union, without top management support, which may have failed to motivate local managers to change current practices with regards to ergonomics. While the use of quantified data proved helpful in Case 1 it was not considered in decision making in Case 2. The researcher's (or ergonomist's) entry point to the company may signal the drive for ergonomics. Initiating ergonomics processes may be greatly assisted by gaining the support of decision makers responsibility for long term company objectives. This was not achieved in Case 2. It may also have been helpful to spend extra time educating and securing support from managers as soon as resistance was detected.

#### **4 Discussion and Conclusion**

These case studies highlight the importance of gaining support for the ergonomics process from the highest possible levels in the organisation. Both cases applied a 'standardised' production system model with an aggressive lead-time for the start-up of new systems as part of their competitive advantage. In Case 1 the engagement of senior management, with long-term strategic responsibilities, greatly facilitated the start up of a corrective ergonomics process that quickly began to identify opportunities for improvement at both the operational and design levels. In this case both the longer term relationship between researchers and company had served to build awareness, and possibly even credibility, for ergonomics. The company was aware of possible limitations to their production system design and was interested in optimising this design since they were planning to build more systems in this growth product area. In Case 2 it was not acceptable to question the production system design. We speculate that the local managers would not be rewarded by senior managers in North America for identifying problems (which might otherwise be called opportunities for improvement) in the production system model applied worldwide. In this case the quarterly responsibilities of the managers appeared to outweigh their long-term responsibilities for ergonomics considerations. It is possible that the involvement of a more senior manager with longer-term focus might have helped secure support for this investigation process.

The initiation of a new ergonomics program is a special and difficult aspect of ergonomics. While no research exists matching initiation strategy to success, it is clear that many contextual and individual factors are relevant. Quantitative exposure data may help secure management buy in – although obtaining this data requires a certain initial commitment. A growth approach is recommended in which credibility and scope is built up over time. Securing support from the many stakeholders inside the company



is difficult and may require a knowledgeable insider in order to identify relevant contextual factors such as industrial relations history, personal interactions, influential individuals and to help determine the best start-up approach. Senior management's demonstrated support appears to establish and maintaining an ergonomic priority. Resistance at any level of the cooperation may be sufficient to terminate an ergonomics initiative. The point of entry into the company, as well as the source of the ergonomics impulse should be examined in order to understand the existing support and possible barriers that may be raised by various stakeholders in the organisation. Obtaining visible support from all levels of management should be a priority, and may be a necessity, for the initiation of ergonomics in industry.

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## Initiating Ergonomics Processes - Tips, Tricks, and Traps

### *Commentary from Focus Groups and Case Studies*

Neumann et al. 2002



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## Introduction: Why Process?

1. Is a hammer or saw the best tool?
  2. Can I build a house with my hammer?
- ✦ Tool use depends on **PROCESS: WHAT** are you trying to do and **HOW** will you do it?
  - ✦ Process initiation is a special challenge  
(look to TQM and other processes for advice)



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## METHODS: 2 Types of Information

### 1. Case Studies:

*What seems to affect success of initiation efforts?*

2 Case Studies – Canada & Sweden

Qualitative assessment of start-up procedures

### 2. Focus Group Interviews:

*What advice do industry personnel have on initiating an ergonomics program?*

2 Focus group session, n=18,

3 companies – multiple sites each.



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## Case Study 1

- Canadian site
- Foam manufacturing
- Multinational company
- Standardised 'fast launch' production systems
- Researchers (UW) connected via ongoing Health & Safety initiative
- Participatory ergonomics



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## Case Study 2

- Swedish site
- Electronics Assembly
- Multinational company
- Standardised 'fast launch' production systems
- Researchers (NIWL) connected via new Union initiative
- Participatory ergonomics



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## Case 1: Initiation Process

- H&S contact researchers regarding opportunity
- Researchers conduct fast RF quantification
- VP provided with quantified data
- VP agrees to support process
- VP announces project and receives regular info
- Team is formed, billing code set, action initiated
- Ergo activity expands in scope ('spill-over' seen)
- Process continues after researchers withdraw

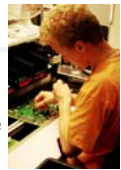


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## Case 2: Initiation Process

- Union approaches researchers due to disorders
- Local plant manager agrees to participate (e-mail)
- Initial meeting finds resistance (engineering, production manager)
- Process initiated
- Prod. Manager stops process of video collection
- Plant managers agree to terminate process due to difficult economic circumstances.



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## Success factors - Case 1

- Senior manager's active support
- Quantified exposure data appeared helpful in gaining support
- Establishment of budget & training of team
- Strategic desire to optimise production system design to avoid future ergonomic problems

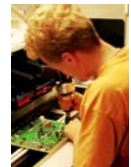


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## Failure Factors - Case 2

- No senior managers with long term responsibility engaged
- Union initiative may have lacked credibility
- Resources not allocated to process
- Would local managers be rewarded for finding ergo problems in global production strategy?
- Despite history of failed interventions participative process did not appeal
- Period of economic downturn



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## Focus Group Results

1. Gain management support
2. Formation of Ergonomics Team
3. Initiating Action: 1<sup>st</sup> Steps
  - *Consistent with current writings*



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## Results: 1<sup>st</sup> Gain Support

- Educate Managers
- Cost analyses & Injury stats
- Emphasize long term benefits
- Use available research evidence
- Use worker reports, work refusals, contracts
- Legal obligations
- Ergonomic assessment results (*less common*)



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## Results: 1<sup>st</sup> Gain Support

- Get managers to put ergo on priority list
- Establish clear lines of responsibility (Ergo work should not be an 'extra' job)
- Set a budget for ergonomics!



### TRAPS

- Lack of resources: financial & time
- Unwillingness to give workers responsibility



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## Results: 2<sup>nd</sup> Form a Team

- 'Cross Functional' teams recommended
- Train all members with *relevant* ergo info
- Assign or recruit a facilitator-leader
- Involve the workforce



### TRAPS

- Workers drop out with poor communications, failed changes, fear of job loss: 'cycle of failure'
- Purchasing not engaged but influential
- Engineering often resistant & distanced with conflicting demands and little ergo mandate



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## Results: 2<sup>nd</sup> Form a Team

- Rapid response to worker input build credibility and stimulates participation
- Give workers responsibility (participation)
- Build relationships with Engineers:
  - Specialised training
  - Informal contact
  - Accountability for (ergonomic) design flaws



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## Results: 3<sup>rd</sup> Start Small

- Start with small simple WIN-WIN solution to specific problem
  - establishes 'action pathway' & builds knowledge
  - builds credibility reduces resistance to change
  - make sure no jobs are eliminated!
  - Visit other sites to discover existing solutions
- Gradually expand scope of actions - slow steady growth.



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## Conclusions

- Much process knowledge exists in companies but is not enacted
- Senior manager support critical
- Quantified data helpful
- Resistance at any level may terminate process
- Point of entry of ergo may affect uptake
- Economic downturns can affect urge to change
- Contextual factors should be examined in intervention research!



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## Productivity - Ergonomics Relationships

		Ergonomics		
		Better	No Change	Worse
Productivity	Better	Go!	OK	\$ + pain
	No change	OK	➡	X
	Worse	Hidden Gains?	X	X



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